



**Milne Inlet Freshwater  
Fish Health Program  
2024 Report**

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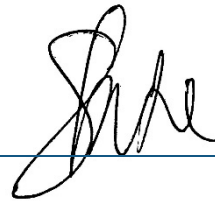
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## **Milne Inlet Freshwater Fish Health 2024 Program**

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## EXECUTIVE SUMMARY

The Mary River Project, owned and operated by Baffinland Iron Mines Corporation (Baffinland), is a high-grade iron ore mining operation located in the Qikiqtani Region of northern Baffin Island, Nunavut. Open pit mining, including pit bench development, ore haulage and stockpiling, and the crushing and screening of high-grade iron ore, commenced at the Mary River Project in mid-September 2014. During early years of mine operation (i.e., 2015 to 2017), the Project produced and transported up to 4.2 million tonnes per annum (Mtpa) of crushed and screened iron ore. Production increased between 2018 and 2024, during which time the Project was permitted to produce and transport up to 6 Mtpa to Milne Port. A proposal was made to double production to 12 Mt per year as part of the Phase II expansion, the review process for which involved extensive consultation with neighboring communities including Mittimatalik (Pond Inlet). During discussions with the community of Pond Inlet, the overall health of arctic charr (*Salvelinus alpinus*) within the freshwater environment was raised, as charr are culturally and nutritionally significant to Inuit. From these discussions, a requirement was included in the Baffinland Iron Mines Corporation Project Certificate (i.e., Condition 48(a)) that stipulated a plan be developed to evaluate the health of arctic charr in Milne Inlet as part of the Milne Inlet Freshwater Fish Health Monitoring Program (the Program). The project has since reverted back to the original Early Revenue Phase permitted amount of 4.2 Mtpa.

This report and its findings, in concert with its appended components including documentation of consultation and partnership with the Mittimatalik Hunters and Trappers Organization (MHTO), and all monitoring data pertaining to the presence and health of arctic charr in lakes within the watershed proximal to the mine, tote road, and Milne Inlet Port project development areas, satisfies Condition 48(a) of the Project Certificate. It was designed in coordination with the community to monitor the health of arctic charr populations proximate to Baffinland's Milne-Port Operations. Field sampling in 2024 represented the third year of data collection for the program, with sampling also completed in 2021 and 2022 by Minnow Environmental Inc. (Minnow) in collaboration with community members from the MHTO, the Qikiqtani Inuit Association (QIA), and the Hamlet of Pond Inlet. Qurluktuk and Ikaluit lakes were sampled in 2024; however, due to weather constraints, sampling was not conducted at Tugaat Lake (previously sampled in 2021 and 2022).

Water collected from the littoral zones of both study lakes during August 2024 indicated that concentrations of all assessed analytes were below Canadian Water Quality Guidelines for the Protection of Aquatic Life. Aqueous total mercury was below detection limits (<0.000026 mg/L) in both lakes. Based on water chemistry, each lake is classified as oligotrophic, which is common for Arctic lakes.





Arctic charr were caught by gillnetting from the two study lakes in 2024. Consistent with previous years, arctic charr was the only fish species captured in both Qurluktuk Lake ( $n = 39$ ) and Ikaluit Lake ( $n = 37$ ). Despite Qurluktuk Lake having a slightly higher total catch, catch-per-unit-effort (CPUE) was greater in Ikaluit Lake (11.4 fish/100 metre/hour [m·hr], compared to 0.74 fish/100 m·hr). CPUE in Ikaluit Lake was higher and CPUE in Qurluktuk Lake was lower in 2024 compared to 2022 (i.e., 1.00 fish/100 m·hr and 4.53 fish/100 m·hr, respectively), likely attributable to factors such as weather, net set locations, time of day of sampling, and annual climate variability.

In 2021 and 2022, the life history strategy of captured arctic charr was assumed based on growth patterns (i.e., resident fish were older-at-size indicating slower growth). To expand on the assessment of life history strategy in 2024, otolith microchemistry was completed on 20 arctic charr from Qurluktuk Lake using laser ablation. Of the otoliths analyzed, 19 individuals displayed an anadromous life history strategy (i.e., migration to the marine environment at least once), while only one individual exhibited a resident life history (i.e., no evidence of marine migration). Age-at-first marine migration among anadromous individuals ranged from three to 14 years, with an average age of nine years. The number of resident individuals captured from Qurluktuk Lake was lower in 2024 than in 2022 (i.e., one vs. six), assuming residents were accurately identified using growth patterns in 2022.

In 2024, Inuit team members had to depart prior to the processing of all fish. Minnow biologists applied Inuit Qaujimagatuqangit (IQ), as shared by experienced hunters and trappers to classify fish life history strategy by visual assessments to compare with otolith microchemistry results. Through visual assessment, 12 out of 20 fish were identified as residents, however, none of these matched the resident individual identified by otolith microchemistry analysis. Inaccuracy in classification by visual assessments was considered to be influenced by the absence of Inuit collaborators to support incorporation of IQ into visual assessments during fish processing, in addition to handling effects on fish prior to assessment (e.g., phenotypic changes due to freezing and thawing).

Life history strategy classifications were determined from the otolith microchemistry for fish classification in subsequent analyses. The single resident fish identified in Qurluktuk Lake was not included in the health analyses in 2024 since the sex was undetermined; however, it was included in the tissue analysis.

Female arctic charr from Qurluktuk Lake were older, longer, and heavier than those sampled from Ikaluit Lake in 2024. The single male fish sampled from Qurluktuk Lake, was within the range of age, body weight, and length of male fish sampled from Ikaluit Lake in 2024.





Growth (i.e., length-at-age) of female arctic charr was higher in Qurluktuk Lake than Ikaluit Lake in 2024, which is inconsistent with results from 2022 where a larger proportion of individuals in Qurluktuk Lake exhibited a resident life history in 2022 (i.e., six suspected residents in 2022 versus one in 2024). Energy storage endpoints were assessed in 2024, where relative liver weight was significantly lower in female Qurluktuk Lake charr compared to Ikaluit Lake but there was no significant difference in body condition (i.e., weight-at-length). Weight-at-age and relative gonad weight, were both significantly greater in females from Qurluktuk Lake than Ikaluit Lake in 2024. Female arctic charr from Qurluktuk Lake expended more energy on reproductive tissues (i.e., higher relative gonad weight), diverting it from storage in the liver (i.e., lower relative liver weight).

Temporal trends in health endpoints in Qurluktuk Lake were compared across the three post-mining sampling years and pre-mining literature data. While some metrics such as length and body condition were higher in recent years, confounding factors, particularly the varying ratios of anadromous to resident individuals, limit definitive conclusions. Data from Ikaluit Lake (2022 to 2024) showed no significant differences in female health indicators and only a minor difference in male body condition, suggesting stable conditions.

Mercury concentrations in fish muscle and liver tissue from both lakes were generally below Health Canada consumption guidelines (i.e., 0.5 mg/kg ww), with only one liver sample, from the resident individual, from Qurluktuk Lake exceeding the limit. Fewer mercury guideline exceedances were observed in fish tissues from Qurluktuk Lake in 2024 than in previous years, where there were several muscle and liver samples above the guideline, all from fish that were assumed to demonstrate resident life histories. These findings are consistent with the literature about the influence of life history on mercury concentrations in arctic charr, which indicates that anadromous individuals are typically faster growing than their resident counterparts, and consequently have lower tissue mercury concentrations (i.e., growth dilution). As in 2022, mean mercury concentrations were higher in the tissues of Qurluktuk fish than Ikaluit fish. Iron naturally occurs in fish tissues and the concentrations in fish tissues from both lakes were within safe dietary limits and consistent with the nutritional information provided by Health Canada, such that consumption of several kilograms of fish would be required to exceed the Health Canada recommendation of a daily upper limit of iron intake of 45 mg/day (2023). Arsenic (in its non-toxic arsenobetaine form), cadmium, copper, and selenium exceeded Health Canada benchmarks in some tissue samples, but reflect natural conditions in the study lakes and are considered a product of the local geochemistry and fish physiology.

The 2024 Program built on previous years' efforts to evaluate the health of arctic charr populations in lakes near Baffinland's Milne Port Operations. Overall, findings suggest that charr populations





are healthy, with fish health endpoints generally within expected natural ranges compared to historical data and contaminant concentrations in fish tissues below Health Canada guidelines. Observed variations between lakes and over time are likely attributable to natural ecological differences, including differences in life history strategies. This study fulfills Condition 48(a) of the Project Certificate and reflects meaningful collaboration with community partners, including the MHTO. The findings of the 2024 Milne Inlet Freshwater Fish Health Monitoring Program in concert with results from previous years, indicate that fish health, tissue contaminants, and water quality remain stable and within previously observed ranges, with no consistent patterns of change pre or post-mining.

Given the lack of consistent patterns and the slow-growing nature of arctic charr, if future sampling is conducted it would fall on a triennial basis rather than annually. This frequency would maintain effective long-term monitoring while reducing the intensity of field efforts and unnecessary harvesting and is in alignment with Federal Environmental Effects Monitoring timelines. Results from the Milne Inlet Freshwater Fish Health Program will be presented to determine a path forward for potential future monitoring in alignment with the perspectives of the MHTO and Baffinland.





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## ACRONYMS AND ABBREVIATIONS

**ALS** – ALS Environmental  
**ANCOVA** – Analysis of Covariance  
**ANOVA** – Analysis of Variance  
**Baffinland** – Baffinland Iron Mines Corporation  
**BCWQG** – British Columbia Water Quality Guidelines  
**BIM** – Baffinland Iron Mines  
**CCME** – Canadian Council of Ministers of the Environment  
**COC** – Chain-of-Custody  
**CPUE** – Catch-per-Unit-Effort  
**CRC ICPMS** – Collision/Reaction Cell Inductively Coupled Plasma Mass Spectrometry  
**CVAAS** – Cold Vapour-Atomic Absorption Spectroscopy  
**CWQG** – Canadian Water Quality Guidelines  
**DFO** – Fisheries and Oceans Canada  
**DOC** – Dissolved Organic Carbon  
**DQO** – Data Quality Objectives  
**DQR** – Data Quality Review  
**EEM** – Environmental Effects Monitoring  
**GPS** – Global Positioning System  
**hr** – Hour  
**IKLL** – Ikaluit Lake  
**IQ** – Inuit Qaujimajatuqangit  
**JHA** – Job Hazard Analysis  
**LA-ICP** – Laser Ablation Inductively Coupled Plasma Mass Spectrometry  
**LRL** – Laboratory Reporting Limit  
**m** – metre  
**MCT** – Measures of Central Tendency  
**MDD** – Minimum Detectable Difference  
**MHTO** – Mittimatalik Hunters and Trappers Organization  
**Minnow** – Minnow Environmental Inc.  
**MOD** – Magnitude of Difference  
**Mtpa** – Million Tonnes per Annum  
**M-W** – Mann-Whitney  
**NIST** – National Institute of Standards and Technology  
**The Program** – The Milne Inlet Freshwater Fish Health Program





**QIA** – Qikiqtani Inuit Association

**TDS** – Total Dissolved Solids

**TKN** – Total Kjeldahl Nitrogen

**TOC** – Total Organic Carbon

**TSS** – Total Suspended Solids

**QA/QC** – Quality Assurance / Quality Control

**QURL** – Qurluktuk Lake

**UTM** – Universal Transverse Mercator

**WQG** – Water Quality Guidelines





# 1 INTRODUCTION

## 1.1 Project Background

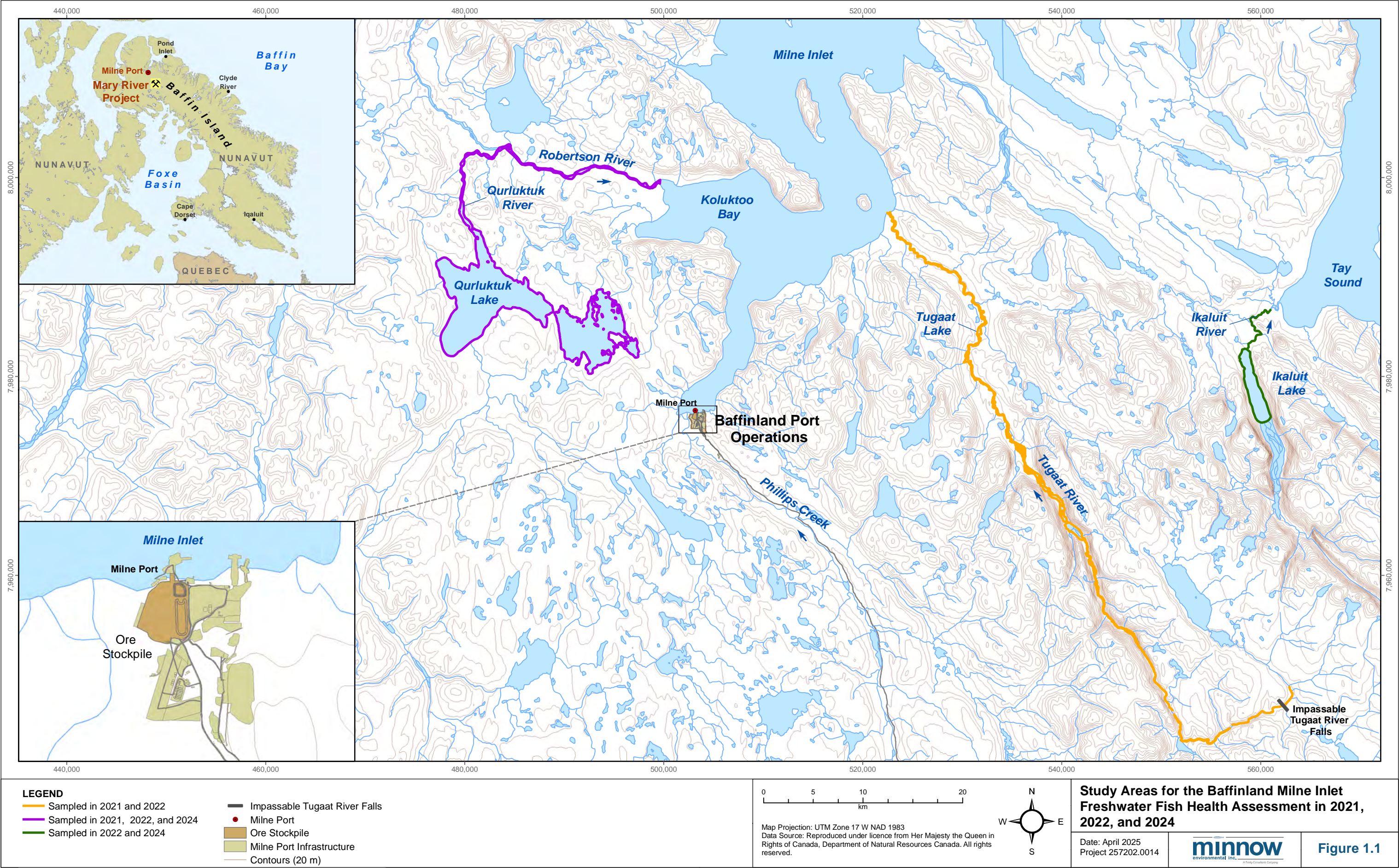
The Mary River Project, owned and operated by Baffinland Iron Mines Corporation (Baffinland), is a high-grade iron ore mining operation located in the Qikiqtani Region of northern Baffin Island, Nunavut (Figure 1.1). Open pit mining, including pit bench development, ore haulage and stockpiling, and the crushing and screening of high-grade iron ore, commenced at the Mary River Project in mid-September 2014. Crushed and screened ore is transported by truck to Milne Port, which is located approximately 100 kilometres (km) north of the mine site. At Milne Port, the ore is stockpiled before being loaded onto bulk carrier ships for transport to international markets during the summer ice-free period. No milling or additional ore processing is conducted on-site, and thus no tailings are produced at the Mary River Project. All waste rock generated at the Project is deposited at a waste rock stockpile facility at the mine site. During early years of mine operation (i.e., 2015 to 2017), the Project produced and transported up to 4.2 million tonnes per annum (Mtpa) of crushed and screened iron ore. Production increased between 2018 and 2024, during which time the Project was permitted to produce and transport up to 6 Mtpa to Milne Port.

In 2018, a proposal was made to double production to 12 Mt per year as part of the Phase II expansion, the review process for which involved extensive consultation with neighboring communities including Mittimatalik (Pond Inlet). This proposal was denied in November 2022 by the Federal Minister; however, engagement associated with this process continued with the local communities and hunters and trappers. Part of the original expansion review process involved extensive consultation with neighboring communities, including Mittimatalik (Pond Inlet). During discussions with the community of Pond Inlet (Appendix A), the overall health of arctic charr (*Salvelinus alpinus*) within the freshwater environment proximal to Milne Port was raised as a concern, as charr are culturally and nutritionally significant to Inuit. From these discussions a requirement of Baffinland Iron Mines Corporation (Baffinland) was added to the Project Certificate, which stipulated a plan be developed for a Milne Inlet Freshwater Fish Health Program.

The Milne Inlet Freshwater Fish Health Program (the Program) serves to satisfy Term and Condition 48(a) of the Project Certificate for the Baffinland Mary River Project. Condition 48(a) of the Project Certificate stipulates that “the Proponent shall develop plans to conduct additional surveys for the presence of arctic charr in freshwater bodies and ongoing monitoring of arctic charr health where applicable, within watersheds proximal to the mine, tote road, and Milne Inlet Port project development areas, including but not limited to Phillips Creek,









Tugaat Lake and Qurluktuk Lake. The Proponent shall consult with the Mittimatalik Hunters and Trappers Organization (MHTO) regarding the design, timing, and location of the proposed surveys and ongoing monitoring.”





## 1.2 Monitoring Background

### 1.2.1 Arctic Charr

Arctic charr (Photo 1.1) are culturally and nutritionally significant to Inuit, and are widely distributed across the Arctic, occupying the most northerly range of any freshwater fish species (Scott and Crossman 1973). Arctic charr can exhibit one of three life history strategies: landlocked, resident, and migratory/anadromous (Power 2008). Landlocked charr inhabit in lakes where there is no access to the marine environment. In contrast, resident charr have access to the marine environment but choose not to migrate, while anadromous (i.e., searun, migratory) have access to the marine environment and undertake seasonal migrations during the open water period. All lakes included in the Program have access to the marine environment. For the purposes of this report a 'resident' charr refers to an individual that has never migrated to the marine environment, while an 'anadromous' charr refers to an individual that has migrated at least once<sup>1</sup>. They are elongate members of the *Salmonidae* family, with an average length between 381 and 457 mm (Scott and Crossman 1973). There is substantial variability in arctic charr colour, ranging from silver to a vibrant orange, especially during spawning. Charr typically spawn in September or October, coinciding with the return of anadromous individuals to the freshwater environment. Spawning occurs in freshwater, over gravel or on rocky shoals in lakes or in deep river pools. Male fish establish and guard territories, while females prepare the nest. Typically, anadromous females produce between 3,000 and 5,000 eggs and spawn every two to three years (see Roux et al. 2011).

### 1.2.2 Program Development

Following the requirements of Condition 48(a) in the Project Certificate, Baffinland initiated the Program in January 2021. A proposed study design was developed to assess the health of arctic charr in lakes near Milne Inlet that were identified as significant by the community (i.e., Tugaat and Qurluktuk lakes; Figure 1.1; Appendix A). This design was presented for feedback during the first community engagement meeting of the program on February 18, 2021 (Appendix A). The meeting was held virtually between Baffinland, Minnow Environmental Inc. (Minnow), and the MHTO (Appendix A). The goal of that meeting was to gather comments specifically on study objectives, sampling locations, and design. The primary outcomes from this meeting included:

- the addition of Ikaluit Lake to the program (Figure 1.1);

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<sup>1</sup> Arctic charr life history is plastic; individuals may exhibit a resident life history for many years and then shift to a migratory life history.







**Photo 1.1:** Arctic Charr (*Salvelinus alpinus*), sampled from Tugaat Lake North Baffin Island, 2021



- the expression of interest in the mercury and iron concentrations in charr tissue from study lakes from a consumption/human health perspective; and
- the refinement of the proposed program objectives and study design.

Although mercury is not a contaminant associated with mining, hauling, shipping, or dust generation from the mine, it is a global pollutant which comes to the Arctic through long range air transport. Mercury bio accumulates through the food web and so has been identified as a contaminant of concern in the Arctic. Following conversations with the MHTO the study approach was established such that the Tugaat River (Tugaat Lake; Figure 1.1, Photo 1.2), the Ikaluit River (Ikaluit Lake; Figure 1.1, Photo 1.3), and the Robertson River (Qurluktuk Lake; Figure 1.1, Photo 1.4) would be sampled to assess arctic charr health.

### 1.2.3 Study Areas

Tugaat Lake (surface area = 0.33 km<sup>2</sup>; Figure 1.1) represents a widening of the Tugaat River which flows into Milne Inlet approximately 120 km southwest of the community of Pond Inlet and provides critical overwintering habitat for the Tugaat River population of arctic charr. A waterfall upstream of Tugaat Lake (Figure 1.1) acts as a migration barrier to/from the larger lakes present upstream in the watershed (DFO 2004). A mark-recapture study undertaken in 1980 indicated that the population was being over-exploited. Subsequently, Fisheries and Oceans Canada (DFO) and the MHTO decided to decrease the yearly arctic charr quota in 1985 from 1,400 kg to 1,000 kg, and in 1993, it was recommended that the commercial fishery be closed, and, since then, records indicate a recovery of the population (DFO 2004). The MHTO maintains two cabins on the shores of Tugaat Lake for subsistence fishing.

Ikaluit Lake is an oblong lake (surface area = ~9.1 km<sup>2</sup>; Figure 1.1) approximately 90 km southwest of Pond Inlet that flows into Tay Sound via the Ikaluit River. The lake has been an important area for commercial and subsistence fishing since the 1960's. An assessment of the commercial harvest in 1989 revealed that the stock was not overexploited at the time of the survey, and a provisional quota of 2,300 kg was recommended (DFO 1998).

Qurluktuk Lake is a large lake (surface area = ~93.8 km<sup>2</sup>; Figure 1.1) located northwest of Baffinland's Milne Port Operations that flows into Koluktoo Bay. The lake is the largest in the watershed and provides important overwintering habitat for the Robertson River arctic charr population. Prior to 1978, a commercial fishery existed on the Robertson River with an annual harvest quota of 4,536 kg; however, at the time of a 1979 report, it was revealed that a decision had been made by the Inuit of Pond Inlet to leave this area primarily to sport fishing, and to concentrate their subsistence fishing efforts to the Tugaat River fishery (DFO 1979).







**Photo 1.2:** Tugaat Lake, North Baffin Island, 2021





**Photo 1.3:** Ikaluit Lake, North Baffin Island, 2024





**Photo 1.4:** Qurluktuk Lake, North Baffin Island, 2024



#### 1.2.4 Final Study Design

The final study design targeted the three lakes identified during consultation, which were to be sampled in late summer (August). Supporting water and sediment samples from the lakes were to be collected concurrently. A target sample size of 40 arctic charr per lake (i.e., 20 males, 20 females) was established prior to the survey. Arctic charr were to be collected using gillnets, dispatched in the field, and transferred to the mine site for processing. In addition to standard measurements, aging structures (i.e., otoliths and pectoral fin rays) and tissues (i.e., muscle and liver) were to be collected for aging and metals analysis, respectively. Health endpoints of interest were to include:

- length-frequency distribution;
- age-frequency distribution;
- age;
- fork length;
- body weight;
- length-at-age (i.e., growth);
- weight-at-age (i.e., growth); and
- condition.

#### 1.2.5 2021 Summary

The 2021 field collection took place on August 16 and 17 in Tugaat Lake and August 18 and 19 in Qurluktuk Lake with a representative of the Qikiqtani Inuit Association [QIA]), two representatives from Minnow, and one representative from the community of Pond Inlet. Due to unsafe helicopter travel conditions related to weather, Ikaluit Lake was not sampled in 2021.

Arctic charr were captured using bottom-set gillnets (102 mm and 127 mm [i.e., 4" and 5"] mesh; 45 m in length) which were deployed in a non-randomized design, targeting areas of the lake which were familiar to the representative from Pond Inlet. In Tugaat Lake, 46 fish were captured, eight of which were juveniles and released alive upon removal from nets. In total, eight net sets were deployed and catch-per-unit-effort (CPUE) for these net sets ranged from 0 to 17.50 fish/hour. Of the 38 adult fish retained, 11 were female, 24 were male, and three were undeveloped adults (Minnow 2023). In Qurluktuk Lake, 39 fish were captured, of which 15 were juveniles and released upon removal from the nets. Catch rates were comparatively lower in Qurluktuk Lake than Tugaat Lake, with CPUE ranging from 0 to 2.32 fish/hour. Of the 24 adult





charr that were collected from Qurluktuk Lake, 7 were female, 13 were male, and 4 were undeveloped adults (Minnow 2023).

Health indicators (i.e., survival, body size, energy usage, energy storage) were calculated separately for males and females and spatially compared between Qurluktuk and Tugaat lakes. Briefly, both males and females sampled from Qurluktuk Lake were older, longer, and heavier than those collected from Tugaat Lake, while relative gonad weight for both males and females sampled in Tugaat Lake were greater than from those collected in Qurluktuk Lake. Differences in relative egg weight and fecundity for females sampled across waterbodies were not significant, nor were differences in condition for either males or females (Minnow 2023).

Fish tissue analysis was also undertaken on a subset of sampled arctic charr, focused particularly on mercury concentrations in muscle and liver tissues as they relate to safe consumption guidelines, and compared spatially between lakes. Analyses revealed that mean concentrations of mercury in muscle and liver tissue of arctic charr from both lakes were below the Health Canada consumption guideline of 0.5 mg/kg wet weight (Minnow 2023). Further, mercury concentrations in both muscle and liver tissue from charr collected from Qurluktuk Lake were greater than from those collected from Tugaat Lake, though this was not surprising given the observed differences in age and size of charr between the lakes (i.e., charr from Qurluktuk Lake were larger and older than charr from Tugaat Lake; Minnow 2023).

### 1.2.6 2022 Summary

Field collection took place between August 19 and 24 in Tugaat, Qurluktuk, and Ikaluit lakes. Sampling efforts were completed by representatives from Pond Inlet, the MHTO, and the QIA as well as two representatives from Baffinland, and two representatives from Minnow.

Arctic charr were captured using bottom-set gillnets (102 mm and 127 mm [i.e., 4" and 5"] mesh; 45 m in length ) which were deployed in a non-randomized design, targeting areas of the lakes which were familiar to the community elder and MHTO representative, who pointed out inuksuit indicating rich fishing areas.

In 2022, total catch was greatest in Tugaat Lake ( $n = 93$ ), followed by Qurluktuk Lake ( $n = 57$ ), and Ikaluit Lake ( $n = 40$ ; Minnow 2023). However, CPUE was the highest in Ikaluit Lake (4.53 fish/100 m<sup>2</sup>·hr) followed Tugaat Lake (1.75 fish/100 m<sup>2</sup>·hr) then Qurluktuk Lake (1.00 fish/100 m<sup>2</sup>·hr; Minnow 2023).

Growth as represented by either total body weight or fork length relative to age, suggested that there are mixed sub-populations of resident and anadromous individuals co-existing in the study lakes, a common structure in arctic charr populations (Young et al. 2021). As such, pooled analysis comprising individuals of different life history strategies, such as the Qurluktuk





Lake sample (which featured six older, likely resident individuals) produced unrealistic statistical trends such as negative growth relationships.

Arctic charr captured in Ikaluit Lake, especially males, were significantly longer and heavier (mean = 58.5 cm and 2,385 g) than charr captured in either Qurluktuk Lake (mean = 51.8 cm and 1,424 g) or Tugaat Lake (mean = 46.7 cm and 1156 g). Charr captured in Ikaluit Lake were also younger on average than charr captured in Qurluktuk Lake, and males had higher growth rates suggesting a greater proportion of the Ikaluit charr were anadromous. Arctic charr captured in Tugaat Lake were significantly younger than charr captured in either of the other study lakes.

Energy storage varied greatly within and between lakes, indicating that charr within the area do not spawn yearly (Dutil 1986), have different life history strategies (resident vs anadromous), and/or that migration/spawning timing relative to sampling timing may be different among the study lakes. Condition in male charr was not significantly different between lakes in 2022; however, females were significantly heavier at length in Tugaat Lake compared to both Qurluktuk and Ikaluit lakes and significantly heavier at length in Qurluktuk Lake compared to Ikaluit Lake.

Temporal trends for both Qurluktuk and Tugaat lakes indicated that both male and female arctic charr sampled in 2022 were significantly younger, shorter, and lighter than charr described in the historical data. Growth varied significantly depending on the years and sexes compared; however, the 2022 and 2021 data for males and the 2022 data for females from Qurluktuk Lake and 2022 data for males in Tugaat Lake indicated that condition was significantly greater (heavier at length) than those from historic sampling events.

For all lakes, mean mercury concentration in muscle tissue was below Health Canada's Human Health consumption guideline for fish (0.5 mg/kg dw; CFIA 2015), and across lakes was highest in Qurluktuk Lake, followed by Ikaluit Lake and then Tugaat Lake. Total mercury concentrations in arctic charr muscle relative to length demonstrate a relationship of increasing mercury concentrations with size/age and individuals identified as likely to be resident arctic charr in 2022 (characterized by slower growth rates) in Qurluktuk Lake also had the highest concentrations of mercury of all sampled fish. Although no consumption guideline exist for iron concentrations in fish tissue, Health Canada does recommend fish as a good natural source of iron with a daily upper limit of iron intake of 45 mg/day (2023). The iron concentrations in both muscle and liver tissues reported were well below this limit, assuming a standard serving size of 75 g.

### 1.3 2024 Objectives

Following engagement with project partners, Inuit community members, and the MHTO, program objectives were reviewed, and the following primary objectives were identified for 2024:

1. collect fish health samples from all three study lakes;





2. continue to assess status of fish health in the chosen study lakes for comparison in future studies;
3. continue to compare fish health from before and after the initiation of mining operations in lakes proximal to the mine, tote road, and Milne Inlet Port identified as significant by community partners;
4. continue to monitor fish tissue metal concentrations, specifically iron and mercury as identified by MHTO;
5. complete an assessment of arctic charr life history in Qurluktuk Lake to elucidate sub-populations and improve interpretation of fish health endpoint results; and,
6. continue to engage with the MHTO regarding the results, design, timing, and location of monitoring.





## 2 METHODS

### 2.1 General Overview

The Program was designed to monitor the health of arctic charr populations proximate to Baffinland's Milne Port Operations as identified by the local community. The 2024 program included assessment of water quality, and collection and sampling adult arctic charr for fish health endpoints<sup>2</sup>. Sampling was conducted within two lakes<sup>3</sup> in 2024 that are situated along river systems that flow into Milne Inlet, including Qurluktuk Lake (QURL) and Ikaluit Lake (IQLL) lakes (Figure 1.1). Sampling was completed by Minnow in collaboration with community members from the MHTO, the QIA, and the Hamlet of Pond Inlet. The study was implemented from August 26 to 28, 2024 (Appendix Photos E.1 to E.5).

### 2.2 Field Program Safety

Prior to the first field day, the team reviewed the Job Hazard Analysis (JHA) and discussed planned fishing locations and techniques. All lakes were accessed via helicopter from the Milne Port Site.

Field safety was a priority for this program, and several precautionary measures were implemented during the field study to maintain safety of the field crew and address potential safety incidents. For example, during sampling at each lake, a second boat and motor was stationed at the shore together with a second set of crew members in the event of any mechanical and/or safety issues (e.g., man overboard, or capsizing) with the primary sampling vessel/crew members. Each vessel was also outfitted with a boat safety kit that, in addition to standard boat safety items, included survival gear that could be used in the event of an inability to depart from the sampling area for an extended period (e.g., >24 hours). All personnel wore personal floatation devices on the water, and the team had at least two modes of communication (e.g., radio, InReach, or satellite phone) for check-ins and emergency communication with Baffinland personnel at the mine site and/or port facility. No field-related injuries or safety incidents occurred throughout the duration of the field program.

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<sup>2</sup> The Program has previously included sediment sampling; however, this was deemed unnecessary for the 2024 study due to low sediment accumulation rates in these lakes.

<sup>3</sup> The study design included a third study lake (Tugaat Lake); however, weather conditions for helicopter transport were unfavorable for the duration of the program, and teams were unable to make it to all three lakes. Ikaluit and Qurluktuk lakes were prioritized because there was only one year of prior data from Ikaluit Lake, and there was a proposed additional research question (i.e., elucidation of sub-population life histories) for investigation at Qurluktuk Lake.





## 2.3 Water Chemistry Data Collection

### 2.3.1 Sample Collection and Laboratory Analysis

One set of water chemistry samples was collected from each of Qurluktuk and Ikaluit lakes in 2024 concurrent with fish sampling (Figures 2.1 and 2.2). Water samples were collected below the water surface, to avoid capturing floating material. At each study location, water was filled by hand directly into pre-labelled sample bottles. For samples requiring preservation, chemical preservatives were added to the samples before capping the bottles, or for sample bottles that were pre-dosed with chemical preservatives, the bottle was filled using a sample transferred from a separate bottle. Following collection, water chemistry samples were placed into coolers in the field and held at 4°C at the Mary River Milne Port and/or Mine Site prior to shipment to the analytical laboratory.

Water chemistry samples were shipped on ice to ALS Environmental (ALS; Waterloo, Ontario) for analysis of pH, conductivity, hardness, total suspended solids (TSS), total dissolved solids (TDS), anions (alkalinity, bromide, chloride, sulphate), nutrients (ammonia, nitrate, nitrite, total Kjeldahl nitrogen [TKN], total phosphorus), dissolved and total organic carbon (DOC and TOC, respectively), mercury, total and dissolved metals, and phenols using standard laboratory methods.<sup>4</sup> The laboratories operated by ALS are accredited by the Canadian Association for Laboratory Accreditation Inc. The water chemistry sample shipment was accompanied by a chain-of-custody (COC) form, a list of expected Laboratory Reporting Limits (LRLs), and laboratory quality assurance/quality control (QA/QC) requirements.

### 2.3.2 Data Analysis

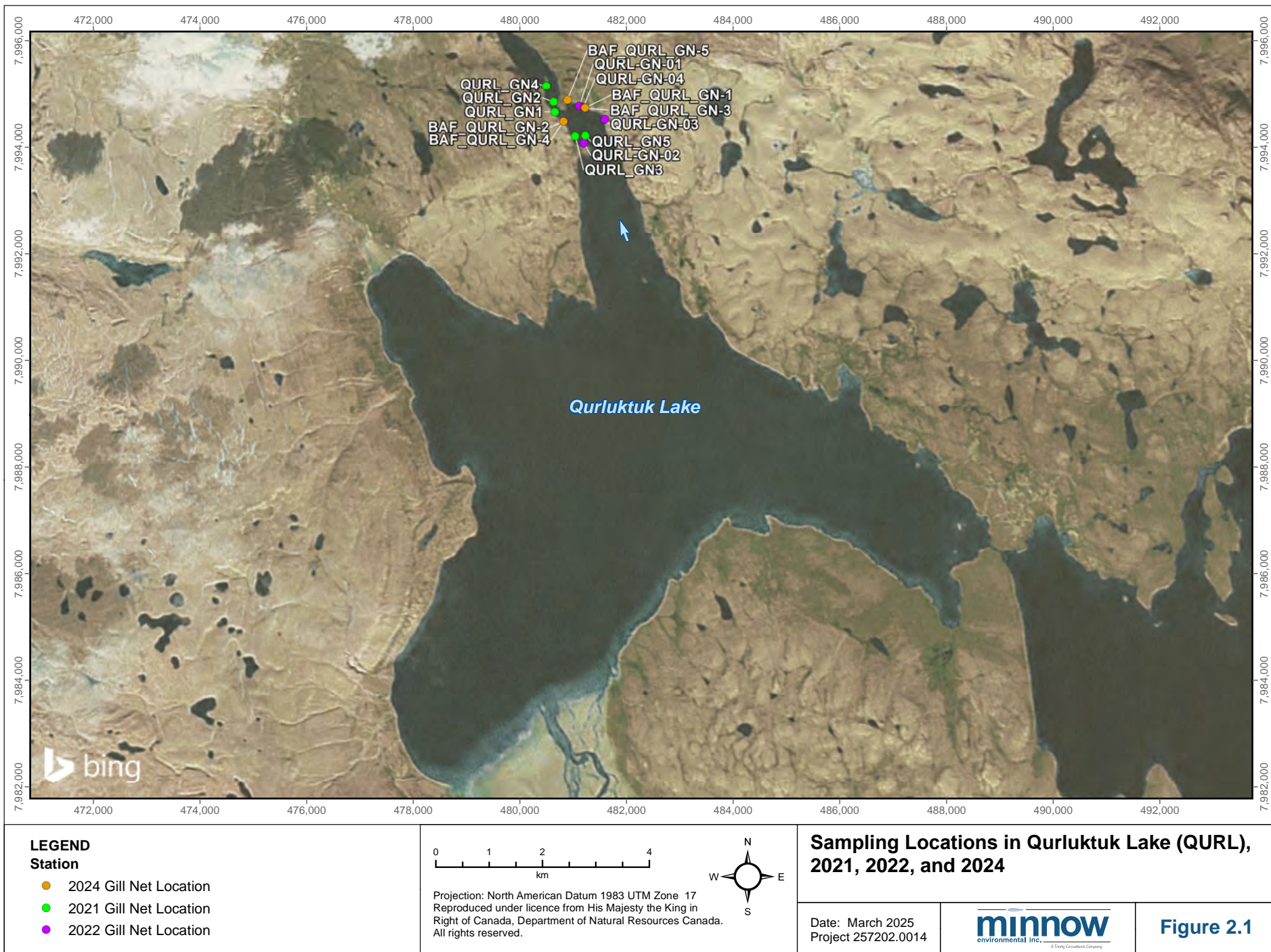
Following lab analysis, water quality data were electronically tabulated and subjected to internal data quality review (DQR) protocols to ensure data of appropriate quality for use and interpretation (Appendix B). Water chemistry data were compared to applicable water quality guidelines (WQG), including the Canadian Water Quality Guidelines (CWQG; CCME 1999, 2022) or, for parameters with no CWQG, the most conservative (i.e., lowest) criterion available from established Ontario Provincial Water Quality Objectives (PWQO; OMOEE 1994) or British Columbia Water Quality Guidelines (BCWQG; BCMOE 2006, 2022). Water quality guidelines are abbreviated simply as 'WQG' in this report, although some of the values presented may represent water quality 'objectives.' For WQGs that are hardness dependent, the hardness of the individual

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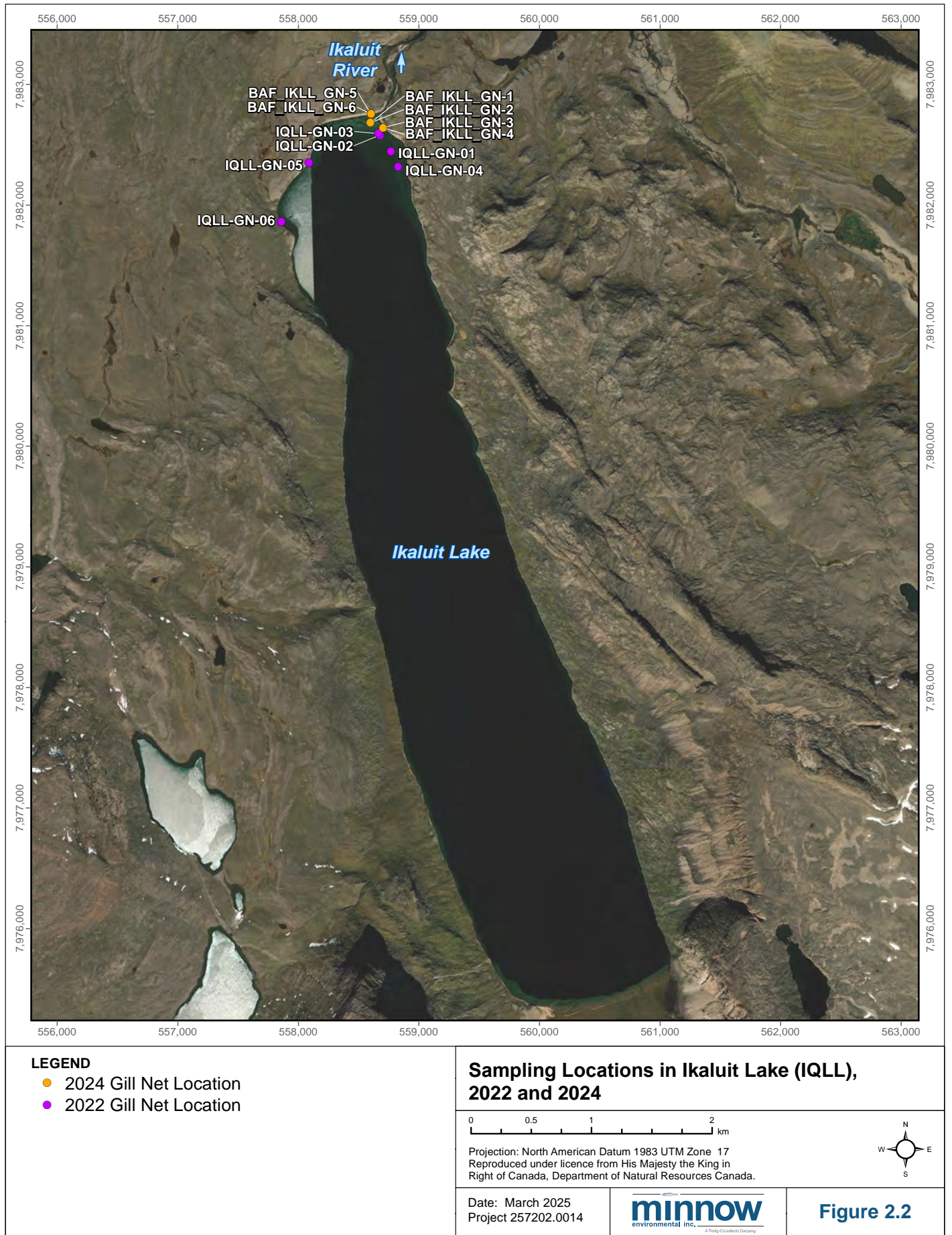
<sup>4</sup> The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by the United States Environmental Protection Agency, American Public Health Association Standard Methods, ASTM International, International Organization for Standards, Environment Canada, British Columbia Ministry of Environment (BCENV), and Ontario Ministry of Environment.













sample was used to calculate the WQG for the specific parameter according to established formulae.

## 2.4 Fish Data Collection

### 2.4.1 Overview

The primary purpose of the fish collection component of the Program was to collect tissue (i.e., muscle and liver), aging structures (i.e., sagittal otoliths and pectoral fin), and microchemistry samples (i.e., otoliths), as well as morphometric (i.e., length and weight) and biological (i.e., sex and maturity) data to provide information on the population, age, and metal concentrations in tissue of fish being consumed by local Inuit communities. The target sample size for the study was a total of 40 arctic charr (20 female and 20 male) collected from each study lake. Fish sampling was conducted using gill nets under a Fisheries and Oceans Canada (DFO) License to Collect Fish for Scientific Purposes (License no. S-24/25-1060-NU; Appendix F).

### 2.4.2 Sample Collection

Gill netting was the sole method used to capture arctic charr for the 2024 study. Consistent with previous work, fishing was conducted using 45 m nets with 102 mm and 127 mm mesh (i.e., 4" and 5") length. Gill nets were deployed for approximately one and 24 hour durations<sup>5</sup>. Gill nets were shore-set<sup>6</sup> at the bottom of the lakes. Sampling locations were chosen based on habitat characteristics preferred by the target species (i.e., presence of gravel, cobble, and/or boulders and near inlet and outlets of the lake) and prior site knowledge provided by MHTO (Figures 2.1 and 2.2). Upon retrieval of each gill net, all captured fish<sup>7</sup> were carefully removed, identified, and enumerated. This program targeted adult arctic charr (i.e., individuals > 35 cm) and would typically involve the release of juveniles and/or other bycatch; however, following the wishes of Inuit team members, no captured fish were released<sup>8</sup>. A maximum of 40 individual arctic charr (20 female and 20 male) from each lake were euthanized by a decisive blow to the head and retained for detailed assessment. For each gill net set, information including date, duration of sampling (set and lift time), sampling depth, Global Positioning System (GPS) Universal Transverse Mercator (UTM) coordinates, and habitat notes were recorded.

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<sup>5</sup> Teams began with one hour sets in each waterbody to gauge productivity before moving on to longer set times.

<sup>6</sup> Setting nets from shore was the suggestion of the MHTO representative based on experience fishing in these lakes.

<sup>7</sup> Arctic charr is the only identified large-bodied fish species in the study lakes.

<sup>8</sup> While no fish were intentionally released, there were instances where juvenile fish escaped during removal from the net.





### 2.4.3 Sample Processing

Adult arctic charr (i.e., >35 cm) that were euthanized and retained for sampling were placed in a cooler in the field and later transferred to a fridge and/or freezer at Milne Port or the Mary River Mine Site for storage until processing could be completed. Fish processing was generally completed the day following sampling, or as soon as possible. Processing included photographing (Appendix Photos D.1 to D.58), measurement of total and fork lengths to the nearest millimetre (mm) using a standard measuring board, and measurement of total body weight using appropriately sized Pesola™ spring scales (e.g., 500 g, 1,000 g, 5,000 g, 10,000 g). The scale was selected so that the weight of the fish was near the top of the scale's range to ensure a measurement resolution near 1%. Clean implements (cutting boards, filet knives, and tweezers) were used for each fish dissection. Upon the opening of the body cavity with a ventral incision, sex was assigned, gonads and liver tissue were removed from each fish and weighed to the nearest milligram (mg) using an analytical balance with a surrounding draft shield. A skinless, boneless muscle fillet sample was also collected. After tissue samples were removed from the fish and weights were taken, liver, and muscle tissue samples were individually placed in pre-labeled WhirlPak™ bags and stored in a freezer at the Mary River Mine Site until shipment to an analytical laboratory. Age structures (i.e., sagittal otoliths and pectoral fins) were removed from each fish, wrapped in waxed paper, and placed inside a pre-labeled envelope. Once all measurements, tissue collections, and observations were complete, the remaining carcass and any other tissue separated from the fish during dissection were discarded.

### 2.4.4 Laboratory Analysis

#### 2.4.4.1 Tissue Chemistry

Upon completion of the field study, fish tissue (liver and muscle) from the subsample of fish for tissue chemistry analysis was shipped frozen (on ice) to ALS (Waterloo, Ontario). The tissue chemistry sample shipment was accompanied by a COC, a list of expected LRLs, and laboratory QA/QC requirements (Appendix B). At the laboratory, the samples were freeze-dried prior to analysis to allow reporting of parameter concentrations on a wet and dry weight basis. The tissue chemistry samples were analyzed for metal, non-metal, and metalloid parameters typically included in a Collision Reaction Cell Inductively Coupled Plasma Mass Spectrometry (CRC ICPMS) scan, as well as percent moisture. Mercury was measured by Cold Vapour-Atomic Absorption Spectroscopy (CVAAS).

#### 2.4.4.2 Age Determination

Aging structures were shipped frozen (on ice) to North/South Consultants Incorporated (North/South; Winnipeg, Manitoba) for determination of fish ages. For fish sampled from





Qurluktuk Lake, one otolith was retained for microchemical analyses, while the other (if recovered) was used for aging. A COC was included with the shipment. At the laboratory, otoliths were the primary aging structure used and were prepared by cleaning and embedding them in epoxy. After the epoxy cured overnight, the otoliths were sectioned using a diamond-blade saw set to low speed. Each otolith was mounted on a glass slide using a mounting medium and examined under a compound microscope using transmitted light to determine fish age. For each structure, the age and edge condition were recorded along with a confidence rating for the age determination. A secondary age reading was completed by another individual from the lab for internal QA/QC purposes to ensure accuracy (see Appendix B).

#### 2.4.4.3 Otolith Microchemistry

Sagittal otoliths were extracted from all adult arctic charr collected from Qurluktuk Lake, one otolith from each fish was placed in 1 mL plastic cryovials for shipment to TrichAnalytics Incorporated (Trich; Victoria, British Columbia). Upon arrival, each otolith was cleaned with distilled water and embedded in epoxy within plastic base molds (dimensions: 5 mm × 5 mm × 15 mm). Once cured overnight, the epoxy blocks were sectioned through the otolith core and polished using a series of lapping papers from coarse to fine grit to achieve a uniform surface. Final polishing was completed using a 0.25 µm diamond suspension on a polishing pad to remove fine surface scratches. Otoliths were then mounted on microscope slides using double-sided tape and placed in the laser ablation chamber.

Elemental analyses were performed using laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS). Each otolith was analyzed along a single ablation transect (i.e., edge to core to edge, where possible) using standardized laser settings (i.e., 40% power, 20 Hz repetition rate, 5 µm/s scan speed, and a 30 µm spot size). Pre-ablation images were taken to document otolith positioning, and post-ablation images were captured to align with the elemental data (Appendix Photos D.59 to D.78). The laser transects proceeded from left to right in accordance with post-ablation images.

Otoliths were analyzed for <sup>7</sup>Li, <sup>24</sup>Mg, <sup>55</sup>Mn, <sup>66</sup>Zn, <sup>88</sup>Sr, and <sup>137</sup>Ba, which were corrected to 40% Ca (or 400,000 ppm Ca), to account for variation in ablation yield. Changes in elemental concentrations along the ablation line were used to infer life history traits (see Section 2.4.6).

Each sample set was bracketed by multiple ablations (i.e., >3) of National Institute of Standards and Technology (NIST) SRM 612, a certified silicate glass reference material provided by the National Institute of Standards and Technology. Blanks were not run between samples; instead, the background counts per second were measured during the first 10 seconds of each run and used to calculate detection limits based on a signal-to-noise ratio of 3.





## 2.4.5 Collection of IQ and Knowledge Blending

The project's Inuit partners are experienced hunters and trappers, who can determine the recent migration history of arctic charr using various visual (e.g., body colour and shape and flesh colour) and other sensory cues (e.g., taste and smell). When they were present during fish collection and processing, they indicated which fish were searun or resident noting features such as colouration and body shape of the fish<sup>9</sup>. Charr that have recently migrated from the marine environment typically display a silvery colour and a more muscular or lean body shape (Photo 2.1), although the duration for which these characteristics are retained following migration back to freshwater is. During the spawning season (i.e., September and/or October), searun charr undergo a morphological transformation, displaying brighter colours. Accordingly, the timing of collection is important to interpret visual cues that indicate recent migration history. Additionally, since Arctic charr can complete multiple migrations throughout their lives and do not necessarily migrate every year (Scott and Crossman 1973), visual cues may not be informative of whether an individual has migrated in the past.

## 2.4.6 Data Analysis

Fish catch data were electronically tabulated and subjected to internal QA/QC procedures for accuracy of the data entry. Fish catch data for the study areas were summarized according to total catch and total CPUE for each lake. Gill netting CPUE was calculated as the number of fish captured per 100 m<sup>2</sup>·hr<sup>-1</sup> of net deployed as follows:

$$\text{CPUE} = \text{No. of fish captured} / ((\text{Fishing Time [hr]} * (\text{Net Length [m]})) / 100)$$

For arctic charr endpoints (age, body length, and weight) summary statistics, including sample size, mean, standard deviation, standard error, minimum, median, and maximum, were calculated.

Statistical analysis differed depending on the endpoint of interest, and included comparison of measures of central tendency, examination of frequency distribution, analysis of variance, and analysis of covariance. All statistical comparisons between areas were tested at a significance level of  $\alpha = 0.1$  using R version 4.2.2. Magnitude of Difference (MOD) was calculated using the following equation:

$$\text{MOD (\%)} = \frac{\text{MCT}_A - \text{MCT}_B}{\text{MCT}_B} \times 100\% \text{ (Equation 1),}$$

where  $\text{MCT}_A$  and  $\text{MCT}_B$  are the measures of central tendency for a given area and/or year.

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<sup>9</sup> Due to flight schedules between Mary River and Pond Inlet, the Inuit team members had to return home prior to the processing of the fish from Qurluktuk Lake in 2024, so the designations were completed by Minnow and Baffinland, based on the qualitative descriptors they provided.







**Photo 2.1:** Examples of [A] Anadromous and [B] Resident Arctic Charr Based on Physical Characteristics



Statistical comparisons of endpoints without a covariate (e.g., fork length) were conducted using a one-way analysis of variance (ANOVA) if the assumptions of normality and homogeneity of variances were met. The assumptions were tested using a Shapiro-Wilk's Test and Levene's test, respectively at  $\alpha = 0.05$ . Data were  $\log_{10}$ -transformed as necessary to meet assumptions. When the assumption of normality was met but not the assumption of homogeneity of variances, a t-test for unequal variances was used (Ruxton 2006). In cases where both assumptions were not met, analysis was conducted using a Kruskal-Wallis test. Post-hoc comparisons were conducted using Tukey-adjusted p-values for all pairwise contrasts. For each comparison, the magnitude of difference was calculated with Equation 1 using means for untransformed data, geometric means for  $\log_{10}$ -transformed data and medians for non-parametric tests. Each endpoint was plotted with a boxplot.

Statistical comparisons of endpoints with a covariate (e.g., condition) were conducted using Analysis of Covariance (ANCOVA) with  $\log_{10}$ -transformed data. Data was visually inspected to confirm sufficient overlap of the covariate between areas. If necessary, analysis was conducted on the entire dataset and a subset of the dataset with sufficient overlap. Statistical outliers were defined as observations with Studentized residuals with magnitude  $> 4$  (Environment Canada 2012). Statistical analyses were reported for comparisons with and without the outliers to assess the influence of the outlier on statistical significance and the magnitude of difference. Significant interactions between the area and the covariate (i.e., the assumption of homogeneity of regression slopes between areas) in the ANCOVA were assessed using  $\alpha = 0.05$ . When the interaction term was significant, the coefficients of determination ( $R^2$ ) of the interaction model and parallel slope model were compared to assess whether the slopes were practically significant. If the  $R^2$  was  $> 0.8$  and within 0.02 between the two models the interaction model and parallel slope models were considered practically the same (Environment Canada 2012) and the ANCOVA proceeded with the parallel slope model. When the interaction could not be removed by comparison of  $R^2$  values the interaction model was selected. When the interaction model was selected, the magnitude of difference was calculated separately using predicted means at the minimum and maximum values of the overlap in covariate values between areas. When the interaction term was not significant, the interaction term was removed from the model and the parallel slope ANCOVA model was fit. Magnitude of difference was then calculated using the adjusted mean at the mean covariate value. When the covariate was not a significant predictor of the response variable in the parallel slope ANCOVA model the analysis proceeded as described above for endpoints without a covariate. For meaningful interpretation, the covariate in an ANCOVA model should be spread across many values. For covariates with discrete values, such as age, this is not always possible.





In ANCOVA models where age was used as a covariate and had limited variability (e.g., <3 age groups), an ANOVA at each age class was conducted instead.

A power analysis to estimate minimum detectable difference (MDD) using  $\alpha=\beta=0.1$  was conducted for each endpoint using either the coefficient of variation (pooled standard deviation divided by reference mean) for untransformed data or the pooled standard deviation of regression residuals for  $\log_{10}$ -transformed data and reported as a percentage difference relative to the reference mean. The MDD percentage was reported as both a percentage increase, and a percentage decrease because MDD differs with respect to the direction of  $\log_{10}$ -transformed measures. The MDD calculations for the Mann-Whitney (M-W) test were estimated based on a two-sample t-test using sample sizes multiplied by 0.864. The 0.864 value is the lower bound of the asymptotic relative efficiency of the Mann-Whitney test and the two-sample t-test (Hodges and Lehmann 1956). Using the same approach, the minimum sample sizes needed to detect percent differences ranging from negative to positive 100% were calculated. The estimated sample sizes were divided by 0.864 for non-parametric tests.

Upon receipt of laboratory results (i.e., water chemistry, tissue metals, aging, and otolith microchemistry), a data quality review (DQR) was performed. This included the assessment of field precision, laboratory precision, and laboratory accuracy against data quality objectives (DQOs) established at the outset of the project (Appendix B). A minimum of 10% of the analyses represented quality control samples. In instances where the DQR revealed potential issues with data quality, results were verified with the laboratory and corrective measures were taken if necessary. Data collected for the Program in 2024 were of acceptable quality as characterized by appropriate LRLs, good detectability, negligible analyte concentration in method blank samples, good laboratory precision, and good laboratory accuracy (see Appendix B for details).

Concentrations of metals in edible muscle tissue were screened against relevant benchmarks (Table 2.1). Spatial differences in mercury and iron tissue concentrations<sup>10</sup> were examined using similar methods as those described above. Briefly, ANCOVA with  $\log_{10}$ -transformed data was used, as length is commonly a significant covariate in fish metals analysis with  $\log_{10}$ -transformed data. Data was visually inspected to confirm sufficient overlap of the covariate between areas. If necessary, analysis was conducted on the entire dataset and a subset of the dataset with sufficient overlap. Statistical outliers were defined as observations with Studentized residuals with magnitude >4 (Environment Canada 2012). Statistical analyses were reported for

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<sup>10</sup> Mercury and iron were chosen as these were identified by the community during consultation (Appendix A).





**Table 2.1: Consumption Benchmarks for Metals in Fish Tissue (mg/kg wet weight)**

Substance	Tolerable Daily Intake	Fish Benchmarks (mg/kg) Based on		
	(mg/kg day) <sup>a</sup>	6.5 g/day <sup>b</sup>	21.8 g/day <sup>c</sup>	111 g/day <sup>d</sup>
Aluminum	0.0004 <sup>e</sup>	0.862	0.257	0.0505
Antimony	0.0004 <sup>e</sup>	0.862	0.257	0.0505
Arsenic	1.8 <sup>f</sup>	0.0598	0.0178	0.00350
Barium	0.2 <sup>f,h</sup>	431	128	25.2
Beryllium	0.002 <sup>f,h</sup>	4.31	1.28	0.252
Boron	0.2 <sup>e</sup>	431	128	25.2
Cadmium	0.0005 <sup>e,h</sup>	1.08	0.321	0.0631
Chromium	0.0022 <sup>f,h</sup>	4.74	1.41	0.277
Copper	0.005 <sup>e,h</sup>	10.8	3.21	0.631
Lead	0.005 <sup>f</sup>	10.8	3.21	0.631
Manganese	0.025 <sup>f,h</sup>	53.9	16.1	3.15
Mercury	0.0003 <sup>f</sup>	0.646	0.193	0.0378
Molybdenum	0.005 <sup>e</sup>	10.8	3.21	0.631
Nickel <sup>g</sup>	0.0013 <sup>e,h</sup>	2.80	0.835	0.164
Selenium	0.005 <sup>f,h</sup>	10.8	3.21	0.631
Silver	0.005 <sup>f</sup>	10.8	3.21	0.631
Strontium	0.6 <sup>f</sup>	1,292	385	75.7
Uranium	0.0006 <sup>e,h</sup>	1.29	0.385	0.0757
Vanadium	0.009 <sup>e</sup>	19.4	5.78	1.14
Zinc	0.3 <sup>e,h</sup>	646	193	37.8

 Selected benchmark.

<sup>a</sup> Where values were reported by both IRIS (2020) and Health Canada (2021), the lowest value was used to derive a conservative benchmark.

<sup>b</sup> USEPA (1997) mean consumption rate for general population; mean value for anglers is 8.0 g/day, 95th percentile for anglers is 25 g/day.

<sup>c</sup> Upper limit consumption rate for Canadian population based on high caloric intake (OHM 1990). Also the highest consumption level considered in development of fish advisories in Ontario.

<sup>d</sup> Health Canada (2010) consumption rate for screening level risk assessments, from Richardson (1997). Exceeds the average value for fishing subsistence populations (70g/day; USEPA 1997).

<sup>e</sup> IRIS (2020).

<sup>f</sup> Health Canada (2021).

<sup>g</sup> Based on nickel chloride.

<sup>h</sup> Most conservative concentration (tolerable daily intakes are defined on an age-group specific basis).



comparisons with and without the outliers to assess the influence of the outlier on statistical significance and the magnitude of difference.

The otolith microchemistry data were used to designate individuals from Qurluktuk Lake as either resident or anadromous. Elemental profiles were plotted and visually examined for rapid changes in element concentration ratios across the otolith transect (Appendix Figures D.1 to D.20). Fish age was estimated by manually enumerating seasonal peaks in Ca-corrected  $^{55}\text{Mn}$  and  $^{66}\text{Zn}$ , which are known to fluctuate annually (e.g., Halden et al. 2000). Life history strategy was inferred by examining changes in  $^{88}\text{Sr}$  profiles. Water strontium concentrations are typically higher in the marine environment compared to freshwater, therefore anadromous individuals show a period of steady  $^{88}\text{Sr}$  followed by a sudden increase or peak, followed by peaks representing seasonal migrations, whereas resident individuals display steady  $^{88}\text{Sr}$  across the entire otolith transect (Brown and Severin 2009). For example, Figure 2.3 shows  $^{88}\text{Sr}$  and  $^{66}\text{Zn}$  profiles overlaid on the post-ablation photograph of a 14-year-old anadromous arctic charr. This individual first migrated to the marine environment at age 8, as indicated by the initial increase in  $^{88}\text{Sr}$ , followed by six distinct marine migration-associated  $^{88}\text{Sr}$  peaks. Fourteen seasonal peaks in  $^{66}\text{Zn}$  correspond to the estimated age of the fish.

#### 2.4.7 Historical Data Comparisons

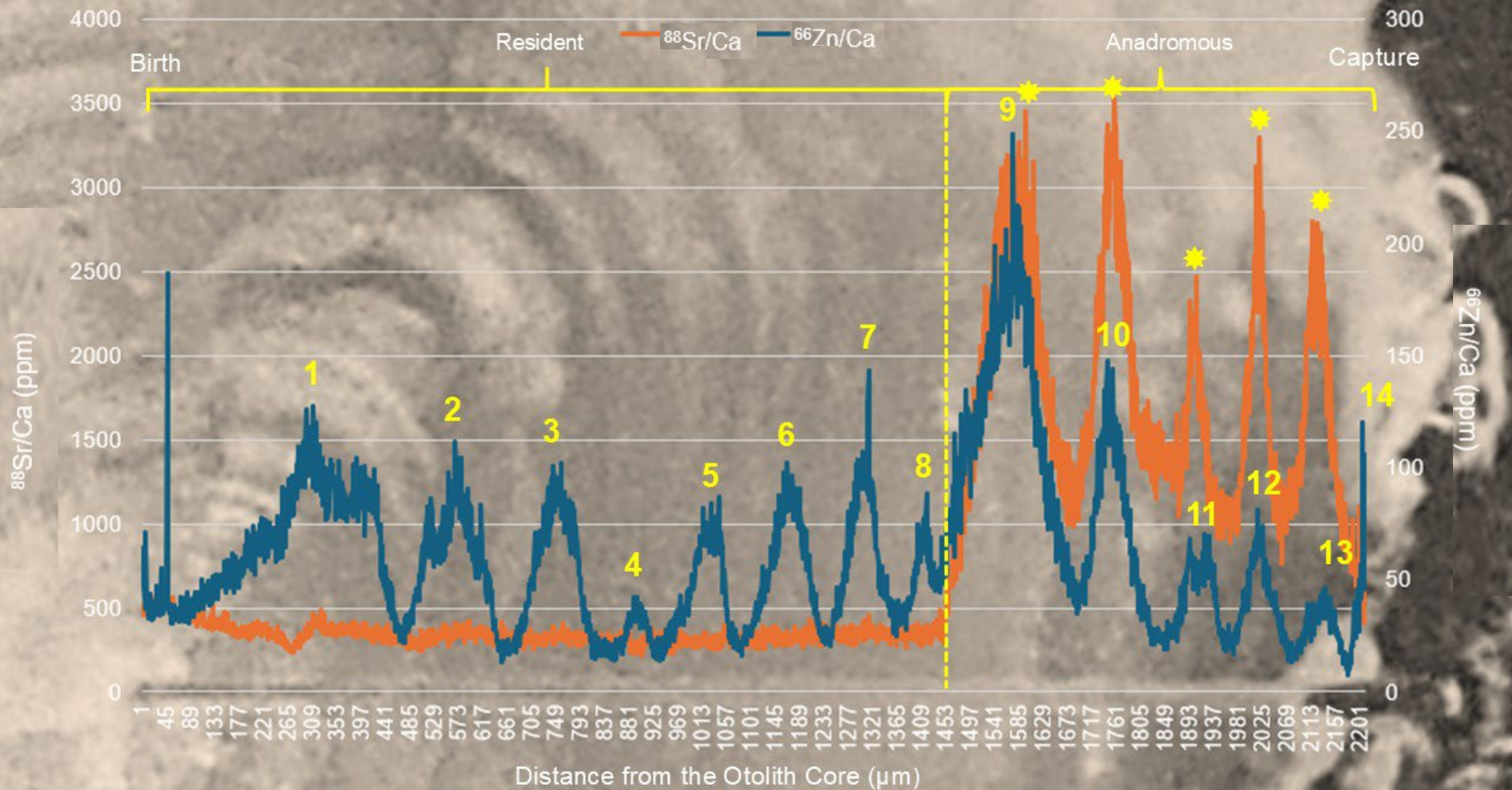
The initial step required for the historical data analysis included extraction of historical fish measurements from DFO reports (i.e., Moshenko 1981, Read 2004)<sup>11</sup>. Summary information presented in the DFO reports (i.e., mean length and weight for various size and age intervals) was reviewed, and for any intervals that included a single individual or two individuals in which an accompanying standard deviation was presented, individual age, fork length, and body weight data were extracted for the comparative analyses (Appendix Tables D.1 and D.2). Fish measurement data collected from both 2021, 2022, and 2024 were compared to information from historical studies based on evaluation of plotted data and statistics using the methods described above. Based on the information available from the historical reports, the endpoints examined for the measurement data included fork length, body weight, growth (i.e., length-at-age relationship), and/or condition (i.e., length-at-weight relationship). These endpoints were analyzed separately for males and females in comparisons between data collected in 2021, 2022, 2024, and historically to assess for adverse Project-related effects on health arctic charr since the commencement of port operations. No historical fish tissue chemistry data were available.

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<sup>11</sup> Historical data for comparison to fish captured at Qurluktuk Lake in 2021, 2022, and 2024 were from charr captured in the Robertson River in 1979, and thus could include charr that overwintered in waterbodies other than Qurluktuk Lake.







**Figure 2.3:** Ratios of  $^{88}\text{Sr}$  and  $^{66}\text{Zn}$  to Calcium along a Core to Edge Transect of an Arctic Charr Otolith Overlain on a Post-Ablation Cross-Section of the Otolith to Assess Life History

Notes: the x-axis represents the core-to-edge laser ablation transect; the yellow numbers denote annual peaks in  $^{66}\text{Zn}$  (indicating age); yellow asterisks denote peaks in  $^{88}\text{Sr}$  (indicating marine migration); yellow dashed line represents life history shift from resident to anadromous.



## 3 RESULTS

### 3.1 Water Chemistry

Water samples collected from the littoral zones of each of the study lakes during August 2024 revealed that all assessed analytes were below the Canadian Council of Ministers of the Environment (CCME) guidelines. Total mercury was below detection limits ( $<0.000026$  mg/L; Appendix Table C.1) in both lakes. While total iron was below detection limits ( $<0.01$  mg/L) in Qurluktuk Lake, and detectable in Ikaluit Lake (0.01 mg/L; Appendix Table C.1). Based on water chemistry, each lake can be classified as oligotrophic, which is common for Arctic lakes.

### 3.2 Arctic Charr

#### 3.2.1 Catch

Arctic charr was the only species captured in each of the study lakes (Appendix Table D.3). Total catch was greater in Qurluktuk Lake ( $n = 39$ ) than in Ikaluit Lake ( $n = 37$ ; Table 3.1). However, CPUE was higher in Ikaluit Lake (11.4 fish/100 m<sup>2</sup>·hr) than in Qurluktuk Lake (0.74 fish/100 m<sup>2</sup>·hr; Table 3.1). In 2024, CPUE was lower than in 2022 for Qurluktuk Lake, but higher for Ikaluit Lake (Table 3.1, Appendix Table D.3); variability in CPUE can be attributed to many things such as weather at the time of study, locations chosen for net deployment, the use of overnight versus daytime sets, and inter-annual climatic factors (e.g., wet years versus dry years).

#### 3.2.2 Life History Assessment

Variability in length-age relationships observed in arctic charr from Qurluktuk Lake in each of 2021 and 2022 suggested that the sampled fish likely represented both resident and anadromous sub-populations. Specifically, a cluster of six individuals sampled in 2022 exhibited notably slower growth, as indicated by their position on a length-at-age plot (Minnow 2023). When all individuals were included in a single linear length-at-age regression, there was not a good fit and the slope of the regression line was negative, contrary to expectations for growing fish. However, when the data were partitioned to separate the slow-growing individuals from the rest of the sample, both groups displayed positive length–age relationships with positive slopes, indicating differing growth rates and life history strategies.

To determine the life history of sampled fish within Qurluktuk Lake, microchemistry of otoliths from 20 adult arctic charr sampled in 2024 were analyzed using LA-ICP-MS. Of the 20 fish, otolith microchemistry results from 19 individuals showed <sup>88</sup>Sr:Ca ratios consistent with a migratory life history (Figure 3.1, Appendix Figures D.1 through D.20). Specifically, the data revealed a period of time, starting at emergence (represented by the distance from the otolith core) where <sup>88</sup>Sr:Ca ratios remained stable, followed by predictable distinct peaks in <sup>88</sup>Sr:Ca ratios,





**Table 3.1: Gill Net Total Catch and Catch-Per-Unit-Effort (CPUE) for Arctic Charr by Lake, Milne Inlet Freshwater Fish Health Monitoring Program, August 2021, 2022, and 2024**

<b>Total Catch</b>	<b>Lake</b>	<b>2021</b>	<b>2022</b>	<b>2024</b>
	Tugaat Lake	46	93	-
	Qurluktuk Lake	39	57	39
	Ikaluit Lake	-	40	37
<b>Catch-per-Unit-Effort</b>	<b>Lake</b>	<b>2021</b>	<b>2022</b>	<b>2024</b>
	Tugaat Lake	9.33	1.75	-
	Qurluktuk Lake	0.97	1.00	0.74
	Ikaluit Lake	-	4.53	11.4

Note: CPUE = (# of fish / 100 m of gill net \* hr). "-" indicates no sampling was completed.



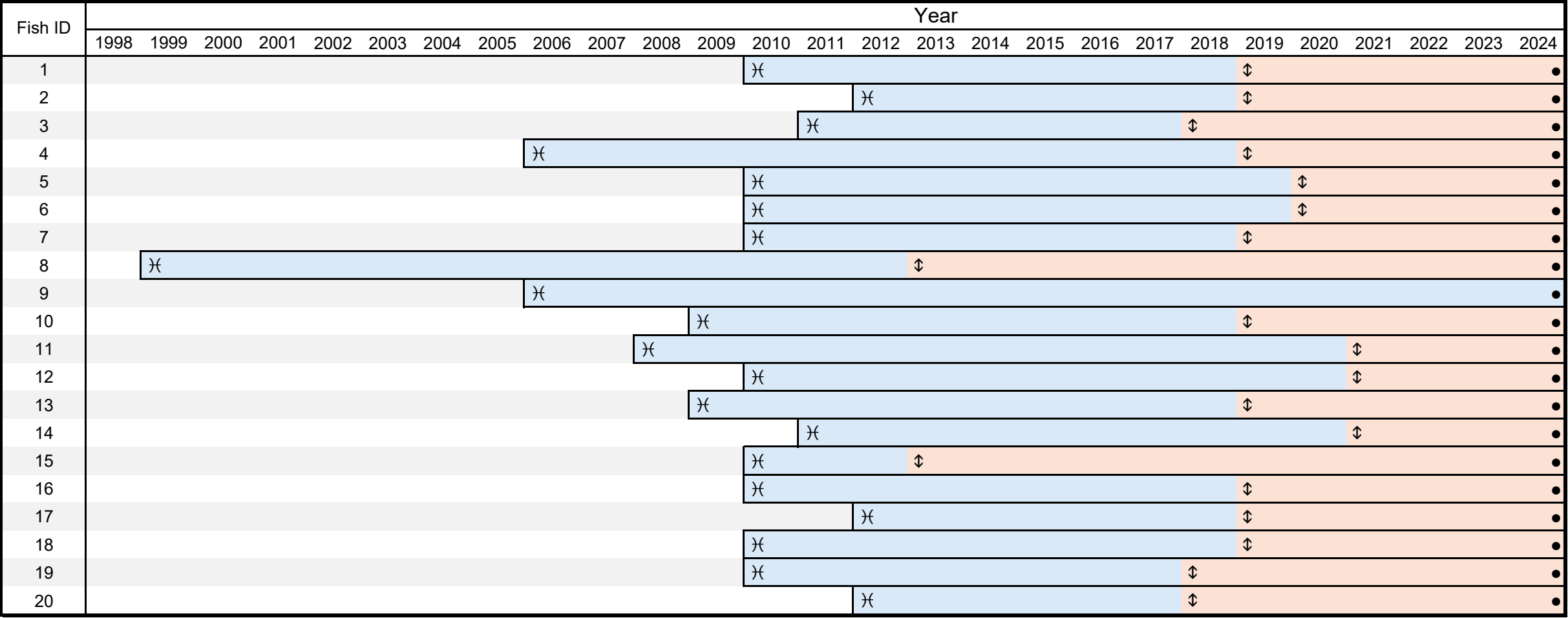


Figure 3.1: Qurluktuk Lake Arctic Charr Anadromy Assessment; Milne Inlet Freshwater Fish Health Program, 2024

- Resident Life History Strategy.
- Anadromous Life History Strategy.

Notes: "X" indicates the an individual's birth. "D" indicates an individual's first migration. "•" indicates sampling the individual.



indicating annual migrations to the marine environment (e.g., Figure 2.3). In contrast, the otolith microchemistry results from a single fish (*QURL\_AC\_09*; Figure 3.1, Appendix Figure D.9) exhibited consistently low and stable  $^{88}\text{Sr}:\text{Ca}$  ratios throughout its life, indicating that it never migrated to the marine environment.

Age at first migration varied among the Qurluktuk Lake anadromous fish, with individuals completing their first migration as early as three years old and as late as 14 years old (Figure 3.1). The average age at first migration was nine years. Each of the anadromous fish migrated annually following their first migration, based on the coupling of  $^{88}\text{Sr}:\text{Ca}$  and  $^{66}\text{Zn}:\text{Ca}$  peaks (Appendix Figures D.1 to D.8, D.10 to D.20).

The visual assessment of the charr based on IQ designated 12 of 20 individuals as residents (Appendix Table D.4). Notably, the IQ-based designated group of resident fish did not include the individual designated as a resident using otolith microchemistry (Figure 3.1, Appendix Table D.4). Lack of agreement between life history strategy determination methods is likely a product of how the visual assessments were conducted. Inuit team members described the characteristics of resident vs anadromous charr to the Minnow team members (see Section 2.4.5), but unfortunately due to flight schedules, they had to leave site prior to the processing of the fish from Qurluktuk Lake and were not present to contribute directly to the designations. As such, the designations were made by Minnow and Baffinland staff attempting to apply IQ. Additionally, fish were frozen and thawed prior to processing, which can cause phenotypic changes to IQ-based indicators of recent marine migration (e.g., colour; Ottestad et al. 2011). Given these factors, combined with the high quality of microchemistry data and robustness of the method, the microchemical designations were used to assign fish as resident or anadromous in further data analyses.

### 3.2.3 Health

#### 3.2.3.1 2024 Results

In 2024, 20 adult arctic charr (1 male, 18 female, 1 of undetermined sex) from Qurluktuk Lake and 37 adult arctic charr (7 male, 14 female, 16 undetermined sex) from Ikaluit Lake were assessed for fish health endpoints (Table 3.2, Appendix Table D.4). Ages ranged from 8 to 25 years in Qurluktuk Lake and from 7 to 16 years in Ikaluit Lake (Table 3.2). On average, female charr from Qurluktuk Lake were older than those from Ikaluit Lake, with median ages of 14 and 12 years, respectively. The single male charr from Qurluktuk Lake was 15 years old (Table 3.2). Since only one male charr was captured from Qurluktuk Lake in 2024, spatial comparisons to Ikaluit Lake and temporal comparisons to earlier sampling years in Qurluktuk Lake could not be completed.





**Table 3.2: Summary Statistics of Fish Health Endpoints for Adult Arctic Charr from Qurluktuk and Ikaluit Lakes, Milne Inlet Freshwater Fish Health Monitoring Program, Historical, 2021, 2022, and 2024**

Lake	Time	Sex	Endpoint	Mean	SD	SE	Minimum	Median	Maximum
Qurluktuk	Historical <sup>a</sup>	Male	Age	20.6	4.64	1.55	14.0	22.0	28.0
			Total Length (cm)	-	-	-	-	-	-
			Fork Length (cm)	72.8	9.27	2.48	58.3	75.5	84.8
			Body Weight (g)	4,011	1,534	410	2,000	3,975	6,100
			Gonad Weight (g)	-	-	-	-	-	-
			Liver Weight (g)	-	-	-	-	-	-
		Female	Age	16.9	4.09	1.02	11.0	16.0	24.0
			Total Length (cm)	-	-	-	-	-	-
			Fork Length (cm)	62.0	11.8	2.52	42.8	60.5	79.5
			Body Weight (g)	2,380	1,156	247	800	2,400	4,500
			Gonad Weight (g)	-	-	-	-	-	-
			Liver Weight (g)	-	-	-	-	-	-
	2021	Male	Age	16.9	2.97	0.857	14.0	15.5	23.0
			Total Length (cm)	79.6	6.67	1.92	69.3	78.5	90.1
			Fork Length (cm)	76.0	6.23	1.80	65.7	75.0	85.6
			Body Weight (g)	5,142	1,293	373	3,600	4,850	7,200
			Gonad Weight (g)	103	39.4	11.4	58.4	96.4	181
			Liver Weight (g)	59.2	22.4	6.46	33.5	49.5	97.1
		Female	Age	15.3	3.30	1.25	10.0	15.0	21.0
			Total Length (cm)	69.9	8.96	3.38	55.0	70.8	80.5
			Fork Length (cm)	66.4	8.71	3.29	51.7	66.5	76.6
			Body Weight (g)	3,344	1,151	435	1,560	3,800	4,600
			Gonad Weight (g)	425	306	116	6.43	560	720
			Liver Weight (g)	49.8	20.0	7.55	27.5	40.5	72.8
	2022	Male	Age	12.5	0.707	0.500	12.0	12.5	13.0
			Total Length (cm)	52.1	7.21	5.10	47.0	52.1	57.2
			Fork Length (cm)	49.0	6.86	4.85	44.1	49.0	53.8
			Body Weight (g)	1,358	767	542	815	1,358	1,900
			Gonad Weight (g)	1.15	0.774	0.547	0.602	1.15	1.70
			Liver Weight (g)	26.0	20.3	14.4	11.6	26.0	40.4
		Female	Age	12.7	3.92	1.09	6.00	13.0	20.0
			Total Length (cm)	57.9	10.3	2.86	38.7	56.5	78.6
			Fork Length (cm)	54.8	10.2	2.82	36.2	53.0	75.2
			Body Weight (g)	2,064	1,154	320	410	1,780	4,550
			Gonad Weight (g)	58.5	113	31.4	1.72	10.5	380
			Liver Weight (g)	40.5	29.8	8.26	6.68	35.4	120
	2024	Male	Age	15.0	-	-	15.0	15.0	15.0
			Total Length (cm)	67.8	-	-	67.8	67.8	67.8
			Fork Length (cm)	61.3	-	-	61.3	61.3	61.3
			Body Weight (g)	2,300	-	-	2,300	2,300	2,300
			Gonad Weight (g)	46.3	-	-	46.3	46.3	46.3
			Liver Weight (g)	20.3	-	-	20.3	20.3	20.3
		Female	Age	14.4	2.79	0.657	12.0	14.0	25.0
			Total Length (cm)	66.4	4.84	1.14	59.8	65.4	78.6
			Fork Length (cm)	62.8	4.80	1.13	57.0	61.8	75.0
			Body Weight (g)	2,642	654	154	1,591	2,542	4,350
			Gonad Weight (g)	362	136	31.9	194	325	692
			Liver Weight (g)	31.8	9.83	2.32	18.9	29.6	56.3
Ikaluit	2022	Male	Age	11.5	2.22	0.444	7.00	12.0	16.0
			Total Length (cm)	62.8	7.80	1.56	44.8	63.5	79.1
			Fork Length (cm)	59.3	7.51	1.50	42.4	59.8	75.2
			Body Weight (g)	2,452	887	177	850	2,350	4,400
			Gonad Weight (g)	44.3	36.7	7.35	0.639	47.8	98.5
			Liver Weight (g)	34.1	12.1	2.43	13.3	34.7	66.0
		Female	Age	11.2	2.96	0.854	6.00	12.0	16.0
			Total Length (cm)	57.9	5.68	1.64	46.0	58.4	67.3
			Fork Length (cm)	54.8	5.68	1.64	43.2	55.2	63.8
			Body Weight (g)	1,782	515	149	920	1,700	2,750
			Gonad Weight (g)	148	132	38.1	1.91	172	345
			Liver Weight (g)	32.9	14.5	4.18	13.5	30.2	68.9
	2024	Male	Age	11.9	1.95	0.738	9.00	12.0	14.0
			Total Length (cm)	61.9	6.83	2.58	52.0	64.4	68.0
			Fork Length (cm)	58.5	6.22	2.35	49.4	60.5	64.0
			Body Weight (g)	2,164	671	254	1,280	2,200	2,850
			Gonad Weight (g)	43.7	41.8	15.8	1.50	53.1	102
			Liver Weight (g)	30.4	11.9	4.50	11.7	32.3	48.5
		Female	Age	11.9	2.67	0.715	7.00	11.5	16.0
			Total Length (cm)	55.9	4.76	1.27	48.6	56.0	63.4
			Fork Length (cm)	52.8	4.47	1.20	45.5	53.3	59.5
			Body Weight (g)	1,648	469	125	1,025	1,550	2,500
			Gonad Weight (g)	109	107	28.5	6.28	77.0	303
			Liver Weight (g)	34.5	12.7	3.40	14.2	34.8	52.4

Note: "-" indicates no data. SD = standard deviation. SE = standard error.  
<sup>a</sup>Historical fish data are from Fisheries and Oceans (DFO) reports (i.e., Moshenko 1981, Read 2004)



Female arctic charr captured from Qurluktuk and Ikaluit lakes in 2024 ranged from 57 to 75 cm and 46 to 60 cm in fork length, and from 1,591 to 4,350 g and 1,025 to 2,500 g in body weight, Qurluktuk and Ikaluit lakes, respectively (Figure 3.2, Table 3.2). Female arctic charr captured in Qurluktuk Lake in 2024 were significantly longer and heavier than those captured in Ikaluit Lake (Figure 3.2, Appendix Table D.5). The single male arctic charr captured from Qurluktuk Lake had a fork length of 61 cm and a body weight of 2,300 g, which were within the range of Ikaluit Lake male charr fork length (i.e., 49 to 64 cm) and body weight (i.e., 1,280 to 2,850 g; Table 3.2, Appendix Table D.4).

The resident individual (i.e., QURL\_AC\_09), aged 18 years, was older than the median age for Qurluktuk Lake fish, but was the shortest and lightest among adults from both lakes. This is consistent with expectations, as resident individuals typically do not grow as large or as quickly their anadromous counterparts (e.g., Swanson et al. 2011).

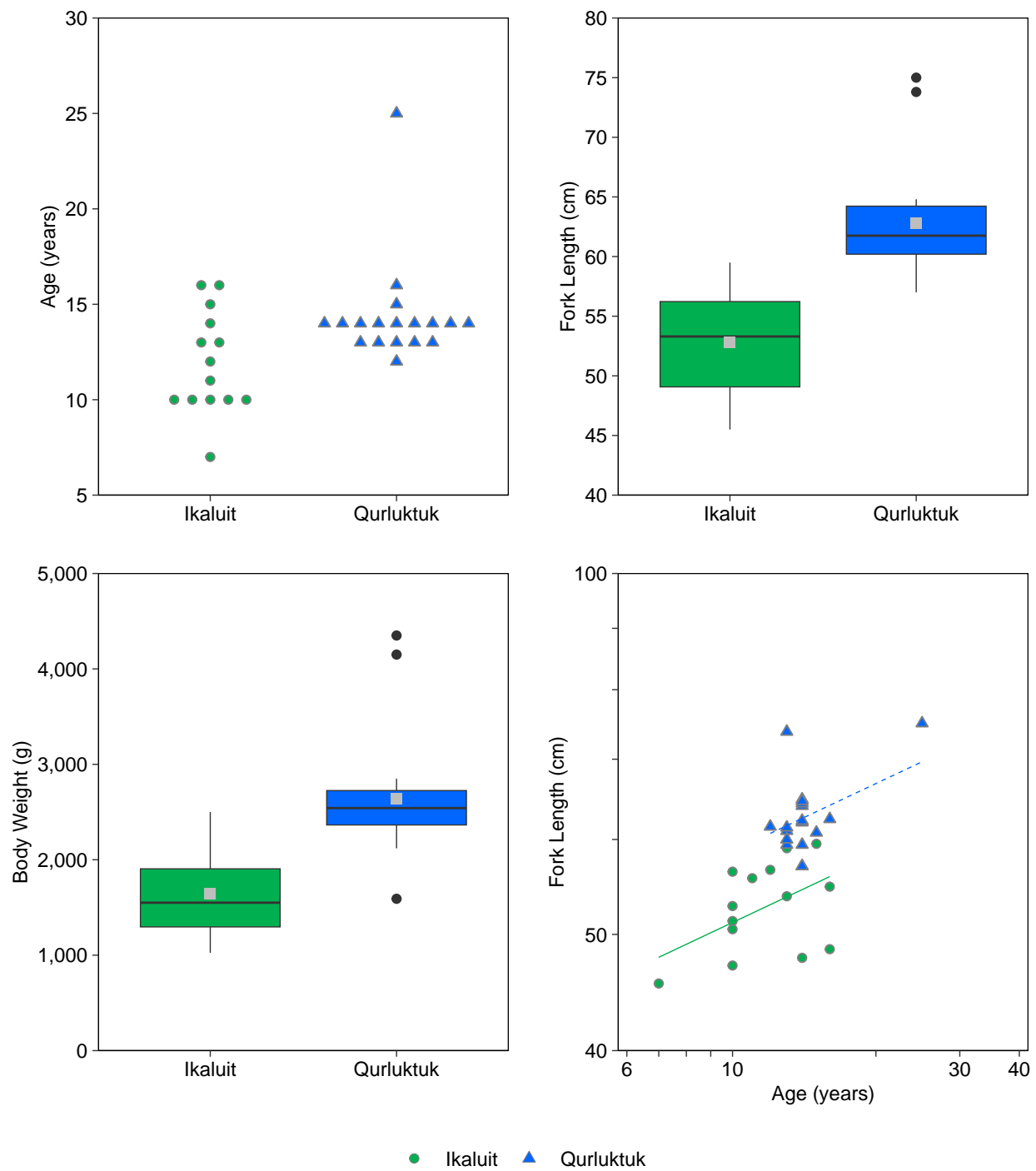
Gonad weight in female arctic charr ranged from 194 to 692 g in Qurluktuk Lake and from 6.3 to 303 g in Ikaluit Lake (Table 3.2). Liver weights ranged from 19 to 56 g and 14 to 52 g in Qurluktuk and Ikaluit lakes, respectively. The single male charr from Qurluktuk Lake had a gonad and liver weights of 46 g and 23 g, respectively, both of which fell within the ranges observed for males from Ikaluit Lake (gonad weight range of 12 to 49 g; liver weight range of 1.5 to 102 g; Table 3.2).

Growth, as measured by fork length relative to age (length-at-age), was higher in Qurluktuk Lake than in Ikaluit Lake (Figure 3.2, Appendix Table D.5). Several factors can influence growth in arctic charr, including water temperature, resource availability, and life history strategy (Grenier and Tallman 2021). Assessment of anadromy based on IQ, indicated that the Ikaluit Lake sampling included both resident and anadromous (i.e., six and 31, respectively; Appendix Table D.3), which may have confounded growth comparisons. Further, two female fish from Ikaluit Lake exhibited length-at-age patterns (i.e., shorter-at-age), similar to the resident charr excluded from the Qurluktuk Lake analysis (Figure 3.2); however, assessment of life history strategies of Ikaluit Lake fish have not been evaluated with supporting otolith microchemical analysis.

Other energy use endpoints including weight-at-age and relative gonad weight were also both significantly higher in females from Qurluktuk Lake than Ikaluit Lake in 2024 (Figure 3.2, Appendix Table D.5). In terms of energy storage, there was no significant difference in female charr body condition (weight-at-length) between lakes in 2024; however, relative liver weight was significantly higher in female charr from Ikaluit Lake than Qurluktuk Lake (Figure 3.2, Appendix Table D.5). These differences in relative gonad weight (i.e., greater in Qurluktuk) and liver weight (i.e., greater in Ikaluit) likely reflect differing energy allocation strategies. The data suggest that females from Qurluktuk Lake invested more energy into reproductive



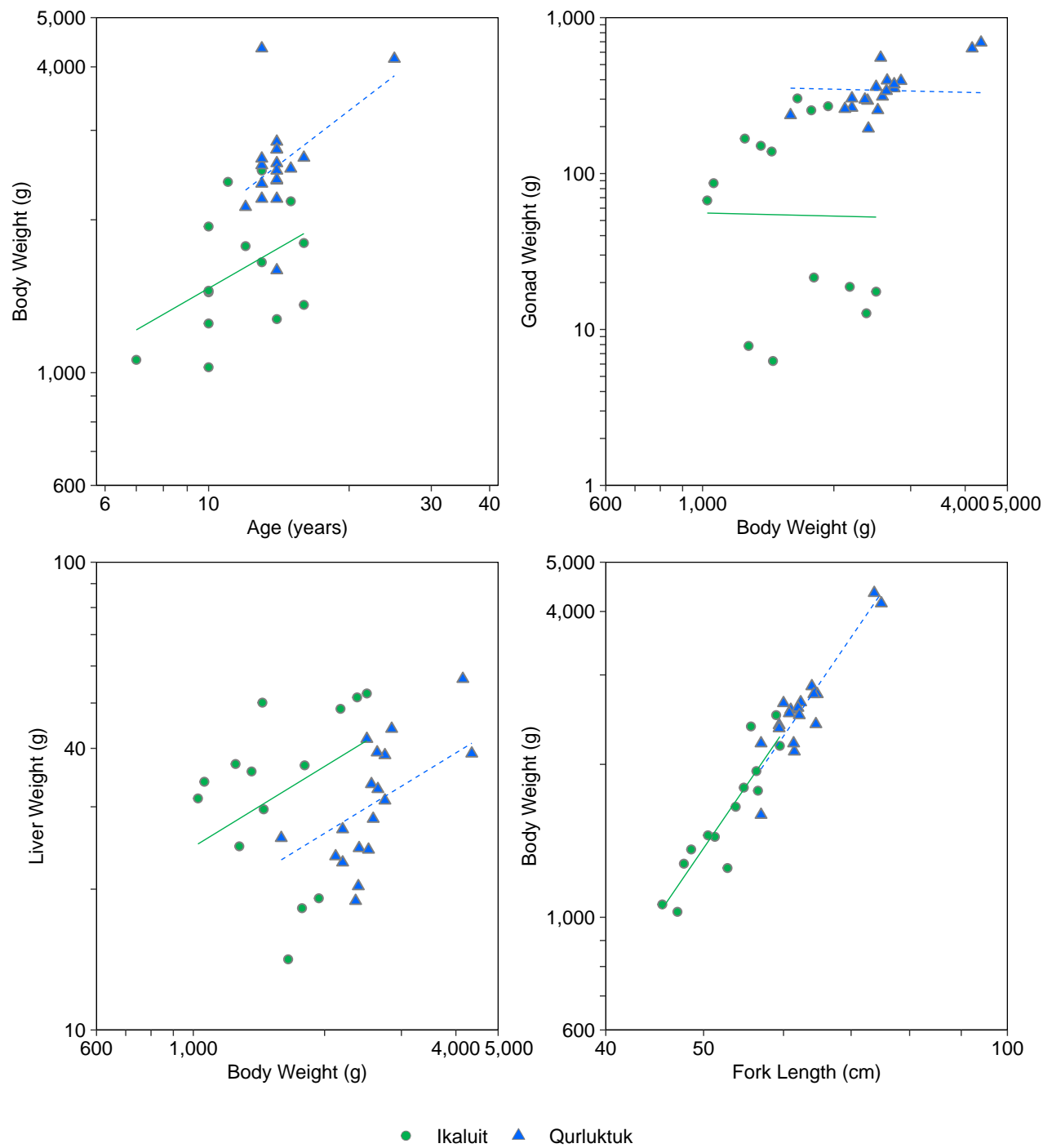




**Figure 3.2: Fish Health Endpoints of Female Arctic Charr, Milne Inlet, August 2024**

Note: Scatterplot x- and y-axes are log10-scaled. Outliers removed from the analysis are plotted as an X.





**Figure 3.2: Fish Health Endpoints of Female Arctic Charr, Milne Inlet, August 2024**

Note: Scatterplot x- and y-axes are log<sub>10</sub>-scaled. Outliers removed from the analysis are plotted as an X.



tissues, while females from Ikaluit Lake stored more energy in the liver. This discrepancy may result from differences in spawning timing between the lakes or variations in the proportion of spawners sampled in 2024. Two distinct clusters are apparent in Ikaluit Lake gonad weight relative to body weight (Figure 3.2), suggesting a mix of spawning (higher relative gonad size) and non spawning (lower relative gonad size) individuals, while only a single cluster was apparent in Qurluktuk Lake (that followed a similar relationship of gonad to body weight as spawning individuals in Ikaluit Lake; Figure 3.2).

### 3.2.3.2 Temporal Health Trends

#### 3.2.3.2.1 Qurluktuk Lake

Life history strategy (i.e., anadromous vs. resident) can influence health endpoints such as growth and condition. Otolith microchemistry analyses conducted on the 2024 samples confirmed the presence of both resident and anadromous fish in Qurluktuk Lake. However, individuals from previous years could not be definitively categorized as either resident or anadromous. As such, fish exhibiting both life history strategies were included in the analysis. However, temporal trends should be interpreted with caution given that the proportions of sampled fish exhibiting each life history strategy appear to vary annually. For example, only one individual captured in 2024 exhibited a resident life history strategy (Figure 3.1), whereas based on length-age relationships, at least six individuals captured in 2022 were considered likely to have exhibited a resident strategy (Minnow 2023).

Female charr sampled in 2021 and 2024 were significantly heavier-at-age than those sampled historically (i.e., prior to mining operations; Tables 3.2 and 3.3, Figure 3.3). Additionally, female charr sampled in 2021, 2022, and 2024 had higher body condition (i.e., heavier-at-length) than their historical counterparts (Table 3.3). However, since anadromous fish typically exhibit better body condition than resident fish, the proportion of anadromous individuals may represent a significant confounding factor. While some significant differences were observed between contemporary (2021 to 2024) and historical samples for specific health endpoints, no endpoint showed a consistent, significant difference across all three contemporary years, except for higher body condition. Further, there were differences between contemporary sampling years for some endpoints (e.g., length and weight), but these were not consistent across years, suggesting that differences are a product of natural variability. Temporal comparisons of male health endpoints were not conducted using 2024 data, as only one male was captured from Qurluktuk Lake.





Table 3.3: Comparison of Health Endpoints in Female Adult Arctic Charr, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, Historical to 2024

Sex	Indicator	Endpoint	Variables		Sample Size				Test			ANCOVA Statistics			Summary Statistics <sup>b</sup>				
									Statistical Test	Shapiro Wilk's P-Value	Levene's Test P-Value	Interaction Model	Parallel Slope Model	Covariate Value for Comparisons <sup>a</sup>					
			Response	Covariate	Historical	2021	2022	2024				Interaction <i>p</i> -value	Covariate <i>p</i> -value		Statistic	Historical	2021	2022	2024
Female	Survival/Recruitment	Length-Frequency Distribution	Fork Length (cm)	-	22	7	13	18	K-S	-	-	-	-	-	0	-	-	-	-
		Age-Frequency Distribution	Age (years)	-	16	7	13	18	K-S	-	-	-	-	-	0	-	-	-	-
	Survival	Age	log10[Age (years)]	-	16	7	13	18	ANOVA	0.069	0.037	-	-	-	Geometric Mean	16.5	15.0	12.1	14.2
	Body Size	Fork Length	Fork Length (cm)	-	22	7	13	18	ANOVA	0.20	0.0010	-	-	-	Mean	62.0	66.4	54.8	62.8
		Body Weight	Body Weight (g)	-	22	7	13	18	ANOVA	0.077	0.062	-	-	-	Mean	2,380	3,344	2,064	2,642
	Energy Usage	Length-at-age	log10[Fork Length (cm)]	log10[Age (years)]	16	7	13	18	ANCOVA	-	-	0.124	<0.001	14.4	Adjusted Mean	57.4	65.0	57.2	62.9
		Weight-at-age	log10[Body Weight (g)]	log10[Age (years)]	16	7	13	18	ANCOVA	-	-	0.260	<0.001	14.4	Adjusted Mean	1,797	3,035	2,070	2,604
	Energy Storage	Condition	log10[Body Weight (g)]	log10[Fork Length (cm)]	22	7	13	18	ANCOVA	-	-	0.363	<0.001	60.4	Adjusted Mean	2,043	2,466	2,434	2,322

Shading indicates an area p-value less than 0.1 or an interaction p-value less than 0.05.

Indicates a Magnitude of Difference (MOD) outside of applicable Critical Effect Size (i.e., ±25% for all endpoints with the exception of ±10% for condition).

Covariate P-value > 0.05

Notes: ns = non-significant. "-" indicates the value is not applicable. ANCOVA = analysis of covariance. K-S = Kolmogorov–Smirnov.

<sup>a</sup> The mean value of the covariate (that corresponds to the adjusted means for the response variable) for the parallel slope ANCOVA model or the minimum and maximum values of the overlap in covariate values for the interaction ANCOVA model.

<sup>b</sup> The median, mean (geometric mean for log<sub>10</sub>-transformed variables), and adjusted mean are reported for Mann-Whitney, t-test and ANCOVA, respectively, and the predicted means of the regression line equations for minimum and maximum values of the covariate (where the data sets overlap) for ANCOVAs where a significant interaction (i.e., different slopes) occurs.

<sup>c</sup> MOD = (MCT<sub>historical</sub> - MCT<sub>recent</sub>/ MCT<sub>recent</sub>) x 100

<sup>d</sup> Minimum detectable effect size (see methods section of report for formula).



Table 3.3: Comparison of Health Endpoints in Female Adult Arctic Charr, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, Historical to 2024

Sex	Indicator	Endpoint	Variables		Sample Size				Test <i>P</i> -value (Location)	Historical vs. 2021				Historical vs. 2022			
										P-Value	Magnitude of Difference (%) <sup>c</sup>	Estimated Minimum Detectable Difference with $\alpha=\beta=0.1^d$		P-Value	Magnitude of Difference (%) <sup>c</sup>	Estimated Minimum Detectable Difference with $\alpha=\beta=0.1^d$	
			Response	Covariate	Historical	2021	2022	2024				Increase	Decrease			Increase	Decrease
Female	Survival/Recruitment	Length-Frequency Distribution	Fork Length (cm)	-	22	7	13	18	-	0.379	ns	-	-	0.128	ns	-	-
		Age-Frequency Distribution	Age (years)	-	16	7	13	18	-	0.666	ns	-	-	0.044	-46	-	-
	Survival	Age	log10[Age (years)]	-	16	7	13	18	0.013	0.821	ns	33	-25	0.007	-27	33	-25
	Body Size	Fork Length	Fork Length (cm)	-	22	7	13	18	0.042	0.706	ns	17	-17	0.145	ns	17	-17
		Body Weight	Body Weight (g)	-	22	7	13	18	0.064	0.147	ns	47	-47	0.816	ns	47	-47
	Energy Usage	Length-at-age	log10[Fork Length (cm)]	log10[Age (years)]	16	7	13	18	0.022	0.113	ns	15	-13	1.000	ns	15	-13
		Weight-at-age	log10[Body Weight (g)]	log10[Age (years)]	16	7	13	18	0.010	0.023	69	58	-37	0.813	ns	58	-37
	Energy Storage	Condition	log10[Body Weight (g)]	log10[Fork Length (cm)]	22	7	13	18	0.005	0.044	21	19	-16	0.019	19	19	-16

Shading indicates an area p-value less than 0.1 or an interaction p-value less than 0.05.

Indicates a Magnitude of Difference (MOD) outside of applicable Critical Effect Size (i.e., ±25% for all endpoints with the exception of ±10% for condition).

Covariate P-value > 0.05

Notes: ns = non-significant. "-" indicates the value is not applicable. ANCOVA = analysis of covariance. K-S = Kolmogorov–Smirnov.

<sup>a</sup> The mean value of the covariate (that corresponds to the adjusted means for the response variable) for the parallel slope ANCOVA model or the minimum and maximum values of the overlap in covariate values for the interaction ANCOVA model.

<sup>b</sup> The median, mean (geometric mean for log<sub>10</sub>-transformed variables), and adjusted mean are reported for Mann-Whitney, t-test and ANCOVA, respectively, and the predicted means of the regression line equations for minimum and maximum values of the covariate (where the data sets overlap) for ANCOVAs where a significant interaction (i.e., different slopes) occurs.

<sup>c</sup> MOD = (MCT<sub>historical</sub> - MCT<sub>recent</sub>/ MCT<sub>recent</sub>) x 100

<sup>d</sup> Minimum detectable effect size (see methods section of report for formula).



Table 3.3: Comparison of Health Endpoints in Female Adult Arctic Charr, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, Historical to 2024

Sex	Indicator	Endpoint	Variables		Sample Size				Historical vs. 2024				2021 vs. 2022			
									P-Value	Magnitude of Difference (%) <sup>c</sup>	Estimated Minimum Detectable Difference with $\alpha=\beta=0.1^d$		P-Value	Magnitude of Difference (%) <sup>c</sup>	Estimated Minimum Detectable Difference with $\alpha=\beta=0.1^d$	
			Response	Covariate	Historical	2021	2022	2024			Increase	Decrease			Increase	Decrease
Female	Survival/Recruitment	Length-Frequency Distribution	Fork Length (cm)	-	22	7	13	18	0.021	45	-	-	0.036	-63	-	-
		Age-Frequency Distribution	Age (years)	-	16	7	13	18	0.005	-52	-	-	0.138	ns	-	-
	Survival	Age	log10[Age (years)]	-	16	7	13	18	0.296	ns	33	-25	0.250	ns	33	-25
	Body Size	Fork Length	Fork Length (cm)	-	22	7	13	18	0.992	ns	17	-17	0.054	-18	16	-16
		Body Weight	Body Weight (g)	-	22	7	13	18	0.852	ns	47	-47	0.049	-38	34	-34
	Energy Usage	Length-at-age	log10[Fork Length (cm)]	log10[Age (years)]	16	7	13	18	0.140	ns	15	-13	0.128	ns	15	-13
		Weight-at-age	log10[Body Weight (g)]	log10[Age (years)]	16	7	13	18	0.044	45	58	-37	0.186	ns	58	-37
	Energy Storage	Condition	log10[Body Weight (g)]	log10[Fork Length (cm)]	22	7	13	18	0.067	14	19	-16	0.998	ns	19	-16

Shading indicates an area p-value less than 0.1 or an interaction p-value less than 0.05.

Indicates a Magnitude of Difference (MOD) outside of applicable Critical Effect Size (i.e., ±25% for all endpoints with the exception of ±10% for condition).

Covariate P-value > 0.05

Notes: ns = non-significant. "-" indicates the value is not applicable. ANCOVA = analysis of covariance. K-S = Kolmogorov–Smirnov.

<sup>a</sup> The mean value of the covariate (that corresponds to the adjusted means for the response variable) for the parallel slope ANCOVA model or the minimum and maximum values of the overlap in covariate values for the interaction ANCOVA model.

<sup>b</sup> The median, mean (geometric mean for log<sub>10</sub>-transformed variables), and adjusted mean are reported for Mann-Whitney, t-test and ANCOVA, respectively, and the predicted means of the regression line equations for minimum and maximum values of the covariate (where the data sets overlap) for ANCOVAs where a significant interaction (i.e., different slopes) occurs.


<sup>c</sup> MOD = (MCT<sub>historical</sub> - MCT<sub>recent</sub>/ MCT<sub>recent</sub>) x 100


<sup>d</sup> Minimum detectable effect size (see methods section of report for formula).




Table 3.3: Comparison of Health Endpoints in Female Adult Arctic Charr, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, Historical to 2024

Sex	Indicator	Endpoint	Variables		Sample Size				2021 vs. 2024				2022 vs. 2024			
									P-Value	Magnitude of Difference (%) <sup>c</sup>	Estimated Minimum Detectable Difference with $\alpha=\beta=0.1^d$		P-Value	Magnitude of Difference (%) <sup>c</sup>	Estimated Minimum Detectable Difference with $\alpha=\beta=0.1^d$	
			Response	Covariate	Historical	2021	2022	2024			Increase	Decrease			Increase	Decrease
Female	Survival/Recruitment	Length-Frequency Distribution	Fork Length (cm)	-	22	7	13	18	0.174	ns	-	-	<0.001	77	-	-
		Age-Frequency Distribution	Age (years)	-	16	7	13	18	0.025	-55	-	-	0.037	41	-	-
	Survival	Age	log10[Age (years)]	-	16	7	13	18	0.962	ns	33	-25	0.274	ns	33	-25
	Body Size	Fork Length	Fork Length (cm)	-	22	7	13	18	0.833	ns	16	-16	0.103	ns	19	-19
		Body Weight	Body Weight (g)	-	22	7	13	18	0.426	ns	34	-34	0.418	ns	55	-55
	Energy Usage	Length-at-age	log10[Fork Length (cm)]	log10[Age (years)]	16	7	13	18	0.928	ns	15	-13	0.149	ns	15	-13
		Weight-at-age	log10[Body Weight (g)]	log10[Age (years)]	16	7	13	18	0.810	ns	58	-37	0.397	ns	58	-37
	Energy Storage	Condition	log10[Body Weight (g)]	log10[Fork Length (cm)]	22	7	13	18	0.830	ns	19	-16	0.866	ns	19	-16

 Shading indicates an area p-value less than 0.1 or an interaction p-value less than 0.05.

 Indicates a Magnitude of Difference (MOD) outside of applicable Critical Effect Size (i.e., ±25% for all endpoints with the exception of ±10% for condition).

 Covariate P-value > 0.05

Notes: ns = non-significant. "-" indicates the value is not applicable. ANCOVA = analysis of covariance. K-S = Kolmogorov–Smirnov.

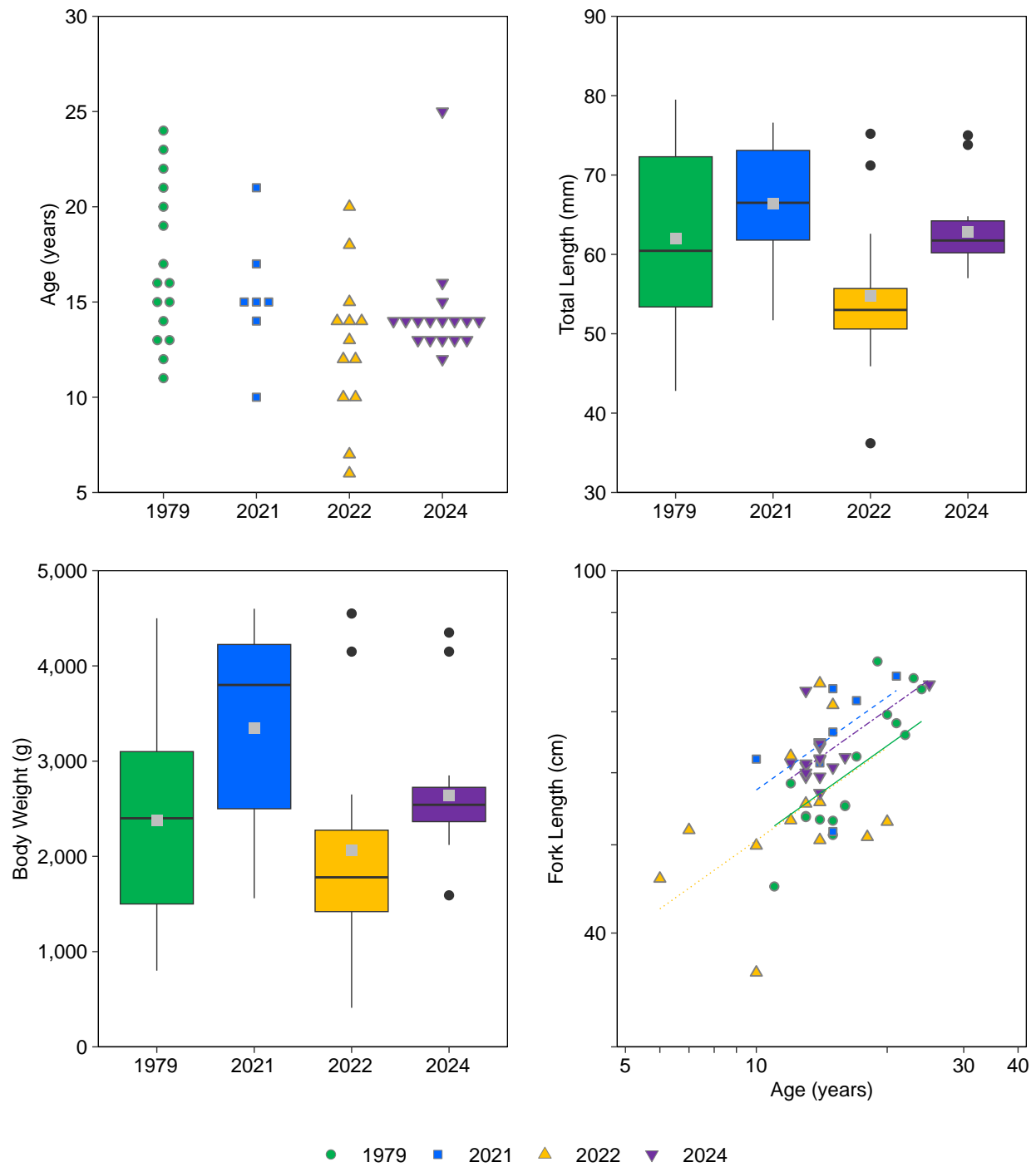
<sup>a</sup> The mean value of the covariate (that corresponds to the adjusted means for the response variable) for the parallel slope ANCOVA model or the minimum and maximum values of the overlap in covariate values for the interaction ANCOVA model.

<sup>b</sup> The median, mean (geometric mean for log<sub>10</sub>-transformed variables), and adjusted mean are reported for Mann-Whitney, t-test and ANCOVA, respectively, and the predicted means of the regression line equations for minimum and maximum values of the covariate (where the data sets overlap) for ANCOVAs where a significant interaction (i.e., different slopes) occurs.

<sup>c</sup> MOD = (MCT<sub>historical</sub> - MCT<sub>recent</sub>/ MCT<sub>recent</sub>) x 100

<sup>d</sup> Minimum detectable effect size (see methods section of report for formula).

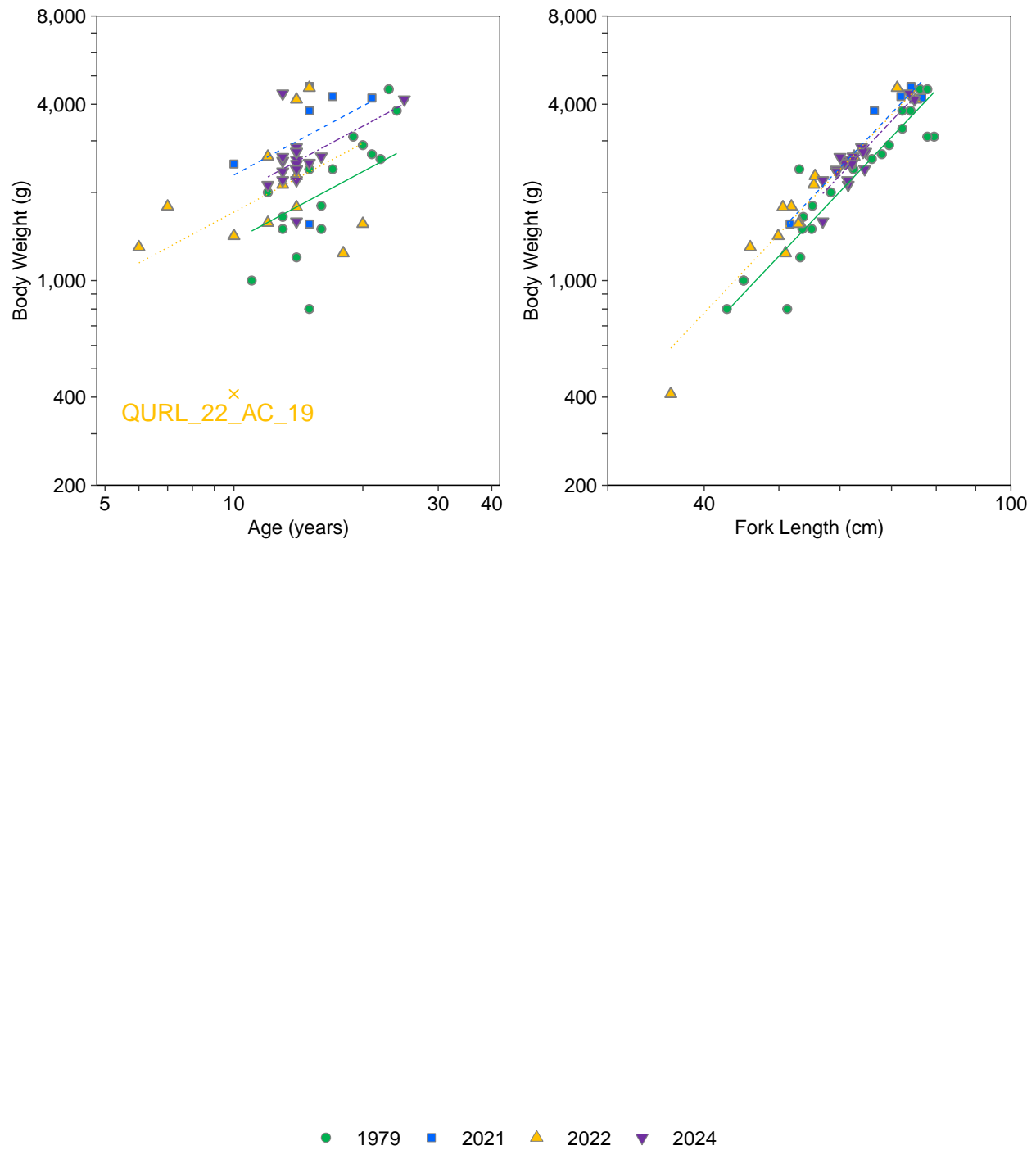




**Figure 3.3: Fish Health Endpoints of Female Adult Arctic Charr, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, Historical, 2021, 2022, and 2024**

Notes: Scatterplot x- and y-axes are log10-scaled. Outliers removed from the analysis are plotted as an X. The 1979 data represent the historical dataset from Moshenko (1979).





**Figure 3.3: Fish Health Endpoints of Female Adult Arctic Charr, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, Historical, 2021, 2022, and 2024**

Notes: Scatterplot x- and y-axes are log10-scaled. Outliers removed from the analysis are plotted as an X. The 1979 data represent the historical dataset from Moshenko (1979).



### 3.2.3.2.2 Ikaluit Lake

Publicly available historical (i.e., pre-mining operations) data for Ikaluit Lake were not accessible, so temporal comparisons could not be made between contemporary and historical fish endpoint data. Comparison of health endpoints between 2022 and 2024 for female and male charr (Table 3.4, Figures 3.4 and 3.5) indicated no significant differences between 2022 and 2024 in any female health endpoints (Table 3.4, Figure 3.4). There was a statistically significant difference in male body condition between 2022 and 2024 in Ikaluit Lake where fish in 2024 had lower condition than 2022 (Table 3.4, Figure 3.5). This difference was small (Magnitude of Difference [MOD] = 7.4%) and represents natural variability.

### 3.2.3.2.3 Summary

Data collected both historically and during the current program include a mix of both resident and anadromous arctic charr. While anthropogenic activities can affect fish health endpoints, the differences in health endpoints observed between the historical and contemporary sampling periods, are likely due to methodological changes (e.g., changes in gill net size and sampling location) and/or sample bias (e.g., ratio of resident and anadromous fish). Additionally, the historical data used for comparison with Qurluktuk Lake in 2021, 2022, and 2024, were collected from the Robertson River, which connects Qurluktuk Lake to Milne Inlet. It is therefore possible that all the fish in the historical dataset were anadromous, unlike the 2021, 2022, and 2024 samples, which likely included varying ratios of resident and anadromous fish. As previously noted, health endpoints such as body condition (length relative to weight) and growth (length or weight relative to age) can vary significantly between resident and anadromous individuals (Young et al. 2021), which contributed to the observed differences in these endpoints between contemporary and historical samples.

### 3.2.4 Fish Tissue

Elevated mercury concentrations in large-bodied fish species of the Arctic are not uncommon, even in the absence of local point sources of contamination. The majority of mercury in Arctic ecosystems originates from long-range atmospheric deposition from anthropogenic sources (e.g., coal combustion), which is transported northward by prevailing air currents and deposited in lakes and on landscapes. Historically, the tundra acted as a sink for elemental mercury; however, with enhanced permafrost thawing due to climate change, mercury that was once sequestered has become more bioavailable for methylation (see Lehnherr 2014). Additionally, the slow growth rates and long lifespans of some Arctic fishes contribute to the bioaccumulation of mercury over extended periods, resulting in elevated concentrations (see Lehnherr 2014).





Table 3.4: Comparison of Health Endpoints in Adult Arctic Charr, Ikaluit Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2022 and 2024

Sex	Indicator	Endpoint	Variables		Sample Size		Test			ANCOVA Statistics			Summary Statistics <sup>b</sup>			Test <i>P</i> -value (Location)	2022 vs. 2024		
							Statistical Test	Shapiro Wilk's P-Value	Levene's Test P-Value	Interaction Model	Parallel Slope Model	Covariate Value for Comparisons <sup>a</sup>					Magnitude of Difference (%) <sup>c</sup>	Estimated Minimum Detectable Difference with α=β=0.1	
			Response	Covariate	2022	2024				Interaction <i>p</i> -value	Covariate <i>p</i> -value		Statistic	2022	2024				
Male	Survival/Recruitment	Length-Frequency Distribution	Fork Length (cm)	-	25	7	K-S	-	-	-	-	-	0	-	-	0.851	ns	-	-
		Age-Frequency Distribution	Age (years)	-	25	7	K-S	-	-	-	-	-	0	-	-	0.907	ns	-	-
	Survival	Age	Age (years)	-	25	7	tequal	0.30	0.91	-	-	-	Mean	11.5	11.9	0.687	ns	13	-13
	Body Size	Fork Length	Fork Length (cm)	-	25	7	tequal	0.80	0.58	-	-	-	Mean	59.3	58.5	0.805	ns	8.3	-8.3
		Body Weight	Body Weight (g)	-	25	7	tequal	0.52	0.58	-	-	-	Mean	2,452	2,164	0.434	ns	23	-23
	Energy Usage	Length-at-age	log10[Fork Length (cm)]	log10[Age (years)]	25	7	ANCOVA	-	-	0.445	<0.001	11.4	Adjusted Mean	59.0	57.5	0.566	ns	7.1	-6.7
		Weight-at-age	log10[Body Weight (g)]	log10[Age (years)]	25	7	ANCOVA	-	-	0.494	0.004	11.4	Adjusted Mean	2,316	2,005	0.311	ns	24	-20
	Energy Storage	Condition	log10[Body Weight (g)]	log10[Fork Length (cm)]	25	7	ANCOVA	-	-	0.873	<0.001	58.7	Adjusted Mean	2,282	2,114	0.069	-7.4	6.6	-6.2
Female	Survival/Recruitment	Length-Frequency Distribution	Fork Length (cm)	-	12	14	K-S	-	-	-	-	-	0	-	-	0.537	ns	-	-
		Age-Frequency Distribution	Age (years)	-	12	14	K-S	-	-	-	-	-	0	-	-	0.846	ns	-	-
	Survival/Recruitment	Age-Frequency Distribution	Age (years)	-	12	14	K-S	-	-	-	-	-	0	-	-	0.846	ns	-	-
	Body Size	Fork Length	Fork Length (cm)	-	12	14	tequal	0.81	0.46	-	-	-	Mean	54.8	52.8	0.325	ns	10	-10
		Body Weight	Body Weight (g)	-	12	14	tequal	0.62	0.87	-	-	-	Mean	1,782	1,648	0.496	ns	30	-30
	Energy Usage	Length-at-age	log10[Fork Length (cm)]	log10[Age (years)]	12	14	ANCOVA	-	-	0.323	0.001	11.3	Adjusted Mean	55.0	52.3	0.113	ns	8.9	-8.2
		Weight-at-age	log10[Body Weight (g)]	log10[Age (years)]	12	14	ANCOVA	-	-	0.697	0.004	11.3	Adjusted Mean	1,752	1,556	0.239	ns	31	-24
	Energy Storage	Condition	log10[Body Weight (g)]	log10[Fork Length (cm)]	12	14	ANCOVA	-	-	0.502	<0.001	53.5	Adjusted Mean	1,621	1,664	0.525	ns	12	-11

- Shading indicates an area p-value less than 0.1 or an interaction p-value less than 0.05.
- Indicates a Magnitude of Difference (MOD) outside of applicable Critical Effect Size (i.e., ±25% for all endpoints with the exception of ±10% for condition).
- Covariate P-value > 0.05.

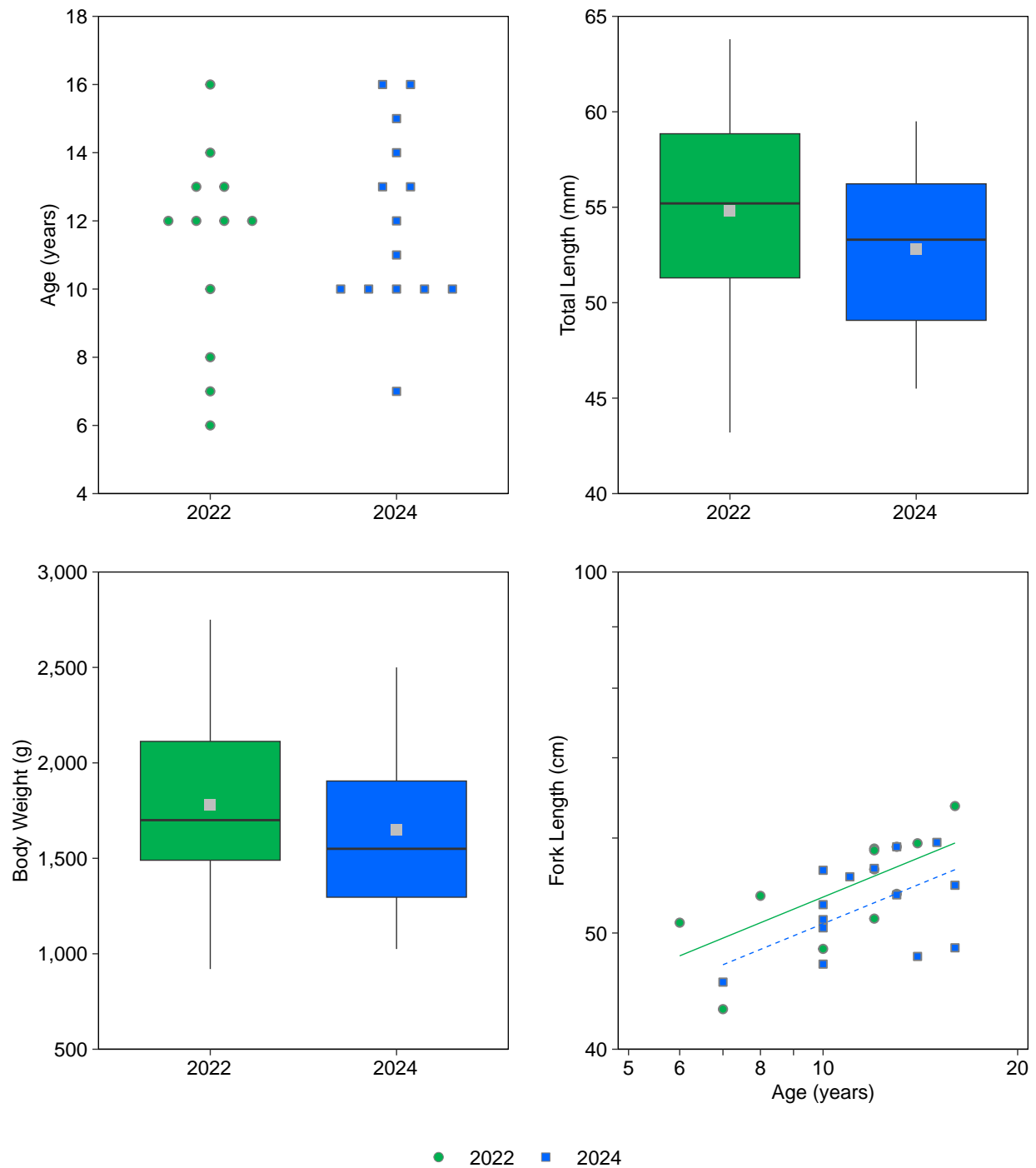
Notes: ns = non-significant. "-" indicates the value is not applicable. ANCOVA = analysis of covariance. K-S = Kolmogorov–Smirnov.

<sup>a</sup> The mean value of the covariate (that corresponds to the adjusted means for the response variable) for the parallel slope ANCOVA model or the minimum and maximum values of the overlap in covariate values for the interaction ANCOVA model.

<sup>b</sup> The median, mean (geometric mean for log<sub>10</sub>-transformed variables), and adjusted mean are reported for Mann-Whitney, t-test and ANCOVA, respectively, and the predicted means of the regression line equations for minimum and maximum values of the covariate (where the data sets overlap) for ANCOVAs where a significant interaction (i.e., different slopes) occurs.

<sup>c</sup> Magnitude of Difference (MOD) = (MCT2022 - MCT2024/ MCT2024) x 100

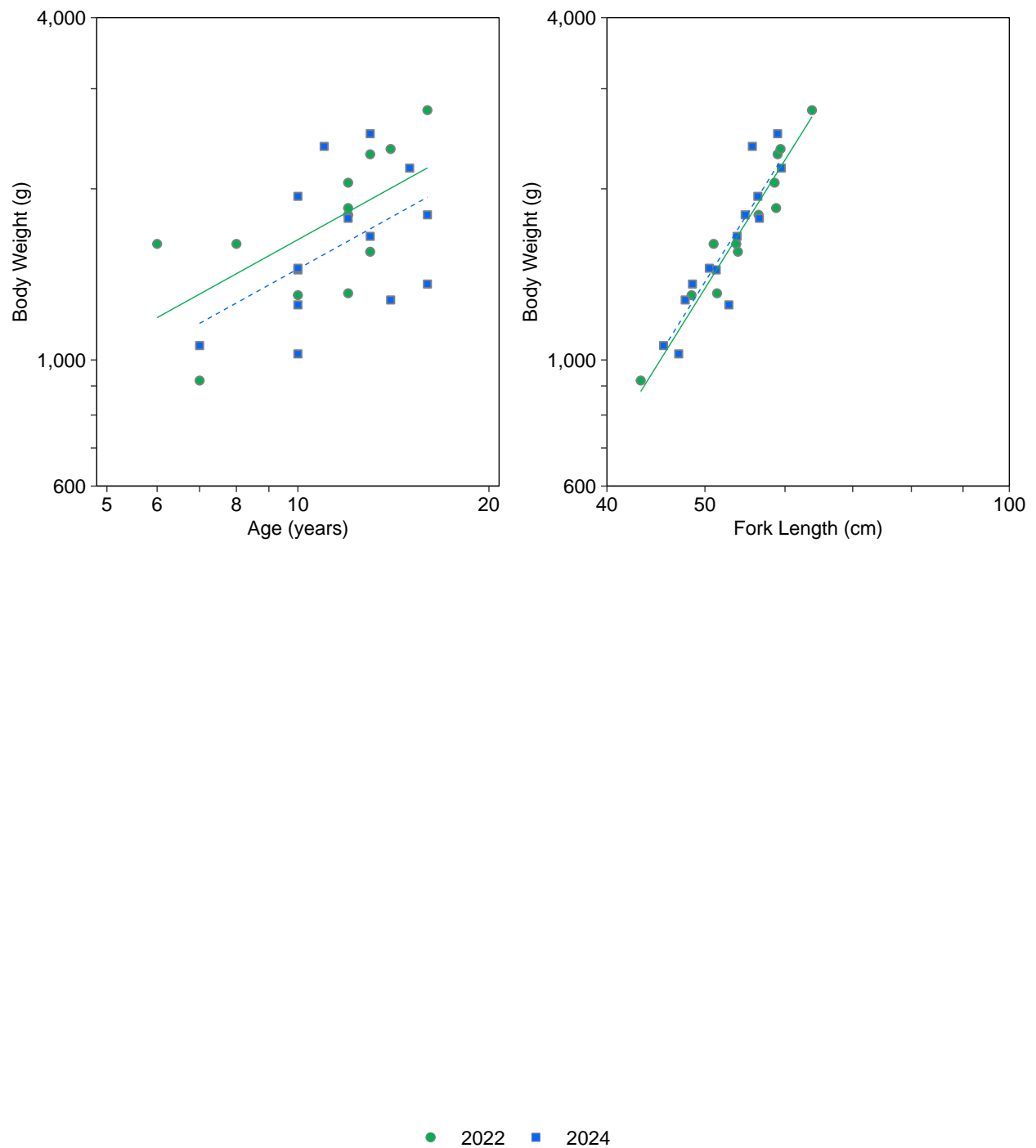




**Figure 3.4: Fish Health Endpoints of Female Adult Arctic Charr, Ikaluit Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2022 and 2024**

Notes: Scatterplot x- and y-axes are log<sub>10</sub>-scaled.

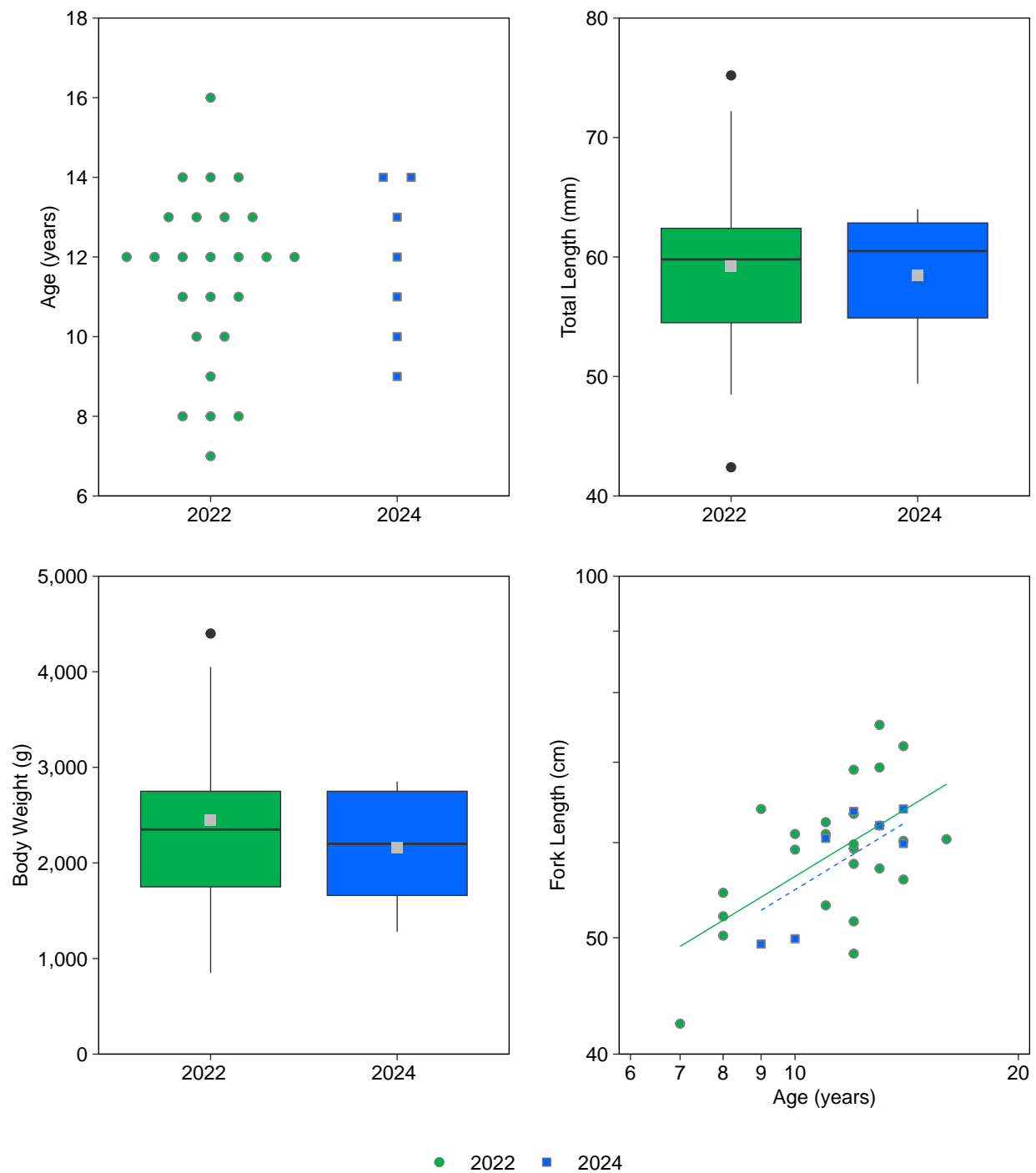




**Figure 3.4: Fish Health Endpoints of Female Adult Arctic Charr, Ikaluit Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2022 and 2024**

Notes: Scatterplot x- and y-axes are log<sub>10</sub>-scaled.

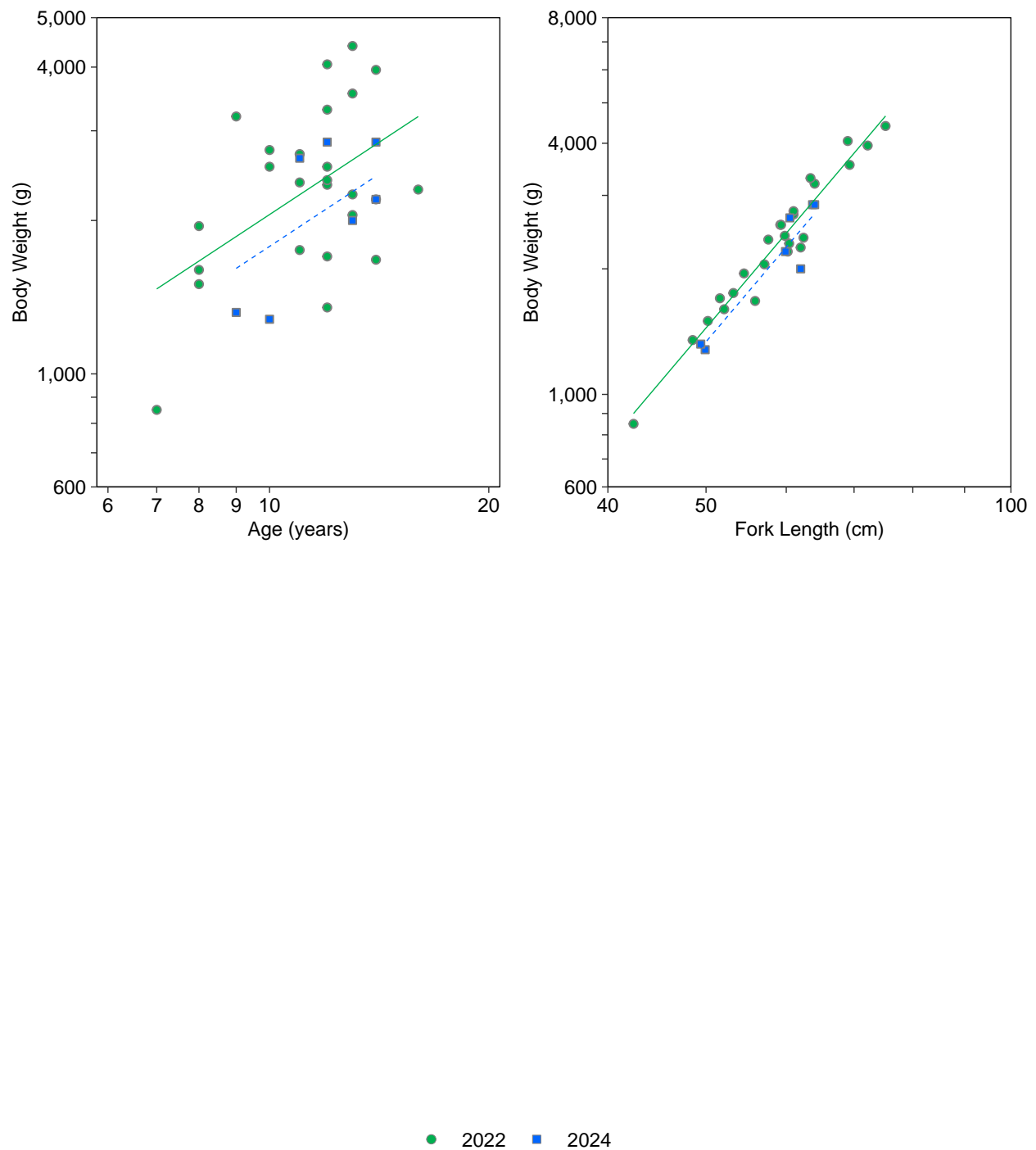




**Figure 3.5: Fish Health Endpoints of Male Adult Arctic Charr, Ikaluit Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2022 and 2024**

Notes: Scatterplot x- and y-axes are log<sub>10</sub>-scaled.





**Figure 3.5: Fish Health Endpoints of Male Adult Arctic Charr, Ikaluit Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2022 and 2024**

Notes: Scatterplot x- and y-axes are log10-scaled.



For both Qurluktuk and Ikaluit lakes in 2024, mean mercury concentrations in muscle and liver tissue of sampled arctic charr were below Maximum Allowable Mercury Concentration in Fish for Commercial Sale (0.5 mg/kg ww; CFIA 2015; Appendix Tables D.7 and D.8). In Ikaluit Lake, none of the fish muscle or liver tissue samples exceeded the consumption guideline (Figure 3.6, Appendix Tables D.7 and D.8). In Qurluktuk Lake, however, one liver sample exceeded the consumption guideline (Figure 3.6; Appendix Tables D.7 and D.8), and one muscle tissue concentration was just under the guideline. Both the liver and muscle samples with the highest mercury concentrations belonged to the single resident individual captured in Qurluktuk Lake (i.e., QURL\_AC\_09). This finding supports previous interpretations that elevated mercury concentrations in charr from Qurluktuk Lake are a product of differences in life history strategy (Minnow 2023).

Consistent with 2022 results, charr mean muscle mercury concentrations were significantly higher in Qurluktuk Lake than in Ikaluit Lake in 2024 when outliers were included in the analysis; however, when removed there was no significant difference (Figure 3.6, Appendix Table D.6; Minnow 2023). The two outliers in the analysis were the only resident individual (i.e., QURL\_AC\_09) and the oldest individual (i.e., 25 years of age) captured in 2024, which is consistent known relationships between life history strategy (Swanson 2011) and age (Mason et al. 2000) and mercury concentration. Liver mercury concentrations were also significantly higher in Qurluktuk Lake in 2024, which contrasts with the 2022 findings, where liver mercury was greater in Ikaluit Lake fish (Figure 3.6, Appendix Table D.6; Minnow 2023). This change may reflect differences in resource allocation or different proportions of life history strategies between the two populations. As described in Section 3.2.3.1, relative liver size was significantly greater in females from Ikaluit Lake, whereas females from Qurluktuk Lake exhibited higher relative gonad weight (Appendix Table D.13). These patterns suggest that females sampled in Qurluktuk Lake invested more energy into reproduction at the time of the 2024 sampling, potentially leading to reduced liver mass due to lipid mobilization. Since methylmercury is primarily associated with protein-rich tissue rather than fat (Bloom 1992), this reduction in liver size could result in higher mercury concentrations. Conversely, the larger livers in Ikaluit Lake females may reflect greater lipid storage in the absence of reproductive investment, leading to a dilution of mercury concentrations within liver tissue.

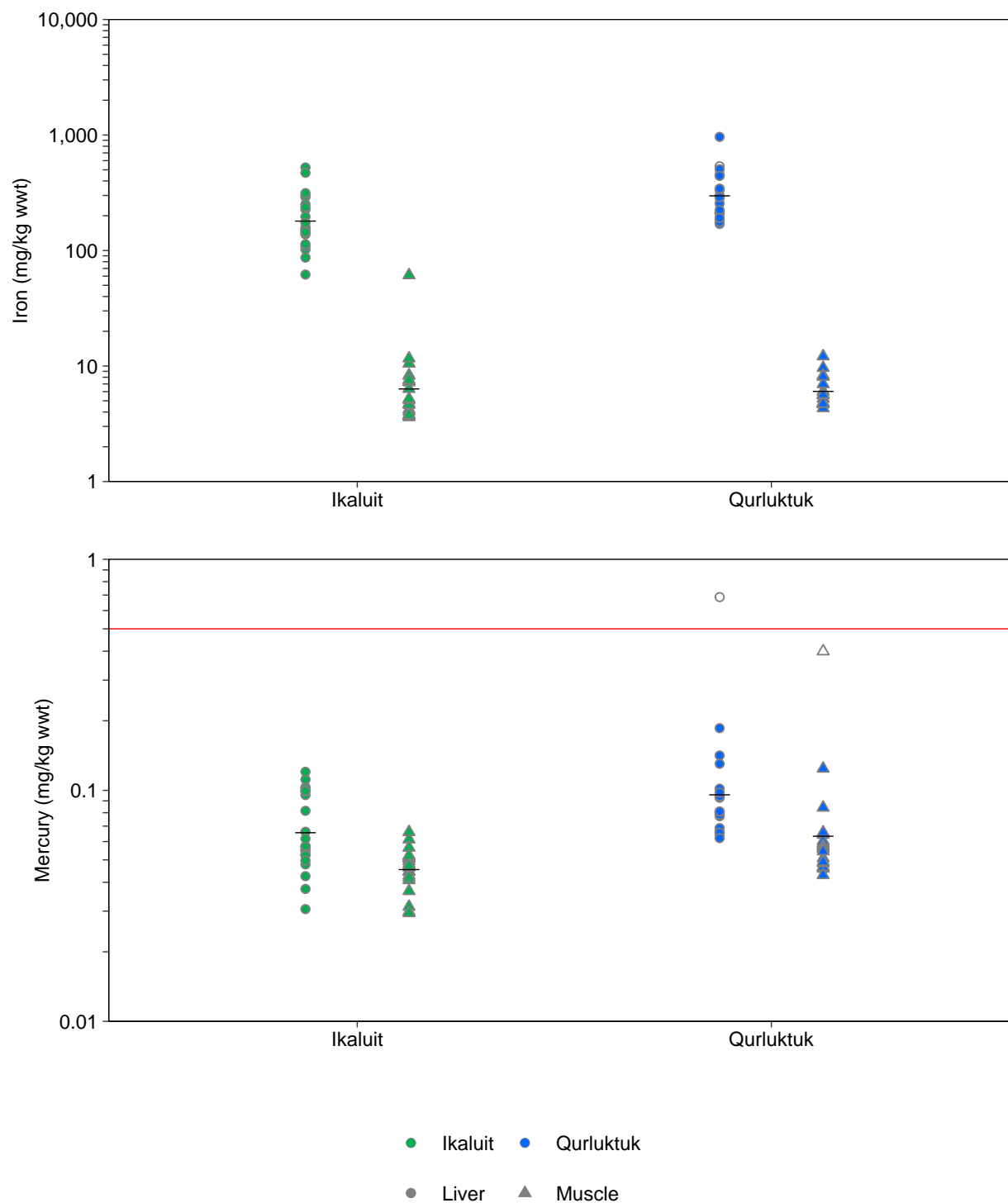
Iron concentrations in arctic charr tissues were also examined, although no consumption guideline is available<sup>12</sup>. Health Canada recommends a daily upper limit of iron intake of 45 mg/day (2006).

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<sup>12</sup> Iron was identified during consultation as an analyte of interest in fish tissues.







**Figure 3.6: Iron and Mercury Concentrations (mg/kg ww) in Arctic Charr Muscle and Liver, Qurluktuk and Ikaluit Lakes, Milne Inlet Freshwater Fish Health Monitoring Program, 2024**

Note: Black bars denote geometric means. Red solid line represents the Maximum Allowable Mercury Concentration in Fish for Commercial Sale (0.5 mg/kg ww). Open symbols represent resident fish.



The iron concentrations in both muscle and liver tissues reported here are consistent with the nutritional information provided by Health Canada for raw arctic charr and well below the recommended limit, assuming an average portion size of 75 g (Health Canada 2025; Figure 3.6; Appendix Table D.7 and D.8). To consume the recommended limit of iron per day, one would need to eat between 5 and 7 kg of fish muscle or 175 to 350 g of liver (e.g., 6 to 12 whole livers). Fish, especially organ meat (e.g., livers), are considered an excellent source of iron, an essential nutrient that must be acquired through diet (Health Canada 2006). Unlike in 2022, mean muscle and liver iron concentration were higher in Qurluktuk Lake than Ikaluit Lake, although the difference in muscle tissue was not statistically significant (Figure 3.6, Appendix Table D.6; Minnow 2023). Similar to mercury, the difference in liver iron concentrations between the lakes could be due to varying relative liver sizes.

Several exceedances of Health Canada consumption benchmarks for arsenic, cadmium<sup>13</sup>, copper, and selenium were observed in both muscle and liver tissues of arctic charr collected from Qurluktuk and Ikaluit Lakes in 2024 (Appendix Tables D.7 and D.8). Additional exceedances were noted for chromium<sup>14</sup> in muscle tissue and for manganese, silver, and zinc in liver tissue. Detection limits for aluminum and nickel were above the Health Canada benchmarks, so whether these metals exceeded guidelines could not be determined. No other metals had concentrations consistently above benchmarks (Appendix Tables D.7 and D.8).

Elevated arsenic concentrations are commonly associated with arsenobetaine, a non-toxic organic form found in marine organisms, which poses little risk to aquatic life or consumers (Eisler 1988). While exceedances of cadmium, copper, and selenium were recorded, these concentrations likely reflect natural conditions in the study lakes and are considered a product of the local geochemistry and fish physiology. Selenium and cadmium are also bioaccumulative, and can be affected by fish age and growth, although less predictably than mercury (Maret et al. 2010). Selenium is an essential micronutrient, and traditional foods, particularly those of marine origin, are naturally rich in selenium (Lemire et al. 2015). Moreover, organic forms of selenium found in food are generally less toxic than inorganic forms found in supplements, occupational settings, or drinking water (Rayman 2012).

### 3.3 Ongoing Consultation and Bridging Knowledge Systems

A component of the Milne Inlet Freshwater Fish Health Monitoring Program is to engage with the MHTO regarding the design, timing, and location of the proposed surveys and ongoing monitoring. The program approach was inspired by the Mi'kmaq concept of Two-Eyed

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<sup>13</sup> Only one fish from Ikaluit Lake had a cadmium muscle concentration exceeding guidelines (Appendix Table D.15).

<sup>14</sup> Only one fish from Ikaluit Lake had a chromium muscle concentration exceeding guidelines (Appendix Table D.15)





Seeing, by integrating Inuit Qaujimagatuqangit (IQ) and western science. Throughout various meetings held among project partners, shared knowledge has helped to guide not only identification of project objectives, but also the study design (e.g., location of study lakes), sampling framework (e.g., where in each lake to sample), and the interpretation of results (e.g., how to identify a “healthy” fish and what endpoints are of concern). Moreover, ongoing conversations will facilitate an adaptive approach to this program which will help to secure its long-term success, and its relevance to the MHTO.

To date, the main objectives of this program have focused on health endpoints for arctic charr such as survival (age), growth (size relative to age), condition (length relative to weight), and tissue quality as it relates to consumption. Inuit Qaujimagatuqangit has helped to define these objectives and the following outlines contributions to the study:

- Two lakes (Tugaat Lake and Qurluktuk Lake) were initially identified as important sources of the subsistence fishery for community members. Community feedback identified a third lake (Ikaluit Lake) which was added to the program.
- During initial discussions with the MHTO, mercury and iron tissue concentrations were identified as analytes of concern in fish tissue.
- To facilitate an integrated approach, crews were made up of individuals who brought a combination of IQ and western science to the project.
- During the field program, members holding IQ identified appropriate locations where fishing should occur within the study lakes.

During fish processing in 2022 there were some charr that the community partners had no interest in keeping for human (nor animal) consumption. Several community members communicated that these particular fish, referred to by some as “unhealthy,” could be identified by slight nuances in appearance and smell. Pairing these and other qualitative descriptors (e.g., texture or color, based on the experience of hunters and trappers) with fish attributes such as age and length may facilitate a more holistic picture of charr health from the study areas and help to ensure that community members can have confidence in consuming the fish.

- During discussions with the MHTO, members expressed the need for increased transparency for all fish data which were included in the 2022 report as well as this report (Minnow 2023; Appendix D).
- During discussions with the MHTO, members expressed interest in the study evaluating whether the arctic charr are acceptable for consumption. In response, Minnow (2023)





and this report included a screening of all tissue data collected with available consumption values (see Table 2.2 and Appendix D).

Ongoing knowledge sharing, and the bridging of knowledge systems, is a tremendous tool which will only help to fortify this program, build relationships among project partners, and ensure the long-term success and value of these monitoring efforts for the Inuit community.





## 4 CONCLUSIONS AND RECOMMENDATIONS

### 4.1 Conclusions

This report and its findings, in concert with its appended components including documentation of consultation and partnership with the MHTO, and all monitoring data pertaining to the presence and health of arctic charr in freshwater bodies within watersheds proximal to the mine, tote road, and Milne Inlet Port project development areas, satisfies condition 48(a) of the Project Certificate. It was designed in coordination with the community to monitor the health of arctic charr populations proximate to Baffinland's Milne Port Operations. The 2024 program included assessment of water chemistry, adult arctic charr health and tissue quality in Qurluktuk and Ikaluit lakes as well as otolith microchemistry for adult arctic charr from Qurluktuk Lake. Sampling was completed in 2024 by Minnow in collaboration with community members from the MHTO, the QIA, and the Hamlet of Pond Inlet. Conclusions of the 2024 arctic charr monitoring are summarized as follows:

- All analytes in littoral water samples were below Canadian Water Quality Guidelines for aquatic life. Total mercury and total iron were below detection limits in Qurluktuk Lake. Total iron was detectable in Ikaluit Lake (0.10 mg/L). Both lakes are oligotrophic, consistent with most Arctic lakes.
- A total of 39 (20 adults), and 37 (37 adults) were collected from Qurluktuk and Ikaluit lakes, respectively. Catch-per-unit-effort Ikaluit Lake (11.4 fish/100 m<sup>2</sup>·hr) than Qurluktuk Lake (0.74 fish/100 m<sup>2</sup>·hr), but both were lower than in 2022 and can be influenced by other factors such as weather, net-set locations, and timing.
- Otolith microchemistry was used to evaluate the life history strategy for the 20 adult charr captured from Qurluktuk Lake in 2024. Of the 20 fish, 19 completed at least one marine migration in their lifetimes, with first marine migration occurring between three and fourteen years of age. There were fewer resident individuals captured in 2024 than 2022 (i.e., one vs six), based on presumed life histories. Visual assessments by biologists (i.e., not Inuit) misclassified 12 fish as residents in 2024, showing poor agreement with the otolith microchemistry results, which identified only one resident individual.
- Female arctic charr from Qurluktuk Lake were older, longer, and heavier than those from Ikaluit Lake in 2024. Only one male fish was captured from Qurluktuk Lake in 2024, which fell within the ranges for age, length, and weight for male fish captured from Ikaluit Lake in 2024. Female growth (i.e., length-at-age) was higher in Qurluktuk Lake in 2024, which





is inconsistent with the 2022 results, and likely driven by the portion of anadromous individuals sampled in a given year.

- In 2024, female arctic charr liver weight was lower in Qurluktuk Lake than Ikaluit Lake, while relative gonad weight and weight-at-age were higher in Qurluktuk Lake, and body condition (weight-at-length) was similar between lakes. The disparity in relative gonad weight and relative liver weight between lakes indicates a difference in energy allocation at the time of sampling. There were no consistent patterns in the results.
- Some Qurluktuk Lake female charr health metrics (i.e., age, weight-at-age, and condition) were higher compared to pre-mining years; however, variable life history strategies complicate temporal comparisons. Ikaluit Lake charr male and female endpoints showed no significant differences between 2022 and 2024 except for male condition, indicating consistent charr health in this lake.
- Mercury concentrations in fish muscle and liver tissues were below Health Canada consumption guidelines (0.5 mg/kg) except for the liver from the single resident fish from Qurluktuk Lake in 2024. There were fewer mercury tissue consumption guideline exceedances in 2024 compared with previous years, which is likely a product of sampling fewer resident individuals in 2024. Consistent with 2022, charr tissue mercury concentrations were typically higher in fish from Qurluktuk Lake than Ikaluit Lake. Iron concentrations in charr tissue in fish from both lakes in 2024 were well within safe dietary limits as designated by Health Canada. Some fish tissue samples exceeded Health Canada benchmarks for arsenic, cadmium, copper, and selenium in 2024, but these reflect natural Arctic background levels.

## 4.2 Recommendations

The findings of the 2024 Milne Inlet Freshwater Fish Health Monitoring Program in concert with results from previous years, indicate that fish health, tissue contaminants, and water quality remain stable and within previously observed ranges, with no consistent patterns of change pre- or post-mining. Given the consistency of results across years, along with community feedback and logistical considerations, several recommendations are proposed to improve the efficiency, relevance, and community value of future monitoring, should it occur<sup>15</sup> including:

### 1. Increase Community Ownership and Integration

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<sup>15</sup> While recommendations for future monitoring are presented, it should be noted that given that the 12 Mt per year Phase II expansion will not occur, requirements for monitoring associated with the application and review process for that expansion are being reevaluated, which may influence further recommendations for continuation of monitoring as part of the Program.





Work with the MHTO and Hamlet of Pond Inlet to explore integrating sampling with existing community activities, such as the annual spring fishing derby at Ikaluit Lake. This approach would strengthen community leadership, reduce disruptions, and support culturally appropriate, on-the-land sampling while responding to local interest in contaminant levels during different seasons.

## **2. A Shift to Triennial Monitoring Cycles**

Transition the intensive field program to a three-year cycle to reduce unnecessary fish mortalities, and ensure resource-efficient long-term monitoring. This timing would also remain consistent with broader Environmental Effects Monitoring (EEM) standards in Canada.

## **3. Inclusion of Otolith Microchemistry**

As there was poor agreement between the otolith microchemical and visual anadromy assessments, it is recommended to include microchemistry on future field programs to confirm different life histories and to have Inuit IQ holders complete the visual assessments directly, reducing confounding effects in comparative temporal and spatial analyses of fish endpoints.

## **4. Presentation of findings to the MHTO**

Results from the Milne Inlet Freshwater Fish Health Program should be presented to determine a path forward for future monitoring in alignment with the perspectives of the MHTO and Baffinland.





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**APPENDIX A  
ENGAGEMENT  
DOCUMENTATION**



APPENDIX A

ENGAGEMENT RECORD

A1

INTRODUCTION .....

1

A2

AGREEMENTS WITH INDIGENOUS PEOPLES.....

2

A3

IDENTIFICATION OF STAKEHOLDERS AND APPROACH TO COMMUNITY INVOLVEMENT .....

3

A4

ENGAGEMENT ACTIVITIES RELATED TO THE MILNE INLET FRESHWATER FISH HEALTH PROGRAM.....

4

TABLE A.1

SUMMARY OF ENGAGEMENT ACTIVITIES RELATED TO MILNE INLET FRESHWATER FISH HEALTH PROGRAM

APPENDIX A.5

CONSULTATION MATERIALS, PRESENTATIONS, AND MEETING NOTES



## A1 INTRODUCTION

Baffinland Iron Mines Corporation (Baffinland) carries out public consultation and engagement to support the Milne Inlet Freshwater Fish Health Program (the Project) planning and design, evaluation, and continuous improvement of community involvement throughout the project cycle. As part of this ongoing consultation and engagement, activities have been undertaken to specifically engage, establish a dialogue, generate feedback, and report on progress related to the development of the project. This appendix describes Baffinland's agreements with Indigenous Peoples and general approach to community involvement. Engagement timing, participation, and meetings are summarized, and engagement materials are provided.





## A2 AGREEMENTS WITH INDIGENOUS PEOPLES

The Milne Inlet Freshwater Fish Health Program serves to satisfy Term and Condition 48(a) required on the Project Certificate for the Baffinland Mary River Project. Condition 48(a) of the Project Certificate stipulates that “the Proponent shall develop plans to conduct additional surveys for the presence of arctic charr in freshwater bodies and ongoing monitoring of arctic charr health where applicable, within watersheds proximal to the mine, tote road, and Milne Inlet Port project development areas, including but not limited to Phillips Creek, Tugaat and Qurluktuk. The Proponent shall consult with the Mittimatalik Hunters and Trappers Organization (MHTO) regarding the design, timing, and location of the proposed surveys and ongoing monitoring.”





## **A3 IDENTIFICATION OF STAKEHOLDERS AND APPROACH TO COMMUNITY INVOLVEMENT**

Public consultation and engagement occur on an annual basis to provide updates on the Mary River Project progress, initiatives, and future work plans. This framework provides for involvement activities that will be carried out to share information on any unforeseen changes to the Project (e.g., temporary closure or production slow downs).

Baffinland's engagement framework identifies Indigenous partners involved in the Project as the Mittimatalik Hunters and Trappers Organization, the Qikiqtani Inuit Association, and representatives from the community of Pond Inlet.





## **A4 ENGAGEMENT ACTIVITIES RELATED TO THE MILNE INLET FRESHWATER FISH HEALTH PROGRAM**

Engagement activities specifically related to the Project have been undertaken since 2021. Consultation to date has focused on program design, timing, and location of the proposed surveys and ongoing monitoring, and the Project has benefited from a two-eyed seeing approach, by incorporating Inuit Qaujimajatuqangit (IQ) and western science shared by Baffinland and Minnow Environmental Inc. (Minnow). Throughout various engagement activities held among project partners, shared knowledge has helped to guide not only identification of project objectives, but also the study design (e.g., location of study lakes), sampling framework (e.g., where in each lake to sample), and the interpretation of results (e.g., how to identify a “healthy” fish, what endpoints are of concern). Moreover, all field data collection has been done in partnership between Inuit and non-Inuit partners.

Documentation of engagement activities, including consultation materials, presentations, and meeting notes, are available for reference in Appendix A-1.





**Table A.1: Summary of Engagement Activities Related to Milne Inlet Freshwater Fish Health Program**

Year	Date	Topic	Participants	Reference
2021	18-Feb	Meeting of project partners to discuss initial study design	<b>Baffinland Participants:</b> Connor Devereaux, Lou Kamermans, Chris Murray, Krista Johnson <b>MHTO Participants:</b> Eric Ootoova, Peter Aglak, Elijah Panipakoocho, Caleb Sangoya, Kaugjak Komangapik, Enookie Inuarak <b>Minnow Environmental Participants:</b> Samantha Burke, Paul Lepage	A.5.1
2021	17-Mar	Summary of project questions and objectives following initial community consultation	Communication from Baffinland representatives to MHTO representatives.	A.5.2
2022	27-Jun	Summary of proposed project activities for 2022	Communication from Baffinland representatives to MHTO representatives.	A.5.3
2023	14-Mar	Meeting request to discuss program results and reporting	Communication from Baffinland representatives to MHTO representatives.	A.5.4
2023	27-Mar	Meeting of project partners to discuss 2022 results and reporting	<b>Baffinland Participants:</b> Connor Devereaux, Todd Swenson, Tabitha (Tapisa) Kasarnak, Genevieve Morinville <b>MHTO Participants:</b> Enookie Inuarak, Jonathan Pitseolak, Joshua Katsak <b>Minnow Environmental Participants:</b> Samantha Burke, Preston Lennox, Jess Tester, and Kim Connors	A.5.5
2023	27-Mar	Presentation to discuss 2022 results and reporting	Communication from Minnow Environmental representatives to Baffinland and MHTO representatives.	A.5.6
2023	28-Mar	Meeting of MHTO board and Baffinland	<b>Baffinland Participants:</b> Tabitha (Tapisa) Kasarnak <b>MHTO Participants:</b> Jennifer Innuaraq, Enookie Innuaraq, (vice-chairperson), Jonathan Pitseolak, Peter Aglak, Daniel Quassa, David Qamaniq (chairperson), Marlene Aqquiaruq	A.5.7
2023	5-Apr	Meeting of project partners to discuss 2022 results and reporting	<b>Baffinland Participants:</b> Connor Devereaux, Todd Swenson, Tabitha (Tapisa) Kasarnak, Genevieve Morinville <b>MHTO Participants:</b> Enookie Inuarak, Jonathan Pitseolak, Joshua Katsak <b>Minnow Environmental Participants:</b> Preston Lennox, Jess Tester, and Kim Connors	A.5.8

Note: MHTO – Mittimatalik Hunters and Trappers Organization.



**APPENDIX A.5**  
**Consultation Materials,**  
**Presentations, and Meeting**  
**Notes**



**APPENDIX A.5.1**  
**Meeting of Project Partners**  
**to Discuss Initial Study**  
**Design**





**Title:** Milne Inlet Freshwater Fish Monitoring Program

**Date:** February 18, 2021

**Purpose:** initial MHTO input on study design

**Group/Organization:** MHTO, Baffinland, Minnow

**Meeting Location:** Conference Call

**Present:**

MHTO

Eric Ootoova (EO)  
Enookie Inuarak (EI)  
Peter Aglak (PA)  
Elijah Panipakoocho (EP)  
Caleb Sangoya (CS)  
Kaugjak Komangapik (KK)

Baffinland

Lou Kamermans (LK)  
Chris Murray (CM)  
Krista Johnson (KJ)  
Connor Devereaux (CD)

Minnow

Paul LePage (PL)  
Samantha Burke (SB)

**Meeting Chair:** Lou Kamermans

**Summary of New Action Items**

ID	Responsibility	Item	Due Date
Action Item #1	BIM (LK)	Send MHTO Map	Feb 26, 2021
Action Item #2	MHTO	Identify two lakes of interest on map provided by BIM (connected to Action Item #1)	March 5, 2021
Action Item #3	Minnow	Consult internal risk assessors to determine what can be defined as an unhealthy	March 12, 2021



		amount of iron in fish/ can be deemed as unhealthy for human consumption.	
Action Item #4	BIM/Minnow	Develop list of questions re: study design. Provide to the MHTO for further input.	Mar 12, 2021
Action Item #5	MHTO	Discuss questions provided by BIM/Minnow with MHTO members, and provide BIM with additional input. (attached to Action Item #4)	TBD

## Meeting Notes

LK: There were a number a questions that we have that we would like to get input on to help us design the program. I appreciate everyone taking time to meet with us to discuss the program. We have discussed it for 6 months, but it is something that has been part of our Project Certificate (PC) for some time. What is in the PC is a requirement for us to conduct arctic char health monitoring, and there are specific waterbodies listed that are meant to be part of this program, and that includes Philips Creek, Tugaat River, and Qurluktuk Lake. This meeting is the first meeting regarding the design of an arctic char health monitoring program – we are looking to explore ideas and get your thoughts on what you see this program looking like, and the questions you would like answered.

LK: I would like to go through the agenda – would like to go over our proposal and would like to ask questions. Once we get through this, we would like to discuss potential MHTO involvement, or community involvement in the program, and what that could look like in 2021, and then there are other logistics to discuss (i.e. planning). We can then have final thoughts on the meeting.

LK: Before I pass it off to Paul from Minnow, does anyone have anything they would like to add to the agenda?

EO: I want to ask one of two questions. You know the rivers coming out of Ikaluit Lake, one river to Phillips Creek, other close to... there are a couple of lakes that follows the river. I know the sediments in that river flows directly to those lakes, I am proposing that those lakes be included in the monitoring programs.





KK: The wildlife up here, they don't stay in all the same waterbodies, and they do migrate to other communities.

LK: to Eric's first point, probably best – we should talk about this first. Maybe after this meeting I could send you a map of the area (**Action Item #1**) and you can outline what two water bodies you are talking about so we know what ones you are exactly referencing (**Action Item #2**).

EP: How long is the research project going to be running?

LK: At this point, I will pass it over to Paul to provide an overview of what we are thinking. Like I said, this first meeting – we do not have all details worked out. We want to talk to MHTO first before we put something together.

CS: Will BIM be doing a study on whether the Pond Inlet area wildlife are gaining or losing arctic char?

LK: This would not be covered by this project. This program is looking at arctic char health in freshwater waterbodies closer to the Project.

CS: Will you be researching why the char are leaving the area? Will we be using traditional knowledge?

KK: Question – if you start monitoring, are you able to work with people who know Inuit knowledge so you can work better together? It would be much easier to resolve issue of fish and fisheries and all that. That would be an excellent idea – we need to work together on this.

EO: We can report on what needs to be reported on after we go through agenda. Let's go through agenda first and move on.

LK: I will pass it over to Paul, who will explain the program and our thoughts. We will then go into discussion.

PL: [*provided introduction of self and freshwater experience*]. Excited to work with you on this project. I also have Samantha with me – she will be helping with project as well. As Lou mentioned, the purpose of this meeting is for us to get an idea on what the MHTO would like to see in the program – what methods, what IQ that can be incorporated into the program. I will run through questions here, but feel free to add in.





PL: One of the questions we want to try to get is deciding on what we are trying to answer here – what are your key concerns with regards to freshwater fish health? Some examples might be: are you interested in changes in fish condition? Is the mine affecting fish? What types of fish are you most interested in? Arctic Char? On top of that, you mentioned two other lakes, on the Tugaat River and the Qurluktuk Lake and Ikaluit Lake areas, are there traditional areas that you would like us to focus on?

EP: Need to look at Kuluktoo Bay and all the other lakes and fish in the area.

CS: Does not believe that BIM is obligated to do anything outside of the Project area (i.e. Tugaat, Kuluktoo Bay, or Ikaluit River).

PL: Are there some areas that you feel are being impacted more than others?

CS: Mary River Lake and [Qinngua?] ... are the most affected by the Project. The other members are saying the whole area is affected as well due to haul trucks and ships.

CS: Can you explain why the fish are leaving the area?

PL: I don't have information right now on this.

LK: We have always monitored waterbodies close to the Project, and especially around the mine site (i.e. Camp Lake, Sheardown Lake), and so that is covered by existing monitoring programs. What we want to talk about here is a program that would be specific to Milne Port, and to investigate char health specifically in waterbodies that are not close to Milne, but not far either (i.e. Tugaat and Qurluktuk). This program, even though it is focused on health, and health of char, we could also, depending on what program looks like, be able to report on how many fish we are seeing in those waterbodies. A concern that has been raised is that fish in the general area are unhealthy – we want to look further into this.

EP: We have heard that there is too much iron, you can have health problems. What level of iron in char is considered unhealthy for human consumption?

PL: There are no guidelines that I am aware of – iron is an essential element. We can look into this and bring it to our risk assessors and provide you with this answer (**Action Item #3**). We can collect fish and take tissue samples to determine this. What we can do in this study on fish health is collect fish this year and future years, we could compare fish health measurements to those collected before the mine was there.





KK: Do you have baseline data for before BIM started operations?

PL: Yes – we do have some. DFO did some studies, and they did provide some data we can use. We can ask for more data.

EP: Requesting information on when arctic char will be unhealthy to eat.

PL: From this monitoring we will be able to get a better idea of this, and we will pass it along to you.

CS: .... [Indecipherable].

LK: PC amended for Early Revenue Phase. Not sure how this Term and Condition got added. We have not done what is called for in it, and we are trying to get it done now.

EI: For this Term and Condition 48(a), it is a must do. If this monitoring is going to proceed, will BIM be open to third-party monitors? For example, MHTO can appoint someone to do the monitoring? And the follow up question to this is, can the report be given to the MHTO and BIM at the same time before the MEWG happens?

LK: I see this program as being our responsibility to implement, and what we are proposing is that we work closely with the MHTO. We want you to tell us what the team should look like, and to help us build the design of the study and be part of the data review. This would mean the MHTO would get the report before it goes to the working groups. This would be more of a collaborative partnership, so the team in the field could be a biologist from Minnow, and depending what we are able to do with COVID-19 restrictions, we can have an MHTO member to be in the field if desired, and someone from the community staffed as well. If the MHTO is interested in running something independent from us, you can always use some of the funding from the Community-Based Monitoring Fund to look at fish in area.

PL: Because we want this to be a collaborative initiative, if there is information you would like to share with us, such as baseline data to include in the data, we are happy to include and use such data in our study. And as we collect data, we will share with you as well.

CS: Asking if BIM has done baseline studies for the lakes near Mary River and Milne Inlet, and have you been approved by DFO to deal with those fish?

PL: We apply for fish collection permit through DFO every year. We try to not kill the fish. Near the port, Golder has been doing the studies there, so I am presuming they get the permits there as well. I do work by the mine site. I am not familiar with the port baseline





studies. For this study, we will have to get a permit by DFO which will go to the MHTO when it is issued.

PL: Another question I have is on fishing methods. From your experience, what is the best way to catch the fish? Are there any methods that you would like us to use that would be successful for this program?

EO: Would make fish ladders to count fish individually.

PL: In your experience, when was the best time for sampling fish that were migrating up to those lakes?

EO: It is obvious when fish are going to migrate back to lake, this has to do with water levels in the river. All the char collect near mouth of the river while migrating to the lake.

CS The MHTO is going to hold their own meeting to discuss this matter and will get back to Baffinland.

LK: This sounds really helpful. Would we be able to provide questions and have them translated so that we get all the information we need to put something together? (**Action Item # 4**).

CS: During our meeting, according to what people have been saying about changes in arctic char in Mary River and Milne area, separate from the actual mining process or proposal.

EI: Won't make any more statements. We will hold off fish study until after the Final Hearing for the Phase 2 Proposal.

LK: What we are trying to do with this program is for the project that is already operating – investigating of current impacts of Project. We would like to keep moving things forward if you are willing to work with us. To do this program in the summer, we need to do a lot of planning up front. I know the Phase 2 review is still happening, but this project is not dependent on Phase 2 – it is to investigate impacts of current project on environment. We are hoping that, if your meeting could happen, and if we could have questions answered, we would like to provide you with direct study design some time in March to get your input on it. We need to plan all of this well before we go into the field (August of this year).

PL: This is not intended to be a one-time study – we could have a set frequency of monitoring. It could be repeated again in the future at the frequency that MHTO would like to see go ahead.



EO: Throughout the past BIM went ahead and did all kinds of monitoring and surveying without letting the community know, especially the MHTO. Such as flying around with helicopters, exploration, flying above water. Why are you asking MHTO about fish monitoring right now? What is making you do this now?

LK: On this specifically, it was raised by the MHTO in September [2020] and we made a commitment to do this work. This is a new program we are developing. We have involved the MHTO with previous programs. I know Elijah was very helpful in setting up our terrestrial monitoring and Bruce Head monitoring program. We are trying to keep that relationship going. We hope you are willing to work with us.

PL: Most of my questions regarding the study design have been answered. We will directly send you the questions so you can provide further input. If we are comfortable with that, we can move onto next part of agenda.

### ***Community Involvement***

PL: As we start to communicate more, what is your preference for how this is done. Are you comfortable with communications through email? Or meetings like this while we develop the design?

KK: *[expressed she did not feel the MHTO Chair's question regarding why we are proposing to do this study was adequately answered].*

LK: We talked about this with the MHTO this past September 2020, and we had to wait until the next open-water season to study the char. This is why we are doing it now. I know there is a lot happening with Phase 2, but whether it was happening or not, this is when the meeting would be to talk about this.

KK: Which year in September did you have this meeting?

LK: It was this past September, 2020. We had previously talked about these plans with the MHTO to carry out a program. We also said that we would look at some of the same things as part of community-based monitoring back in 2019, but this didn't come together as we thought it would. What matters is we want to do the work now, and we would like to work with the MHTO to do it. We are looking for your guidance to put this program together.

EO: MHTO will discuss questions provided on the study design and get back to you (**Action Item #5**).

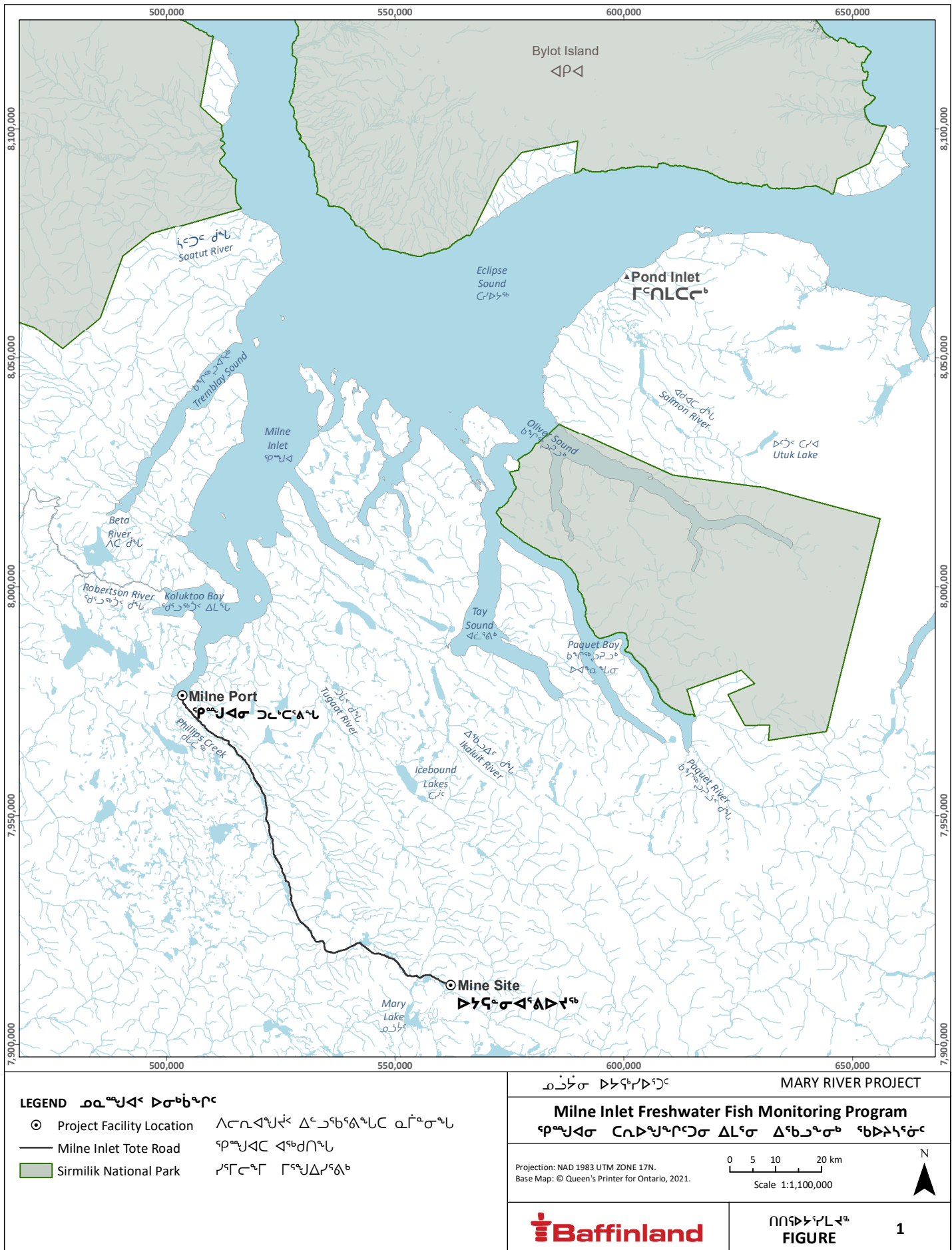




LK: We would be happy to put this together, and I will probably provide a map as well so you can outline those two lakes you were talking about earlier on in the meeting, and we will wait for your feedback.

DRAFT







**APPENDIX A.5.2**  
**Summary of Project**  
**Questions and**  
**Objectives Following**  
**Initial Consultation**























#	Discussion Item Description	Confirmation of Baffinland/Minnow Understanding of Discussion Outcome	Outstanding Questions Baffinland/Minnow is Seeking Information from MHTO to Incorporate into Study Design
1	Key questions to address for the fish health monitoring study	<p>Under the Project Certificate Term and Condition 48(a), the NIRB recommended that Baffinland undertake a study in or near Milne Inlet which would monitor the health of arctic char, and outlined the importance of consulting with the MHTO prior to commencing this work to determine the design, timing, and locations to undertake such monitoring.</p> <p>During the meeting, the MHTO representatives indicated the questions they would like to address for Milne Inlet Freshwater Fish Health Monitoring included:</p> <p>1) is the health of fish being affected by Baffinland port operations in a manner that is reducing the population size?</p> <p>2) what are the concentrations of iron in fish tissues, and are the concentrations of iron high enough in fish tissue to affect Inuit consuming these fish?</p>	Does the MHTO agree with the proposed study questions?
2	Target fish species and life stage used for the study	In freshwater lakes and rivers near the port, we understood that MHTO feels that arctic char are the most important fish species and should be the species used for monitoring effects on fish health. Because they are an important country food, the adult stage of sea run arctic char should be monitored. Please confirm that arctic char are the best fish for the study.	Does the MHTO agree with the proposed target fish species? If no, what other fish should be considered?
3	Freshwater study areas of interest associated with Milne Inlet	Tugaat, Qurluqtuk, and Ikaluit river systems were suggested by MHTO as good study areas. During our meeting, the MHTO discussed two lakes near the Baffinland Port area that may be of interest for monitoring.	Can the MHTO indicate where these two waterbodies are located on a map so that they may be included in the study (Action Item #2 in meeting minutes, map attached, initially provided via email on March 2 <sup>nd</sup> ).



4	Timing of field sampling	<p>The MHTO indicated that arctic char will congregate near the mouth of rivers in the marine areas before migrating up to freshwater lakes, at which time it will be obvious due to predator activity and other signs. The MHTO noted that normally the migration will happen in response to water levels in the river. The MHTO stated that they were going to have their own meeting to discuss timing.</p> <p>Mr. Kamermans indicated that it was important to determine a time for the field study in order for Baffinland to make plans well ahead of time. For example, to allow enough time for fishing permits to be issued, plan for equipment, and to schedule people for the study.</p>	<p>Previous studies by DFO showed that mid-August is the peak char migration for the Tugaat system at Milne Inlet.</p> <p>Does the MHTO feel that this timing is appropriate and acceptable?</p> <p>Does the MHTO think another sampling timeframe would be more appropriate?</p>
5	Numbers of Fish Collected for the Study	<p>The question of numbers of fish to be collected for the study had not been presented to MHTO during the meeting. Baffinland/Minnow is proposing that 40 fish, 20 males and 20 females, be collected and sacrificed from each study area for the study. This number of fish was based on the protocols recommended for the Canada Environmental Effects Monitoring (EEM) program for metal mines. Please see questions by Baffinland/Minnow regarding fish numbers needed for the study.</p>	<p>Would MHTO approve of the collection of at least 40 arctic char from each study area for the study? If using up to three study areas, this would mean the total collection of 120 fish for the study.</p>
6	Methods for fish sample collection	<p>The MHTO indicated that previous char studies had installed a fish ladder in the rivers to be able to catch fish. The use of fish ladders may have been used to support DFO studies in the past.</p> <p>In the meeting, the MHTO had questions regarding what equipment was required for the study. Baffinland has gill nets that could be used to collect fish for the study (mesh sizes of 4 inches and 5 inches). If sampling on lakes, Baffinland can provide and transport the required boats, motor, and gas to be able to set and retrieve the gill nets at the study areas.</p>	<p>Does the MHTO feel that using large mesh gill nets (owned/provided by Baffinland) would be an appropriate and successful sampling technique? These nets would be set in lakes of each river system of interest to MHTO (e.g., Tugaat Lake, Qurluqtuk Lake, Ikaluit Lake).</p> <p>Are there opportunities to use IQ for the sampling of fish that you would like to have in the study design? Can you provide some examples so that we can include these methods in the study?</p> <p>If MHTO is comfortable with using gill nets for the study, is it okay to set the gill nets overnight, or does the MHTO feel this would result in too many fish being caught and dying (for example, more than 40 fish caught in nets left overnight)?</p> <p>Due to the remote location of the sampling sites, helicopters are the most efficient way to get to the sampling areas. Would this be acceptable to the</p>



			MHTO? And if so, could the MHTO please provide guidance on best practices as to not disturb wildlife (e.g., timing, flight paths, areas to avoid)?
7	Fish measurements and data collection	<p>The general measurements of fish health and fish tissue chemistry were discussed with MHTO during the meeting. However, the question of actual fish measurements had not been presented to MHTO during the meeting.</p> <p>Baffinland/Minnow is proposing that measurements of fish length, fish weight, age, liver size, ovary/testes size, female number of eggs and egg weight, and fish tissues for chemistry analysis be collected from up to 40 fish (as appropriate depending on fish sex) at each study area. The use of these measurements is based on the protocols recommended for the Canada Environmental Effects Monitoring (EEM) program for metal mines. Please see questions by Baffinland/Minnow regarding fish numbers needed for the study.</p>	<p>Does the MHTO agree with the collection of the measurements proposed? Are there additional measurements from arctic char that MHTO would like to have included in the study?</p> <p>Baffinland/Minnow are proposing the collection of muscle tissue for chemistry analysis. Are there types of fish tissue other than muscle tissue that are consumed by MHTO/community members that the MHTO would like to see analyzed for the study? For example, liver?</p> <p>For the fish tissue chemistry analysis, in addition to iron, are there other metals or chemicals that the MHTO like to have analyzed (e.g., mercury)?</p> <p>Because only a small amount of tissue will be sampled from each fish for the study, there will be a considerable amount of fish leftover from the sampling. Does the MHTO think that the community could make use of the leftover fish from the study (after collecting measurements and some tissues, the remainder of the fish may be able to be frozen and provided to the community if deemed edible by people)?</p>

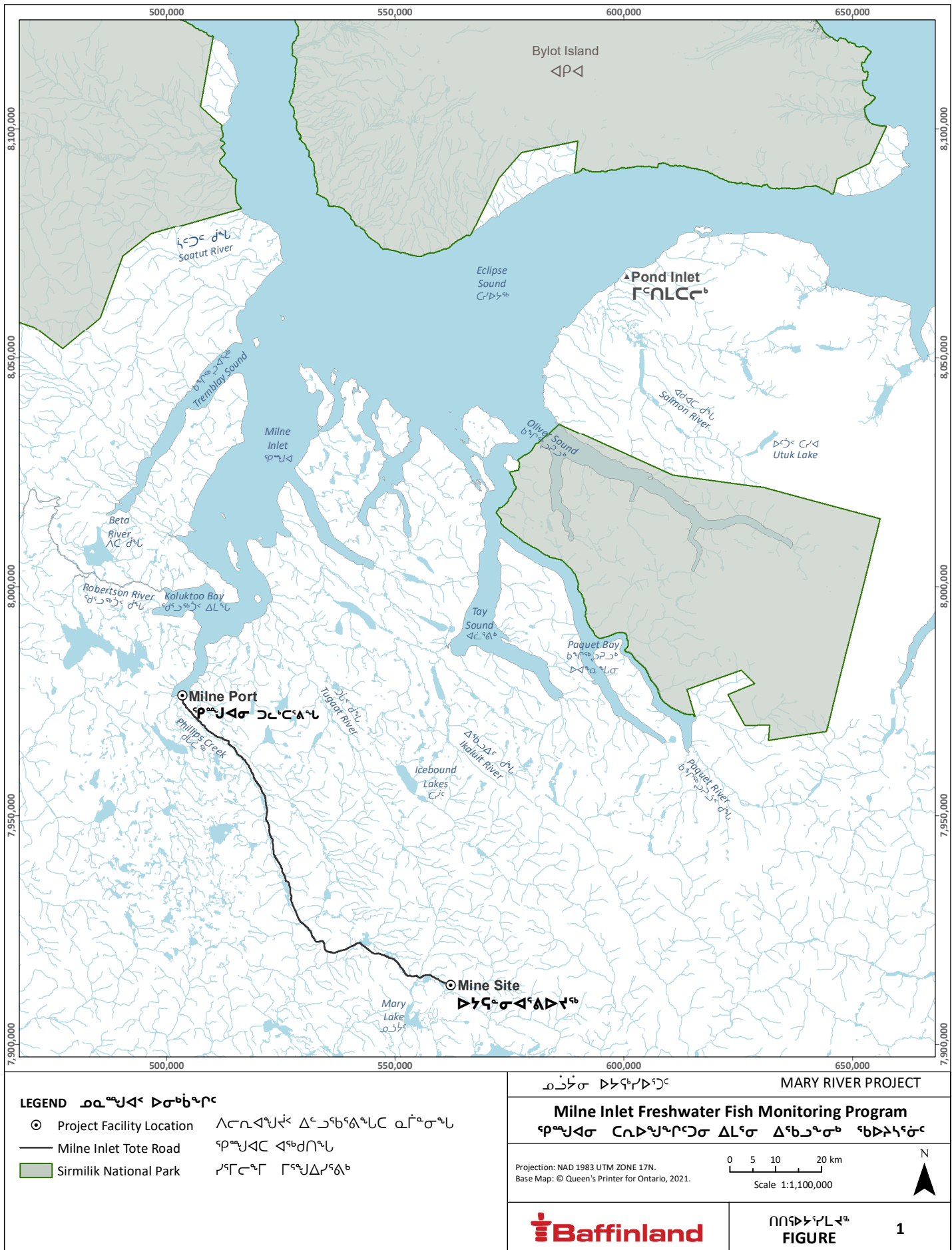


8	How the data from the field study will be assessed	<p>The question of how the information from the study will be assessed will be dependent upon what questions the study is designed to address (Question #1 above). During the meeting, the MHTO was not asked about how the information from the field study will be used and reported.</p> <p>Baffinland/Minnow suggested that we can use the information collected in the study to compare to information collected before the Baffinland port facility was constructed. In this way, we can look at how the port operations may have affected fish health in the river systems near the port. This before and after comparison will be possible for fish population health measures such as growth (size of fish at a certain age) and condition (how 'fat' fish are) by comparing the recent data to historical information collected by DFO. We are not sure it will be possible to do a similar before and after comparison for fish tissue chemistry and other health measures because these types of information may not have been collected in the past (e.g., by DFO or for baseline studies) or perhaps these data are not publicly available. Baffinland/Minnow will ask DFO if they can provide all data from past studies for us to use in our study.</p> <p>The study that is designed by MHTO and Baffinland/Minnow will also be used as the basis for tracking changes in fish health and tissue chemistry over time, and in that way, the program will assess if conditions are getting better or not for fish in the area of the port.</p>	<p>The fish health measures that could be included in the study are: 1) fish growth (size of fish at a given age in years); 2) reproductive capacity (gonad size, number and size of eggs produced by females); 3) energy storage (liver size, body condition); and 4) occurrence of physical abnormalities and parasites that may indicate stress to fish because of the Baffinland port operations.</p> <p>Does MHTO agree with the evaluation of the fish health measures indicated above? Are there traditional fish health measures that MHTO would also like to see included?</p> <p>Does the MHTO have arctic char measurements information from in the past (baseline) for Tugaat, Qurluqtuk, and Ikaluit river systems that could be shared with Baffinland to be included in the study?</p> <p>For fish tissue chemistry, Baffinland/Minnow propose to analyze samples for total metals (including iron). Does MHTO agree with this analysis?</p> <p>Does the MHTO have arctic char tissue chemistry information from in the past (baseline) for Tugaat, Qurluqtuk, and Ikaluit river systems that could be shared with Baffinland to be included in the study?</p> <p>Does the MHTO know of any historical tissue samples from before operations that could be assessed now for tissue chemistry?</p>
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9	Study team composition	<p>During the meeting, the MHTO expressed interest in having local involvement in the fish sampling study, which Baffinland/Minnow wholly support (as long as COVID-19 restrictions at the time of sampling will allow for this). In addition, a greater role for MHTO and community involvement in field studies and reporting is envisioned by Baffinland/Minnow in the future.</p> <p>The fish health monitoring program is Baffinland's responsibility to implement, but we want to work closely with the MHTO. This means that the MHTO will get reports to provide review and input before they go out to the working groups.</p> <p>If the MHTO is interested in running something independent from Baffinland, the MHTO can always use some of the funding from the Community-Based Monitoring Fund to look at fish in area.</p>	<p>Baffinland feels this should be a collaborative project, including personnel from Baffinland, Minnow, MHTO and potentially the community as well. The field team can be a biologist from Minnow, and depending on what is possible based on COVID-10 restrictions, an MHTO member and possibly a community member.</p> <p>Does the MHTO support this team structure?</p> <p>Can the MHTO recommend members who are experienced at fishing and would like to participate in the project? The use of IQ would be highly valued for the field study.</p>
10	Frequency of the monitoring program	<p>The intent of this monitoring is to examine current impacts of the Baffinland operations on the health of fish in freshwater habitats of the Milne Inlet area, as well as to track changes in possible effects to fish at these areas over time. In addition to the study that we would like to carry out in 2021, we would like to suggest a frequency of monitoring for the study so we can track changes over time.</p>	<p>Canada's Environmental Effects Monitoring (EEM) program assesses fish health at mine sites every three years. This allows time to assess potential effects, discuss the implications of these effects, and potentially modify the study to examine outstanding questions. Is conducting the study every three years an acceptable frequency for the MHTO?</p>







**APPENDIX A.5.3**  
**Summary of Proposed**  
**Project Activities for 2022**



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## **2022 Milne Inlet Freshwater Fish Health Assessment**

Baffinland plans to conduct a second year of sampling for the Milne Inlet Freshwater Fish Health Assessment in 2022 to meet Term and Condition 48(a) under the Project Certificate for the Mary River Project. The goal of this assessment is to determine potential impacts of Baffinland's Milne Inlet port operations on the health of arctic charr that use freshwater systems that drain into Milne Inlet near the port. The same sampling plan used following consultation with MHTO in February 2021 will be used for the fish health assessment in 2022. This plan includes sampling arctic charr from up to three river systems, including Tugaat River, Robertson/Qurluktuk River, and Ikaluit River, in 2022 for measurements to assess growth, reproduction, and overall condition of adult sea-run arctic charr. In addition, tissues of these fish will be assessed for concentrations of metals including iron and mercury to determine possible effects on fish health as well as to evaluate risks to humans consuming fish collected from the river systems sampled for the study. The fish health information collected in 2022 will be compared to available information collected in the 1970s and 1990s, well before the construction and operation of the Baffinland port facility, to determine potential impacts of the port operation on arctic charr health in freshwater systems of Milne Inlet.

Baffinland welcomes receiving input from the Community of Pond Inlet and MHTO concerning the sampling approach used for the fish health assessment prior to the initiation of the 2022 field study. In addition, at the discretion of MHTO, Baffinland welcomes the presence and participation of an MHTO representative during the field study. Based on current resources, Baffinland has scheduled the field study to be conducted over an approximately one week to ten-day period between August 9<sup>th</sup> and 22<sup>nd</sup> 2022. The ideal field study crew would include the MHTO representative, a QIA representative, a Baffinland representative, and a member from Minnow Environmental Inc., who are the consultants that Baffinland has contracted to assist with this work. The field study will include setting gill nets from a small inflatable boat and transferring captured arctic charr to a laboratory located at the Mary River Project mine site for measurements, dissections, and tissue chemistry sample collection. The field study crew members will be housed at the Sailivik Camp at the Baffinland mine site, and will travel by helicopter to the Milne Inlet sampling sites. If weather conditions do not allow travel to the Milne Inlet sampling sites on any given day, the MHTO representative is welcome to participate in fish sampling conducted at the Mary River Project mine site.



**APPENDIX A.5.4**  
**Meeting Request to Discuss**  
**Program Results and**  
**Reporting**





ᐱᐅ 14, 2023

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pond@baffinhto.ca

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March 14, 2023

Mr. David Qamaniq  
Mittimatalik Hunters and Trappers Organization  
Pond Inlet, NU  
[pond@baffinhnto.ca](mailto:pond@baffinhnto.ca)

Dear Mr. Qamaniq,

Baffinland Iron Mines Corporation (Baffinland) is requesting a meeting with the Mittimatalik Hunters and Trappers Organization (MHTO) at your earliest convenience to facilitate continued discussions/feedback on the ongoing fish health monitoring program in freshwater bodies north of Milne Inlet, as required under Project Certificate No. 005 (PC) Term and Condition 48(a). Baffinland has retained Minnow Environmental (Minnow) to support the collection of field data alongside the MHTO and provide technical support for data interpretation. The purpose of the meeting will be to continue collaborating with the MHTO to gain their feedback and perspectives on the ongoing fish health monitoring program completed at freshwater bodies near Baffinland's Milne Inlet Port. In this meeting, we would like to get your input on the following:

**Key Questions for the fish health monitoring study;**


1. What is the ideal frequency and timing for future implementation of this study?
2. What are the characteristics of a healthy fish?
3. Is there any information that has not been collected that you think would be meaningful in helping to assess fish health?
4. Does the MHTO see any potential ways to integrate Inuit Qaujimajatuqangit into the sampling for this program (e.g., determining whether a fish is sea-run)?

Based on this meeting, Minnow will incorporate the feedback from the MHTO into 2022 data analyses and subsequent reporting efforts. If suggestions are provided on the study design for future data collection, an amended study design will be drafted and provided to the MHTO for review. Our overall goal is to work collaboratively with the MHTO to refine the project questions to better understand Arctic char health in the freshwater bodies of interest to the community of Pond Inlet, and that meets the expectations of relevant groups involved and Project Certificate Term and Condition 48(a).

We look forward to hearing from you on when we can meet to further discuss a mutually agreeable path forward.



Qujannamiik,



Connor Devereaux  
Environmental Manager

c.c      Jennifer Innuraaq, MHTO Manager  
            Lou Kamermans, Senior Director, Sustainable  
            Development  
            Katie Babin, Environmental Superintendent  
            Todd Swenson, Environmental Superintendent  
            Natalie O'Grady, Environmental Engagement Lead  
            Genevieve Morinville, Manager Environmental, Social and Governance



**APPENDIX A.5.5**  
**Meeting of Project Partners**  
**to Discuss 2022 Results**  
**and Reporting**





**CONFIDENTIAL MEETING (IE FOR INTERNAL TRACKING PURPOSES ONLY): [NO]**

**Meeting Date:** March 27, 2023

**Time:** 2pm

**Meeting Type:** Milne Inlet Freshwater Fish Health Program

**Meeting Location:** Virtual (MHTO in Pond Inlet)

**Baffinland Participants Present:**

Connor Devereaux

Todd Swenson

Tabitha (Tapisa) Kasarnak

Genevieve Morinville

**Other Participants (provide affiliation):**

MHTO: Enookie Inuarak, Jonathan Pitseolak, Joshua Katsak

Minnow: Preston Lennox, Jess Tester, and Kim Connors

**Interpreter:** Lizzie Phillip-Qanatsiaq – Interpreter

**Meeting Description:** Input of MHTO on reporting of 2021 and 2022 analyses from fish sampling completed in 3 freshwater lakes

**IIBA/ICA Relevance:** n/a; Mary River Project Certificate Term and Condition 48(a)

**Project Phase:** PIPE and PIPR (2021 and 2022 sampling)

**Photo Waivers Required:** n/a

**Photo Waivers Recorded:** n/a

**Comment Tracker and Follow-up Actions**

Comment #	Comment	Follow-up Required	Due Date
1	Provide raw data to the MHTO	BIM committed to providing raw data in report	April 30, 2023
2			
3			
4			
5			



**Start of Meeting: 2pm**

- Enookie Inuarak
- Peter Aglak
- David Qamaniq

Tabitha Kasarnak (BIM) – Interpreter

Minnow – Samantha Burkner, Jess Tester, and Kim Connors

Baffinland – Connor, Todd Swenson and Genevieve Morinville

Samantha gives presentation of slides.

Question 1

Enookie - You mentioned no pre-development metals data – do you have any backup data to show on this?

Sam- we have data from DFO data on fish health data, fish weight, and condition, but not concentration of metals in the fish.

Question 2: I understand DFO does not have data but do you have data?

Sam – we have 2021 and 2022 data and as far as I know, we will be including the raw data in the reports for what we collected.

Does this answer your question?

Enookie – yes, thank you.

David – we should have data available. Not ok that there wasn't any data collected before

Enookie – are you able to share the raw data with the MHTO?

Connor – we will provide the raw data to the MHTO before end of April 2023

David Q – I wonder why we have to wait to get these reports? Why wait a month?

Connor – once we receive the lab results, we need to do the lab analysis, it is standard practice that we will include the raw data with the analysis. **(Action 1)**

David Q – why would we wait for 2021 data? that has been a year. We can redistribute the 2021 memo that was previously shared. **(ACTION)**

Sam resumes going through slides Program Objectives



**APPENDIX A.5.6**  
**Presentation to Discuss**  
**2022 Results and Reporting**



# Baffinland Milne Inlet Freshwater Fish Health Program

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TBD, 2023

Samantha Burke

ᐅᐅᐅᐅ







- [illegible]



- Trinity**  
Consultants
- 
- Minnow Aquatic  
Environmental Services







- Endpoints:  $\Delta r^{\text{c}} \Delta \lambda^{\text{c}}$ :

2. Collect data on freshwater Arctic char fish health to be used as existing conditions for monitoring during operations

[illegible]

- Above endpoints ፍፅረኛ ዓላማ ምርጫ
- Tissue metals (e.g., mercury, iron) ምግባራዊ ምግባራዊ (ግንባር ምግባራዊ፣ ምግባራዊ)
- Liver, gonads (ovary and testes), fecundity ገሳ፣ ግንባራዊ ግንባራዊ (ግንባራዊ ግንባራዊ ግንባራዊ), ግንባራዊ ግንባራዊ











## 2021 Field Season – Tugaat Lake 2021 ᓄᓇᓂᓐᓂᓐ - ᐅᓂᓐ ᑕᓯᓐ

- Fishing occurred at Tugaat lake on August 16 and 17 using 4" and 5" mesh gillnets  
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- 38 adult char (11 female, 24 male, 3 undeveloped) were captured and brought back to the Mary River Mine Site for processing

38 ᐱᓂᐃᓂᓐᑕᓂᓐ ᑕᓂᓂᓐᑕᓂᓐ (11 ᐃᓐᑕᓂᓐ, 24 ᐃᓐᑕᓂᓐ, ᐃᓂᓐ 3  
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Paul and Robert Setting Nets  
on Tugaat Lake

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Robert and Tom Holding Char from Tugaat Lake

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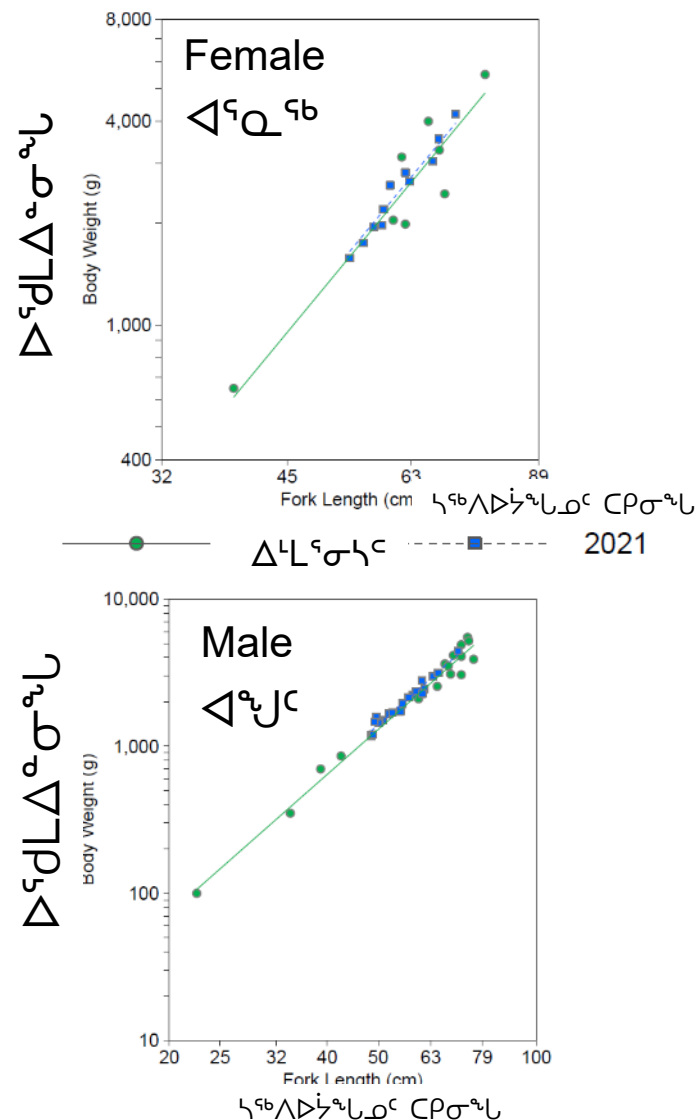


# 2021 Findings – Tugaat Lake (Before-After)

12

## 2021 ᖃᐅᔨᔭᐅᔪᑦ - ᐅᑖᑦ ᑕᔪᓐᓴᑦ (ᐱᔪᐅᖃᖃᑎᓐᓴᔪᑦ-ᔪᓐᓴᑦᐅᑦ) 2021

- Body Condition (weight-at-length) ᑎᒥᓐᑕ ᖃᐅᐅᑦᓴᓴᑦᓴᑦ
  - Female Arctic char caught in August 2021 weighed 12% less at the same length than female char caught historically in August (1975 - 1996)
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  - Male Arctic char no significant difference between 2021 and historical
  - ᐅᖃᐅᑦᓴᓴᑦ ᑕᐅᐅᖃᐅᑦᓴᑦ ᐅᖃᐅᑦᓴᓴᑦ ᐅᖃᐅᑦᓴᓴᑦ ᐅᖃᐅᑦᓴᓴᑦ ᐅᖃᐅᑦᓴᓴᑦ ᐅᖃᐅᑦᓴᓴᑦ (1975 - 1996)
- Data overlap ᖃᐅᔨᔭᐅᑦᓴᑦ ᐅᖃᐅᑦᓴᓴᑦ
- No consistent trend between male and female fish ᑕᔪᐅᖃᖃᑎᓐᓴᑦ ᖃᐅᐅᑦᓴᓴᑦᐅᑦᓴᑦᐅᑦᓴᑦ ᑕᔪᐅᑦ ᐅᖃᐅᑦᓴᓴᑦ ᐅᖃᐅᑦᓴᓴᑦ ᐅᖃᐅᑦᓴᓴᑦ













**Female**

CP Length (cm)

Age (years)

Historical (solid green line, circles) vs. 2021 (dashed blue line, squares)

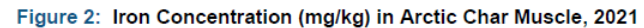
**Male**

Fork Length (cm)

Age (years)

Historical (solid green line, circles) vs. 2021 (dashed blue line, squares)



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Note: Black bars indicate geometric means. Numbers indicate overlapping points.

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Minnow Aquatic



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## 2022 Field Season – Ikaluit Lake 2022 ᓄᓇᓂᓄᓐ - ᐃᑦᓇᓇᑦ ᑕᓯᓴ

- Crews were able to sample Ikaluit Lake in August of 2022
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- Fishing occurred on August 19 using 4" and 5" mesh gillnets
- ᐃᑦᓇᓇᓇᓂᓄᓐ ᐃᓂᓂᓄᓐ 19-ᓂ ᐃᓂᓂᓄᓐ 4" ᐃᓂᓂᓄᓐ 5" >ᓂᓂᓄᓐ ᓂᓂᓄᓐ
- 40 adult Arctic char were captured (28 male, 12 female)



Team Setting Nets on Ikaluit Lake

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Phanuel and Silas Checking Nets at Ikaluit Lake

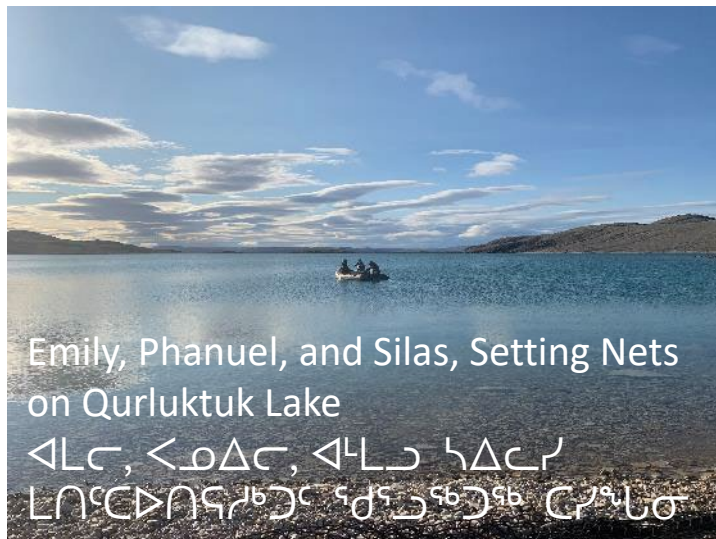
ᐃᓂᓂᓄᓐ ᐃᓂᓂᓄᓐ ᓂᓂᓄᓐ ᐃᑦᓇᓇᑦ ᑕᓯᓴ



## 2022 Field Season – Qurluktuk and Tugaat Lakes 2022

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- Crews returned to Tugaat and Qurluktuk Lakes in 2022
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- Fishing occurred on August 21 and 22 in Tugaat Lake and August 23 and 24 in Qurluktuk Lake using 4" and 5" mesh gillnets
- ᑭᓄᓐᓂᓐᓂᓐᓂᓐ ᑭᓄᓐᓂᓐᓂᓐ 21-ᓂ 22-ᓂ ᑭᓄᓐᓂᓐᓂᓐ ᑭᓄᓐᓂᓐᓂᓐ 23-ᓂ 24-ᓂ ᓄᓐᓂᓐᓂᓐ ᑭᓄᓐᓂᓐᓂᓐ ᑭᓄᓐᓂᓐᓂᓐ 4" ᑭᓄᓐᓂᓐᓂᓐ 5" ᑭᓄᓐᓂᓐᓂᓐ ᑭᓄᓐᓂᓐᓂᓐ
- In Tugaat Lake 40 adult Arctic char were collected (18 male, 22 female)
- ᑭᓄᓐᓂᓐᓂᓐ 40-ᓂ ᑭᓄᓐᓂᓐᓂᓐ ᑭᓄᓐᓂᓐᓂᓐ ᑭᓄᓐᓂᓐᓂᓐ (18 ᑭᓄᓐᓂᓐ, 22 ᑭᓄᓐᓂᓐ)
- In Qurluktuk Lake 31 adult char were collected (18 male, 13 female)
- ᓄᓐᓂᓐᓂᓐ ᑭᓄᓐᓂᓐᓂᓐ 31-ᓂ ᑭᓄᓐᓂᓐᓂᓐ ᑭᓄᓐᓂᓐᓂᓐ ᑭᓄᓐᓂᓐᓂᓐ (18 ᑭᓄᓐᓂᓐ, 13 ᑭᓄᓐᓂᓐ)









# Qujannamiik!

## ᑭᑦᑯᑦᑲᑦᑲᑦ !









**APPENDIX A.5.7**  
**Meeting of MHTO Board and**  
**Baffinland**



**CONFIDENTIAL MEETING (IE FOR INTERNAL TRACKING PURPOSES ONLY): [YES]**

**Meeting Date:** March 28, 2023

**Time:** 7pm

**Meeting Type:** MHTO Board Meeting

**Meeting Location:** Pond Inlet

**Baffinland Participants Present:**

Tabitha Kasarnak (Tapisa K.)

**Other Participants (provide affiliation):**

**MHTO:**

Jennifer Innuaq, Enookie Innuaq, (vice-chairperson), Jonathan Pitseolak, Peter Aglak, Daniel Quassa, David Qamaniq (chairperson), Marlene Aqqiaruq

**Interpreter:** None required

**Meeting Description:** Regular Meeting

Meeting commenced at 7:15

David: thank you for coming. Peter Aglak opening prayers, Thank you Peter

Delegation: Tapisa Kasarnak, Baffinland

Tapisa K.: I am here on behalf of Baffinland Milne Inlet Freshwater fish program.

Enookie I.: MHTO community research the fish studies conducted the presentation

David Q.: The Qurluktuq study , Phanuel heard only from him, Silas Katsak, and Phanuel's son only reported.

Peter A.: I have never heard any reports of the study conducted.

Jonathan P.: the fish in general they're asking about that, and to include the specialist, trace metals from historical data should be included. *\*\*\*DFO confirmed to Baffinland via email that no historical metals data exists for the 3 lakes sampled\*\*\**

David Q: the reports should have page numbers so when we have questions we can refer to it., We were told how much consumption is required by Health Canada. During zoom meeting issues were discussed

Enookie I.: The operations of the monitoring how is the MHTO think about it, in the summer they go to the lakes and use gillnets and they go back to Mary River. They do lab analysis and the fish is just thrown out, and the fish that go into the sea are also sampled. We want the reporting of the monitoring, we want to see the raw data. April 30 is when the report will be distributed. The monitoring about the fish to keep them alive, what else we want to see in the fish don't contain minerals and mercury for trace



metals, this was from the NIRB conditions, as long as the char we eat don't have any metals or mercury. And if they can have a lab here in Pond Inlet, questions raised by MHTO there should be included. There are also surveys at Milne Inlet using gillnets. We would want reports on seagoing fish.

Peter A.: the fish doesn't have to be thrown out. Give them back to Pond Inlet. The fish that don't go to sea are the best fish. They have to use gloves if conducting the surveys because they leave hand prints.

David Q.: Board members want to include people from the MHTO. Fish should have a tagging device, the ones that were tagged with a device had hand prints, the ones that were tagged, some came from Inuvik, as long as they use gloves for the tagging devices.



**APPENDIX A.5.8**  
**Meeting of Project Partners**  
**to Discuss 2022 Results and**  
**Reporting**





**CONFIDENTIAL MEETING (IE FOR INTERNAL TRACKING PURPOSES ONLY): [NO]**

**Meeting Date:** April 5, 2023

**Time:** 3pm

**Meeting Type:** Milne Inlet Freshwater Fish Health Program

**Meeting Location:** Virtual (MHTO in Pond Inlet)

**Baffinland Participants Present:**

Connor Devereaux

Todd Swenson

Tabitha (Tapisa) Kasarnak

Genevieve Morinville

**Other Participants (provide affiliation):**

MHTO: Enookie Inuarak, Jonathan Pitseolak, Joshua Katsak

Minnow: Preston Lennox, Jess Tester, and Kim Connors

**Interpreter:** Lizzie Phillip-Qanatsiaq – Interpreter

**Meeting Description:** Input of MHTO on reporting of 2021 and 2022 analyses from fish sampling completed in 3 freshwater lakes

**IIBA/ICA Relevance:** n/a; Mary River Project Certificate Term and Condition 48(a)

**Project Phase:** PIPE and PIPR (2021 and 2022 sampling)

**Photo Waivers Required:** n/a

**Photo Waivers Recorded:** n/a

**Comment Tracker and Follow-up Actions**

Comment #	Comment	Follow-up Required	Due Date
1	Minnow to include raw data for 2021 and 2022 sampling years in report		April 30, 2023
2	MHTO does not want any fish to be wasted if edible for humans or dog		
3	MHTO does not like catch and release. This leaves fingerprints on the fish and it's not good for fish.		



4			
5			

**Start of Meeting: 3:15pm**

- Enookie Inuarak
- Jonathan Pitseolak
- Joshua Katsak

Lizzie Phillip-Qanatsiaq – Interpreter

Minnow – Preston Lennox, Jess Tester, and Kim Connors

Baffinland – Connor, Todd Swenson and Genevieve Morinville

Connor – we will provide the 2021 and 2022 raw data along with the 2022 report.

Minnow – we will provide it all in the same report.

Connor – We recognize the importance for developing a plan for fish sharing for all of our programs including marine and freshwater environment. As part of this review, there is a good lead into some of our questions that we had for you.

The first question we have – in the field, or at time of sampling, how could we determine when fish is healthy in the field

Enookie – you can know the difference between sick and healthy. Over what was caught over the summer in. they caught fish and it was sick and not edible.

Minnow – can you give descriptors, was it smaller? colour, or shape? or texture? what are the descriptors?

Joshua Katsak -

Joshua – we know fish our lifetime. it's our tradition. we can recognize from the first catch. like farming, fish preparation, drying. etc. when you catch a fish, and you're a fisherman all your life. the first thing you notice is the colour and the shape. when they're in the lake, the fish is healthy. when they go through the river, the head gets bigger and body smaller, once in ocean, their head is way smaller because they're not getting enough nutrients. but over the summer, most recently this summer. one of the fish. we cache some of the fish and then get it back after the winter. ask Inuit, that's our tradition. we're Inuit and we've been hunting for hundreds of years. that's it.

Minnow – thank you for the clarification. That was helpful.

Enookie- once you catch a fish, you'll know right away. last year, we caught a fish and froze it so he could have it when the time comes. after thawing it, after preparing it, the skin wasn't attached to the fat, and the fat was very easy to remove. it was different and still cooked it and ate it. most of the family had stomach problems. I think the fish was sick.



Connor – was that with the 2022 program?

Enookie: this was just a family gathering with a family trip. Not through the program.

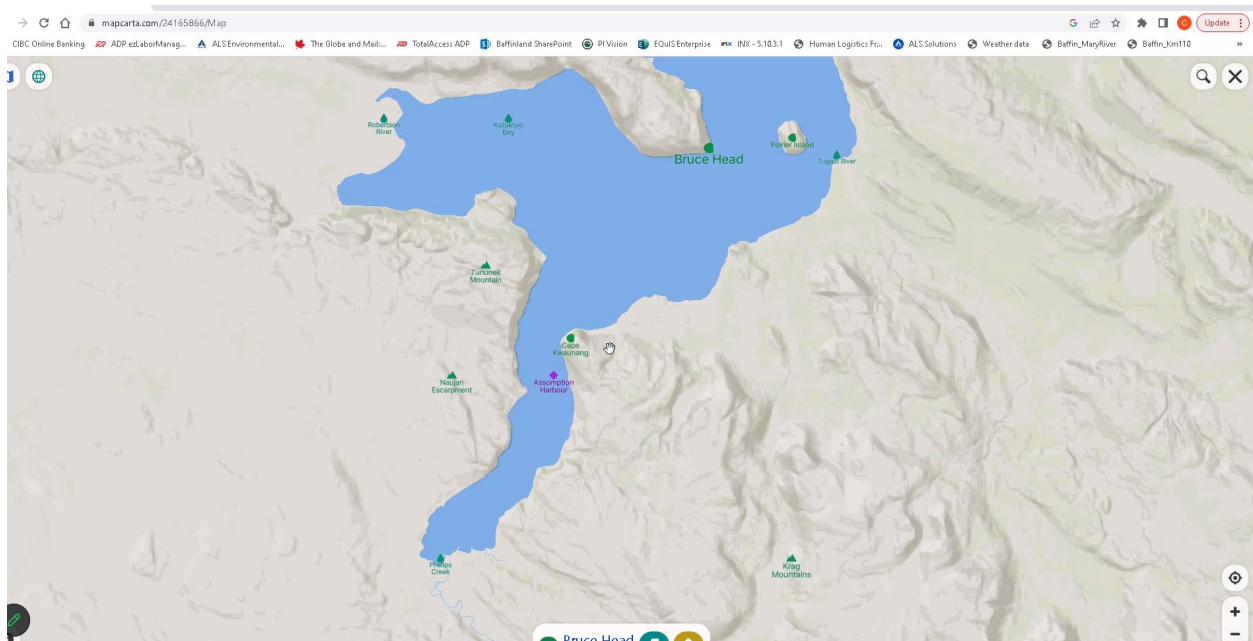
Joshua – these fish sampling areas that we've been doing since last year. we like to get all of the data and everything that is being collected. what if the database that we have. if it looks healthy, we're going to eat it anyway. if the fish is not edible, we're collecting all of the data but not getting the data. we're going to make sure we're eating healthy fish, not scary fish. there are 4 main lakes from the river. when they travel from ocean to river and to those 4 lakes, I think we need to get all of those 4 lakes. Qurluktuk river, and then the 4 other major lakes. they are all connected to Qurluktuq lake when they go back for the winter.

Also, back in 1962, before the exploration people came, they built a cabin at Milne inlet to see if there was a mine site in the area. that cabin has been there ever since. in that area, there used to be a lot of fish and it was their fishing spot. there used to be a lot of fish but now not so much. That's it for now.

Jonathan – the fish . the river used to flow from the pond to the ocean. ships were still around but no mine at the time. a little pond farther up. he wants more research for cleaning and not environmental damage to go on. for healthy food. no more depletion. more working for health. need more for future generation. now they are very dirty. that's it for him today. he may have more to say later.

Connor – thank you for your insight. we also monitor in the marine environment.

*Below screenshot was sent to Erica (BCLO in Pond Inlet) for printing and was shared with the MHTO. Tapisa subsequently shared the map with input from MHTO participants.*



Enookie? – we want to continue monitoring. it's better to deal directly with the community. they were expecting to get all of the monitoring in the Pond Inlet area for fish that go from lake to the ocean, or back to river, then lake. those are the fish that we need to eat.

Tapisa – will send the map.



Enookie – will need to meet in person for long term purposes. we had pushed for char to be monitored because we eat them. they are part of our important diet. and we wanted to make sure that they were not impacted with different iron, and what not. the studies you have started are the freshwater. some people eat them, but not as much as the ones that go to the ocean. I know you guys do some sampling in Milne Inlet during the summer. are we also going to see the data from those fish?

Genevieve – yes, we are going through reporting right now. we will be including all of the raw data, we've also included past data as hard copies to the MHTO, and also past reports on a USB stick.

Joshua –

Over the summer, there are 4 lakes that come through from the ocean. there was an old man that netted. he didn't most of us can't even recognize in the ocean what lake the fish comes from. and there's not much anymore. Those are the fish that we want monitored. those that go to lake and those that go to the ocean.

BIM: What are the 4 areas?

Connor- how frequently do you want the program run? What seasons and how often?

MHTO (Joshua Katsak) – qurluktuk river, in that area, when the fish are going back to the lakes, that little Qurluktuk river, that little pond has so many fish when they're taking a rest. it can be at end of august, early septemebr for that waterbody. that pond used to overflow with a lot of fish. not as much now because we have less narwhal, less seal, and we have to do monitoring every year just so that we're not feeding our community bad fish or sick fish before they go extinct or even what if we're eating dangerous fish. it's our food.

Connor – can we take a break?

I think on our end, I think we're good. I'll just ask minnow if they're good. we'll have more meetings on future programs.

10 min health break or what

we'll sign back on at 4:30pm.

Connor – we're back. any more questions?

We're good.

We'll have the report with raw data and analyses done before April 30, we will be sending that directly to the MHTO, and including it in the NIRB annual report.

Enookie – another comment – do you catch and release?

Minnow - we did not last year during our program because the folks we were with said we shouldn't put them back. is this consistent with MHTO?

Enookie – no we don't like the catch and release monitoring. you can have fingerprints, and hands can be printed to the fish skin.



Minnow – thank you for confirming this.

Enookie – also the fish, don't throw away the fish. some may be edible, if not it could be good for dog food.

Jonathan – thank you. one of the guys that went with MHTO members . you guys can correct. he felt he was rushed. if it's an Inuit culture, it shouldn't be rushed. he wants to do it properly. he wanted to cache them, once he knew they were going to be thrown out. we would rather they are given to the dogs, or given to the community.

Connor – from our understanding, some fish were cached. we will make sure this year that we consider these requests. If I can, I do have a follow-up question –

Minnow – thank you for that feedback. we will make sure that our staff are trained to have that understanding.

Connor – we can wrap it up. thank you again for the valuable feedback and insights.

**Meeting ended at ~4:40pm**



**APPENDIX B**  
**DATA QUALITY REVIEW**



## APPENDIX B DATA QUALITY REVIEW

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## B1 INTRODUCTION

### B1.1 Background

A variety of factors can influence the physical, chemical, and biological measurements made in an environmental study and thus affect the accuracy and/or precision of the data. Depending on their magnitude, inaccuracy and/or imprecision have the potential to affect the reliability of conclusions made from data; therefore, it is important to ensure that programs incorporate appropriate steps to control non-natural sources of data variability (i.e., minimize variability that does not reflect authentic spatial and temporal variability in the environment) and thus assure the quality of the data. Data quality as a concept is meaningful only when it relates to the intended use of the data. That is, one must know the context in which the data will be interpreted in order to establish a relevant basis for judging whether or not the data set is adequate. A data quality review (DQR) involves the comparison of field and laboratory measurement performance to Data Quality Objectives (DQOs) established for a particular study, such as evaluation of Laboratory Reporting Limits (LRL), blank sample data, data precision (based on field and laboratory duplicate samples), and data accuracy (based on matrix spike recoveries and/or analysis of standards or certified reference materials). Trusted analytical laboratories certified by the Canadian Association for Laboratory Accreditation (CALA) or the National Environmental Laboratory Accreditation Program (NELAP), with a rigorous internal quality assurance program, were selected to ensure the highest possible data quality. Data quality objectives were established *a priori* to reflect reasonable and achievable performance expectations. Programs involving many samples and analytes may sometimes yield results that exceed DQOs, which is particularly true for multielement scans, as the analytical conditions are not necessarily optimal for every element included in the scan. Generally, scan results may be considered acceptable if no more than 20% of the parameters fail to meet DQOs. Overall, the intent of a DQR is not to reject any measurement that did not meet a DQO, but to ensure that any questionable data received more scrutiny to determine what effect, if any, this had on interpretation of results within the context of the project.

### B1.2 Types of Quality Control Samples

DQR was conducted on all laboratory data collected as part of the Baffinland Milne Inlet Freshwater Fish Health 2024 program and involves the examination of analytical results associated with several types of Quality Control (QC) samples collected (or prepared) in the field and laboratory. General QC samples collected for this project, and a description of each, include the following:





- **Laboratory Reporting Limits** are the lowest achievable concentrations for individual parameters that the laboratory can detect using specified methods. Achieving satisfactory LRLs is important when comparing concentrations to guidelines for that medium. If detection limits are above the guideline, no accurate interpretation of the data can be made. Consistency is also important for LRLs when taking consecutive samples. Changes in LRLs between reports can affect summary calculations and also introduce confounding factors when assessing trends. LRLs were screened against guidelines and between samples.
- **Field Duplicates** are replicate samples collected from a randomly selected field station using identical collection and handling methods that are then analyzed separately in the laboratory. For fish tissue samples, the field duplicate samples represent two different samples taken from the same randomly selected fish. The duplicate samples are handled and analyzed in an identical manner in the laboratory. The data from field replicate samples reflect natural variability, as well as the variability associated with sample collection methods, and therefore provide a measure of field precision.
- **Laboratory Duplicates** are replicate sub-samples created in the laboratory from randomly selected field samples which are sub-sampled and then analyzed independently using identical analytical methods. For fish tissue, laboratory duplicates represent separate aliquots of material collected after sample homogenization. The laboratory duplicate sample results reflect any variability introduced during laboratory sample handling and analysis and thus provide a measure of laboratory precision.
- **Laboratory Control Samples** are created in the laboratory to have a known analyte concentration in a matrix free of interferences. The sample results are compared to the target results to confirm that the analytical method is accurate in a purified reference sample. The results are reported as the percent of the known concentration that was recovered in the analysis.





## B2 WATER CHEMISTRY

### B2.1 Laboratory Reporting Limits

The analytical laboratory reports included one ALS report from 2024 (Ikaluit and Qurluktuk Lakes; BF2400295; Appendix G). Within this report, analytes for which one or more results were below the LRL were identified. The range of reported LRLs for these analytes were then assessed relative to existing water quality guidelines (WQGs), including Canadian Water Quality Guidelines (CCME 1999, 2017) and Ontario Provincial Water Quality Objectives (OMOE 1994; Appendix Table B.1<sup>1</sup>). For analytes with results below the LRL, all reported LRLs were lower than applicable guidelines. Therefore, the achieved LRLs were appropriate for this study.

### B2.2 Laboratory Blanks

Method blank (MB) samples were analyzed in the ALS Laboratory Report (BF2400295; Appendix G). Of the 100 reported MB results, all met the laboratory DQO, indicating no inadvertent contamination within the laboratory.

### B2.3 Laboratory Data Precision

Laboratory duplicate samples were used to evaluate laboratory precision within the water chemistry report from ALS (BF2400295; Appendix G). All of the 97 duplicate pair results met the laboratory DQO of <25% indicating excellent laboratory analytical precision.

### B2.4 Data Accuracy

Data accuracy was evaluated based on results of Laboratory Control Samples (LCS) and Matrix Spike (MS) samples within the ALS Laboratory Reports (BF2400295; Appendix G). All of calculable 98 LCS individual analyte results and 66 MS individual analyte results met the laboratory DQO. As all LCS and MS results met the laboratory DQO, the accuracy achieved by the laboratory in this study is considered acceptable.

### B2.5 Hold Times

The recommended hold times for chlorophyll-a and pheophytin-a (BF2400295; Appendix G) were exceeded prior to sample receipt by the laboratory. The recommended hold time for both chlorophyll-a and pheophytin-a were exceeded by one day in two samples each (BF2400295; Appendix G). Although effort is made to ensure the timely shipping of field

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<sup>1</sup> Tables only include constituents with at least one result below the LRL or where the LRL was above guidelines. This applies to all other LRL tables for this report.





samples, due to the remote nature of the sampling site, samples may take longer than usual to arrive at the laboratory leading to hold time exceedances. Overall, hold time exceedances were limited and are not expected to impact data interpretation.

## **B2.6 Data Quality Statement**

Water chemistry data collected for the 2024 Milne Inlet Study were of acceptable quality as characterized by good detectability, appropriate LRLs, negligible analyte concentrations in MBs, good laboratory precision and accuracy, and few hold time exceedances. Overall, the water quality data can be used with a good level of confidence for interpretation.





## B3 FISH TISSUE CHEMISTRY

### B3.1 Laboratory Reporting Limits

The analytical ALS laboratory reports for fish tissue chemistry included one report from 2024 (Ikaluit and Qurluktuk Lakes; WT2437881; Appendix G). Within this report, analytes for which one or more results were below the LRL were identified. The range of reported LRLs for these analytes were assessed relative to existing fish consumption guidelines for human health, including Health Canada (2010), IRIS (2010), and the Canadian Food Inspection Agency guideline for mercury (CFIA 2015; Appendix Table B.2). For analytes with results below the LRL, all reported LRLs were lower than applicable consumption guidelines. Overall, the achieved LRLs were appropriate for this study.

### B3.2 Laboratory Blanks

Method Blank samples were analyzed in the ALS Laboratory Report (WT2437881; Appendix G). Of the 180 reported MB results, one result for arsenic did not meet the laboratory DQO. However, the result was lower than the LRL but was five times the blank level and was considered a reliable result. Since all other MB samples met the DQO, these laboratory flags had a negligible impact on data reliability.

### B3.3 Data Precision

Laboratory duplicate samples were used to evaluate laboratory precision within the fish tissue chemistry report from ALS (WT2437881; Appendix G). Of the 180 duplicate pair results, only two results including one for calcium and chromium did not meet the laboratory DQO due to sample heterogeneity (WT2437881; Appendix G). Since only 1.11% of laboratory duplicate samples did not meet the laboratory DQO, laboratory analytical precision was considered acceptable for this study.

Field sampling precision looks at relative percent difference (RPD), calculated as follows:

$$RPD = \frac{|R1 - R2|}{(|R1 + R2|/2)} * 100$$

Where R1 is the value of the original (“parent”) sample and R2 is the value of the duplicate sample, with the absolute difference and sum of the two samples used. RPDs cannot be calculated if both values are below the LRL. If the original and duplicate sample have the same value, then the RPD is 0%.

There are two applicable DQOs for field duplicates:





1. Each RPD comparison between the original and duplicate result should be  $\leq 25\%$ ; and,
2. Within each original and duplicate pairing (i.e., each duplicate pair), fewer than 20% of the total comparisons should be above the 25% DQO.

A total of 11 sets of field duplicate samples were collected to assess field sampling precision (Appendix Table B.3). All duplicate samples were collected during the 2024 fish tissue monitoring (WT2437881; Appendix G). Duplicate samples consisted of five muscle and six liver duplicate sets. Several RPDs could not be calculated as both analyte concentrations were below the LRL. Of the 11 field duplicate sets, four sets had  $>20\%$  of analyte comparisons in exceedance of the RPD DQO (25%; Appendix Table B.3). However, of the 269 total individual duplicate comparison, only 49 ( $<20\%$  of all comparisons) did not meet the DQO. Therefore, field duplicate samples of fish tissue were considered to have acceptable field precision and reproducibility for the purposes of this study.

#### **B3.4 Data Accuracy**

Data accuracy was evaluated based on results of MS and LCS samples. Of the 175 MS results, five results (2.86% of all results) marginally exceeded the laboratory DQO due to heterogenous analyte background in sample or sample matrix effects. Of the 180 LCS results, six results (3.33% of all results) were below the laboratory DQO, however the lab determined the results are considered reliable (WT2437881; Appendix G). As most MS and LCS samples met the laboratory DQO, laboratory data accuracy was considered acceptable for this study.

#### **B3.5 Hold Times**

Recommended hold times for the fish tissue chemistry samples were exceeded for mercury in 92 results (WT2437881; Appendix G). For samples identified as being analyzed outside of recommended holding times, measurement uncertainties may be increased and will be taken into consideration when interpreting results.

#### **B3.6 Data Quality Statement**

Fish tissue chemistry data collected for the 2024 Milne Inlet Study were of good quality as characterized by appropriate LRLs, excellent laboratory precision, low laboratory contamination, and good laboratory accuracy. Overall, fish tissue chemistry data can be used with a high level of confidence in the derivation of conclusions for the 2024 Milne Inlet Study.





## B4 FISH AGING

### B4.1 Data Accuracy

Fish aging was completed by North/South Consultants in 2024 (North/South Lab Report; Appendix G). Aging structures for 2024 included a combination of otoliths (preferred aging structure) and fin rays. In 2024, a total of 50 otolith and seven fin ray aging samples from Ikaluit and Qurluktuk Lakes were submitted to North/South Consultants. A laboratory analyst assigned an age and confidence index to each sample. Of these 57 samples, 10% (i.e., 8 samples) of the samples were reprocessed by a second analyst for quality control purposes. Original and reassessed age estimates were the same except for two samples (one year different; Appendix Table B.4), and all samples were within the laboratory DQO. Therefore, accuracy achieved by the laboratory is acceptable for this study.





## B5 Otolith Microchemistry

### B5.1 Laboratory Reporting Limits

The analytical Trich laboratory report for otolith microchemistry included one report from 2024 (Qurluktuk Lake; # 2024-724; Appendix G). Within this report, the range of reported LRLs were assessed relative to sample results. All of the 62,976 individual results for each analyte (lithium, magnesium, manganese, zinc, strontium, and barium) were above the detection limits achieved by the lab (Appendix Table B.5). Therefore, LRL were appropriate for this study.

### B5.2 B5.2 Other Concerns

Due to the shape of the otoliths, it was difficult for the laboratory to expose both edges during analysis, therefore some ablation lines went from core to edge, instead of edge to core to edge. Age estimation derived chemically was compared to fish ages estimated by counting otolith annuli (See section B.4). A total of 10 chemically derived age estimates were different from annuli ages, of which eight were different by 1 year and met the DQO ( $\pm 1$  year; Appendix Table B.6). Three ages were different by 2 years and will be considered during data interpretation (Appendix Table B.6).

Additionally, two samples (BA-QURL-AC-OT-08-Aug-28, and BA-QURL-AC-OT-09-Aug-28; see laboratory report 2024-724; Appendix G) were re-analyzed using a different ablation path due to the original path being incomplete. The age estimates for four fish were also reanalyzed based on re-examination of photos and chemistry. Overall, otolith microchemistry data can be used with a high level of confidence in the derivation of conclusion for the 2024 Milne Inlet Study.





## B6 DATA QUALITY REVIEW SUMMARY

Data collected for the 2024 Milne Inlet Study were of acceptable quality as characterized by appropriate LRLs, good detectability, negligible analyte concentration in MB samples, good laboratory precision, and good laboratory accuracy. Field sampling precision, as measured by RPD in field duplicate pairs, was low in fish tissue chemistry samples, reflecting natural variability. Sources of variation will be considered during data interpretation. Recommended hold time exceedances were isolated to three analytes for water and fish tissue chemistry samples; however, when these results were compared to results from samples collected at the same area, no observable differences were apparent. As such, hold time exceedances had a negligible effect on data interpretation. For samples identified as being analyzed outside of recommended holding times, measurement uncertainties may be increased and will be taken into consideration when interpreting results. Fish aging samples showed good laboratory accuracy, with all samples meeting the laboratory DQO. Overall, data collected as part of the 2024 Milne Inlet Study can be used with a high level of confidence in the derivation of conclusions.





Table B.1: Laboratory Reporting Limits (LRLs) for Water Chemistry Samples, Baffinland Milne Inlet, 2024

Constituent	Units	CCME WQG		PWQO	Range of LRLs	No LRLs > Guideline	No. Sample Results < LRL
		Long-term	Short-term				
Physical Tests							
Phenols, total (4AAP)	mg/L	-	-	-	0.00100	-	2 (100%)
Total Suspended Solids	mg/L	-	-	-	1.00	-	2 (100%)
Anions, Nutrients, and Organics							
Ammonia, Total (as N)	mg/L	0.172	-	1.67	0.00500	0	1 (50%)
Bromide (Br)	mg/L	-	-	-	0.100	-	2 (100%)
Nitrate (as N)	mg/L	3.00	124	-	0.0200	0	1 (50%)
Nitrite (as N)	mg/L	0.0600	-	-	0.0100	0	2 (100%)
Phosphorus (P)-Dissolved	mg/L	-	-	-	0.0500	-	2 (100%)
Phosphorus (P)-Total	mg/L	-	-	-	0.00200 to 0.0500	-	2 (50%)
Total Metals							
Antimony (Sb)	mg/L	-	-	0.0200	0.000100	0	2 (100%)
Arsenic (As)	mg/L	0.00500	-	0.00500	0.000100	0	2 (100%)
Beryllium (Be)	mg/L	-	-	0.0110	0.0000200	0	2 (100%)
Bismuth (Bi)	mg/L	-	-	-	0.0000500	-	2 (100%)
Boron (B)	mg/L	1.50	29.0	0.200	0.0100	0	2 (100%)
Cadmium (Cd)	mg/L	0.0000400	0.000160	0.000100	0.00000500	0	1 (50%)
Cesium (Cs)	mg/L	-	-	-	0.0000100	-	2 (100%)
Chromium (Cr)	mg/L	0.00100	-	0.00100	0.000500	0	2 (100%)
Cobalt (Co)	mg/L	-	-	0.000900	0.000100	0	2 (100%)
Copper (Cu)	mg/L	0.00200	-	0.00100	0.000500	0	1 (50%)
Iron (Fe)	mg/L	0.300	-	0.300	0.0100	0	1 (50%)
Lead (Pb)	mg/L	0.00100	-	0.00100	0.0000500	0	2 (100%)
Lithium (Li)	mg/L	-	-	-	0.00100	-	1 (50%)
Mercury (Hg)	mg/L	0.0000260	-	-	0.00000500	0	2 (100%)
Nickel (Ni)	mg/L	0.0250	-	0.0250	0.000500	0	2 (100%)
Selenium (Se)	mg/L	0.00100	-	0.100	0.0000500	0	2 (100%)
Silver (Ag)	mg/L	0.000250	-	0.000100	0.0000100	0	2 (100%)
Sulphur (S)	mg/L	-	-	-	0.500	-	1 (50%)
Tellurium (Te)	mg/L	-	-	-	0.000200	-	2 (100%)
Thallium (Tl)	mg/L	0.000800	-	0.000300	0.0000100	0	2 (100%)
Thorium (Th)	mg/L	-	-	-	0.000100	-	2 (100%)
Tin (Sn)	mg/L	-	-	-	0.000100	-	2 (100%)
Titanium (Ti)	mg/L	-	-	-	0.000300	-	1 (50%)
Tungsten (W)	mg/L	-	-	0.0300	0.000100	0	2 (100%)
Vanadium (V)	mg/L	-	-	0.00600	0.000500	0	2 (100%)
Zinc (Zn)	mg/L	-	-	0.0200	0.00300	0	2 (100%)
Zirconium (Zr)	mg/L	-	-	0.00400	0.000200	0	2 (100%)
Dissolved Metals							
Antimony (Sb)	mg/L	-	-	-	0.000100	-	2 (100%)
Arsenic (As)	mg/L	-	-	-	0.000100	-	2 (100%)
Beryllium (Be)	mg/L	-	-	-	0.0000200	-	2 (100%)
Bismuth (Bi)	mg/L	-	-	-	0.0000500	-	2 (100%)
Boron (B)	mg/L	-	-	-	0.0100	-	2 (100%)
Cadmium (Cd)	mg/L	-	-	-	0.00000500	-	1 (50%)
Cesium (Cs)	mg/L	-	-	-	0.0000100	-	2 (100%)
Chromium (Cr)	mg/L	-	-	-	0.000500	-	2 (100%)
Cobalt (Co)	mg/L	-	-	-	0.000100	-	2 (100%)
Iron (Fe)	mg/L	-	-	-	0.0100	-	2 (100%)
Lead (Pb)	mg/L	-	-	-	0.0000500	-	2 (100%)
Lithium (Li)	mg/L	-	-	-	0.00100	-	1 (50%)
Mercury (Hg)	mg/L	-	-	0.000200	0.00000500	0	2 (100%)
Nickel (Ni)	mg/L	-	-	-	0.000500	-	2 (100%)
Selenium (Se)	mg/L	-	-	-	0.0000500	-	2 (100%)
Silver (Ag)	mg/L	-	-	-	0.0000100	-	2 (100%)
Sulphur (S)	mg/L	-	-	-	0.500	-	1 (50%)
Tellurium (Te)	mg/L	-	-	-	0.000200	-	2 (100%)
Thallium (Tl)	mg/L	-	-	-	0.0000100	-	2 (100%)
Thorium (Th)	mg/L	-	-	-	0.000100	-	2 (100%)
Tin (Sn)	mg/L	-	-	-	0.000100	-	2 (100%)
Titanium (Ti)	mg/L	-	-	-	0.000300	-	2 (100%)
Tungsten (W)	mg/L	-	-	-	0.000100	-	2 (100%)
Vanadium (V)	mg/L	-	-	-	0.000500	-	2 (100%)
Zinc (Zn)	mg/L	0.00315	0.0166	-	0.00100	0	1 (50%)
Zirconium (Zr)	mg/L	-	-	-	0.000300	-	2 (100%)

Notes: Total number of samples in 2024 was two (2), which included one sample from each of Qurluktuk Lake and Ikaluit Lake (collected in 2024; report BF2400295). "-" indicates no applicable guideline. Only constituents with at least one sample < LRL are displayed.



**Table B.2: Laboratory Reporting Limits (LRLs) for Fish Tissue Chemistry Samples, Baffinland Milne Inlet, 2024**

Constituent	Units	Consumption Guidelines <sup>a</sup>	Range of LRLs	No. of Sample Results < LRL
<b>Metals</b>				
Aluminum (Al)	mg/kg	-	2	84(91.3%)
Antimony (Sb)	mg/kg	0.00040 <sup>b</sup>	0.010	88(95.7%)
Barium (Ba)	mg/kg	0.20 <sup>b,c</sup>	0.10	85(92.4%)
Beryllium (Be)	mg/kg	0.0020 <sup>b</sup>	0.010	91(98.9%)
Bismuth (Bi)	mg/kg	-	0.010	92(100%)
Boron (B)	mg/kg	0.0175 <sup>c</sup>	1.0	75(81.5%)
Cadmium (Cd)	mg/kg	0.0010 <sup>b,c</sup>	0.005	1(1.1%)
Chromium (Cr)	mg/kg	0.0030 <sup>c</sup>	0.05	76(82.6%)
Cobalt (Co)	mg/kg	-	0.020	21(22.8%)
Lead (Pb)	mg/kg	0.0036 <sup>c</sup>	0.0	32(34.8%)
Lithium (Li)	mg/kg	-	0.5	91(98.9%)
Manganese (Mn)	mg/kg	0.122 <sup>c,d</sup>	0.50	45(48.9%)
Mercury (Hg)	mg/kg	0.05 <sup>e</sup>	0.03	0(0%)
Molybdenum (Mo)	mg/kg ww	0.0050 <sup>b</sup>	0.020	46(50%)
Nickel (Ni)	mg/kg	0.0011 <sup>c,f</sup>	0.20	85(92.4%)
Silver (Ag)	mg/kg	0.005 <sup>b</sup>	0	47.8%
Strontium (Sr)	mg/kg	378.4 <sup>b</sup>	0	9(9.8%)
Tellurium (Te)	mg/kg	-	0.100	92(100%)
Tin (Sn)	mg/kg	-	0.10	91(98.9%)
Uranium (U)	mg/kg	0.00060 <sup>c</sup>	0.0200	91(98.9%)
Vanadium (V)	mg/kg	-	0.10	51(55.4%)
Zirconium (Zr)	mg/kg	-	0.30	92(100%)

Notes: Total number of samples for 2024 was 92, which included 11 fish tissue quality field duplicate samples. Only analytes for which at least one result was < LRL are displayed. Table displays combined LRLs for muscle and liver results. mg/lg = milligrams per kilogram. mg/kg ww = milligrams per kilogram wet weight. "-" indicates no applicable guideline.

<sup>a</sup> For more information regarding consumption guidelines refer to Table 2.2.

<sup>b</sup> IRIS (2020).

<sup>c</sup> Health Canada (2010).

<sup>d</sup> Most conservative concentration (tolerable daily intakes are defined on an age-group specific basis).

<sup>e</sup> Human health consumption guideline for muscle tissue in fish (CFIA 2015).

<sup>f</sup> Based on nickel chloride.



Table B.3: Field Duplicate Results for Analysis of Fish Tissue Samples, Baffinland Milne Inlet, 2024

Constituent	Units	ALS Report Number WT2437881 - Ikaluit Lake																	
		27-Aug-24																	
		BA-IKLL-AC-LIV-12-AUG-27			BA-IKLL-AC-LIV-22-AUG-27			BA-IKLL-AC-LIV-31-AUG-27			BA-IKLL-AC-MUS-12-AUG-27			BA-IKLL-AC-MUS-22-AUG-27			BA-IKLL-AC-MUS-31-AUG-27		
		Replicate 1	Replicate 2	RPD <sup>a</sup>	Replicate 1	Replicate 2	RPD <sup>a</sup>	Replicate 1	Replicate 2	RPD <sup>a</sup>	Replicate 1	Replicate 2	RPD <sup>a</sup>	Replicate 1	Replicate 2	RPD <sup>a</sup>	Replicate 1	Replicate 2	RPD <sup>a</sup>
Moisture	%	63.6	62.9	1	67.6	67.5	0	60.1	60.3	0	74	74.2	0	71.9	72.2	0.42	73.6	73.9	0.4
Aluminum (Al)	mg/kg	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	-	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0
Antimony (Sb)	mg/kg	<0.010	<0.010	0	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-
Arsenic (As)	mg/kg	3.46	3.3	5	1.94	1.96	1	2.65	2.52	5	1.98	2.2	11	2.61	2.24	14.18	2.99	3.36	12
Barium (Ba)	mg/kg	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	0	0.17	0.110	35
Beryllium (Be)	mg/kg	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-
Bismuth (Bi)	mg/kg	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-
Boron (B)	mg/kg	<1.0	<1.0	-	<1.0	<1.0	-	<1.0	<1.0	-	<1.0	<1.0	-	<1.0	<1.0	-	<1.0	<1.0	-
Cadmium (Cd)	mg/kg	1.36	1.35	1	1.5	1.38	8	1.32	1.36	3	0.022	0.0147	33	0.0417	0.0178	57	0.0546	0.0301	45
Calcium (Ca)	mg/kg	117	103	12	106	120	13	68	76	12	144	140	3	151	144	5	138	131	5
Chromium (Cr)	mg/kg	<0.050	<0.050	0	<0.050	<0.050	0	<0.050	<0.050	0	<0.050	<0.050	0	<0.050	<0.050	0	<0.050	0.233	366
Cobalt (Co)	mg/kg	0.134	0.119	11	0.202	0.168	17	0.291	0.263	-	<0.020	<0.020	0	0.021	0.119	467	0.043	<0.020	53
Copper (Cu)	mg/kg	19.4000	22.3	15	72.6000	62.2	14	55.7000	48.4	-	1.6900	2.2	30	3.1400	2.32	26	1.7600	2.86	63
Iron (Fe)	mg/kg	379	352	7	472	467	1	400	415	4	16.2	16.3	1	37.4	24.9	33	17.5	25	43
Lead (Pb)	mg/kg	0.033	<0.020	39	0.091	0.044	52	0.038	0.025	34	0.108	0.02	81	<0.020	<0.020	-	<0.020	<0.020	0
Lithium (Li)	mg/kg	<0.50	<0.50	0	<0.50	<0.50	0	<0.50	<0.50	-	<0.50	<0.50	0	<0.50	<0.50	-	<0.50	<0.50	0
Magnesium (Mg)	mg/kg	487	443	-	491	490	-	422	405	-	1430	1310	-	1140	1230	-	1430	1240	-
Manganese (Mn)	mg/kg	3.12	3.14	0.6	2.37	2.72	14.8	3	3.07	2.3	<0.50	<0.50	0.0	<0.50	<0.50	0.0	<0.50	<0.50	0.0
Mercury (Hg)	mg/kg	0.15	0.15	0.0	0.344	0.356	3.5	0.131	0.126	3.8	0.141	0.146	3.5	0.201	0.172	14.4	0.162	0.148	8.6
Molybdenum (Mo)	mg/kg ww	0.559	0.574	3	0.676	0.563	17	0.671	0.685	2	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0
Nickel (Ni)	mg/kg	<0.20	<0.20	0	<0.20	<0.20	0	<0.20	<0.20	-	<0.20	<0.20	0	<0.20	<0.20	-	<0.20	<0.20	0
Phosphorus (P)	mg/kg	9580	8890	-	9620	9000	-	8400	7930	-	11500	11600	-	9540	10400	-	11000	10800	-
Potassium (K)	mg/kg	7,800	7,080	9.2	8,230	7,940	3.5	6,780	6,490	4.3	17,600	17,800	1.1	14,100	15,800	12.1	16,700	15,900	4.79
Rubidium (Rb)	mg/kg	3	3	7.5	4	4	0.0	3	3	1.2	5	5	4.7	5	5	8.1	5	5	11.5
Selenium (Se)	mg/kg	7.46	7.34	1.6	6.08	5.91	2.8	9.78	9.87	0.92	1.48	1.46	1.4	1.39	1.37	1.4	1.34	1.26	6.0
Sodium (Na)	mg/kg	0.503	0.58	15.3	1.76	1.6	-	1.58	1.46	7.6	<0.0050	<0.0050	0.0	<0.0050	<0.0050	0.0	<0.0050	<0.0050	0.0
Silver (Ag)	mg/kg	3090	3110	1	2990	2990	0	2180	2330	7	886	1020	15	1550	952	39	1040	1100	6
Strontium (Sr)	mg/kg	0.52	0.38	27	0.21	0.22	5	0.25	0.26	4	0.2	0.21	5	0.23	0.16	30	0.2	0.21	5
Tellurium (Te)	mg/kg	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-
Thallium (Tl)	mg/kg	0.0217	0.0186	14	0.0182	0.0165	9	0.0264	0.0233	-	0.0046	0.0045	2	0.0066	0.0062	6	0.0075	0.0047	37
Tin (Sn)	mg/kg	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0
Uranium (U)	mg/kg	<0.020	<0.020	-	<0.020	<0.020	0	<0.020	<0.020	-	<0.020	<0.020	0	<0.020	<0.020	-	<0.020	<0.020	0
Vanadium (V)	mg/kg	<0.10	<0.10	-	0.29	0.25	-	0.14	0.13	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-
Zinc (Zn)	mg/kg	89.9	90.3	0	98.8	106	7	82.9	82.9	-	16	16.1	1	17.1	14.8	13	15.9	16.9	6
Zirconium (Zr)	mg/kg	<0.30	<0.30	-	<0.30	<0.30	-	<0.30	<0.30	-	<0.30	<0.30	-	<0.30	<0.30	-	<0.30	<0.30	-

Did not meet the data quality objective of ≤ 25% relative percent difference (RPD).  
Notes: mg/kg = milligrams per kilogram. mg/kg ww = milligrams per kilogram wet weight. "-" indicates RPD was not calculated.

<sup>a</sup> RPD = Relative Percent Difference. If results were both below the Laboratory Reporting Limit (<LRL), RPD was not calculated. If one results was <LRL, the value of the LRL was used.



Table B.3: Field Duplicate Results for Analysis of Fish Tissue Samples, Baffinland Milne Inlet, 2024

Constituent	Units	ALS Report Number WT2437881 - Qurluktuk Lake														
		30-Aug-24														
		BA-QURL-AC-LI-05-AUG-29			BA-QURL-AC-LI-15-AUG-30			BA-QURL-AC-MUS-05-AUG-29			BA-QURL-AC-MUS-15-AUG-30			QURL-22-AC-20-LIV-X		
		Replicate 1	Replicate 2	RPD <sup>a</sup>	Replicate 1	Replicate 2	RPD <sup>a</sup>	Replicate 1	Replicate 2	RPD <sup>a</sup>	Replicate 1	Replicate 2	RPD <sup>a</sup>	Replicate 1	Replicate 2	RPD <sup>a</sup>
Moisture	%	81	79.9	1	77.5	77.5	0.00	78.4	78.9	0.6	77.9	78.5	1	68.6	54.1	21
Aluminum (Al)	mg/kg	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	3	50	<2.0	<2.0	0	<0.40	<1.0	150
Antimony (Sb)	mg/kg	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.0020	<0.0020	-
Arsenic (As)	mg/kg	2.08	1.94	7	2.16	2.3	6.48	2.23	1.96	12	2	2.51	26	0.179	0.256	43
Barium (Ba)	mg/kg	<0.10	<0.10	-	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.010	0.014	40
Beryllium (Be)	mg/kg	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.0020	<0.0020	-
Bismuth (Bi)	mg/kg	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.0020	<0.0020	-
Boron (B)	mg/kg	1.7	1.2	-	<1.0	<1.0	-	1	<1.0	-	<1.0	<1.0	-	<0.20	<0.20	-
Cadmium (Cd)	mg/kg	4.22	4.9	16	8.07	9.23	14	0.009	0.0087	3	0.0138	0.0134	3	0.443	0.469	6
Calcium (Ca)	mg/kg	584	502	14	331	714	116	248	138	44	177	180	2	35.5	51.8	46
Cesium (Cs)	mg/kg	<0.050	<0.050	0	<0.050	<0.050	0	<0.050	<0.050	0	<0.050	0.088	76	0.0074	0.0062	16
Chromium (Cr)	mg/kg	0.173	0.195	13	0.19	0.242	27	0.025	<0.020	20	0.133	<0.020	85	<0.010	<0.040	300
Cobalt (Co)	mg/kg	6.4500	6.61	2	9.0600	10.6	17	3.1600	2.17	31	1.9500	2.12	9	0.0719	0.0871	21
Copper (Cu)	mg/kg	974	1080	11	1330	1500	13	27.9	19.8	29	21.4	17.3	19	13.6	16.9	24
Iron (Fe)	mg/kg	0.074	0.042	43	0.047	0.119	-	<0.020	0.03	50	<0.020	0.027	35	180	170	6
Lead (Pb)	mg/kg	<0.50	<0.50	0	<0.50	<0.50	-	<0.50	<0.50	0	<0.50	<0.50	0	0.0056	<0.010	79
Lithium (Li)	mg/kg	1080	1090	-	1100	1260	-	1210	1210	-	1110	1350	-	<0.10	<0.10	-
Magnesium (Mg)	mg/kg	5.17	5.86	13.3	4.78	5.73	19.9	<0.50	<0.50	0.0	<0.50	<0.50	0.0	134	150	11.9
Manganese (Mn)	mg/kg	0.346	0.346	0.0	0.579	0.503	13.1	0.212	0.239	12.7	0.381	0.413	8.4	0.569	0.718	26
Mercury (Hg)	mg/kg ww	0.348	0.351	1	0.486	0.51	5	<0.020	<0.020	0	<0.020	<0.020	0	0.0695	0.0803	16
Molybdenum (Mo)	mg/kg	<0.20	<0.20	0	<0.20	<0.20	-	<0.20	<0.20	0	<0.20	<0.20	0	0.129	0.140	9
Nickel (Ni)	mg/kg	18400	20500	-	19000	21100	-	10100	10300	-	9220	10500	-	<0.040	0.047	18
Phosphorus (P)	mg/kg	16,200	15,900	1.9	15,100	16,800	11.3	16,600	17,300	4.22	14,700	16,900	15.0	2540	3270	28.7
Potassium (K)	mg/kg	9	10	1.8	7	8	12.2	8	8	8.2	7	8	14.18	2740	2420	11.7
Rubidium (Rb)	mg/kg	3.21	3.23	0.6	4.15	4.61	11.1	1.2	1.24	3.3	1.13	1.34	18.6	1.16	1.03	11.2
Selenium (Se)	mg/kg	0.0486	0.0484	0.4	0.135	0.161	19.3	<0.0050	<0.0050	0.0	0.0122	0.0294	141.0	1.03	1.27	23.3
Sodium (Na)	mg/kg	7400	6780	8	5030	5160	3	1720	1640	5	3190	2730	14	941	914	3
Strontium (Sr)	mg/kg	0.47	0.39	17	0.24	0.67	179	0.21	<0.10	52	0.1	0.1	0	0.060	0.091	52
Tellurium (Te)	mg/kg	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.0040	<0.0040	-
Thallium (Tl)	mg/kg	0.114	0.113	1	0.152	0.16	5	0.0114	0.0153	34	0.0102	0.0103	1	0.00420	0.00485	15
Tin (Sn)	mg/kg	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	0.053	0.133	151
Uranium (U)	mg/kg	<0.020	<0.020	0	<0.020	<0.020	-	<0.020	<0.020	0	<0.020	<0.020	0	0.00059	0.00092	56
Vanadium (V)	mg/kg	0.21	0.24	-	0.39	0.46	-	<0.10	<0.10	-	<0.10	<0.10	0	0.037	0.055	49
Zinc (Zn)	mg/kg	127	140	10	167	208	25	15.4	14.2	8	15.4	15.6	1	26.0	39.9	53
Zirconium (Zr)	mg/kg	<0.30	<0.30	-	<0.30	<0.30	-	<0.30	<0.30	-	<0.30	<0.30	-	<0.040	<0.040	-

Did not meet the data quality objective of ≤ 30% relative percent difference (RPD).

Notes: mg/kg = milligrams per kilogram. mg/kg ww = milligrams per kilogram wet weight. "-" indicates RPD was not calculated.

<sup>a</sup> RPD = Relative Percent Difference. If results were both below the Laboratory Reporting Limit (<LRL), RPD was not calculated. If one results was <LRL, the value of the LRL was used.



**Table B.4: Age Estimates for Arctic Char, Baffinland Milne Inlet, 2024**

Location	Date	Aging Structures	Species	Fish #	Age	Con. Index	QA/QC	Original Age - QA/QC Age
IKLL	27-Aug-24	OT	ARCH	1	10	G	10	0
IKLL	27-Aug-24	OT	ARCH	2	14	G	13	1
IKLL	27-Aug-24	OT	ARCH	3	11	G	11	0
IKLL	28-Aug-24	FR	ARCH	36	7	G	7	0
IKLL	28-Aug-24	OT	ARCH	37	14	G	14	0
QURL	28-Aug-24	OT	ARCH	1	15	G	15	0
QURL	28-Aug-24	OT	ARCH	2	13	G	12	1
QURL	28-Aug-24	OT	ARCH	3	13	G	13	0

Notes: Only samples with quality assurance/quality control (QA/QC) age are displayed (i.e., 10% of samples submitted to North/South Consultants in 2024). Confidence index (Con. Index): G = Good, F = Fair. ARCH = arctic charr. OT = otolith.



**Table B.5:** Laboratory Reporting Limits (LRLs) for Otolith Microchemistry Analysis, Baffinland Milne Inlet, 2024

Constituent	Units	LRL Achieved	Number of Sample Results <LRL
Lithium-7	ppm	0.097 to 0.513	0 (0%)
Magnesium-24	ppm	0.149 to 0.403	0 (0%)
Manganese-55	ppm	0.051 to 0.183	0 (0%)
Zinc-66	ppm	0.458 to 1.550	0 (0%)
Strontium-88	ppm	0.001 to 0.494	0 (0%)
Barium-137	ppm	0.003 to 0.021	0 (0%)

Note: Total number of samples for 2024 was 20. ppm = parts per million.



**Table B.6: Age Estimate Comparison Between Chemically Derived Ages and Visually Derived Ages, Baffinland Milne Inlet, 2024**

Sample ID	Otolith Microchemistry Analyses		Otolith Age Assessment	Age Difference
	Laser Ablation Method	Estimated Age (based on chemistry)		
BA-QURL-AC-OT-01-Aug-28	Core to edge	14	15	±1
BA-QURL-AC-OT-02-Aug-28	Edge to core to edge	12	13	±1
BA-QURL-AC-OT-03-Aug-28	Edge to core to edge	13	13	0
BA-QURL-AC-OT-04-Aug-28	Core to edge	18	16	±2
BA-QURL-AC-OT-05-Aug-28	Edge to core to edge	14	14	0
BA-QURL-AC-OT-06-Aug-28	Core to edge	14	14	0
BA-QURL-AC-OT-07-Aug-28	Edge to core to edge	14	14	0
BA-QURL-AC-OT-08-Aug-28	Core to edge	25	25	0
BA-QURL-AC-OT-09-Aug-28	Core to edge	18	18	0
BA-QURL-AC-OT-10-Aug-28	Edge to core to edge	15	13	±2
BA-QURL-AC-OT-11-Aug-28	Edge to core to edge	16	15	±1
BA-QURL-AC-OT-12-Aug-28	Core to edge	14	14	0
BA-QURL-AC-OT-13-Aug-28	Core to edge	15	14	±1
BA-QURL-AC-OT-14-Aug-28	Edge to core to edge	13	14	±1
BA-QURL-AC-OT-15-Aug-28	Core to edge	14	13	±1
BA-QURL-AC-OT-16-Aug-28	Edge to core to edge	14	14	0
BA-QURL-AC-OT-17-Aug-28	Edge to core to edge	12	12	0
BA-QURL-AC-OT-18-Aug-28	Edge to core to edge	14	13	±1
BA-QURL-AC-OT-19-Aug-28	Edge to core to edge	14	14	0
BA-QURL-AC-OT-20-Aug-28	Core to edge	12	14	±2



**APPENDIX C**  
**WATER DATA**



Table C.1: Water Quality Screening, Milne Inlet Freshwater Fish Health Monitoring Program, 2021, 2022 and 2024

Parameter	Units	CCME Guidelines		Ikaluit Lake	Qurluktuk Lake	Ikaluit Lake	Tugaat Lake	Qurluktuk Lake	Tugaat Lake	Qurluktuk Lake
		Long-term chronic	Short-term acute	26-Aug-24	26-Aug-24	19-Aug-22	21-Aug-22	23-Aug-22	17-Aug-21	18-Aug-21
Alkalinity, Total (as CaCO3)	mg/L	-	-	7.3	78.1	8	65.3	77.5	31.9	88.3
Ammonia, Total (as N)	mg/L	0.343 to 1.54	-	<0.005	0.0057	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide (Br)	mg/L	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloride (Cl)	mg/L	120	640	1.07	1.27	0.85	1.01	1.49	0.98	1.73
Chlorophyll a	ug/L	-	-	1.45	0.623	1.48	1.41	1.18	0.46	0.11
Conductivity	uS/cm	-	-	21.5	167	21.6	72.8	171	58.8	176
Dissolved Organic Carbon	mg/L	-	-	1.65	1.51	1.21	1.88	1.17	6.88	2
Hardness (as CaCO3)	mg/L	-	-	7.92	80.9	8.38	33.6	87.1	27.1	87.9
Nitrate (as N)	mg/L	3	124	0.05	<0.02	0.048	0.039	<0.02	0.043	<0.02
Nitrite (as N)	mg/L	0.06	-	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005
Lab pH	pH units	6.5 - 9.0	-	7.65	8.05	7.28	7.74	8.02	7.74	8.26
Phaeophytin a	ug/L	-	-	0.373	0.13	1.14	1.26	0.49	0.44	0.56
Phenols (4AAP)	mg/L	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus, Total	mg/L	-	-	0.0025	0.0024	0.0047	0.0216	<0.003	0.0048	<0.003
Sulphate	mg/L	-	-	0.86	6.19	0.7	0.8	7.05	0.74	7.87
Temperature, Field	°C	-	-	7	8.3	-	-	-	6	-
Total Dissolved Solids	mg/L	-	-	21	100	21	65	96	19	88
Total Kjeldahl Nitrogen	mg/L	-	-	0.126	0.115	0.101	0.126	0.056	0.07	0.06
Total Organic Carbon	mg/L	-	-	1.27	1.28	1.86	2.02	0.98	1.68	1.61
Total Suspended Solids	mg/L	-	-	<1	<1	<2	20.7	3	2	<2
Turbidity	NTU	-	-	0.31	0.41	0.41	3.4	2.4	1	0.35
Aluminum (Al)-Total	mg/L	0.1	-	0.0144	0.0068	0.0202	0.0596	0.0065	0.0512	0.0063
Antimony (Sb)-Total	mg/L	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic (As)-Total	mg/L	0.005	-	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Barium (Ba)-Total	mg/L	-	-	0.019	0.00217	0.0193	0.0143	0.00216	0.00986	0.00234
Beryllium (Be)-Total	mg/L	-	-	<0.00002	<0.00002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)-Total	mg/L	-	-	<0.00005	<0.00005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron (B)-Total	mg/L	1.5	29	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium (Cd)-Total	mg/L	0.00400 to 0.0003	0.0160 to 0.0003	0.0000084	<0.000005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Calcium (Ca)-Total	mg/L	-	-	2.05	24.1	1.99	6.92	24.1	5.84	25.9
Cesium (Cs)-Total	mg/L	-	-	<0.00001	<0.00001	-	-	-	-	-
Chromium (Cr)-Total	mg/L	0.001	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt (Co)-Total	mg/L	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Copper (Cu)-Total	mg/L	0.00200 to 0.0021	-	0.00084	<0.0005	0.00076	0.00108	0.00071	0.00078	<0.0005
Iron (Fe)-Total	mg/L	0.3	-	0.01	<0.01	<0.03	0.1	<0.03	0.054	<0.03
Lead (Pb)-Total	mg/L	0.0100 to 0.0027	-	<0.00005	<0.00005	<0.00005	0.000164	<0.00005	0.000085	<0.00005
Lithium (Li)-Total	mg/L	-	-	<0.001	0.0012	<0.001	<0.001	0.0018	<0.001	0.0018
Magnesium (Mg)-Total	mg/L	-	-	0.728	5.21	0.73	3.92	5.85	3.12	5.47
Manganese (Mn)-Total	mg/L	-	-	0.0005	0.00068	0.000774	0.00424	0.00113	0.00183	0.000958
Mercury (Hg)-Total	mg/L	0.000026	-	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Molybdenum (Mo)-Total	mg/L	0.073	-	0.000225	0.0001	0.000204	0.000285	0.000087	0.00036	0.000103
Nickel (Ni)-Total	mg/L	0.0250 to 0.0867	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Potassium (K)-Total	mg/L	-	-	0.376	0.317	0.34	0.41	0.23	0.38	0.24
Rubidium (Rb)-Total	mg/L	-	-	0.00104	0.00023	-	-	-	-	-
Selenium (Se)-Total	mg/L	0.001	-	<0.00005	<0.00005	<0.001	<0.001	<0.001	<0.001	<0.001
Silicon (Si)-Total	mg/L	-	-	0.38	0.36	0.38	0.84	0.28	0.5	0.31
Silver (Ag)-Total	mg/L	0.00025	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium (Na)-Total	mg/L	-	-	0.632	0.617	0.6	0.791	1.02	0.704	0.806
Strontium (Sr)-Total	mg/L	-	-	0.00575	0.058	0.00587	0.0089	0.0604	0.00635	0.0606
Sulfur (S)-Total	mg/L	-	-	<0.5	2.15	-	-	-	-	-
Tellurium (Te)-Total	mg/L	-	-	<0.0002	<0.0002	-	-	-	-	-
Thallium (Tl)-Total	mg/L	0.0008	-	<0.00001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thorium (Th)-Total	mg/L	-	-	<0.0001	<0.0001	-	-	-	-	-
Tin (Sn)-Total	mg/L	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium (Ti)-Total	mg/L	-	-	0.00038	<0.0003	<0.01	<0.01	<0.01	<0.01	<0.01
Tungsten (W)-Total	mg/L	-	-	<0.0001	<0.0001	-	-	-	-	-
Uranium (U)-Total	mg/L	0.015	0.033	0.000379	0.000456	0.000384	0.0019	0.000163	0.0027	0.000308
Vanadium (V)-Total	mg/L	-	-	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)-Total	mg/L	-	-	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)-Total	mg/L	-	-	<0.0002	<0.0002	<0.0001	0.00012	<0.0001	-	-

Indicates value greater than the long-term average Canadian Water Quality Guidelines.

Indicates value greater than the short-term maximum Canadian Water Quality Guidelines.

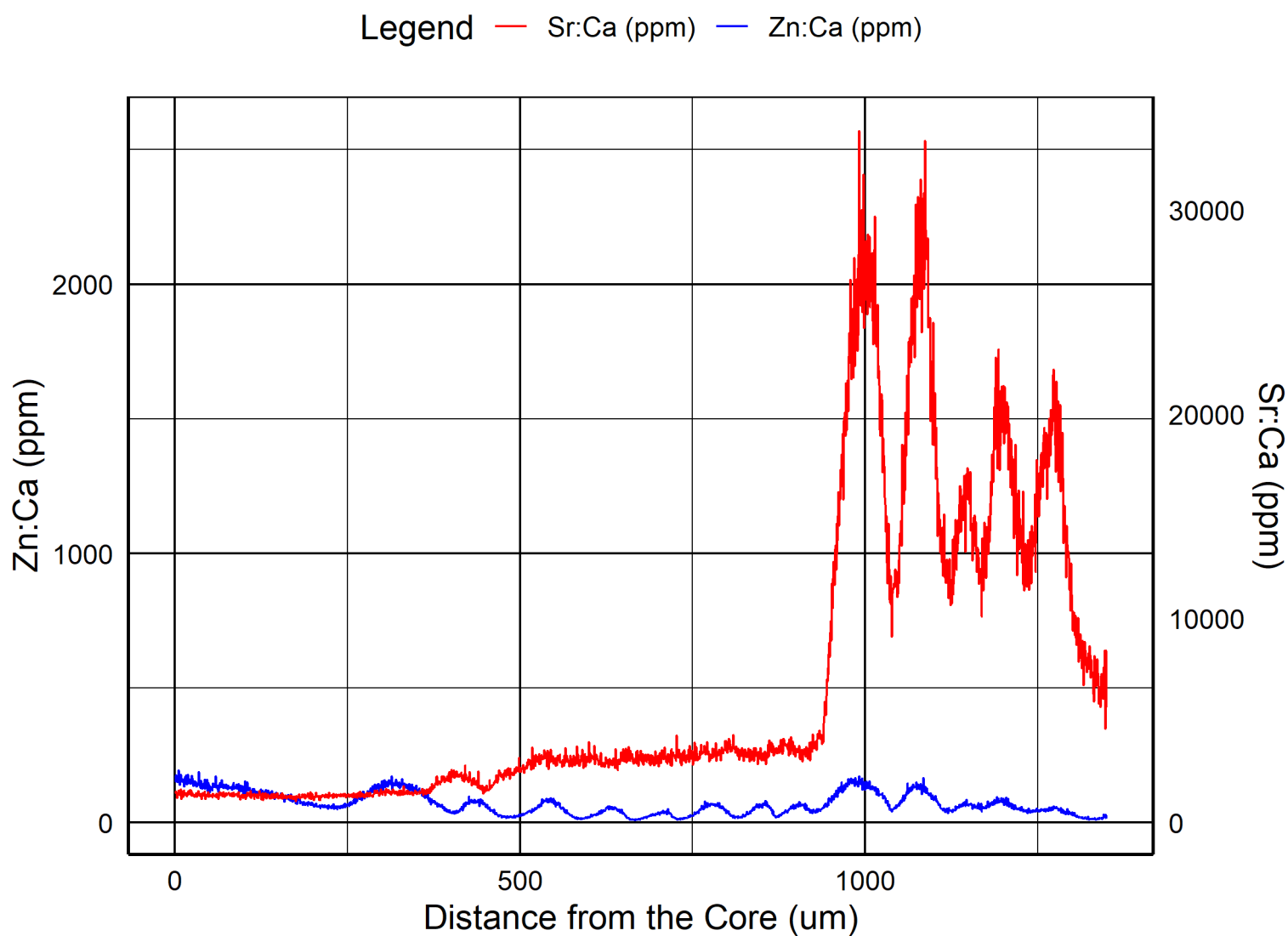
Note: "-" indicates no available data or guideline. Field temperature and pH were not taken in 2022 and 2021, for guideline calculation purposes these values were estimated using 2024 values.



## **APPENDIX D**

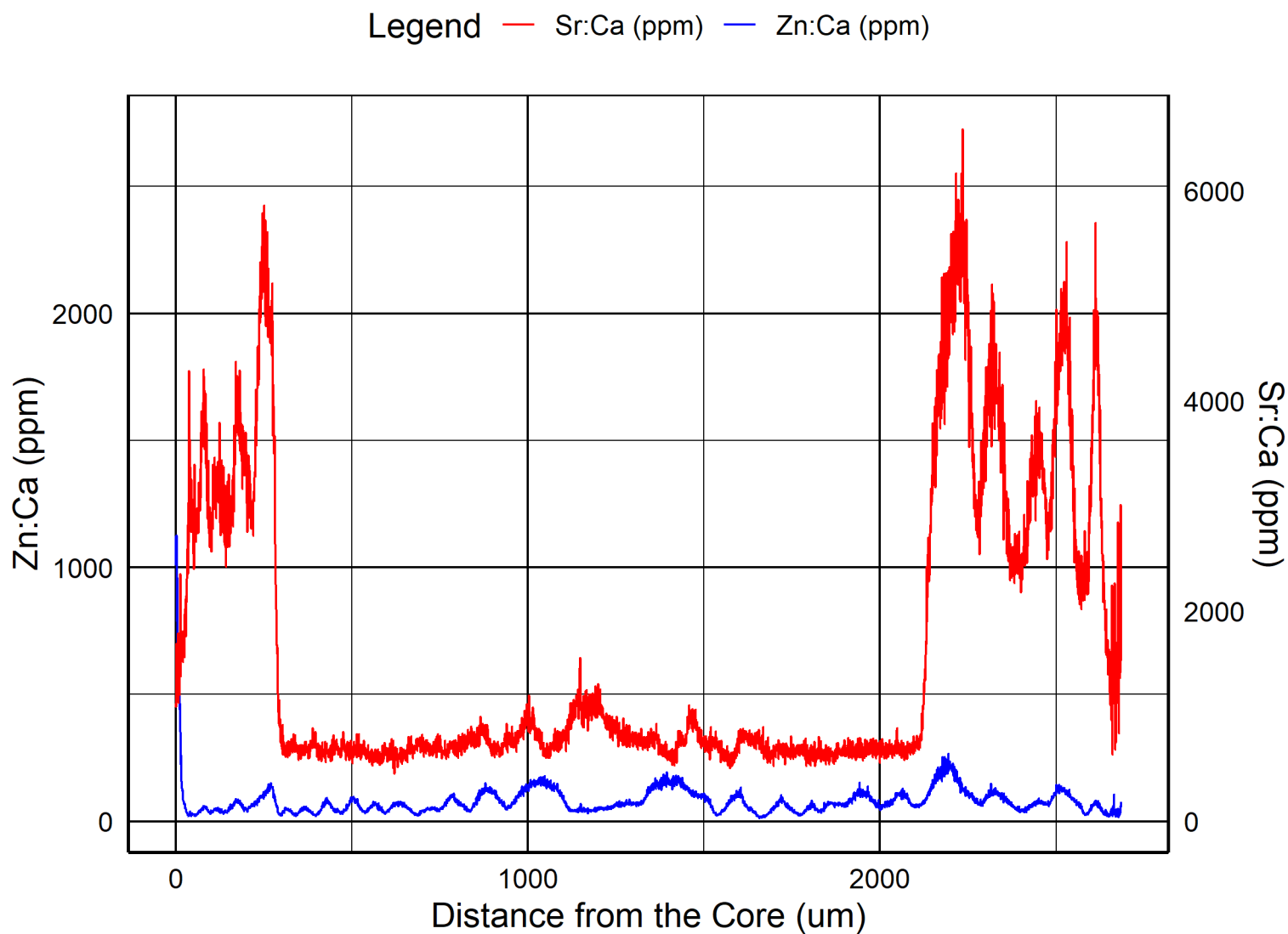
### **FISH DATA**





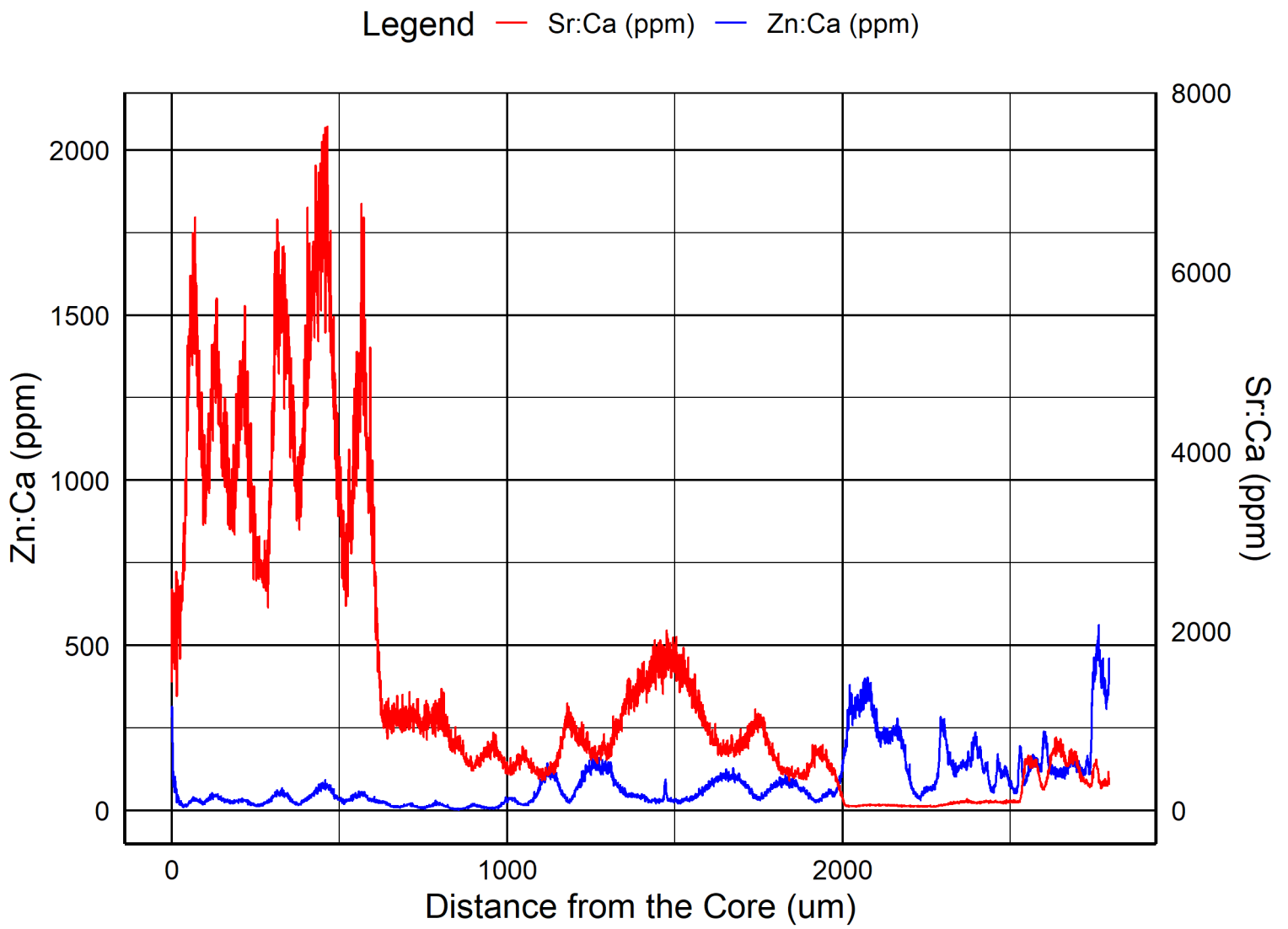
**Figure D.1:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_01, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Core to Edge





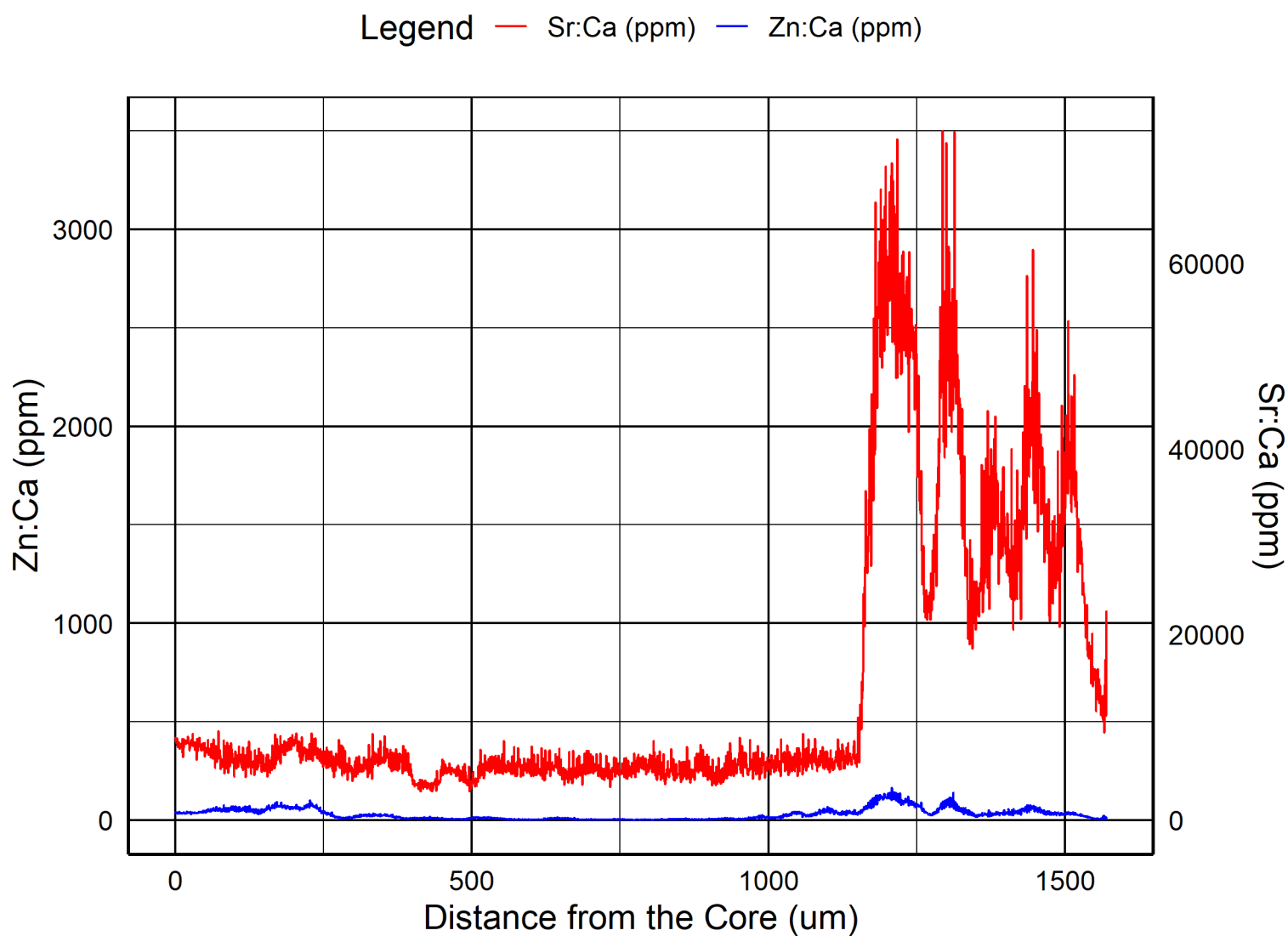
**Figure D.2:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_02, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Edge to Core to Edge





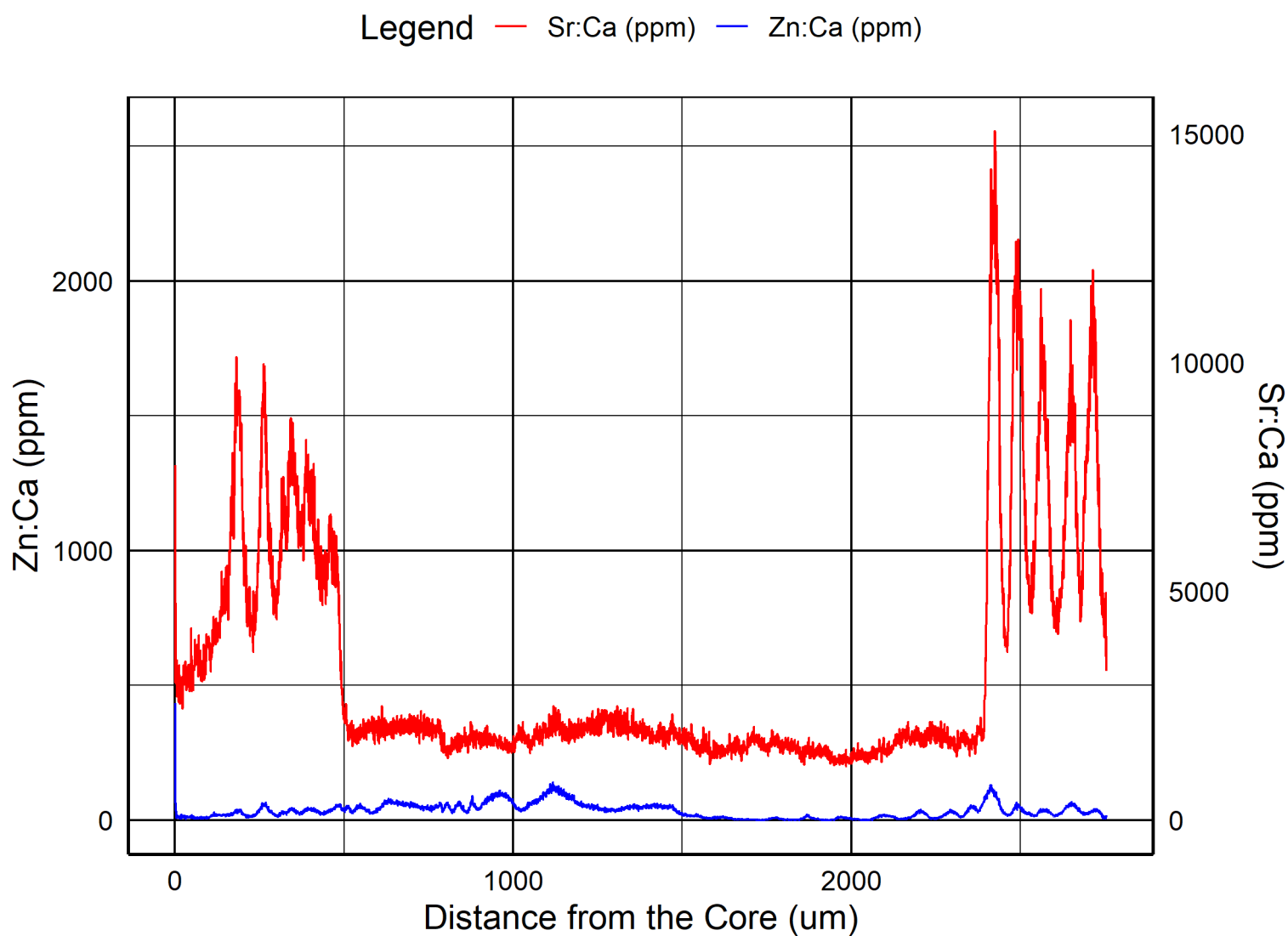
**Figure D.3:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_03, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Edge to Core to Edge





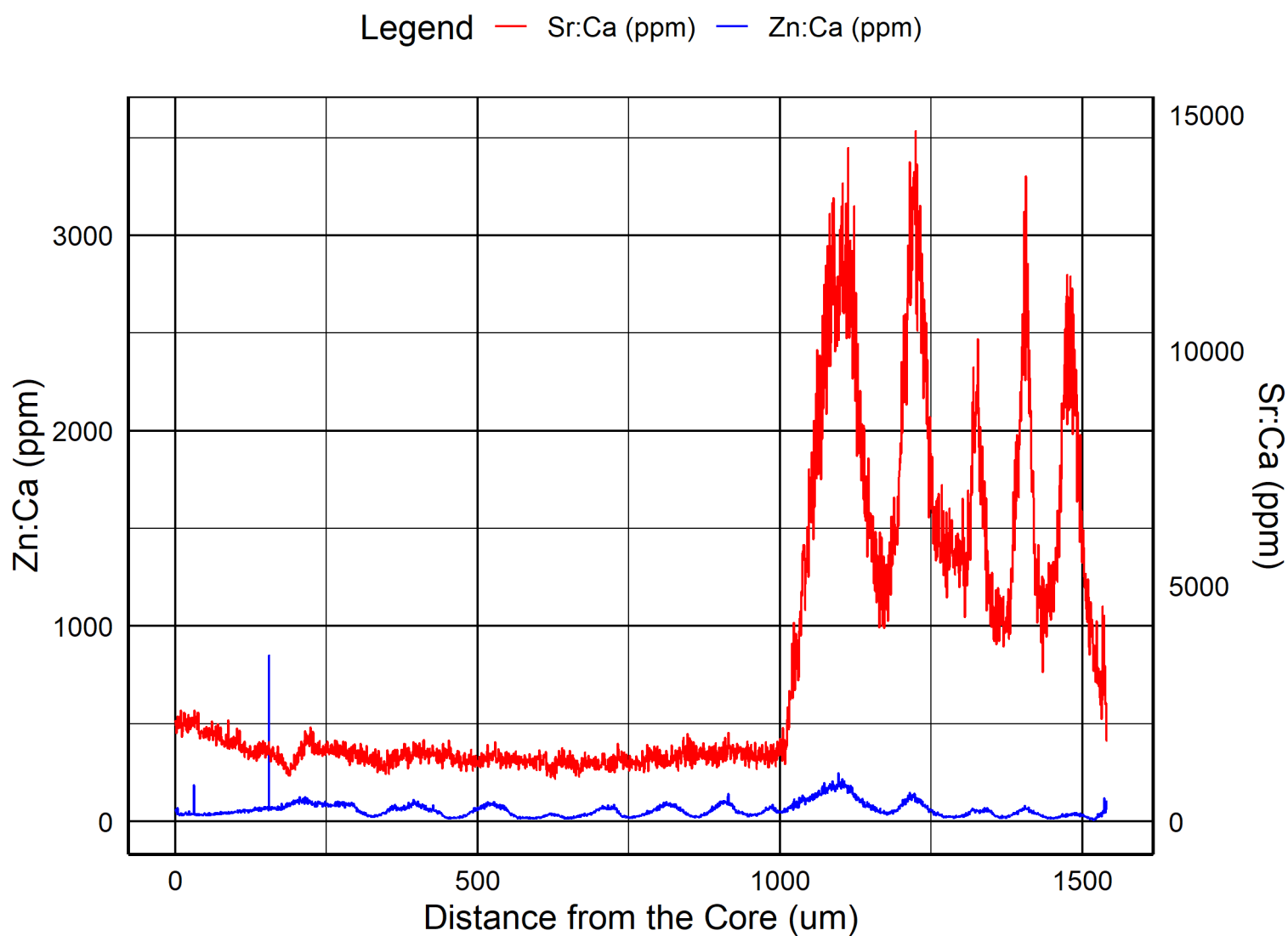
**Figure D.4:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_04, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Core to Edge





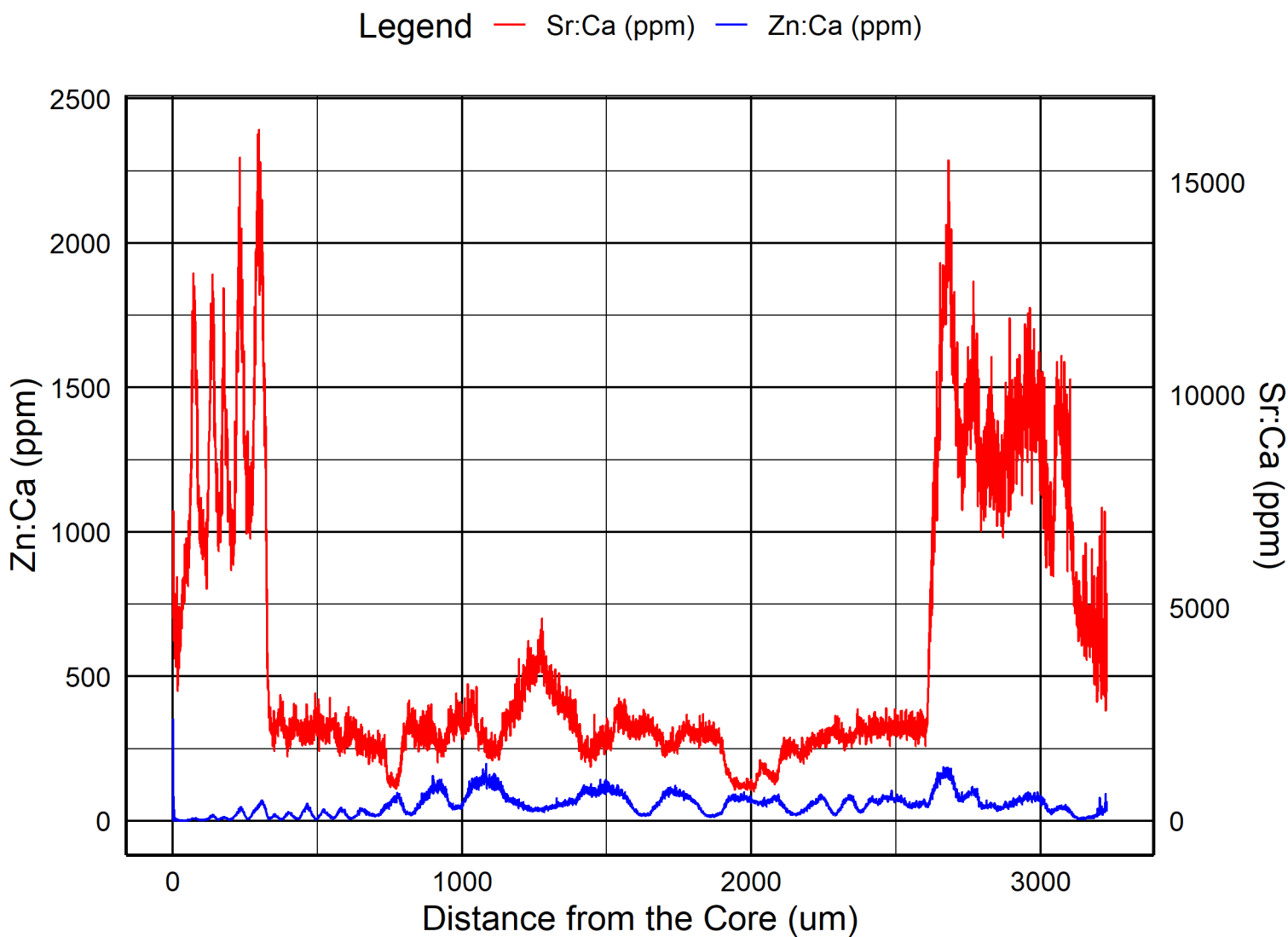
**Figure D.5:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_05, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Edge to Core to Edge





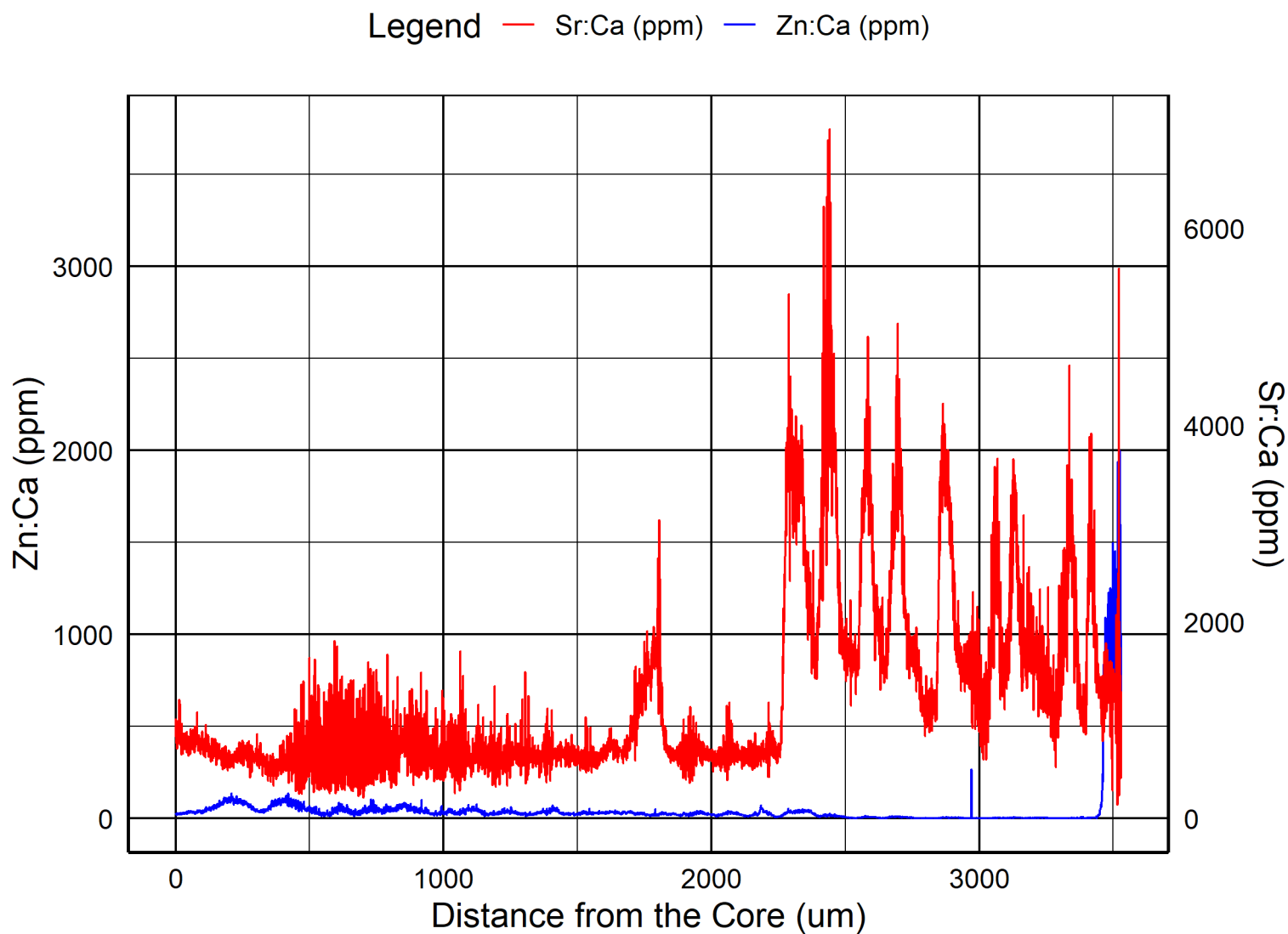
**Figure D.6:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_06, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Core to Edge





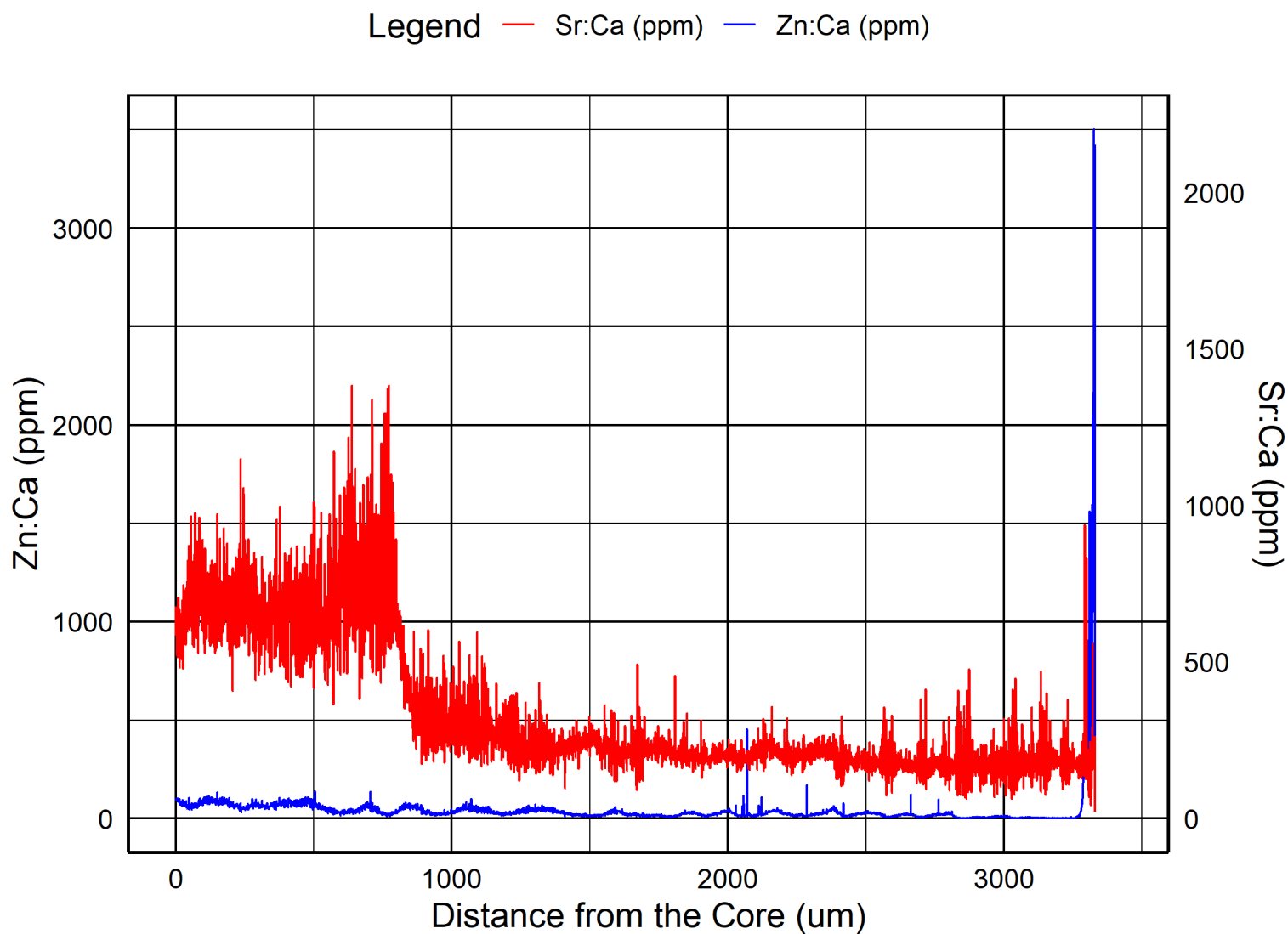
**Figure D.7:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_07, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Edge to Core to Edge





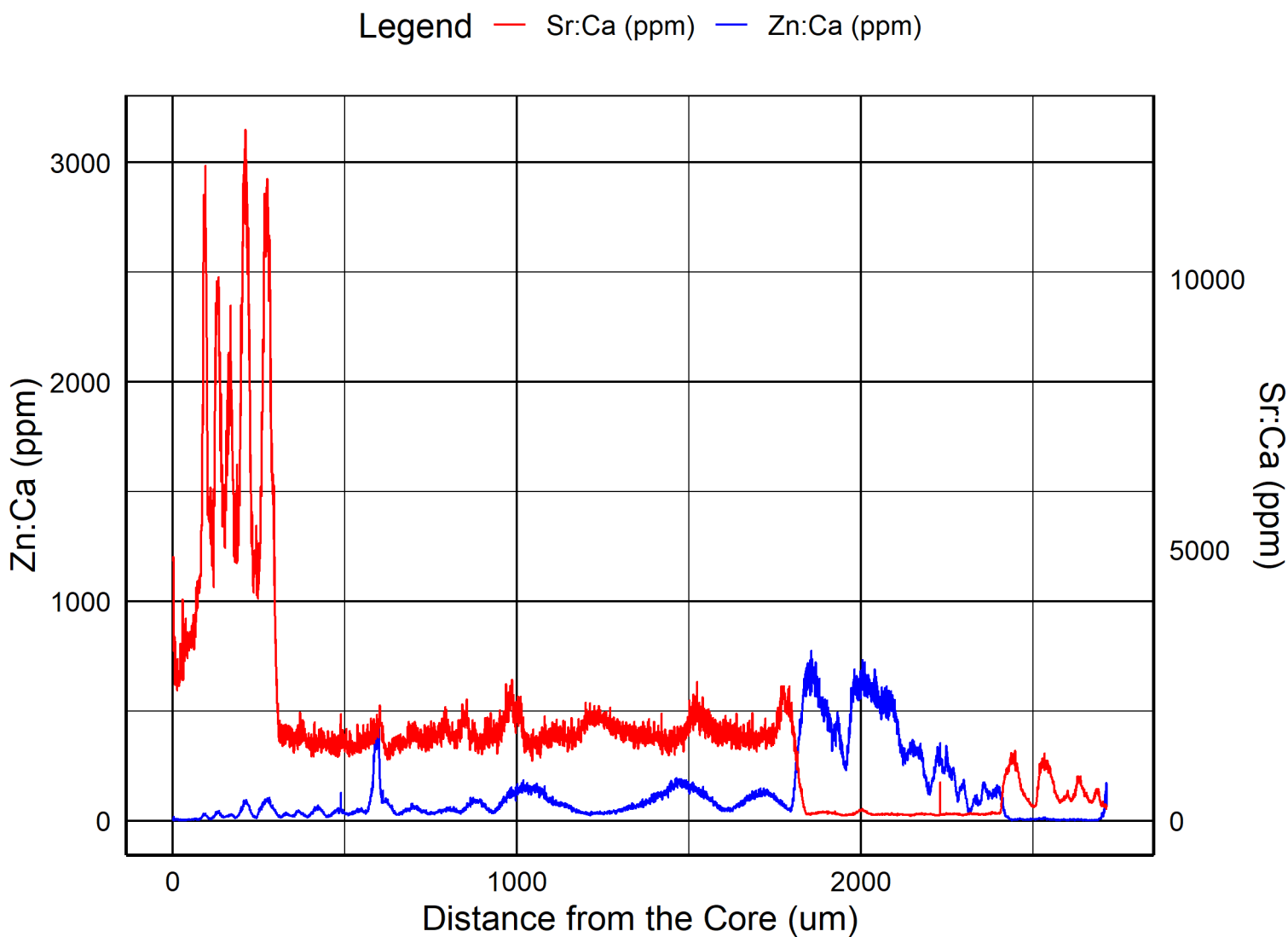
**Figure D.8:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_08, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Core to Edge





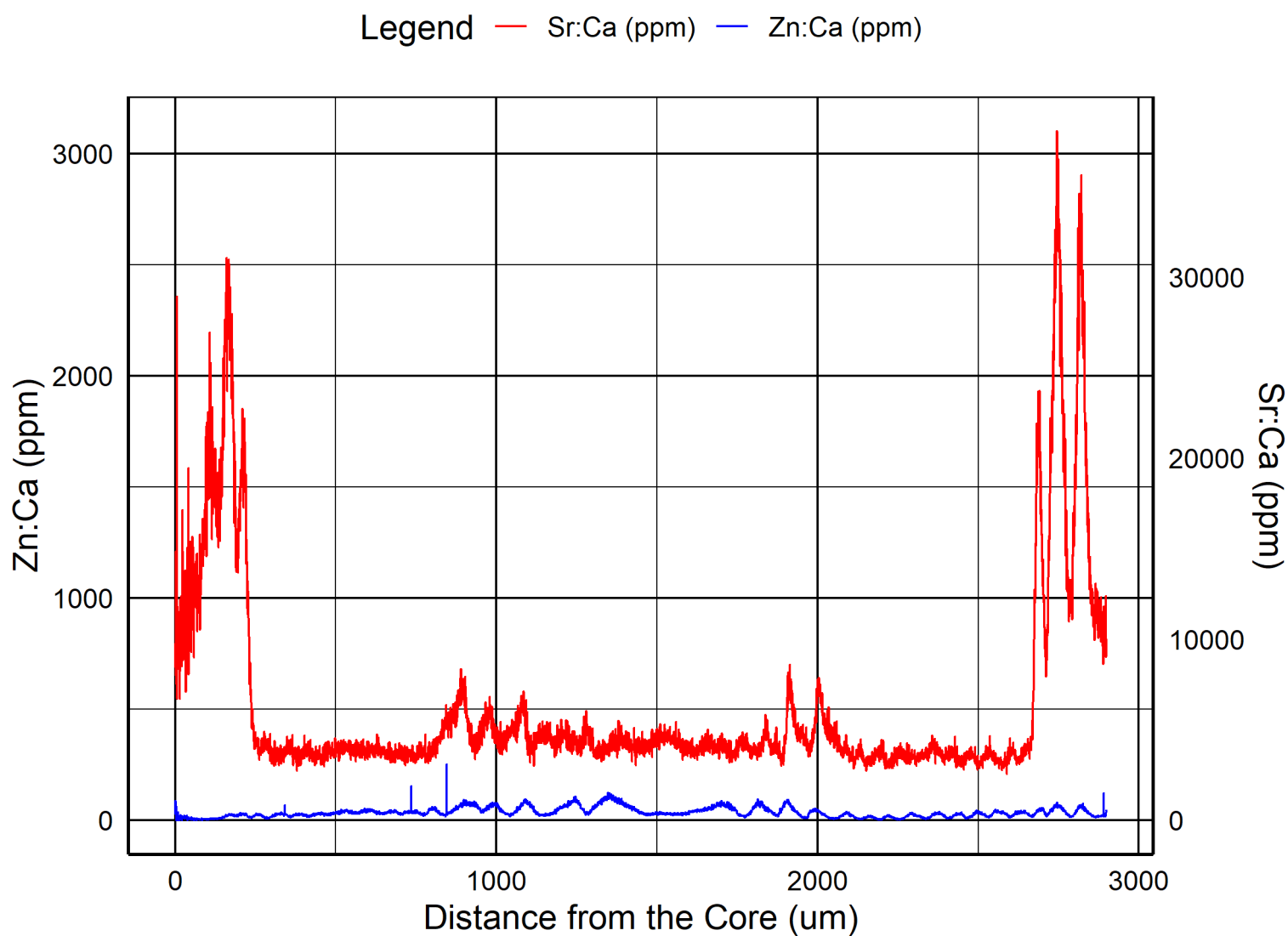
**Figure D.9:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_09, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Core to Edge





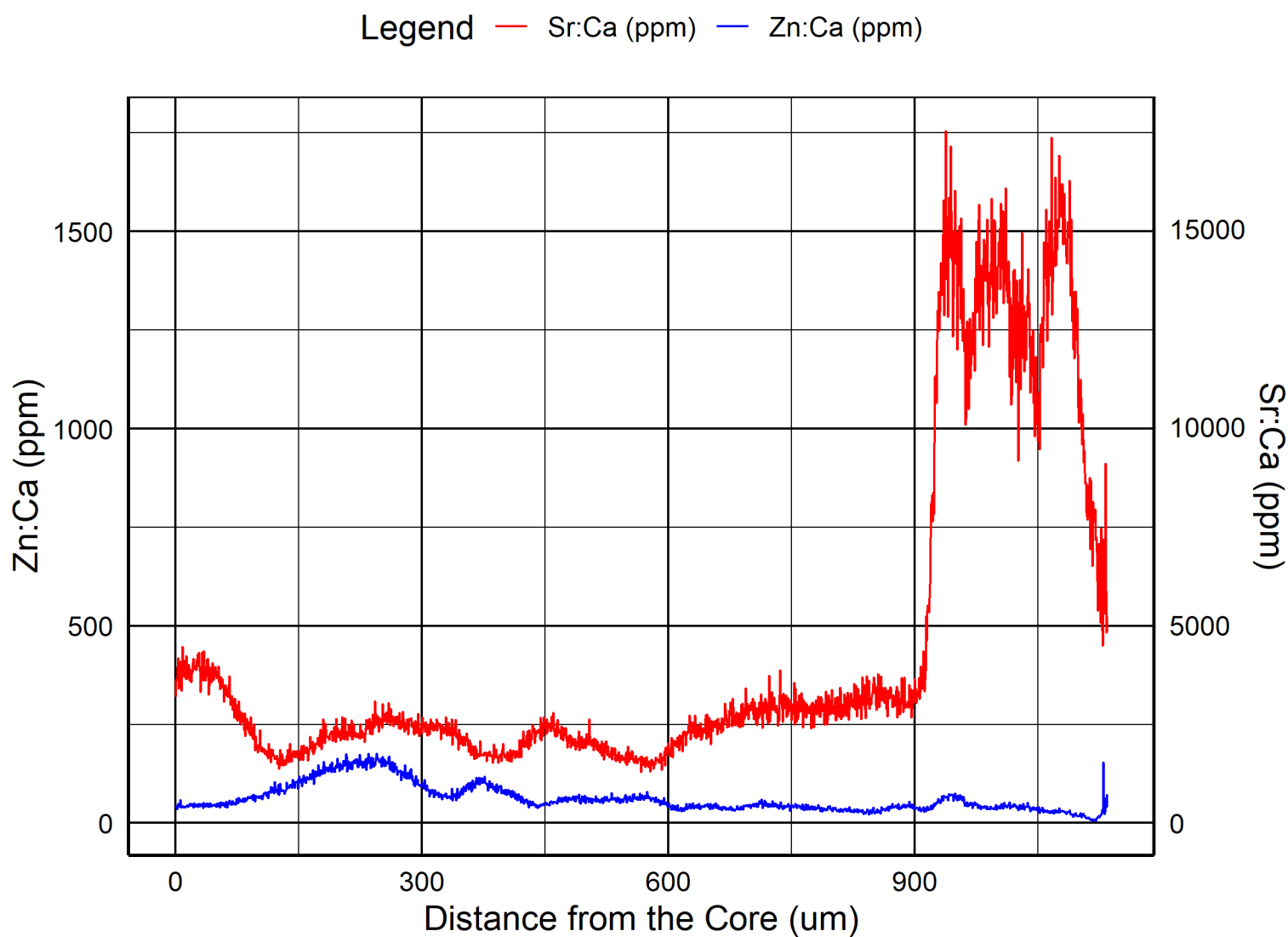
**Figure D.10:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_10, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Edge to Core to Edge





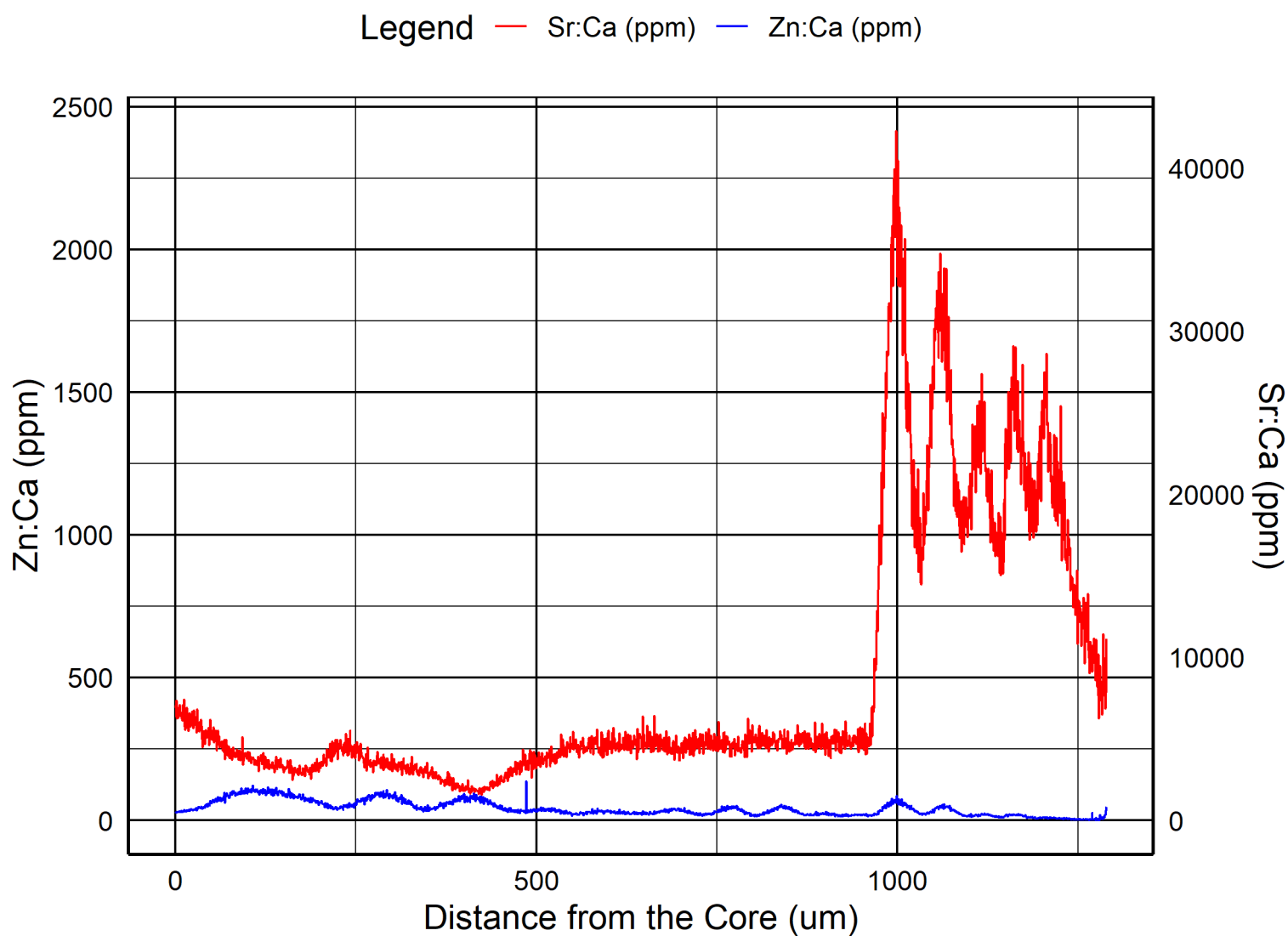
**Figure D.11:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_11, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Edge to Core to Edge





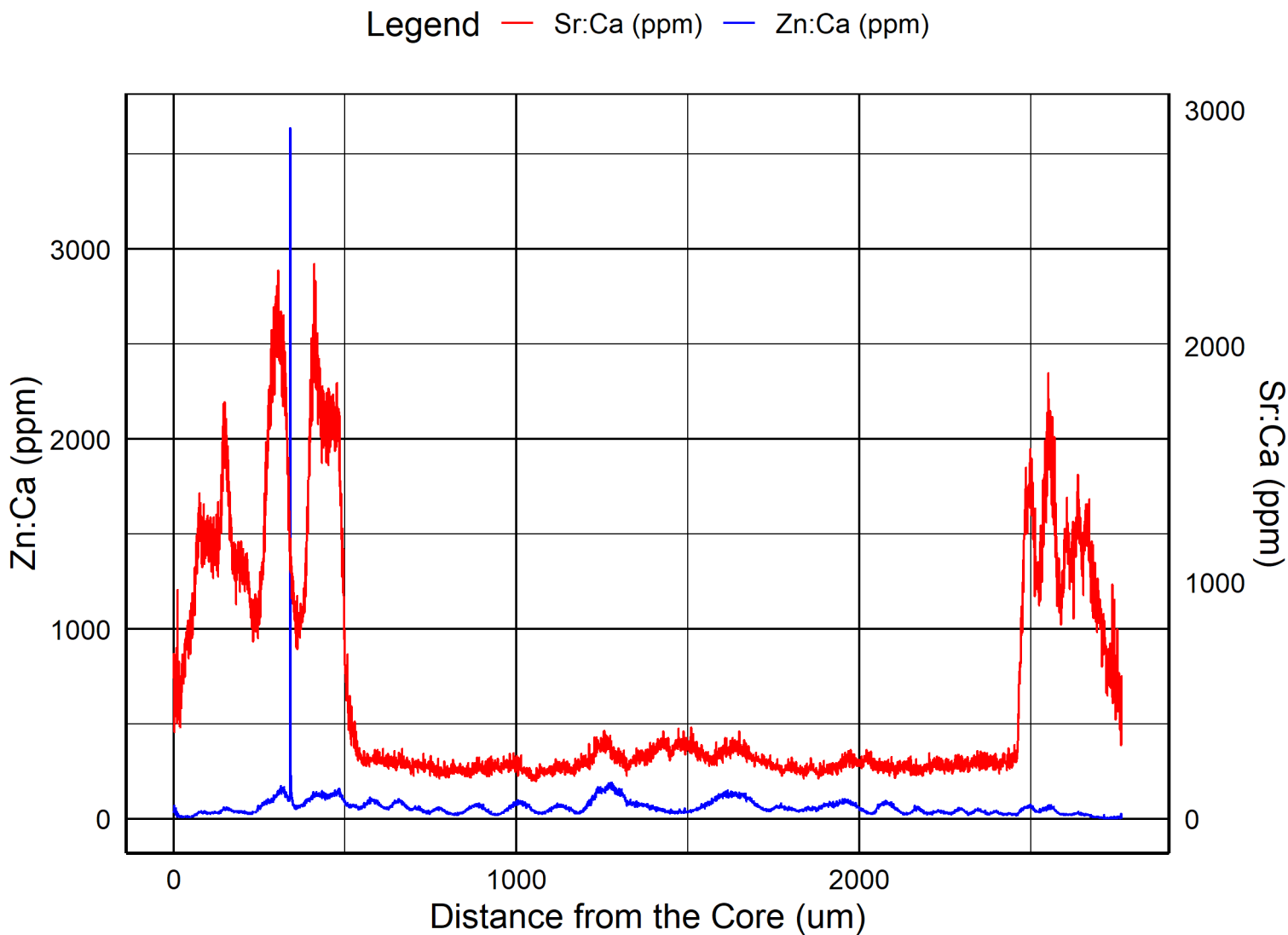
**Figure D.12:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_12, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Core to Edge





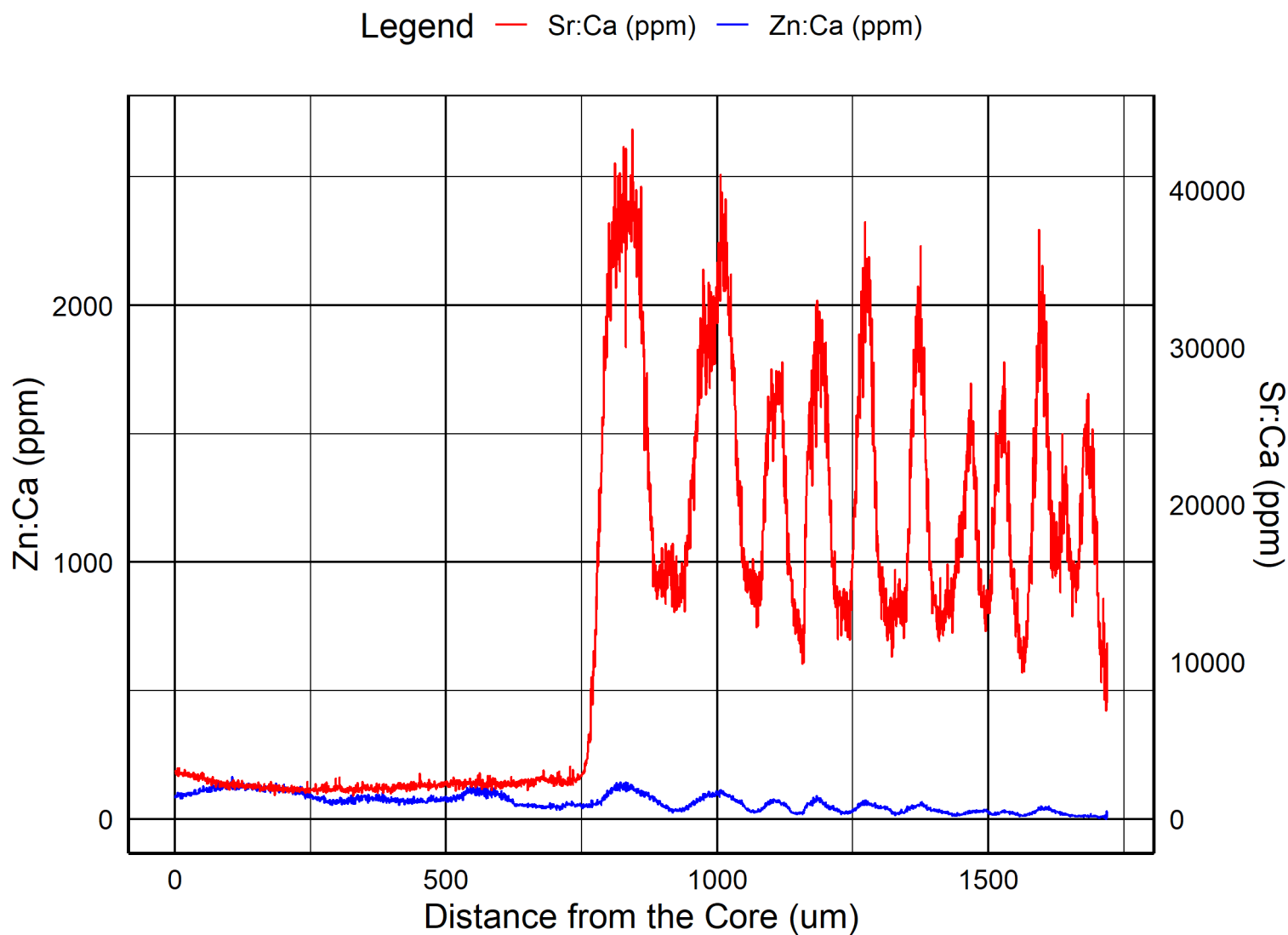
**Figure D.13:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_13, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Core to Edge





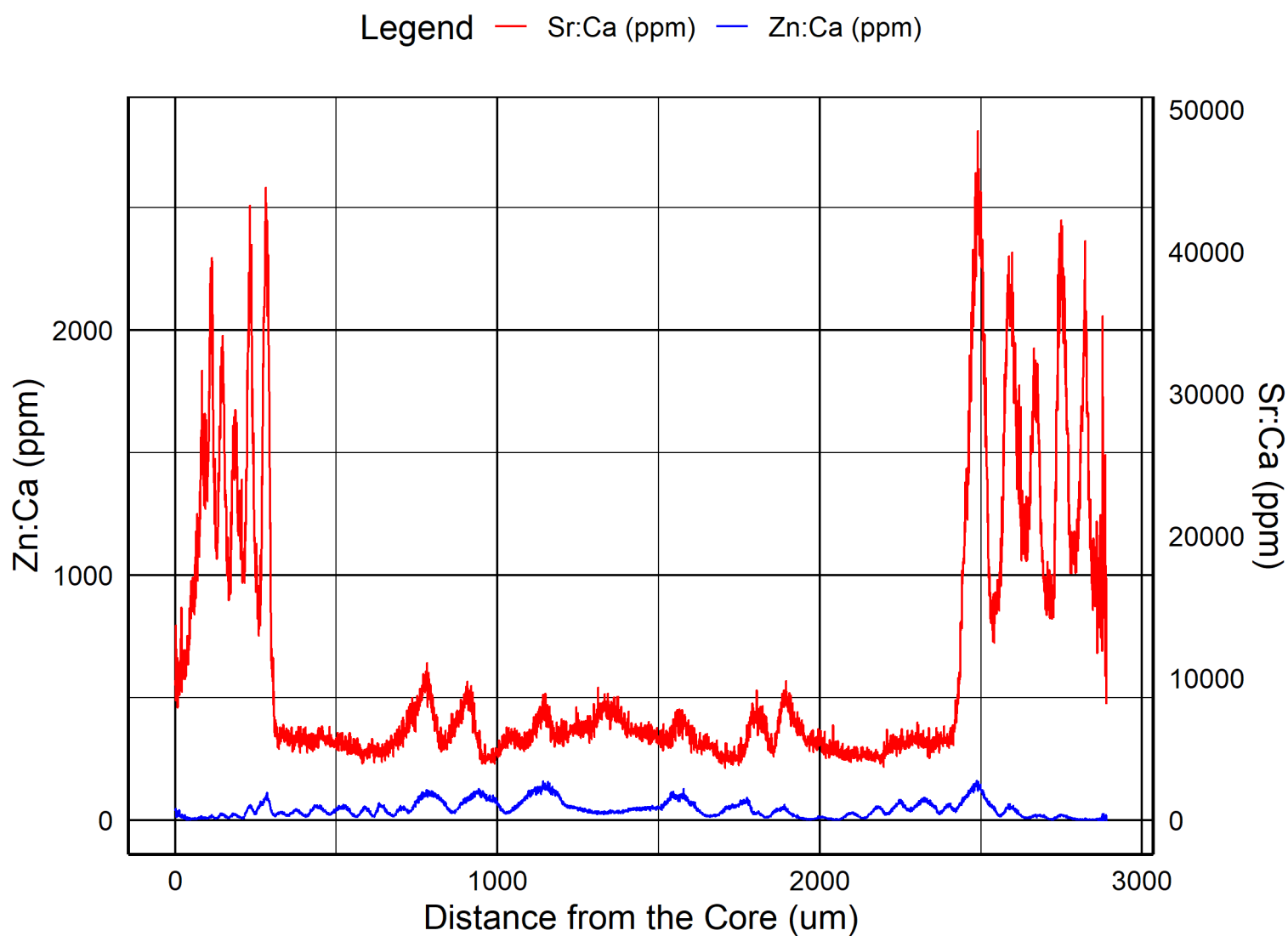
**Figure D.14:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_14, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Edge to Core to Edge





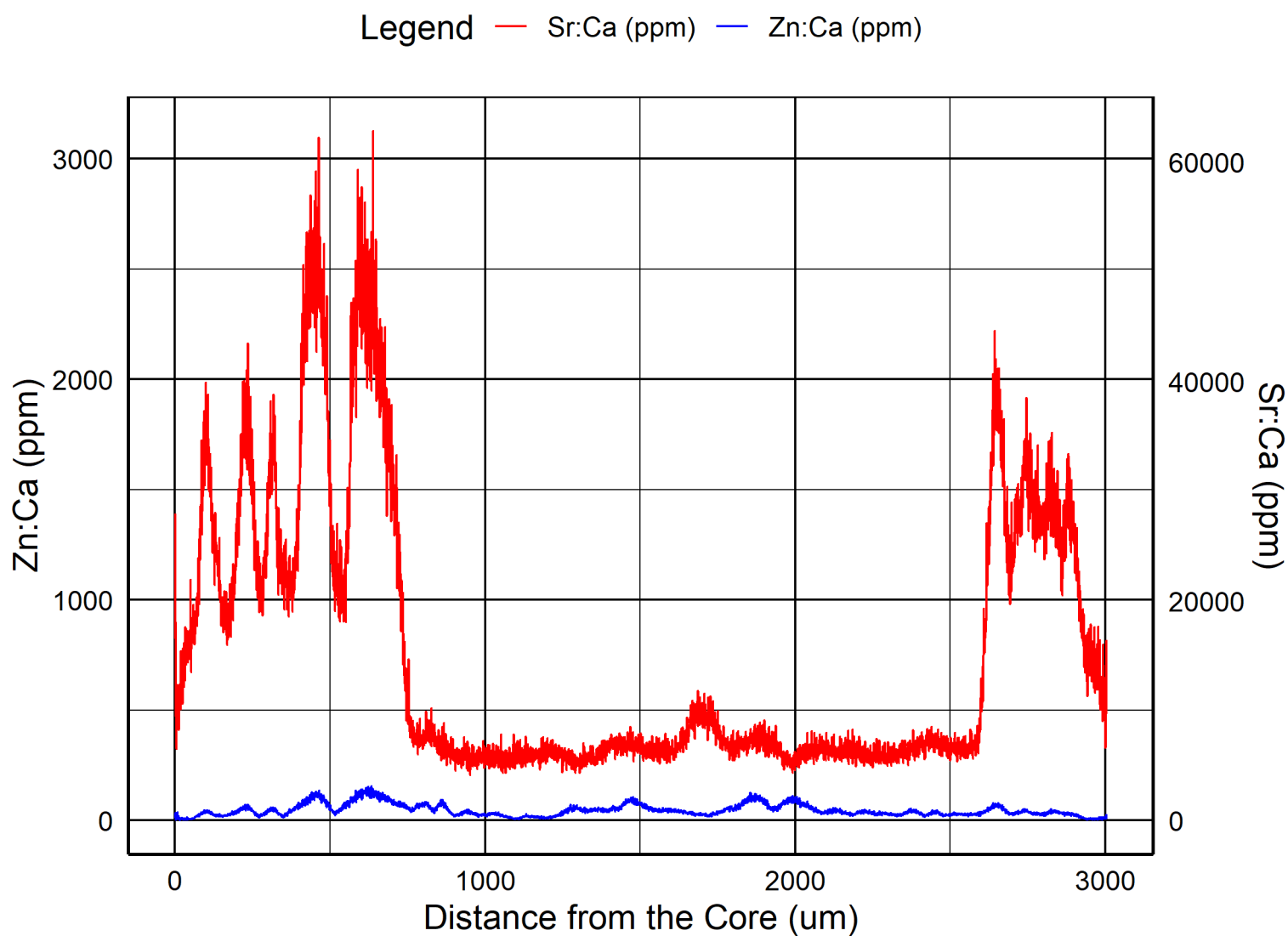
**Figure D.15:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_15, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Core to Edge





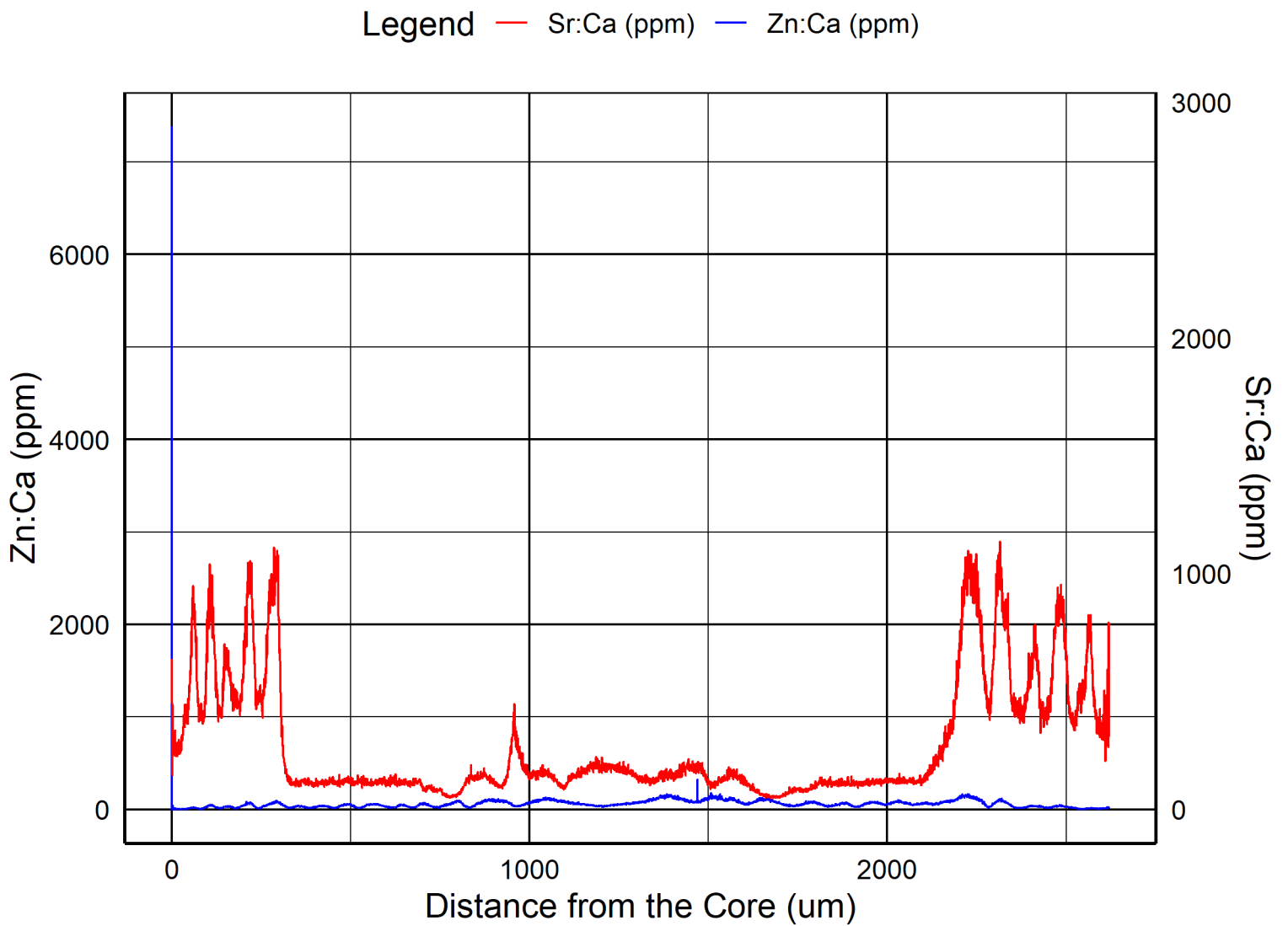
**Figure D.16:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_16, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Edge to Core to Edge





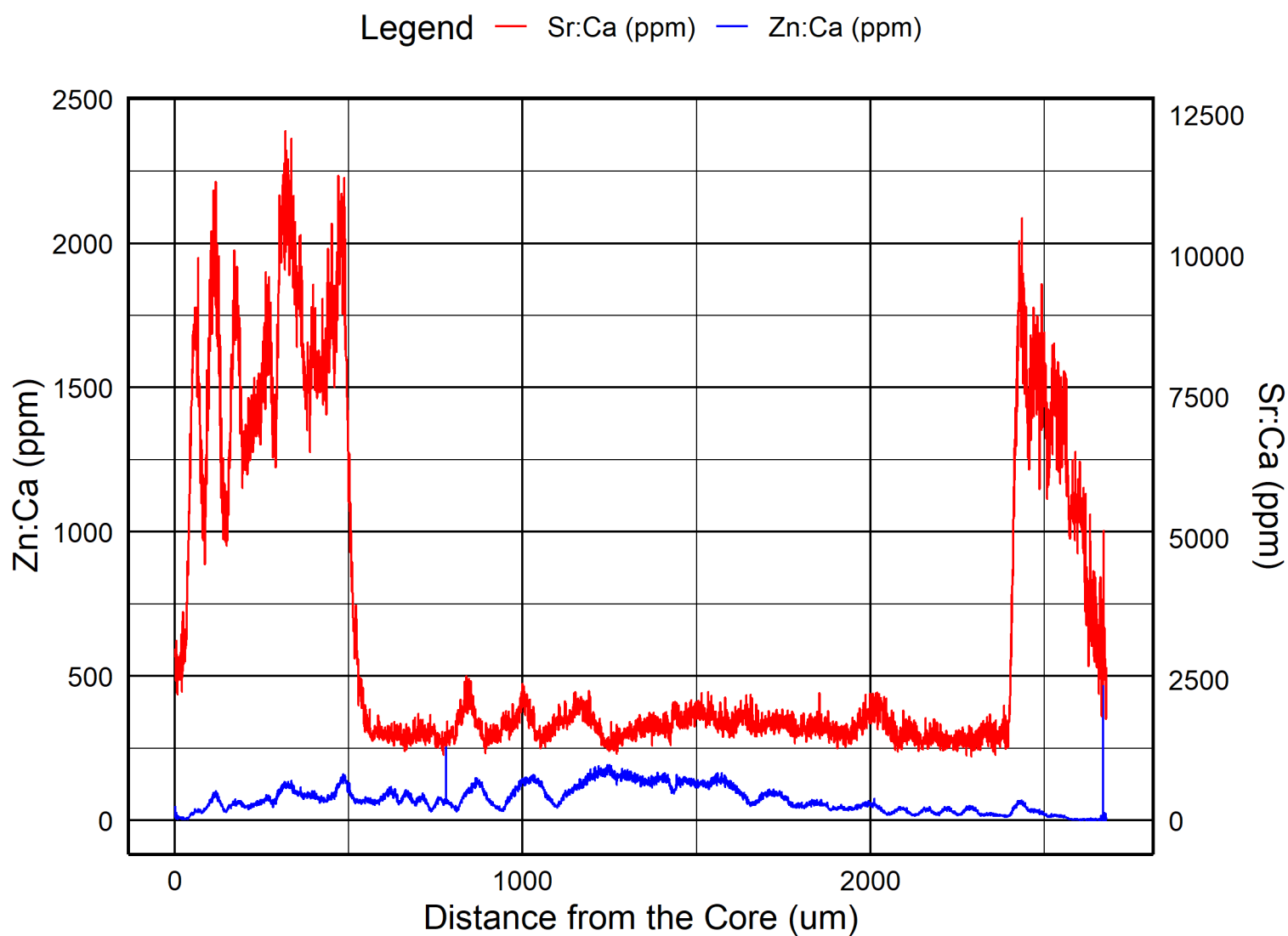
**Figure D.17:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_17, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Edge to Core to Edge





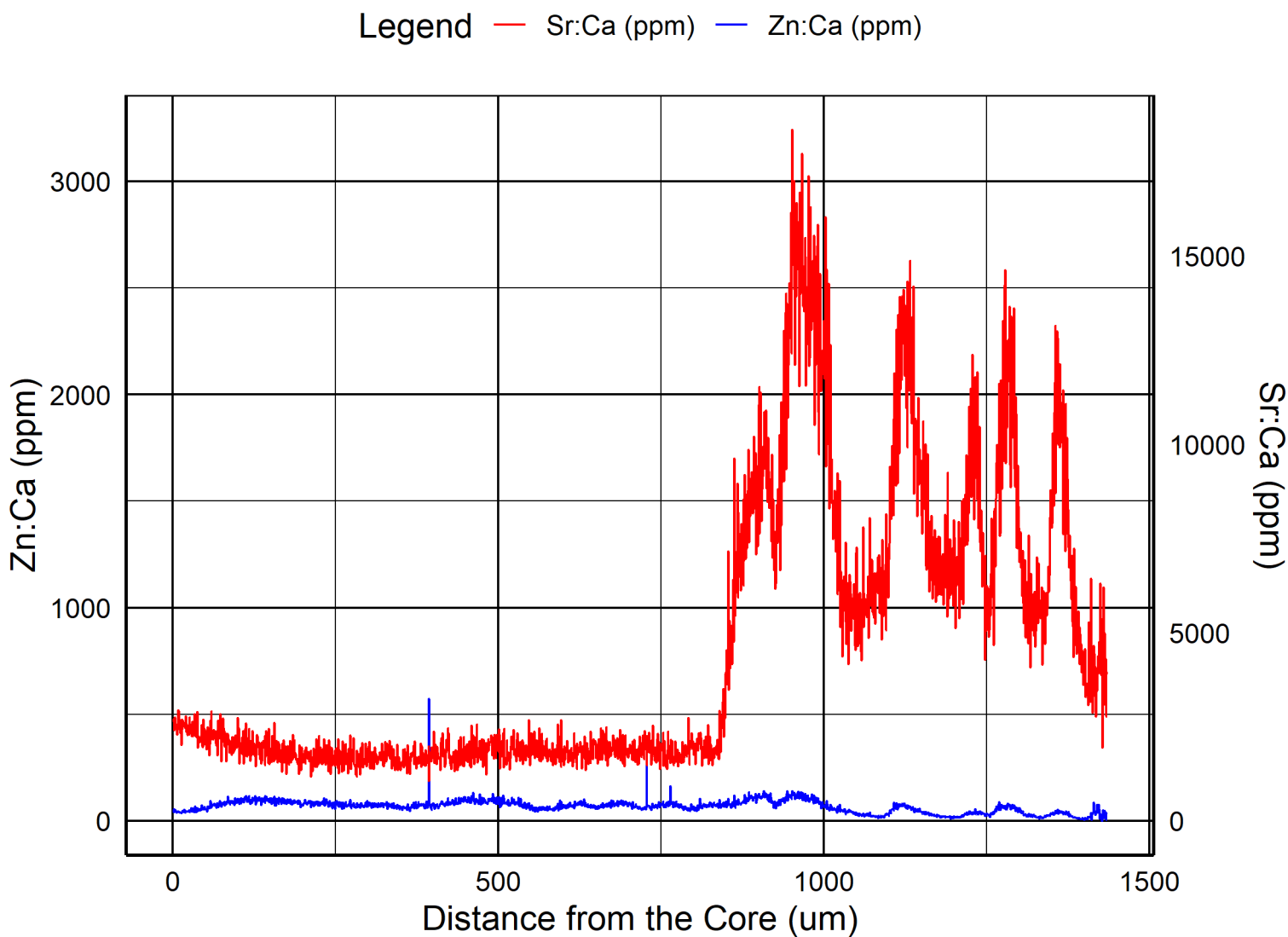
**Figure D.18:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_18, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Edge to Core to Edge





**Figure D.19:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_19, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Edge to Core to Edge





**Figure D.20:** Zn:Ca and Sr:Ca ratios from the Otolith of QURL\_AC\_20, from Qurluktuk Lake, 2024; LA-ICPMS Scan from Core to Edge





**Photo D.1:** Arctic Charr IKLL\_AC-01\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.2:** Arctic Charr IKLL\_AC-02\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.3:** Arctic Charr IKLL\_AC-03\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.4:** Arctic Charr IKLL\_AC-04\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.5:** Arctic Charr IKLL\_AC-05\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.6:** Arctic Charr IKLL\_AC-06\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





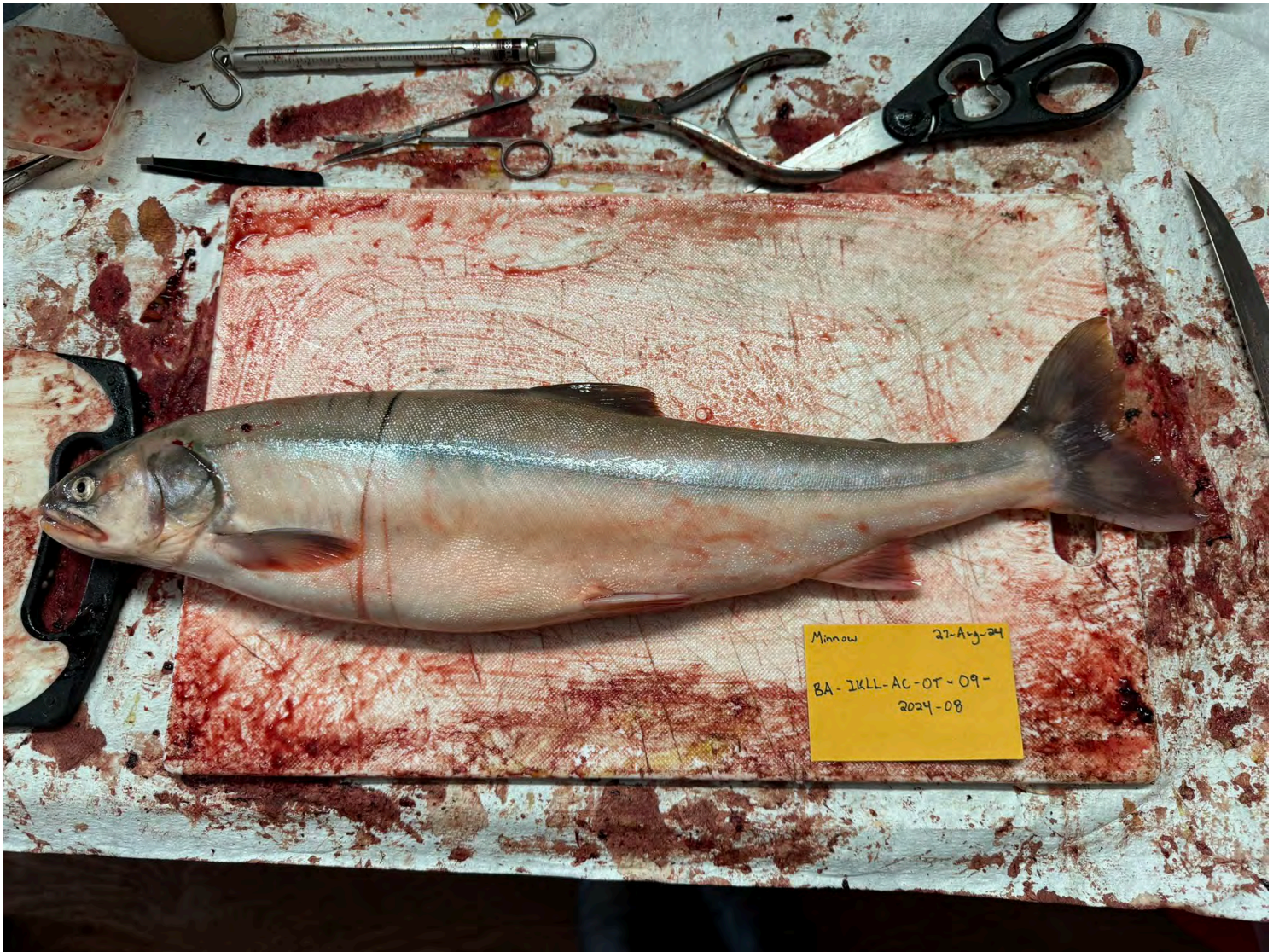
**Photo D.7:** Arctic Charr IKLL\_AC-07\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.8:** Arctic Charr IKLL\_AC-08\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.9:** Arctic Charr IKLL\_AC-09\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.10:** Arctic Charr IKLL\_AC-10\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.11:** Arctic Charr IKLL\_AC-11\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.12:** Arctic Charr IKLL\_AC-12\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.13:** Arctic Charr IKLL\_AC-13\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.14:** Arctic Charr IKLL\_AC-14\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.15:** Arctic Charr IKLL\_AC-15\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.16:** Arctic Charr IKLL\_AC-16\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.17:** Arctic Charr IKLL\_AC-17\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.18:** Arctic Charr IKLL\_AC-18\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.19:** Arctic Charr IKLL\_AC-19\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.20:** Arctic Charr IKLL\_AC-20\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.21:** Arctic Charr IKLL\_AC-21\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.22:** Arctic Charr IKLL\_AC-22\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.23:** Arctic Charr IKLL\_AC-23\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.24:** Arctic Charr IKLL\_AC-24\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.25:** Arctic Charr IKLL\_AC-25\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.26:** Arctic Charr IKLL\_AC-026\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.27:** Arctic Charr IKLL\_AC-27\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.28:** Arctic Charr IKLL\_AC-28\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.29:** Arctic Charr IKLL\_AC-29\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.30:** Arctic Charr IKLL\_AC-30\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.31:** Arctic Charr IKLL\_AC-31\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D32:** Arctic Charr IKLL\_AC-32\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.33:** Arctic Charr IKLL\_AC-33\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.34:** Arctic Charr IKLL\_AC-34\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.35:** Arctic Charr IKLL\_AC-36\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.36:** Arctic Charr IKLL\_AC-36\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.37:** Arctic Charr IKLL\_AC-37\_2024, Ikaluit Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.38:** Arctic Charr QURL\_AC-01\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.39:** Arctic Charr QURL\_AC-02\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.40:** Arctic Charr QURL\_AC-03\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.41:** Arctic Charr QURL\_AC-04\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.42:** Arctic Charr QURL\_AC-04\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.43:** Arctic Charr QURL\_AC-05\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.44:** Arctic Charr QURL\_AC-06\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.45:** Arctic Charr QURL\_AC-07\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.46:** Arctic Charr QURL\_AC-08\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.47:** Arctic Charr QURL\_AC-09\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.48:** Arctic Charr QURL\_AC-10\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.49:** Arctic Charr QURL\_AC-11\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.50:** Arctic Charr QURL\_AC-12\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.51:** Arctic Charr QURL\_AC-13\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.52:** Arctic Charr QURL\_AC-14\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.53:** Arctic Charr QURL\_AC-15\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.54:** Arctic Charr QURL\_AC-16\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.55:** Arctic Charr QURL\_AC-17\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.56:** Arctic Charr QURL\_AC-18\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





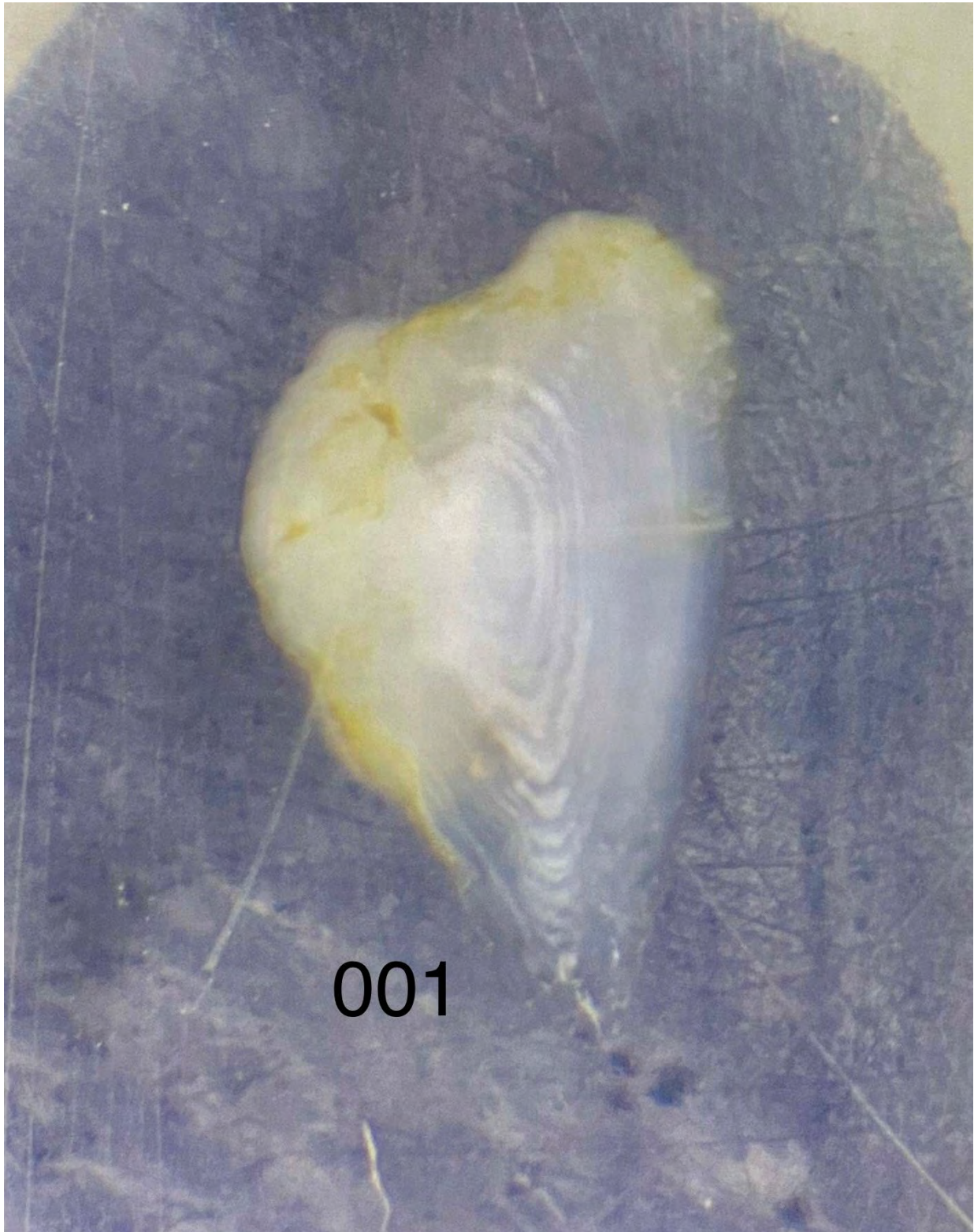
**Photo D.57:** Arctic Charr QURL\_AC-19\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





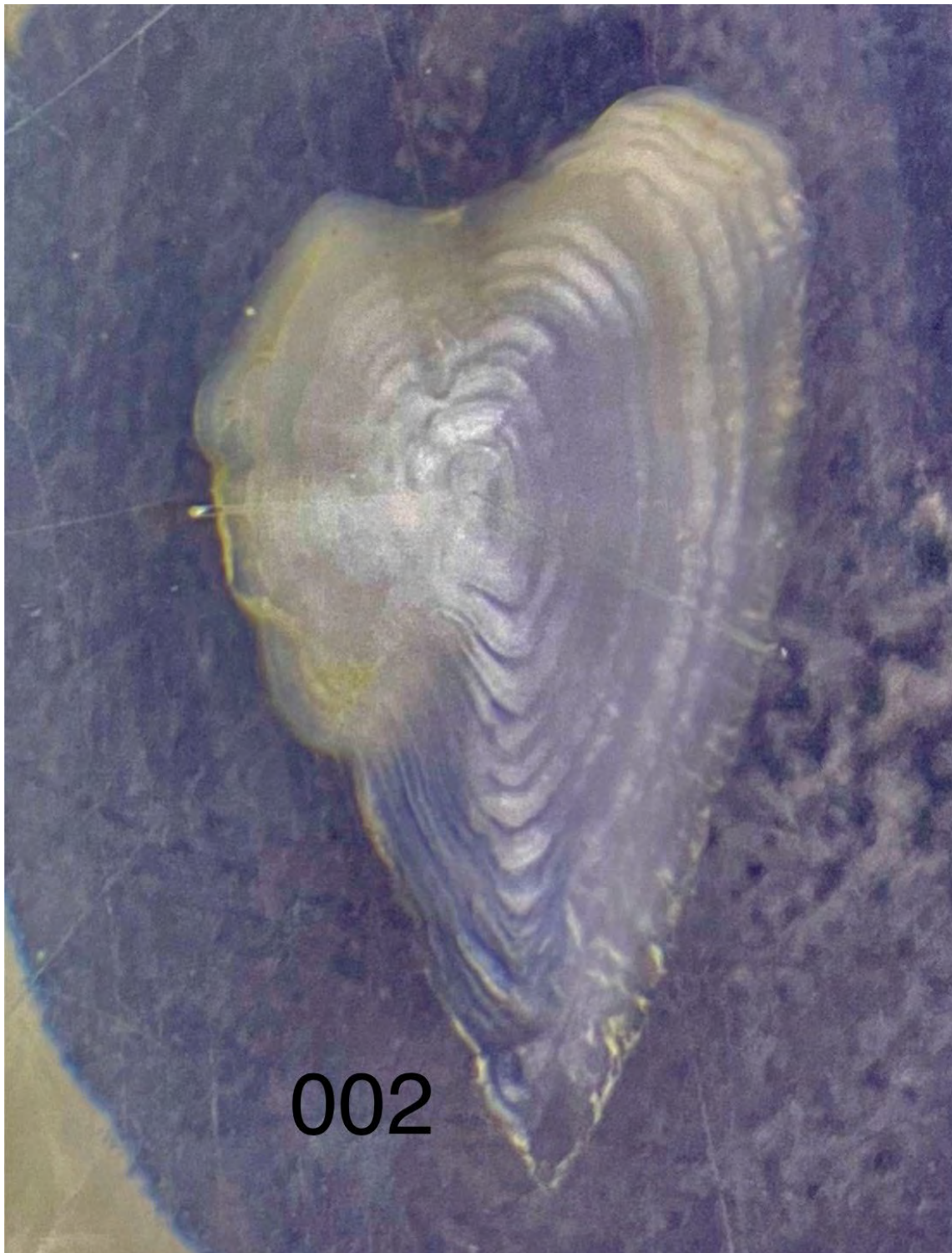
**Photo D.58:** Arctic Charr QURL\_AC-20\_2024, Qurluktuk Lake, Milne Lake Freshwater Fish Health Program, 2024





**Photo D.59:** Arctic Charr QURL-AC-01 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





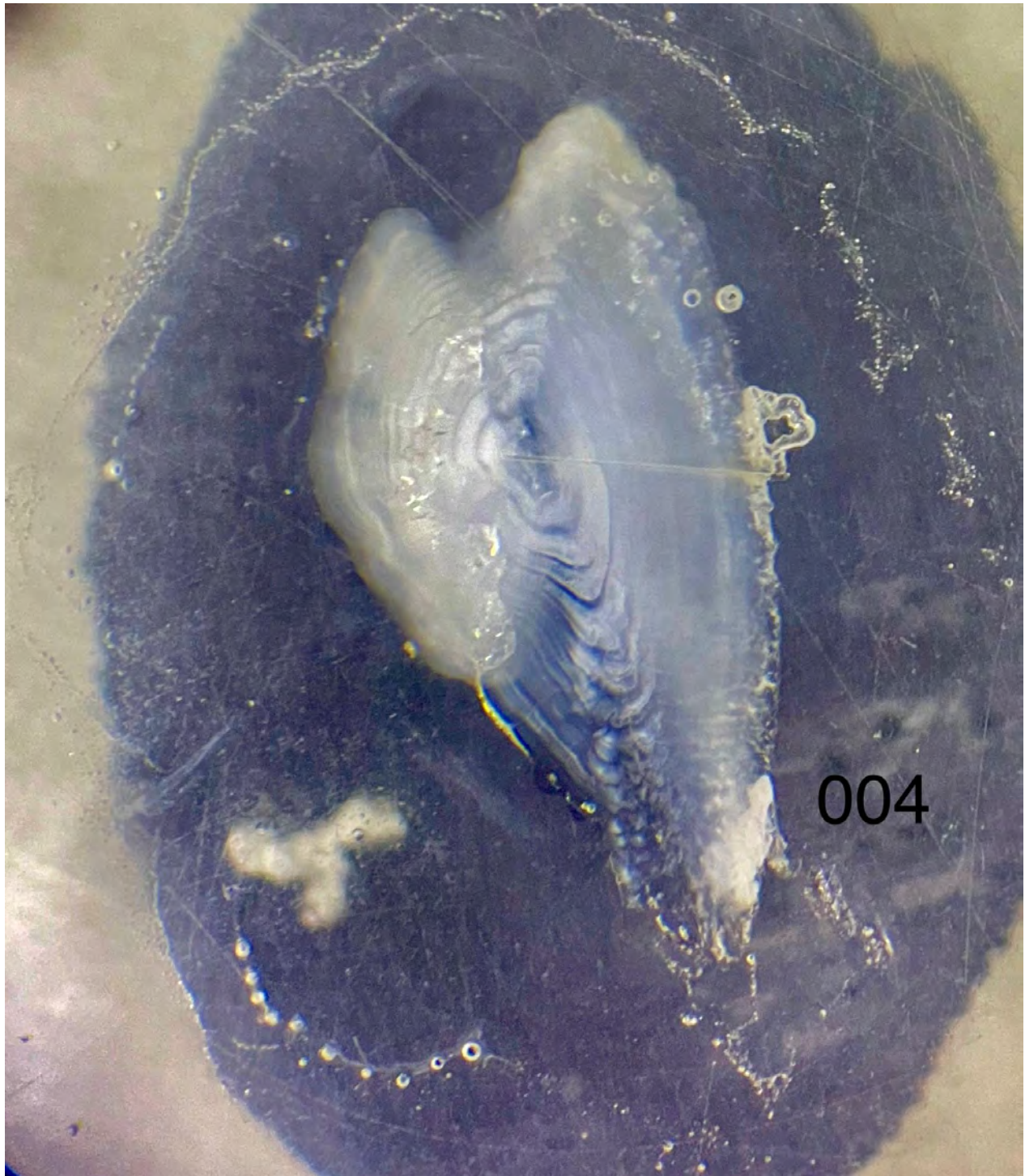
**Photo D.60:** Arctic Charr QURL-AC-02 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





**Photo D.61:** Arctic Charr QURL-AC-03 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





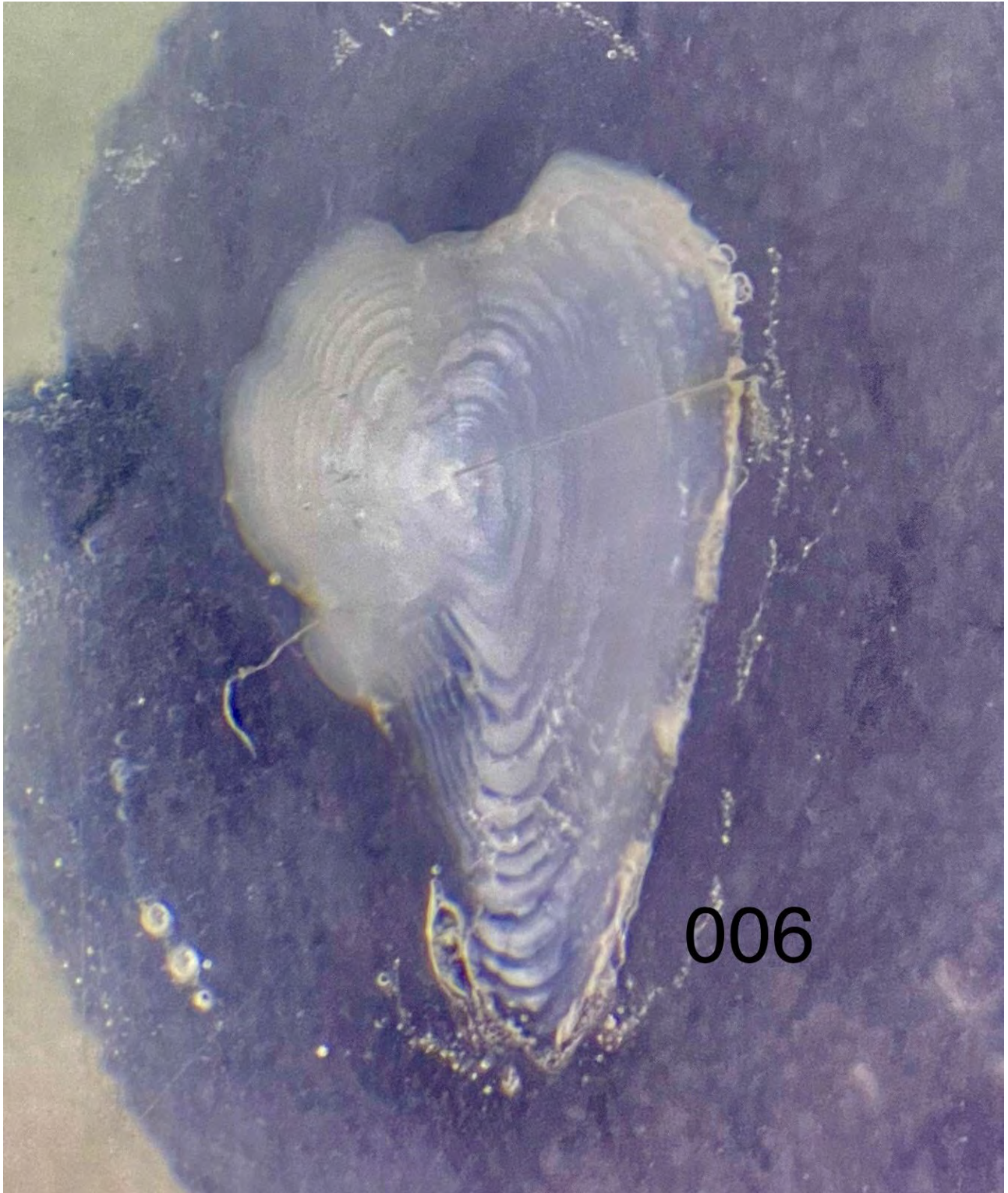
**Photo D.62:** Arctic Charr QURL-AC-04 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





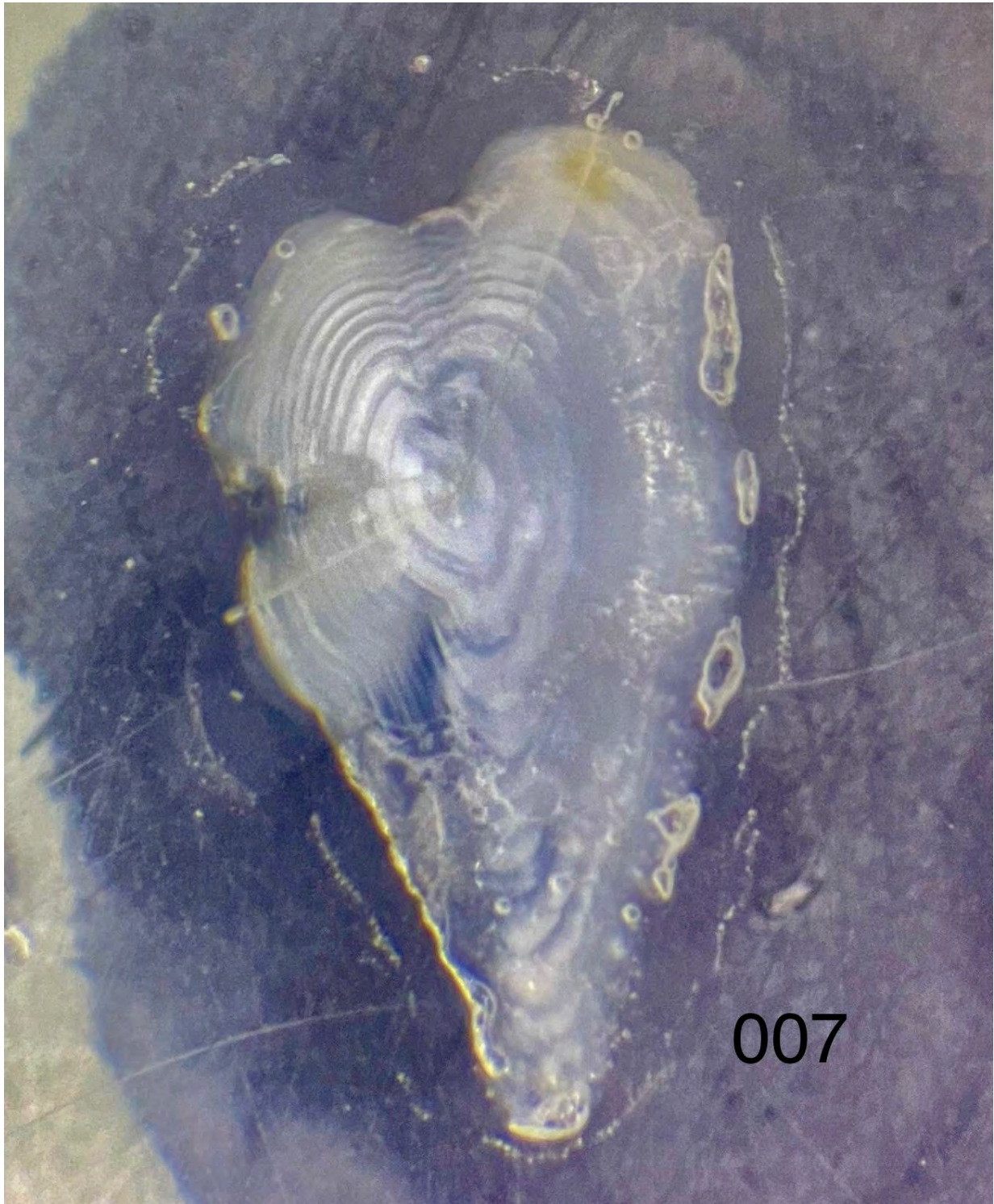
**Photo D.63:** Arctic Charr QURL-AC-05 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





**Photo D.64:** Arctic Charr QURL-AC-06 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





**Photo D.65:** Arctic Charr QURL-AC-07 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





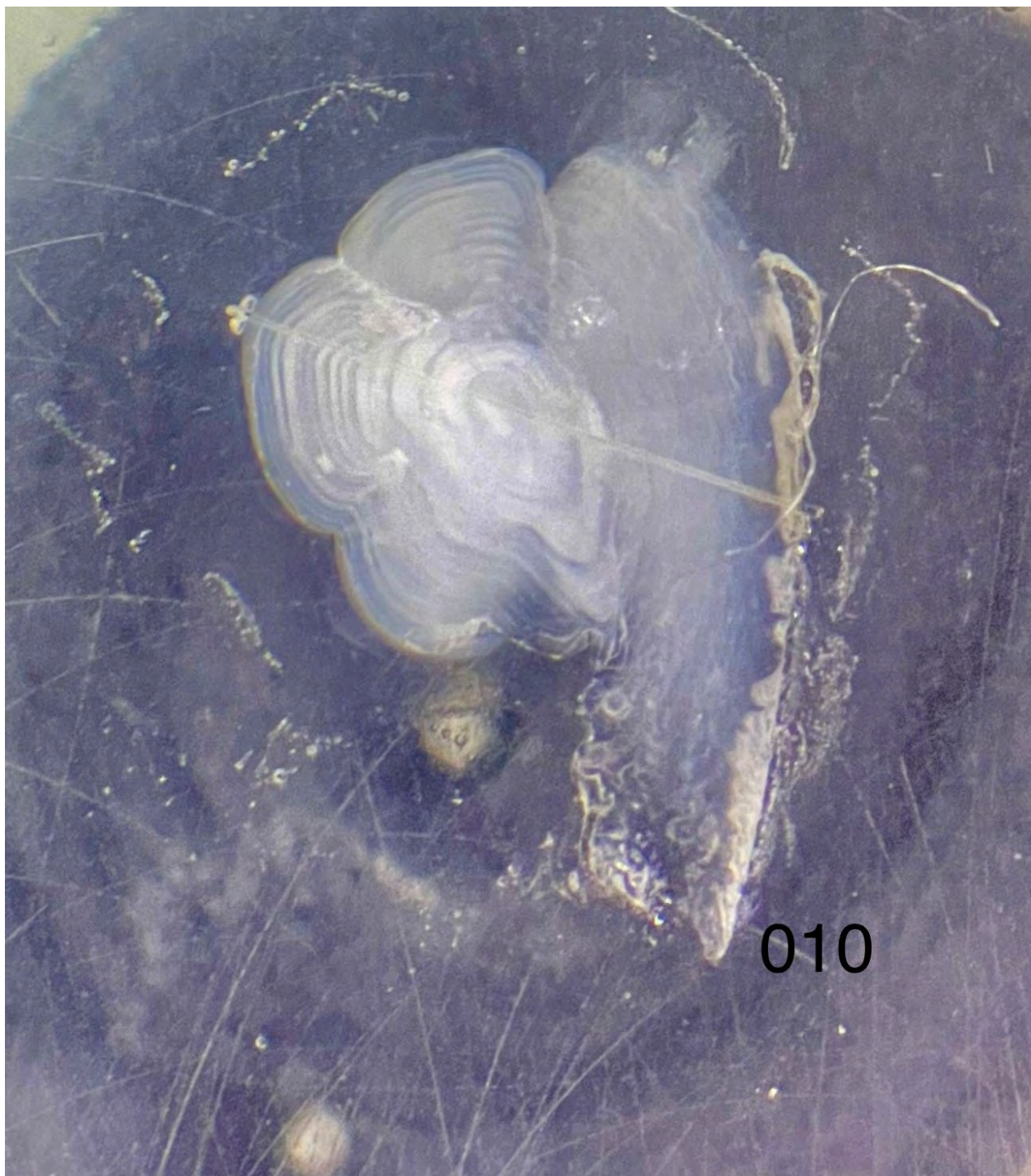
**Photo D.66:** Arctic Charr QURL-AC-08 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





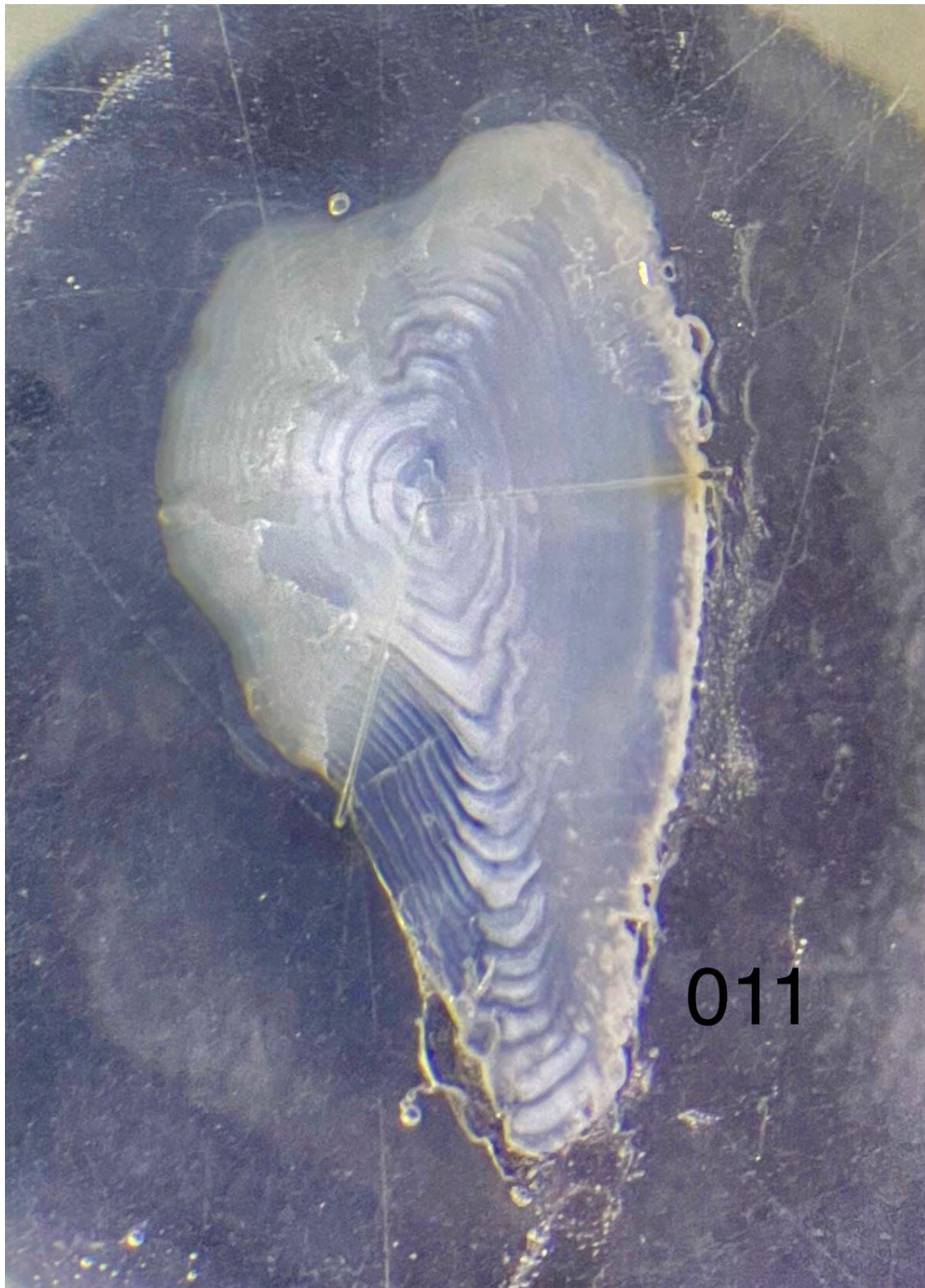
**Photo D.67:** Arctic Charr QURL-AC-09 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





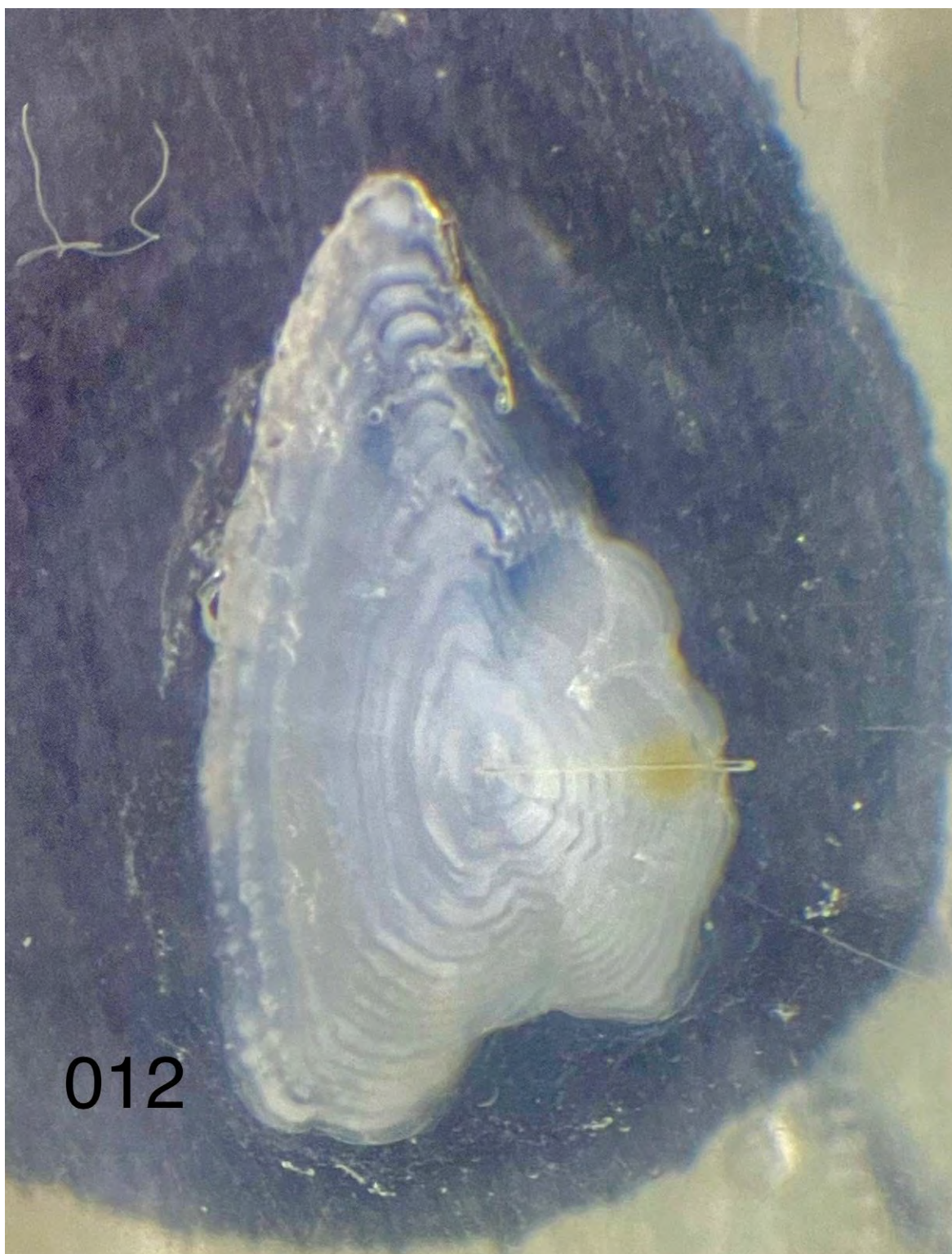
**Photo D.68:** Arctic Charr QURL-AC-10 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





**Photo D.69:** Arctic Charr QURL-AC-11 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





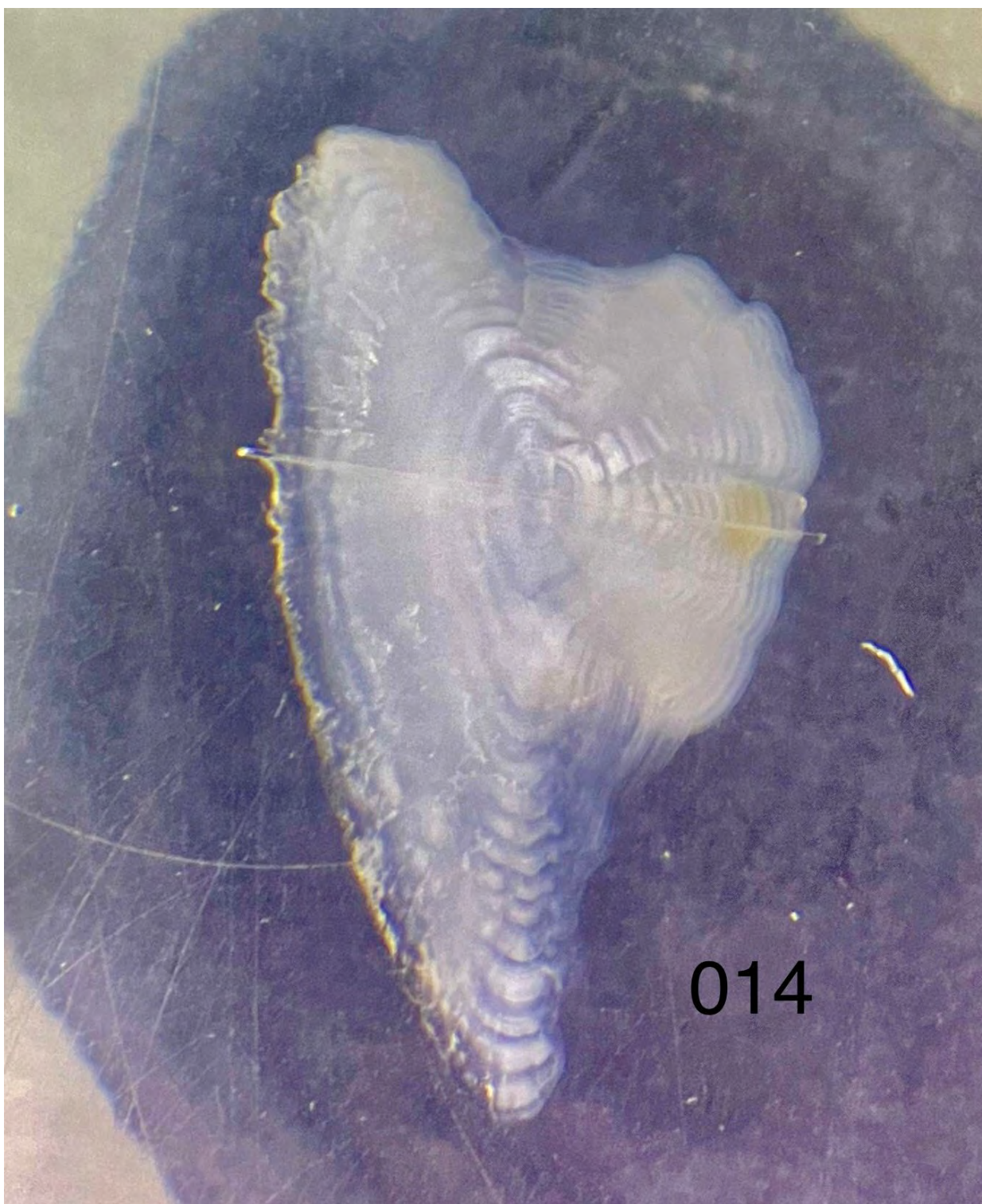
**Photo D.70:** Arctic Charr QURL-AC-12 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





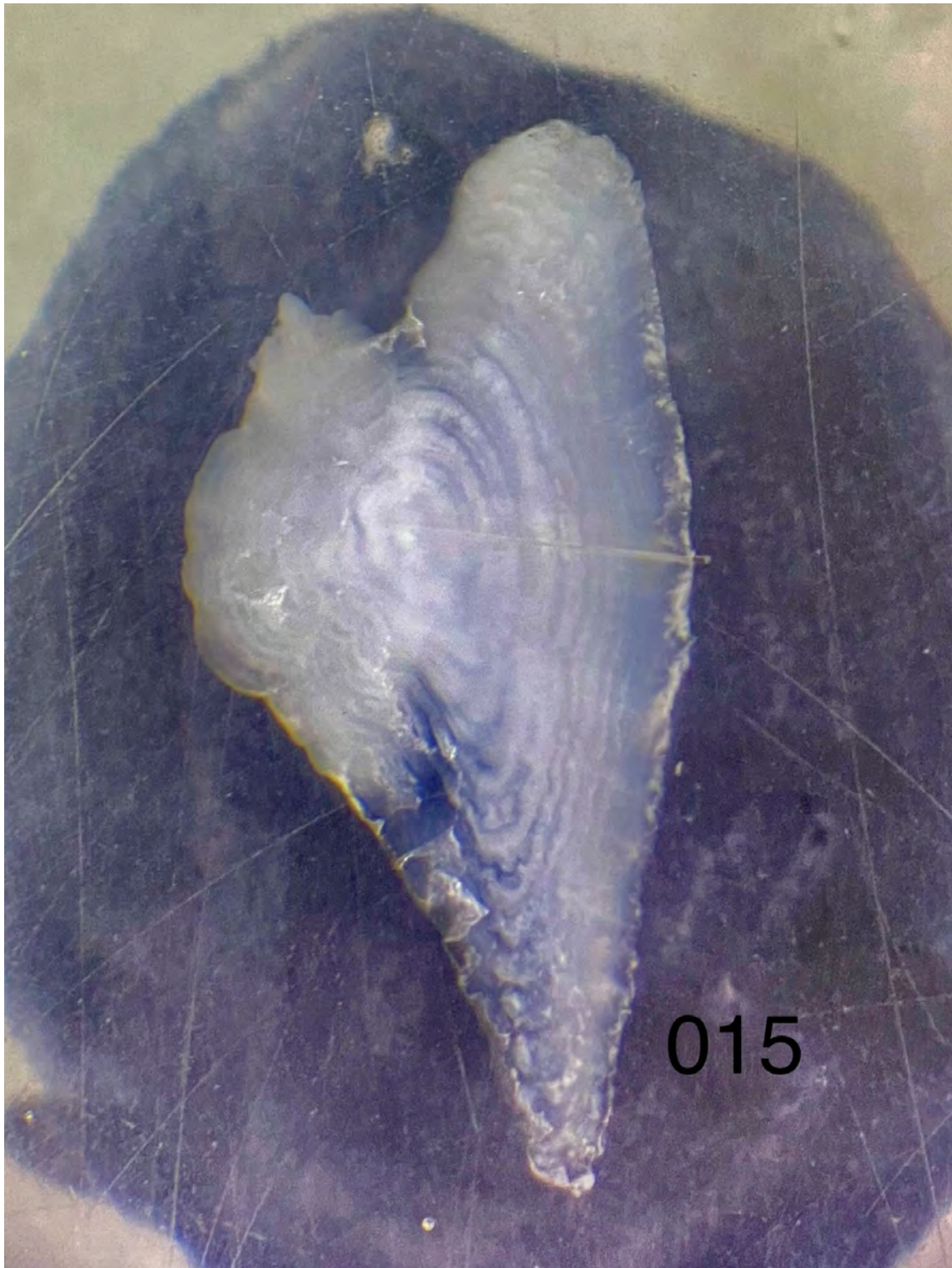
**Photo D.71:** Arctic Charr QURL-AC-13 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





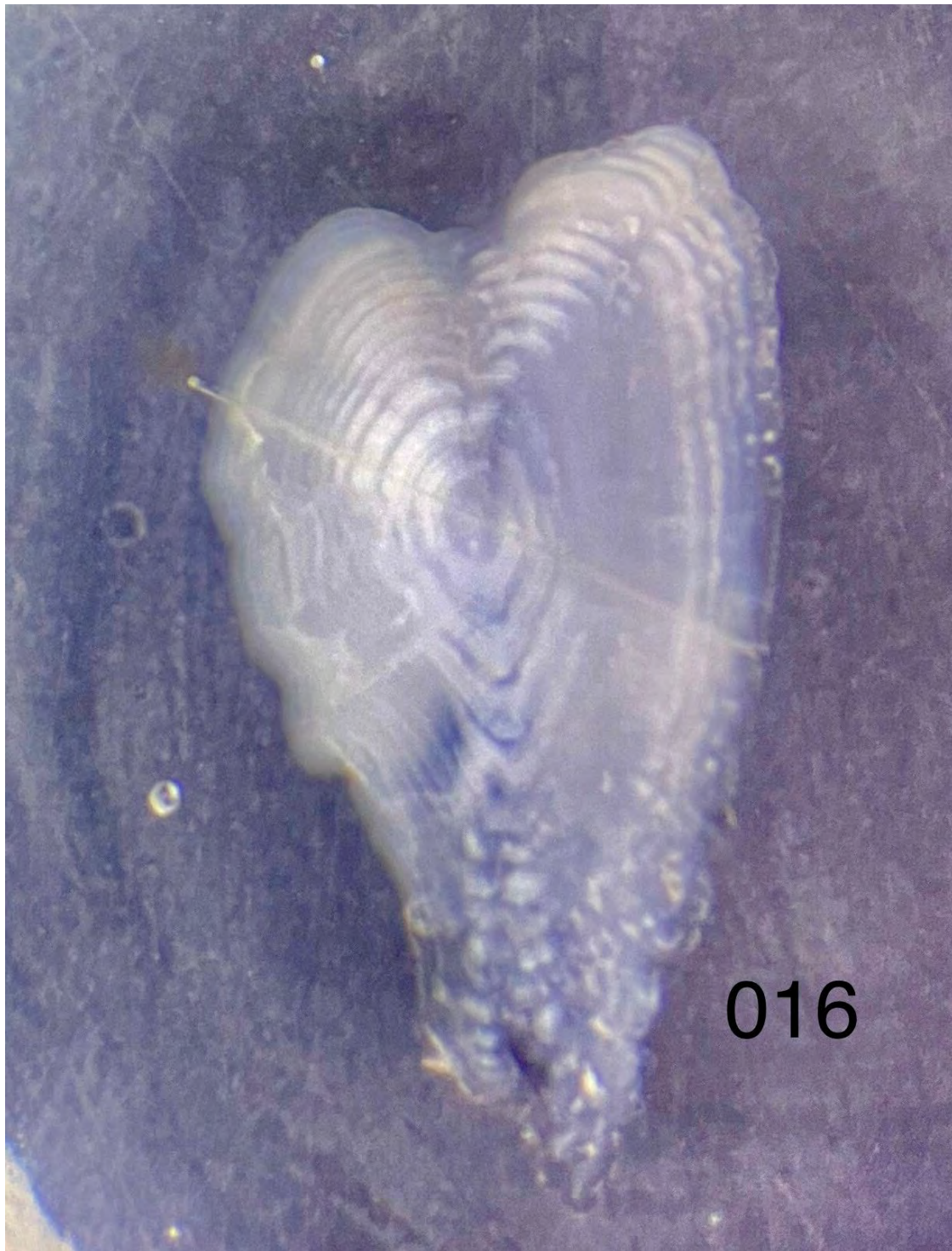
**Photo D.72:** Arctic Charr QURL-AC-14 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





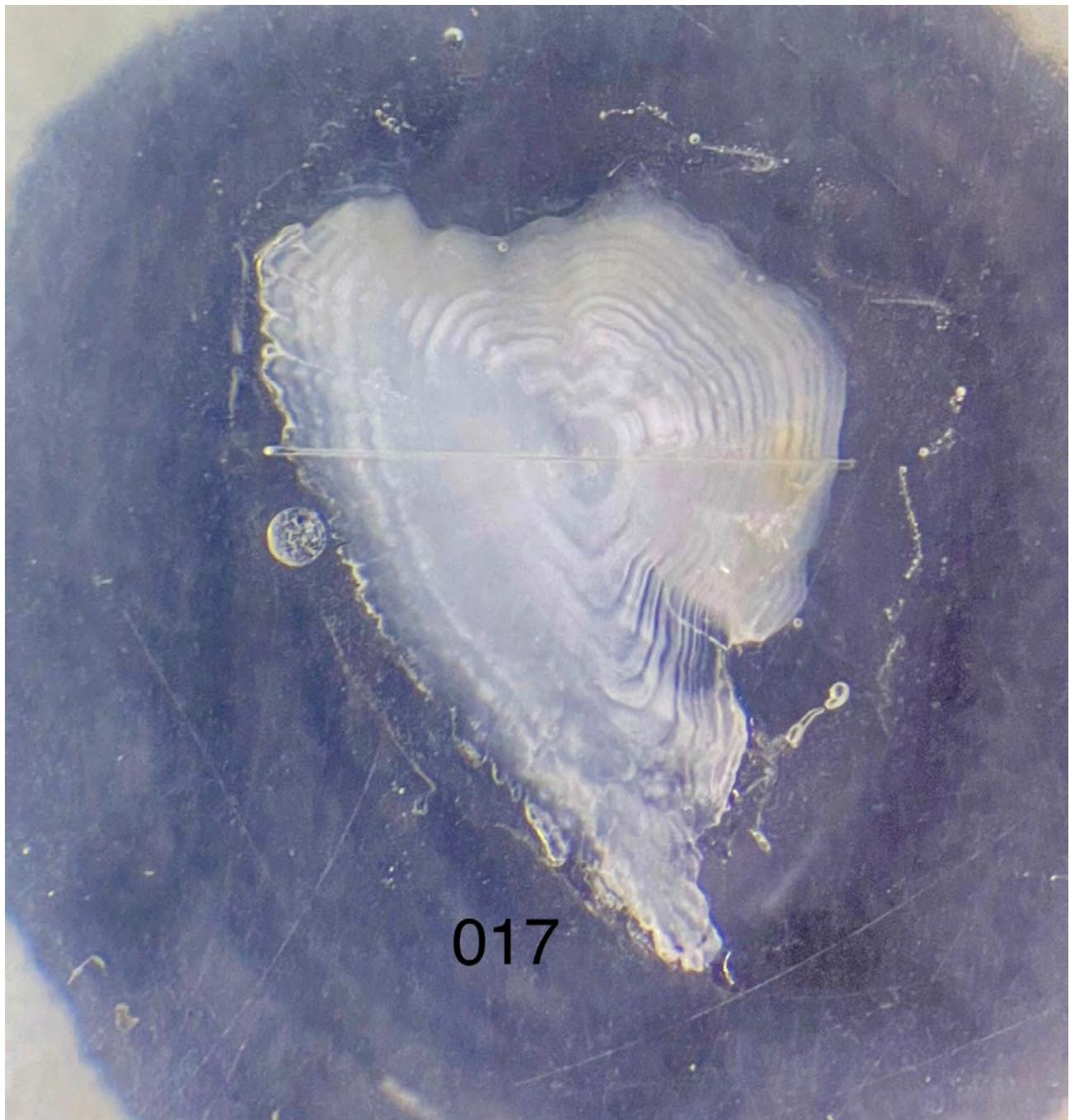
**Photo D.73:** Arctic Charr QURL-AC-15 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





**Photo D.74:** Arctic Charr QURL-AC-16 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





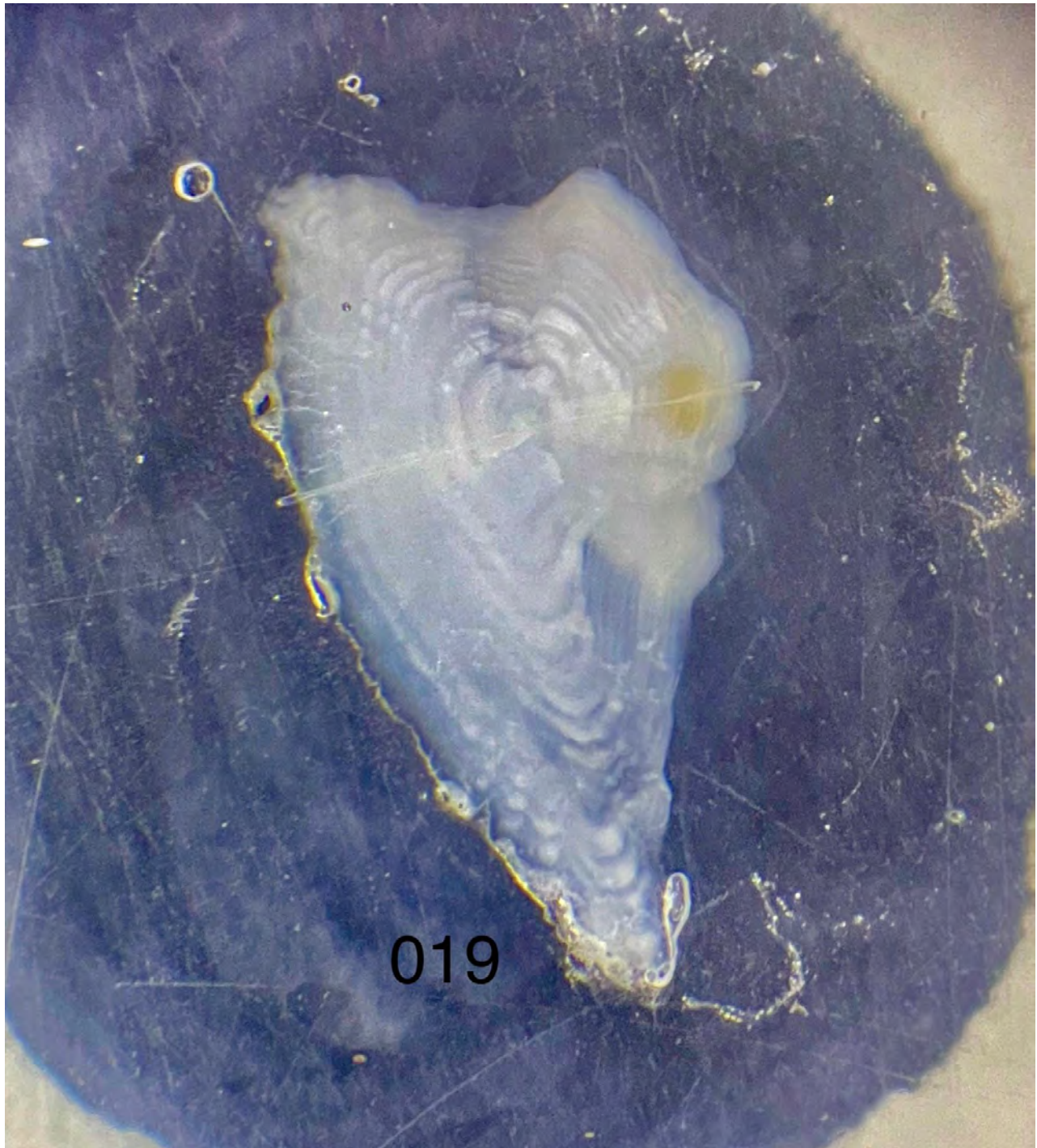
**Photo D.75:** Arctic Charr QURL-AC-17 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





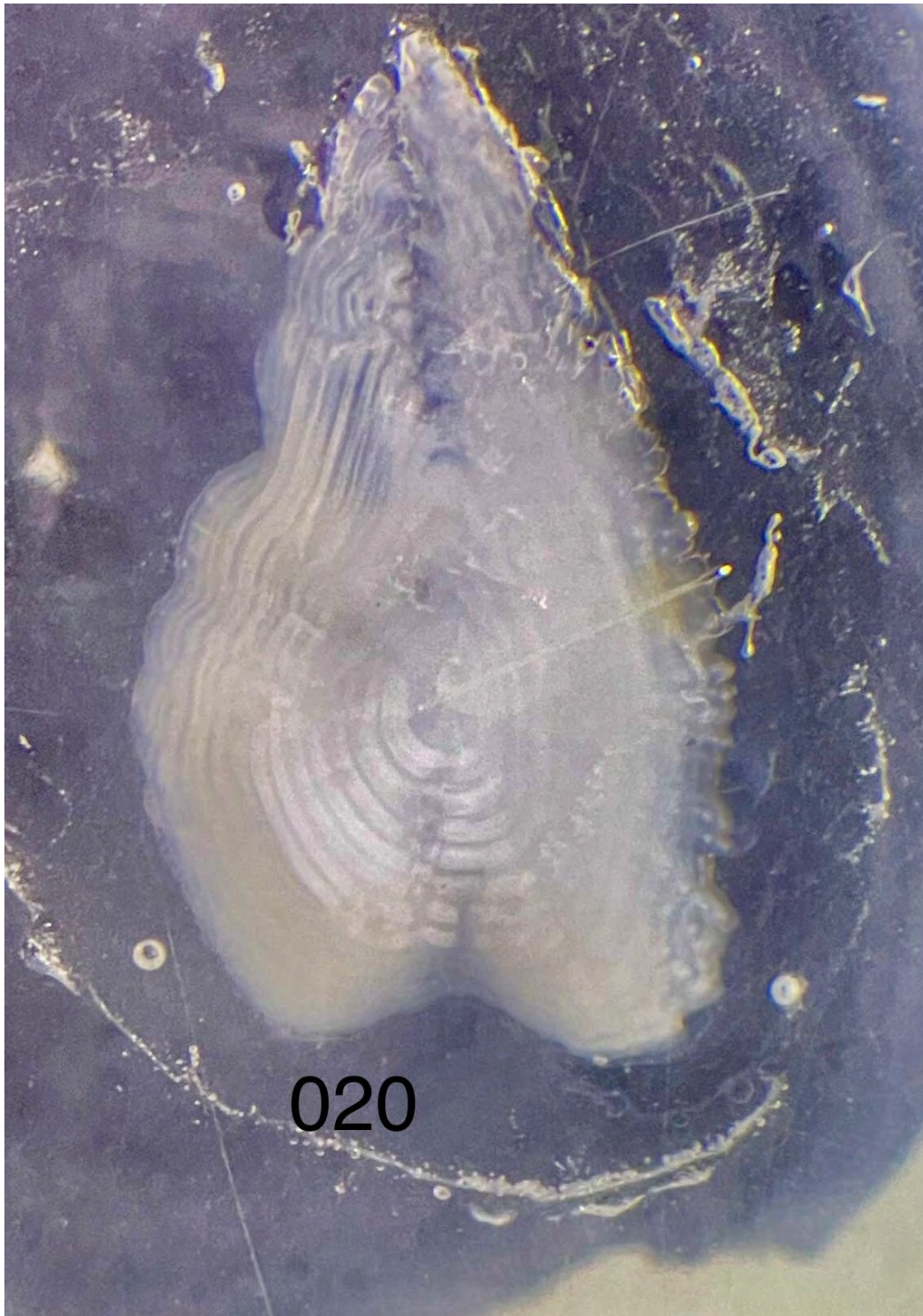
**Photo D.76:** Arctic Charr QURL-AC-18 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





**Photo D.77:** Arctic Charr QURL-AC-19 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.





**Photo D.78:** Arctic Charr QURL-AC-20 Otolith Post-Ablation, Qurluktuk Lake, Milne Inlet Freshwater Fish Health Monitoring Program, 2024.



**Table D.1: Detailed Fish Data for Arctic Charr Sampled from Qurluktuk Lake and Robertson River, 1979 (Moshenko 1979)**

Year	Month	Sex	Age	Length (mm)	Weight (g)
1979	August	Female	-	428	800
1979	August	Female	-	450	1000
1979	August	Female	11	450	1000
1979	August	Female	12	584	2000
1979	August	Female	14	533	1200
1979	August	Female	17	625	2400
1979	August	Female	19	795	3100
1979	August	Female	20	695	2900
1979	August	Female	21	680	2700
1979	August	Female	22	660	2600
1979	August	Female	23	762	4500
1979	August	Female	24	741	3800
1979	August	Female	-	723	3800
1979	August	Female	-	723	3300
1979	August	Female	-	779	4500
1979	August	Female	-	779	3100
1979	August	Female	13	538	1650
1979	August	Female	13	536	1500
1979	August	Female	15	531	2400
1979	August	Female	15	513	800
1979	August	Female	16	553	1800
1979	August	Female	16	551	1500
1979	August	Male	-	583	2000
1979	August	Male	-	583	2000
1979	August	Male	-	827	6100
1979	August	Male	-	827	5800
1979	August	Male	22	771	4500
1979	August	Male	22	769	3800
1979	August	Male	-	663	2800
1979	August	Male	14	710	4800
1979	August	Male	15	627	2400
1979	August	Male	16	645	2700
1979	August	Male	21	805	5800
1979	August	Male	23	848	6100
1979	August	Male	24	740	4150
1979	August	Male	28	795	3200

Note: "-" indicates data not available.



Table D.2: Detailed Fish Data for Arctic Charr Sampled from Tugaat Lake, 1975 to 2000 (DFO 2004)

Year	Month	Mesh Size (mm)	Sex	Length Interval	Sample Size	Mean Total Length (mm)	Mean Weight (g)	Weight Standard Deviation	Mean Fork Length (mm)	Mean Dressed Weight (g)
1975	May	127	Male	550 - 599	1	560	1928	-	-	-
1975	May	127	Male	600 - 649	5	622	2449	306	-	-
1975	May	127	Male	650 - 699	5	676	3606	325	-	-
1975	May	127	Male	700 - 749	8	716	3998	337	-	-
1975	May	127	Male	750 - 799	6	777	4806	707	-	-
1975	May	127	Male	800 - 849	2	805	5217	962	-	-
1975	May	127	Male	850 - 899	1	850	7258	-	-	-
				Total	28	711	3954	1210		
1975	May	127	Female	550 - 599	3	582	2079	66	-	-
1975	May	127	Female	600 - 649	26	620	2516	288	-	-
1975	May	127	Female	650 - 699	38	669	3174	321	-	-
1975	May	127	Female	700 - 749	5	702	3402	331	-	-
				Total	72	650	2906	479		
1975	Dec	127	Male	500 - 549	1	520	1588	-	-	-
1975	Dec	127	Male	550 - 599	1	550	1701	-	-	-
1975	Dec	127	Male	600 - 649	1	620	1814	-	-	-
1975	Dec	127	Male	650 - 699	1	650	2155	-	-	-
1975	Dec	127	Male	700 - 749	1	720	3062	-	-	-
1975	Dec	127	Male	750 - 799	1	780	4309	-	-	-
				Total	6	640	2438	1061		
1975	Dec	127	Female	550 - 599	1	580	1928	-	-	-
1975	Dec	127	Female	600 - 649	2	630	2014	38	-	-
1975	Dec	127	Female	650 - 699	1	690	2441	-	-	-
				Total	4	633	2099	232		
1980	Aug	140	-	350 - 399	5	-	-	-	392	670
1980	Aug	140	-	400 - 449	17	-	-	-	421	809
1980	Aug	140	-	450 - 499	13	-	-	-	469	1158
1980	Aug	140	-	500 - 549	12	-	-	-	526	1604
1980	Aug	140	-	550 - 599	11	-	-	-	575	2005
1980	Aug	140	-	600 - 649	20	-	-	-	622	2395
1980	Aug	140	-	650 - 699	14	-	-	-	667	3111
1980	Aug	140	-	700 - 749	4	-	-	-	726	3825
1980	Aug	140	-	750 - 799	1	-	-	-	773	3800
				Total	97				550	1897
1985	Dec	127	-	300 - 349	2	-	375	35	323	-
1985	Dec	127	-	350 - 399	2	-	500	212	368	-
1985	Dec	127	-	400 - 449	1	-	750	-	445	-
1985	Dec	127	-	450 - 499	2	-	1350	283	460	-
1985	Dec	127	-	500 - 549	13	-	2046	227	536	-
1985	Dec	127	-	550 - 599	48	-	2335	237	568	-
1985	Dec	127	-	600 - 649	28	-	2771	300	616	-
1985	Dec	127	-	650 - 699	3	-	3833	486	660	-
1985	Dec	127	-	700 - 749	1	-	4150	-	720	-
				Total	100		2372	647	569	
1995	Aug	140	Male	600 - 649	1	600	2500	-	-	-
1995	Aug	140	Male	650 - 699	4	668	3925	299	-	-
1995	Aug	140	Male	700 - 749	4	733	5350	311	-	-
1995	Aug	140	Male	750 - 799	8	770	6388	594	-	-
1995	Aug	140	Male	800 - 849	3	813	6633	493	-	-
				Total	20	740	5530	1311		
1995	Aug	140	Female	600 - 649	5	624	3080	239	-	-
1995	Aug	140	Female	650 - 699	2	655	3900	141	-	-
1995	Aug	140	Female	700 - 749	2	700	4800	1131	-	-
1995	Aug	140	Female	750 - 799	1	770	5500	-	-	-
				Total	10	660	3830	1001		

Note: "-" Data not available.



Table D.2: Detailed Fish Data for Arctic Charr Sampled from Tugaat Lake, 1975 to 2000 (DFO 2004)

Year	Month	Mesh Size (mm)	Sex	Length Interval	Sample Size	Mean Total Length (mm)	Mean Weight (g)	Weight Standard Deviation	Mean Fork Length (mm)	Mean Dressed Weight (g)
1996	Feb	114 - 140	Male	400 - 449	2	437	806	40	-	-
1996	Feb	114 - 140	Male	450 - 499	2	484	1104	82	-	-
1996	Feb	114 - 140	Male	500 - 549	3	524	1567	154	-	-
1996	Feb	114 - 140	Male	550 - 599	7	578	2120	212	-	-
1996	Feb	114 - 140	Male	600 - 649	15	624	2544	341	-	-
1996	Feb	114 - 140	Male	650 - 699	13	681	3388	413	-	-
1996	Feb	114 - 140	Male	700 - 749	8	719	4040	301	-	-
1996	Feb	114 - 140	Male	750 - 799	4	768	4829	90	-	-
1996	Feb	114 - 140	Male	800 - 849	1	802	6600	-	-	-
				Total	55	642	2978	1164		
1996	Feb	114 - 140	Female	450 - 499	3	485	1583	605	-	-
1996	Feb	114 - 140	Female	500 - 549	2	530	1619	372	-	-
1996	Feb	114 - 140	Female	550 - 599	14	584	2134	247	-	-
1996	Feb	114 - 140	Female	600 - 649	17	620	2639	270	-	-
1996	Feb	114 - 140	Female	650 - 699	8	669	3156	387	-	-
1996	Feb	114 - 140	Female	700 - 749	1	704	3670	-	-	-
				Total	45	606	2481	583		
2000	Dec	89 - 114	-	400 - 449	4	-	625	250	430	-
2000	Dec	89 - 114	-	450 - 499	30	-	980	246	476	-
2000	Dec	89 - 114	-	500 - 549	85	-	1442	408	521	-
2000	Dec	89 - 114	-	550 - 599	97	-	1899	521	572	-
2000	Dec	89 - 114	-	600 - 649	77	-	2601	424	620	-
2000	Dec	89 - 114	-	650 - 699	59	-	3229	815	671	-
2000	Dec	89 - 114	-	700 - 749	27	-	3981	893	714	-
2000	Dec	89 - 114	-	750 - 799	2	-	5750	354	765	-
2000	Dec	89 - 114	-	800 - 849	5	-	5140	2593	822	-
				Total	386		2265	1118	591	
1992	Aug	-	-	150 - 199	15	-	59	23	190	-
1992	Aug	-	-	200 - 249	328	-	147	48	233	-
1992	Aug	-	-	250 - 299	983	-	216	50	271	-
1992	Aug	-	-	300 - 349	427	-	360	72	322	-
1992	Aug	-	-	350 - 399	203	-	612	173	376	-
1992	Aug	-	-	400 - 449	443	-	936	211	425	-
1992	Aug	-	-	450 - 499	619	-	1310	190	474	-
1992	Aug	-	-	500 - 549	449	-	1780	264	521	-
1992	Aug	-	-	550 - 599	239	-	2346	410	571	-
1992	Aug	-	-	600 - 649	105	-	2996	436	620	-
1992	Aug	-	-	650 - 699	53	-	3990	594	671	-
1992	Aug	-	-	700 - 749	23	-	4763	621	718	-
1992	Aug	-	-	750 - 799	7	-	5164	847	757	-
1992	Aug	-	-	800 - 849	2	-	6125	389	827	-
				Total	3896	Mean	1061	950	395	

Note: "-" Data not available.



**Table D.3: Gill Net Total Catch and Catch-Per-Unit-Effort in Ikaluit and Qurluktuk Lakes, Milne Inlet Freshwater Fish Health Monitoring Program, August 2024**

Water-body	Gill Net Station Identification	UTM (NAD 83, 17W)		Gill Net Set Information		Set Date	Lift Date	Set Time	Lift Time	Effort (m*hrs/100m)	Arctic Charr		
		Easting	Northing	Length (m)	Mesh Size (mm)						Catch	Mortality/Sacrificed	CPUE <sup>a</sup>
Ikaluit Lake (IKLL)	IKLL-GN-01	558598	7982683	45	102 to 127	26-Aug-24	26-Aug-24	15:00	16:00	0.45	6	6	13.3
	IKLL-GN-02	558598	7982683	45	102 to 127	26-Aug-24	26-Aug-24	16:10	17:50	0.75	13	13	17.3
	IKLL-GN-03	558704	7982642	45	102 to 127	26-Aug-24	26-Aug-24	15:25	16:15	0.38	2	2	5.33
	IKLL-GN-04	558704	7982642	45	102 to 127	26-Aug-24	26-Aug-24	16:20	18:00	0.75	2	2	2.67
	IKLL-GN-05	558602	7982756	45	102 to 127	27-Aug-24	27-Aug-24	15:18	16:10	0.39	4	4	10.3
	IKLL-GN-06	558602	7982756	45	102 to 127	27-Aug-24	27-Aug-24	16:10	17:20	0.52	10	10	19.1
<b>Total</b>										<b>3.24</b>	<b>37</b>	<b>37</b>	<b>11.42</b>
Qurluktuk Lake (QURL)	QURL-GN-01	481222	7994737	45	102 to 127	26-Aug-24	27-Aug-24	11:05	11:42	11.08	11	10	0.99
	QURL-GN-02	480818	7994482	45	102 to 127	26-Aug-24	27-Aug-24	11:40	11:32	10.74	3	3	0.279
	QURL-GN-03	481222	7994737	45	102 to 127	27-Aug-24	28-Aug-24	11:42	10:36	10.30	7	7	0.679
	QURL-GN-04	480818	7994482	45	102 to 127	27-Aug-24	28-Aug-24	11:32	10:05	10.15	4	4	0.394
	QURL-GN-05	480894	7994883	45	102 to 127	27-Aug-24	28-Aug-24	12:21	10:57	10.17	14	14	1.38
<b>Total</b>										<b>52.44</b>	<b>39</b>	<b>75</b>	<b>0.74</b>

<sup>a</sup> Total catch-per-unit-effort (CPUE) calculated as the total catch of arctic charr over the total effort for all the gill net sets in each lake.



**Table D.4: Detailed Fish Data for Adult<sup>a</sup> Arctic Charr Sampled from Ikaluit and Qurluktuk Lake in August 2024, Milne Inlet Freshwater Fish Health Monitoring Program**

Lake	Fish ID	Total Length (cm)	Fork Length (cm)	Body Weight (g)	Age	Sex recorded (F,M or U)	Gonad Weight (g)	Gonad Sub-sample Weight (g)	Liver Weight (g)	Anadromous (Y/N) <sup>b</sup>	Abnormalities	Tissue Collected
Ikaluit Lake	IKLL-AC-01	52.4	49.9	1,280	10	M	53.1	-	11.7	Y	-	M, L
Ikaluit Lake	IKLL-AC-02	63.0	59.9	2,200	14	M	102	-	25.8	N	stomach empty	M, L
Ikaluit Lake	IKLL-AC-03	69.5	66.0	3,100	11	U	2.27	-	63.3	Y	-	M, L
Ikaluit Lake	IKLL-AC-04	50.4	47.5	1,500	9	U	0.580	-	15.9	Y	-	M, L
Ikaluit Lake	IKLL-AC-05	47.6	45.2	1,000	8	U	0.610	-	15.8	Y	white liver abscess - pic	M, L
Ikaluit Lake	IKLL-AC-06	61.5	58.1	2,340	11	U	2.49	-	46.8	Y	-	M, L
Ikaluit Lake	IKLL-AC-07	58.3	55.0	2,100	10	U	1.61	-	39.3	Y	-	M, L
Ikaluit Lake	IKLL-AC-08	53.7	51.3	1,440	10	F	138	93.1	50.1	Y	-	M,L,O
Ikaluit Lake	IKLL-AC-09	51.4	48.6	1,360	16	F	151	105	35.7	Y	-	M,L,O
Ikaluit Lake	IKLL-AC-10	48.6	45.5	1,060	7	F	86.8	47.2	33.9	Y	-	M,L,O
Ikaluit Lake	IKLL-AC-11	60.8	58.0	2,300	9	U	0.747	-	51.1	Y	-	M, L
Ikaluit Lake	IKLL-AC-12	63.5	60.3	2,500	10	U	2.00	-	47.9	Y	duplicate M&L	M, L
Ikaluit Lake	IKLL-AC-13	56.3	53.8	1,650	13	F	303	101	14.2	N	-	M,L,O
Ikaluit Lake	IKLL-AC-14	63.4	59.5	2,175	15	F	18.8	18.8	48.6	Y	entire gonad	M,L,O
Ikaluit Lake	IKLL-AC-15	53.6	50.5	1,450	10	F	6.28	6.28	29.6	Y	-	M,L,O
Ikaluit Lake	IKLL-AC-16	59.7	56.6	1,775	12	F	255	83.0	18.2	N	-	M,L,O
Ikaluit Lake	IKLL-AC-17	63.1	59.2	2,400	13	U	1.23	-	51.6	Y	-	M, L
Ikaluit Lake	IKLL-AC-18	56.6	53.7	1,560	8	U	1.11	-	40.6	Y	-	M, L
Ikaluit Lake	IKLL-AC-19	62.7	59.0	2,500	13	F	17.5	-	52.4	Y	-	M,L,O
Ikaluit Lake	IKLL-AC-20	55.4	51.7	1,425	10	U	1.14	-	26.6	Y	-	M, L
Ikaluit Lake	IKLL-AC-21	55.6	52.8	1,250	10	F	168	46.1	37.0	Y	-	M,L,O
Ikaluit Lake	IKLL-AC-22	64.3	60.7	2,400	14	U	2.66	-	41.2	Y	sea lice on gills; duplicate	M,L
Ikaluit Lake	IKLL-AC-23	36.8	34.7	390	9	U	0.165	-	6.94	Y	-	M,L
Ikaluit Lake	IKLL-AC-24	50.9	47.8	1,275	14	F	7.84	-	24.7	Y	-	M,L,O
Ikaluit Lake	IKLL-AC-25	60.1	56.4	1,940	10	F	270	77.7	19.1	N	1OT,1PF	M,L,O
Ikaluit Lake	IKLL-AC-26	46.7	44.4	975	8	U	0.465	-	19.7	Y	-	M,L
Ikaluit Lake	IKLL-AC-27	49.9	47.1	1,025	10	F	67.2	-	31.3	Y	-	M,L,O
Ikaluit Lake	IKLL-AC-28	52.0	49.4	1,320	9	M	1.58	-	21.7	Y	-	M,L
Ikaluit Lake	IKLL-AC-29	64.4	60.5	2,650	11	M	2.62	-	48.5	Y	-	M,L
Ikaluit Lake	IKLL-AC-30	65.5	62.0	2,000	13	M	1.50	-	35.6	Y	1 OT	M,L
Ikaluit Lake	IKLL-AC-31	59.4	55.7	2,375	11	F	12.7	-	51.4	Y	-	M,L,O
Ikaluit Lake	IKLL-AC-32	57.6	54.8	1,800	16	F	21.5	-	36.8	Y	-	M,L,O
Ikaluit Lake	IKLL-AC-33	61.2	57.6	2,350	7	U	2.05	-	63.2	Y	1 OT	M,L
Ikaluit Lake	IKLL-AC-34	68.0	63.7	2,850	12	M	78.9	-	37.3	N	-	M,L
Ikaluit Lake	IKLL-AC-35	61.5	58.1	2,375	10	U	2.86	-	81.5	Y	-	M,L
Ikaluit Lake	IKLL-AC-36	55.6	52.2	1,575	7	U	1.08	-	23.8	Y	1OT for microchem	M,L
Ikaluit Lake	IKLL-AC-37	67.7	64.0	2,850	14	M	65.5	-	32.3	N	white liver cyst	M,L
Qurluktuk Lake	QURL-AC-01	64.2	60.8	2,522	15	F	255	39.7	24.3	N	-	M/L/O
Qurluktuk Lake	QURL-AC-02	63.9	60.0	2,640	13	F	339	86.6	39.2	N	-	M/L/O
Qurluktuk Lake	QURL-AC-03	64.9	61.0	2,561	13	F	553	76.8	33.5	N	Liver cysts	M/L/O
Qurluktuk Lake	QURL-AC-04	66.0	62.4	2,650	16	F	395	83.1	32.7	N	parasites in mouth	M/L/O
Qurluktuk Lake	QURL-AC-05	59.8	57.0	2,200	14	F	264	51.0	22.8	N	-	M/L/O
Qurluktuk Lake	QURL-AC-06	65.3	62.0	2,585	14	F	312	63.1	28.3	Y	liver parasites	M/L/O
Qurluktuk Lake	QURL-AC-07	63.3	59.4	2,390	14	F	293	62.2	20.3	N	-	M/L/O
Qurluktuk Lake	QURL-AC-08	78.6	75.0	4,150	25	F	635	79.5	56.3	Y	parasites	M/L/O
Qurluktuk Lake	QURL-AC-09	47.8	45.6	630	18	U	-	-	8.53	Y	cysts	M/L
Qurluktuk Lake	QURL-AC-10	62.5	59.4	2,356	13	F	298	60.2	18.9	N	-	M/L/O
Qurluktuk Lake	QURL-AC-11	67.8	61.3	2,300	15	M	46.3	-	20.3	N	-	M/L
Qurluktuk Lake	QURL-AC-12	60.5	57.0	1,591	14	F	237	45.1	25.7	N	-	M/L/O
Qurluktuk Lake	QURL-AC-13	68.6	64.8	2,750	14	F	353	48.6	30.9	Y	-	M/L/O
Qurluktuk Lake	QURL-AC-14	67.6	64.0	2,850	14	F	393	51.4	44.0	N	Liver cyst	M/L/O
Qurluktuk Lake	QURL-AC-15	77.2	73.8	4,350	13	F	692	72.1	39.0	Y	-	M/L/O
Qurluktuk Lake	QURL-AC-16	68.1	64.3	2,750	14	F	374	61.9	38.7	N	-	M/L/O
Qurluktuk Lake	QURL-AC-17	65.3	61.5	2,120	12	F	260	62.7	23.5	N	stomach cysts	M/L/O
Qurluktuk Lake	QURL-AC-18	65.5	61.4	2,200	13	F	304	73.3	26.9	Y	parasites/cysts	M/L/O
Qurluktuk Lake	QURL-AC-19	66.1	62.2	2,500	14	F	360	64.2	41.9	Y	liver cyst	M/L/O
Qurluktuk Lake	QURL-AC-20	68.1	64.6	2,400	14	F	194	55.0	24.5	Y	-	M/L/O

Notes: M = male. F = female. U = undeveloped. M = muscle. L = liver. O = ovaries. "-" indicates data are not available.

<sup>a</sup> Individuals >35 cm were considered adults (Scott and Crossman 1973)

<sup>b</sup> Designation based on visual indicators of recent marine migration derived from IQ provided by Inuit program participants. Designations for fish from Ikaliut Lake completed primarily by Inuit participants. Designations for fish from Qurluktuk Lake completed by Minnow Environmental Staff, based on IQ shared by Inuit participants



Table D.5: Comparison of Health Endpoints in Female Arctic Charr between Ikaluit and Qurluktuk Lakes, Milne Inlet Freshwater Fish Health Monitoring Program, 2024

Sex	Indicator	Endpoint	Variables		Sample Size		Test			ANCOVA Statistics			Summary Statistics <sup>b</sup>			Test P-value (Location)	Ikaluit vs. Qurluktuk		
							Statistical Test	Shapiro Wilk's P-Value	Levene's Test P-Value	Interaction <i>p</i> -value	Parallel Slope Model	Covariate Value for Comparisons <sup>a</sup>					Magnitude of Difference (%) <sup>c</sup>	Estimated Minimum Detectable Difference with α=β=0.1 <sup>d</sup>	
			Response	Covariate	Ikaluit	Qurluktuk							Statistic	Ikaluit	Qurluktuk			Increase	Decrease
Female	Survival/Recruitment	Length-Frequency Distribution	Fork Length (cm)	-	14	18	K-S	-	-	-	-	-	NA	-	-	<0.001	86	-	-
		Age-Frequency Distribution	Age (years)	-	14	18	K-S	-	-	-	-	-	NA	-	-	0.003	52	-	-
	Survival	Age	Age (years)	-	14	18	M-W	0.0010 <sup>e</sup>	0.18	-	-	-	Median	11.5	14.0	0.022	22	22	-18
	Body Size	Fork Length	Fork Length (cm)	-	14	18	tequal	0.089	0.58	-	-	-	Mean	52.8	62.8	<0.001	19	8.3	-8.3
		Body Weight	log10[Body Weight (g)]	-	14	18	tequal	0.25	0.12	-	-	-	Geometric Mean	1,588	2,577	<0.001	62	27	-21
	Energy Usage	Length-at-age	log10[Fork Length (cm)]	log10[Age (years)]	14	18	ANCOVA	-	-	0.465	0.009	13.0	Adjusted Mean	53.8	61.6	<0.001	15	6.9	-6.4
		Weight-at-age	log10[Body Weight (g)]	log10[Age (years)]	14	18	ANCOVA	-	-	0.700	0.010	13.0	Adjusted Mean	1,697	2,447	<0.001	44	24	-19
		Relative Gonad Weight	log10[Gonad Weight (g)]	log10[Body Weight (g)]	14	18	tequal	0.46	0.0010	0.097	0.925	-	Geometric Mean	54.2	342	<0.001	531	147	-60
	Energy Storage	Relative Liver Weight	log10[Liver Weight (g)]	log10[Body Weight (g)]	14	18	ANCOVA	-	-	0.232	0.023	2,085	Adjusted Mean	37.5	27.0	0.054	-28	36	-26
		Condition	log10[Body Weight (g)]	log10[Fork Length (cm)]	14	18	ANCOVA	-	-	0.632	<0.001	58.0	Adjusted Mean	2,111	2,065	0.704	ns	11	-9.6

- Indicates an area p-value less than 0.1 or an interaction p-value less than 0.05.
- Indicates a Magnitude of Difference (MOD) outside of applicable Critical Effect Size (i.e., ±25% for all endpoints with the exception of ±10% for condition).
- Covariate P-value > 0.05.

Notes: ns = non-significant. "-" indicates the value is not applicable. K-S = Kolmogorov-Smirnov. M-W = Mann-Whitney.

<sup>a</sup> The mean value of the covariate (that corresponds to the adjusted means for the response variable) for the parallel slope analysis of covariance (ANCOVA) model or the minimum and maximum values of the overlap in covariate values for the interaction ANCOVA model.

<sup>b</sup> The median, mean (geometric mean for log<sub>10</sub>-transformed variables), and adjusted mean are reported for Mann-Whitney, t-test and ANCOVA, respectively, and the predicted means of the regression line equations for minimum and maximum values of the covariate (where the data sets overlap) for ANCOVAs where a significant interaction

<sup>c</sup> Magnitude of Difference (MOD) =  $MCT_{Qurluktuk} - MCT_{Ikaluit} / MCT_{Ikaluit}$

<sup>d</sup> Minimum detectable effect size (see methods section of report for formula).

<sup>e</sup> When a non-parametric test was selected only untransformed results are displayed. Results were qualitatively similar when log-10 transformed.



**Table D.6: Comparison of Iron and Mercury Concentrations in Muscle and Liver Tissues of Arctic Charr between Ikaluit and Qurluktuk Lakes, Milne Inlet Freshwater Fish Health Monitoring Program, 2024**

Tissue	Analyte	Sample Size		Statistical Test	ANCOVA Statistics			Summary Statistics <sup>b</sup>			Ikaluit vs. Qurluktuk	
		Interaction Model	Parallel Slope Model		Covariate Value for Comparisons <sup>a</sup>							
			Ikaluit			Qurluktuk	Interaction <i>p</i> -value	Covariate <i>p</i> -value	Statistic	Iqaluit	Qurluktuk	Test <i>P</i> -value (Location)
Muscle	Iron	21	20	M-W	0.797	0.885	-	Median	5.20	5.63	0.575	ns
		20 <sup>d</sup>	20	M-W	0.668	0.512	-	Median	5.15	5.63	0.394	ns
	Mercury	21	20	ANCOVA	0.012	0.517	45.6	Predicted Mean	0.0372	0.114	0.005	207
						64.0	0.0526		0.0587	12		
			21	18 <sup>e</sup>	ANCOVA	0.766	0.003	58.3	Adjusted Mean	0.0480	0.0516	0.279
Liver	Iron	21	20	ANCOVA	0.189	0.046	58.4	Adjusted Mean	195	273	0.053	40
	Mercury	21	20	ANCOVA	0.004	0.880	45.6	Predicted Mean	0.0440	0.181	0.022	312
						64.0	0.0880		0.0881	0.21		
		21	19 <sup>f</sup>	ANCOVA	0.686	0.001	58.7	Adjusted Mean	0.0743	0.0750	0.941	ns



P-value < 0.05.



Indicates Significant Magnitude of Difference (MOD).



Covariate P-value > 0.05.

Notes: Analysis of covariance (ANCOVA) models included fork length as a covariate terms. ns = non-significant. "-" indicates the value is not applicable. M-W = Mann-Whitney. MOD = magnitude of c

<sup>a</sup> The mean value of the covariate (that corresponds to the adjusted means for the response variable) for the parallel slope ANCOVA model or the minimum and maximum values of the overlap in covariate values for the interaction ANCOVA model.

<sup>b</sup> The median, mean (geometric mean for log<sub>10</sub>-transformed variables), and adjusted mean are reported for Mann-Whitney, t-test and ANCOVA, respectively, and the predicted means of the regression line equations for minimum and maximum values of the covariate (where the data sets overlap) for ANCOVAs where a significant interaction (i.e., different slopes) occurs.

<sup>c</sup> MOD =  $MCT_{Qurluktuk} - MCT_{Ikaluit} / MCT_{Ikaluit}$

<sup>d</sup> One outlier (IKLL-AC-02 with Studentized Residual: 6.902) was removed from the analyses.

<sup>e</sup> Two outliers (QURL-AC-08 with Studentized Residual: 4.173; QURL-AC-09 with Studentized Residual: 9.831) were removed from the analyses.

<sup>f</sup> One outlier (QURL-AC-09 with Studentized Residual: 6.633) was removed from the analyses.



## **APPENDIX E**

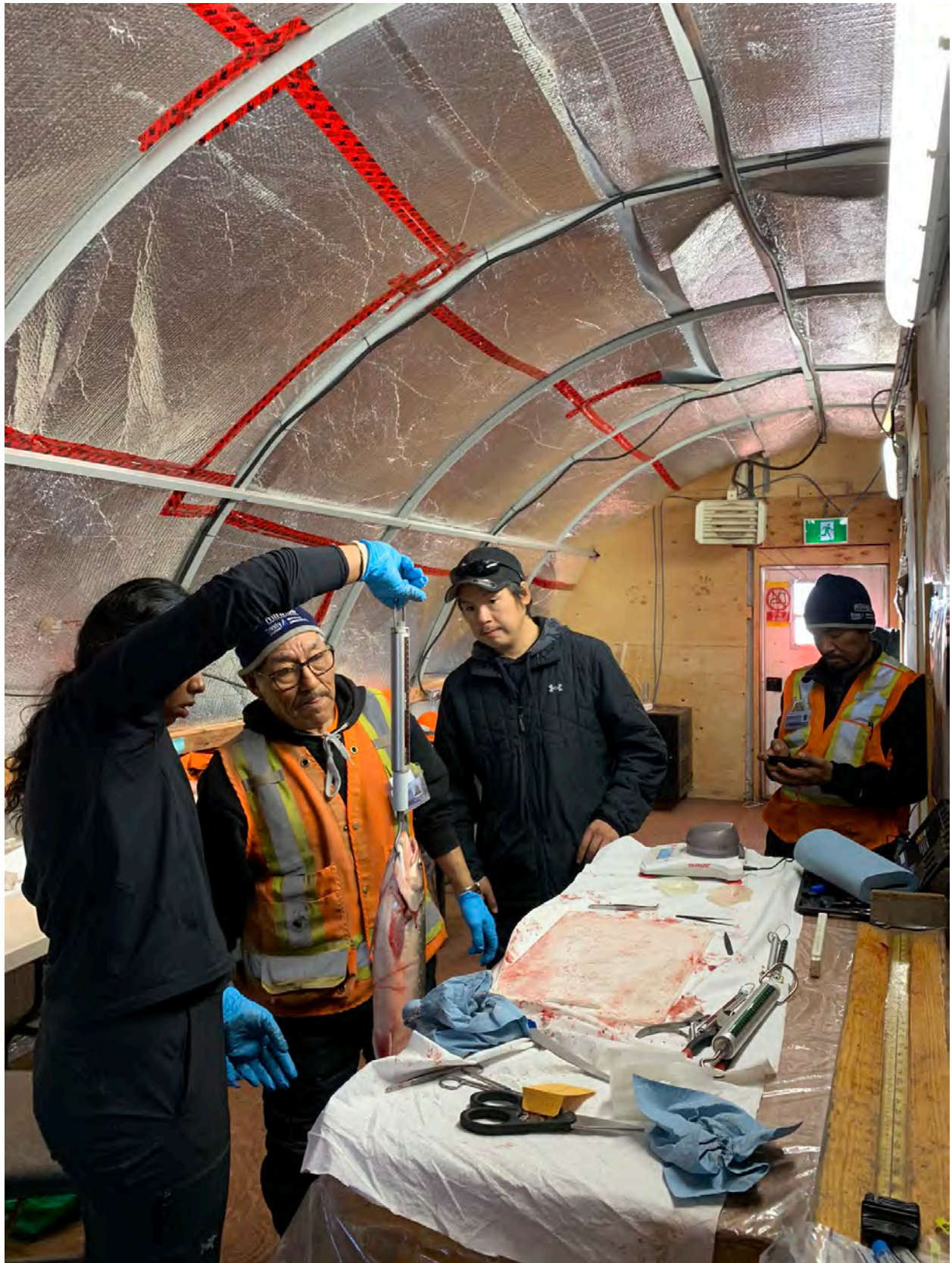
### **PHOTOS**





**Photo E.1:** Gillnetting at Ikaluit Lake, 2024





**Photo E.2:** Processing Fish at Milne Port, 2024





**Photo E.3:** Processing Fish at Milne Port, 2024





**Photo E.4:** Gillnetting at Ikaluit Lake, 2024





**Photo E.5:** Phaniel Driving the Zodiac at Qurluktuk Lake, 2024



## **APPENDIX F**

### **PERMITS**



Licence #: S-24/25-1060-NU

Samantha Burke  
21 Lewis St  
Guelph, ON, CA N1H 1E9

Dear Samantha Burke,

Enclosed is your Licence to Fish for Scientific Purposes issued pursuant to Section 52 of the Fishery (General) Regulations.

Failure to comply with any of the conditions specified on the attached licence may result in a contravention of the Fishery (General) Regulations.

Please be advised that this licence only permits those activities stated on your licence. Any other activity may require approval under the Fisheries Act or other legislation. It is the Project Authority's responsibility to obtain any other approvals.

Please ensure that you include the licence number and project title in any future correspondence and that you complete the Summary Harvest Report upon completion of activities under this licence.

Yours truly,

---

Colin Charles  
Fisheries Management  
Arctic Region  
Fisheries and Oceans Canada

---

Date

Enclosure



LICENCE TO FISH FOR SCIENTIFIC PURPOSES

S-24/25-1060-NU

Pursuant to Section 52 of the Fishery (General) Regulations, the Minister of Fisheries and Oceans hereby authorizes the individual(s) listed below to fish for scientific purposes, subject to the conditions specified.

- Project Authority:

Samantha Burke

Minnow Environmental Inc.

21 Lewis St

Guelph, ON, CA N1H 1E9
- Other Personnel:

Noel Soogrim, Samantha Burke, Kathryn Kuchapski, Dante Freitas, Emmie Button, Kim Connors
- Objectives:

Milne Inlet Freshwater Fish Health Program 2024

The overall objective of the Milne Inlet Freshwater Fish Program is to assess the health of Arctic Char in lakes (i.e., Tugaat, Qurluktuk, and Ikaluit) adjacent to the Milne Inlet Port that are important to Inuit subsistence fishing. This program serves to satisfy serves Term and Condition 48(a) required on the Project Certificate for the Baffinland Mary River Project.

CONDITIONS

Specified Conditions:

See Appendix A for map of authorized sampling locations

- Waterbody Group 1 refers to: Qurluktuk Lake (71.99745, -81.48837)
- Waterbody Group 2 refers to: Ikaluit Lake (71.95791, -80.08263)
- Waterbody Group 3 refers to: Tugaat Lake (71.89755, -79.28922)

Waters:

Water Body: Waterbody Group 1 - See Conditions  
Point A: 0° 0' N, 0° 0' W

Species: Arctic Char (SR OR LL)				Gear: 10 MM Mesh Gillnets and Larger				
Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
			200	44				

Water Body: Waterbody Group 2 - See Conditions  
Point A: 0° 0' N, 0° 0' W

Species: Arctic Char (SR OR LL)				Gear: 10 MM Mesh Gillnets and Larger				
Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
			200	44				

Water Body: Waterbody Group 3 - See Conditions  
Point A: 0° 0' N, 0° 0' W



Species: Arctic Char (SR OR LL)

Gear: 10 MM Mesh Gillnets and Larger

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
			200	44				

**Fishing Period:** August 21, 2024 to September 30, 2024

**A copy of this licence must be available at the study site and produced at the request of a fishery officer.**

**Live fish may not be retained unless specified in the conditions of this licence.**

**The licence holder shall immediately cease fishing when the total fish killed or live sampled reaches any of the maximums set for any of the species listed.**

**Transportation:**

Other approvals/permits may be necessary to collect or transport certain species, such as Marine Mammal Transportation Permits. For marine mammal parts, products and derivatives a Marine Mammal Transportation Licence is required for domestic transport and, for international transport a Canadian CITES Export Permit is also required.

**Report on Activities:**

The Project Authority will submit to the Area Licensing Coordinator, Department of Fisheries and Oceans, within one month of the expiry date, a report stating:

- i) whether or not the field work was conducted; and if conducted
- ii) waterbody location, fishing coordinates, gear types used at each coordinate, numbers or amount of fish (by species) collected and/or marked and the date or period of collection.

A Summary Harvest Report template is provided by the Licensing Coordinator at time of issuance of this licence .

The Project Authority also will provide a copy of any published or public access documents which result from the project . Information supplied will be used for population management purposes by the Department of Fisheries and Oceans and becomes part of the public record.

All documents should be sent to:  
DFO.ArcticLicensing-PermisArctique.MPO@dfo-mpo.gc.ca

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Jessica DeGrave  
A/ Regional Director, Fisheries Management  
Arctic Region  
Fisheries and Oceans Canada

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Date

For the Minister of Fisheries and Oceans.  
Pursuant to Section 52 of the Fishery (General) Regulations.



## Licensed Waterbodies





**APPENDIX G**  
**LABORATORY REPORTS**



2024/2025	Qualitative characteristics (pattern clarity)	Quantitative characteristics (repeatability)
Very Good (VG)	annuli are clear with no interpretation problems	Reader always gets the same age
Good (G)	annuli are clear with a few easy interpretation problems	Reader would get the same age most of the time for fish <10 years, within one year for fish 11-20 years
Fair (F)	annuli are fairly clear with some areas presenting easy and moderate interpretation problems	Reader would be within 1 year most of the time for fish <10 years and 2-3 years for fish >10 years
Poor (P)	annuli are fairly unclear presenting a number of difficult interpretation problems	Reader would be within 2-3 years most of the time for fish <10 years and 4-5 years for fish >10 years
Very Poor (VP)	annuli are very unclear presenting significant interpretation problems	Reader has little confidence in repeatability of age within 4-5 years



2024/2025

Date Received: 30-Jan-25  
 Company Name: Minnow Environmental  
 Project Name & #: Milne Inlet #247202.00XX  
 Client Contact: Samantha Burke  
 Client Email: [Samantha.Burke@minnow.ca](mailto:Samantha.Burke@minnow.ca)  
 # & Type of Structures: 50 OT + 7 FR = 57  
 Work to be Completed: set/section/age  
 Special Instructions: na  
 Inventoried By: Ambrose  
 Set / Processed By: RT/JP  
 Ageing Code: AGE-24-68  
 Invoice: [49 OT + 8 FR = 57](#)

Location	Date	Structures (FR/OT/SC)	Species	Fish #	Age	Con. Index KA	QA/QC DS	Comments
IKLL	27-Aug-24	OT	ARCH	1	10	G	10	BA-IKLL-AC-OT-01-Aug-27
IKLL	27-Aug-24	OT	ARCH	2	14	G	13	BA-IKLL-AC-OT-02-Aug-27
IKLL	27-Aug-24	OT	ARCH	3	11	G	11	BA-IKLL-AC-OT-03-Aug-27
IKLL	27-Aug-24	OT	ARCH	4	9	G		BA-IKLL-AC-OT-04-Aug-27
IKLL	27-Aug-24	OT	ARCH	5	8	G		BA-IKLL-AC-OT-05-Aug-27
IKLL	27-Aug-24	OT	ARCH	6	11	G		BA-IKLL-AC-OT-06-Aug-27
IKLL	27-Aug-24	OT	ARCH	7	10	G		BA-IKLL-AC-OT-07-Aug-27
IKLL	27-Aug-24	OT	ARCH	8	10	G		BA-IKLL-AC-OT-08-Aug-27
IKLL	27-Aug-24	OT	ARCH	9	16	G		BA-IKLL-AC-OT-09-Aug-27
IKLL	27-Aug-24	OT	ARCH	10	7	G		BA-IKLL-AC-OT-10-Aug-27
IKLL	27-Aug-24	FR	ARCH	11	9	F		BA-IKLL-AC-OT-11-Aug-27
IKLL	27-Aug-24	OT	ARCH	12	10	G		BA-IKLL-AC-OT-12-Aug-27
IKLL	27-Aug-24	OT	ARCH	13	13	G		BA-IKLL-AC-OT-13-Aug-27
IKLL	27-Aug-24	OT	ARCH	14	15	G		BA-IKLL-AC-OT-14-Aug-27
IKLL	27-Aug-24	OT	ARCH	15	10	G		BA-IKLL-AC-OT-15-Aug-27
IKLL	27-Aug-24	OT	ARCH	16	12	G		BA-IKLL-AC-OT-16-Aug-27
IKLL	27-Aug-24	OT	ARCH	17	13	G		BA-IKLL-AC-OT-17-Aug-27
IKLL	27-Aug-24	FR	ARCH	18	8	F		BA-IKLL-AC-OT-18-Aug-27
IKLL	27-Aug-24	OT	ARCH	19	13	G		BA-IKLL-AC-OT-19-Aug-27
IKLL	27-Aug-24	OT	ARCH	20	10	G		BA-IKLL-AC-OT-20-Aug-27
IKLL	27-Aug-24	OT	ARCH	21	10	G		BA-IKLL-AC-OT-21-Aug-27
IKLL	27-Aug-24	OT	ARCH	22	14	G		BA-IKLL-AC-OT-22-Aug-27
IKLL	28-Aug-24	OT	ARCH	23	9	G		BA-IKLL-AC-OT-23-Aug-28
IKLL	28-Aug-24	OT	ARCH	24	14	G		BA-IKLL-AC-OT-24-Aug-28
IKLL	28-Aug-24	FR	ARCH	25	10	P		BA-IKLL-AC-OT-25-Aug-28
IKLL	28-Aug-24	OT	ARCH	26	8	G		BA-IKLL-AC-OT-26-Aug-28
IKLL	28-Aug-24	OT	ARCH	27	10	G		BA-IKLL-AC-OT-27-Aug-28
IKLL	28-Aug-24	OT	ARCH	28	9	G		BA-IKLL-AC-OT-28-Aug-28
IKLL	28-Aug-24	OT	ARCH	29	11	G		BA-IKLL-AC-OT-29-Aug-28
IKLL	28-Aug-24	FR	ARCH	30	13	F		BA-IKLL-AC-OT-30-Aug-28
IKLL	28-Aug-24	OT	ARCH	31	11	G		BA-IKLL-AC-OT-31-Aug-28
IKLL	28-Aug-24	OT	ARCH	32	16	G		BA-IKLL-AC-OT-32-Aug-28
IKLL	28-Aug-24	FR	ARCH	33	7	F		BA-IKLL-AC-OT-33-Aug-28
IKLL	28-Aug-24	OT	ARCH	34	12	G		BA-IKLL-AC-OT-34-Aug-28
IKLL	28-Aug-24	OT	ARCH	35	10	G		BA-IKLL-AC-OT-35-Aug-28
IKLL	28-Aug-24	FR	ARCH	36	7	G	7	BA-IKLL-AC-OT-36-Aug-28
IKLL	28-Aug-24	OT	ARCH	37	14	G	14	BA-IKLL-AC-OT-37-Aug-28
QURL	28-Aug-24	OT	ARCH	1	15	G	15	BA-QURL-AC-OT-01-Aug-28
QURL	28-Aug-24	OT	ARCH	2	13	G	12	BA-QURL-AC-OT-02-Aug-28
QURL	28-Aug-24	OT	ARCH	3	13	G	13	BA-QURL-AC-OT-03-Aug-28
QURL	29-Aug-24	FR	ARCH	4	16	F		BA-QURL-AC-OT-04-Aug-29
QURL	29-Aug-24	FR	ARCH	5	14	G		BA-QURL-AC-OT-05-Aug-29
QURL	29-Aug-24	OT	ARCH	6	14	G		BA-QURL-AC-OT-06-Aug-29
QURL	29-Aug-24	OT	ARCH	7	14	G		BA-QURL-AC-OT-07-Aug-29
QURL	29-Aug-24	OT	ARCH	8	25	G		BA-QURL-AC-OT-08-Aug-29
QURL	29-Aug-24	OT	ARCH	9	18	G		BA-QURL-AC-OT-09-Aug-29
QURL	29-Aug-24	OT	ARCH	10	13	G		BA-QURL-AC-OT-10-Aug-29
QURL	30-Aug-24	OT	ARCH	11	15	G		BA-QURL-AC-OT-11-Aug-30
QURL	30-Aug-24	OT	ARCH	12	14	G		BA-QURL-AC-OT-12-Aug-30
QURL	30-Aug-24	OT	ARCH	13	14	G		BA-QURL-AC-OT-13-Aug-30
QURL	30-Aug-24	OT	ARCH	14	14	G		BA-QURL-AC-OT-14-Aug-30
QURL	30-Aug-24	OT	ARCH	15	13	G		BA-QURL-AC-OT-15-Aug-30
QURL	30-Aug-24	OT	ARCH	16	14	G		BA-QURL-AC-OT-16-Aug-30
QURL	30-Aug-24	OT	ARCH	17	12	G		BA-QURL-AC-OT-17-Aug-30
QURL	30-Aug-24	OT	ARCH	18	13	G		BA-QURL-AC-OT-18-Aug-30
QURL	30-Aug-24	OT	ARCH	19	14	G		BA-QURL-AC-OT-19-Aug-30
QURL	30-Aug-24	OT	ARCH	20	14	G		BA-QURL-AC-OT-20-Aug-30



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.097	0.295	0.139	1.5	0.001	0.005					
Length (µm)											
0.4	0.546	16	4.4	98	99	16	7.9	7.9	151	113	12
1.1	0.667	17	4.8	106	102	25	9.6	8.8	163	117	18
1.8	0.469	16	4.0	115	97	17	6.8	7.2	176	111	12
2.5	0.104	16	3.8	114	98	17	1.5	6.9	175	112	12
3.1	0.317	15	3.6	102	80	15	4.6	6.5	156	91	11
3.8	0.346	14	4.0	98	93	16	5.0	7.4	150	107	11
4.5	0.459	16	4.2	115	100	18	6.6	7.6	177	115	13
5.2	1.2	20	4.2	127	106	20	18	7.7	195	121	15
5.9	0.452	14	3.8	99	91	14	6.5	6.9	151	104	10
6.6	0.097	15	3.5	97	95	17	1.4	6.4	148	109	12
7.3	0.383	16	4.0	91	89	14	5.5	7.3	140	102	11
8.0	0.448	15	4.3	104	96	18	6.5	7.8	159	110	13
8.7	0.417	16	3.7	116	109	16	6.0	6.7	178	125	12
9.4	0.498	13	4.3	100	77	15	7.2	7.9	153	88	11
10.1	0.275	14	3.9	106	100	16	4.0	7.1	163	114	12
10.8	0.355	17	4.2	105	102	17	5.1	7.6	161	117	13
11.5	0.295	16	3.8	98	84	19	4.3	6.9	151	96	14
12.2	0.298	15	3.3	105	86	14	4.3	6.1	161	98	11
12.9	0.281	16	4.7	104	105	17	4.1	8.5	160	121	13
13.6	0.670	16	4.1	88	92	16	9.7	7.5	134	106	11
14.3	0.403	14	3.9	94	98	19	5.8	7.1	144	112	14
15.0	0.379	20	3.7	111	91	14	5.5	6.8	170	104	10
15.7	0.271	14	4.3	107	92	17	3.9	7.8	164	106	12
16.4	0.326	16	4.3	115	96	16	4.7	7.9	177	109	12
17.1	0.132	14	3.7	93	85	15	1.9	6.8	143	97	11
17.8	0.456	16	3.7	100	89	17	6.6	6.7	153	101	13
18.5	0.462	18	3.7	116	100	16	6.7	6.7	178	115	12
19.2	0.409	17	3.7	98	104	17	5.9	6.7	151	119	12
19.9	0.254	15	3.8	96	92	16	3.7	6.9	147	105	12
20.6	0.471	17	3.8	106	95	15	6.8	6.9	162	109	11
21.3	0.576	14	3.3	98	102	17	8.3	6.1	150	116	12
22.0	0.472	17	3.7	98	108	17	6.8	6.8	150	123	12
22.7	0.097	16	3.0	94	91	16	1.4	5.5	145	104	12
23.4	0.485	17	3.7	104	104	17	7.0	6.7	160	119	13
24.1	0.428	16	3.5	114	88	15	6.2	6.3	174	101	11
24.8	0.097	16	3.8	107	96	17	1.4	6.9	165	110	12
25.5	0.301	16	3.7	97	87	14	4.3	6.7	149	100	10
26.2	0.402	14	3.5	97	94	17	5.8	6.3	149	108	12
26.9	0.228	15	3.3	90	90	17	3.3	6.0	137	103	12
27.6	0.614	16	2.9	101	87	14	8.9	5.3	154	100	10
28.3	0.500	15	3.1	99	83	15	7.2	5.6	151	95	11
28.9	0.322	14	3.3	101	90	18	4.6	6.0	155	102	13
29.6	0.314	16	3.5	98	92	13	4.5	6.3	151	105	9.6
30.3	0.737	14	3.3	99	96	17	11	6.0	151	110	12
31.0	0.350	16	2.9	89	90	15	5.1	5.4	137	103	11
31.7	0.302	16	2.9	88	84	14	4.4	5.3	134	96	10
32.4	0.445	15	3.5	96	90	14	6.4	6.4	147	103	11
33.1	0.097	13	3.9	94	95	15	1.4	7.0	144	109	11
33.8	0.395	15	4.4	97	104	18	5.7	8.0	148	119	13
34.5	0.097	17	3.9	123	95	17	1.4	7.0	189	109	12
35.2	0.352	15	3.0	90	88	15	5.1	5.4	138	101	11
35.9	0.230	13	3.2	96	90	15	3.3	5.8	147	103	11
36.6	0.378	13	3.4	84	94	16	5.5	6.2	129	108	12
37.3	0.146	15	3.1	89	85	15	2.1	5.7	136	97	11
38.0	0.412	14	2.9	102	89	16	6.0	5.3	156	102	12
38.7	0.243	12	2.2	86	77	15	3.5	4.0	132	88	11
39.4	0.306	13	3.2	83	86	15	4.4	5.9	127	98	11
40.1	0.155	15	3.2	90	96	21	2.2	5.8	139	110	15
40.8	0.545	16	3.1	92	95	17	7.9	5.6	141	109	12
41.5	0.566	16	3.1	96	91	16	8.2	5.6	147	104	11
42.2	0.097	13	2.6	86	87	16	1.4	4.8	132	99	12
42.9	0.097	14	2.7	105	102	19	1.4	5.0	161	117	14
43.6	0.188	16	3.2	83	89	15	2.7	5.8	127	101	11
44.3	0.100	14	2.9	90	77	13	1.4	5.2	138	88	9.2
45.0	0.515	15	3.1	99	89	15	7.4	5.6	151	102	11
45.7	0.097	15	2.5	92	88	15	1.4	4.6	141	101	11
46.4	0.356	13	3.2	105	93	16	5.1	5.9	160	106	11
47.1	0.218	14	3.0	77	85	16	3.1	5.4	119	97	12
47.8	0.305	18	3.2	97	100	16	4.4	5.8	149	114	11
48.5	0.327	14	3.0	88	84	12	4.7	5.5	134	96	9.0
49.2	0.403	13	2.8	91	93	15	5.8	5.2	139	106	11
49.9	0.263	14	2.5	91	87	14	3.8	4.6	140	99	10
50.6	0.384	15	2.7	73	85	14	5.5	4.8	112	97	10.0
51.3	0.192	16	3.0	88	88	15	2.8	5.4	134	101	11
52.0	0.799	13	2.5	85	89	14	12	4.6	131	101	10
52.7	0.314	15	2.8	80	86	15	4.5	5.1	123	98	11
53.4	0.235	14	3.0	86	92	17	3.4	5.4	132	105	13
54.1	0.302	14	3.0	79	82	13	4.4	5.4	120	93	9.3
54.7	0.159	16	3.0	86	92	15	2.3	5.4	131	105	11
55.4	0.204	13	3.1	95	95	15	2.9	5.7	146	109	11
56.1	0.403	15	2.5	88	89	16	5.8	4.6	135	102	12



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Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
56.8	0.604	15	3.3	87	90	16	8.7	6.0	133	103	12
57.5	0.097	14	3.3	90	86	16	1.4	6.0	138	99	12
58.2	0.443	14	3.2	90	88	14	6.4	5.9	138	101	10
58.9	0.512	14	2.7	112	84	14	7.4	4.8	172	97	11
59.6	0.323	13	2.6	85	92	14	4.7	4.8	130	105	10
60.3	0.574	15	3.3	88	95	14	8.3	6.0	135	108	10
61.0	0.097	15	2.5	88	82	17	1.4	4.6	135	93	12
61.7	0.605	17	3.2	90	93	18	8.7	5.9	138	106	13
62.4	0.149	16	2.8	79	88	16	2.1	5.0	122	101	12
63.1	0.256	14	2.7	75	76	12	3.7	5.0	115	87	8.9
63.8	0.205	15	3.0	83	94	15	3.0	5.4	128	107	11
64.5	0.632	14	2.8	93	99	18	9.1	5.0	142	114	13
65.2	0.106	14	3.1	97	89	15	1.5	5.6	149	102	11
65.9	0.097	14	3.2	88	90	13	1.4	5.9	134	103	9.8
66.6	0.097	14	2.8	86	94	17	1.4	5.1	132	107	13
67.3	0.369	14	3.1	90	97	17	5.3	5.6	137	111	12
68.0	0.585	15	3.4	104	96	17	8.4	6.2	159	110	12
68.7	0.443	16	2.7	92	88	13	6.4	4.8	140	100	9.7
69.4	0.106	16	2.7	86	85	17	1.5	4.9	132	98	12
70.1	0.097	13	3.0	83	99	16	1.4	5.4	128	113	11
70.8	0.199	15	3.2	92	90	17	2.9	5.8	141	102	13
71.5	0.276	15	3.1	89	85	16	4.0	5.7	136	97	11
72.2	0.537	14	2.6	87	92	14	7.8	4.7	134	105	10
72.9	0.108	13	3.4	85	94	14	1.6	6.1	130	108	10
73.6	0.222	15	3.0	84	88	15	3.2	5.5	129	101	11
74.3	0.523	14	3.8	93	97	17	7.6	7.0	142	111	13
75.0	0.666	13	2.9	89	89	15	9.6	5.4	136	102	11
75.7	0.313	14	2.6	84	91	14	4.5	4.8	129	104	10
76.4	0.188	13	3.0	81	94	16	2.7	5.5	124	107	12
77.1	0.479	14	3.4	91	95	19	6.9	6.2	139	109	14
77.8	0.465	14	2.9	88	97	15	6.7	5.3	135	111	11
78.5	0.414	17	3.4	84	94	18	6.0	6.2	129	107	13
79.2	0.410	14	2.6	83	94	15	5.9	4.8	128	108	11
79.9	0.431	18	3.3	85	89	17	6.2	5.9	130	102	12
80.5	0.299	15	2.8	84	87	15	4.3	5.2	129	100	11
81.2	0.097	16	3.1	84	88	15	1.4	5.6	128	100	11
81.9	0.730	16	2.7	88	97	16	11	5.0	135	111	12
82.6	0.097	14	2.8	80	86	14	1.4	5.1	123	99	10.0
83.3	0.391	14	3.6	85	86	14	5.6	6.6	131	99	11
84.0	0.751	17	3.2	93	96	16	11	5.9	143	110	12
84.7	0.097	18	3.1	96	99	17	1.4	5.7	148	113	12
85.4	0.143	15	2.8	88	86	14	2.1	5.1	135	99	10
86.1	0.104	13	3.4	83	90	16	1.5	6.2	127	102	11
86.8	0.510	15	2.9	87	88	17	7.4	5.2	134	100	12
87.5	0.362	15	3.2	83	91	16	5.2	5.9	128	105	11
88.2	0.334	16	3.3	89	95	16	4.8	6.0	136	109	11
88.9	0.097	16	3.2	93	91	15	1.4	5.8	142	104	11
89.6	0.354	14	3.5	82	95	15	5.1	6.3	126	109	11
90.3	0.472	14	3.3	83	85	16	6.8	6.0	128	97	11
91.0	0.480	16	2.9	83	93	16	6.9	5.2	127	106	12
91.7	0.358	15	3.0	86	85	16	5.2	5.5	131	97	12
92.4	0.628	15	3.2	95	99	13	9.1	5.9	145	113	9.3
93.1	0.142	15	3.5	74	86	15	2.0	6.4	114	98	11
93.8	0.267	13	2.9	78	84	13	3.9	5.3	120	96	9.5
94.5	0.664	17	3.3	77	75	14	9.6	6.1	118	86	10
95.2	0.329	16	3.1	90	86	15	4.8	5.6	138	99	11
95.9	0.410	16	3.4	84	89	14	5.9	6.2	128	101	10
96.6	0.101	15	2.8	76	86	13	1.5	5.2	116	98	9.5
97.3	0.280	17	3.1	86	91	17	4.0	5.7	132	104	12
98.0	0.202	14	3.1	89	91	15	2.9	5.6	136	105	11
98.7	0.180	14	2.5	83	81	13	2.6	4.5	126	93	9.4
99.4	0.420	13	3.0	70	89	14	6.1	5.4	107	102	10.0
100.1	0.363	15	3.6	83	91	15	5.2	6.6	127	104	11
100.8	0.633	19	3.1	80	86	16	9.1	5.6	123	99	12
101.5	0.378	16	3.1	101	91	15	5.5	5.7	155	104	11
102.2	0.142	15	3.0	72	78	12	2.0	5.5	110	89	8.6
102.9	0.180	15	3.1	77	81	15	2.6	5.6	117	93	11
103.6	0.244	15	3.5	95	89	14	3.5	6.5	145	101	10
104.3	0.097	15	3.1	79	85	14	1.4	5.6	121	98	10
105.0	0.717	15	3.0	99	98	17	10	5.4	151	112	12
105.7	0.500	16	2.4	78	89	15	7.2	4.3	120	102	11
106.3	0.403	15	3.0	81	97	16	5.8	5.5	124	111	11
107.0	0.449	15	2.8	83	97	14	6.5	5.1	127	111	10
107.7	0.371	16	3.1	85	91	15	5.4	5.7	130	104	11
108.4	0.185	16	2.7	76	88	15	2.7	4.9	116	100	11
109.1	0.472	16	3.2	79	84	17	6.8	5.8	121	96	12
109.8	0.298	14	2.8	77	104	17	4.3	5.1	117	119	12
110.5	0.270	15	2.8	78	81	15	3.9	5.2	120	92	11
111.2	0.097	16	2.7	75	84	18	1.4	5.0	115	96	13
111.9	0.277	15	2.5	76	88	14	4.0	4.6	117	101	10
112.6	0.278	16	3.1	82	93	16	4.0	5.6	125	106	12



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Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.3	0.318	13	3.0	69	91	13	4.6	5.4	106	104	9.7
114.0	0.097	17	2.8	82	88	15	1.4	5.2	125	101	11
114.7	0.435	14	2.1	75	77	13	6.3	3.8	116	88	9.6
115.4	0.111	15	2.5	78	94	18	1.6	4.6	120	108	13
116.1	0.271	14	2.9	68	91	14	3.9	5.3	104	104	10
116.8	0.550	14	2.7	68	85	14	7.9	5.0	105	97	9.9
117.5	0.733	14	3.8	73	89	18	11	7.0	112	102	13
118.2	0.101	16	2.2	75	92	16	1.5	4.1	116	105	12
118.9	0.338	14	2.4	69	80	14	4.9	4.3	106	91	10
119.6	0.149	14	2.8	73	86	14	2.2	5.1	113	99	10
120.3	0.152	16	2.9	67	87	16	2.2	5.3	102	99	12
121.0	0.097	14	2.3	69	81	15	1.4	4.1	105	93	11
121.7	0.186	14	2.2	76	89	13	2.7	4.0	116	102	9.3
122.4	0.228	13	2.1	72	103	13	3.3	3.9	111	118	9.7
123.1	0.354	14	2.2	66	89	16	5.1	4.0	101	102	11
123.8	0.641	16	2.8	79	92	15	9.3	5.0	120	105	11
124.5	0.097	14	2.3	81	93	16	1.4	4.3	124	106	12
125.2	0.611	13	2.6	68	76	13	8.8	4.7	104	87	9.8
125.9	0.503	14	2.9	75	91	13	7.3	5.4	115	104	9.6
126.6	0.156	15	2.5	79	97	14	2.2	4.6	120	111	10
127.3	0.105	13	2.3	72	84	15	1.5	4.1	110	96	11
128.0	0.749	13	2.1	64	74	11	11	3.8	97	85	8.3
128.7	0.097	13	2.2	74	94	14	1.4	4.1	114	107	10
129.4	0.306	13	2.3	68	87	14	4.4	4.2	105	99	10
130.1	0.320	14	2.4	74	82	14	4.6	4.3	114	94	10
130.8	0.509	16	2.5	77	97	15	7.3	4.6	118	111	11
131.5	0.097	13	2.4	80	90	12	1.4	4.3	122	103	8.8
132.1	0.195	13	2.3	74	93	14	2.8	4.3	114	107	9.9
132.8	0.298	14	2.5	64	79	14	4.3	4.6	98	90	10
133.5	0.103	14	2.4	75	88	13	1.5	4.4	114	101	9.6
134.2	0.407	14	2.5	75	88	15	5.9	4.5	115	100	11
134.9	0.289	14	2.4	79	92	15	4.2	4.3	121	105	11
135.6	0.097	14	2.5	72	89	14	1.4	4.5	110	102	10
136.3	0.103	12	1.9	67	82	14	1.5	3.5	103	94	10
137.0	0.443	12	2.3	68	79	14	6.4	4.2	105	90	9.9
137.7	0.147	12	2.1	73	80	16	2.1	3.9	112	92	12
138.4	0.705	14	2.6	73	79	12	10	4.8	112	91	8.8
139.1	0.506	14	2.1	66	87	13	7.3	3.9	102	99	9.8
139.8	0.245	11	2.3	72	92	14	3.5	4.2	110	105	10
140.5	0.097	15	2.0	78	93	16	1.4	3.7	119	106	11
141.2	0.097	13	2.4	65	81	17	1.4	4.3	100	92	12
141.9	0.357	12	2.3	68	80	13	5.2	4.2	104	92	9.8
142.6	0.226	13	2.4	63	94	15	3.3	4.5	97	107	11
143.3	0.110	14	2.9	70	89	15	1.6	5.3	107	102	11
144.0	0.258	13	2.5	57	80	15	3.7	4.5	87	91	11
144.7	0.318	12	2.2	64	93	14	4.6	3.9	98	107	10
145.4	0.597	12	2.2	67	88	14	8.6	4.0	103	100	10
146.1	0.097	15	2.5	65	90	15	1.4	4.6	99	103	11
146.8	0.379	14	2.6	74	94	15	5.5	4.7	113	107	11
147.5	0.346	14	2.1	67	81	14	5.0	3.8	103	93	10
148.2	0.232	14	2.3	64	96	16	3.4	4.2	98	110	12
148.9	0.436	13	1.7	67	86	11	6.3	3.2	102	99	8.3
149.6	0.099	11	2.1	63	78	14	1.4	3.9	97	89	10
150.3	0.223	12	2.1	62	82	12	3.2	3.8	96	94	8.8
151.0	0.349	13	1.9	67	84	14	5.0	3.5	102	97	10
151.7	0.136	11	1.7	62	81	13	2.0	3.2	96	93	9.6
152.4	0.105	13	2.2	64	88	12	1.5	4.0	99	100	8.8
153.1	0.097	14	2.3	64	90	15	1.4	4.2	98	103	11
153.8	0.250	14	2.5	71	91	17	3.6	4.6	109	104	12
154.5	0.102	13	2.0	59	79	12	1.5	3.7	90	90	9.0
155.2	0.097	15	1.7	71	96	14	1.4	3.1	109	110	11
155.9	0.269	12	2.0	60	79	12	3.9	3.6	92	91	9.0
156.6	0.201	14	2.0	65	90	13	2.9	3.7	99	103	9.8
157.3	0.097	14	2.0	58	89	13	1.4	3.7	88	102	9.6
158.0	0.593	14	1.8	65	84	14	8.6	3.2	100	96	10
158.6	0.097	12	2.2	51	80	13	1.4	4.0	79	91	9.8
159.3	0.150	11	2.2	57	82	13	2.2	4.0	87	93	9.8
160.0	0.109	14	2.3	66	87	14	1.6	4.2	102	100	11
160.7	0.533	13	2.1	63	88	16	7.7	3.8	96	100	11
161.4	0.364	12	2.3	65	79	13	5.2	4.2	99	90	9.6
162.1	0.097	12	2.1	59	87	12	1.4	3.9	90	99	9.1
162.8	0.320	14	2.1	62	86	13	4.6	3.8	95	98	9.8
163.5	0.388	13	2.0	62	84	14	5.6	3.7	94	96	10
164.2	0.261	13	1.9	67	88	11	3.8	3.4	103	101	8.0
164.9	0.325	12	1.6	56	84	14	4.7	2.9	87	96	10
165.6	0.097	11	2.0	57	83	12	1.4	3.7	88	95	8.6
166.3	0.524	12	1.9	61	88	15	7.6	3.4	93	101	11
167.0	0.097	13	2.0	54	78	13	1.4	3.6	82	89	9.4
167.7	0.400	14	2.1	69	90	14	5.8	3.8	106	103	11
168.4	0.539	11	1.7	58	83	14	7.8	3.2	88	95	10
169.1	0.106	10	2.4	59	88	14	1.5	4.4	90	100	9.9



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Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
169.8	0.290	11	1.8	63	86	15	4.2	3.3	96	98	11
170.5	0.557	13	2.0	51	79	13	8.0	3.7	78	90	9.4
171.2	0.147	12	2.2	56	78	12	2.1	3.9	85	89	8.8
171.9	0.097	12	2.0	61	85	15	1.4	3.7	93	97	11
172.6	0.107	11	1.5	55	86	14	1.5	2.7	84	99	10
173.3	0.227	11	1.5	54	78	12	3.3	2.7	82	89	8.5
174.0	0.097	14	1.8	55	83	13	1.4	3.3	84	95	9.8
174.7	0.423	10	1.5	56	81	12	6.1	2.7	85	92	8.7
175.4	0.368	11	1.4	47	69	10	5.3	2.6	71	79	7.3
176.1	0.152	13	2.4	51	87	13	2.2	4.4	79	99	9.7
176.8	0.553	12	1.7	46	81	12	8.0	3.1	70	92	8.4
177.5	0.478	11	1.8	54	84	15	6.9	3.2	83	97	11
178.2	0.097	12	1.9	57	84	15	1.4	3.5	87	96	11
178.9	0.197	12	1.7	55	82	13	2.8	3.0	84	94	9.8
179.6	0.097	12	1.8	55	93	16	1.4	3.3	85	107	12
180.3	0.556	13	1.5	53	80	13	8.0	2.8	81	91	9.3
181.0	0.097	13	1.8	59	83	11	1.4	3.3	91	95	8.3
181.7	0.101	13	1.8	47	79	15	1.5	3.3	72	91	11
182.4	0.097	11	1.8	50	82	12	1.4	3.3	76	94	8.8
183.1	0.555	11	2.0	51	82	14	8.0	3.7	79	94	10
183.8	0.097	12	1.6	49	82	15	1.4	3.0	76	93	11
184.4	0.254	12	1.7	48	93	14	3.7	3.0	74	107	10
185.1	0.097	11	1.7	43	86	13	1.4	3.0	66	98	9.6
185.8	0.233	11	1.7	44	84	13	3.4	3.0	67	96	9.3
186.5	0.097	13	1.6	49	91	13	1.4	2.9	75	104	9.4
187.2	0.318	12	1.4	51	82	12	4.6	2.6	78	93	8.8
187.9	0.390	11	1.7	49	92	13	5.6	3.2	74	105	9.6
188.6	0.097	10	1.7	43	79	12	1.4	3.1	65	91	8.8
189.3	0.115	13	1.7	47	89	15	1.7	3.1	73	101	11
190.0	0.110	12	1.6	47	84	16	1.6	2.9	72	96	11
190.7	0.111	12	1.5	48	84	14	1.6	2.8	74	96	10
191.4	0.295	12	1.9	48	90	14	4.3	3.4	74	103	10
192.1	0.535	11	1.4	42	86	13	7.7	2.5	64	99	9.8
192.8	0.383	12	1.6	48	96	13	5.5	3.0	74	109	9.4
193.5	0.485	12	1.6	50	85	15	7.0	3.0	77	98	11
194.2	0.480	13	1.7	50	85	14	6.9	3.1	77	97	10
194.9	0.267	11	1.2	46	79	10	3.9	2.3	71	91	7.5
195.6	0.109	11	1.6	47	86	15	1.6	2.9	72	99	11
196.3	0.354	13	1.4	42	99	13	5.1	2.5	65	113	9.8
197.0	0.299	11	1.6	47	77	13	4.3	2.9	72	88	9.8
197.7	0.097	12	1.6	50	88	11	1.4	2.8	76	100	8.3
198.4	0.097	11	1.5	49	95	14	1.4	2.7	75	108	10
199.1	0.097	12	1.5	42	93	14	1.4	2.6	65	107	10
199.8	0.197	13	1.6	46	84	13	2.8	3.0	71	96	9.8
200.5	0.206	12	1.2	44	86	17	3.0	2.2	68	98	12
201.2	0.317	9.9	1.2	40	73	12	4.6	2.1	61	84	8.6
201.9	0.097	11	1.4	39	80	10	1.4	2.5	59	92	7.6
202.6	0.284	11	1.5	42	85	14	4.1	2.7	65	97	10
203.3	0.097	10	1.1	44	85	11	1.4	2.0	68	97	8.2
204.0	0.097	12	1.5	47	98	13	1.4	2.8	71	112	9.2
204.7	0.097	14	1.2	41	88	13	1.4	2.2	63	101	9.7
205.4	0.354	12	0.990	40	88	11	5.1	1.8	61	100	8.2
206.1	0.275	12	1.4	40	83	12	4.0	2.6	61	95	8.5
206.8	0.274	11	1.4	39	87	12	4.0	2.6	60	99	8.9
207.5	0.194	13	1.1	40	85	13	2.8	2.1	61	97	9.3
208.2	0.514	9.6	1.1	39	87	10	7.4	2.0	59	100	7.5
208.9	0.143	11	1.5	40	74	12	2.1	2.7	61	85	9.0
209.6	0.159	11	1.3	42	87	14	2.3	2.4	65	99	10
210.2	0.187	11	1.1	36	73	14	2.7	2.0	54	84	10
210.9	0.376	11	1.2	38	87	12	5.4	2.1	58	99	9.0
211.6	0.097	12	1.3	39	86	12	1.4	2.3	59	98	8.6
212.3	0.144	11	1.3	40	83	11	2.1	2.3	61	95	7.8
213.0	0.365	9.9	0.672	43	86	10	5.3	1.2	65	98	7.6
213.7	0.305	12	1.1	43	90	12	4.4	2.1	66	103	8.6
214.4	0.272	11	1.1	37	85	11	3.9	2.0	57	98	8.3
215.1	0.097	12	0.864	39	88	13	1.4	1.6	59	101	9.1
215.8	0.256	14	1.2	38	90	10	3.7	2.2	58	103	7.6
216.5	0.199	11	1.2	43	82	12	2.9	2.1	66	94	8.9
217.2	0.275	11	1.2	39	90	11	4.0	2.1	59	102	8.3
217.9	0.328	11	0.962	38	84	11	4.7	1.8	59	96	8.1
218.6	0.241	10	0.797	38	93	13	3.5	1.5	58	107	9.8
219.3	0.431	12	1.0	40	90	13	6.2	1.9	61	103	9.4
220.0	0.366	11	0.855	40	83	9.8	5.3	1.6	61	95	7.2
220.7	0.629	13	0.859	40	91	11	9.1	1.6	61	104	8.1
221.4	0.102	11	0.949	33	87	11	1.5	1.7	51	100	8.0
222.1	0.170	11	1.1	43	91	12	2.5	2.1	66	104	8.6
222.8	0.155	13	1.1	39	80	10	2.2	2.0	59	91	7.6
223.5	0.168	12	1.1	41	98	15	2.4	2.0	63	113	11
224.2	0.097	10	1.1	39	89	10	1.4	2.0	60	102	7.6
224.9	0.097	9.0	0.853	37	86	11	1.4	1.6	57	99	7.7
225.6	0.097	11	1.4	38	88	11	1.4	2.5	58	101	8.3



Minnow Environmental  
Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.3	0.323	11	0.689	35	87	12	4.7	1.3	53	100	8.6
227.0	0.340	9.7	1.1	41	90	12	4.9	2.0	63	102	9.1
227.7	0.247	11	1.1	37	92	13	3.6	2.1	57	105	9.7
228.4	0.377	9.7	0.694	41	83	12	5.4	1.3	63	95	8.8
229.1	0.375	9.9	0.846	36	81	11	5.4	1.5	56	92	8.1
229.8	0.426	13	1.0	46	95	11	6.2	1.9	70	109	8.4
230.5	0.141	12	0.837	34	81	11	2.0	1.5	52	93	8.1
231.2	0.148	11	1.0	36	86	10	2.1	1.9	55	98	7.6
231.9	0.247	12	1.1	35	89	14	3.6	2.0	54	102	11
232.6	0.097	12	0.879	40	90	12	1.4	1.6	61	102	8.8
233.3	0.116	12	0.986	35	93	11	1.7	1.8	53	106	7.9
234.0	0.150	11	1.1	35	83	13	2.2	2.0	54	95	9.5
234.7	0.259	11	0.736	32	86	9.9	3.7	1.3	49	98	7.2
235.4	0.155	13	1.1	39	85	11	2.2	1.9	59	97	7.9
236.1	0.097	12	1.1	40	91	12	1.4	1.9	62	104	8.8
236.7	0.247	11	0.864	38	88	13	3.6	1.6	58	101	9.5
237.4	0.097	13	1.5	40	90	11	1.4	2.8	61	103	7.9
238.1	0.097	12	0.990	36	90	14	1.4	1.8	55	103	9.9
238.8	0.200	12	0.984	35	87	12	2.9	1.8	53	99	8.9
239.5	0.097	11	0.836	37	92	13	1.4	1.5	56	106	9.8
240.2	0.097	12	0.904	42	93	13	1.4	1.6	64	106	9.3
240.9	0.097	11	1.1	40	86	11	1.4	2.1	61	98	8.4
241.6	0.097	9.9	0.762	38	90	12	1.4	1.4	59	103	8.7
242.3	0.202	10	0.879	38	94	11	2.9	1.6	58	107	7.9
243.0	0.114	13	1.2	36	89	13	1.6	2.2	56	102	9.7
243.7	0.097	14	1.1	43	85	13	1.4	2.1	66	97	9.5
244.4	0.097	11	1.1	43	95	11	1.4	2.1	66	108	8.3
245.1	0.197	10	0.920	38	88	14	2.8	1.7	59	101	11
245.8	0.639	12	1.0	47	95	13	9.2	1.9	71	108	9.2
246.5	0.259	11	0.971	37	87	13	3.7	1.8	57	99	9.7
247.2	0.824	11	0.929	39	92	12	12	1.7	60	105	8.6
247.9	0.343	10	0.930	41	82	10	5.0	1.7	62	93	7.4
248.6	0.097	11	1.5	42	83	13	1.4	2.7	64	95	9.1
249.3	0.446	13	1.1	41	88	12	6.4	2.1	63	101	8.9
250.0	0.113	13	1.6	45	90	11	1.6	2.9	69	103	8.2
250.7	0.487	13	1.1	42	93	12	7.0	2.0	64	106	9.0
251.4	0.097	12	1.2	40	93	11	1.4	2.2	61	106	8.3
252.1	0.603	11	1.1	40	91	11	8.7	2.0	62	104	8.0
252.8	0.097	14	1.6	48	83	13	1.4	2.9	73	95	9.4
253.5	0.097	15	1.3	48	89	13	1.4	2.4	74	101	9.6
254.2	0.097	12	1.5	43	89	11	1.4	2.7	65	102	8.0
254.9	0.097	14	1.8	51	87	15	1.4	3.2	78	99	11
255.6	0.156	11	1.8	49	92	14	2.3	3.2	74	105	10
256.3	0.097	13	1.3	44	84	11	1.4	2.4	68	96	8.2
257.0	0.158	14	1.4	47	88	14	2.3	2.6	73	100	10
257.7	0.236	14	1.4	47	83	11	3.4	2.6	72	95	7.7
258.4	0.257	13	2.0	52	96	15	3.7	3.7	79	109	11
259.1	0.467	13	1.7	56	85	12	6.7	3.1	85	97	8.4
259.8	0.258	14	2.0	56	94	15	3.7	3.7	86	108	11
260.5	0.274	12	1.7	59	88	11	4.0	3.0	90	100	7.7
261.2	0.225	11	2.5	46	83	12	3.2	4.6	71	95	8.5
261.9	0.247	13	1.9	51	89	14	3.6	3.5	78	101	10
262.6	0.209	12	2.5	51	94	13	3.0	4.5	78	107	9.2
263.2	0.313	11	2.0	53	89	13	4.5	3.7	80	102	9.6
263.9	0.405	15	1.9	59	81	11	5.8	3.5	90	93	8.3
264.6	0.288	13	2.4	65	95	11	4.2	4.3	99	108	8.3
265.3	0.621	14	2.2	58	90	13	9.0	4.0	89	103	9.6
266.0	0.473	13	2.4	65	98	13	6.8	4.5	100	112	9.5
266.7	0.190	15	2.0	60	91	12	2.7	3.6	92	104	8.9
267.4	0.400	14	2.0	57	84	11	5.8	3.7	87	96	8.0
268.1	0.519	14	2.8	65	101	14	7.5	5.0	100	116	10
268.8	0.149	13	2.2	62	84	12	2.2	4.0	95	96	9.0
269.5	0.159	16	3.1	64	96	16	2.3	5.6	97	110	12
270.2	0.450	15	2.2	64	85	14	6.5	4.1	98	98	10
270.9	0.097	12	2.9	55	90	15	1.4	5.4	84	103	11
271.6	0.329	15	2.8	59	88	14	4.8	5.1	90	101	10
272.3	0.097	13	2.7	75	94	18	1.4	4.9	115	107	13
273.0	0.116	14	3.2	76	93	17	1.7	5.8	117	106	12
273.7	0.501	15	2.4	64	84	13	7.2	4.3	98	96	9.6
274.4	0.554	15	2.5	59	82	14	8.0	4.5	90	94	10
275.1	0.322	15	2.9	64	84	14	4.7	5.2	97	96	10
275.8	0.739	14	3.0	65	93	16	11	5.5	99	106	11
276.5	0.384	15	2.5	69	93	16	5.5	4.5	106	106	12
277.2	0.187	16	2.6	65	88	14	2.7	4.7	100	101	10
277.9	0.232	13	2.9	67	86	14	3.4	5.2	103	99	10
278.6	0.420	14	2.7	63	98	16	6.1	5.0	97	112	11
279.3	0.560	17	3.2	78	94	16	8.1	5.8	119	107	12
280.0	0.146	15	3.1	70	85	13	2.1	5.6	108	97	9.6
280.7	0.097	15	2.9	74	93	16	1.4	5.2	113	107	12
281.4	0.309	13	3.1	69	87	14	4.5	5.6	106	99	10
282.1	0.382	16	2.9	74	99	16	5.5	5.4	113	113	12



Minnow Environmental  
Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
282.8	0.231	14	3.2	81	88	14	3.3	5.9	125	101	10
283.5	0.243	16	3.0	83	93	14	3.5	5.5	128	107	10
284.2	0.100	12	2.8	73	89	15	1.4	5.1	112	102	11
284.9	0.101	14	2.8	78	87	15	1.5	5.2	119	99	11
285.6	0.105	16	3.3	77	89	16	1.5	6.0	118	102	12
286.3	0.111	15	3.9	89	84	18	1.6	7.1	136	96	13
287.0	0.322	15	3.1	75	90	15	4.6	5.6	115	103	11
287.7	0.097	15	3.7	82	93	18	1.4	6.7	125	106	13
288.4	0.532	13	3.5	77	95	15	7.7	6.4	118	109	11
289.0	0.097	15	3.2	77	95	16	1.4	5.9	117	109	12
289.7	0.439	16	4.4	92	105	16	6.3	8.1	142	120	12
290.4	0.519	16	3.4	89	100	16	7.5	6.2	136	115	12
291.1	0.275	14	3.7	77	97	16	4.0	6.8	117	111	12
291.8	0.194	15	4.0	83	97	15	2.8	7.3	127	111	11
292.5	0.219	18	4.5	91	105	18	3.2	8.2	140	121	13
293.2	0.452	17	3.4	88	98	14	6.5	6.2	135	112	10
293.9	0.422	17	3.4	94	96	17	6.1	6.2	144	110	12
294.6	0.281	16	3.9	84	97	16	4.1	7.0	129	110	12
295.3	0.329	16	4.5	95	98	17	4.8	8.2	145	112	13
296.0	0.376	15	3.4	77	88	15	5.4	6.2	118	101	11
296.7	0.522	16	3.7	84	97	16	7.5	6.8	129	110	12
297.4	0.199	15	4.2	88	93	15	2.9	7.7	135	106	11
298.1	0.299	18	4.2	91	108	16	4.3	7.7	140	123	12
298.8	0.556	18	4.3	91	100	17	8.0	7.8	139	115	13
299.5	0.108	18	4.3	101	102	16	1.6	7.8	154	117	12
300.2	0.097	17	3.9	82	90	15	1.4	7.1	126	103	11
300.9	0.223	19	3.9	88	94	15	3.2	7.1	134	108	11
301.6	0.182	16	3.8	79	99	18	2.6	6.8	121	113	13
302.3	0.196	17	3.7	102	100	19	2.8	6.7	157	114	14
303.0	0.490	16	4.3	90	103	19	7.1	7.8	138	117	14
303.7	0.097	16	4.0	103	101	16	1.4	7.3	158	115	11
304.4	0.203	14	3.8	86	89	16	2.9	6.9	132	101	12
305.1	0.407	17	4.1	90	101	18	5.9	7.6	138	116	13
305.8	0.243	15	4.1	97	110	18	3.5	7.4	149	125	13
306.5	0.385	17	4.7	100	106	19	5.6	8.5	153	121	14
307.2	0.097	15	4.1	92	97	19	1.4	7.4	141	111	14
307.9	0.762	15	3.8	94	99	17	11	7.0	143	114	12
308.6	0.226	15	4.6	88	104	19	3.3	8.4	135	119	14
309.3	0.536	17	4.6	90	106	20	7.7	8.5	139	121	14
310.0	0.224	15	4.2	103	96	17	3.2	7.7	158	110	12
310.7	0.190	16	3.6	94	100	17	2.7	6.6	145	114	12
311.4	0.179	15	3.5	100	95	15	2.6	6.4	153	109	11
312.1	0.226	16	4.2	99	102	18	3.3	7.6	151	116	13
312.8	0.099	15	3.9	92	91	14	1.4	7.1	141	104	10
313.5	0.730	15	4.0	93	90	16	11	7.3	142	103	12
314.2	0.461	14	4.0	113	94	15	6.7	7.3	174	108	11
314.9	0.295	15	4.2	80	102	14	4.3	7.6	122	117	9.9
315.5	0.148	14	4.0	97	108	21	2.1	7.4	148	124	15
316.2	0.237	16	4.1	94	99	17	3.4	7.5	144	114	13
316.9	0.268	14	4.4	93	103	18	3.9	8.0	142	118	13
317.6	0.265	15	3.7	96	94	11	3.8	6.8	147	108	7.8
318.3	0.097	15	4.2	91	99	15	1.4	7.7	140	113	11
319.0	0.097	15	3.6	91	95	18	1.4	6.6	139	109	13
319.7	0.097	15	3.6	100	95	14	1.4	6.6	153	109	10
320.4	0.097	14	4.0	105	101	14	1.4	7.3	160	115	10
321.1	0.313	14	3.6	92	101	14	4.5	6.6	141	116	11
321.8	0.274	14	3.7	98	96	15	4.0	6.8	150	109	11
322.5	0.265	16	3.7	89	89	18	3.8	6.8	136	102	13
323.2	0.297	14	3.9	89	90	16	4.3	7.2	136	103	12
323.9	0.278	17	4.2	93	101	14	4.0	7.6	143	116	9.9
324.6	0.314	15	3.1	87	93	15	4.5	5.7	133	107	11
325.3	0.097	16	4.1	98	104	17	1.4	7.4	151	119	12
326.0	0.097	13	3.1	84	89	14	1.4	5.6	128	102	10
326.7	0.228	14	3.6	87	99	13	3.3	6.6	133	113	9.6
327.4	0.402	14	3.3	94	105	16	5.8	5.9	143	120	12
328.1	0.261	15	3.2	91	92	15	3.8	5.9	140	105	11
328.8	0.320	13	3.4	106	98	13	4.6	6.2	162	112	9.8
329.5	0.402	14	3.3	95	95	15	5.8	6.0	145	109	11
330.2	0.263	15	3.2	93	91	13	3.8	5.9	142	104	9.8
330.9	0.429	16	3.1	90	98	13	6.2	5.7	138	112	9.5
331.6	0.410	15	3.3	85	120	15	5.9	6.1	131	137	11
332.3	0.097	13	3.6	96	92	13	1.4	6.5	147	105	9.5
333.0	0.139	16	2.9	85	94	13	2.0	5.2	131	107	9.6
333.7	0.190	15	3.2	88	99	12	2.7	5.8	135	114	9.1
334.4	0.144	17	2.9	90	98	13	2.1	5.2	138	112	9.4
335.1	0.466	15	3.4	92	95	16	6.7	6.3	142	109	12
335.8	0.097	17	3.5	84	106	12	1.4	6.3	128	121	9.0
336.5	0.097	15	3.1	91	93	15	1.4	5.7	139	107	11
337.2	0.319	13	2.8	85	92	11	4.6	5.1	130	106	8.4
337.9	0.097	15	3.4	91	104	13	1.4	6.2	140	119	9.1
338.6	0.097	15	3.1	80	94	14	1.4	5.7	123	107	10.0



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Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.3	0.112	16	2.8	94	100	13	1.6	5.2	144	114	9.1
340.0	0.165	16	3.5	84	95	15	2.4	6.4	129	108	11
340.7	0.224	14	2.6	79	92	12	3.2	4.8	121	106	8.7
341.4	0.097	16	2.8	90	97	13	1.4	5.0	138	110	9.2
342.1	0.101	14	3.0	81	94	12	1.5	5.6	125	108	8.5
342.7	0.097	15	3.0	84	99	13	1.4	5.4	129	113	9.3
343.4	0.097	16	3.5	94	100	16	1.4	6.3	143	115	11
344.1	0.097	15	2.9	83	97	11	1.4	5.3	127	111	8.2
344.8	0.266	15	2.7	75	89	12	3.8	4.9	115	102	8.8
345.5	0.282	16	2.8	87	95	13	4.1	5.1	133	109	9.4
346.2	0.097	15	2.6	85	96	13	1.4	4.8	131	110	9.3
346.9	0.235	17	2.7	76	97	11	3.4	4.9	116	110	7.8
347.6	0.097	15	2.4	79	106	12	1.4	4.4	121	121	8.7
348.3	0.341	15	2.7	80	97	11	4.9	5.0	122	111	7.7
349.0	0.097	14	2.6	81	98	11	1.4	4.7	124	112	7.7
349.7	0.097	14	3.0	90	101	11	1.4	5.5	139	116	7.9
350.4	0.197	18	2.6	80	92	10	2.8	4.8	122	106	7.5
351.1	0.198	15	2.9	79	96	13	2.9	5.4	121	110	9.3
351.8	0.342	15	2.6	74	99	13	4.9	4.8	113	113	9.1
352.5	0.282	15	2.8	73	95	10	4.1	5.2	111	109	7.6
353.2	0.097	15	2.7	81	94	9.3	1.4	4.8	124	107	6.8
353.9	0.332	14	3.1	84	94	12	4.8	5.6	129	108	9.0
354.6	0.244	16	3.8	79	103	13	3.5	6.9	121	118	9.2
355.3	0.204	14	3.3	75	100	12	2.9	6.0	115	115	8.6
356.0	0.097	14	2.5	72	96	11	1.4	4.6	110	110	8.1
356.7	0.361	14	3.3	72	98	11	5.2	6.0	111	113	8.2
357.4	0.317	13	2.5	72	102	10	4.6	4.5	110	116	7.5
358.1	0.097	15	2.4	65	111	12	1.4	4.3	100	127	8.7
358.8	0.114	14	2.6	82	105	14	1.6	4.7	125	120	10.0
359.5	0.267	14	2.4	64	89	11	3.8	4.4	98	101	7.9
360.2	0.097	14	2.5	73	107	12	1.4	4.5	112	122	8.5
360.9	0.097	13	2.3	74	101	12	1.4	4.2	113	115	8.4
361.6	0.204	14	2.6	66	106	11	2.9	4.8	101	121	8.2
362.3	0.187	13	2.4	60	98	11	2.7	4.4	92	112	7.7
363.0	0.287	13	2.3	67	99	9.7	4.1	4.3	103	113	7.1
363.7	0.419	14	2.4	72	93	11	6.0	4.5	111	107	8.1
364.4	0.097	13	2.4	65	107	9.9	1.4	4.3	100	122	7.2
365.1	0.430	13	2.5	61	108	11	6.2	4.6	94	123	8.2
365.8	0.097	15	2.1	65	105	12	1.4	3.8	100	120	9.0
366.5	0.241	15	2.4	70	107	11	3.5	4.4	107	123	8.3
367.2	0.097	13	1.9	58	97	10.0	1.4	3.6	89	110	7.3
367.9	0.144	14	2.3	56	100	9.0	2.1	4.1	85	115	6.5
368.6	0.270	13	2.2	50	110	8.8	3.9	4.1	77	126	6.5
369.2	0.097	12	2.2	60	97	9.3	1.4	3.9	92	111	6.8
369.9	0.206	13	2.2	58	115	11	3.0	3.9	88	132	8.1
370.6	0.136	12	1.6	44	101	8.4	2.0	2.9	68	116	6.1
371.3	0.471	12	1.8	57	111	11	6.8	3.2	87	127	8.0
372.0	0.401	14	2.0	57	127	11	5.8	3.7	87	145	7.9
372.7	0.117	15	1.9	55	121	11	1.7	3.5	84	138	8.2
373.4	0.316	12	2.0	49	109	8.8	4.6	3.6	75	124	6.4
374.1	0.341	14	1.9	51	121	11	4.9	3.5	78	138	7.9
374.8	0.097	12	1.9	49	121	9.2	1.4	3.4	75	139	6.7
375.5	0.468	14	2.0	54	114	9.1	6.8	3.6	82	130	6.6
376.2	0.610	13	2.3	52	122	9.1	8.8	4.2	80	140	6.6
376.9	0.097	11	2.0	47	129	8.4	1.4	3.7	72	147	6.1
377.6	0.097	12	2.0	46	127	7.8	1.4	3.7	71	145	5.7
378.3	0.097	12	2.2	48	149	8.5	1.4	4.1	73	171	6.2
379.0	0.290	11	1.7	47	133	8.6	4.2	3.1	72	152	6.3
379.7	0.235	14	1.6	49	152	9.0	3.4	2.8	75	173	6.6
380.4	0.229	10	1.7	38	123	9.3	3.3	3.0	59	140	6.8
381.1	0.663	12	2.0	44	128	9.5	9.6	3.7	68	146	6.9
381.8	0.200	11	1.8	41	130	9.8	2.9	3.4	63	148	7.1
382.5	0.161	9.9	1.6	45	135	9.3	2.3	2.9	69	154	6.8
383.2	0.097	10	1.6	43	127	7.8	1.4	3.0	66	146	5.7
383.9	0.149	11	1.9	42	125	6.6	2.2	3.4	64	143	4.8
384.6	0.432	12	1.7	39	131	8.7	6.2	3.1	60	150	6.3
385.3	0.455	12	1.4	39	132	8.6	6.6	2.6	59	151	6.2
386.0	0.305	12	2.2	39	132	8.8	4.4	4.0	60	151	6.4
386.7	0.097	12	1.7	44	151	9.1	1.4	3.0	67	172	6.6
387.4	0.810	11	1.8	39	147	5.9	12	3.2	59	168	4.3
388.1	0.112	11	1.9	36	143	8.2	1.6	3.5	54	163	6.0
388.8	0.119	13	1.9	38	151	8.8	1.7	3.4	59	173	6.5
389.5	0.097	12	1.7	34	137	6.0	1.4	3.1	51	156	4.4
390.2	0.097	11	1.4	37	148	7.8	1.4	2.5	57	169	5.7
390.9	0.398	9.9	2.3	30	132	8.6	5.7	4.2	45	150	6.3
391.6	0.097	9.4	1.7	29	138	7.3	1.4	3.1	45	158	5.4
392.3	0.109	10.0	1.8	33	144	7.9	1.6	3.4	51	165	5.8
393.0	0.485	10	1.5	33	142	7.8	7.0	2.8	51	162	5.7
393.7	0.218	11	1.5	27	137	7.5	3.1	2.7	42	157	5.5
394.4	0.421	12	2.1	31	151	8.8	6.1	3.8	48	173	6.4
395.0	0.228	9.1	1.2	29	142	6.9	3.3	2.3	44	163	5.0



Minnow Environmental  
Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
395.7	0.213	12	1.2	26	135	7.2	3.1	2.3	40	154	5.3
396.4	0.218	8.6	1.2	29	150	6.9	3.1	2.1	44	172	5.0
397.1	0.535	11	0.940	29	159	7.0	7.7	1.7	44	182	5.1
397.8	0.104	9.9	1.2	31	165	6.9	1.5	2.2	47	188	5.1
398.5	0.451	11	0.958	25	154	8.9	6.5	1.7	38	176	6.5
399.2	0.097	11	1.0	24	132	5.7	1.4	1.8	37	151	4.1
399.9	0.529	10	1.1	25	144	5.4	7.6	1.9	39	165	3.9
400.6	0.144	11	1.1	24	172	6.1	2.1	2.0	36	197	4.4
401.3	0.097	11	0.777	24	154	6.8	1.4	1.4	36	176	5.0
402.0	0.154	11	0.833	27	153	6.3	2.2	1.5	41	175	4.6
402.7	0.352	11	0.808	27	150	5.4	5.1	1.5	41	172	3.9
403.4	0.308	11	1.1	27	163	5.2	4.4	2.0	42	187	3.8
404.1	0.148	9.8	0.756	26	171	5.3	2.1	1.4	40	196	3.9
404.8	0.229	10	0.786	21	146	4.8	3.3	1.4	33	166	3.5
405.5	0.097	11	1.0	28	153	7.2	1.4	1.8	43	175	5.2
406.2	0.097	9.9	0.858	27	149	5.6	1.4	1.6	41	170	4.1
406.9	0.186	11	0.900	23	151	5.9	2.7	1.6	36	172	4.3
407.6	0.626	10	1.2	30	166	5.1	9.0	2.2	45	190	3.7
408.3	0.198	13	0.833	27	166	5.8	2.9	1.5	42	190	4.2
409.0	0.161	11	0.936	28	159	6.5	2.3	1.7	43	182	4.7
409.7	0.097	11	1.1	25	150	4.9	1.4	2.0	38	171	3.6
410.4	0.097	9.4	0.935	26	156	6.0	1.4	1.7	40	178	4.4
411.1	0.097	11	1.2	29	154	5.0	1.4	2.2	45	176	3.6
411.8	0.184	10	1.4	27	150	6.1	2.7	2.5	41	171	4.4
412.5	0.152	12	1.6	31	158	5.6	2.2	2.9	48	181	4.1
413.2	0.097	11	1.6	34	154	6.2	1.4	3.0	52	176	4.5
413.9	0.345	12	1.8	32	151	4.6	5.0	3.2	49	173	3.4
414.6	0.097	14	1.6	32	163	6.0	1.4	3.0	50	186	4.4
415.3	0.097	14	2.0	37	157	6.7	1.4	3.6	57	180	4.9
416.0	0.097	12	1.9	38	143	7.1	1.4	3.5	59	164	5.2
416.7	0.097	11	2.2	30	137	6.6	1.4	4.0	46	156	4.8
417.4	0.097	13	2.4	34	152	5.5	1.4	4.5	52	174	4.0
418.1	0.109	13	2.2	45	155	8.3	1.6	4.0	69	178	6.1
418.8	0.101	12	2.0	38	134	8.1	1.5	3.6	59	153	5.9
419.5	0.351	12	2.5	48	160	8.6	5.1	4.5	74	182	6.3
420.2	0.097	13	2.7	42	186	11	1.4	5.0	64	212	7.8
420.9	0.097	14	2.2	40	147	7.3	1.4	4.0	62	168	5.4
421.5	0.097	14	2.8	49	158	11	1.4	5.1	75	180	8.0
422.2	0.097	14	2.9	50	140	9.8	1.4	5.3	76	161	7.1
422.9	0.200	14	3.2	45	144	12	2.9	5.9	70	165	8.8
423.6	0.097	11	2.5	45	146	9.9	1.4	4.6	69	167	7.3
424.3	0.187	11	2.8	50	135	11	2.7	5.1	76	154	7.9
425.0	0.261	14	2.7	49	132	10	3.8	5.0	75	150	7.6
425.7	0.111	13	3.1	64	152	12	1.6	5.6	98	174	8.8
426.4	0.211	11	2.7	45	133	12	3.1	5.0	70	152	9.0
427.1	0.149	12	2.4	50	166	13	2.1	4.4	77	189	9.7
427.8	0.097	14	3.1	54	141	14	1.4	5.7	82	161	10
428.5	0.581	12	3.5	52	139	15	8.4	6.4	79	159	11
429.2	0.097	13	3.1	56	136	15	1.4	5.6	86	155	11
429.9	0.371	11	3.0	49	120	14	5.4	5.5	76	138	10.0
430.6	0.303	13	3.4	53	139	18	4.4	6.3	81	158	13
431.3	0.097	16	3.5	53	144	17	1.4	6.3	81	165	13
432.0	0.097	15	3.3	50	139	21	1.4	6.1	76	159	16
432.7	0.097	14	3.2	48	125	19	1.4	5.9	73	143	14
433.4	0.277	13	3.3	55	146	26	4.0	6.0	85	167	19
434.1	0.291	14	3.3	55	125	20	4.2	6.0	85	143	15
434.8	0.097	15	3.5	48	131	19	1.4	6.4	74	150	14
435.5	0.097	15	4.3	49	130	18	1.4	7.9	75	149	13
436.2	0.285	15	3.4	52	123	23	4.1	6.2	80	140	17
436.9	0.397	15	3.4	52	136	19	5.7	6.2	80	156	14
437.6	0.210	15	3.6	49	134	21	3.0	6.5	75	154	15
438.3	0.361	12	3.3	54	123	19	5.2	6.0	83	141	14
439.0	0.267	15	3.9	53	114	20	3.9	7.1	81	130	14
439.7	0.281	14	3.8	55	167	23	4.0	6.9	85	191	16
440.4	0.097	13	3.8	52	112	20	1.4	6.9	79	128	15
441.1	0.232	15	3.8	41	113	19	3.3	6.9	62	129	14
441.8	0.097	14	3.5	50	120	27	1.4	6.4	77	138	20
442.5	0.128	14	3.6	57	109	21	1.9	6.5	88	125	16
443.2	0.118	13	2.8	47	118	20	1.7	5.1	72	135	14
443.9	0.351	13	3.2	48	118	23	5.1	5.9	74	135	17
444.6	0.097	16	3.9	53	105	21	1.4	7.1	81	120	16
445.3	0.173	15	3.7	54	120	24	2.5	6.7	83	138	17
446.0	0.097	15	3.8	50	110	23	1.4	6.9	77	126	17
446.7	0.355	14	3.2	44	95	18	5.1	5.8	68	108	13
447.3	0.175	14	3.4	46	108	22	2.5	6.2	70	124	16
448.0	0.097	12	3.1	48	116	23	1.4	5.7	73	133	17
448.7	0.281	12	2.7	43	100	19	4.1	4.9	66	115	14
449.4	0.129	14	3.0	41	103	22	1.9	5.4	63	118	16
450.1	0.500	13	3.5	44	115	25	7.2	6.3	67	132	18
450.8	0.194	12	2.5	38	104	19	2.8	4.6	58	119	14
451.5	0.097	14	2.8	40	121	22	1.4	5.2	61	138	16



Minnow Environmental  
Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
452.2	0.216	12	3.0	44	106	20	3.1	5.5	67	122	15
452.9	0.097	14	2.5	37	105	21	1.4	4.5	56	120	15
453.6	0.097	14	2.2	34	109	18	1.4	4.0	53	124	13
454.3	0.121	11	2.3	33	106	18	1.7	4.1	51	121	13
455.0	0.530	12	2.4	36	109	16	7.7	4.4	55	125	12
455.7	0.098	14	2.2	37	139	18	1.4	3.9	57	159	13
456.4	0.243	13	2.4	33	109	17	3.5	4.4	51	124	12
457.1	0.097	14	2.0	28	114	16	1.4	3.6	44	130	12
457.8	0.127	14	2.4	30	113	17	1.8	4.4	46	130	12
458.5	0.130	14	2.1	29	114	17	1.9	3.8	45	130	12
459.2	0.166	14	2.0	31	123	15	2.4	3.7	47	140	11
459.9	0.097	14	1.7	30	120	15	1.4	3.0	46	138	11
460.6	0.358	15	1.5	28	122	14	5.2	2.7	43	139	10
461.3	0.097	14	1.7	24	124	12	1.4	3.1	36	142	8.8
462.0	0.097	14	1.5	33	132	15	1.4	2.8	50	151	11
462.7	0.211	12	1.5	31	128	12	3.0	2.7	47	146	8.9
463.4	0.272	13	1.5	24	130	12	3.9	2.7	37	149	8.8
464.1	0.097	12	1.2	21	136	12	1.4	2.2	32	156	8.4
464.8	0.494	14	2.0	23	134	12	7.1	3.7	35	153	8.6
465.5	0.097	15	1.3	24	154	12	1.4	2.4	37	177	8.6
466.2	0.097	13	1.3	22	152	10	1.4	2.5	34	173	7.6
466.9	0.097	11	0.953	20	130	12	1.4	1.7	30	149	9.1
467.6	0.329	13	1.4	19	155	10	4.7	2.5	30	177	7.4
468.3	0.411	12	0.805	18	140	11	5.9	1.5	27	160	8.3
469.0	0.099	12	1.3	15	157	11	1.4	2.4	24	179	7.9
469.7	0.145	14	1.1	19	170	13	2.1	1.9	30	195	9.7
470.4	0.279	14	0.960	17	163	9.8	4.0	1.8	27	186	7.2
471.1	0.336	13	1.0	19	164	8.7	4.8	1.9	30	188	6.4
471.8	0.281	14	0.892	18	151	8.4	4.1	1.6	28	173	6.1
472.5	0.191	12	0.924	18	158	9.1	2.8	1.7	27	181	6.6
473.2	0.173	11	0.997	13	148	7.5	2.5	1.8	19	170	5.5
473.9	0.145	13	0.920	15	154	9.1	2.1	1.7	23	177	6.6
474.5	0.488	13	1.1	16	154	8.2	7.0	2.1	25	176	6.0
475.2	0.145	11	0.887	14	153	6.9	2.1	1.6	22	175	5.0
475.9	0.510	11	0.737	17	138	8.7	7.4	1.3	26	158	6.4
476.6	0.141	10	0.638	14	162	6.4	2.0	1.2	21	185	4.7
477.3	0.256	9.8	0.825	15	153	5.5	3.7	1.5	23	175	4.0
478.0	0.382	12	1.0	16	171	7.5	5.5	1.8	24	195	5.5
478.7	0.534	10	0.978	15	158	6.1	7.7	1.8	22	181	4.4
479.4	0.349	12	0.860	11	150	5.7	5.0	1.6	16	172	4.2
480.1	0.214	9.9	0.818	12	163	5.3	3.1	1.5	19	187	3.9
480.8	0.362	11	0.486	13	160	6.3	5.2	0.886	20	183	4.6
481.5	0.097	13	0.885	16	175	7.8	1.4	1.6	25	200	5.7
482.2	0.097	10	0.689	12	155	5.6	1.4	1.3	19	178	4.1
482.9	0.252	12	0.671	13	178	4.9	3.6	1.2	20	204	3.6
483.6	0.107	12	0.727	12	177	9.0	1.5	1.3	18	202	6.5
484.3	0.097	12	0.969	15	170	4.6	1.4	1.8	23	194	3.4
485.0	0.570	10	1.0	14	142	6.2	8.2	1.8	21	162	4.5
485.7	0.272	9.0	0.805	14	177	6.4	3.9	1.5	21	202	4.6
486.4	0.351	11	0.776	16	154	4.7	5.1	1.4	24	176	3.4
487.1	0.143	10	0.760	13	164	5.3	2.1	1.4	20	188	3.9
487.8	0.097	11	0.714	14	163	4.5	1.4	1.3	22	187	3.3
488.5	0.145	12	0.742	13	161	5.4	2.1	1.4	20	185	3.9
489.2	0.097	11	0.916	12	155	5.0	1.4	1.7	19	177	3.6
489.9	0.097	9.9	0.832	15	154	4.9	1.4	1.5	22	176	3.6
490.6	0.144	11	0.983	12	154	5.7	2.1	1.8	19	177	4.1
491.3	0.237	12	0.858	18	169	4.7	3.4	1.6	27	193	3.4
492.0	0.275	11	1.2	15	176	5.4	4.0	2.2	23	201	3.9
492.7	0.097	11	1.1	16	166	5.2	1.4	2.0	24	190	3.8
493.4	0.226	9.9	1.1	13	161	3.9	3.3	1.9	19	184	2.9
494.1	0.187	11	1.1	15	175	5.6	2.7	2.0	23	200	4.1
494.8	0.110	13	1.3	16	181	5.9	1.6	2.4	25	207	4.3
495.5	0.185	9.8	1.3	16	169	4.1	2.7	2.4	25	193	3.0
496.2	0.137	11	0.898	15	169	4.3	2.0	1.6	23	193	3.1
496.9	0.097	9.2	1.3	18	167	5.5	1.4	2.3	28	191	4.0
497.6	0.097	12	1.6	15	170	4.4	1.4	3.0	23	194	3.2
498.3	0.186	12	1.9	20	211	5.3	2.7	3.5	30	241	3.9
499.0	0.097	9.7	1.4	17	166	4.8	1.4	2.6	26	189	3.5
499.6	0.332	11	1.8	17	175	3.6	4.8	3.4	27	200	2.7
500.3	0.141	9.5	1.9	21	180	4.9	2.0	3.5	32	206	3.6
501.0	0.097	9.1	1.8	16	165	3.6	1.4	3.2	25	189	2.6
501.7	0.338	11	2.0	19	177	4.0	4.9	3.7	30	202	2.9
502.4	0.097	12	1.8	22	176	5.0	1.4	3.2	34	201	3.7
503.1	0.097	9.7	1.7	17	174	5.0	1.4	3.2	27	199	3.6
503.8	0.204	11	2.3	20	183	4.2	2.9	4.2	31	210	3.1
504.5	0.097	11	2.3	22	188	4.1	1.4	4.1	33	215	3.0
505.2	0.263	11	2.2	21	176	4.0	3.8	3.9	32	201	2.9
505.9	0.097	11	2.1	19	162	3.5	1.4	3.9	29	185	2.5
506.6	0.097	8.9	1.9	21	172	4.0	1.4	3.5	32	197	2.9
507.3	0.268	11	2.2	22	180	4.0	3.9	4.0	34	206	2.9
508.0	0.411	11	2.5	23	176	3.8	5.9	4.6	36	201	2.8



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Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.7	0.275	11	2.2	24	184	3.7	4.0	4.0	36	211	2.7
509.4	0.137	11	2.1	23	175	3.4	2.0	3.8	35	201	2.5
510.1	0.477	11	2.1	26	197	4.5	6.9	3.9	40	225	3.3
510.8	0.136	12	2.2	27	185	3.1	2.0	4.0	42	212	2.3
511.5	0.097	12	1.7	25	186	3.3	1.4	3.0	39	213	2.4
512.2	0.097	13	1.7	28	205	3.8	1.4	3.2	43	235	2.8
512.9	0.191	12	2.2	27	196	3.0	2.8	4.0	41	224	2.2
513.6	0.101	12	2.3	29	204	3.4	1.5	4.3	45	234	2.5
514.3	0.136	11	2.2	27	197	3.3	2.0	4.0	41	225	2.4
515.0	0.097	11	1.8	28	185	2.8	1.4	3.4	43	212	2.1
515.7	0.215	11	2.2	26	190	3.0	3.1	4.1	40	217	2.2
516.4	0.243	11	1.9	25	172	3.0	3.5	3.5	38	197	2.2
517.1	0.128	10.0	2.0	26	184	2.8	1.8	3.6	39	210	2.0
517.8	0.218	12	2.0	33	244	2.2	3.2	3.6	51	279	1.6
518.5	0.097	15	2.3	32	221	2.7	1.4	4.2	50	253	2.0
519.2	0.258	12	2.1	28	176	2.9	3.7	3.9	43	201	2.1
519.9	0.097	12	2.2	32	181	2.8	1.4	3.9	50	207	2.0
520.6	0.097	13	2.6	31	207	2.6	1.4	4.7	48	237	1.9
521.3	0.097	14	2.7	36	203	2.6	1.4	4.9	55	232	1.9
522.0	0.097	13	2.3	32	184	3.1	1.4	4.2	49	210	2.3
522.7	0.258	12	2.5	36	221	2.9	3.7	4.5	55	253	2.1
523.4	0.097	12	2.3	34	220	2.9	1.4	4.1	52	251	2.1
524.1	0.174	13	2.6	34	200	2.5	2.5	4.7	52	229	1.8
524.8	0.205	13	2.3	36	203	1.9	3.0	4.2	55	232	1.4
525.4	0.097	12	2.2	38	197	2.1	1.4	4.0	58	226	1.5
526.1	0.524	12	2.0	43	201	2.4	7.6	3.6	65	230	1.7
526.8	0.097	13	2.2	39	217	2.4	1.4	4.1	60	248	1.8
527.5	0.200	12	2.3	37	223	2.1	2.9	4.2	57	255	1.5
528.2	0.097	13	1.9	45	191	2.5	1.4	3.5	68	218	1.8
528.9	0.097	13	2.0	42	191	2.3	1.4	3.6	64	218	1.6
529.6	0.171	12	1.8	40	192	1.8	2.5	3.3	61	219	1.3
530.3	0.286	11	1.8	40	204	1.8	4.1	3.2	61	234	1.3
531.0	0.097	13	2.4	50	220	1.6	1.4	4.3	76	252	1.2
531.7	0.097	14	2.3	58	217	1.9	1.4	4.1	89	248	1.4
532.4	0.097	12	2.5	46	205	2.6	1.4	4.6	71	235	1.9
533.1	0.097	12	2.0	49	210	2.1	1.4	3.6	75	241	1.5
533.8	0.097	11	2.3	55	207	2.8	1.4	4.1	84	237	2.0
534.5	0.564	13	2.0	53	221	2.5	8.1	3.6	81	253	1.8
535.2	0.599	15	2.0	54	236	2.1	8.6	3.7	82	270	1.5
535.9	0.462	12	1.7	53	215	2.0	6.7	3.1	81	246	1.5
536.6	0.097	12	1.9	52	209	1.5	1.4	3.4	79	239	1.1
537.3	0.269	13	2.2	53	227	1.9	3.9	4.1	82	259	1.4
538.0	0.268	14	1.8	58	209	1.7	3.9	3.3	89	240	1.2
538.7	0.258	13	1.3	52	183	1.9	3.7	2.3	80	209	1.4
539.4	0.259	13	2.1	49	235	2.2	3.7	3.8	75	269	1.6
540.1	0.379	11	2.3	54	206	2.0	5.5	4.1	84	235	1.5
540.8	0.205	15	1.5	57	233	2.9	3.0	2.8	88	266	2.2
541.5	0.097	12	1.4	49	175	1.7	1.4	2.5	75	200	1.2
542.2	0.465	13	1.7	51	226	2.0	6.7	3.1	78	258	1.5
542.9	0.407	14	1.9	58	196	1.6	5.9	3.4	89	224	1.2
543.6	0.384	15	1.9	51	213	1.1	5.5	3.6	79	243	0.793
544.3	0.330	14	1.8	60	238	1.4	4.8	3.2	92	272	1.0
545.0	0.107	14	1.5	49	208	2.4	1.5	2.7	76	238	1.7
545.7	0.097	14	1.6	50	207	1.8	1.4	2.9	77	237	1.3
546.4	0.097	13	1.6	54	198	1.4	1.4	2.9	83	227	1.000
547.1	0.097	15	1.4	55	200	1.5	1.4	2.6	85	229	1.1
547.8	0.199	14	1.3	51	216	2.3	2.9	2.4	78	247	1.7
548.5	0.230	14	1.0	59	192	2.0	3.3	1.9	91	220	1.4
549.2	0.097	13	1.0	45	192	1.7	1.4	1.9	70	220	1.2
549.9	0.097	14	1.1	53	206	1.9	1.4	2.0	81	235	1.4
550.6	0.269	14	1.0	46	210	1.5	3.9	1.8	71	240	1.1
551.2	0.404	13	0.874	39	185	2.2	5.8	1.6	60	211	1.6
551.9	0.241	13	1.2	45	186	1.7	3.5	2.2	69	213	1.2
552.6	0.250	14	1.2	50	212	2.0	3.6	2.1	76	242	1.4
553.3	0.134	13	0.929	42	186	1.4	1.9	1.7	65	213	1.0
554.0	0.104	13	1.0	48	202	1.4	1.5	1.9	73	231	0.988
554.7	0.791	12	0.938	44	219	2.0	11	1.7	67	251	1.5
555.4	0.611	13	1.2	50	211	1.8	8.8	2.3	76	242	1.3
556.1	0.269	12	0.825	47	202	1.8	3.9	1.5	73	231	1.3
556.8	0.357	13	1.0	41	208	1.6	5.1	1.9	63	238	1.2
557.5	0.447	15	1.1	46	221	1.8	6.5	1.9	71	253	1.3
558.2	0.241	15	0.937	38	195	2.0	3.5	1.7	58	223	1.4
558.9	0.350	12	0.774	38	195	1.9	5.0	1.4	58	223	1.4
559.6	0.350	13	0.688	33	197	1.9	5.1	1.3	51	225	1.4
560.3	0.228	12	0.783	34	197	1.5	3.3	1.4	53	225	1.1
561.0	0.097	13	0.743	35	182	1.9	1.4	1.4	54	208	1.4
561.7	0.233	13	0.828	38	205	1.4	3.4	1.5	58	234	0.995
562.4	0.232	14	1.1	36	193	1.3	3.4	2.0	56	220	0.943
563.1	0.358	12	0.807	31	184	1.1	5.2	1.5	48	211	0.838
563.8	0.323	13	0.796	26	200	1.9	4.7	1.5	40	229	1.4
564.5	0.329	15	0.609	32	219	2.4	4.7	1.1	49	251	1.7



Minnow Environmental  
Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
565.2	0.437	12	0.708	32	193	1.1	6.3	1.3	48	221	0.779
565.9	0.484	13	0.524	26	243	1.4	7.0	0.955	40	278	1.0
566.6	0.217	12	0.536	24	200	1.8	3.1	0.978	36	228	1.3
567.3	0.468	15	0.708	31	218	1.5	6.8	1.3	48	249	1.1
568.0	0.427	13	0.764	27	210	2.0	6.2	1.4	41	240	1.4
568.7	0.220	13	0.601	24	198	1.7	3.2	1.1	37	226	1.3
569.4	0.168	11	0.667	21	199	1.6	2.4	1.2	32	227	1.2
570.1	0.471	14	0.668	22	193	1.9	6.8	1.2	34	221	1.4
570.8	0.229	15	0.653	22	202	2.1	3.3	1.2	33	231	1.5
571.5	0.384	14	0.547	22	183	1.6	5.5	0.997	33	209	1.1
572.2	0.297	14	0.424	20	191	2.8	4.3	0.773	30	219	2.0
572.9	0.097	13	0.680	17	218	1.7	1.4	1.2	27	249	1.2
573.6	0.368	13	0.687	18	194	1.6	5.3	1.3	28	222	1.2
574.3	0.269	15	0.752	19	192	1.6	3.9	1.4	30	219	1.2
575.0	0.097	15	0.603	15	183	1.6	1.4	1.1	22	210	1.2
575.7	0.229	12	0.713	15	194	1.8	3.3	1.3	24	221	1.3
576.4	0.501	12	0.634	13	209	2.1	7.2	1.2	21	239	1.5
577.0	0.504	12	0.577	14	200	2.6	7.3	1.1	22	228	1.9
577.7	0.202	16	0.580	15	218	2.6	2.9	1.1	23	250	1.9
578.4	0.190	15	0.620	14	199	2.3	2.7	1.1	21	228	1.6
579.1	0.545	12	0.697	11	187	2.5	7.9	1.3	17	214	1.8
579.8	0.105	14	0.725	12	199	1.8	1.5	1.3	19	227	1.3
580.5	0.097	15	0.721	9.8	192	2.1	1.4	1.3	15	219	1.5
581.2	0.244	13	0.649	14	215	2.1	3.5	1.2	21	246	1.5
581.9	0.276	12	0.426	11	203	2.0	4.0	0.777	16	232	1.4
582.6	0.097	15	0.600	11	249	2.3	1.4	1.1	16	285	1.7
583.3	0.097	12	0.492	8.1	192	2.7	1.4	0.897	12	219	2.0
584.0	0.201	14	0.781	12	222	2.2	2.9	1.4	19	254	1.6
584.7	0.097	11	0.763	9.9	204	2.6	1.4	1.4	15	233	1.9
585.4	0.106	13	0.600	10	184	1.5	1.5	1.1	16	210	1.1
586.1	0.105	11	0.591	12	184	2.8	1.5	1.1	18	210	2.0
586.8	0.230	12	0.936	8.8	204	1.7	3.3	1.7	14	233	1.2
587.5	0.401	11	0.763	11	201	1.6	5.8	1.4	18	230	1.1
588.2	0.097	11	0.907	11	196	2.0	1.4	1.7	17	225	1.5
588.9	0.097	13	1.3	11	218	3.0	1.4	2.4	17	249	2.2
589.6	0.410	9.8	1.1	8.0	210	2.7	5.9	2.1	12	240	2.0
590.3	0.097	12	1.3	9.7	238	3.2	1.4	2.4	15	272	2.3
591.0	0.097	12	1.2	11	211	2.1	1.4	2.2	17	242	1.5
591.7	0.097	11	1.2	10	177	2.2	1.4	2.2	16	203	1.6
592.4	0.527	11	1.4	9.8	205	1.4	7.6	2.5	15	235	0.986
593.1	0.148	11	1.7	11	203	2.2	2.1	3.1	16	232	1.6
593.8	0.097	11	1.6	12	223	2.8	1.4	2.9	18	255	2.1
594.5	0.097	9.7	1.2	12	212	2.8	1.4	2.2	19	243	2.0
595.2	0.365	8.7	1.9	12	184	1.6	5.3	3.5	19	210	1.2
595.9	0.327	9.3	1.5	13	202	2.1	4.7	2.7	20	232	1.5
596.6	0.104	8.7	1.8	11	214	2.8	1.5	3.2	16	245	2.1
597.3	0.097	10.0	1.5	12	196	2.5	1.4	2.7	18	224	1.8
598.0	0.097	9.7	1.8	14	201	1.9	1.4	3.2	21	230	1.4
598.7	0.215	8.2	1.9	13	209	1.8	3.1	3.5	21	239	1.3
599.4	0.097	9.8	2.1	14	263	1.8	1.4	3.8	22	300	1.3
600.1	0.103	11	1.9	13	195	2.4	1.5	3.4	20	223	1.8
600.8	0.362	10	2.0	13	209	1.7	5.2	3.6	20	239	1.2
601.5	0.097	11	1.8	14	226	3.6	1.4	3.2	21	259	2.7
602.2	0.097	11	1.7	16	199	2.0	1.4	3.1	25	227	1.4
602.8	0.097	9.9	1.5	21	221	2.0	1.4	2.7	32	252	1.5
603.5	0.179	11	1.6	15	213	1.9	2.6	2.9	23	244	1.4
604.2	0.252	9.4	1.5	15	215	1.9	3.6	2.8	23	246	1.4
604.9	0.145	11	1.8	18	214	2.6	2.1	3.2	27	245	1.9
605.6	0.138	10	1.7	18	206	1.7	2.0	3.2	27	236	1.2
606.3	0.097	11	1.7	17	217	1.8	1.4	3.1	26	248	1.3
607.0	0.270	10	1.9	19	212	2.0	3.9	3.4	30	243	1.5
607.7	0.097	12	1.8	19	250	1.1	1.4	3.2	29	286	0.812
608.4	0.097	11	1.5	19	190	1.2	1.4	2.7	29	218	0.851
609.1	0.140	9.9	1.5	20	210	2.2	2.0	2.8	30	241	1.6
609.8	0.386	9.5	1.3	18	222	1.2	5.6	2.4	27	254	0.905
610.5	0.147	11	1.5	19	208	1.6	2.1	2.8	30	238	1.2
611.2	0.097	13	2.0	23	217	1.2	1.4	3.6	35	248	0.885
611.9	0.097	11	1.2	23	210	1.0	1.4	2.3	35	240	0.730
612.6	0.393	12	1.6	19	205	0.929	5.7	2.9	30	234	0.678
613.3	0.269	10	1.7	23	200	1.7	3.9	3.1	36	229	1.2
614.0	0.097	11	1.3	22	188	1.2	1.4	2.3	34	215	0.895
614.7	0.282	11	1.2	28	202	1.6	4.1	2.1	44	231	1.2
615.4	0.097	11	1.6	24	191	1.1	1.4	2.9	37	219	0.804
616.1	0.232	11	1.9	21	219	0.816	3.4	3.4	33	250	0.595
616.8	0.268	10	1.4	24	226	1.5	3.9	2.6	36	259	1.1
617.5	0.097	12	1.4	31	207	1.6	1.4	2.6	47	237	1.1
618.2	0.097	11	1.6	22	182	0.890	1.4	2.9	34	209	0.650
618.9	0.226	10	1.3	28	185	1.2	3.3	2.4	42	211	0.869
619.6	0.097	12	2.0	26	196	1.0	1.4	3.6	39	224	0.764
620.3	0.097	11	1.8	27	183	1.3	1.4	3.3	41	209	0.956
621.0	0.097	12	1.4	31	193	1.7	1.4	2.6	48	221	1.2



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Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.7	0.097	11	1.6	28	192	1.4	1.4	2.8	43	220	0.993
622.4	0.101	9.2	1.6	29	182	0.791	1.5	2.9	44	208	0.577
623.1	0.156	12	2.2	30	199	1.1	2.3	4.1	46	228	0.790
623.8	0.195	10.0	2.0	33	201	1.3	2.8	3.6	50	230	0.968
624.5	0.097	12	2.0	35	213	0.786	1.4	3.7	53	243	0.574
625.2	0.149	11	1.9	36	193	0.621	2.2	3.5	55	220	0.453
625.9	0.379	11	1.8	36	199	1.1	5.5	3.3	56	228	0.783
626.6	0.637	13	1.6	36	204	1.1	9.2	2.9	56	233	0.770
627.3	0.417	11	2.0	40	194	1.3	6.0	3.7	61	222	0.978
628.0	0.303	11	1.7	34	180	1.6	4.4	3.1	51	206	1.1
628.7	0.219	12	1.6	33	192	1.0	3.2	3.0	50	220	0.747
629.3	0.377	11	2.0	34	207	0.854	5.4	3.7	53	237	0.623
630.0	0.249	12	1.7	41	208	0.803	3.6	3.1	62	237	0.586
630.7	0.097	12	1.6	34	189	1.2	1.4	3.0	52	216	0.869
631.4	0.237	11	1.3	34	198	1.3	3.4	2.4	52	226	0.965
632.1	0.108	11	1.6	35	203	1.1	1.6	3.0	53	232	0.825
632.8	0.097	14	1.6	39	192	1.3	1.4	3.0	59	220	0.972
633.5	0.151	12	2.0	33	187	1.3	2.2	3.6	50	214	0.918
634.2	0.097	13	2.0	37	193	1.0	1.4	3.6	56	221	0.742
634.9	0.097	13	1.6	37	209	1.5	1.4	2.9	57	239	1.1
635.6	0.097	12	1.7	32	197	0.873	1.4	3.0	49	225	0.637
636.3	0.581	11	1.6	36	197	0.744	8.4	3.0	55	226	0.543
637.0	0.097	12	1.6	38	197	0.987	1.4	3.0	58	225	0.720
637.7	0.097	13	1.4	38	178	1.2	1.4	2.5	58	204	0.862
638.4	0.476	12	1.6	36	239	1.9	6.9	2.9	55	274	1.4
639.1	0.233	11	1.7	35	192	1.0	3.4	3.0	54	219	0.748
639.8	0.436	11	1.7	33	205	1.3	6.3	3.1	51	234	0.973
640.5	0.236	14	1.6	30	176	1.1	3.4	2.9	46	201	0.806
641.2	0.299	12	1.4	33	170	1.0	4.3	2.6	50	194	0.749
641.9	0.097	13	1.2	30	196	1.5	1.4	2.1	45	224	1.1
642.6	0.097	11	1.5	28	198	1.4	1.4	2.8	43	227	1.0
643.3	0.243	13	1.6	31	206	1.6	3.5	2.9	48	236	1.1
644.0	0.140	13	1.6	33	191	1.0	2.0	2.9	50	218	0.757
644.7	0.097	12	1.3	26	202	1.2	1.4	2.4	40	231	0.885
645.4	0.544	11	1.9	24	199	1.1	7.9	3.6	37	227	0.802
646.1	0.097	15	1.6	25	229	1.4	1.4	2.9	38	262	1.0
646.8	0.238	13	1.3	32	205	1.8	3.4	2.4	49	234	1.3
647.5	0.350	15	1.0	29	210	1.3	5.1	1.8	44	240	0.918
648.2	0.097	14	1.5	26	227	1.4	1.4	2.8	41	260	1.0
648.9	0.330	13	1.3	21	201	1.2	4.8	2.5	33	230	0.864
649.6	0.549	17	1.4	24	240	1.6	7.9	2.6	37	274	1.2
650.3	0.148	14	1.6	24	210	1.9	2.1	2.9	36	240	1.4
651.0	0.618	14	1.5	22	198	1.0	8.9	2.7	34	227	0.746
651.7	0.576	14	1.4	19	220	1.4	8.3	2.6	29	252	0.999
652.4	0.097	12	1.2	17	215	1.6	1.4	2.2	25	246	1.2
653.1	0.097	14	1.3	17	242	2.2	1.4	2.3	26	277	1.6
653.8	0.400	16	1.3	15	214	2.2	5.8	2.3	23	245	1.6
654.5	0.097	13	0.813	12	196	2.0	1.4	1.5	19	224	1.5
655.2	0.284	13	0.806	12	200	1.3	4.1	1.5	18	228	0.976
655.8	0.283	15	0.637	12	216	1.5	4.1	1.2	18	247	1.1
656.5	0.324	12	0.677	12	219	1.7	4.7	1.2	18	250	1.2
657.2	0.630	14	0.942	12	247	1.6	9.1	1.7	19	282	1.2
657.9	0.097	12	0.632	10	203	1.5	1.4	1.2	15	232	1.1
658.6	0.451	12	0.505	7.8	206	1.7	6.5	0.921	12	236	1.2
659.3	0.097	12	0.694	9.0	200	1.5	1.4	1.3	14	228	1.1
660.0	0.097	9.8	0.500	9.0	235	1.0	1.4	0.911	14	268	0.746
660.7	0.207	12	0.398	8.3	214	1.3	3.0	0.727	13	244	0.923
661.4	0.097	9.6	0.673	7.5	208	0.868	1.4	1.2	11	238	0.633
662.1	0.384	13	0.580	9.0	223	1.2	5.5	1.1	14	255	0.848
662.8	0.338	12	0.578	7.9	216	1.7	4.9	1.1	12	247	1.3
663.5	0.199	13	0.366	7.4	198	1.6	2.9	0.668	11	226	1.1
664.2	0.097	11	0.386	6.8	192	1.5	1.4	0.704	10	219	1.1
664.9	0.113	11	0.410	8.7	204	1.0	1.6	0.748	13	233	0.752
665.6	0.198	9.1	0.395	7.0	205	1.3	2.9	0.721	11	234	0.984
666.3	0.097	11	0.451	6.7	195	1.2	1.4	0.823	10	223	0.898
667.0	0.097	8.8	0.466	6.5	202	1.4	1.4	0.849	9.9	231	1.1
667.7	0.293	10	0.452	8.1	211	1.5	4.2	0.824	12	241	1.1
668.4	0.303	11	0.566	8.9	231	1.2	4.4	1.0	14	264	0.876
669.1	0.191	11	0.486	6.5	192	1.4	2.8	0.887	10.0	219	1.0
669.8	0.339	11	0.611	7.0	233	1.6	4.9	1.1	11	267	1.2
670.5	0.108	11	0.544	8.0	217	1.9	1.6	0.992	12	248	1.4
671.2	0.097	11	0.652	8.2	184	1.3	1.4	1.2	13	210	0.972
671.9	0.111	11	0.800	9.4	220	1.6	1.6	1.5	14	251	1.2
672.6	0.097	9.4	1.1	9.4	216	2.0	1.4	2.0	14	247	1.5
673.3	0.097	9.7	0.752	7.4	204	1.8	1.4	1.4	11	233	1.3
674.0	0.097	10	0.965	7.6	205	2.4	1.4	1.8	12	234	1.8
674.7	0.154	10	1.4	9.5	234	2.2	2.2	2.6	15	268	1.6
675.4	0.097	8.6	1.7	9.4	219	1.4	1.4	3.1	14	250	1.0
676.1	0.151	10	1.4	12	198	1.4	2.2	2.6	18	226	1.0
676.8	0.207	11	2.1	11	221	2.5	3.0	3.8	16	253	1.8
677.5	0.097	9.5	1.5	9.5	191	2.4	1.4	2.7	15	218	1.8



Minnow Environmental  
Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
678.2	0.097	8.6	2.1	9.7	224	2.0	1.4	3.7	15	256	1.5
678.9	0.097	11	2.1	11	189	2.2	1.4	3.8	17	216	1.6
679.6	0.110	8.8	2.2	12	204	2.0	1.6	4.0	18	233	1.5
680.3	0.377	9.5	2.3	13	201	1.9	5.4	4.2	20	229	1.4
681.0	0.177	11	2.7	12	215	2.6	2.6	4.9	18	245	1.9
681.6	0.097	9.0	2.2	14	221	1.7	1.4	4.1	21	253	1.3
682.3	0.194	11	2.1	13	205	2.9	2.8	3.9	20	234	2.1
683.0	0.097	8.7	2.3	12	198	1.2	1.4	4.1	18	226	0.872
683.7	0.097	9.5	2.8	16	220	2.0	1.4	5.1	24	251	1.5
684.4	0.097	9.7	2.7	14	205	2.3	1.4	4.9	21	234	1.7
685.1	0.097	9.7	2.8	15	219	2.3	1.4	5.1	23	251	1.7
685.8	0.097	9.4	2.2	16	222	1.4	1.4	4.1	24	254	1.0
686.5	0.097	8.7	2.0	15	208	1.7	1.4	3.6	23	237	1.2
687.2	0.150	11	2.6	16	191	1.1	2.2	4.7	25	219	0.812
687.9	0.561	10	2.0	17	199	1.3	8.1	3.7	27	227	0.924
688.6	0.097	9.9	1.8	18	186	2.3	1.4	3.3	27	213	1.7
689.3	0.097	10	2.0	20	213	1.7	1.4	3.7	31	244	1.3
690.0	0.324	11	1.5	16	220	1.4	4.7	2.7	25	251	1.0
690.7	0.097	10.0	1.8	18	193	1.7	1.4	3.2	28	221	1.3
691.4	0.100	9.5	1.4	18	219	1.3	1.4	2.6	28	250	0.953
692.1	0.097	10	1.5	22	211	1.3	1.4	2.8	33	241	0.914
692.8	0.143	12	1.6	18	213	1.4	2.1	3.0	27	244	1.0
693.5	0.242	9.7	1.6	21	189	1.4	3.5	2.8	32	216	1.1
694.2	0.139	9.6	1.2	18	187	1.2	2.0	2.2	28	214	0.845
694.9	0.097	9.6	1.3	20	194	1.2	1.4	2.3	31	222	0.884
695.6	0.269	11	1.3	18	204	1.3	3.9	2.4	28	234	0.973
696.3	0.097	11	1.9	22	232	1.5	1.4	3.4	33	266	1.1
697.0	0.189	11	1.5	22	215	1.3	2.7	2.7	34	246	0.942
697.7	0.182	11	1.1	20	206	1.2	2.6	2.0	30	235	0.857
698.4	0.217	11	1.2	23	191	1.2	3.1	2.2	35	218	0.880
699.1	0.097	9.6	1.0	20	209	1.4	1.4	1.9	30	238	1.0
699.8	0.097	10	1.0	25	219	1.4	1.4	1.9	39	250	1.0
700.5	0.540	11	1.5	22	183	0.832	7.8	2.8	34	209	0.607
701.2	0.222	8.6	1.3	21	200	0.584	3.2	2.4	32	228	0.426
701.9	0.097	8.9	1.2	20	202	0.889	1.4	2.2	30	231	0.649
702.6	0.144	10.0	1.0	24	227	1.1	2.1	1.9	37	260	0.829
703.3	0.097	12	1.1	25	214	1.5	1.4	2.0	38	245	1.1
704.0	0.316	9.0	1.1	25	194	1.0	4.6	2.0	38	222	0.741
704.7	0.154	10.0	1.4	23	205	0.785	2.2	2.6	35	234	0.573
705.4	0.422	9.4	1.4	27	237	1.1	6.1	2.5	41	271	0.832
706.1	0.336	12	1.5	26	222	0.719	4.8	2.7	39	254	0.525
706.8	0.155	10	1.4	30	220	0.863	2.2	2.5	46	252	0.630
707.5	0.228	11	1.3	23	209	0.868	3.3	2.3	35	240	0.634
708.1	0.422	11	1.5	25	205	0.927	6.1	2.8	38	235	0.676
708.8	0.097	10	1.5	23	217	0.796	1.4	2.8	35	248	0.581
709.5	0.355	13	1.2	26	244	0.836	5.1	2.2	40	279	0.610
710.2	0.097	11	1.4	27	209	0.657	1.4	2.6	41	239	0.479
710.9	0.097	13	1.4	25	211	1.2	1.4	2.5	38	241	0.887
711.6	0.097	10	1.4	28	196	0.770	1.4	2.6	43	225	0.562
712.3	0.157	12	1.4	21	216	0.800	2.3	2.6	32	248	0.584
713.0	0.150	11	1.8	27	191	0.695	2.2	3.4	41	219	0.507
713.7	0.097	12	1.3	29	216	0.960	1.4	2.4	44	247	0.700
714.4	0.370	12	1.8	33	223	1.0	5.3	3.3	51	255	0.752
715.1	0.097	8.7	1.6	25	198	0.286	1.4	3.0	39	227	0.209
715.8	0.097	10	1.8	26	218	1.6	1.4	3.3	39	250	1.1
716.5	0.097	11	1.8	22	221	0.909	1.4	3.3	34	253	0.663
717.2	0.255	12	1.8	22	193	1.5	3.7	3.4	33	221	1.1
717.9	0.222	12	1.7	23	186	1.2	3.2	3.1	36	213	0.900
718.6	0.107	13	1.5	20	235	0.903	1.5	2.7	31	269	0.659
719.3	0.201	13	1.5	20	240	1.3	2.9	2.7	30	275	0.949
720.0	0.163	11	1.1	16	184	1.7	2.3	1.9	24	210	1.2
720.7	0.097	13	1.2	13	224	0.790	1.4	2.1	20	257	0.576
721.4	0.150	12	1.1	16	229	1.6	2.2	2.0	24	262	1.2
722.1	0.097	9.4	1.2	13	219	1.3	1.4	2.1	20	250	0.944
722.8	0.379	12	1.4	14	220	2.0	5.5	2.5	22	252	1.5
723.5	0.236	11	1.2	12	216	1.5	3.4	2.2	18	247	1.1
724.2	0.628	10.0	0.889	13	210	1.6	9.1	1.6	19	240	1.2
724.9	0.097	13	0.855	9.5	220	1.4	1.4	1.6	15	252	1.0
725.6	0.508	9.7	0.891	11	200	1.7	7.3	1.6	17	229	1.2
726.3	0.097	11	0.579	9.9	216	1.1	1.4	1.1	15	247	0.802
727.0	0.207	14	0.741	10	283	1.3	3.0	1.4	16	324	0.977
727.7	0.461	12	0.686	7.9	215	1.4	6.7	1.3	12	246	1.0
728.4	0.097	12	0.841	7.6	224	1.3	1.4	1.5	12	257	0.943
729.1	0.155	11	0.621	9.3	212	1.9	2.2	1.1	14	242	1.4
729.8	0.293	12	0.437	8.1	238	1.6	4.2	0.796	12	272	1.2
730.5	0.147	11	0.422	8.0	228	1.2	2.1	0.770	12	260	0.891
731.2	0.768	11	0.366	11	215	0.894	11	0.668	17	245	0.652
731.9	0.194	11	0.525	6.9	216	0.625	2.8	0.957	11	247	0.456
732.6	0.281	12	0.250	10	196	1.4	4.1	0.456	16	224	1.0
733.3	0.154	12	0.492	9.4	194	1.8	2.2	0.896	14	222	1.3
734.0	0.097	10	0.484	9.6	186	1.1	1.4	0.883	15	213	0.795



Minnow Environmental Sample ID: 001											
Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
734.7	0.156	11	0.449	11	225	1.8	2.2	0.819	16	257	1.3
735.3	0.572	9.0	0.482	8.2	203	1.3	8.3	0.880	13	232	0.941
736.0	0.157	10	0.501	11	230	1.2	2.3	0.913	17	263	0.901
736.7	0.465	11	0.536	10	204	2.1	6.7	0.977	16	233	1.5
737.4	0.158	10	0.662	12	223	1.5	2.3	1.2	19	255	1.1
738.1	0.114	11	0.854	9.2	237	1.8	1.6	1.6	14	271	1.3
738.8	0.387	10.0	0.737	11	201	1.0	5.6	1.3	16	230	0.763
739.5	0.097	8.5	0.873	12	214	1.1	1.4	1.6	18	245	0.831
740.2	0.340	10	0.696	11	195	1.4	4.9	1.3	17	223	1.0
740.9	0.233	8.3	0.696	11	216	1.0	3.4	1.3	17	247	0.748
741.6	0.097	8.8	0.989	11	220	2.1	1.4	1.8	17	252	1.5
742.3	0.348	11	1.1	12	206	1.8	5.0	1.9	19	236	1.3
743.0	0.097	11	0.993	12	218	2.3	1.4	1.8	18	249	1.6
743.7	0.097	10	1.1	15	212	1.9	1.4	2.0	23	242	1.4
744.4	0.114	8.7	0.855	16	238	1.8	1.6	1.6	25	272	1.3
745.1	0.267	7.3	1.5	13	197	1.4	3.8	2.7	20	225	1.0
745.8	0.097	9.9	1.2	14	251	1.5	1.4	2.2	21	287	1.1
746.5	0.097	9.8	1.6	19	230	1.2	1.4	3.0	29	263	0.875
747.2	0.113	13	1.3	18	217	0.880	1.6	2.4	27	248	0.642
747.9	0.097	9.2	1.3	16	208	0.984	1.4	2.3	25	237	0.718
748.6	0.695	10	1.4	17	234	2.0	10	2.6	26	267	1.5
749.3	0.200	9.8	1.3	17	209	2.0	2.9	2.5	26	239	1.5
750.0	0.120	9.5	1.4	17	210	1.5	1.7	2.6	27	240	1.1
750.7	0.353	9.0	1.4	16	188	1.9	5.1	2.6	25	215	1.4
751.4	0.226	8.5	1.8	17	206	1.5	3.3	3.2	27	236	1.1
752.1	0.209	11	2.0	21	233	1.6	3.0	3.6	32	267	1.1
752.8	0.097	12	1.4	26	261	1.4	1.4	2.6	40	298	1.0
753.5	0.683	12	1.3	21	203	1.7	9.9	2.4	32	232	1.2
754.2	0.107	9.6	1.8	25	244	1.8	1.6	3.3	38	279	1.3
754.9	0.097	9.5	1.3	22	246	1.1	1.4	2.4	34	282	0.816
755.6	0.097	9.6	1.4	24	219	1.5	1.4	2.6	37	251	1.1
756.3	0.289	12	1.8	25	227	1.6	4.2	3.4	38	259	1.2
757.0	0.272	9.6	1.4	26	203	0.875	3.9	2.5	40	232	0.638
757.7	0.105	9.2	1.4	25	213	1.3	1.5	2.6	39	244	0.945
758.4	0.102	10	1.5	23	206	1.5	1.5	2.8	36	236	1.1
759.1	0.097	10	1.4	30	215	1.5	1.4	2.6	46	245	1.1
759.8	0.097	13	1.6	31	207	1.2	1.4	2.8	48	237	0.903
760.5	0.437	11	1.6	34	232	1.6	6.3	2.9	52	265	1.1
761.1	0.097	14	1.5	30	220	0.818	1.4	2.8	47	251	0.597
761.8	0.269	9.7	1.4	33	232	0.998	3.9	2.5	51	265	0.728
762.5	0.097	13	1.8	34	255	1.3	1.4	3.2	52	291	0.947
763.2	0.111	13	1.4	41	223	1.2	1.6	2.6	64	255	0.842
763.9	0.287	11	1.6	41	228	1.3	4.1	2.8	63	261	0.934
764.6	0.277	12	1.6	36	226	1.1	4.0	3.0	56	258	0.800
765.3	0.101	10	1.4	33	229	1.1	1.5	2.6	50	261	0.814
766.0	0.097	11	1.6	34	232	1.3	1.4	3.0	52	266	0.947
766.7	0.246	11	1.5	43	251	0.793	3.6	2.7	66	286	0.578
767.4	0.097	11	1.7	43	228	1.1	1.4	3.0	65	261	0.768
768.1	0.200	12	1.6	52	242	0.931	2.9	2.9	80	277	0.680
768.8	0.097	9.7	1.8	37	223	0.921	1.4	3.4	57	255	0.672
769.5	0.192	12	2.0	44	227	1.0	2.8	3.6	67	259	0.754
770.2	0.201	12	1.4	48	237	0.720	2.9	2.6	74	272	0.525
770.9	0.097	11	1.5	38	262	1.1	1.4	2.8	58	300	0.799
771.6	0.378	11	1.9	49	221	1.7	5.5	3.4	75	253	1.3
772.3	0.342	12	1.8	45	233	0.879	4.9	3.3	69	267	0.641
773.0	0.097	12	1.7	44	219	1.1	1.4	3.0	67	250	0.768
773.7	0.097	11	1.7	45	226	0.666	1.4	3.2	69	259	0.486
774.4	0.147	8.8	1.3	44	199	1.3	2.1	2.4	68	228	0.943
775.1	0.097	13	1.8	40	203	1.0	1.4	3.2	61	232	0.751
775.8	0.097	11	1.8	43	212	0.790	1.4	3.3	65	242	0.576
776.5	0.339	12	1.7	46	221	0.945	4.9	3.0	71	253	0.690
777.2	0.375	12	2.0	46	215	0.920	5.4	3.6	70	246	0.671
777.9	0.097	11	2.0	45	209	0.847	1.4	3.7	69	239	0.618
778.6	0.547	13	1.6	46	241	1.2	7.9	2.9	70	275	0.891
779.3	0.312	12	1.8	45	236	1.1	4.5	3.3	70	270	0.788
780.0	0.377	10	1.6	43	234	1.1	5.4	2.8	66	268	0.832
780.7	0.531	11	1.6	44	214	1.1	7.7	3.0	67	244	0.795
781.4	0.097	13	1.8	45	235	1.1	1.4	3.3	68	269	0.792
782.1	0.255	13	1.9	45	239	1.2	3.7	3.4	69	273	0.874
782.8	0.291	10	1.8	40	227	0.358	4.2	3.2	62	259	0.261
783.5	0.302	13	1.9	44	259	0.671	4.4	3.4	67	296	0.489
784.2	0.097	11	2.0	43	200	1.2	1.4	3.7	65	229	0.863
784.9	0.280	12	1.7	43	223	1.0	4.0	3.2	67	255	0.760
785.6	0.202	11	2.0	40	223	1.3	2.9	3.6	62	255	0.954
786.3	0.097	12	2.0	49	230	1.2	1.4	3.7	75	264	0.885
786.9	0.097	11	1.9	41	218	0.956	1.4	3.5	62	249	0.697
787.6	0.097	12	2.1	44	228	0.695	1.4	3.8	68	261	0.507
788.3	0.202	12	2.4	48	238	1.1	2.9	4.4	73	272	0.793
789.0	0.149	11	2.4	36	221	1.6	2.2	4.3	55	252	1.2
789.7	0.399	13	2.5	39	233	2.0	5.8	4.5	60	266	1.4
790.4	0.146	12	2.4	38	202	1.1	2.1	4.4	58	231	0.787



Minnow Environmental  
Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
791.1	0.235	9.6	2.0	40	213	1.3	3.4	3.6	61	244	0.953
791.8	0.097	12	2.0	35	240	1.7	1.4	3.7	54	275	1.2
792.5	0.210	11	2.0	38	245	1.1	3.0	3.6	58	280	0.823
793.2	0.428	13	2.5	40	226	1.1	6.2	4.5	62	259	0.792
793.9	0.097	10	2.2	34	226	2.1	1.4	4.1	53	258	1.5
794.6	0.097	11	2.3	36	235	1.1	1.4	4.1	55	268	0.832
795.3	0.239	12	2.4	33	236	1.3	3.4	4.4	50	270	0.919
796.0	0.097	13	2.0	29	238	1.2	1.4	3.6	45	272	0.871
796.7	0.164	14	2.0	32	267	1.7	2.4	3.6	48	305	1.2
797.4	0.149	11	1.9	32	255	1.5	2.2	3.5	49	292	1.1
798.1	0.402	9.5	1.9	29	234	2.0	5.8	3.4	44	267	1.5
798.8	0.097	11	1.5	23	265	1.5	1.4	2.8	35	303	1.1
799.5	0.206	14	1.7	30	237	2.1	3.0	3.1	46	271	1.6
800.2	0.302	12	1.6	27	227	1.7	4.4	2.9	42	260	1.3
800.9	0.406	12	1.6	25	235	2.0	5.9	2.8	38	269	1.5
801.6	0.337	12	1.2	28	253	1.4	4.9	2.2	43	290	1.0
802.3	0.592	12	1.3	22	272	2.2	8.5	2.4	34	311	1.6
803.0	0.110	9.4	1.1	20	252	1.5	1.6	2.0	31	289	1.1
803.7	0.486	13	1.1	22	266	1.4	7.0	2.0	33	304	1.0
804.4	0.511	9.2	1.5	19	258	1.2	7.4	2.7	29	294	0.885
805.1	0.105	10	0.940	16	230	1.6	1.5	1.7	25	263	1.2
805.8	0.113	9.9	0.735	17	246	2.4	1.6	1.3	26	282	1.7
806.5	0.113	11	1.1	18	233	1.1	1.6	2.0	28	267	0.806
807.2	0.097	12	1.1	18	240	1.9	1.4	2.1	28	274	1.4
807.9	0.367	12	0.842	13	245	1.0	5.3	1.5	21	280	0.758
808.6	0.164	10	0.755	12	285	1.4	2.4	1.4	19	326	0.996
809.3	0.322	12	0.968	17	258	1.7	4.6	1.8	27	295	1.2
810.0	0.392	11	0.885	15	246	1.6	5.7	1.6	23	281	1.2
810.7	0.505	9.8	0.624	14	241	1.5	7.3	1.1	21	276	1.1
811.4	0.528	9.1	0.481	12	240	1.4	7.6	0.878	18	275	1.0
812.1	0.106	10	0.477	13	227	1.2	1.5	0.870	21	259	0.859
812.7	0.318	11	0.559	16	248	1.1	4.6	1.0	24	284	0.803
813.4	0.350	11	0.319	13	244	1.2	5.0	0.582	20	279	0.875
814.1	0.346	11	0.576	14	232	1.6	5.0	1.1	21	265	1.1
814.8	0.454	8.1	0.401	12	217	0.900	6.5	0.732	18	248	0.657
815.5	0.097	11	0.199	12	226	1.5	1.4	0.362	18	259	1.1
816.2	0.379	11	0.509	16	241	1.2	5.5	0.928	25	276	0.888
816.9	0.097	11	0.564	14	239	0.725	1.4	1.0	22	273	0.529
817.6	0.097	9.3	0.241	13	204	1.6	1.4	0.439	21	234	1.2
818.3	0.354	9.7	0.299	12	228	0.802	5.1	0.546	19	260	0.585
819.0	0.156	11	0.292	14	231	0.939	2.3	0.532	21	264	0.685
819.7	0.197	9.7	0.378	14	239	1.1	2.8	0.690	21	273	0.826
820.4	0.146	11	0.378	13	217	0.541	2.1	0.689	20	248	0.395
821.1	0.345	11	0.379	13	231	1.6	5.0	0.691	20	265	1.2
821.8	0.119	8.9	0.211	14	243	1.6	1.7	0.384	21	278	1.1
822.5	0.232	11	0.304	16	216	0.951	3.3	0.554	24	247	0.694
823.2	0.097	10	0.479	20	232	1.1	1.4	0.873	31	266	0.838
823.9	0.193	11	0.234	18	200	0.968	2.8	0.426	28	229	0.706
824.6	0.155	9.1	0.385	16	211	1.2	2.2	0.702	25	241	0.839
825.3	0.507	11	0.719	15	237	1.1	7.3	1.3	23	271	0.773
826.0	0.299	12	0.672	16	237	1.7	4.3	1.2	25	271	1.2
826.7	0.405	12	0.726	21	219	1.2	5.8	1.3	32	251	0.899
827.4	0.097	11	0.684	20	212	1.8	1.4	1.2	31	243	1.3
828.1	0.103	9.9	0.784	21	225	1.3	1.5	1.4	32	258	0.977
828.8	0.317	12	0.662	27	230	1.7	4.6	1.2	41	263	1.2
829.5	0.097	11	0.636	21	214	1.9	1.4	1.2	33	245	1.4
830.2	0.102	11	0.633	21	212	1.6	1.5	1.2	32	243	1.2
830.9	0.145	11	0.802	22	242	1.5	2.1	1.5	34	277	1.1
831.6	0.097	11	0.867	22	211	1.7	1.4	1.6	34	241	1.3
832.3	0.097	14	1.0	25	198	1.3	1.4	1.8	38	227	0.928
833.0	0.097	12	0.845	28	239	1.0	1.4	1.5	43	273	0.734
833.7	0.218	11	0.832	23	225	1.3	3.1	1.5	36	257	0.932
834.4	0.175	11	0.956	28	207	1.0	2.5	1.7	42	237	0.733
835.1	0.097	9.9	0.796	30	203	1.7	1.4	1.5	45	232	1.2
835.8	0.247	14	1.2	29	232	2.0	3.6	2.2	44	265	1.5
836.5	0.159	13	1.2	32	230	1.8	2.3	2.2	49	263	1.3
837.2	0.097	13	1.2	33	221	1.7	1.4	2.1	51	253	1.2
837.9	0.097	14	1.1	37	225	2.1	1.4	2.1	57	257	1.5
838.6	0.106	13	1.2	33	243	1.5	1.5	2.1	51	278	1.1
839.2	0.219	11	1.4	31	201	1.2	3.2	2.5	47	230	0.890
839.9	0.483	13	1.3	36	237	1.0	7.0	2.4	55	270	0.754
840.6	0.097	13	1.2	39	224	1.2	1.4	2.1	60	256	0.855
841.3	0.109	12	1.8	38	243	1.3	1.6	3.2	58	278	0.930
842.0	0.545	13	1.7	41	217	0.908	7.9	3.1	63	248	0.663
842.7	0.097	14	1.1	45	221	1.2	1.4	2.0	69	253	0.861
843.4	0.381	14	1.3	38	228	1.0	5.5	2.5	58	261	0.736
844.1	0.187	12	1.4	38	189	0.872	2.7	2.6	59	217	0.636
844.8	0.158	12	1.5	38	231	0.877	2.3	2.8	58	264	0.640
845.5	0.357	15	1.6	42	228	0.842	5.2	2.9	65	260	0.614
846.2	0.205	12	1.3	37	208	0.736	3.0	2.3	56	238	0.537
846.9	0.097	12	1.4	45	208	0.741	1.4	2.6	69	238	0.540



Minnow Environmental  
Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
847.6	0.097	13	1.4	38	211	1.1	1.4	2.5	59	241	0.808
848.3	0.225	12	1.5	44	242	1.0	3.2	2.8	68	277	0.765
849.0	0.828	12	1.7	40	209	0.529	12	3.1	61	239	0.386
849.7	0.340	12	1.1	42	203	0.875	4.9	2.1	64	232	0.638
850.4	0.333	11	1.2	36	210	1.1	4.8	2.2	56	240	0.832
851.1	0.116	15	1.5	40	225	0.758	1.7	2.7	61	257	0.553
851.8	0.204	12	1.0	47	216	0.583	2.9	1.9	72	247	0.425
852.5	0.097	14	0.950	44	218	1.3	1.4	1.7	68	249	0.913
853.2	0.097	12	1.2	43	203	0.547	1.4	2.2	66	232	0.399
853.9	0.171	13	1.5	48	229	0.789	2.5	2.7	74	262	0.575
854.6	0.292	13	1.6	45	231	1.0	4.2	2.9	69	264	0.739
855.3	0.120	14	1.3	53	230	0.934	1.7	2.4	81	263	0.681
856.0	0.097	12	1.0	42	190	0.788	1.4	1.8	64	217	0.575
856.7	0.218	14	1.2	51	220	0.858	3.1	2.2	77	252	0.626
857.4	0.106	14	1.3	50	218	0.551	1.5	2.3	76	249	0.402
858.1	0.393	15	1.1	45	213	1.4	5.7	2.1	69	243	1.0
858.8	0.097	14	1.4	39	211	0.697	1.4	2.6	60	242	0.508
859.5	0.430	15	0.862	42	254	1.4	6.2	1.6	64	291	1.0
860.2	0.262	14	0.746	42	214	1.4	3.8	1.4	64	245	1.0
860.9	0.213	13	0.978	37	269	0.839	3.1	1.8	57	307	0.612
861.6	0.097	12	1.3	35	254	0.860	1.4	2.3	53	291	0.628
862.3	0.409	15	1.2	38	238	0.926	5.9	2.1	58	272	0.676
863.0	0.302	15	0.776	34	240	1.1	4.4	1.4	52	275	0.817
863.7	0.163	13	0.815	31	228	0.902	2.3	1.5	48	261	0.658
864.4	0.154	12	0.538	30	261	1.1	2.2	0.980	46	298	0.780
865.1	0.506	14	0.889	33	256	1.2	7.3	1.6	50	293	0.902
865.7	0.502	13	0.544	22	250	0.981	7.3	0.992	34	286	0.715
866.4	0.097	13	0.918	28	249	1.5	1.4	1.7	43	285	1.1
867.1	0.410	12	0.541	18	219	1.6	5.9	0.987	27	250	1.2
867.8	0.097	13	0.397	18	229	0.855	1.4	0.724	28	262	0.624
868.5	0.503	12	0.575	17	223	1.1	7.3	1.0	26	255	0.818
869.2	0.300	12	0.267	17	241	1.4	4.3	0.488	26	275	1.0
869.9	0.162	11	0.567	17	233	1.3	2.3	1.0	26	266	0.933
870.6	0.107	12	0.220	13	227	1.2	1.5	0.401	20	260	0.865
871.3	0.422	11	0.429	15	243	2.0	6.1	0.782	23	278	1.5
872.0	0.322	11	0.566	14	227	1.2	4.6	1.0	21	260	0.906
872.7	0.255	13	0.515	17	226	1.1	3.7	0.940	26	258	0.819
873.4	0.211	9.7	0.554	15	235	0.982	3.0	1.0	23	268	0.716
874.1	0.338	10	0.562	14	229	1.0	4.9	1.0	22	261	0.739
874.8	0.097	11	0.591	19	250	1.8	1.4	1.1	29	286	1.3
875.5	0.293	10	0.500	17	241	1.3	4.2	0.913	26	276	0.954
876.2	0.097	12	0.788	16	228	1.8	1.4	1.4	25	261	1.3
876.9	0.109	11	0.552	20	231	1.3	1.6	1.0	30	264	0.934
877.6	0.359	11	0.918	18	268	1.5	5.2	1.7	27	307	1.1
878.3	0.097	11	0.775	18	270	1.6	1.4	1.4	28	309	1.2
879.0	0.158	9.8	0.999	20	247	1.9	2.3	1.8	31	283	1.4
879.7	0.136	8.8	0.694	24	223	1.2	2.0	1.3	37	255	0.870
880.4	0.257	9.3	0.829	23	230	0.954	3.7	1.5	35	263	0.696
881.1	0.097	11	0.756	23	273	1.6	1.4	1.4	35	312	1.2
881.8	0.097	12	0.783	25	248	1.5	1.4	1.4	38	284	1.1
882.5	0.097	12	1.1	24	271	1.3	1.4	2.1	36	310	0.930
883.2	0.278	11	0.881	27	253	1.3	4.0	1.6	42	289	0.953
883.9	0.233	9.6	1.1	27	258	1.5	3.4	2.0	42	295	1.1
884.6	0.101	9.5	0.642	30	250	1.3	1.5	1.2	46	285	0.963
885.3	0.097	9.6	1.3	29	254	1.0	1.4	2.3	44	290	0.741
886.0	0.398	13	1.1	27	251	2.0	5.7	2.0	42	287	1.5
886.7	0.147	11	1.2	25	245	1.3	2.1	2.1	38	280	0.945
887.4	0.105	11	1.1	29	238	1.2	1.5	2.0	45	272	0.899
888.1	0.104	11	1.1	28	252	1.2	1.5	1.9	43	288	0.893
888.8	0.109	13	1.2	30	259	1.8	1.6	2.2	46	297	1.3
889.5	0.389	12	0.913	31	219	0.985	5.6	1.7	48	250	0.718
890.2	0.513	13	0.885	34	271	1.3	7.4	1.6	52	310	0.939
890.9	0.191	12	1.3	35	254	1.8	2.8	2.4	54	291	1.3
891.5	0.345	13	1.2	33	223	0.848	5.0	2.1	51	255	0.619
892.2	0.097	13	1.2	41	279	0.943	1.4	2.2	62	319	0.688
892.9	0.371	11	1.4	38	242	1.5	5.4	2.6	59	276	1.1
893.6	0.195	13	0.988	37	245	1.6	2.8	1.8	56	280	1.2
894.3	0.097	11	1.2	36	239	0.887	1.4	2.3	54	273	0.647
895.0	0.368	13	1.2	41	264	1.4	5.3	2.2	62	302	1.0
895.7	0.198	14	1.4	44	232	0.923	2.9	2.5	68	265	0.674
896.4	0.484	12	1.2	33	222	1.3	7.0	2.2	51	254	0.952
897.1	0.185	11	1.2	41	249	0.730	2.7	2.3	63	285	0.532
897.8	0.101	12	1.2	38	240	0.918	1.5	2.1	58	274	0.669
898.5	0.104	11	1.1	35	214	1.1	1.5	2.0	54	245	0.792
899.2	0.477	12	1.3	42	240	0.801	6.9	2.3	64	275	0.584
899.9	0.293	13	1.3	44	242	1.2	4.2	2.4	68	277	0.846
900.6	0.097	13	1.2	41	231	0.558	1.4	2.1	63	264	0.407
901.3	0.228	12	1.1	40	231	0.666	3.3	2.1	61	265	0.486
902.0	0.242	12	1.1	46	228	0.281	3.5	2.0	70	261	0.205
902.7	0.110	12	1.4	39	242	0.860	1.6	2.5	60	276	0.628
903.4	0.406	11	1.2	43	236	0.960	5.9	2.1	66	269	0.701



Minnow Environmental  
Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
904.1	0.487	13	1.3	50	251	1.0	7.0	2.5	77	287	0.760
904.8	0.311	13	1.5	42	208	0.732	4.5	2.8	64	237	0.534
905.5	0.097	12	1.3	49	221	0.627	1.4	2.4	75	253	0.457
906.2	0.229	13	0.918	41	205	0.468	3.3	1.7	62	235	0.342
906.9	0.097	13	1.1	43	237	1.0	1.4	2.1	65	271	0.739
907.6	0.288	12	1.2	41	230	0.856	4.2	2.2	64	263	0.625
908.3	0.288	14	1.4	43	238	0.354	4.2	2.5	66	272	0.258
909.0	0.277	13	1.2	44	200	1.1	4.0	2.1	68	228	0.800
909.7	0.097	13	0.968	44	220	0.933	1.4	1.8	68	251	0.681
910.4	0.196	12	1.2	42	237	0.845	2.8	2.3	64	271	0.616
911.1	0.148	13	0.986	38	226	0.548	2.1	1.8	59	259	0.400
911.8	0.800	17	0.961	39	240	0.854	12	1.8	60	274	0.623
912.5	0.161	14	1.2	34	230	0.895	2.3	2.1	53	263	0.653
913.2	0.208	14	1.1	47	229	0.671	3.0	2.0	72	262	0.489
913.9	0.232	13	1.2	31	215	0.474	3.3	2.1	47	246	0.346
914.6	0.262	15	0.898	42	246	0.765	3.8	1.6	65	282	0.558
915.3	0.097	12	1.3	36	217	0.805	1.4	2.3	56	248	0.588
916.0	0.393	14	0.544	32	238	0.667	5.7	0.992	49	272	0.487
916.7	0.562	13	1.0	31	208	0.647	8.1	1.8	48	237	0.472
917.4	0.199	14	1.2	32	232	0.998	2.9	2.2	49	265	0.728
918.1	0.485	16	0.998	35	241	1.0	7.0	1.8	54	275	0.756
918.7	0.097	15	0.998	29	241	1.2	1.4	1.8	45	275	0.894
919.4	0.114	13	1.0	32	261	0.665	1.6	1.9	49	298	0.485
920.1	0.097	14	0.818	24	202	0.648	1.4	1.5	37	231	0.473
920.8	0.203	13	1.0	30	244	0.580	2.9	1.8	46	280	0.423
921.5	0.258	14	1.1	31	263	1.3	3.7	2.0	47	301	0.939
922.2	0.166	15	0.581	29	252	1.2	2.4	1.1	44	288	0.899
922.9	0.290	12	1.0	29	232	1.0	4.2	1.9	45	265	0.734
923.6	0.199	12	1.1	23	243	0.854	2.9	2.0	35	278	0.623
924.3	0.308	14	0.976	30	288	0.837	4.4	1.8	46	329	0.610
925.0	0.204	13	0.843	32	247	1.1	3.0	1.5	49	283	0.802
925.7	0.097	14	0.892	27	242	1.1	1.4	1.6	41	276	0.813
926.4	0.158	15	0.873	28	247	1.4	2.3	1.6	42	283	1.0
927.1	0.484	11	0.688	26	241	1.3	7.0	1.3	40	275	0.937
927.8	0.438	12	0.867	25	264	0.814	6.3	1.6	38	302	0.594
928.5	0.668	13	0.752	28	243	0.664	9.6	1.4	43	278	0.484
929.2	0.610	13	0.340	25	247	0.796	8.8	0.620	39	282	0.581
929.9	0.389	11	0.877	34	235	0.955	5.6	1.6	52	269	0.697
930.6	0.395	11	0.661	26	269	1.4	5.7	1.2	40	308	1.0
931.3	0.599	15	1.0	31	289	1.5	8.7	1.9	47	331	1.1
932.0	0.255	14	0.678	32	273	0.670	3.7	1.2	50	312	0.489
932.7	0.097	14	1.0	34	279	0.747	1.4	1.9	52	319	0.545
933.4	0.246	12	0.672	28	299	1.2	3.6	1.2	42	342	0.896
934.1	0.301	13	0.628	29	289	1.3	4.3	1.1	44	331	0.979
934.8	0.164	13	0.971	28	280	1.3	2.4	1.8	42	320	0.940
935.5	0.645	14	0.757	30	274	1.4	9.3	1.4	46	313	1.0
936.2	0.262	14	1.2	32	272	0.922	3.8	2.2	49	311	0.672
936.9	0.378	13	1.1	32	285	1.3	5.5	2.0	49	326	0.939
937.6	0.112	14	1.0	35	255	1.8	1.6	1.9	54	292	1.3
938.3	0.530	15	0.639	35	276	1.0	7.6	1.2	53	315	0.754
939.0	0.241	14	0.844	38	261	0.990	3.5	1.5	58	299	0.722
939.7	0.377	13	1.1	36	322	1.5	5.4	2.0	55	368	1.1
940.4	0.158	14	1.0	43	345	1.8	2.3	1.9	65	394	1.3
941.1	0.559	17	0.981	42	393	0.856	8.1	1.8	65	449	0.625
941.8	0.097	15	1.0	39	381	1.9	1.4	1.9	60	435	1.4
942.5	0.865	15	1.1	47	366	0.973	12	2.1	72	419	0.710
943.2	0.244	14	0.981	41	349	1.0	3.5	1.8	63	399	0.731
943.9	0.193	13	1.2	43	411	1.5	2.8	2.1	66	470	1.1
944.5	0.726	14	1.2	39	466	1.8	10	2.1	61	533	1.3
945.2	0.717	15	0.922	43	459	0.974	10	1.7	65	524	0.711
945.9	1.0	16	1.5	51	502	1.0	15	2.7	77	575	0.765
946.6	0.442	13	1.0	43	483	1.2	6.4	1.8	65	553	0.887
947.3	0.787	12	1.1	60	548	1.3	11	2.1	92	626	0.946
948.0	0.594	15	1.2	54	584	1.3	8.6	2.1	82	668	0.945
948.7	0.681	17	1.3	54	538	1.1	9.8	2.4	83	615	0.823
949.4	0.594	14	1.6	55	619	1.1	8.6	2.8	84	707	0.771
950.1	1.1	13	1.1	59	655	1.7	15	2.1	91	749	1.3
950.8	1.5	14	1.4	50	591	1.6	22	2.6	76	676	1.1
951.5	1.1	16	1.7	66	778	1.3	16	3.1	101	889	0.938
952.2	0.808	16	1.2	56	778	2.1	12	2.3	85	889	1.5
952.9	1.1	15	1.1	61	697	1.6	16	2.0	93	797	1.1
953.6	1.2	14	1.3	61	792	1.5	18	2.4	94	906	1.1
954.3	0.921	16	1.2	56	848	1.8	13	2.2	86	970	1.3
955.0	1.1	16	1.4	67	832	1.9	16	2.5	102	951	1.4
955.7	1.8	16	1.7	71	773	2.0	26	3.1	108	883	1.4
956.4	1.4	14	1.8	63	889	0.943	20	3.3	96	1017	0.688
957.1	1.2	16	1.6	69	901	1.2	18	2.9	106	1030	0.840
957.8	1.4	15	1.7	79	821	1.5	21	3.0	121	939	1.1
958.5	1.3	15	1.6	77	973	1.5	18	3.0	118	1112	1.1
959.2	1.2	14	1.7	62	877	1.5	18	3.1	96	1002	1.1
959.9	1.3	15	1.7	63	915	1.9	19	3.2	96	1046	1.4



Minnow Environmental  
Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.6	0.939	16	2.0	69	996	1.7	14	3.7	106	1139	1.3
961.3	2.6	16	2.5	84	1074	2.3	37	4.6	129	1228	1.7
962.0	1.1	14	1.8	75	965	1.4	16	3.3	114	1104	0.994
962.7	1.5	15	2.3	76	1050	2.0	21	4.3	116	1201	1.4
963.4	1.3	15	2.2	76	1050	2.3	19	3.9	116	1201	1.7
964.1	2.1	14	2.4	88	1148	1.4	30	4.4	134	1312	1.0
964.8	1.6	17	1.9	85	1095	1.6	23	3.4	130	1252	1.1
965.5	1.4	17	2.3	99	1144	2.3	20	4.2	151	1308	1.7
966.2	1.6	16	2.4	85	1197	1.7	23	4.4	130	1368	1.2
966.9	1.6	14	1.9	74	1093	1.8	24	3.6	113	1250	1.3
967.6	1.7	15	3.0	82	1264	1.7	24	5.5	126	1446	1.3
968.3	0.814	13	2.1	76	1051	1.9	12	3.9	117	1201	1.4
969.0	1.4	15	2.8	90	1305	1.8	21	5.0	138	1493	1.3
969.7	1.3	14	2.5	92	1319	1.6	19	4.5	141	1508	1.2
970.4	1.8	17	2.8	82	1305	2.5	26	5.2	126	1492	1.8
971.0	1.4	15	2.7	81	1333	1.7	21	5.0	124	1524	1.2
971.7	2.0	16	3.0	90	1257	1.4	28	5.4	139	1437	0.996
972.4	1.8	18	2.4	96	1429	2.0	27	4.4	147	1634	1.5
973.1	1.3	16	2.6	87	1275	2.2	19	4.8	134	1458	1.6
973.8	1.7	15	3.1	87	1374	1.8	25	5.6	134	1571	1.3
974.5	2.1	16	3.2	96	1437	2.2	31	5.8	148	1643	1.6
975.2	1.3	18	3.1	106	1335	2.4	18	5.6	162	1527	1.7
975.9	1.9	14	2.9	99	1515	2.3	27	5.4	152	1732	1.7
976.6	1.6	16	3.9	94	1493	1.8	22	7.1	143	1708	1.3
977.3	1.5	15	4.2	102	1592	2.6	22	7.6	156	1820	1.9
978.0	1.8	18	3.2	98	1531	0.999	26	5.8	149	1751	0.729
978.7	1.6	18	3.1	103	1764	1.8	24	5.6	158	2018	1.3
979.4	1.9	14	3.2	107	1647	1.4	28	5.8	165	1884	1.0
980.1	1.2	14	3.5	97	1440	1.9	17	6.3	148	1647	1.4
980.8	1.4	18	3.3	95	1553	2.3	20	6.0	146	1776	1.7
981.5	1.4	17	3.4	96	1537	1.0	20	6.3	147	1757	0.739
982.2	1.4	18	4.3	105	1670	1.7	21	7.8	161	1910	1.3
982.9	1.4	18	3.2	97	1445	1.8	20	5.8	149	1653	1.3
983.6	1.4	16	3.8	98	1530	2.4	21	7.0	150	1750	1.7
984.3	1.3	19	4.3	97	1835	1.7	19	7.9	148	2099	1.2
985.0	0.510	17	3.6	89	1484	1.6	7.4	6.6	136	1697	1.2
985.7	1.0	21	3.9	109	1707	1.7	15	7.2	167	1952	1.2
986.4	1.2	19	3.7	93	1700	2.1	17	6.7	143	1944	1.5
987.1	1.1	17	3.2	96	1670	1.7	16	5.8	147	1909	1.2
987.8	1.2	17	3.4	100	1767	1.6	17	6.2	153	2021	1.1
988.5	0.752	17	3.5	98	1533	1.8	11	6.4	150	1753	1.3
989.2	0.357	17	3.3	102	1801	1.3	5.2	6.0	156	2060	0.935
989.9	0.807	19	3.4	87	1582	1.3	12	6.2	134	1809	0.919
990.6	1.1	19	3.2	98	1845	1.9	16	5.9	151	2110	1.4
991.3	0.665	19	3.7	113	2246	2.6	9.6	6.8	173	2569	1.9
992.0	0.576	21	3.4	103	1805	1.4	8.3	6.3	157	2064	0.998
992.7	0.890	19	3.3	102	1789	1.1	13	6.0	156	2046	0.822
993.4	0.655	16	3.8	93	1679	1.4	9.5	7.0	143	1920	1.0
994.1	0.633	18	3.1	98	1784	1.8	9.1	5.7	150	2040	1.3
994.8	1.1	20	3.0	106	1990	1.5	16	5.4	162	2276	1.1
995.5	0.987	19	2.6	107	1879	1.3	14	4.8	165	2148	0.974
996.2	1.1	19	2.5	80	1657	2.2	15	4.6	122	1895	1.6
996.9	0.810	18	2.9	87	1697	1.9	12	5.4	133	1941	1.4
997.5	0.721	19	3.5	100	2105	1.0	10	6.4	153	2408	0.761
998.2	0.637	18	2.4	88	1606	1.7	9.2	4.4	136	1837	1.2
998.9	0.522	20	3.0	85	1775	1.6	7.5	5.4	131	2030	1.2
999.6	0.426	17	2.7	80	1826	1.2	6.2	4.9	122	2088	0.856
1000.3	0.816	17	2.7	94	1804	1.7	12	4.9	144	2063	1.2
1001.0	0.723	20	2.5	93	1699	1.5	10	4.6	142	1943	1.1
1001.7	0.917	20	3.5	100	1889	2.0	13	6.3	154	2160	1.4
1002.4	0.327	18	2.6	99	1785	1.3	4.7	4.8	152	2041	0.922
1003.1	0.507	16	2.3	83	1651	0.635	7.3	4.3	127	1888	0.463
1003.8	0.569	18	2.3	84	1910	0.875	8.2	4.2	129	2184	0.638
1004.5	0.724	20	2.5	91	1684	1.1	10	4.5	139	1926	0.819
1005.2	0.734	18	2.2	95	1755	1.6	11	3.9	145	2007	1.2
1005.9	0.677	19	2.0	101	1905	0.597	9.8	3.6	155	2178	0.436
1006.6	0.379	16	2.2	81	1674	0.931	5.5	4.1	125	1914	0.680
1007.3	0.345	19	2.4	86	1786	1.7	5.0	4.4	131	2042	1.2
1008.0	0.629	18	2.2	85	1791	1.5	9.1	4.0	131	2049	1.1
1008.7	0.425	17	2.1	81	1737	0.861	6.1	3.8	125	1986	0.629
1009.4	0.336	17	2.2	81	1693	1.8	4.9	4.0	125	1936	1.3
1010.1	0.718	17	2.7	89	1850	1.3	10	4.9	136	2116	0.974
1010.8	0.105	18	2.0	87	1631	0.957	1.5	3.7	134	1865	0.698
1011.5	0.148	17	2.1	82	1554	1.1	2.1	3.8	126	1777	0.800
1012.2	0.477	15	2.0	81	1686	2.0	6.9	3.6	124	1928	1.4
1012.9	0.523	19	1.7	80	1831	1.5	7.6	3.0	123	2093	1.1
1013.6	0.249	18	1.7	86	1861	1.3	3.6	3.1	132	2129	0.960
1014.3	0.592	18	2.2	78	1969	1.4	8.5	4.0	119	2252	1.1
1015.0	0.448	18	1.7	86	1555	1.2	6.5	3.1	132	1778	0.883
1015.7	0.512	16	1.4	77	1629	1.4	7.4	2.6	118	1863	1.0
1016.4	0.350	14	1.5	67	1547	1.4	5.1	2.8	103	1769	1.0



Minnow Environmental  
Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1017.1	0.629	16	1.6	74	1660	1.7	9.1	2.9	113	1898	1.3
1017.8	0.251	16	1.9	83	1683	1.8	3.6	3.4	127	1925	1.3
1018.5	0.697	17	1.9	78	1445	1.3	10	3.5	120	1652	0.946
1019.2	0.237	15	1.6	67	1483	1.6	3.4	2.9	103	1695	1.2
1019.9	0.238	15	1.5	66	1471	2.2	3.4	2.7	101	1682	1.6
1020.6	0.489	14	1.8	68	1420	1.7	7.1	3.3	104	1624	1.2
1021.3	0.147	17	1.4	67	1276	2.0	2.1	2.5	103	1459	1.5
1022.0	0.097	19	1.4	69	1257	2.2	1.4	2.6	106	1437	1.6
1022.7	0.292	17	1.5	68	1341	1.6	4.2	2.7	104	1534	1.2
1023.4	0.301	18	1.2	70	1393	2.0	4.3	2.2	107	1593	1.5
1024.1	0.216	19	1.4	69	1324	2.1	3.1	2.5	106	1514	1.5
1024.7	0.462	18	1.3	72	1372	2.1	6.7	2.4	110	1569	1.5
1025.4	0.543	17	1.3	67	1137	1.9	7.8	2.3	103	1301	1.4
1026.1	0.574	16	1.2	59	1249	2.4	8.3	2.2	90	1429	1.7
1026.8	0.243	14	1.1	61	1195	1.9	3.5	1.9	94	1367	1.4
1027.5	1.0	15	0.913	65	1159	2.8	14	1.7	99	1325	2.0
1028.2	0.572	17	1.2	62	1057	2.1	8.3	2.2	94	1208	1.5
1028.9	0.617	15	1.3	60	1033	1.8	8.9	2.3	93	1182	1.3
1029.6	0.102	14	0.969	47	946	2.7	1.5	1.8	73	1082	1.9
1030.3	0.458	15	0.850	50	990	2.5	6.6	1.6	76	1132	1.8
1031.0	0.634	16	0.821	49	997	1.5	9.1	1.5	75	1140	1.1
1031.7	0.417	15	0.662	48	844	1.7	6.0	1.2	74	965	1.2
1032.4	0.705	16	0.712	53	777	2.1	10	1.3	81	888	1.5
1033.1	1.0	14	0.632	41	837	2.0	15	1.2	63	957	1.4
1033.8	1.4	15	1.0	40	973	1.2	21	1.8	62	1112	0.880
1034.5	1.2	15	0.734	45	825	2.1	17	1.3	69	943	1.5
1035.2	1.5	16	0.810	32	725	2.0	22	1.5	49	829	1.5
1035.9	1.5	12	0.701	31	715	0.823	21	1.3	47	818	0.601
1036.6	1.5	14	0.614	31	710	1.7	22	1.1	47	812	1.3
1037.3	1.3	14	0.642	34	803	1.8	19	1.2	52	918	1.3
1038.0	0.852	13	0.896	30	750	1.9	12	1.6	46	857	1.4
1038.7	1.5	12	0.777	27	603	1.4	22	1.4	41	690	0.992
1039.4	1.7	14	0.997	32	745	1.1	25	1.8	49	852	0.801
1040.1	2.1	14	0.935	32	762	1.3	30	1.7	49	871	0.979
1040.8	2.6	13	1.1	34	760	1.8	37	2.0	52	869	1.3
1041.5	2.9	11	2.0	34	777	1.8	42	3.7	52	889	1.3
1042.2	2.7	13	1.5	38	767	1.4	38	2.8	58	877	1.0
1042.9	3.0	13	1.2	36	784	1.8	43	2.1	55	896	1.3
1043.6	2.5	13	1.2	38	824	2.4	36	2.2	58	942	1.7
1044.3	3.4	12	1.6	35	816	1.9	49	2.9	54	933	1.4
1045.0	3.3	14	1.6	43	818	1.3	48	2.9	66	935	0.940
1045.7	3.3	13	1.6	37	765	1.6	47	3.0	57	875	1.2
1046.4	3.6	12	1.4	40	734	1.3	52	2.6	61	839	0.960
1047.1	2.8	10	1.4	40	741	1.7	40	2.5	62	848	1.2
1047.8	4.1	12	1.9	45	778	2.2	59	3.4	68	890	1.6
1048.5	3.7	12	1.8	46	853	1.9	54	3.3	70	975	1.4
1049.2	3.8	12	2.0	42	778	2.5	56	3.6	64	890	1.8
1049.9	5.4	13	2.7	49	903	2.2	78	5.0	75	1032	1.6
1050.6	4.7	14	2.8	46	941	3.1	68	5.0	70	1076	2.3
1051.2	4.0	15	2.2	54	938	2.1	57	4.1	83	1072	1.5
1051.9	4.5	12	2.7	53	981	2.5	65	4.9	81	1122	1.8
1052.6	5.3	12	2.4	50	900	1.4	77	4.5	77	1029	1.0
1053.3	6.0	13	2.9	56	1229	2.4	86	5.3	86	1405	1.8
1054.0	6.3	14	3.3	61	1189	2.8	91	5.9	94	1359	2.1
1054.7	6.1	13	2.9	66	1119	2.6	88	5.2	101	1280	1.9
1055.4	6.3	12	3.0	64	1039	1.8	90	5.5	98	1188	1.3
1056.1	6.2	14	4.0	54	1036	2.9	89	7.3	82	1185	2.1
1056.8	6.5	14	3.4	59	1227	2.3	94	6.3	90	1403	1.7
1057.5	7.5	13	3.5	58	1080	2.3	108	6.4	89	1235	1.7
1058.2	7.6	14	3.6	68	1333	3.5	109	6.6	105	1525	2.5
1058.9	6.3	13	4.5	66	1192	2.1	91	8.2	102	1363	1.6
1059.6	7.2	13	3.9	73	1313	1.8	103	7.2	112	1502	1.3
1060.3	7.1	14	4.4	77	1452	2.3	102	8.0	118	1661	1.7
1061.0	7.4	15	5.8	96	1448	3.1	107	11	147	1656	2.2
1061.7	6.2	15	4.9	70	1301	2.6	89	9.0	108	1488	1.9
1062.4	6.0	15	4.5	72	1260	3.6	87	8.2	110	1441	2.6
1063.1	7.1	15	4.8	74	1563	2.7	103	8.7	113	1787	2.0
1063.8	8.0	14	5.0	75	1479	2.1	115	9.1	115	1692	1.5
1064.5	6.4	16	5.7	85	1575	3.0	92	10	130	1801	2.2
1065.2	5.6	14	5.7	79	1531	1.9	81	10	122	1751	1.4
1065.9	4.3	15	5.5	82	1581	2.3	62	10	126	1808	1.6
1066.6	4.9	15	5.9	77	1495	3.4	71	11	118	1710	2.5
1067.3	7.4	17	6.5	88	1703	3.0	107	12	135	1948	2.2
1068.0	5.9	16	5.9	80	1552	3.0	85	11	123	1775	2.2
1068.7	5.8	15	5.2	83	1595	3.4	84	9.5	127	1824	2.5
1069.4	5.5	14	6.3	93	1712	3.3	80	12	143	1958	2.4
1070.1	5.9	17	6.3	85	1676	3.4	85	11	130	1916	2.5
1070.8	5.3	17	5.8	85	1779	3.5	77	11	130	2034	2.6
1071.5	4.6	16	4.8	86	1511	3.1	67	8.8	133	1728	2.3
1072.2	4.1	15	5.5	86	1760	3.3	60	10	132	2012	2.4
1072.9	4.7	14	5.8	87	1726	2.2	67	11	134	1974	1.6



Minnow Environmental  
Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.6	4.9	16	6.4	89	2009	2.3	71	12	137	2297	1.7
1074.3	5.1	17	5.8	99	1911	3.0	73	11	152	2185	2.2
1075.0	3.8	16	5.1	81	1674	3.2	55	9.3	124	1914	2.3
1075.7	4.1	16	4.9	87	1712	2.1	59	8.9	133	1958	1.5
1076.4	3.6	14	5.7	93	2034	3.9	52	10	143	2326	2.8
1077.1	3.7	15	5.4	84	1893	3.0	54	9.8	128	2165	2.2
1077.7	2.4	16	4.7	82	1790	3.7	34	8.6	126	2047	2.7
1078.4	3.3	16	5.6	87	1962	3.2	47	10	134	2243	2.3
1079.1	2.6	13	4.6	81	1700	3.4	38	8.4	124	1944	2.5
1079.8	2.9	16	4.5	82	2013	2.8	41	8.3	125	2302	2.0
1080.5	2.1	16	5.6	94	2091	3.9	30	10	145	2391	2.9
1081.2	2.4	15	4.3	81	1878	2.8	35	7.8	124	2148	2.0
1081.9	2.6	13	3.8	69	1592	2.4	37	7.0	106	1821	1.8
1082.6	2.4	15	5.4	80	2028	2.9	35	9.8	122	2319	2.1
1083.3	2.2	17	4.2	80	1803	2.4	32	7.6	122	2062	1.8
1084.0	2.9	17	4.8	109	2028	2.7	42	8.8	167	2319	2.0
1084.7	1.9	18	4.8	87	2046	2.5	27	8.8	133	2339	1.8
1085.4	1.9	18	4.7	79	1734	1.7	27	8.6	121	1983	1.2
1086.1	1.4	15	4.0	75	1795	2.9	20	7.3	115	2053	2.1
1086.8	2.2	15	4.3	87	2216	3.6	32	7.8	134	2534	2.6
1087.5	0.858	18	3.7	77	1926	2.5	12	6.7	119	2203	1.8
1088.2	1.2	17	3.4	72	1853	2.8	17	6.2	111	2119	2.1
1088.9	1.1	14	3.8	84	1883	2.5	16	7.0	129	2153	1.8
1089.6	1.2	14	3.0	74	1830	2.7	17	5.5	113	2092	2.0
1090.3	0.822	17	3.7	72	1899	3.2	12	6.8	110	2171	2.4
1091.0	1.3	18	2.9	71	1658	1.7	18	5.3	109	1896	1.3
1091.7	0.594	17	3.1	70	1609	1.5	8.6	5.7	107	1840	1.1
1092.4	0.577	18	2.0	67	1622	2.3	8.3	3.6	102	1855	1.7
1093.1	1.1	16	3.0	68	1620	2.3	15	5.6	104	1853	1.7
1093.8	1.1	17	2.9	68	1640	2.9	16	5.3	104	1876	2.1
1094.5	0.613	15	2.1	72	1304	2.4	8.9	3.9	111	1492	1.7
1095.2	0.415	19	2.1	63	1493	2.0	6.0	3.9	96	1708	1.4
1095.9	0.968	15	2.5	57	1480	2.4	14	4.6	87	1692	1.7
1096.6	0.767	18	2.3	64	1485	2.4	11	4.2	99	1698	1.7
1097.3	0.882	19	2.8	67	1502	2.9	13	5.0	102	1717	2.1
1098.0	0.700	17	1.5	60	1229	3.3	10	2.8	93	1405	2.4
1098.7	0.518	17	1.7	63	1625	2.4	7.5	3.1	96	1858	1.7
1099.4	0.232	17	1.9	55	1226	2.2	3.3	3.5	84	1402	1.6
1100.1	0.735	17	1.6	63	1248	2.3	11	2.8	96	1427	1.7
1100.8	0.338	17	1.8	61	1396	2.8	4.9	3.3	93	1597	2.0
1101.5	0.520	16	2.2	65	1247	2.0	7.5	3.9	100	1426	1.5
1102.2	0.596	19	1.2	58	1117	2.2	8.6	2.3	89	1277	1.6
1102.9	0.518	19	1.5	51	1284	2.3	7.5	2.7	78	1468	1.7
1103.6	0.430	18	1.7	52	1158	2.3	6.2	3.1	80	1324	1.6
1104.2	0.112	19	1.1	54	1120	3.1	1.6	2.0	83	1280	2.2
1104.9	0.146	16	1.1	51	932	2.3	2.1	2.0	78	1066	1.7
1105.6	0.510	17	1.2	47	1072	2.0	7.4	2.2	73	1226	1.5
1106.3	0.454	13	1.2	42	1035	1.8	6.5	2.1	65	1183	1.3
1107.0	0.331	16	0.971	45	977	1.6	4.8	1.8	69	1117	1.1
1107.7	0.459	18	0.976	44	986	2.0	6.6	1.8	68	1128	1.4
1108.4	0.382	16	1.3	43	966	1.7	5.5	2.4	66	1105	1.3
1109.1	0.617	14	0.889	38	878	1.6	8.9	1.6	58	1004	1.2
1109.8	0.629	14	0.784	34	894	2.0	9.1	1.4	53	1022	1.5
1110.5	0.195	14	0.942	35	871	1.7	2.8	1.7	54	996	1.2
1111.2	0.473	17	0.704	34	846	2.0	6.8	1.3	52	968	1.5
1111.9	0.336	14	0.969	33	959	1.7	4.8	1.8	50	1097	1.3
1112.6	0.584	13	0.721	30	802	1.6	8.4	1.3	46	917	1.2
1113.3	0.258	14	0.686	34	854	1.5	3.7	1.3	52	976	1.1
1114.0	0.117	13	0.993	34	1003	2.0	1.7	1.8	52	1146	1.4
1114.7	0.097	11	0.528	32	796	2.0	1.4	0.963	49	910	1.5
1115.4	0.390	13	0.669	32	837	2.0	5.6	1.2	49	957	1.5
1116.1	0.097	17	0.521	25	821	1.5	1.4	0.951	39	939	1.1
1116.8	0.336	12	0.622	27	779	1.7	4.8	1.1	42	891	1.2
1117.5	0.567	11	0.469	28	779	1.2	8.2	0.855	43	891	0.901
1118.2	0.120	12	0.540	35	855	1.9	1.7	0.984	54	978	1.4
1118.9	0.815	11	0.439	29	812	1.8	12	0.801	45	929	1.3
1119.6	0.837	11	0.428	23	785	1.6	12	0.780	36	898	1.2
1120.3	0.369	11	0.527	26	729	1.5	5.3	0.961	41	834	1.1
1121.0	0.205	14	0.522	36	849	2.1	3.0	0.953	56	971	1.5
1121.7	0.300	12	0.332	30	746	1.6	4.3	0.606	46	854	1.1
1122.4	0.637	12	0.485	31	856	0.985	9.2	0.884	48	979	0.718
1123.1	0.321	11	0.488	32	793	1.1	4.6	0.891	48	907	0.802
1123.8	0.558	13	0.493	30	706	1.1	8.1	0.900	46	807	0.836
1124.5	0.894	13	0.295	30	782	2.2	13	0.538	46	895	1.6
1125.2	0.268	9.1	0.603	29	711	1.4	3.9	1.1	44	813	1.0
1125.9	0.668	12	0.399	25	789	0.896	9.6	0.729	39	903	0.654
1126.6	0.584	10	0.417	33	921	1.7	8.4	0.761	50	1054	1.3
1127.3	0.415	12	0.560	31	743	2.4	6.0	1.0	48	849	1.7
1128.0	0.646	10	0.299	31	774	1.5	9.3	0.545	47	885	1.1
1128.7	0.442	11	0.539	30	801	1.1	6.4	0.983	46	916	0.837
1129.4	0.607	11	0.496	31	932	1.4	8.8	0.905	48	1066	1.1



Minnow Environmental  
Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1130.0	0.986	12	0.409	29	840	1.3	14	0.746	45	961	0.964
1130.7	0.423	14	0.779	40	984	1.3	6.1	1.4	61	1125	0.934
1131.4	1.1	12	0.503	32	895	2.2	15	0.917	49	1023	1.6
1132.1	0.738	10	0.495	34	821	2.1	11	0.902	53	939	1.5
1132.8	1.1	13	0.646	34	885	1.9	16	1.2	53	1013	1.4
1133.5	0.634	12	0.518	37	882	2.0	9.2	0.946	57	1009	1.4
1134.2	0.984	13	0.445	39	905	1.9	14	0.812	59	1035	1.4
1134.9	0.880	12	0.831	36	984	2.3	13	1.5	56	1125	1.7
1135.6	0.969	14	0.877	36	940	2.4	14	1.6	56	1075	1.7
1136.3	1.2	14	0.967	45	1034	2.9	17	1.8	68	1183	2.1
1137.0	0.875	14	1.1	42	1094	2.8	13	1.9	65	1251	2.0
1137.7	0.970	15	0.837	44	1087	3.6	14	1.5	68	1244	2.7
1138.4	1.1	13	0.999	39	974	2.6	16	1.8	60	1114	1.9
1139.1	1.0	12	1.0	40	946	3.5	15	1.9	62	1081	2.6
1139.8	2.0	14	0.985	43	1061	3.7	29	1.8	65	1213	2.7
1140.5	1.0	16	0.795	46	996	3.3	15	1.5	70	1138	2.4
1141.2	1.8	14	0.839	41	1006	3.1	25	1.5	62	1150	2.3
1141.9	1.6	12	1.0	48	982	3.2	23	1.9	74	1123	2.4
1142.6	1.9	14	1.0	48	1065	4.2	27	1.8	73	1218	3.1
1143.3	1.8	15	1.2	46	1127	3.0	26	2.2	71	1289	2.2
1144.0	1.6	17	1.5	51	1032	3.7	23	2.7	78	1180	2.7
1144.7	1.3	14	0.818	40	1014	3.6	18	1.5	62	1160	2.7
1145.4	1.1	16	1.2	41	881	2.4	15	2.1	63	1007	1.8
1146.1	1.9	15	1.1	48	1080	4.2	28	2.1	74	1235	3.0
1146.8	1.8	16	1.2	57	1133	4.3	26	2.2	87	1295	3.1
1147.5	1.5	15	1.3	47	1123	4.2	22	2.3	72	1285	3.1
1148.2	1.4	14	1.1	44	1151	2.8	20	2.0	68	1317	2.0
1148.9	1.6	16	0.991	43	1049	3.5	23	1.8	66	1200	2.5
1149.6	1.3	15	1.4	41	1129	6.0	18	2.5	63	1291	4.4
1150.3	1.4	15	1.3	44	1059	4.8	20	2.5	68	1211	3.5
1151.0	1.2	14	1.0	45	1063	3.5	17	1.9	69	1216	2.6
1151.7	1.5	15	1.1	46	1036	3.8	21	1.9	70	1184	2.8
1152.4	2.4	15	1.7	44	1140	4.9	35	3.1	68	1304	3.5
1153.1	1.8	15	1.3	47	949	4.1	27	2.3	72	1085	3.0
1153.8	2.1	15	1.3	42	971	4.4	30	2.5	65	1111	3.2
1154.5	1.4	16	1.4	44	959	4.1	20	2.5	67	1097	3.0
1155.2	1.9	13	1.5	33	851	3.1	27	2.8	51	973	2.2
1155.9	1.6	13	1.5	39	929	4.3	23	2.8	60	1063	3.2
1156.5	2.2	15	1.7	39	886	4.7	31	3.0	60	1013	3.4
1157.2	2.2	16	1.7	42	991	3.8	32	3.2	65	1133	2.8
1157.9	2.4	14	1.4	44	911	4.0	34	2.6	67	1042	2.9
1158.6	2.5	15	1.7	39	998	2.6	36	3.2	60	1141	1.9
1159.3	2.0	15	1.5	37	899	4.9	28	2.8	56	1028	3.6
1160.0	2.5	17	1.7	40	977	4.7	36	3.2	61	1117	3.4
1160.7	2.2	15	1.7	39	881	4.2	31	3.1	60	1008	3.1
1161.4	2.2	17	1.4	35	814	4.1	32	2.6	54	931	3.0
1162.1	1.9	15	1.4	35	848	3.4	28	2.5	54	970	2.5
1162.8	2.0	15	2.1	41	895	4.0	29	3.8	63	1023	2.9
1163.5	2.8	15	2.1	43	891	3.9	41	3.9	65	1019	2.8
1164.2	3.0	14	1.8	48	865	3.6	43	3.3	73	989	2.7
1164.9	2.8	15	2.0	34	776	3.3	40	3.6	52	887	2.4
1165.6	2.1	15	2.2	42	803	4.2	30	4.0	64	918	3.1
1166.3	2.8	14	1.8	33	779	2.9	41	3.3	50	890	2.1
1167.0	3.5	18	2.2	44	825	3.3	50	3.9	67	943	2.4
1167.7	3.2	14	1.7	47	823	3.7	47	3.1	72	942	2.7
1168.4	2.8	12	1.9	27	669	2.6	40	3.4	41	765	1.9
1169.1	3.4	14	2.5	37	808	2.7	49	4.6	57	924	2.0
1169.8	4.0	15	2.3	39	925	3.1	58	4.1	60	1058	2.2
1170.5	3.3	15	1.9	39	904	2.7	47	3.5	60	1034	2.0
1171.2	3.4	13	2.6	35	754	2.1	49	4.8	53	863	1.5
1171.9	3.0	12	2.4	37	872	2.8	44	4.5	56	997	2.0
1172.6	4.1	14	2.5	35	976	2.5	59	4.6	53	1116	1.8
1173.3	4.1	14	2.6	36	923	2.7	59	4.8	55	1056	1.9
1174.0	3.6	13	3.1	39	823	2.3	52	5.7	60	941	1.7
1174.7	4.3	12	3.5	42	796	3.1	62	6.5	64	911	2.3
1175.4	3.1	11	2.8	35	795	2.9	45	5.1	54	909	2.1
1176.1	4.5	14	3.6	40	961	2.6	65	6.6	61	1099	1.9
1176.8	4.0	14	3.1	39	951	2.9	58	5.6	60	1088	2.1
1177.5	4.3	14	2.8	51	959	4.8	62	5.1	79	1097	3.5
1178.2	5.3	13	3.3	41	873	2.3	77	6.1	63	998	1.7
1178.9	4.6	14	3.2	37	996	2.7	67	5.9	57	1139	2.0
1179.6	4.9	12	3.4	42	911	2.2	70	6.1	65	1042	1.6
1180.3	5.9	15	3.4	45	947	3.1	85	6.2	70	1083	2.2
1181.0	5.3	16	3.5	48	1037	2.6	76	6.4	73	1186	1.9
1181.6	5.8	14	3.8	42	999	3.1	84	7.0	64	1142	2.2
1182.3	5.8	14	3.1	44	1107	2.9	83	5.7	67	1266	2.1
1183.0	6.2	15	4.3	48	1062	3.1	90	7.8	74	1214	2.2
1183.7	5.6	16	4.2	50	1197	2.8	81	7.6	77	1369	2.0
1184.4	5.0	14	3.7	43	1133	2.7	73	6.8	66	1296	2.0
1185.1	5.0	13	3.3	44	1106	2.3	72	6.0	67	1265	1.7
1185.8	4.9	14	4.4	49	1209	3.6	70	8.1	74	1383	2.6



Minnow Environmental  
Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1186.5	4.5	14	4.2	44	1276	2.9	65	7.7	68	1459	2.1
1187.2	5.1	18	4.6	56	1350	4.2	73	8.4	85	1544	3.1
1187.9	5.4	15	4.3	52	1213	2.8	78	7.9	80	1387	2.1
1188.6	3.3	18	3.8	46	1415	2.7	48	7.0	71	1618	2.0
1189.3	3.6	16	4.9	51	1512	3.6	52	8.9	79	1729	2.6
1190.0	4.7	17	4.9	55	1324	2.8	67	8.9	84	1514	2.1
1190.7	4.0	17	4.9	63	1251	3.0	57	8.9	96	1431	2.2
1191.4	3.1	15	4.0	49	1150	3.4	45	7.2	74	1316	2.5
1192.1	3.1	14	4.1	56	1282	3.0	45	7.6	86	1466	2.2
1192.8	3.8	19	4.5	59	1538	3.8	54	8.1	91	1759	2.8
1193.5	3.9	14	4.0	54	1253	2.7	56	7.3	82	1433	1.9
1194.2	3.0	15	3.9	50	1336	2.8	44	7.2	77	1527	2.1
1194.9	2.6	16	4.5	52	1145	3.5	38	8.1	80	1310	2.6
1195.6	2.8	14	4.3	54	1223	3.0	41	7.9	82	1399	2.2
1196.3	3.5	18	3.7	51	1403	3.2	51	6.7	79	1604	2.3
1197.0	3.7	17	4.3	60	1295	3.8	53	7.8	92	1481	2.8
1197.7	2.9	16	4.1	53	1417	4.4	42	7.4	81	1621	3.2
1198.4	3.5	16	4.0	55	1359	3.2	50	7.3	85	1554	2.3
1199.1	3.0	16	3.8	50	1269	2.6	44	7.0	76	1451	1.9
1199.8	2.7	20	4.3	58	1338	3.4	39	7.8	88	1531	2.5
1200.5	2.1	17	4.2	59	1419	2.8	30	7.6	90	1623	2.1
1201.2	1.5	12	3.3	43	1232	2.9	22	6.0	66	1409	2.1
1201.9	2.5	17	3.8	49	1415	3.5	35	7.0	75	1619	2.6
1202.6	2.5	18	3.8	49	1367	2.6	37	7.0	75	1563	1.9
1203.3	1.9	16	3.6	46	1264	2.6	27	6.5	71	1446	1.9
1204.0	2.0	16	3.3	61	1333	2.8	29	6.0	94	1524	2.0
1204.7	1.4	15	3.1	42	1361	2.6	20	5.7	64	1556	1.9
1205.4	1.4	16	3.7	45	1366	2.5	20	6.7	68	1562	1.8
1206.1	1.8	19	3.3	52	1285	2.9	27	5.9	80	1469	2.1
1206.8	1.6	16	3.5	59	1354	3.0	23	6.4	90	1548	2.2
1207.5	1.8	16	3.0	51	1148	2.2	25	5.4	78	1312	1.6
1208.1	1.3	17	2.3	39	1298	2.8	19	4.3	59	1484	2.1
1208.8	1.3	16	2.7	44	1223	3.2	18	5.0	68	1398	2.3
1209.5	1.1	17	2.9	42	1176	3.8	16	5.4	65	1345	2.7
1210.2	1.6	19	3.4	44	1247	2.5	23	6.1	68	1426	1.8
1210.9	0.456	17	2.1	47	1088	2.2	6.6	3.9	71	1245	1.6
1211.6	1.6	15	2.2	46	1244	3.3	23	4.0	71	1422	2.4
1212.3	1.5	17	2.3	34	1194	2.2	21	4.2	53	1365	1.6
1213.0	0.989	17	2.0	46	1063	2.4	14	3.6	70	1216	1.7
1213.7	1.1	16	3.0	44	1121	1.8	16	5.5	67	1282	1.3
1214.4	1.4	13	1.7	38	1180	2.0	20	3.2	58	1350	1.5
1215.1	0.998	13	2.0	33	924	2.5	14	3.7	50	1056	1.9
1215.8	1.3	15	1.9	36	1082	2.0	18	3.4	55	1238	1.4
1216.5	0.592	14	1.5	34	938	2.3	8.5	2.7	52	1073	1.6
1217.2	0.966	15	1.3	43	1008	1.1	14	2.4	66	1153	0.825
1217.9	0.886	17	1.5	38	1228	2.1	13	2.7	59	1404	1.6
1218.6	0.839	15	1.4	33	1072	2.1	12	2.5	51	1226	1.5
1219.3	0.694	15	1.6	35	1008	2.4	10	2.9	54	1152	1.7
1220.0	0.878	15	0.851	34	803	1.8	13	1.6	51	919	1.3
1220.7	1.0	15	1.3	32	879	1.3	15	2.3	48	1006	0.932
1221.4	1.0	14	1.5	34	988	2.4	15	2.7	53	1130	1.8
1222.1	0.568	12	1.2	32	1080	1.8	8.2	2.2	49	1235	1.3
1222.8	0.755	16	1.4	33	989	2.6	11	2.5	51	1131	1.9
1223.5	1.5	15	1.1	36	889	1.5	22	2.0	55	1017	1.1
1224.2	0.623	16	1.2	35	988	3.4	9.0	2.2	54	1130	2.5
1224.9	0.953	14	1.2	30	905	1.5	14	2.1	45	1035	1.1
1225.6	1.5	15	1.6	30	965	1.6	22	2.8	46	1104	1.1
1226.3	1.1	15	1.3	39	926	2.8	16	2.4	59	1059	2.0
1227.0	0.762	14	0.985	31	845	2.1	11	1.8	47	966	1.5
1227.7	0.783	17	1.0	30	849	2.0	11	1.9	46	971	1.5
1228.4	1.2	13	0.812	28	774	2.0	17	1.5	42	885	1.5
1229.1	0.933	14	0.860	28	1076	1.9	13	1.6	43	1231	1.4
1229.8	1.4	17	0.898	33	888	2.4	21	1.6	50	1016	1.8
1230.5	1.2	15	0.752	30	755	2.2	18	1.4	46	863	1.6
1231.2	0.452	14	0.946	29	829	1.8	6.5	1.7	45	948	1.3
1231.9	1.2	13	0.481	27	906	1.8	18	0.878	42	1036	1.3
1232.6	1.1	12	0.784	30	837	2.0	16	1.4	46	958	1.5
1233.3	1.2	16	0.927	31	860	1.8	17	1.7	47	984	1.3
1233.9	1.1	16	0.892	30	832	1.9	17	1.6	46	952	1.4
1234.6	1.5	14	0.614	27	767	2.1	22	1.1	42	877	1.5
1235.3	1.6	16	0.866	23	875	1.8	24	1.6	35	1001	1.3
1236.0	1.1	15	0.946	28	918	2.4	16	1.7	43	1050	1.8
1236.7	2.0	16	0.577	35	854	2.8	29	1.1	53	977	2.0
1237.4	0.928	14	0.854	26	755	1.9	13	1.6	40	864	1.4
1238.1	1.4	16	0.858	28	888	2.3	19	1.6	42	1016	1.7
1238.8	1.1	14	0.818	24	945	1.9	15	1.5	37	1080	1.4
1239.5	1.6	15	0.936	29	902	2.5	23	1.7	44	1031	1.8
1240.2	1.2	15	0.615	26	849	2.5	18	1.1	40	971	1.8
1240.9	1.4	13	0.699	28	777	1.7	20	1.3	43	888	1.3
1241.6	1.3	14	0.895	26	966	2.8	19	1.6	40	1104	2.0
1242.3	1.5	15	0.932	25	865	1.9	22	1.7	39	989	1.4



Minnow Environmental  
Sample ID: 001

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1243.0	1.4	15	0.951	31	905	2.4	21	1.7	48	1034	1.7
1243.7	1.6	15	0.981	27	897	1.9	22	1.8	41	1025	1.4
1244.4	0.952	17	0.756	28	943	2.1	14	1.4	42	1078	1.5
1245.1	0.858	15	0.886	28	927	2.0	12	1.6	42	1060	1.5
1245.8	1.4	14	1.1	31	1068	1.9	21	2.0	48	1221	1.4
1246.5	1.1	14	0.999	27	815	1.8	15	1.8	41	932	1.3
1247.2	1.3	14	0.861	29	907	2.2	18	1.6	45	1037	1.6
1247.9	0.884	13	0.980	28	1016	1.4	13	1.8	43	1162	1.0
1248.6	1.4	14	1.1	35	1180	2.1	20	2.0	53	1349	1.5
1249.3	1.0	16	1.2	31	1093	2.2	15	2.1	47	1250	1.6
1250.0	2.5	13	1.0	29	994	1.7	36	1.8	45	1137	1.3
1250.7	1.3	13	1.1	27	1023	1.3	18	2.1	42	1170	0.938
1251.4	1.0	14	1.0	30	994	1.6	15	1.8	47	1137	1.2
1252.1	1.2	17	1.3	27	1137	1.9	17	2.3	41	1300	1.4
1252.8	1.2	14	1.3	31	1110	2.0	17	2.4	48	1270	1.5
1253.5	1.4	13	1.3	31	1050	1.7	20	2.4	47	1200	1.2
1254.2	1.2	15	1.3	28	1157	2.4	17	2.3	44	1323	1.8
1254.9	1.0	13	1.5	34	1197	1.7	15	2.8	52	1369	1.2
1255.6	0.773	14	1.8	31	1202	1.8	11	3.3	47	1374	1.3
1256.3	0.967	16	1.4	32	1116	2.2	14	2.6	49	1277	1.6
1257.0	1.6	14	1.5	31	1090	2.2	24	2.7	48	1246	1.6
1257.7	1.3	13	1.5	31	1236	2.0	18	2.7	48	1413	1.5
1258.4	1.7	15	1.5	28	1260	2.5	24	2.8	43	1441	1.8
1259.1	1.2	17	2.0	34	1283	2.0	17	3.6	52	1468	1.5
1259.8	1.3	16	1.6	32	1150	2.5	18	2.9	49	1315	1.8
1260.4	0.884	17	1.7	32	1199	2.2	13	3.1	48	1372	1.6
1261.1	1.5	17	1.8	28	1207	2.0	22	3.2	42	1380	1.4
1261.8	1.1	16	1.8	33	1266	3.1	15	3.3	51	1448	2.3
1262.5	0.975	15	1.7	29	1216	2.4	14	3.1	45	1390	1.7
1263.2	1.0	15	1.8	31	1051	2.8	15	3.2	48	1201	2.0
1263.9	1.5	15	1.7	34	1261	2.7	21	3.1	52	1442	2.0
1264.6	0.842	14	1.6	31	1187	2.7	12	2.9	48	1358	2.0
1265.3	0.600	14	1.6	29	1166	2.9	8.7	3.0	44	1333	2.1
1266.0	0.597	16	1.4	32	1157	2.1	8.6	2.6	49	1323	1.5
1266.7	1.1	16	1.8	38	1314	2.4	16	3.2	58	1502	1.8
1267.4	0.769	15	1.9	31	1262	2.5	11	3.4	48	1444	1.9
1268.1	0.729	15	1.7	31	1194	2.9	11	3.0	48	1365	2.1
1268.8	0.921	17	1.9	30	1342	3.2	13	3.4	46	1534	2.3
1269.5	0.837	18	2.3	37	1258	3.0	12	4.2	57	1438	2.2
1270.2	0.936	17	1.4	36	1305	3.1	14	2.5	55	1492	2.3
1270.9	0.742	14	2.0	32	1271	2.1	11	3.6	49	1453	1.5
1271.6	0.586	15	2.0	31	1310	2.9	8.5	3.6	48	1498	2.1
1272.3	1.0	18	2.5	35	1455	3.5	15	4.6	54	1664	2.6
1273.0	0.716	18	1.9	40	1472	2.8	10	3.4	61	1683	2.1
1273.7	0.650	15	1.7	36	1304	2.1	9.4	3.1	55	1492	1.5
1274.4	0.915	14	1.8	36	1328	2.6	13	3.2	55	1519	1.9
1275.1	0.730	17	2.0	35	1227	3.2	11	3.6	54	1404	2.3
1275.8	0.582	18	2.1	35	1139	2.4	8.4	3.7	54	1303	1.7
1276.5	1.1	15	1.6	39	1246	2.7	16	2.9	60	1425	2.0
1277.2	0.214	18	1.9	37	1434	2.6	3.1	3.5	56	1640	1.9
1277.9	0.993	14	1.6	35	1253	2.9	14	3.0	54	1433	2.1
1278.6	0.288	15	1.8	34	1244	2.6	4.2	3.3	53	1423	1.9
1279.3	0.311	17	1.8	34	1369	2.8	4.5	3.3	53	1566	2.0
1280.0	0.144	18	1.7	29	1106	2.1	2.1	3.1	45	1265	1.5
1280.7	0.284	17	1.3	31	1228	2.3	4.1	2.5	47	1404	1.7
1281.4	0.097	17	1.4	30	1223	2.8	1.4	2.5	46	1398	2.0
1282.1	0.420	17	1.6	29	1358	2.6	6.1	3.0	45	1553	1.9
1282.8	0.171	17	1.9	31	1236	2.6	2.5	3.4	48	1414	1.9
1283.5	0.478	16	1.5	36	1077	2.6	6.9	2.8	55	1231	1.9
1284.2	0.406	19	1.5	25	1179	2.9	5.9	2.7	38	1348	2.1
1284.9	0.371	22	1.4	27	1255	2.8	5.4	2.5	41	1435	2.1
1285.6	0.097	22	1.6	32	1268	2.7	1.4	2.9	48	1450	1.9
1286.2	0.199	20	1.6	31	1120	2.1	2.9	3.0	48	1281	1.5
1286.9	0.101	19	1.3	23	908	2.0	1.5	2.4	35	1038	1.5
1287.6	0.097	16	1.2	25	1001	2.4	1.4	2.2	38	1145	1.8
1288.3	0.108	23	1.6	26	982	3.2	1.6	2.9	40	1123	2.4
1289.0	0.382	19	1.6	27	1031	1.5	5.5	2.9	41	1178	1.1
1289.7	0.097	20	1.1	26	925	2.1	1.4	2.0	40	1057	1.6
1290.4	0.136	17	1.2	20	919	1.3	2.0	2.2	31	1051	0.967
1291.1	0.137	16	0.966	24	796	1.7	2.0	1.8	37	911	1.2
1291.8	0.097	21	1.3	25	964	1.7	1.4	2.3	38	1102	1.2
1292.5	0.189	20	1.5	34	905	2.6	2.7	2.7	51	1035	1.9
1293.2	0.112	26	1.2	25	884	2.0	1.6	2.3	38	1011	1.5
1293.9	0.276	22	0.995	27	879	2.3	4.0	1.8	41	1005	1.7
1294.6	0.097	19	1.1	20	882	1.5	1.4	2.1	31	1009	1.1
1295.3	0.195	24	0.881	27	860	1.4	2.8	1.6	41	984	1.0
1296.0	0.097	21	0.927	26	757	1.2	1.4	1.7	41	866	0.853
1296.7	0.235	22	0.822	24	757	1.8	3.4	1.5	37	865	1.3
1297.4	0.097	22	0.710	23	689	1.9	1.4	1.3	35	788	1.4
1298.1	0.147	21	0.720	22	843	1.4	2.1	1.3	33	964	1.0
1298.8	0.097	22	0.930	19	741	2.1	1.4	1.7	29	848	1.6



Minnow Environmental Sample ID: 001											
Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1299.5	0.097	23	0.591	26	690	2.2	1.4	1.1	39	789	1.6
1300.2	0.184	20	0.729	20	624	1.6	2.7	1.3	31	714	1.2
1300.9	0.097	21	0.776	18	659	1.3	1.4	1.4	28	753	0.919
1301.6	0.145	21	0.608	20	656	1.7	2.1	1.1	31	750	1.2
1302.3	0.255	25	0.432	17	683	2.5	3.7	0.788	26	782	1.9
1303.0	0.230	26	0.272	24	668	1.8	3.3	0.496	37	764	1.3
1303.7	0.216	22	0.325	18	610	1.2	3.1	0.593	27	698	0.879
1304.4	0.097	25	0.423	16	672	1.4	1.4	0.772	25	769	1.0
1305.1	0.178	27	0.371	17	600	1.0	2.6	0.676	27	686	0.747
1305.8	0.097	25	0.394	14	578	1.2	1.4	0.718	22	661	0.908
1306.5	0.308	25	0.339	18	635	1.3	4.4	0.618	27	727	0.915
1307.2	0.178	22	0.244	16	582	1.3	2.6	0.445	25	665	0.934
1307.9	0.097	21	0.315	14	590	0.674	1.4	0.574	22	675	0.492
1308.6	0.309	26	0.139	15	666	1.2	4.5	0.253	23	762	0.869
1309.3	0.097	20	0.361	12	523	1.3	1.4	0.658	18	598	0.956
1310.0	0.420	21	0.189	14	588	1.3	6.1	0.344	22	672	0.985
1310.7	0.339	20	0.399	14	565	1.2	4.9	0.727	21	646	0.841
1311.4	0.099	21	0.176	13	614	1.0	1.4	0.320	20	702	0.754
1312.1	0.298	24	0.286	13	534	1.0	4.3	0.522	20	611	0.746
1312.7	0.262	25	0.262	13	587	1.2	3.8	0.477	20	671	0.852
1313.4	0.165	29	0.472	12	557	0.886	2.4	0.861	19	637	0.647
1314.1	0.097	31	0.550	11	501	0.981	1.4	1.0	17	573	0.716
1314.8	0.401	37	0.395	14	591	1.1	5.8	0.720	21	676	0.804
1315.5	0.205	36	0.348	11	567	1.4	3.0	0.634	17	648	1.1
1316.2	0.097	43	0.501	9.7	447	0.968	1.4	0.914	15	511	0.706
1316.9	0.152	60	0.547	9.9	530	0.844	2.2	0.997	15	606	0.616
1317.6	0.097	44	0.370	13	588	1.4	1.4	0.674	20	672	1.0
1318.3	0.142	49	0.627	11	546	0.855	2.1	1.1	16	624	0.624
1319.0	0.097	54	0.444	14	562	1.4	1.4	0.811	21	643	1.0
1319.7	0.154	52	0.678	11	540	1.9	2.2	1.2	16	618	1.4
1320.4	0.097	41	0.402	11	511	0.623	1.4	0.734	17	584	0.455
1321.1	0.131	41	0.363	7.9	489	0.785	1.9	0.662	12	560	0.573
1321.8	0.546	39	0.418	9.3	502	0.712	7.9	0.762	14	574	0.520
1322.5	0.301	45	0.615	15	525	1.2	4.3	1.1	23	601	0.848
1323.2	0.312	69	0.520	8.6	551	1.0	4.5	0.948	13	630	0.732
1323.9	0.184	60	0.483	7.4	499	1.2	2.7	0.880	11	571	0.866
1324.6	0.374	56	0.588	8.9	500	1.3	5.4	1.1	14	572	0.923
1325.3	0.097	53	0.837	9.1	573	1.1	1.4	1.5	14	655	0.816
1326.0	0.219	72	0.470	10	546	0.899	3.2	0.858	16	624	0.656
1326.7	0.097	63	0.690	8.0	471	1.0	1.4	1.3	12	538	0.759
1327.4	0.105	83	0.533	9.8	530	1.2	1.5	0.973	15	606	0.902
1328.1	0.097	74	0.731	8.9	482	0.792	1.4	1.3	14	551	0.578
1328.8	0.097	77	0.775	9.8	489	1.1	1.4	1.4	15	559	0.802
1329.5	0.235	89	0.639	9.6	471	1.4	3.4	1.2	15	539	1.0
1330.2	0.351	96	0.760	8.6	416	1.2	5.1	1.4	13	476	0.866
1330.9	0.313	111	1.2	8.1	457	0.769	4.5	2.2	12	523	0.561
1331.6	0.163	91	0.914	8.2	393	0.816	2.3	1.7	13	450	0.596
1332.3	0.144	108	0.841	11	542	0.667	2.1	1.5	17	620	0.487
1333.0	0.215	121	0.937	11	490	1.6	3.1	1.7	16	561	1.2
1333.7	0.156	121	1.2	8.8	501	1.2	2.3	2.1	13	573	0.845
1334.4	0.284	95	0.752	7.3	443	0.607	4.1	1.4	11	506	0.443
1335.1	0.318	126	1.1	8.2	522	1.5	4.6	2.0	12	597	1.1
1335.8	0.219	123	0.816	8.1	532	1.2	3.2	1.5	12	608	0.858
1336.5	0.097	132	1.2	11	446	1.1	1.4	2.2	16	510	0.767
1337.2	0.385	195	1.2	8.6	486	1.2	5.6	2.2	13	556	0.903
1337.9	0.097	178	1.4	11	444	1.7	1.4	2.6	16	508	1.2
1338.6	0.097	131	1.4	8.1	386	0.927	1.4	2.6	12	441	0.676
1339.3	0.097	147	1.5	13	425	1.3	1.4	2.7	19	486	0.971
1339.9	0.148	177	1.5	10	431	1.5	2.1	2.8	15	493	1.1
1340.6	0.097	183	1.3	9.7	375	0.575	1.4	2.4	15	429	0.420
1341.3	0.368	187	1.2	10	476	1.1	5.3	2.2	16	545	0.785
1342.0	0.097	155	1.1	9.2	409	0.336	1.4	2.0	14	468	0.245
1342.7	0.431	169	1.5	12	483	0.881	6.2	2.8	19	553	0.643
1343.4	0.097	179	1.3	9.2	423	0.261	1.4	2.4	14	483	0.190
1344.1	0.368	174	1.2	11	482	1.6	5.3	2.2	17	551	1.2
1344.8	0.097	250	2.0	11	402	0.775	1.4	3.6	17	459	0.565
1345.5	0.097	259	2.5	20	505	0.439	1.4	4.6	31	578	0.320
1346.2	1.6	273	2.2	13	460	0.708	23	3.9	20	526	0.517
1346.9	0.097	237	2.6	18	559	2.3	1.4	4.8	27	639	1.7
1347.6	0.097	274	2.6	19	304	0.545	1.4	4.7	29	348	0.398
1348.3	0.097	274	2.8	19	309	0.302	1.4	5.2	29	353	0.220
1349.0	0.097	415	4.5	17	560	0.918	1.4	8.3	27	641	0.670
1349.7	0.686	283	4.7	10	374	0.881	9.9	8.5	15	427	0.643



Minnow Environmental  
Sample ID: 002

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.097	0.295	0.139	1.5	0.001	0.005					
Length (µm)											
0.1	4.7	4524	94	732	407	15	68	171	1122	466	11
0.8	0.926	5012	112	660	395	12	13	204	1011	452	9.0
1.5	8.1	4995	120	657	396	12	117	219	1007	453	9.1
2.2	4.9	6394	165	736	613	12	71	301	1128	701	8.9
2.9	6.7	4565	133	514	458	24	97	242	787	524	17
3.6	7.8	4642	110	628	565	8.7	113	200	962	646	6.3
4.3	8.5	4269	140	554	473	14	123	255	850	541	10
5.0	5.7	2909	95	447	497	9.8	83	173	686	568	7.2
5.7	2.6	2342	63	409	580	17	38	115	627	663	12
6.4	3.4	2257	48	342	548	7.9	49	88	525	626	5.7
7.1	6.4	2226	41	408	649	7.2	92	74	625	742	5.2
7.8	3.2	1599	24	474	409	4.4	47	43	726	467	3.2
8.5	3.0	2013	27	334	552	3.5	44	49	511	631	2.6
9.2	4.0	2148	25	361	513	3.2	58	46	554	587	2.4
9.9	2.8	2121	31	338	435	2.3	41	56	518	498	1.7
10.6	3.9	1539	22	287	436	4.7	56	40	439	499	3.4
11.3	2.8	1780	25	296	525	4.1	41	46	454	600	3.0
12.0	4.2	1519	20	302	553	7.2	61	36	463	633	5.3
12.7	2.6	1399	15	230	852	5.9	38	28	352	974	4.3
13.4	2.7	1094	14	146	500	5.4	39	25	223	572	3.9
14.1	2.2	945	11	155	531	4.7	32	21	237	607	3.5
14.8	3.5	1019	14	172	660	6.5	50	25	263	755	4.7
15.5	2.8	752	10	126	609	4.8	40	18	193	696	3.5
16.2	1.9	633	8.8	103	580	1.8	28	16	158	663	1.3
16.9	1.0	575	13	97	553	4.2	15	24	148	633	3.1
17.6	2.1	459	6.4	85	563	2.0	31	12	130	644	1.5
18.2	1.8	395	7.7	77	577	1.4	26	14	118	660	1.0
18.9	1.3	431	11	81	609	2.0	19	20	123	697	1.5
19.6	1.6	344	6.4	69	552	1.5	23	12	106	631	1.1
20.3	1.2	320	3.5	64	548	1.3	17	6.4	98	627	0.920
21.0	1.5	279	4.3	56	581	1.8	22	7.8	85	664	1.3
21.7	1.5	243	2.4	53	593	0.964	22	4.4	81	678	0.703
22.4	1.3	254	2.9	52	656	2.4	19	5.3	80	750	1.8
23.1	1.1	201	2.2	50	571	1.9	16	4.0	77	653	1.4
23.8	1.3	202	2.1	44	650	0.863	19	3.8	67	743	0.630
24.5	1.7	228	2.3	42	566	1.2	24	4.2	64	647	0.846
25.2	1.7	193	2.1	46	715	1.1	24	3.8	70	818	0.833
25.9	1.0	191	2.5	42	732	0.935	15	4.6	65	837	0.682
26.6	1.0	170	1.8	33	694	1.1	15	3.2	51	794	0.767
27.3	1.2	140	1.6	35	708	1.8	17	2.9	54	810	1.3
28.0	1.0	153	1.7	30	766	4.5	15	3.0	46	876	3.3
28.7	1.2	122	1.4	31	638	1.5	17	2.6	48	729	1.1
29.4	1.1	122	1.4	28	746	1.5	16	2.5	43	853	1.1
30.1	1.5	96	1.4	24	778	1.0	21	2.5	37	889	0.751
30.8	1.2	87	0.869	23	757	1.1	17	1.6	35	866	0.830
31.5	0.822	77	0.958	22	835	1.7	12	1.7	34	955	1.2
32.2	1.3	72	0.958	23	939	2.3	18	1.7	35	1074	1.7
32.9	0.664	65	1.1	20	925	1.4	9.6	2.0	30	1058	1.0
33.6	1.2	58	0.819	19	1022	1.4	17	1.5	29	1169	1.0
34.3	0.972	38	0.878	16	853	0.699	14	1.6	24	975	0.510
35.0	1.3	44	0.981	14	1032	1.2	19	1.8	21	1180	0.895
35.7	1.4	51	1.0	15	1099	1.8	20	1.9	24	1256	1.3
36.4	1.5	42	0.807	16	960	1.0	21	1.5	25	1097	0.758
37.1	1.4	35	0.924	15	1133	1.7	20	1.7	23	1296	1.2
37.8	1.1	37	0.953	18	1552	3.0	16	1.7	28	1775	2.2
38.5	2.2	37	0.667	20	1047	1.7	32	1.2	30	1197	1.2
39.2	2.2	35	0.773	18	1156	2.0	32	1.4	28	1322	1.5
39.9	1.8	35	0.657	26	1314	2.2	26	1.2	40	1503	1.6
40.6	1.6	29	0.415	18	1222	1.5	23	0.756	28	1397	1.1
41.3	1.8	26	0.548	18	998	1.3	26	1.000	28	1141	0.919
42.0	2.0	27	0.881	16	1147	1.5	29	1.6	24	1312	1.1
42.7	1.7	26	0.678	16	1068	1.6	24	1.2	25	1221	1.2
43.4	1.2	22	0.490	15	997	0.914	17	0.894	23	1140	0.667
44.1	1.6	29	0.747	14	1179	1.8	22	1.4	22	1348	1.3
44.7	1.7	23	0.665	17	1063	2.1	25	1.2	26	1216	1.6
45.4	1.8	23	0.669	21	1024	1.3	26	1.2	33	1171	0.974
46.1	1.5	20	0.558	17	1028	1.7	22	1.0	26	1176	1.2
46.8	1.2	19	0.621	20	1019	1.5	18	1.1	31	1165	1.1
47.5	1.8	19	0.899	20	1109	1.8	26	1.6	30	1268	1.3
48.2	1.6	21	0.503	20	1066	1.8	22	0.917	30	1219	1.3
48.9	1.9	21	0.316	18	921	1.3	27	0.577	28	1053	0.977
49.6	1.9	18	0.434	18	1090	2.3	27	0.791	27	1247	1.6
50.3	1.8	17	0.498	20	984	2.5	26	0.908	30	1125	1.8
51.0	1.4	17	0.294	18	981	1.2	20	0.536	27	1122	0.901
51.7	1.3	12	0.189	17	870	1.6	19	0.344	25	995	1.2
52.4	1.8	11	0.386	15	984	1.8	26	0.704	22	1125	1.3
53.1	1.5	14	0.332	19	1229	1.5	21	0.605	28	1405	1.1
53.8	1.7	11	0.286	14	1094	2.1	25	0.522	21	1251	1.5
54.5	1.2	15	0.349	19	1004	1.7	17	0.636	29	1149	1.3
55.2	1.5	12	0.314	16	1053	1.6	22	0.572	25	1205	1.2
55.9	1.2	11	0.475	17	971	1.9	17	0.867	26	1110	1.4



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
56.6	1.4	9.7	0.458	20	1021	1.3	21	0.836	30	1167	0.979
57.3	1.2	9.3	0.397	15	963	1.5	17	0.724	23	1101	1.1
58.0	2.2	12	0.426	17	987	1.6	32	0.778	27	1129	1.2
58.7	1.8	10	0.362	19	1062	2.2	25	0.659	29	1215	1.6
59.4	2.0	11	0.502	18	1011	1.7	28	0.916	28	1156	1.2
60.1	1.7	9.6	0.383	20	1079	2.2	25	0.698	30	1234	1.6
60.8	1.8	10	0.403	18	1080	1.7	26	0.736	28	1234	1.3
61.5	1.0	10	0.428	20	999	1.2	15	0.780	30	1143	0.853
62.2	1.7	11	0.481	23	1034	2.2	25	0.878	35	1183	1.6
62.9	2.1	10.0	0.512	24	1008	1.6	30	0.934	37	1153	1.2
63.6	1.8	11	0.509	20	1016	1.7	26	0.928	31	1162	1.2
64.3	1.6	9.8	0.466	22	993	2.1	23	0.850	34	1135	1.6
65.0	1.7	11	0.533	27	1168	1.7	24	0.973	42	1336	1.2
65.7	1.3	9.5	0.609	24	1136	1.8	19	1.1	36	1299	1.3
66.4	1.3	11	0.550	26	1139	1.3	18	1.0	40	1303	0.971
67.1	1.6	11	0.623	28	1121	2.2	23	1.1	43	1282	1.6
67.8	1.7	11	0.406	27	1157	1.6	24	0.741	42	1323	1.2
68.5	1.6	11	0.893	25	1070	2.5	24	1.6	39	1223	1.8
69.2	1.8	12	0.499	24	1175	2.2	26	0.910	37	1344	1.6
69.9	1.3	9.8	0.660	27	1214	1.7	19	1.2	41	1388	1.3
70.6	0.895	9.1	0.770	28	1117	2.3	13	1.4	44	1278	1.7
71.2	1.4	11	1.1	32	1339	2.0	20	1.9	49	1531	1.5
71.9	1.3	9.8	0.903	28	1236	2.4	19	1.6	42	1413	1.8
72.6	1.6	12	0.820	33	1412	2.2	23	1.5	51	1615	1.6
73.3	1.6	13	0.808	32	1340	2.4	24	1.5	49	1532	1.8
74.0	1.9	12	0.815	35	1353	2.0	28	1.5	53	1547	1.5
74.7	1.6	11	0.891	34	1346	2.5	23	1.6	53	1539	1.8
75.4	1.6	12	0.978	35	1369	1.9	23	1.8	54	1565	1.4
76.1	1.8	10	0.946	29	1290	2.0	26	1.7	44	1476	1.4
76.8	2.6	13	1.6	36	1365	2.1	38	2.8	55	1560	1.5
77.5	3.1	12	1.4	37	1443	2.3	44	2.6	56	1650	1.7
78.2	3.1	11	1.5	38	1404	2.6	45	2.7	59	1606	1.9
78.9	3.6	15	1.4	40	1558	2.0	52	2.6	61	1781	1.4
79.6	3.3	12	1.5	37	1535	2.0	48	2.7	56	1755	1.5
80.3	3.1	12	1.2	39	1386	2.0	44	2.2	59	1585	1.5
81.0	3.8	12	1.4	40	1416	2.4	54	2.6	61	1619	1.8
81.7	6.0	12	1.6	36	1483	3.6	87	2.9	55	1696	2.6
82.4	4.7	9.9	1.5	35	1281	2.6	68	2.7	53	1465	1.9
83.1	4.7	12	1.4	33	1325	1.8	67	2.5	50	1515	1.3
83.8	5.2	12	1.4	38	1474	3.2	75	2.6	57	1686	2.3
84.5	5.0	11	1.5	38	1354	2.0	71	2.6	59	1548	1.4
85.2	6.1	12	1.9	37	1365	3.1	87	3.4	57	1561	2.3
85.9	5.2	10	1.5	36	1231	2.6	75	2.7	56	1408	1.9
86.6	5.6	11	1.6	33	1214	2.5	81	3.0	51	1388	1.8
87.3	6.8	11	1.7	37	1372	2.9	98	3.1	57	1569	2.1
88.0	6.5	11	1.3	32	1232	3.4	93	2.5	50	1408	2.5
88.7	5.5	10	1.5	30	1105	2.3	79	2.8	46	1263	1.7
89.4	5.0	11	1.2	29	1042	2.6	72	2.2	45	1192	1.9
90.1	5.2	8.6	1.4	29	1155	2.8	75	2.6	45	1320	2.1
90.8	8.2	10	1.3	30	1172	2.7	118	2.3	46	1340	2.0
91.5	5.3	12	1.1	27	1218	2.6	76	2.1	41	1393	1.9
92.2	5.2	12	0.967	26	1211	2.4	74	1.8	40	1385	1.7
92.9	4.5	8.9	1.2	26	1241	1.7	65	2.3	39	1420	1.2
93.6	5.5	9.7	0.995	23	1010	1.9	79	1.8	35	1155	1.4
94.3	5.0	10	0.848	25	1067	2.5	72	1.5	38	1220	1.8
95.0	4.4	9.6	0.644	25	990	1.9	63	1.2	38	1133	1.4
95.7	3.4	9.8	0.798	24	944	1.3	50	1.5	37	1079	0.983
96.4	3.5	10	0.895	22	1083	1.5	51	1.6	34	1238	1.1
97.1	4.7	9.4	0.767	24	1022	2.4	67	1.4	37	1168	1.7
97.7	3.7	8.1	0.798	25	1076	1.7	54	1.5	38	1231	1.2
98.4	3.9	9.7	0.722	20	943	2.0	57	1.3	30	1079	1.4
99.1	4.5	11	0.764	24	987	1.8	65	1.4	37	1129	1.3
99.8	3.7	10	0.829	29	1056	2.4	54	1.5	45	1207	1.8
100.5	4.1	11	0.936	21	1016	1.7	59	1.7	33	1162	1.3
101.2	3.2	8.8	0.774	27	929	2.1	47	1.4	41	1062	1.5
101.9	3.2	9.6	0.933	25	939	2.6	46	1.7	39	1074	1.9
102.6	3.0	9.6	0.730	26	1033	3.0	43	1.3	40	1182	2.2
103.3	3.6	8.8	0.864	25	1067	2.0	52	1.6	38	1220	1.5
104.0	3.6	9.9	0.812	26	1067	2.8	52	1.5	39	1220	2.0
104.7	3.5	8.6	0.652	23	1009	2.5	51	1.2	35	1154	1.9
105.4	2.4	10	0.712	24	1016	2.2	35	1.3	37	1162	1.6
106.1	2.5	13	0.936	28	1229	2.6	36	1.7	43	1405	1.9
106.8	3.0	11	0.646	27	1146	2.8	43	1.2	42	1310	2.1
107.5	2.2	11	0.814	30	1093	2.6	32	1.5	46	1250	1.9
108.2	1.5	9.1	0.916	30	1075	2.4	21	1.7	47	1229	1.8
108.9	2.4	10	0.610	31	1104	2.1	34	1.1	48	1263	1.5
109.6	2.1	12	0.691	33	1254	3.1	30	1.3	50	1434	2.3
110.3	2.7	10	0.937	30	1161	1.8	39	1.7	45	1328	1.3
111.0	2.8	12	0.795	32	1168	3.3	40	1.4	49	1336	2.4
111.7	2.1	12	0.856	30	1181	3.2	31	1.6	46	1350	2.3
112.4	1.6	13	0.814	29	1118	2.1	24	1.5	45	1278	1.5



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.1	1.9	11	0.821	34	1184	2.9	27	1.5	52	1353	2.1
113.8	2.2	11	0.784	35	1221	4.2	32	1.4	53	1397	3.0
114.5	1.4	8.7	0.893	27	1043	2.1	20	1.6	42	1193	1.5
115.2	2.5	8.9	0.903	30	1151	1.8	35	1.6	46	1316	1.3
115.9	2.0	12	0.606	33	1208	2.9	29	1.1	51	1381	2.1
116.6	1.2	13	0.929	32	1222	3.2	18	1.7	50	1397	2.3
117.3	2.2	11	1.0	34	1181	2.7	32	1.9	53	1351	2.0
118.0	1.3	13	1.0	28	1157	2.4	19	1.9	42	1323	1.8
118.7	1.7	13	1.0	36	1239	2.5	24	1.8	56	1416	1.8
119.4	1.7	8.4	0.722	31	1170	2.0	24	1.3	47	1338	1.5
120.1	1.7	8.9	0.687	26	1136	2.1	25	1.3	40	1300	1.5
120.8	1.9	10	1.1	30	1098	2.3	27	1.9	46	1255	1.7
121.5	2.0	8.0	0.916	31	1201	2.3	28	1.7	47	1373	1.6
122.2	1.5	9.9	0.971	29	1102	2.2	21	1.8	45	1260	1.6
122.9	1.2	8.4	0.859	25	1242	2.9	18	1.6	39	1420	2.1
123.5	1.6	9.1	0.459	29	1127	2.4	23	0.838	44	1289	1.7
124.2	1.3	10	0.670	34	1373	2.0	19	1.2	52	1570	1.5
124.9	1.2	8.0	0.764	29	1127	2.2	18	1.4	45	1289	1.6
125.6	1.4	9.0	0.521	22	1028	2.4	20	0.951	34	1175	1.7
126.3	1.6	8.6	0.609	30	1063	2.0	23	1.1	46	1215	1.5
127.0	1.8	11	0.689	22	1057	2.7	25	1.3	34	1208	1.9
127.7	1.3	10	0.699	27	985	2.6	19	1.3	42	1127	1.9
128.4	1.6	9.6	0.906	30	1107	2.4	22	1.7	46	1266	1.8
129.1	1.5	8.0	0.451	23	1034	1.7	22	0.823	35	1182	1.3
129.8	1.6	7.7	0.741	31	1243	2.7	23	1.4	48	1422	1.9
130.5	2.3	9.5	0.795	26	1094	1.6	33	1.4	41	1251	1.1
131.2	2.1	11	0.765	25	1112	2.9	30	1.4	38	1271	2.1
131.9	1.7	9.1	0.750	27	1157	2.0	24	1.4	41	1323	1.4
132.6	0.833	9.5	0.632	25	1226	2.8	12	1.2	38	1402	2.0
133.3	1.5	9.1	0.517	24	1062	2.1	22	0.943	37	1215	1.5
134.0	1.9	8.7	0.743	25	1058	2.0	28	1.4	38	1210	1.5
134.7	1.8	9.9	0.602	20	993	1.8	26	1.1	30	1136	1.3
135.4	1.9	9.3	0.573	26	1022	1.5	28	1.0	40	1169	1.1
136.1	2.0	12	0.572	24	1220	2.6	29	1.0	37	1395	1.9
136.8	1.5	8.8	0.559	24	1116	2.3	22	1.0	36	1276	1.7
137.5	1.4	8.9	0.460	23	959	1.8	21	0.839	35	1096	1.3
138.2	1.5	9.5	0.726	22	1158	1.5	21	1.3	34	1324	1.1
138.9	1.6	8.3	0.917	30	1006	2.0	23	1.7	45	1151	1.4
139.6	0.996	10	0.593	23	951	2.1	14	1.1	36	1088	1.5
140.3	1.3	10	0.543	27	1155	2.4	19	0.990	41	1321	1.8
141.0	1.8	11	0.593	29	1022	2.4	26	1.1	44	1169	1.7
141.7	1.9	12	0.454	23	944	2.0	28	0.827	35	1080	1.5
142.4	1.7	10	0.505	25	876	2.4	24	0.921	38	1002	1.7
143.1	1.4	14	0.664	25	966	1.1	20	1.2	38	1105	0.797
143.8	2.1	10	0.377	23	963	2.2	30	0.687	35	1101	1.6
144.5	1.5	12	0.816	24	1026	2.4	22	1.5	37	1173	1.8
145.2	1.4	12	0.378	22	1049	2.0	21	0.690	33	1200	1.4
145.9	0.782	14	0.738	26	944	1.4	11	1.3	40	1079	1.0
146.6	1.7	10	0.448	27	959	1.7	24	0.817	41	1096	1.3
147.3	2.7	11	1.2	29	1170	1.8	39	2.1	44	1338	1.3
148.0	2.1	12	0.787	30	969	1.8	30	1.4	45	1108	1.3
148.7	1.4	11	0.644	30	969	1.6	20	1.2	46	1108	1.2
149.3	1.6	11	0.626	29	1037	1.9	23	1.1	45	1186	1.4
150.0	2.4	10	0.847	26	969	2.1	34	1.5	40	1109	1.6
150.7	2.0	13	1.0	37	1196	1.8	28	1.9	57	1368	1.3
151.4	1.2	15	0.861	31	1044	1.8	17	1.6	48	1194	1.3
152.1	1.4	11	0.829	33	946	2.6	21	1.5	51	1082	1.9
152.8	1.2	12	0.889	31	972	2.2	17	1.6	48	1112	1.6
153.5	2.2	14	1.4	41	1122	2.3	32	2.5	62	1282	1.7
154.2	1.4	13	0.944	44	1121	2.4	20	1.7	68	1282	1.7
154.9	1.6	11	1.2	35	1018	1.5	23	2.1	54	1164	1.1
155.6	1.6	10	0.970	32	991	2.2	23	1.8	49	1133	1.6
156.3	1.7	11	0.836	35	1085	2.3	24	1.5	54	1241	1.7
157.0	1.6	12	0.991	43	1053	1.8	23	1.8	67	1204	1.3
157.7	1.4	12	0.867	38	1055	2.4	20	1.6	58	1206	1.7
158.4	2.2	13	1.1	41	1081	2.1	31	2.0	63	1236	1.6
159.1	1.8	12	1.3	37	1095	2.7	26	2.4	56	1253	2.0
159.8	1.9	11	0.968	33	1084	1.9	28	1.8	50	1240	1.4
160.5	1.4	12	1.5	37	1177	2.2	21	2.8	56	1346	1.6
161.2	2.5	13	1.8	44	1124	2.3	37	3.4	67	1286	1.6
161.9	2.0	11	1.3	40	1016	1.5	28	2.3	61	1162	1.1
162.6	2.5	12	1.6	45	1192	1.2	36	2.9	69	1363	0.840
163.3	1.8	11	1.7	42	1173	2.1	26	3.1	64	1341	1.5
164.0	2.1	13	1.7	41	1201	2.7	30	3.1	62	1374	2.0
164.7	2.0	12	1.6	48	1219	1.9	29	2.9	74	1394	1.4
165.4	2.0	11	1.7	42	1069	2.2	28	3.0	64	1222	1.6
166.1	2.3	11	2.2	45	1364	2.4	33	4.0	69	1560	1.8
166.8	2.8	11	2.3	52	1305	2.5	40	4.2	80	1493	1.8
167.5	2.8	13	3.0	51	1228	3.6	41	5.5	78	1404	2.6
168.2	3.4	13	2.4	52	1290	2.7	49	4.3	80	1475	2.0
168.9	3.5	19	2.1	49	1324	1.9	51	3.9	75	1514	1.4



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
169.6	3.7	11	3.6	59	1583	2.2	54	6.7	90	1810	1.6
170.3	3.8	14	3.0	48	1487	3.3	55	5.5	73	1700	2.4
171.0	4.3	11	2.6	54	1533	3.7	61	4.7	83	1754	2.7
171.7	4.0	12	2.6	48	1341	3.1	57	4.8	74	1533	2.3
172.4	3.1	10	3.0	51	1362	3.2	45	5.4	78	1558	2.3
173.1	3.2	12	3.5	52	1507	2.2	46	6.4	80	1724	1.6
173.8	4.1	12	3.3	51	1535	2.8	60	5.9	78	1755	2.0
174.5	3.0	12	3.3	53	1457	3.6	44	6.0	82	1666	2.6
175.1	3.5	12	3.4	52	1390	3.4	50	6.3	79	1589	2.5
175.8	4.3	11	3.4	57	1346	2.3	62	6.3	88	1539	1.7
176.5	4.8	12	3.5	47	1343	2.8	70	6.3	71	1535	2.1
177.2	5.3	14	3.7	53	1500	3.2	77	6.8	82	1715	2.3
177.9	4.5	12	3.8	47	1329	3.3	65	6.9	72	1519	2.4
178.6	6.7	13	3.1	53	1515	3.0	96	5.6	82	1732	2.2
179.3	5.3	13	3.3	49	1392	2.2	76	6.0	74	1591	1.6
180.0	5.7	11	3.4	48	1469	2.8	82	6.1	74	1680	2.1
180.7	6.2	10	2.9	47	1299	3.3	90	5.2	72	1485	2.4
181.4	6.6	13	3.5	54	1553	3.8	95	6.4	82	1776	2.7
182.1	6.8	13	3.3	47	1356	2.7	98	6.1	72	1551	2.0
182.8	5.9	14	3.5	45	1483	3.6	85	6.3	69	1696	2.6
183.5	5.4	12	2.7	43	1277	2.1	77	5.0	66	1460	1.5
184.2	6.1	13	2.9	48	1407	2.8	88	5.3	73	1609	2.1
184.9	6.0	11	2.5	45	1374	2.5	87	4.5	69	1571	1.8
185.6	4.8	9.2	2.9	39	1260	2.4	69	5.3	60	1441	1.8
186.3	5.4	12	2.4	47	1371	3.0	78	4.5	72	1567	2.2
187.0	5.0	12	2.6	37	1238	3.3	73	4.7	56	1416	2.4
187.7	5.0	9.9	2.4	37	1298	2.0	73	4.3	57	1484	1.5
188.4	4.4	9.4	1.8	38	1145	2.3	64	3.2	59	1309	1.7
189.1	4.1	9.0	2.2	34	1365	2.7	59	3.9	52	1561	2.0
189.8	4.0	9.8	2.4	37	1270	1.5	58	4.3	57	1452	1.1
190.5	3.9	11	2.4	43	1325	2.1	57	4.4	67	1516	1.5
191.2	4.8	11	2.0	38	1349	2.1	69	3.7	58	1542	1.5
191.9	3.8	9.1	1.7	38	1305	1.5	55	3.0	58	1492	1.1
192.6	4.8	10	1.8	31	1222	2.1	69	3.4	48	1397	1.6
193.3	3.9	9.5	1.5	27	1193	1.8	57	2.7	41	1364	1.3
194.0	3.7	9.7	2.1	31	1284	1.9	54	3.8	48	1468	1.4
194.7	2.9	9.8	1.8	36	1247	1.6	42	3.3	56	1426	1.2
195.4	3.8	9.1	2.2	33	1203	1.9	55	3.9	50	1375	1.4
196.1	4.1	9.8	1.8	34	1306	1.5	60	3.3	52	1493	1.1
196.8	4.0	10	1.7	30	1253	1.8	58	3.2	46	1433	1.3
197.5	6.5	9.8	1.2	36	1191	1.5	94	2.3	55	1362	1.1
198.2	3.9	8.9	1.2	30	1246	1.8	56	2.2	46	1424	1.3
198.9	3.7	10	1.5	30	1339	1.4	53	2.7	46	1531	0.993
199.6	4.1	10.0	1.6	30	1242	2.1	59	2.9	47	1420	1.5
200.3	3.5	10	1.5	30	1275	1.6	51	2.7	46	1458	1.2
201.0	2.9	15	1.7	31	1094	2.1	42	3.2	47	1252	1.5
201.7	3.7	11	1.5	30	1159	1.5	53	2.7	47	1325	1.1
202.3	2.8	8.7	1.3	33	1169	2.0	40	2.4	51	1337	1.5
203.0	2.6	7.0	1.5	25	997	1.5	38	2.7	39	1140	1.1
203.7	3.9	9.9	1.5	34	1198	2.7	56	2.8	52	1369	2.0
204.4	3.5	10	1.8	31	1147	1.4	50	3.3	48	1311	1.1
205.1	2.4	10	1.7	33	1164	1.4	35	3.2	51	1332	1.1
205.8	2.6	9.1	2.1	34	1225	2.4	38	3.9	51	1400	1.8
206.5	4.2	12	2.1	35	1261	1.8	61	3.8	53	1442	1.3
207.2	3.4	11	2.1	39	1240	2.5	49	3.9	60	1418	1.8
207.9	4.7	11	1.9	37	1229	2.1	68	3.4	57	1405	1.5
208.6	3.7	11	1.9	36	1045	2.2	53	3.5	55	1194	1.6
209.3	3.3	10	2.4	37	1210	2.2	47	4.3	57	1384	1.6
210.0	3.9	12	1.8	35	1162	2.5	57	3.3	54	1328	1.8
210.7	4.4	13	1.8	38	1156	2.5	64	3.3	58	1322	1.8
211.4	4.1	12	1.8	37	1089	2.0	59	3.3	57	1246	1.5
212.1	4.1	11	1.6	39	1162	2.3	59	2.8	59	1329	1.7
212.8	4.6	11	2.2	40	1067	2.5	66	4.0	61	1220	1.9
213.5	4.5	14	1.9	40	1008	3.0	65	3.4	62	1152	2.2
214.2	4.0	13	1.9	43	1103	2.0	57	3.4	65	1261	1.4
214.9	4.0	11	2.1	45	1097	2.9	58	3.8	70	1254	2.1
215.6	3.1	11	1.8	39	1048	1.9	45	3.3	59	1198	1.4
216.3	4.1	11	1.7	40	1078	2.9	59	3.1	61	1233	2.1
217.0	4.8	12	2.2	39	1077	2.8	69	4.0	60	1232	2.0
217.7	4.9	12	1.6	44	1032	2.9	70	2.9	67	1180	2.1
218.4	4.0	11	1.5	46	1098	2.8	58	2.7	70	1255	2.0
219.1	3.8	10	1.6	42	984	2.7	54	2.9	64	1125	2.0
219.8	3.1	11	1.5	43	1071	2.2	45	2.7	67	1224	1.6
220.5	4.1	12	1.9	43	1111	2.6	59	3.4	65	1271	1.9
221.2	4.3	13	1.3	45	1137	2.6	63	2.4	69	1301	1.9
221.9	4.1	11	1.7	47	1135	2.7	59	3.1	73	1297	2.0
222.6	3.7	13	1.4	39	1104	2.2	53	2.6	60	1262	1.6
223.3	4.2	12	1.4	51	1184	2.4	60	2.5	78	1354	1.8
224.0	3.4	14	1.6	50	1205	2.6	50	2.9	77	1378	1.9
224.7	4.0	12	1.5	43	1197	2.2	58	2.7	66	1369	1.6
225.4	4.4	12	1.6	49	1188	2.1	64	3.0	75	1359	1.5



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.1	4.5	13	1.5	52	1360	2.2	65	2.7	80	1555	1.6
226.8	3.5	11	1.4	48	1301	2.1	50	2.6	74	1488	1.5
227.5	3.5	13	1.5	50	1488	2.9	50	2.8	77	1702	2.1
228.2	3.7	12	1.5	48	1298	1.8	53	2.7	73	1484	1.3
228.8	3.3	13	1.4	48	1295	2.4	47	2.6	74	1481	1.8
229.5	3.4	11	1.4	45	1377	1.7	49	2.6	69	1575	1.2
230.2	2.9	11	1.4	42	1442	2.1	42	2.5	65	1649	1.5
230.9	2.6	13	1.4	55	1490	2.0	38	2.5	84	1704	1.4
231.6	2.3	13	1.4	58	1559	1.7	34	2.6	90	1782	1.2
232.3	2.4	13	1.5	57	1635	2.1	35	2.7	87	1870	1.5
233.0	2.6	12	1.9	49	1626	1.4	37	3.4	75	1860	1.0
233.7	2.5	14	1.7	57	1503	2.0	36	3.0	87	1719	1.5
234.4	2.2	14	1.8	56	1637	3.0	32	3.2	86	1872	2.2
235.1	1.9	13	1.9	56	1505	2.0	28	3.5	86	1721	1.4
235.8	2.1	11	1.9	50	1519	1.5	30	3.5	76	1738	1.1
236.5	1.9	13	1.8	58	1706	2.4	27	3.4	89	1950	1.8
237.2	2.6	14	2.0	64	1765	2.1	37	3.6	98	2019	1.5
237.9	2.1	16	2.1	61	1811	2.5	31	3.8	94	2071	1.8
238.6	2.5	14	1.6	60	1716	2.2	37	3.0	91	1962	1.6
239.3	2.0	12	1.5	61	1815	2.6	29	2.8	93	2076	1.9
240.0	2.6	15	2.0	66	1927	2.7	38	3.6	102	2204	2.0
240.7	1.8	14	1.9	64	1803	1.8	26	3.5	98	2062	1.3
241.4	2.3	14	2.0	61	1738	2.2	33	3.7	93	1987	1.6
242.1	2.2	14	2.0	60	1804	1.8	32	3.7	93	2063	1.3
242.8	3.1	14	1.9	63	1908	1.6	44	3.4	97	2182	1.2
243.5	2.2	14	1.8	64	1799	2.3	32	3.3	98	2058	1.7
244.2	2.6	14	2.0	66	1981	1.8	38	3.6	101	2265	1.3
244.9	2.4	15	1.5	62	1876	1.8	34	2.7	96	2145	1.3
245.6	2.8	13	2.0	61	1958	2.1	41	3.7	94	2239	1.5
246.3	3.3	16	1.7	69	2095	2.3	48	3.1	106	2396	1.7
247.0	3.1	14	1.8	69	2048	2.1	44	3.2	106	2342	1.5
247.7	3.3	14	1.8	64	2019	1.6	48	3.3	98	2309	1.2
248.4	2.9	13	1.6	63	1911	1.6	42	3.0	97	2186	1.1
249.1	3.8	15	1.6	59	1824	1.2	55	2.8	90	2086	0.880
249.8	3.9	13	1.7	76	1968	1.3	56	3.1	117	2250	0.933
250.5	3.8	15	1.9	63	2122	2.2	55	3.4	97	2427	1.6
251.2	4.5	16	1.8	71	2050	2.2	65	3.2	109	2345	1.6
251.9	3.8	18	2.0	71	1968	1.6	56	3.7	108	2250	1.1
252.6	4.5	14	1.9	71	1929	2.3	65	3.5	109	2205	1.7
253.3	4.2	14	1.9	74	1934	1.6	60	3.4	114	2211	1.1
253.9	3.3	13	2.0	73	1737	1.6	47	3.6	112	1987	1.1
254.6	3.9	14	2.3	80	2070	2.3	57	4.3	122	2367	1.7
255.3	3.8	12	2.1	67	1706	1.5	55	3.7	103	1951	1.1
256.0	3.9	15	2.4	76	1887	2.0	56	4.4	116	2158	1.5
256.7	3.9	15	2.5	73	1840	2.2	56	4.6	112	2104	1.6
257.4	4.3	14	2.8	78	2016	1.8	62	5.1	120	2305	1.3
258.1	3.9	14	2.7	82	1763	2.0	56	4.9	126	2016	1.4
258.8	3.5	12	3.2	74	1763	2.2	51	5.7	113	2016	1.6
259.5	4.0	15	3.0	85	2030	2.7	58	5.5	130	2321	2.0
260.2	3.5	14	3.2	87	1846	1.4	50	5.9	133	2110	1.1
260.9	4.1	14	3.4	87	1729	2.1	59	6.1	134	1977	1.6
261.6	3.6	12	3.1	74	1669	2.4	52	5.6	114	1908	1.8
262.3	4.2	14	3.2	86	1836	2.4	60	5.8	131	2099	1.8
263.0	4.7	13	3.4	96	1905	2.7	67	6.3	147	2178	2.0
263.7	4.1	16	3.1	88	1705	1.7	60	5.6	134	1950	1.2
264.4	4.3	13	3.6	87	1760	1.8	62	6.6	133	2013	1.3
265.1	3.2	13	3.5	78	1671	1.6	47	6.4	120	1910	1.1
265.8	3.9	12	3.2	90	1773	1.6	57	5.9	138	2028	1.2
266.5	4.0	13	3.3	88	1669	2.9	58	6.0	135	1909	2.1
267.2	4.7	14	3.5	92	1746	1.9	67	6.4	141	1997	1.4
267.9	4.2	12	3.0	83	1647	2.3	61	5.5	127	1883	1.7
268.6	4.6	13	3.1	93	1673	2.5	66	5.6	143	1913	1.8
269.3	4.2	14	3.5	94	1680	2.0	61	6.3	143	1921	1.5
270.0	4.2	14	2.5	100	1707	1.9	61	4.6	153	1952	1.4
270.7	4.9	14	2.9	88	1681	2.3	71	5.2	135	1922	1.7
271.4	4.3	13	2.8	87	1763	1.6	62	5.1	134	2016	1.2
272.1	4.7	12	3.2	87	1605	2.2	68	5.9	134	1835	1.6
272.8	5.0	15	2.9	88	1795	1.8	72	5.3	135	2052	1.3
273.5	4.9	15	3.4	87	1853	2.1	71	6.2	134	2119	1.5
274.2	6.0	15	2.6	87	1692	2.1	86	4.7	134	1934	1.6
274.9	5.0	13	3.0	90	1722	2.0	72	5.4	137	1970	1.5
275.6	5.4	14	2.7	85	1517	2.2	77	4.9	130	1735	1.6
276.3	3.3	12	2.2	82	1328	2.0	48	4.0	126	1519	1.4
277.0	4.4	12	2.6	81	1504	1.2	63	4.7	124	1719	0.859
277.7	4.2	12	2.6	62	1384	1.7	61	4.7	95	1583	1.2
278.4	4.8	12	2.5	72	1427	2.2	70	4.6	110	1632	1.6
279.1	5.9	12	1.7	60	1266	1.6	85	3.1	92	1448	1.2
279.7	5.4	12	2.2	68	1315	1.5	79	4.0	105	1504	1.1
280.4	5.3	14	1.9	66	1329	1.9	77	3.5	101	1520	1.4
281.1	7.3	12	2.0	59	1107	1.7	105	3.7	91	1265	1.3
281.8	5.9	11	1.8	54	982	1.8	86	3.3	82	1123	1.3



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
282.5	4.9	11	2.1	52	955	2.4	70	3.9	79	1093	1.8
283.2	4.5	12	2.2	56	863	1.8	65	4.0	86	986	1.3
283.9	4.1	9.4	2.1	48	817	2.2	59	3.9	73	934	1.6
284.6	3.9	10	1.8	46	780	1.7	57	3.3	70	892	1.2
285.3	4.1	8.3	1.9	41	730	1.7	60	3.4	63	835	1.2
286.0	5.2	9.2	1.3	36	605	1.7	75	2.3	56	692	1.3
286.7	4.9	8.7	1.7	41	610	1.7	71	3.0	63	697	1.2
287.4	3.9	9.8	1.4	35	575	2.1	56	2.6	53	658	1.6
288.1	5.0	9.0	1.5	37	601	1.6	72	2.8	57	687	1.2
288.8	3.2	9.3	1.5	33	500	1.7	47	2.6	51	572	1.2
289.5	2.9	7.7	1.2	27	442	1.8	42	2.2	42	505	1.3
290.2	3.4	8.9	0.978	23	441	1.7	49	1.8	36	504	1.3
290.9	2.6	8.2	1.1	24	374	1.5	37	2.0	36	427	1.1
291.6	2.9	9.4	0.940	20	403	1.6	42	1.7	31	461	1.2
292.3	2.8	8.5	0.735	19	363	1.4	40	1.3	28	415	1.0
293.0	3.2	8.2	0.759	21	336	1.5	46	1.4	32	384	1.1
293.7	2.7	6.7	0.830	18	417	1.2	39	1.5	28	477	0.851
294.4	1.6	8.4	0.744	16	330	1.5	23	1.4	25	377	1.1
295.1	2.3	9.4	0.749	17	322	1.2	33	1.4	26	368	0.899
295.8	2.6	8.0	0.726	20	354	1.0	37	1.3	31	405	0.762
296.5	2.2	8.2	0.711	16	296	0.733	32	1.3	24	339	0.535
297.2	2.1	8.0	0.692	18	271	1.1	30	1.3	28	310	0.789
297.9	2.0	6.7	0.727	15	297	1.4	29	1.3	22	340	1.0
298.6	1.6	8.4	0.790	18	288	0.988	22	1.4	27	330	0.721
299.3	1.9	9.3	0.590	16	269	0.745	27	1.1	24	308	0.544
300.0	1.6	8.9	0.663	18	256	1.1	23	1.2	27	292	0.800
300.7	1.5	8.7	0.797	15	271	0.731	21	1.5	24	310	0.533
301.4	1.4	7.6	0.635	21	246	1.3	20	1.2	32	281	0.924
302.1	2.1	8.3	0.620	25	280	1.3	30	1.1	38	320	0.967
302.8	1.7	8.1	0.776	23	332	1.1	25	1.4	35	380	0.785
303.5	1.3	8.7	0.610	23	230	1.0	19	1.1	35	264	0.744
304.2	1.6	8.5	0.735	27	298	1.2	23	1.3	42	341	0.852
304.9	1.3	8.9	0.758	25	258	1.5	18	1.4	39	296	1.1
305.6	1.1	11	1.1	22	251	1.1	15	2.1	34	288	0.815
306.3	1.4	8.0	0.909	24	248	0.820	21	1.7	36	283	0.599
306.9	1.7	9.8	0.915	28	273	0.786	24	1.7	43	312	0.573
307.6	1.4	8.3	1.0	22	231	1.4	20	1.9	34	264	1.0
308.3	0.950	8.7	0.952	27	248	0.963	14	1.7	42	283	0.702
309.0	0.653	12	1.3	32	242	1.1	9.4	2.3	49	277	0.826
309.7	1.8	10	1.5	36	244	0.742	25	2.7	56	279	0.541
310.4	1.7	8.6	1.1	34	222	0.852	24	1.9	51	254	0.622
311.1	0.781	10	1.4	32	261	1.1	11	2.6	49	299	0.830
311.8	1.5	9.1	1.3	37	241	1.0	22	2.3	56	276	0.761
312.5	2.0	9.0	1.3	31	260	0.588	29	2.3	47	297	0.429
313.2	1.0	7.8	1.1	35	250	1.1	15	2.0	54	285	0.821
313.9	1.0	9.2	1.5	33	241	0.958	15	2.6	51	275	0.699
314.6	1.2	8.4	1.2	32	235	0.563	18	2.3	50	269	0.411
315.3	1.0	8.6	1.2	33	273	1.1	15	2.2	50	313	0.801
316.0	1.6	11	1.2	30	234	0.779	23	2.1	45	267	0.568
316.7	0.849	8.3	1.0	32	220	0.803	12	1.9	49	251	0.586
317.4	1.0	9.9	1.0	34	228	0.451	15	1.8	52	261	0.329
318.1	0.785	9.5	1.3	32	235	0.850	11	2.3	50	268	0.620
318.8	1.8	9.1	1.4	33	268	0.603	26	2.6	51	307	0.440
319.5	1.4	8.5	1.2	30	277	1.3	20	2.2	46	317	0.922
320.2	1.0	9.5	1.1	30	267	0.662	15	2.0	46	305	0.483
320.9	0.582	10	1.1	30	244	1.8	8.4	1.9	46	279	1.3
321.6	0.868	9.4	1.1	26	226	1.5	13	1.9	39	258	1.1
322.3	1.1	8.3	1.0	27	254	1.1	16	1.9	41	291	0.830
323.0	0.677	9.3	0.920	30	234	0.778	9.8	1.7	46	267	0.568
323.7	1.1	10	1.3	27	230	1.4	16	2.4	41	264	1.0
324.4	0.846	9.5	1.1	32	272	1.4	12	2.0	50	312	1.1
325.1	0.654	7.9	1.2	24	255	1.3	9.4	2.3	37	292	0.962
325.8	0.625	9.7	1.1	26	269	0.954	9.0	2.0	40	308	0.696
326.5	0.974	10	0.778	26	278	0.617	14	1.4	40	317	0.450
327.2	1.1	9.8	0.926	25	259	1.2	15	1.7	38	296	0.871
327.9	0.499	7.6	0.864	25	285	1.0	7.2	1.6	38	326	0.734
328.6	0.952	7.8	0.903	27	283	1.2	14	1.6	42	324	0.871
329.3	0.943	8.8	1.0	23	252	1.3	14	1.9	35	288	0.976
330.0	0.771	9.2	0.779	20	259	1.6	11	1.4	31	297	1.1
330.7	1.1	11	0.999	18	237	1.6	16	1.8	27	271	1.2
331.4	1.0	8.7	0.995	21	267	1.1	15	1.8	32	305	0.796
332.1	1.1	8.2	0.905	17	240	1.4	16	1.7	27	275	1.1
332.8	1.2	11	1.0	19	248	2.1	18	1.9	28	284	1.5
333.5	0.303	8.8	1.1	19	245	1.1	4.4	2.1	29	280	0.830
334.1	0.867	9.3	0.554	19	301	2.0	13	1.0	29	345	1.5
334.8	1.6	8.3	0.928	21	253	2.0	24	1.7	33	290	1.5
335.5	0.654	7.2	0.780	15	260	1.5	9.4	1.4	23	297	1.1
336.2	1.1	9.9	0.810	19	295	1.3	16	1.5	30	337	0.972
336.9	0.937	7.7	0.564	18	239	1.5	14	1.0	27	273	1.1
337.6	0.932	9.1	0.779	14	272	2.1	13	1.4	22	311	1.6
338.3	1.3	9.1	0.988	15	298	1.0	18	1.8	23	341	0.766



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.0	0.954	9.3	0.821	18	262	1.3	14	1.5	28	300	0.982
339.7	0.706	8.8	1.1	17	253	1.7	10	2.0	26	289	1.3
340.4	1.5	10	0.892	21	272	1.5	22	1.6	33	311	1.1
341.1	1.3	11	0.722	14	266	1.1	19	1.3	21	305	0.775
341.8	0.883	7.8	0.738	15	241	1.4	13	1.3	23	275	0.998
342.5	1.2	8.2	0.948	17	265	1.2	18	1.7	27	303	0.855
343.2	1.2	9.7	0.991	20	262	1.3	17	1.8	31	300	0.939
343.9	1.1	8.0	0.653	18	240	1.1	16	1.2	27	274	0.808
344.6	1.0	8.0	0.734	17	255	0.859	15	1.3	26	292	0.627
345.3	1.3	9.0	0.680	21	261	1.4	18	1.2	33	298	0.991
346.0	1.1	8.3	0.885	21	232	0.998	16	1.6	32	266	0.728
346.7	0.734	8.7	1.1	20	255	1.3	11	2.1	31	291	0.921
347.4	1.4	8.0	1.0	21	247	1.5	20	1.9	33	282	1.1
348.1	0.832	8.0	0.964	21	211	1.2	12	1.8	32	242	0.896
348.8	1.2	9.9	1.1	22	262	1.6	17	1.9	33	300	1.2
349.5	0.639	8.5	1.1	26	236	1.4	9.2	1.9	40	270	1.000
350.2	0.636	8.4	0.732	25	237	1.1	9.2	1.3	39	270	0.801
350.9	0.821	8.0	1.1	25	247	1.1	12	1.9	39	282	0.834
351.6	1.1	8.7	1.0	23	234	0.766	15	1.9	35	268	0.559
352.3	0.989	10	0.962	29	248	1.1	14	1.8	45	283	0.828
353.0	0.965	9.9	1.2	30	264	1.6	14	2.3	46	301	1.1
353.7	0.488	11	1.3	26	217	1.4	7.0	2.4	40	248	1.0
354.4	0.747	9.4	1.5	33	251	1.4	11	2.7	50	287	0.986
355.1	1.4	8.6	1.1	31	216	1.2	21	1.9	47	247	0.850
355.8	1.1	12	1.2	30	252	0.954	15	2.2	46	288	0.696
356.5	0.743	9.9	1.2	26	249	0.891	11	2.1	40	285	0.650
357.2	1.1	9.6	1.3	27	262	1.9	16	2.4	41	300	1.4
357.9	1.0	9.6	1.3	36	263	1.0	15	2.4	55	301	0.732
358.6	1.1	7.7	0.977	29	239	1.1	16	1.8	45	273	0.782
359.3	0.943	9.8	0.931	28	233	1.3	14	1.7	43	267	0.930
360.0	1.3	9.8	1.2	33	239	0.892	19	2.3	51	273	0.651
360.7	1.3	9.1	0.816	33	228	1.1	18	1.5	50	260	0.774
361.4	0.959	9.9	1.0	28	250	0.808	14	1.9	43	286	0.589
362.0	1.2	10	1.2	31	260	0.840	17	2.2	47	298	0.613
362.7	0.898	9.8	1.1	32	262	0.910	13	2.0	50	299	0.664
363.4	1.1	9.2	1.2	38	236	0.618	17	2.2	58	270	0.451
364.1	1.3	8.7	1.1	34	263	1.1	19	2.1	52	301	0.797
364.8	0.931	9.0	0.911	31	265	1.5	13	1.7	47	303	1.1
365.5	0.785	8.9	1.0	30	227	1.1	11	1.8	46	260	0.803
366.2	1.3	10	1.0	32	274	1.1	18	1.9	49	314	0.797
366.9	1.1	11	0.593	31	231	0.804	15	1.1	47	264	0.587
367.6	0.832	7.8	1.1	34	254	0.704	12	2.1	52	290	0.513
368.3	0.865	9.2	1.1	35	276	1.5	12	2.0	53	315	1.1
369.0	1.0	9.4	0.892	35	252	0.661	14	1.6	53	288	0.482
369.7	0.652	11	1.2	39	274	1.3	9.4	2.2	60	314	0.957
370.4	0.764	8.5	1.1	32	237	0.650	11	2.0	49	271	0.474
371.1	1.2	9.0	1.1	30	255	1.1	17	2.0	46	291	0.781
371.8	0.768	7.9	1.2	33	253	0.891	11	2.2	51	289	0.650
372.5	1.1	10	1.3	31	258	1.8	16	2.4	47	295	1.3
373.2	0.518	9.5	0.939	28	246	1.3	7.5	1.7	43	282	0.928
373.9	0.831	9.1	0.933	35	241	1.4	12	1.7	53	275	1.0
374.6	0.788	9.3	1.3	28	249	1.1	11	2.3	43	285	0.811
375.3	0.825	10	1.2	31	251	1.2	12	2.2	48	287	0.849
376.0	0.721	9.7	0.974	32	228	2.0	10	1.8	50	260	1.5
376.7	1.6	9.7	0.997	31	217	1.2	24	1.8	47	248	0.854
377.4	0.735	11	1.5	28	265	1.7	11	2.7	43	304	1.3
378.1	0.493	9.6	1.1	25	260	1.8	7.1	2.0	39	298	1.3
378.8	0.858	9.2	1.2	26	255	1.4	12	2.1	39	291	1.0
379.5	0.977	8.8	0.933	29	219	1.9	14	1.7	44	250	1.4
380.2	1.2	11	0.806	29	255	1.2	17	1.5	45	291	0.885
380.9	1.0	8.3	0.781	29	240	1.8	14	1.4	44	274	1.3
381.6	0.780	10	0.988	24	279	1.1	11	1.8	37	319	0.792
382.3	1.2	8.7	0.643	28	255	1.5	17	1.2	42	291	1.1
383.0	1.3	9.3	0.724	27	268	0.958	19	1.3	41	306	0.699
383.7	0.890	9.0	0.589	25	279	1.7	13	1.1	38	318	1.2
384.4	0.791	8.7	0.827	22	269	1.5	11	1.5	34	307	1.1
385.1	0.893	9.3	0.538	21	271	1.8	13	0.981	33	310	1.3
385.8	1.4	10	0.771	21	272	1.5	21	1.4	33	311	1.1
386.5	1.0	9.4	0.756	21	269	1.1	15	1.4	32	308	0.829
387.2	1.2	10.0	0.733	21	252	1.4	17	1.3	32	288	1.0
387.9	0.955	7.0	0.531	19	259	1.2	14	0.968	30	296	0.868
388.5	1.1	8.5	0.985	25	298	1.1	17	1.8	39	340	0.812
389.2	1.3	9.7	0.584	18	322	1.2	19	1.1	28	368	0.885
389.9	1.3	9.5	0.483	19	263	1.5	19	0.881	30	301	1.1
390.6	0.967	9.3	0.683	17	302	1.2	14	1.2	27	346	0.905
391.3	1.5	8.3	0.617	17	273	1.0	21	1.1	25	312	0.763
392.0	0.842	8.9	0.690	20	254	1.6	12	1.3	30	291	1.1
392.7	0.864	7.6	0.690	16	259	1.4	12	1.3	25	296	1.0
393.4	1.2	8.7	0.449	18	288	1.4	17	0.819	27	329	1.0
394.1	0.853	8.2	0.590	18	268	1.6	12	1.1	27	307	1.1
394.8	0.816	8.5	0.431	18	267	1.7	12	0.787	28	305	1.2



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
395.5	1.0	8.7	0.564	16	254	1.4	15	1.0	25	291	1.0
396.2	1.1	7.5	0.397	13	260	1.3	16	0.724	20	297	0.934
396.9	1.2	8.8	0.569	16	310	0.996	17	1.0	24	354	0.727
397.6	0.846	7.4	0.379	14	266	1.5	12	0.691	21	304	1.1
398.3	1.1	8.3	0.455	15	258	1.1	16	0.830	24	296	0.809
399.0	1.1	7.6	0.534	19	266	1.0	16	0.974	29	304	0.735
399.7	1.4	8.1	0.275	16	250	1.6	21	0.502	25	286	1.2
400.4	0.725	8.0	0.585	18	267	1.0	10	1.1	28	305	0.766
401.1	0.746	6.6	0.515	20	222	1.2	11	0.939	31	253	0.842
401.8	0.951	9.7	0.820	18	260	0.739	14	1.5	28	297	0.539
402.5	0.847	7.6	0.742	18	266	1.1	12	1.4	28	304	0.812
403.2	1.3	8.5	0.683	18	259	1.4	19	1.2	27	296	1.0
403.9	1.2	12	0.885	23	270	1.2	17	1.6	36	309	0.859
404.6	0.957	8.6	0.540	18	234	1.7	14	0.984	27	268	1.2
405.3	0.560	10	0.699	26	259	0.852	8.1	1.3	39	296	0.621
406.0	0.781	7.8	0.685	24	211	1.3	11	1.2	37	242	0.970
406.7	1.8	9.0	0.887	27	245	0.745	25	1.6	41	280	0.544
407.4	1.3	8.9	0.821	25	263	1.3	19	1.5	38	301	0.947
408.1	1.6	8.4	0.701	22	217	1.1	23	1.3	33	248	0.767
408.8	0.675	9.4	0.720	26	225	1.0	9.8	1.3	40	258	0.756
409.5	1.1	8.6	1.0	29	235	1.1	16	1.9	45	269	0.776
410.2	0.905	9.9	0.793	26	231	1.3	13	1.4	40	264	0.978
410.9	0.783	9.2	0.995	30	244	1.1	11	1.8	45	278	0.783
411.6	1.2	10	1.1	32	222	1.4	18	1.9	49	254	0.991
412.3	1.0	9.8	1.2	30	214	1.5	15	2.1	45	245	1.1
413.0	1.6	10	0.809	30	237	1.6	24	1.5	45	271	1.1
413.7	1.1	10	1.1	32	208	1.1	16	1.9	49	238	0.830
414.3	1.1	12	1.3	35	263	0.872	16	2.4	54	300	0.636
415.0	1.5	9.3	1.1	42	237	1.3	21	1.9	64	271	0.928
415.7	1.3	12	1.1	36	273	1.2	19	2.0	55	312	0.906
416.4	1.5	13	1.2	36	268	1.1	22	2.1	55	306	0.829
417.1	1.5	8.7	0.858	45	230	0.825	21	1.6	69	263	0.602
417.8	1.6	11	1.0	39	229	0.673	22	1.9	59	261	0.491
418.5	1.1	11	0.995	50	226	0.977	16	1.8	77	258	0.713
419.2	1.8	9.9	1.2	45	224	1.4	26	2.2	69	256	1.0
419.9	1.4	12	1.0	47	250	0.884	21	1.9	72	285	0.645
420.6	1.5	12	0.842	38	228	0.996	21	1.5	58	261	0.726
421.3	1.4	11	1.0	49	240	1.2	21	1.9	75	275	0.877
422.0	1.9	12	1.1	48	222	0.802	27	2.0	74	254	0.585
422.7	1.4	10	0.922	41	220	1.3	20	1.7	63	251	0.912
423.4	1.3	11	1.2	54	275	0.814	18	2.2	83	315	0.594
424.1	1.2	11	1.0	44	217	0.958	18	1.8	68	248	0.699
424.8	2.4	13	1.2	56	245	0.971	35	2.3	85	280	0.708
425.5	1.6	12	0.987	46	205	0.916	23	1.8	71	234	0.669
426.2	1.0	13	1.2	60	242	1.4	15	2.3	91	277	0.997
426.9	1.8	11	1.2	53	234	0.654	26	2.1	81	268	0.477
427.6	1.3	11	1.3	57	261	0.485	19	2.3	88	299	0.354
428.3	1.3	13	1.2	61	269	0.797	18	2.1	94	307	0.582
429.0	1.3	11	0.936	51	242	1.2	19	1.7	77	276	0.869
429.7	1.6	12	1.1	57	247	1.0	24	2.1	88	283	0.749
430.4	1.7	11	1.1	47	233	0.729	25	2.0	72	267	0.532
431.1	1.2	12	0.681	53	245	0.841	18	1.2	81	280	0.613
431.8	0.909	10	0.965	54	245	0.921	13	1.8	82	280	0.672
432.5	1.1	12	1.0	52	238	0.632	16	1.9	80	272	0.461
433.2	1.4	12	1.2	49	220	0.616	20	2.2	75	252	0.449
433.9	1.5	10	1.2	47	226	0.342	21	2.2	71	259	0.250
434.6	1.1	11	1.5	52	245	0.830	16	2.7	79	280	0.605
435.3	1.2	10	1.3	45	229	1.0	17	2.3	68	261	0.760
436.0	1.1	12	1.2	49	231	0.840	16	2.2	75	265	0.613
436.7	1.8	10	1.3	45	253	1.4	26	2.4	68	290	1.0
437.4	1.1	11	1.6	47	239	0.955	16	2.9	72	273	0.697
438.1	1.1	10	1.2	42	235	1.2	16	2.2	65	269	0.911
438.8	1.3	11	1.4	46	236	1.0	18	2.6	71	270	0.740
439.5	1.1	9.6	1.5	46	262	1.3	16	2.8	70	300	0.924
440.2	0.547	8.4	1.2	41	207	1.0	7.9	2.2	63	237	0.732
440.8	1.6	11	1.5	43	265	1.2	23	2.8	65	303	0.884
441.5	1.3	9.7	1.4	35	222	1.5	18	2.6	54	254	1.1
442.2	0.849	11	1.2	36	231	0.787	12	2.2	55	264	0.575
442.9	1.1	9.4	1.0	36	210	0.865	16	1.9	55	240	0.631
443.6	0.878	10	1.0	39	282	1.5	13	1.8	60	323	1.1
444.3	1.6	10	1.3	34	259	1.1	24	2.3	52	296	0.829
445.0	0.948	10	1.4	35	240	1.4	14	2.6	54	275	1.0
445.7	0.949	11	1.5	35	247	1.5	14	2.8	54	282	1.1
446.4	1.2	9.6	1.1	35	228	1.0	17	2.1	53	261	0.760
447.1	1.3	9.4	1.3	34	235	1.1	18	2.3	52	269	0.773
447.8	1.2	11	1.4	28	298	1.4	17	2.5	43	341	1.0
448.5	1.0	12	1.4	32	289	1.4	15	2.5	49	331	1.0
449.2	1.0	9.5	1.5	31	242	0.754	14	2.8	48	277	0.550
449.9	0.361	7.8	1.2	33	254	1.4	5.2	2.2	50	290	1.0
450.6	1.1	10	1.3	25	229	1.3	15	2.4	39	262	0.913
451.3	2.0	10	1.8	28	251	1.1	29	3.3	43	287	0.792



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
452.0	0.749	10	1.4	24	251	0.791	11	2.6	36	287	0.577
452.7	1.0	9.2	1.1	30	254	1.2	15	2.0	46	290	0.841
453.4	1.0	9.7	1.6	29	267	1.2	15	2.9	44	306	0.851
454.1	1.2	9.8	1.1	29	277	1.2	17	2.0	45	317	0.870
454.8	1.2	9.8	1.9	30	247	1.8	17	3.4	46	283	1.3
455.5	1.8	11	1.6	31	251	1.2	25	3.0	48	286	0.865
456.2	1.1	10	2.1	29	283	1.5	16	3.9	45	323	1.1
456.9	1.1	9.3	1.6	23	251	1.1	15	2.8	36	287	0.780
457.6	1.1	9.9	1.7	33	267	0.961	16	3.0	50	306	0.701
458.3	1.3	8.7	1.4	29	244	1.2	19	2.5	44	279	0.870
459.0	1.5	11	1.5	32	256	1.8	21	2.8	49	293	1.3
459.7	0.724	10	1.6	25	242	1.6	10	2.8	39	277	1.1
460.4	1.3	11	1.2	27	247	1.6	19	2.2	41	282	1.2
461.1	1.5	10	1.4	28	258	1.4	21	2.6	43	296	1.0
461.8	0.933	8.9	1.0	27	230	0.882	13	1.9	41	263	0.644
462.5	1.5	8.2	0.904	27	239	1.2	22	1.6	42	273	0.897
463.2	1.0	12	1.2	28	250	1.3	15	2.2	42	285	0.959
463.9	1.2	8.5	0.925	24	235	1.2	17	1.7	37	269	0.910
464.6	1.0	8.9	0.821	24	235	1.4	15	1.5	37	269	1.0
465.3	1.3	8.8	0.942	25	236	0.938	18	1.7	39	270	0.684
466.0	1.3	9.5	0.850	23	239	0.990	18	1.6	35	274	0.722
466.6	1.9	8.8	1.1	25	252	1.7	28	2.0	39	289	1.2
467.3	1.4	10.0	0.807	23	232	0.957	20	1.5	35	265	0.699
468.0	0.653	8.3	0.737	19	221	0.876	9.4	1.3	29	253	0.639
468.7	0.576	7.6	0.684	20	238	0.941	8.3	1.2	31	272	0.687
469.4	0.780	8.5	0.727	22	225	0.920	11	1.3	34	257	0.671
470.1	1.3	8.5	0.553	23	240	0.968	18	1.0	35	275	0.706
470.8	1.5	11	0.572	27	284	1.1	22	1.0	41	325	0.778
471.5	1.2	7.1	0.657	22	242	1.1	17	1.2	33	277	0.819
472.2	0.787	11	0.588	26	283	1.5	11	1.1	41	324	1.1
472.9	1.6	9.6	0.458	19	261	0.843	23	0.834	29	299	0.615
473.6	1.4	7.3	0.355	21	256	1.0	20	0.648	32	292	0.736
474.3	1.2	9.1	0.559	23	276	1.2	17	1.0	35	315	0.889
475.0	1.2	11	0.541	26	274	0.850	18	0.986	40	314	0.620
475.7	1.3	8.6	0.417	26	308	0.824	18	0.761	39	353	0.601
476.4	1.5	9.6	0.662	24	260	0.594	22	1.2	36	297	0.434
477.1	1.5	8.9	0.591	31	283	0.882	21	1.1	48	324	0.644
477.8	1.6	9.1	0.539	28	281	0.803	23	0.982	42	322	0.586
478.5	1.4	8.0	0.643	27	248	0.690	20	1.2	42	283	0.504
479.2	1.8	10	0.485	29	239	1.3	25	0.884	45	273	0.957
479.9	1.3	10	0.721	27	246	1.3	18	1.3	42	282	0.917
480.6	1.5	9.3	0.505	27	249	0.690	22	0.921	42	284	0.504
481.3	2.1	11	0.507	28	260	0.972	30	0.925	43	297	0.709
482.0	1.8	9.6	0.615	30	245	1.1	25	1.1	45	281	0.767
482.7	1.5	11	0.860	29	211	1.5	22	1.6	44	242	1.1
483.4	1.6	9.9	0.957	31	261	0.803	24	1.7	48	299	0.586
484.1	1.8	10	1.0	28	265	0.807	26	1.9	43	304	0.589
484.8	1.9	12	0.813	45	268	1.1	27	1.5	69	306	0.777
485.5	1.4	9.9	0.716	33	231	0.679	21	1.3	50	264	0.495
486.2	2.1	10	0.794	36	254	1.2	30	1.4	55	290	0.854
486.9	1.9	11	0.694	33	251	1.1	28	1.3	50	288	0.820
487.6	3.9	9.5	1.0	35	233	0.913	56	1.9	53	266	0.666
488.3	1.9	14	0.909	37	274	0.757	28	1.7	57	314	0.552
489.0	2.1	11	0.778	39	223	0.658	31	1.4	60	255	0.480
489.7	1.7	11	0.789	41	226	0.861	24	1.4	63	258	0.628
490.4	1.8	13	0.685	44	236	0.474	26	1.2	68	269	0.346
491.1	2.3	13	0.668	43	250	0.574	33	1.2	65	285	0.419
491.8	1.6	13	0.649	42	224	0.536	23	1.2	64	256	0.391
492.4	1.7	10	0.645	44	212	0.968	24	1.2	67	242	0.706
493.1	2.2	12	0.746	50	246	0.780	32	1.4	77	282	0.569
493.8	1.7	11	0.720	54	270	0.856	25	1.3	83	309	0.625
494.5	1.7	9.8	0.621	47	214	0.570	24	1.1	71	244	0.416
495.2	2.0	13	0.672	50	259	0.503	29	1.2	77	297	0.367
495.9	1.6	13	0.533	58	225	0.981	23	0.973	88	258	0.715
496.6	2.1	12	0.738	54	241	0.862	31	1.3	82	276	0.629
497.3	1.9	11	0.498	63	279	0.523	28	0.908	96	319	0.382
498.0	1.5	12	0.546	52	238	0.836	22	0.996	79	273	0.610
498.7	1.5	11	0.616	50	217	0.543	21	1.1	77	248	0.396
499.4	1.2	12	0.705	56	218	0.680	17	1.3	86	250	0.496
500.1	0.811	10	0.825	54	240	0.876	12	1.5	83	275	0.639
500.8	1.5	12	0.725	57	237	0.515	21	1.3	87	271	0.376
501.5	1.3	11	0.564	58	199	0.550	18	1.0	88	228	0.402
502.2	1.7	12	0.494	60	258	0.613	25	0.900	92	295	0.447
502.9	1.6	10	0.553	58	221	0.507	23	1.0	89	253	0.370
503.6	1.3	14	0.642	57	232	0.429	18	1.2	88	265	0.313
504.3	1.4	13	0.689	64	227	0.537	21	1.3	98	259	0.391
505.0	1.6	12	0.729	59	222	0.596	22	1.3	91	254	0.435
505.7	1.4	12	0.832	56	275	0.880	20	1.5	86	315	0.642
506.4	1.2	11	0.742	60	260	0.742	17	1.4	92	298	0.541
507.1	0.977	9.7	0.810	60	243	0.425	14	1.5	92	278	0.310
507.8	1.5	12	0.955	50	261	0.562	22	1.7	77	298	0.410



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Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.5	1.7	12	1.2	58	255	0.863	25	2.2	88	292	0.629
509.2	0.920	12	1.1	51	263	0.357	13	2.1	78	301	0.261
509.9	1.1	11	0.989	47	240	0.612	16	1.8	71	275	0.447
510.6	1.1	10	0.908	55	246	1.3	16	1.7	84	282	0.916
511.3	1.4	13	1.1	54	242	0.716	20	2.0	83	277	0.523
512.0	0.937	11	1.2	55	226	0.822	14	2.2	84	258	0.600
512.7	1.3	11	1.3	53	232	0.736	18	2.4	81	265	0.537
513.4	1.1	12	1.2	52	300	0.762	15	2.2	79	343	0.556
514.1	0.976	11	1.4	48	221	0.468	14	2.5	73	253	0.341
514.8	1.2	11	1.6	54	267	0.991	17	2.8	82	305	0.723
515.5	1.0	12	1.5	59	259	1.4	15	2.7	90	296	1.0
516.2	1.3	10	1.7	40	232	0.494	18	3.1	62	265	0.360
516.9	1.8	12	1.6	53	245	1.6	26	2.8	81	280	1.2
517.6	1.3	11	1.5	49	252	1.3	19	2.8	75	288	0.980
518.3	0.716	12	1.6	45	272	1.3	10	3.0	69	311	0.984
518.9	0.960	12	1.9	43	235	1.4	14	3.4	66	269	1.0
519.6	1.1	11	2.0	42	301	0.972	16	3.7	65	344	0.709
520.3	0.809	9.7	1.8	37	225	1.1	12	3.3	57	257	0.791
521.0	1.2	12	2.7	41	250	1.2	18	4.9	63	286	0.880
521.7	0.694	8.6	1.6	35	259	0.690	10	2.8	53	296	0.503
522.4	0.716	8.3	1.5	37	240	0.971	10	2.7	57	275	0.709
523.1	0.862	9.3	1.6	31	238	0.989	12	2.9	47	272	0.722
523.8	1.2	10	2.2	37	248	1.1	17	4.0	57	284	0.780
524.5	0.817	10	1.7	36	213	1.2	12	3.1	54	244	0.880
525.2	0.748	9.8	2.2	32	266	1.0	11	4.0	49	305	0.748
525.9	0.510	11	1.6	35	256	1.0	7.4	2.8	53	292	0.751
526.6	0.593	8.4	1.6	31	219	1.1	8.6	2.8	48	251	0.788
527.3	0.922	8.9	2.2	32	247	1.2	13	3.9	50	282	0.901
528.0	0.812	9.3	1.6	32	237	0.958	12	2.9	48	271	0.699
528.7	0.776	10	1.4	25	245	1.0	11	2.6	39	281	0.736
529.4	0.996	8.4	2.0	25	260	0.978	14	3.6	39	297	0.714
530.1	1.1	11	2.1	27	238	0.907	16	3.8	42	272	0.662
530.8	1.1	9.2	1.6	27	267	0.929	16	2.8	41	305	0.678
531.5	0.525	8.9	1.9	26	231	1.4	7.6	3.4	40	264	1.0
532.2	1.1	11	1.7	27	253	1.6	16	3.1	41	289	1.1
532.9	1.0	11	1.8	26	243	0.747	15	3.2	40	278	0.545
533.6	1.2	8.9	2.0	28	253	0.930	18	3.6	43	289	0.678
534.3	1.1	9.9	1.4	25	279	1.4	15	2.6	38	319	1.0
535.0	1.1	11	1.5	26	238	0.860	16	2.7	40	272	0.628
535.7	0.734	9.4	1.4	24	234	0.895	11	2.5	38	268	0.653
536.4	1.1	9.6	1.2	21	231	0.929	16	2.1	32	264	0.678
537.1	0.996	9.3	1.4	26	226	0.657	14	2.5	40	258	0.479
537.8	0.841	10	1.6	24	254	0.868	12	2.9	37	290	0.633
538.5	0.724	9.8	1.2	24	237	1.1	10	2.1	37	271	0.769
539.2	0.445	9.4	1.4	25	252	0.852	6.4	2.5	39	288	0.622
539.9	1.2	8.6	1.0	24	216	0.697	18	1.9	37	247	0.508
540.6	1.4	11	1.2	28	232	1.3	20	2.2	43	265	0.919
541.3	1.1	8.9	1.4	23	215	1.0	16	2.5	35	245	0.757
542.0	0.915	11	1.3	29	231	1.0	13	2.4	44	264	0.753
542.7	1.4	11	1.0	26	227	0.913	20	1.9	40	260	0.666
543.4	1.1	9.5	1.1	26	218	1.0	15	2.0	39	249	0.755
544.1	1.2	11	1.3	24	238	1.1	17	2.3	37	272	0.773
544.8	1.2	10	1.0	25	218	1.2	17	1.9	39	250	0.860
545.4	1.7	11	1.3	35	228	1.3	25	2.4	53	261	0.981
546.1	1.8	11	1.3	32	264	1.2	25	2.4	48	302	0.876
546.8	0.989	12	0.895	28	234	0.961	14	1.6	43	268	0.701
547.5	1.2	12	0.944	32	220	1.2	18	1.7	49	251	0.848
548.2	1.0	10	0.823	33	230	0.716	15	1.5	51	263	0.522
548.9	1.1	10	0.867	35	204	0.496	16	1.6	54	233	0.362
549.6	1.8	11	0.899	36	215	1.1	26	1.6	54	246	0.825
550.3	1.2	13	0.577	33	208	0.646	17	1.1	51	238	0.472
551.0	1.4	10	0.718	38	218	0.701	20	1.3	58	249	0.512
551.7	1.4	10	0.669	33	219	0.409	21	1.2	51	251	0.298
552.4	1.3	9.8	0.676	35	242	0.539	18	1.2	53	276	0.394
553.1	1.4	11	0.762	39	226	0.728	20	1.4	60	258	0.531
553.8	1.5	11	0.588	42	230	0.291	22	1.1	64	264	0.213
554.5	1.8	11	0.557	41	241	0.623	25	1.0	63	276	0.455
555.2	1.6	11	0.477	38	224	0.645	23	0.870	58	256	0.471
555.9	1.2	11	0.450	39	248	0.803	17	0.822	60	284	0.586
556.6	2.1	11	0.613	37	235	1.0	31	1.1	56	269	0.733
557.3	1.6	10	0.552	40	194	0.294	23	1.0	61	222	0.215
558.0	1.3	11	0.374	45	193	0.638	19	0.682	69	221	0.466
558.7	0.753	12	0.547	44	226	1.2	11	0.997	68	258	0.847
559.4	1.3	9.5	0.659	44	241	0.592	18	1.2	68	276	0.432
560.1	1.2	11	0.780	49	213	0.964	18	1.4	76	244	0.703
560.8	1.5	10	0.560	51	234	0.462	22	1.0	78	268	0.337
561.5	0.903	8.8	0.390	42	204	0.732	13	0.711	64	233	0.534
562.2	1.3	9.5	0.715	41	203	0.707	19	1.3	62	232	0.516
562.9	1.2	12	0.599	48	229	0.872	17	1.1	74	262	0.636
563.6	1.5	11	0.743	43	216	0.821	21	1.4	65	247	0.599
564.3	1.8	11	0.792	45	218	0.263	27	1.4	69	249	0.192



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
565.0	1.6	11	0.730	50	229	0.641	24	1.3	76	262	0.468
565.7	1.5	9.5	0.837	47	219	1.2	22	1.5	72	251	0.887
566.4	1.2	9.7	0.726	50	249	0.456	17	1.3	76	284	0.333
567.1	1.5	11	0.851	46	218	0.845	22	1.6	71	249	0.616
567.8	1.4	12	0.702	46	224	0.709	20	1.3	71	256	0.517
568.5	0.589	9.4	0.788	45	205	0.847	8.5	1.4	69	235	0.618
569.2	1.4	9.8	0.909	43	237	1.0	20	1.7	67	271	0.736
569.9	1.3	11	0.980	43	231	1.0	18	1.8	66	264	0.763
570.6	1.1	11	0.850	42	208	0.343	15	1.6	65	238	0.250
571.2	1.2	12	0.708	37	245	0.896	18	1.3	57	280	0.654
571.9	1.4	10.0	0.977	46	221	0.674	20	1.8	71	253	0.492
572.6	1.5	11	0.785	32	202	0.997	22	1.4	49	231	0.727
573.3	1.0	9.2	0.959	35	219	0.517	15	1.7	53	250	0.377
574.0	1.1	11	1.1	35	249	1.0	15	2.1	53	285	0.732
574.7	1.4	13	0.688	36	235	0.828	20	1.3	56	269	0.604
575.4	0.916	8.7	0.935	47	227	1.2	13	1.7	71	260	0.841
576.1	1.1	8.8	0.854	29	227	1.1	15	1.6	44	260	0.821
576.8	0.944	8.8	0.744	31	213	0.916	14	1.4	48	244	0.668
577.5	1.2	9.6	0.884	32	221	1.0	17	1.6	49	252	0.757
578.2	1.1	12	0.717	40	232	1.2	16	1.3	62	266	0.900
578.9	1.6	12	0.856	38	238	1.3	23	1.6	58	273	0.926
579.6	1.0	10	0.728	29	195	1.1	14	1.3	45	223	0.812
580.3	1.1	8.9	1.1	31	211	0.455	15	1.9	47	241	0.332
581.0	1.5	8.5	0.871	32	214	1.1	21	1.6	49	244	0.814
581.7	0.665	9.2	0.853	31	229	1.0	9.6	1.6	48	262	0.746
582.4	0.942	8.9	0.936	28	226	0.733	14	1.7	43	258	0.535
583.1	1.2	9.0	0.810	30	224	1.4	17	1.5	46	256	1.0
583.8	1.8	9.1	0.608	31	221	0.639	26	1.1	47	252	0.466
584.5	1.3	9.4	0.696	38	235	1.3	18	1.3	58	269	0.979
585.2	1.1	8.7	0.646	26	201	0.798	16	1.2	40	229	0.582
585.9	1.6	10	0.984	30	233	1.2	24	1.8	46	266	0.868
586.6	0.706	8.9	0.808	26	246	1.4	10	1.5	39	281	1.0
587.3	1.5	9.5	0.912	23	262	1.7	21	1.7	36	299	1.2
588.0	1.1	8.9	1.1	28	229	0.865	15	1.9	43	262	0.631
588.7	0.820	8.7	0.695	23	206	1.3	12	1.3	36	235	0.930
589.4	1.1	10	0.752	25	241	1.5	16	1.4	38	276	1.1
590.1	1.0	8.3	0.782	26	236	1.2	15	1.4	40	269	0.872
590.8	0.810	9.5	0.834	21	217	1.8	12	1.5	32	248	1.3
591.5	1.2	10	0.796	23	264	0.847	17	1.5	35	302	0.618
592.2	1.4	6.9	0.830	21	239	1.4	20	1.5	32	273	1.0
592.9	1.5	8.2	0.797	23	271	1.5	22	1.5	35	310	1.1
593.6	1.4	7.9	0.711	19	229	1.2	20	1.3	30	261	0.882
594.3	1.1	10	0.914	23	256	1.4	16	1.7	36	292	1.1
595.0	1.2	8.9	0.785	24	244	1.4	17	1.4	37	279	0.996
595.7	1.5	8.3	0.931	22	236	1.7	22	1.7	33	270	1.3
596.4	0.605	8.1	0.721	22	228	1.2	8.7	1.3	33	261	0.889
597.0	1.5	10	0.846	23	254	1.2	22	1.5	35	290	0.882
597.7	1.1	11	0.583	27	240	2.2	17	1.1	41	275	1.6
598.4	1.2	8.2	0.686	25	236	1.2	18	1.3	38	270	0.884
599.1	1.5	8.7	0.926	24	234	1.4	22	1.7	37	267	1.0
599.8	1.2	8.5	0.720	26	211	0.872	18	1.3	40	241	0.636
600.5	1.4	9.6	0.725	25	226	1.0	20	1.3	38	259	0.761
601.2	0.967	7.0	0.709	26	206	0.783	14	1.3	41	236	0.571
601.9	1.4	9.8	0.577	30	222	1.3	21	1.1	47	254	0.921
602.6	1.4	14	0.683	27	253	1.7	20	1.2	41	289	1.2
603.3	1.1	9.4	0.956	28	226	1.5	17	1.7	43	258	1.1
604.0	1.2	10	0.722	31	248	2.0	17	1.3	47	284	1.5
604.7	1.6	11	0.434	25	221	0.865	23	0.791	38	253	0.631
605.4	1.1	8.9	0.657	30	253	1.8	15	1.2	45	289	1.3
606.1	1.8	9.2	0.749	33	211	0.926	26	1.4	51	241	0.675
606.8	1.5	9.4	0.393	31	217	0.557	22	0.717	47	248	0.407
607.5	1.2	10	0.718	34	270	1.2	17	1.3	53	309	0.909
608.2	1.3	12	0.872	33	248	1.1	18	1.6	51	283	0.826
608.9	1.4	9.6	0.687	33	229	1.4	21	1.3	51	262	1.0
609.6	1.2	10	0.890	36	261	1.4	17	1.6	55	299	1.0
610.3	1.2	12	0.675	37	245	0.673	18	1.2	57	280	0.491
611.0	1.6	10	0.923	38	225	0.716	23	1.7	58	257	0.522
611.7	2.3	11	0.539	35	214	0.978	33	0.983	54	245	0.713
612.4	1.3	9.9	0.910	42	284	1.1	19	1.7	64	325	0.785
613.1	1.4	10	0.724	35	229	1.2	20	1.3	53	262	0.839
613.8	1.8	12	0.687	44	214	1.0	26	1.3	67	244	0.735
614.5	1.7	12	0.782	43	235	0.552	24	1.4	65	269	0.403
615.2	1.3	12	0.825	37	215	1.0	18	1.5	57	246	0.749
615.9	0.981	10	0.751	41	223	0.463	14	1.4	62	255	0.338
616.6	1.7	11	0.671	43	221	0.871	25	1.2	65	252	0.635
617.3	2.0	12	0.845	49	278	0.805	29	1.5	75	318	0.587
618.0	2.0	11	0.816	38	183	0.584	29	1.5	59	209	0.426
618.7	1.4	9.9	1.1	39	229	0.956	20	2.0	60	262	0.697
619.4	1.9	11	0.855	44	241	1.0	28	1.6	67	276	0.763
620.1	2.3	12	1.0	42	204	1.2	33	1.9	64	233	0.866
620.8	1.0	9.8	0.757	41	164	0.725	15	1.4	63	188	0.529



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.5	1.5	11	0.911	49	240	0.835	21	1.7	75	274	0.609
622.2	1.7	12	0.686	39	219	0.666	25	1.3	59	251	0.486
622.9	1.5	13	0.757	42	229	1.4	21	1.4	64	261	1.0
623.5	1.2	11	0.909	46	231	0.520	17	1.7	71	264	0.380
624.2	1.4	11	1.0	46	256	0.866	20	1.9	70	292	0.632
624.9	1.9	11	0.667	45	224	1.1	27	1.2	69	256	0.808
625.6	1.7	13	0.958	49	226	0.827	25	1.7	75	258	0.603
626.3	2.1	10	0.773	49	218	0.870	30	1.4	75	250	0.635
627.0	1.7	14	0.849	46	214	0.638	25	1.5	70	245	0.465
627.7	1.7	13	1.1	51	250	1.3	25	2.0	77	286	0.978
628.4	1.0	12	0.728	43	235	1.4	15	1.3	66	269	1.0
629.1	1.4	10	1.1	46	210	0.952	20	2.0	70	240	0.695
629.8	1.1	11	0.712	44	218	0.925	17	1.3	68	249	0.675
630.5	1.2	9.8	0.597	47	188	0.670	17	1.1	73	215	0.489
631.2	1.5	11	0.809	51	223	1.1	21	1.5	79	255	0.808
631.9	1.2	11	0.589	39	216	0.800	17	1.1	59	247	0.584
632.6	1.4	12	0.836	50	220	0.519	20	1.5	76	252	0.379
633.3	1.7	12	0.880	48	230	0.529	25	1.6	74	263	0.386
634.0	1.7	10	0.920	50	216	0.519	24	1.7	76	247	0.378
634.7	1.7	13	0.700	48	236	1.1	25	1.3	73	270	0.782
635.4	1.9	10	0.673	43	226	0.402	28	1.2	66	259	0.294
636.1	1.6	11	0.652	49	234	1.2	23	1.2	75	268	0.844
636.8	1.8	12	1.1	49	228	1.1	26	2.1	74	261	0.814
637.5	1.9	12	1.2	51	221	1.1	28	2.2	79	253	0.832
638.2	1.5	11	0.969	44	254	0.729	22	1.8	67	290	0.532
638.9	1.6	11	0.942	46	204	1.1	23	1.7	70	234	0.787
639.6	1.7	12	0.981	44	222	0.991	24	1.8	68	254	0.723
640.3	1.8	11	1.2	50	255	0.655	25	2.1	77	292	0.478
641.0	0.834	11	0.943	44	203	0.709	12	1.7	68	232	0.517
641.7	1.3	11	0.743	41	198	0.868	18	1.4	62	226	0.633
642.4	1.5	12	0.754	47	250	0.423	21	1.4	72	286	0.309
643.1	1.3	10	0.922	49	211	1.5	18	1.7	75	241	1.1
643.8	1.5	12	0.652	44	224	0.697	21	1.2	68	256	0.508
644.5	1.1	10	0.858	38	207	1.2	16	1.6	58	236	0.847
645.2	1.3	11	0.765	43	236	0.412	18	1.4	65	270	0.301
645.9	1.7	11	0.848	39	227	0.923	25	1.5	59	260	0.673
646.6	2.0	9.5	0.934	46	248	0.944	29	1.7	70	284	0.688
647.3	1.5	11	1.0	45	231	0.660	22	1.8	70	264	0.482
648.0	1.4	10	0.801	49	230	0.778	21	1.5	75	263	0.567
648.7	1.5	10	0.968	39	217	1.3	22	1.8	59	248	0.981
649.4	1.8	10	0.757	45	246	0.709	25	1.4	68	281	0.517
650.0	1.8	10	0.932	45	231	1.1	26	1.7	69	264	0.831
650.7	2.0	10	0.886	39	231	0.770	30	1.6	61	264	0.562
651.4	1.2	9.4	0.597	39	231	0.890	18	1.1	59	264	0.650
652.1	0.821	9.4	1.0	36	225	1.1	12	1.8	55	258	0.779
652.8	1.5	10.0	0.704	37	225	1.2	21	1.3	57	257	0.866
653.5	1.8	10	0.880	38	210	1.0	26	1.6	57	240	0.736
654.2	1.3	10.0	0.556	41	236	0.497	18	1.0	63	270	0.363
654.9	0.889	11	0.882	38	248	1.3	13	1.6	58	283	0.949
655.6	1.3	9.6	0.895	34	228	0.957	19	1.6	52	261	0.699
656.3	1.1	9.3	0.759	38	242	1.3	16	1.4	58	276	0.934
657.0	1.9	11	0.876	34	236	1.1	28	1.6	53	270	0.809
657.7	1.1	9.4	0.855	36	204	0.915	16	1.6	56	233	0.667
658.4	1.3	11	0.689	37	265	0.773	19	1.3	57	303	0.564
659.1	0.818	9.9	1.0	32	250	1.3	12	1.9	49	286	0.920
659.8	0.864	11	0.774	37	255	0.888	12	1.4	56	291	0.648
660.5	1.2	11	0.662	34	233	0.941	17	1.2	52	266	0.686
661.2	1.2	12	0.886	32	292	0.753	17	1.6	50	334	0.549
661.9	1.1	7.9	0.905	32	260	1.5	17	1.7	49	297	1.1
662.6	1.2	12	0.728	33	241	1.5	17	1.3	50	275	1.1
663.3	1.2	12	0.997	33	252	1.7	17	1.8	51	288	1.2
664.0	0.983	9.7	0.695	34	247	0.901	14	1.3	52	282	0.658
664.7	1.3	8.2	0.647	29	262	0.829	19	1.2	44	300	0.605
665.4	1.2	10.0	0.736	29	245	0.896	17	1.3	45	280	0.654
666.1	1.2	11	0.540	29	232	1.0	18	0.985	44	266	0.746
666.8	2.0	9.5	0.734	25	263	1.4	28	1.3	39	300	1.0
667.5	0.707	7.9	0.786	27	270	1.1	10	1.4	41	308	0.789
668.2	1.3	9.8	0.784	32	293	2.1	18	1.4	49	335	1.5
668.9	1.1	7.8	0.792	27	255	0.927	15	1.4	41	291	0.676
669.6	1.5	11	0.668	26	254	0.950	22	1.2	39	291	0.693
670.3	0.885	9.7	0.673	28	265	1.7	13	1.2	43	303	1.3
671.0	1.0	8.8	0.417	24	261	1.9	15	0.760	37	298	1.4
671.7	1.2	8.1	0.654	24	240	1.0	17	1.2	37	274	0.762
672.4	1.0	8.4	0.669	22	253	1.3	15	1.2	34	290	0.939
673.1	1.1	9.4	0.567	23	217	1.8	16	1.0	36	248	1.3
673.8	1.2	9.8	0.525	24	233	1.1	17	0.957	37	266	0.832
674.5	1.5	10	0.543	22	251	0.877	22	0.990	33	287	0.640
675.2	1.3	9.4	0.438	23	233	1.6	19	0.799	36	267	1.2
675.9	1.2	9.3	0.558	19	244	1.7	17	1.0	30	278	1.2
676.5	1.1	7.8	0.572	19	259	0.924	15	1.0	30	296	0.674
677.2	0.871	9.5	0.334	17	236	1.0	13	0.609	26	270	0.750



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
677.9	1.1	6.3	0.354	21	253	1.3	16	0.646	32	289	0.935
678.6	1.1	6.6	0.232	18	262	0.874	16	0.422	27	299	0.638
679.3	1.1	9.7	0.502	21	261	1.2	16	0.915	32	298	0.843
680.0	1.1	8.1	0.219	22	257	1.4	16	0.399	34	294	1.0
680.7	0.838	7.3	0.264	20	248	0.817	12	0.482	30	283	0.596
681.4	1.1	9.1	0.330	21	261	1.2	16	0.601	31	299	0.848
682.1	0.852	8.2	0.411	16	266	1.2	12	0.750	25	304	0.905
682.8	0.887	10	0.264	17	285	0.793	13	0.482	27	326	0.578
683.5	0.733	10	0.412	16	270	1.7	11	0.751	25	309	1.2
684.2	0.819	8.6	0.365	17	255	0.982	12	0.665	26	292	0.717
684.9	0.890	7.9	0.327	17	242	0.853	13	0.596	26	277	0.623
685.6	1.2	9.3	0.340	15	285	0.889	18	0.621	23	326	0.649
686.3	1.3	8.5	0.326	19	284	1.2	19	0.595	29	325	0.891
687.0	1.3	9.0	0.652	19	276	1.8	19	1.2	29	315	1.3
687.7	1.1	7.4	0.410	19	281	1.2	16	0.747	29	321	0.868
688.4	0.945	7.6	0.561	15	276	1.7	14	1.0	24	315	1.2
689.1	1.4	9.6	0.555	18	284	0.780	21	1.0	27	325	0.569
689.8	0.963	9.8	0.618	19	260	1.2	14	1.1	29	298	0.881
690.5	0.820	9.1	0.473	19	275	0.913	12	0.862	30	314	0.666
691.2	0.944	7.6	0.346	23	258	0.732	14	0.631	35	295	0.534
691.9	1.4	8.5	0.398	17	265	0.524	20	0.726	26	303	0.382
692.6	1.2	9.8	0.405	21	278	0.574	18	0.738	33	318	0.419
693.3	1.4	9.7	0.446	22	291	0.734	20	0.814	34	333	0.536
694.0	1.2	10	0.706	27	282	1.1	17	1.3	41	322	0.826
694.7	1.3	8.1	0.573	23	256	0.790	18	1.0	35	293	0.577
695.4	1.1	8.8	0.535	27	237	1.1	16	0.976	41	271	0.825
696.1	1.8	11	0.630	21	276	1.1	26	1.1	32	315	0.773
696.8	1.5	8.6	0.743	25	249	1.5	22	1.4	38	285	1.1
697.5	1.0	7.8	0.812	26	244	1.0	15	1.5	40	279	0.762
698.2	1.5	11	0.916	26	269	1.5	22	1.7	40	308	1.1
698.9	1.1	11	0.705	28	276	0.741	16	1.3	42	316	0.541
699.6	1.1	8.8	0.638	28	299	1.4	15	1.2	42	341	1.0
700.3	1.0	10	0.777	27	262	0.740	15	1.4	42	300	0.540
701.0	0.930	9.8	0.627	29	270	1.4	13	1.1	44	309	1.1
701.7	0.712	8.1	0.716	27	242	0.708	10	1.3	41	276	0.517
702.4	0.783	10	0.789	26	287	0.871	11	1.4	40	329	0.636
703.0	1.4	9.9	0.822	26	243	0.650	20	1.5	39	277	0.474
703.7	1.1	9.6	0.589	24	222	0.984	15	1.1	36	254	0.718
704.4	1.6	9.2	0.787	28	269	1.2	23	1.4	44	307	0.878
705.1	1.1	7.4	0.834	25	255	1.2	16	1.5	39	291	0.851
705.8	1.4	10	0.747	28	255	1.4	20	1.4	43	291	1.1
706.5	1.8	9.6	0.693	31	274	0.636	26	1.3	47	314	0.464
707.2	0.635	9.1	0.648	25	242	0.777	9.2	1.2	38	276	0.567
707.9	1.8	8.7	0.574	30	273	1.0	26	1.0	45	312	0.760
708.6	1.6	9.1	0.650	27	259	0.862	24	1.2	41	296	0.629
709.3	1.4	9.2	0.525	27	261	1.2	20	0.957	42	298	0.855
710.0	1.6	9.6	0.802	31	234	0.613	23	1.5	48	268	0.447
710.7	1.7	9.7	0.615	33	281	0.847	24	1.1	51	321	0.618
711.4	1.7	9.6	0.622	30	253	1.2	24	1.1	46	290	0.901
712.1	1.6	10	0.603	31	244	0.946	24	1.1	47	279	0.690
712.8	0.667	11	0.607	31	253	1.0	9.6	1.1	48	289	0.745
713.5	1.5	9.3	0.586	32	280	0.363	22	1.1	49	320	0.265
714.2	1.4	8.9	0.651	34	245	0.904	21	1.2	52	280	0.659
714.9	1.1	12	0.713	35	267	1.2	16	1.3	54	305	0.849
715.6	1.4	11	0.615	36	246	1.0	20	1.1	55	281	0.741
716.3	1.1	10	0.779	33	272	1.4	16	1.4	51	311	0.991
717.0	1.2	9.4	0.572	33	265	1.1	17	1.0	50	303	0.807
717.7	1.3	8.9	0.717	31	237	0.759	19	1.3	47	271	0.554
718.4	0.947	13	0.639	31	261	1.1	14	1.2	48	298	0.816
719.1	1.1	9.5	0.518	30	226	0.814	16	0.944	46	259	0.594
719.8	0.602	9.8	0.490	34	255	0.563	8.7	0.893	52	292	0.411
720.5	1.3	8.6	0.539	30	228	0.871	19	0.983	45	261	0.635
721.2	1.5	9.1	0.686	34	246	0.737	21	1.3	52	281	0.537
721.9	1.8	9.7	0.581	30	268	0.913	26	1.1	46	306	0.666
722.6	1.1	9.1	0.646	31	228	0.593	15	1.2	47	261	0.433
723.3	1.1	10	0.518	37	249	1.7	17	0.945	56	285	1.2
724.0	1.9	11	0.497	35	255	1.4	27	0.906	54	291	1.0
724.7	1.6	9.8	0.345	34	250	0.831	24	0.629	52	286	0.606
725.4	0.982	8.3	0.679	31	255	0.729	14	1.2	47	292	0.532
726.1	1.8	8.5	0.531	30	246	0.726	27	0.968	46	281	0.529
726.8	1.8	10	0.678	37	256	1.2	25	1.2	57	293	0.839
727.5	1.2	9.4	0.462	34	236	1.1	17	0.842	53	270	0.775
728.2	1.9	11	0.708	34	259	0.745	27	1.3	52	297	0.543
728.8	1.2	10	0.386	35	226	1.2	18	0.703	54	259	0.865
729.5	1.6	10	0.317	33	262	0.933	23	0.579	51	299	0.681
730.2	1.7	9.7	0.770	34	233	0.899	25	1.4	53	266	0.656
730.9	1.9	11	0.461	31	230	0.597	27	0.842	48	263	0.436
731.6	1.3	9.2	0.514	32	252	0.765	19	0.937	48	288	0.558
732.3	2.0	11	0.457	34	274	1.1	28	0.833	52	314	0.819
733.0	1.3	11	0.656	35	253	0.910	19	1.2	53	289	0.664
733.7	1.1	11	0.590	32	251	1.1	16	1.1	50	287	0.812



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
734.4	1.7	11	0.678	37	245	0.623	25	1.2	56	280	0.454
735.1	1.6	11	0.463	31	237	1.4	23	0.845	48	272	1.0
735.8	0.835	13	0.826	31	259	1.2	12	1.5	47	296	0.886
736.5	1.4	10.0	0.477	32	276	1.2	20	0.870	49	315	0.879
737.2	1.2	12	0.458	29	260	1.3	17	0.836	45	297	0.976
737.9	1.1	9.0	0.507	30	284	1.1	17	0.924	45	325	0.800
738.6	1.1	11	0.620	35	236	1.1	15	1.1	54	270	0.832
739.3	2.0	10	0.282	32	286	1.0	29	0.515	49	327	0.742
740.0	1.7	9.0	0.475	32	221	0.862	25	0.867	48	253	0.629
740.7	1.0	11	0.470	34	233	0.879	14	0.858	52	266	0.642
741.4	1.0	7.7	0.559	26	249	0.777	15	1.0	40	284	0.567
742.1	1.4	10	0.806	26	293	0.453	20	1.5	40	335	0.330
742.8	0.770	10	0.588	33	245	1.2	11	1.1	50	280	0.865
743.5	0.734	9.2	0.432	27	240	0.730	11	0.789	41	275	0.533
744.2	1.5	11	0.568	26	301	1.2	22	1.0	40	344	0.871
744.9	1.7	8.9	0.417	27	249	1.2	25	0.761	41	285	0.864
745.6	0.970	10	0.571	31	258	0.900	14	1.0	47	295	0.657
746.3	1.5	10	0.515	30	252	0.697	22	0.940	46	288	0.509
747.0	1.1	9.7	0.447	31	242	0.797	15	0.815	48	276	0.581
747.7	1.2	10	0.384	27	262	1.2	17	0.700	42	300	0.909
748.4	1.3	9.8	0.769	26	255	1.1	19	1.4	40	292	0.810
749.1	1.9	8.9	0.574	27	240	0.772	27	1.0	41	275	0.563
749.8	1.3	13	0.801	29	243	0.936	19	1.5	44	278	0.683
750.5	1.3	13	0.856	31	296	1.0	18	1.6	48	338	0.743
751.2	1.3	9.6	0.940	34	251	0.918	18	1.7	53	287	0.670
751.9	1.2	11	0.671	35	282	0.660	17	1.2	53	323	0.482
752.6	1.3	11	0.625	33	247	1.2	18	1.1	50	283	0.885
753.3	1.6	11	0.761	33	258	1.3	24	1.4	50	295	0.968
754.0	1.2	11	0.813	35	237	0.771	18	1.5	54	271	0.562
754.7	1.6	12	0.838	32	254	0.809	23	1.5	49	291	0.590
755.4	1.4	12	0.708	36	254	0.780	20	1.3	54	290	0.569
756.0	1.8	11	0.815	36	216	0.570	26	1.5	55	247	0.416
756.7	1.6	12	0.501	39	245	0.793	23	0.914	59	281	0.578
757.4	1.5	12	0.578	31	229	1.1	22	1.1	48	262	0.775
758.1	1.7	12	0.710	33	231	0.931	24	1.3	51	264	0.679
758.8	1.9	13	0.581	37	246	0.548	28	1.1	57	281	0.399
759.5	1.5	11	0.691	41	242	1.3	22	1.3	62	277	0.956
760.2	2.2	13	0.508	39	236	0.935	31	0.927	60	270	0.682
760.9	1.3	12	0.542	38	234	1.0	19	0.988	58	268	0.737
761.6	1.6	12	0.458	40	235	0.791	24	0.836	61	268	0.577
762.3	1.8	13	0.628	42	228	0.786	26	1.1	64	261	0.573
763.0	1.6	12	0.490	44	242	1.3	23	0.894	67	276	0.926
763.7	2.0	13	0.627	48	237	0.891	28	1.1	73	271	0.650
764.4	1.9	13	0.730	50	279	0.558	28	1.3	77	320	0.407
765.1	1.3	11	0.586	48	236	0.483	19	1.1	74	270	0.353
765.8	1.4	12	0.493	45	226	0.893	20	0.899	69	258	0.652
766.5	2.1	12	0.697	48	248	0.711	31	1.3	73	284	0.519
767.2	1.8	12	0.632	40	214	0.515	27	1.2	62	245	0.376
767.9	1.8	11	0.514	48	237	0.626	26	0.938	74	271	0.457
768.6	2.5	12	0.714	57	240	1.2	36	1.3	87	275	0.847
769.3	1.6	13	0.415	54	237	0.341	23	0.758	83	271	0.249
770.0	1.6	12	0.653	55	239	0.907	23	1.2	84	273	0.662
770.7	1.7	12	0.882	47	242	0.136	25	1.6	72	276	0.099
771.4	1.6	12	0.768	54	235	1.1	23	1.4	82	269	0.825
772.1	1.8	13	0.721	53	249	0.472	27	1.3	81	284	0.345
772.8	2.2	12	0.628	60	267	0.518	31	1.1	92	305	0.378
773.5	1.9	11	0.726	52	221	0.666	27	1.3	80	252	0.486
774.2	2.2	14	0.887	60	264	1.3	32	1.6	91	302	0.921
774.9	2.3	13	0.740	59	246	0.636	33	1.3	91	281	0.464
775.6	0.890	11	0.835	54	236	0.753	13	1.5	83	270	0.549
776.3	1.4	13	0.762	62	246	0.769	20	1.4	94	281	0.561
777.0	1.4	12	0.805	57	245	0.563	20	1.5	87	280	0.411
777.7	1.1	12	0.661	57	245	0.695	16	1.2	87	280	0.507
778.4	1.5	12	0.841	64	278	0.688	21	1.5	99	317	0.502
779.1	1.3	13	0.808	67	254	0.559	19	1.5	103	291	0.408
779.8	1.4	11	0.876	67	253	1.2	20	1.6	103	290	0.910
780.5	1.2	12	0.938	62	252	0.782	17	1.7	95	288	0.570
781.2	1.5	13	1.1	67	257	0.821	22	2.1	103	293	0.599
781.9	1.7	12	1.1	62	250	0.871	25	1.9	95	286	0.635
782.5	1.4	12	0.935	68	252	0.791	21	1.7	105	288	0.577
783.2	1.6	13	0.844	69	251	0.899	23	1.5	106	288	0.656
783.9	1.5	13	1.2	66	276	1.3	22	2.2	102	315	0.927
784.6	1.0	14	1.3	68	258	0.747	15	2.4	104	295	0.545
785.3	1.1	15	1.3	68	260	1.0	16	2.3	104	297	0.754
786.0	1.4	13	1.6	63	262	1.2	21	2.8	96	300	0.850
786.7	1.5	16	0.989	65	262	0.824	22	1.8	100	299	0.601
787.4	1.3	14	1.5	62	269	0.851	19	2.7	95	307	0.621
788.1	1.1	12	1.3	65	237	0.832	16	2.3	100	271	0.607
788.8	1.2	13	1.5	68	249	1.9	18	2.7	105	285	1.4
789.5	1.6	14	1.6	73	278	1.5	23	2.9	111	318	1.1
790.2	1.0	12	1.1	57	243	1.3	15	2.0	87	278	0.972



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Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
790.9	1.1	11	1.1	58	238	1.3	16	1.9	88	273	0.942
791.6	1.6	14	1.2	56	231	1.0	23	2.2	86	265	0.751
792.3	1.3	12	1.3	51	228	1.4	19	2.3	78	261	0.989
793.0	1.4	14	1.6	58	245	1.1	20	2.9	89	280	0.832
793.7	2.2	13	1.2	59	255	1.2	31	2.2	91	292	0.902
794.4	0.956	12	0.947	59	280	0.681	14	1.7	90	321	0.497
795.1	2.0	12	1.1	53	261	0.989	29	2.0	81	299	0.721
795.8	1.3	13	1.5	49	230	0.750	19	2.7	75	263	0.547
796.5	1.3	13	1.0	53	224	1.1	19	1.9	81	256	0.769
797.2	1.4	13	1.1	56	246	0.446	20	1.9	86	281	0.325
797.9	1.6	15	0.982	54	257	0.651	23	1.8	83	294	0.475
798.6	1.5	15	0.971	57	254	0.731	22	1.8	87	290	0.533
799.3	1.3	15	1.0	47	248	1.2	19	1.9	72	284	0.872
800.0	1.6	13	0.961	46	272	0.595	23	1.8	70	311	0.434
800.7	1.6	14	0.978	48	261	0.951	24	1.8	74	298	0.694
801.4	1.4	13	0.878	42	218	0.769	20	1.6	64	249	0.561
802.1	1.9	12	0.838	48	246	0.732	27	1.5	73	281	0.534
802.8	1.9	13	1.1	53	297	0.864	28	1.9	82	339	0.630
803.5	1.4	15	0.994	48	251	0.716	20	1.8	73	287	0.522
804.2	1.7	13	1.1	42	242	1.6	25	2.0	64	277	1.2
804.9	1.5	14	0.851	50	283	1.6	22	1.6	77	324	1.1
805.6	1.5	12	0.923	44	244	0.727	22	1.7	67	279	0.531
806.3	1.4	14	1.2	45	292	1.3	21	2.1	68	334	0.961
807.0	1.6	13	0.779	46	243	0.863	23	1.4	71	278	0.629
807.7	1.4	12	0.825	49	256	0.913	20	1.5	76	293	0.666
808.3	1.2	12	0.551	40	291	1.5	17	1.0	62	333	1.1
809.0	2.0	12	1.1	49	252	0.873	28	1.9	76	288	0.637
809.7	1.5	13	0.680	40	264	1.8	21	1.2	62	302	1.3
810.4	1.6	13	0.605	43	280	1.4	23	1.1	66	320	0.990
811.1	1.1	13	1.2	43	228	0.969	16	2.2	66	261	0.707
811.8	1.6	13	0.970	42	243	1.1	22	1.8	65	278	0.811
812.5	1.4	14	0.703	42	268	1.0	20	1.3	65	307	0.736
813.2	1.1	13	0.945	43	275	1.2	15	1.7	66	314	0.903
813.9	1.3	13	0.761	45	303	1.1	19	1.4	68	346	0.796
814.6	1.1	12	0.585	38	249	0.896	17	1.1	59	285	0.654
815.3	1.3	15	0.909	42	289	1.2	19	1.7	64	331	0.862
816.0	1.5	12	0.718	42	273	1.2	21	1.3	64	313	0.870
816.7	1.3	14	0.497	37	272	0.858	19	0.906	57	311	0.626
817.4	1.4	12	0.822	40	260	1.2	21	1.5	62	298	0.847
818.1	1.6	12	0.665	45	288	0.610	23	1.2	68	329	0.445
818.8	1.0	14	0.752	41	287	0.920	15	1.4	63	328	0.671
819.5	1.6	12	0.760	41	299	0.986	24	1.4	62	342	0.719
820.2	1.3	14	0.655	40	294	1.1	19	1.2	61	336	0.824
820.9	0.793	11	0.759	30	240	0.903	11	1.4	46	274	0.659
821.6	1.7	13	0.892	38	274	1.0	24	1.6	59	313	0.760
822.3	1.5	11	0.488	35	248	1.3	22	0.890	54	283	0.922
823.0	2.6	11	0.526	36	287	2.1	38	0.960	56	329	1.5
823.7	1.2	11	0.722	39	258	1.2	17	1.3	60	295	0.894
824.4	1.1	11	0.830	34	274	0.916	16	1.5	53	313	0.669
825.1	1.1	15	0.887	39	294	2.2	16	1.6	60	336	1.6
825.8	1.1	12	0.626	37	268	1.1	16	1.1	56	307	0.799
826.5	0.983	12	0.551	30	295	1.1	14	1.0	46	338	0.793
827.2	1.1	10	0.550	27	251	1.1	16	1.0	41	287	0.799
827.9	1.7	12	0.575	32	278	1.3	25	1.0	49	318	0.965
828.6	1.1	10	0.450	29	278	0.691	16	0.821	44	318	0.504
829.3	0.801	13	0.483	32	317	0.998	12	0.881	48	362	0.728
830.0	1.1	9.2	0.327	29	264	0.854	15	0.596	44	302	0.623
830.7	1.5	11	0.529	29	303	0.368	22	0.964	44	347	0.269
831.4	1.4	10	0.342	26	265	0.525	20	0.623	40	303	0.383
832.1	1.6	11	0.340	31	297	1.8	23	0.619	47	340	1.3
832.8	0.685	11	0.356	26	286	1.1	9.9	0.649	40	326	0.767
833.5	1.1	9.8	0.419	26	307	0.690	16	0.765	40	350	0.503
834.2	1.2	9.5	0.571	28	285	0.672	18	1.0	42	326	0.491
834.8	0.842	9.9	0.491	25	298	1.4	12	0.895	39	341	0.999
835.5	1.0	11	0.455	28	299	1.0	15	0.829	44	342	0.739
836.2	1.6	11	0.515	25	277	0.498	23	0.939	38	317	0.363
836.9	1.5	11	0.311	29	276	0.915	21	0.567	44	315	0.668
837.6	1.2	12	0.510	27	312	0.781	18	0.929	42	357	0.570
838.3	2.0	10	0.406	29	327	0.902	29	0.741	45	374	0.658
839.0	1.8	12	0.438	31	259	1.4	26	0.799	48	296	0.997
839.7	1.7	13	0.419	32	319	1.5	24	0.764	50	365	1.1
840.4	1.2	9.4	0.452	30	273	1.3	18	0.824	46	313	0.920
841.1	1.2	12	0.379	35	298	1.3	17	0.692	54	340	0.957
841.8	1.5	14	0.463	35	310	1.0	22	0.844	53	354	0.752
842.5	0.985	15	0.635	36	295	0.972	14	1.2	55	337	0.710
843.2	0.990	12	0.553	40	269	0.869	14	1.0	61	308	0.634
843.9	1.9	12	0.427	37	296	0.984	27	0.779	57	339	0.718
844.6	1.4	13	0.527	38	260	1.3	21	0.962	58	298	0.957
845.3	2.0	15	0.751	47	292	1.1	28	1.4	72	334	0.770
846.0	1.6	12	0.588	39	259	1.4	22	1.1	59	296	0.986
846.7	1.7	15	0.596	37	272	1.2	24	1.1	56	311	0.904



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Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
847.4	1.5	13	0.549	43	308	1.4	21	1.0	66	352	1.0
848.1	1.4	13	0.578	43	253	1.2	20	1.1	66	289	0.901
848.8	1.2	16	0.540	46	285	1.1	17	0.984	71	326	0.805
849.5	1.7	13	0.297	46	301	0.652	24	0.543	70	344	0.476
850.2	1.6	15	0.731	46	267	1.4	23	1.3	70	305	1.0
850.9	1.5	13	0.384	50	278	1.1	22	0.701	76	317	0.796
851.6	1.6	13	0.810	50	268	1.1	24	1.5	77	306	0.789
852.3	1.8	15	0.736	53	255	1.2	26	1.3	81	292	0.884
853.0	1.0	14	0.801	61	294	1.1	15	1.5	93	336	0.788
853.7	2.1	14	0.634	50	284	0.905	30	1.2	77	325	0.660
854.4	1.3	14	0.698	44	259	1.2	19	1.3	67	297	0.899
855.1	1.8	15	0.542	59	280	1.2	26	0.989	91	320	0.862
855.8	2.1	15	0.766	61	323	0.914	31	1.4	94	370	0.667
856.5	1.3	14	0.583	65	282	0.937	19	1.1	100	322	0.684
857.2	2.0	16	0.789	55	297	0.626	29	1.4	85	340	0.457
857.9	1.6	14	0.744	59	278	1.1	23	1.4	91	318	0.815
858.6	2.0	14	0.686	58	281	0.771	29	1.3	88	322	0.562
859.3	1.6	15	0.719	73	317	1.2	23	1.3	112	362	0.871
860.0	1.6	15	0.717	61	292	1.4	23	1.3	93	334	1.1
860.6	1.3	13	0.804	55	259	1.0	18	1.5	84	296	0.742
861.3	1.4	16	0.788	63	285	1.2	20	1.4	97	326	0.864
862.0	1.9	18	0.908	81	330	0.862	27	1.7	124	378	0.629
862.7	1.3	16	0.611	58	262	1.3	19	1.1	88	300	0.915
863.4	1.7	15	1.1	73	308	1.7	24	1.9	112	353	1.2
864.1	0.923	16	0.894	66	325	2.4	13	1.6	101	372	1.8
864.8	1.6	17	0.991	70	335	1.9	23	1.8	107	383	1.4
865.5	1.6	14	1.0	79	362	2.1	23	1.8	122	414	1.6
866.2	1.2	17	0.980	70	302	1.4	18	1.8	108	346	1.0
866.9	1.0	16	0.952	76	336	2.0	15	1.7	117	384	1.4
867.6	1.6	16	1.1	72	298	2.3	24	2.1	110	340	1.7
868.3	1.4	18	1.0	68	321	1.8	20	1.8	105	367	1.3
869.0	1.3	17	1.3	73	321	2.2	19	2.3	111	367	1.6
869.7	1.8	17	1.3	77	332	1.7	27	2.4	117	380	1.2
870.4	1.7	17	1.1	84	331	1.9	24	2.0	129	378	1.4
871.1	1.6	16	1.1	71	331	1.8	23	2.0	109	379	1.3
871.8	1.6	18	1.3	75	337	2.0	23	2.3	116	385	1.4
872.5	1.8	17	1.6	73	302	1.9	26	2.9	112	345	1.4
873.2	1.5	16	1.3	71	296	1.9	22	2.4	110	338	1.4
873.9	1.2	16	1.6	77	314	2.4	17	2.9	118	359	1.7
874.6	1.5	17	1.5	73	323	2.0	21	2.8	112	370	1.5
875.3	1.2	15	1.8	78	288	2.6	17	3.2	119	329	1.9
876.0	1.6	16	1.8	86	310	1.6	24	3.2	132	355	1.2
876.7	0.930	16	1.7	74	292	2.1	13	3.1	113	334	1.5
877.4	1.0	15	1.3	77	323	1.7	14	2.4	118	369	1.3
878.1	1.0	19	1.8	83	284	2.3	15	3.3	127	324	1.7
878.8	1.4	17	1.8	78	290	1.7	21	3.2	119	331	1.2
879.5	1.2	16	2.2	99	333	1.7	18	4.0	151	381	1.2
880.2	0.950	16	2.1	83	286	1.8	14	3.8	127	328	1.3
880.9	1.4	16	1.9	82	279	1.6	21	3.6	125	319	1.2
881.6	1.1	18	2.1	85	301	2.1	16	3.8	130	344	1.5
882.3	0.598	16	2.0	78	268	2.4	8.6	3.7	120	307	1.7
883.0	1.2	18	1.9	85	290	1.9	17	3.5	131	332	1.4
883.7	2.1	15	2.1	77	286	1.5	31	3.8	118	327	1.1
884.4	1.4	17	1.9	80	334	1.7	20	3.4	123	382	1.2
885.1	0.933	16	1.8	82	302	2.0	13	3.3	125	345	1.5
885.8	1.3	16	2.1	87	320	2.0	19	3.9	133	366	1.5
886.5	1.6	15	1.9	76	261	2.8	23	3.5	116	299	2.0
887.1	1.0	16	2.5	83	269	1.5	15	4.5	128	308	1.1
887.8	1.4	18	2.1	79	284	2.4	20	3.8	121	324	1.8
888.5	1.2	18	2.4	76	271	1.9	18	4.4	117	309	1.4
889.2	1.1	18	2.4	81	259	2.4	16	4.3	124	297	1.8
889.9	1.2	17	2.2	83	277	1.2	17	4.0	127	317	0.907
890.6	1.3	16	2.4	76	287	1.9	19	4.4	116	328	1.4
891.3	0.821	18	2.5	73	253	1.5	12	4.6	112	289	1.1
892.0	1.5	17	2.5	89	260	2.3	22	4.6	136	297	1.7
892.7	0.988	17	2.2	78	284	2.0	14	4.0	120	325	1.4
893.4	1.1	16	2.3	85	266	1.8	16	4.2	130	304	1.3
894.1	1.2	17	2.3	86	248	1.9	18	4.2	131	284	1.4
894.8	1.2	16	2.0	77	241	1.4	17	3.7	118	275	1.0
895.5	1.3	17	2.5	80	259	2.1	18	4.5	122	296	1.6
896.2	1.5	16	2.3	85	234	1.8	21	4.1	131	268	1.3
896.9	1.4	18	3.1	81	268	2.2	20	5.6	123	306	1.6
897.6	1.7	20	2.3	77	263	2.1	24	4.3	117	301	1.5
898.3	0.652	16	1.5	71	226	1.5	9.4	2.7	108	258	1.1
899.0	1.4	16	2.2	78	259	2.2	20	4.1	120	296	1.6
899.7	1.0	16	1.8	74	259	1.6	15	3.3	114	297	1.1
900.4	2.0	14	2.2	74	263	1.5	29	4.1	114	300	1.1
901.1	0.917	17	2.0	77	250	1.6	13	3.7	118	285	1.2
901.8	1.4	17	1.5	72	243	2.2	20	2.8	111	278	1.6
902.5	0.821	16	1.8	76	243	1.8	12	3.3	117	278	1.3
903.2	1.3	18	2.4	72	268	2.0	19	4.4	110	306	1.4



Minnow Environmental  
Sample ID: 002

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.097	0.295	0.139	1.5	0.001	0.005					
Length (µm)											
903.9	1.3	16	1.5	81	276	1.7	19	2.7	124	316	1.3
904.6	1.0	17	1.9	69	232	1.6	15	3.4	106	265	1.2
905.3	1.1	17	1.6	74	221	1.7	16	3.0	113	253	1.3
906.0	1.2	17	1.7	74	251	2.1	18	3.2	114	287	1.5
906.7	1.6	16	1.8	69	269	2.1	23	3.3	106	307	1.5
907.4	1.2	16	1.5	70	269	0.914	18	2.7	107	308	0.667
908.1	1.2	15	1.8	60	263	1.4	17	3.3	91	301	1.0
908.8	1.9	16	1.5	79	261	1.8	27	2.7	121	298	1.3
909.5	1.9	14	1.6	64	244	0.875	27	2.9	97	279	0.638
910.2	1.2	15	1.4	67	243	1.1	17	2.6	102	278	0.813
910.9	1.3	15	1.3	58	230	1.4	19	2.5	89	263	0.987
911.6	0.724	13	1.1	66	243	1.5	10	2.1	101	278	1.1
912.3	1.1	17	1.4	68	257	2.2	16	2.5	104	294	1.6
912.9	1.4	14	1.4	62	270	1.6	20	2.6	96	309	1.1
913.6	1.4	14	1.4	63	251	1.2	21	2.6	97	287	0.898
914.3	1.1	15	1.3	56	275	1.6	16	2.4	86	314	1.1
915.0	1.9	15	1.3	62	243	1.6	27	2.3	96	278	1.1
915.7	1.7	17	1.3	61	264	1.6	24	2.3	94	302	1.2
916.4	1.4	11	1.3	57	253	1.1	21	2.4	88	290	0.802
917.1	1.5	15	0.995	53	237	0.997	22	1.8	81	271	0.728
917.8	1.1	13	1.2	58	258	1.2	15	2.2	89	295	0.899
918.5	1.1	14	1.4	61	248	1.5	16	2.5	94	284	1.1
919.2	0.970	14	1.0	50	254	0.858	14	1.9	76	290	0.626
919.9	1.1	14	0.912	47	222	0.959	15	1.7	72	253	0.700
920.6	1.3	15	1.2	55	255	1.4	19	2.2	84	292	1.0
921.3	1.4	15	0.812	54	229	2.0	20	1.5	82	262	1.4
922.0	0.848	13	1.0	54	227	1.8	12	1.9	83	259	1.3
922.7	1.5	14	1.2	49	247	1.8	21	2.2	74	283	1.3
923.4	1.7	13	0.815	51	250	1.8	24	1.5	78	286	1.3
924.1	0.998	13	1.2	50	239	1.5	14	2.1	76	273	1.1
924.8	1.2	16	1.0	51	270	1.7	17	1.9	79	309	1.2
925.5	1.6	14	1.0	56	251	1.3	23	1.9	86	287	0.951
926.2	1.7	14	1.1	47	265	1.3	25	2.0	72	304	0.914
926.9	1.1	16	1.0	40	248	1.8	15	1.8	61	283	1.3
927.6	0.617	13	0.674	43	231	0.874	8.9	1.2	66	264	0.638
928.3	1.5	11	0.952	43	272	1.4	22	1.7	66	311	1.0
929.0	1.0	11	0.602	48	255	1.6	15	1.1	73	292	1.1
929.7	1.6	14	0.693	46	266	1.4	24	1.3	71	304	1.0
930.4	1.7	13	0.837	39	262	1.3	25	1.5	60	300	0.916
931.1	0.985	12	0.807	51	261	1.6	14	1.5	78	299	1.2
931.8	1.5	16	0.973	45	276	1.6	21	1.8	70	315	1.2
932.5	1.4	13	0.694	47	275	0.964	20	1.3	71	315	0.703
933.2	1.7	14	0.644	37	282	0.962	24	1.2	56	322	0.702
933.9	1.5	11	0.572	42	290	1.7	22	1.0	65	332	1.2
934.6	1.7	13	0.808	38	304	1.6	25	1.5	57	347	1.2
935.3	1.4	13	0.488	39	287	1.5	21	0.890	59	328	1.1
936.0	0.992	12	0.550	38	297	1.1	14	1.0	58	340	0.784
936.7	1.2	10	0.588	32	258	1.1	17	1.1	50	295	0.830
937.4	1.7	12	0.565	37	288	0.649	24	1.0	57	329	0.474
938.1	1.3	10	0.590	32	260	1.2	19	1.1	49	297	0.863
938.7	0.933	10	0.358	31	264	1.3	13	0.652	47	302	0.954
939.4	1.4	9.8	0.519	34	247	0.886	20	0.946	52	283	0.647
940.1	1.6	11	0.621	34	337	1.5	23	1.1	52	386	1.1
940.8	1.2	12	0.477	31	289	0.920	17	0.869	47	331	0.671
941.5	1.4	12	0.491	32	304	1.3	20	0.895	50	347	0.979
942.2	1.4	12	0.510	34	238	1.4	20	0.930	52	272	1.0
942.9	1.4	10	0.508	35	287	0.667	21	0.926	54	328	0.487
943.6	1.2	10	0.504	41	307	0.614	18	0.920	64	351	0.448
944.3	1.7	13	0.467	37	305	1.6	24	0.852	56	349	1.2
945.0	1.7	13	0.493	40	290	1.8	25	0.899	61	332	1.3
945.7	1.2	13	0.505	39	278	1.5	17	0.921	59	318	1.1
946.4	1.3	16	0.586	37	274	1.6	18	1.1	57	313	1.2
947.1	1.5	11	0.582	39	274	1.3	22	1.1	60	313	0.975
947.8	1.6	11	0.372	35	308	1.1	22	0.678	54	352	0.770
948.5	1.6	13	0.726	37	270	0.902	23	1.3	57	308	0.658
949.2	1.7	12	0.509	34	263	0.869	24	0.928	53	301	0.634
949.9	1.8	11	0.489	42	288	1.4	26	0.891	65	329	1.0
950.6	1.5	11	0.489	42	289	1.7	21	0.891	64	330	1.2
951.3	1.6	12	0.528	36	256	1.0	23	0.963	56	292	0.753
952.0	0.983	12	0.679	43	293	1.1	14	1.2	66	335	0.809
952.7	1.5	14	0.710	40	283	1.1	22	1.3	61	323	0.827
953.4	1.1	11	0.598	42	271	1.4	15	1.1	64	310	1.0
954.1	1.4	13	0.505	47	283	0.945	20	0.922	72	324	0.690
954.8	1.8	14	0.647	50	327	0.534	26	1.2	77	374	0.389
955.5	1.5	11	0.763	50	307	1.2	22	1.4	77	351	0.869
956.2	1.5	12	0.550	45	269	0.888	22	1.0	69	308	0.648
956.9	1.6	11	0.581	46	278	1.4	23	1.1	71	317	1.0
957.6	1.1	13	0.565	51	272	1.3	16	1.0	77	311	0.974
958.3	1.5	14	0.664	45	254	0.677	22	1.2	68	291	0.494
959.0	0.978	14	0.525	50	273	0.828	14	0.957	77	312	0.604
959.7	1.7	12	0.682	47	278	0.640	25	1.2	72	318	0.467



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.4	1.3	12	0.774	50	275	1.3	19	1.4	76	314	0.934
961.1	1.3	15	1.0	57	290	1.1	18	1.8	88	332	0.832
961.8	1.1	15	0.814	55	284	1.1	16	1.5	85	324	0.823
962.5	1.8	14	0.733	54	281	1.2	26	1.3	83	322	0.854
963.2	1.9	11	0.667	46	261	0.866	27	1.2	70	299	0.632
963.9	1.5	15	0.800	49	307	0.936	21	1.5	75	351	0.683
964.6	1.4	13	0.845	53	253	0.775	21	1.5	80	290	0.565
965.2	1.5	15	0.856	53	289	0.592	22	1.6	81	330	0.432
965.9	1.4	16	0.963	65	304	2.0	20	1.8	100	348	1.4
966.6	1.8	16	0.741	63	304	1.1	25	1.4	96	348	0.828
967.3	1.9	14	0.759	52	239	0.932	28	1.4	79	274	0.680
968.0	0.788	15	0.714	64	270	0.997	11	1.3	98	309	0.728
968.7	1.6	15	0.669	65	276	0.805	24	1.2	100	315	0.587
969.4	2.4	14	0.748	65	288	1.2	35	1.4	100	330	0.887
970.1	2.2	16	0.817	61	272	0.937	32	1.5	93	311	0.683
970.8	1.8	15	1.0	65	312	0.815	27	1.8	100	357	0.595
971.5	1.3	16	0.704	64	269	1.2	19	1.3	98	308	0.892
972.2	1.6	15	0.964	69	299	1.4	22	1.8	106	342	1.1
972.9	1.6	16	1.1	61	277	1.3	23	2.1	93	316	0.922
973.6	1.8	19	0.802	68	304	0.676	26	1.5	104	348	0.493
974.3	1.8	17	0.785	76	291	0.920	26	1.4	117	333	0.672
975.0	1.4	17	0.971	72	287	0.706	20	1.8	110	329	0.515
975.7	1.5	17	1.2	72	313	0.961	21	2.3	110	358	0.701
976.4	1.6	17	0.981	66	301	1.5	24	1.8	101	344	1.1
977.1	1.2	16	1.6	69	295	1.1	18	2.9	106	337	0.828
977.8	1.7	21	1.0	75	333	0.926	25	1.9	114	381	0.676
978.5	2.2	18	0.903	70	291	1.3	32	1.6	107	332	0.956
979.2	1.7	17	0.999	66	307	1.0	25	1.8	101	351	0.748
979.9	1.4	17	1.3	80	323	1.4	20	2.3	123	370	1.0
980.6	1.6	18	1.3	72	295	0.906	22	2.4	110	337	0.661
981.3	1.4	16	1.2	73	312	1.5	20	2.2	112	357	1.1
982.0	1.4	17	1.4	75	297	1.5	20	2.6	115	339	1.1
982.7	1.4	18	1.0	74	305	0.645	21	1.9	114	348	0.471
983.4	1.6	19	1.3	90	357	1.6	24	2.3	138	408	1.2
984.1	1.7	16	1.1	85	333	1.2	24	2.0	130	381	0.847
984.8	1.6	15	1.4	74	323	1.3	24	2.5	114	369	0.984
985.5	1.3	17	1.2	75	301	1.8	19	2.2	116	345	1.3
986.2	1.7	17	1.2	83	323	1.6	24	2.2	127	369	1.2
986.9	1.1	17	1.1	65	282	1.3	16	2.1	99	322	0.971
987.6	1.4	17	1.3	78	330	2.1	20	2.4	119	377	1.5
988.3	1.6	17	1.4	77	306	1.1	22	2.5	119	350	0.818
989.0	1.9	18	1.2	85	354	1.5	27	2.2	130	405	1.1
989.7	1.1	15	1.1	80	318	1.6	16	1.9	123	363	1.1
990.4	1.7	19	1.4	79	333	2.1	25	2.6	121	381	1.5
991.0	2.1	21	1.6	91	382	1.0	31	2.9	139	437	0.761
991.7	1.2	20	1.5	81	343	2.1	18	2.8	124	392	1.5
992.4	1.4	15	1.3	83	341	1.7	20	2.4	127	390	1.2
993.1	1.6	17	1.2	82	322	1.7	23	2.2	125	368	1.2
993.8	1.1	16	1.6	76	333	1.8	16	2.8	117	381	1.3
994.5	1.8	19	1.6	96	332	1.6	26	3.0	147	380	1.2
995.2	1.4	20	1.7	90	345	1.7	20	3.1	137	395	1.2
995.9	1.3	18	1.6	86	404	1.4	19	2.9	132	462	1.0
996.6	1.2	18	1.6	83	353	2.5	17	2.9	127	403	1.8
997.3	1.2	18	1.8	91	338	1.4	18	3.2	139	386	1.0
998.0	1.1	18	1.6	83	360	1.7	15	2.9	127	412	1.3
998.7	1.8	17	1.6	86	341	1.7	26	2.9	131	390	1.2
999.4	1.7	19	1.6	93	372	1.9	24	3.0	142	425	1.4
1000.1	1.4	16	1.6	81	334	1.9	20	2.9	125	382	1.4
1000.8	1.4	18	1.6	78	308	2.1	20	2.9	119	352	1.5
1001.5	1.4	18	1.6	95	375	2.0	20	2.9	145	429	1.5
1002.2	1.6	19	1.6	81	343	1.9	23	2.9	124	393	1.4
1002.9	1.5	18	1.8	91	337	1.9	21	3.2	139	385	1.4
1003.6	1.5	19	1.6	90	434	2.3	21	2.9	137	497	1.7
1004.3	2.2	18	1.4	90	332	1.6	31	2.6	138	379	1.1
1005.0	2.0	19	1.9	99	349	2.4	29	3.4	151	399	1.7
1005.7	1.9	20	1.4	93	303	2.1	28	2.5	142	347	1.6
1006.4	1.4	16	1.9	93	358	1.8	20	3.5	143	409	1.3
1007.1	1.6	17	1.5	107	357	1.9	23	2.8	164	408	1.4
1007.8	1.7	16	1.6	87	313	1.8	24	2.9	134	357	1.3
1008.5	1.4	18	1.9	100	335	1.4	20	3.4	153	384	1.0
1009.2	1.5	18	1.8	87	334	1.2	21	3.2	134	382	0.843
1009.9	1.8	16	1.9	91	350	1.6	26	3.5	139	400	1.2
1010.6	2.0	20	2.1	92	333	1.3	29	3.9	142	381	0.973
1011.3	1.6	18	2.1	93	351	2.2	23	3.9	143	402	1.6
1012.0	1.7	19	2.0	103	378	2.2	25	3.6	158	432	1.6
1012.7	1.4	20	2.0	103	359	2.3	20	3.6	158	411	1.7
1013.4	1.4	18	1.9	99	345	1.7	20	3.4	151	395	1.3
1014.1	1.6	19	1.8	95	393	2.5	24	3.4	146	450	1.8
1014.8	1.4	17	2.3	104	341	2.1	20	4.2	160	390	1.5
1015.5	1.7	20	1.8	97	319	2.1	24	3.3	149	365	1.5
1016.2	1.5	20	1.8	95	367	1.8	21	3.3	145	419	1.3



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1016.9	1.6	18	1.9	91	324	0.840	23	3.4	140	370	0.613
1017.5	2.2	19	2.0	107	359	1.4	32	3.7	164	410	1.1
1018.2	2.3	18	2.0	97	319	2.3	33	3.6	149	365	1.7
1018.9	1.7	20	2.0	105	315	1.8	24	3.7	160	360	1.3
1019.6	1.5	19	1.8	98	330	2.0	21	3.3	150	377	1.5
1020.3	1.1	17	2.1	89	280	1.8	16	3.7	137	320	1.3
1021.0	1.7	21	2.4	105	322	1.9	25	4.4	160	368	1.4
1021.7	1.8	19	1.9	105	284	1.8	27	3.5	161	324	1.3
1022.4	1.2	18	1.6	95	292	1.4	17	3.0	145	334	1.0
1023.1	1.5	18	2.0	101	319	1.8	21	3.7	154	365	1.3
1023.8	2.0	18	1.8	95	323	1.8	29	3.4	145	369	1.3
1024.5	1.8	21	1.8	102	317	2.2	26	3.3	156	362	1.6
1025.2	1.6	21	2.4	104	295	2.6	23	4.3	160	337	1.9
1025.9	1.4	21	1.8	102	297	2.8	21	3.3	157	339	2.0
1026.6	1.5	19	2.4	103	280	1.0	22	4.4	158	320	0.760
1027.3	2.0	17	1.8	95	280	0.953	29	3.2	146	320	0.695
1028.0	1.8	18	1.6	102	317	2.0	27	3.0	157	363	1.5
1028.7	1.6	20	2.1	107	301	1.7	23	3.8	164	344	1.2
1029.4	1.7	17	2.0	96	295	2.0	25	3.6	147	337	1.5
1030.1	1.5	19	2.0	110	298	1.3	21	3.6	168	340	0.968
1030.8	1.7	20	2.1	97	321	1.9	25	3.9	149	367	1.4
1031.5	2.0	19	2.5	112	279	1.7	29	4.5	172	319	1.3
1032.2	1.6	21	2.5	108	269	1.4	23	4.6	165	307	1.0
1032.9	1.8	19	1.9	101	273	1.4	26	3.6	154	312	1.0
1033.6	2.0	16	2.1	97	268	1.3	28	3.7	149	306	0.950
1034.3	1.5	16	2.5	109	315	2.0	21	4.6	167	360	1.5
1035.0	1.2	18	2.0	111	248	2.5	17	3.6	171	284	1.9
1035.7	1.4	21	2.3	114	282	1.5	20	4.1	174	322	1.1
1036.4	1.6	19	2.1	106	264	1.8	22	3.8	162	302	1.3
1037.1	1.2	15	2.0	93	262	1.2	17	3.7	142	299	0.897
1037.8	2.3	18	1.8	109	290	1.7	33	3.3	167	332	1.2
1038.5	1.5	18	2.3	101	273	1.9	21	4.1	154	313	1.4
1039.2	1.3	18	2.2	100	261	1.9	18	4.0	154	298	1.4
1039.9	1.4	19	2.2	103	306	1.6	20	4.1	157	350	1.2
1040.6	2.1	20	1.7	103	263	1.6	30	3.2	159	300	1.2
1041.3	2.1	22	2.2	99	272	2.0	31	4.0	152	311	1.5
1042.0	1.9	19	2.0	114	248	2.1	27	3.6	174	284	1.5
1042.7	1.4	19	2.4	100	238	1.2	21	4.3	153	272	0.862
1043.3	1.9	15	2.1	93	227	1.5	27	3.8	142	259	1.1
1044.0	2.7	20	2.2	110	251	1.5	39	4.0	169	287	1.1
1044.7	1.8	20	2.5	104	272	2.3	26	4.5	159	311	1.7
1045.4	2.2	20	2.1	103	246	2.2	32	3.9	159	281	1.6
1046.1	1.4	21	2.5	100	253	1.3	21	4.6	153	289	0.922
1046.8	1.1	21	2.0	93	225	2.0	16	3.7	142	257	1.5
1047.5	1.9	20	2.4	117	253	1.4	28	4.3	179	290	1.0
1048.2	1.8	22	2.5	104	251	2.3	27	4.6	160	287	1.7
1048.9	1.7	19	1.9	101	253	1.4	25	3.4	155	289	1.1
1049.6	1.6	18	2.3	94	230	1.6	24	4.2	144	263	1.2
1050.3	1.3	21	2.0	91	220	1.2	19	3.6	139	251	0.892
1051.0	1.6	19	1.9	94	230	0.812	24	3.5	145	264	0.592
1051.7	1.6	20	2.1	104	247	0.820	24	3.9	160	283	0.598
1052.4	2.4	20	2.1	85	237	1.3	34	3.9	130	271	0.945
1053.1	1.3	18	2.2	97	245	2.0	18	4.0	149	280	1.4
1053.8	1.8	18	2.0	88	235	1.2	26	3.6	135	269	0.905
1054.5	2.3	21	2.3	109	270	2.2	34	4.1	167	308	1.6
1055.2	2.0	19	2.1	102	244	1.4	29	3.8	157	280	0.985
1055.9	1.7	18	2.0	98	233	1.6	25	3.6	150	266	1.1
1056.6	2.0	18	2.1	89	232	1.5	28	3.8	136	265	1.1
1057.3	2.2	20	2.0	90	219	1.6	32	3.6	138	251	1.2
1058.0	1.5	20	2.0	103	244	2.0	21	3.7	158	280	1.5
1058.7	2.1	16	2.3	102	230	1.3	31	4.3	156	263	0.927
1059.4	1.5	19	2.2	98	226	1.2	22	4.0	150	259	0.909
1060.1	2.5	20	2.6	95	241	1.5	37	4.7	145	276	1.1
1060.8	2.4	20	2.3	102	252	1.1	35	4.3	157	289	0.819
1061.5	1.3	22	2.1	102	219	1.2	19	3.8	156	251	0.882
1062.2	1.7	21	2.8	100	261	1.3	25	5.1	153	299	0.983
1062.9	1.4	18	1.8	92	271	1.6	21	3.2	142	310	1.2
1063.6	1.9	19	2.4	85	225	1.7	28	4.4	131	258	1.2
1064.3	2.0	22	2.7	106	262	1.1	29	4.8	163	300	0.834
1065.0	1.9	19	2.5	94	244	1.4	27	4.5	144	279	0.989
1065.7	1.7	20	2.5	90	264	1.2	25	4.5	138	302	0.845
1066.4	2.0	19	2.2	90	256	2.7	29	4.0	137	293	1.9
1067.1	1.7	24	2.6	92	267	2.1	24	4.7	141	306	1.5
1067.8	1.4	18	1.7	79	256	1.3	21	3.1	121	293	0.933
1068.5	2.2	20	2.4	91	259	1.3	32	4.4	140	296	0.958
1069.2	2.0	18	2.2	83	253	1.5	29	4.0	127	289	1.1
1069.8	2.0	21	2.5	93	273	1.8	29	4.6	142	312	1.3
1070.5	3.0	22	2.4	91	256	1.8	43	4.4	140	292	1.3
1071.2	1.9	22	2.2	96	253	1.9	28	4.0	147	289	1.4
1071.9	1.9	20	1.9	90	266	35	27	3.4	139	304	26
1072.6	1.9	18	2.1	84	248	2.0	27	3.8	129	284	1.5



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.3	1.7	19	2.5	78	266	1.5	24	4.5	120	304	1.1
1074.0	1.8	19	2.6	98	302	1.7	25	4.7	151	345	1.3
1074.7	1.8	18	2.5	87	243	1.4	26	4.6	134	278	1.0
1075.4	2.3	20	2.3	90	286	2.2	33	4.2	137	328	1.6
1076.1	1.9	22	2.7	92	294	2.0	28	5.0	141	337	1.5
1076.8	1.9	20	2.4	91	320	2.1	27	4.3	140	366	1.5
1077.5	1.6	19	2.4	91	279	2.4	24	4.4	139	319	1.8
1078.2	2.1	18	2.0	89	275	3.5	31	3.7	136	315	2.6
1078.9	1.9	19	2.5	85	272	1.8	28	4.5	130	311	1.3
1079.6	1.3	18	2.1	86	281	2.6	19	3.9	132	322	1.9
1080.3	1.5	18	2.6	87	275	3.0	21	4.8	134	314	2.2
1081.0	1.2	17	2.0	81	244	1.5	18	3.7	124	279	1.1
1081.7	1.9	20	1.9	91	288	1.8	27	3.4	139	329	1.3
1082.4	1.4	19	2.0	90	278	2.1	21	3.7	138	317	1.5
1083.1	2.2	18	2.3	91	288	2.1	32	4.2	140	330	1.5
1083.8	2.0	17	2.1	98	312	2.3	29	3.9	150	356	1.7
1084.5	1.3	19	1.9	79	296	2.1	19	3.5	121	338	1.5
1085.2	1.4	17	1.7	77	278	2.0	20	3.2	118	318	1.4
1085.9	1.4	18	1.9	76	269	2.5	20	3.5	117	308	1.9
1086.6	1.3	16	2.0	76	239	2.0	18	3.6	116	273	1.5
1087.3	1.3	17	2.2	79	274	2.0	19	4.0	121	314	1.5
1088.0	1.3	17	2.0	79	282	2.0	19	3.7	122	323	1.5
1088.7	1.5	16	1.7	73	261	2.2	22	3.1	112	298	1.6
1089.4	1.9	16	1.9	75	308	2.3	27	3.5	115	352	1.7
1090.1	2.1	16	1.7	73	273	1.7	30	3.1	112	312	1.2
1090.8	1.9	19	1.4	81	299	1.8	27	2.6	124	342	1.3
1091.5	1.6	16	1.5	65	248	1.7	24	2.8	99	283	1.2
1092.2	1.5	15	1.6	74	271	1.4	22	2.8	114	310	1.0
1092.9	1.9	17	1.6	71	281	1.6	27	3.0	109	321	1.2
1093.6	1.6	19	1.5	69	301	1.9	23	2.7	105	344	1.4
1094.3	2.9	18	1.6	75	307	2.0	42	2.9	116	351	1.4
1095.0	1.1	14	1.2	65	254	1.2	16	2.2	100	291	0.908
1095.7	2.6	17	1.5	64	282	2.4	38	2.7	97	322	1.8
1096.3	1.1	19	1.5	68	302	3.1	15	2.8	104	345	2.2
1097.0	1.8	18	1.3	67	295	1.4	26	2.4	102	338	1.0
1097.7	1.7	18	0.957	60	271	1.7	24	1.7	92	310	1.3
1098.4	2.1	19	1.1	61	313	2.4	30	2.1	94	357	1.8
1099.1	1.6	16	1.6	57	285	1.2	23	2.9	88	326	0.846
1099.8	2.7	17	0.987	58	288	1.5	39	1.8	89	330	1.1
1100.5	2.2	18	1.2	66	317	2.2	32	2.1	102	362	1.6
1101.2	2.1	19	1.2	57	279	1.4	30	2.1	87	319	1.0
1101.9	1.4	18	0.897	54	282	2.3	20	1.6	82	323	1.7
1102.6	2.1	16	0.908	52	297	2.3	31	1.7	79	340	1.7
1103.3	2.0	18	1.0	50	303	2.8	29	1.9	76	346	2.0
1104.0	1.9	18	1.1	52	288	2.3	27	1.9	79	329	1.7
1104.7	2.4	18	1.1	53	309	1.7	35	1.9	81	353	1.2
1105.4	2.2	19	1.2	47	287	2.6	32	2.1	72	328	1.9
1106.1	2.1	18	1.1	52	299	2.5	30	2.1	79	342	1.8
1106.8	2.1	17	1.4	48	284	1.9	30	2.5	74	325	1.4
1107.5	2.0	19	1.2	39	241	2.1	29	2.2	60	276	1.5
1108.2	2.2	21	1.2	49	330	2.6	32	2.2	75	377	1.9
1108.9	2.1	18	1.2	45	321	2.3	30	2.2	70	367	1.6
1109.6	2.6	19	0.993	36	278	2.3	37	1.8	55	318	1.7
1110.3	2.5	20	1.2	42	316	2.1	36	2.1	65	361	1.5
1111.0	2.9	20	1.2	36	307	2.2	42	2.2	56	351	1.6
1111.7	3.3	19	1.5	40	291	2.2	47	2.7	61	333	1.6
1112.4	3.2	23	1.3	38	352	3.1	47	2.4	58	402	2.2
1113.1	2.3	20	1.5	37	301	2.8	33	2.7	57	344	2.0
1113.8	2.3	21	1.6	39	311	3.1	33	2.9	60	356	2.3
1114.5	2.3	22	1.2	32	288	2.4	33	2.1	48	329	1.7
1115.2	1.8	20	1.2	27	267	1.9	27	2.3	42	305	1.3
1115.9	2.4	22	1.3	34	315	2.8	34	2.5	52	360	2.1
1116.6	2.6	23	1.2	36	331	1.6	38	2.2	56	378	1.2
1117.3	2.0	20	1.1	31	368	2.2	29	2.1	48	421	1.6
1118.0	2.9	20	1.2	31	334	2.1	42	2.2	47	382	1.5
1118.7	2.4	20	1.6	32	347	2.0	35	2.9	48	396	1.5
1119.4	2.2	23	1.3	26	328	1.3	32	2.4	40	375	0.968
1120.1	2.6	25	1.5	32	408	2.1	38	2.7	49	466	1.5
1120.8	3.0	24	1.3	28	336	1.5	44	2.3	42	384	1.1
1121.5	2.3	22	1.2	27	339	2.8	34	2.1	41	388	2.0
1122.2	2.4	23	1.4	29	318	1.7	35	2.5	45	363	1.3
1122.8	2.5	22	1.6	26	353	1.7	37	3.0	40	404	1.2
1123.5	2.3	31	1.3	29	378	1.5	33	2.4	44	432	1.1
1124.2	2.8	20	1.8	27	379	1.4	41	3.2	42	434	1.0
1124.9	2.0	25	1.5	30	409	1.5	29	2.7	46	468	1.1
1125.6	2.4	25	1.5	26	339	1.3	34	2.7	41	388	0.951
1126.3	2.4	24	1.5	29	361	1.4	34	2.8	45	413	0.990
1127.0	2.5	25	1.4	28	382	1.7	35	2.6	43	436	1.2
1127.7	2.6	29	1.6	26	405	1.6	37	3.0	40	463	1.2
1128.4	2.7	25	1.5	26	350	2.0	39	2.8	40	400	1.5
1129.1	2.1	21	1.5	27	362	2.0	31	2.7	41	414	1.4



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1129.8	2.5	24	1.5	27	394	1.4	36	2.8	41	450	1.0
1130.5	2.9	28	1.7	29	419	1.5	42	3.1	44	479	1.1
1131.2	2.4	28	1.8	30	349	1.5	35	3.2	45	400	1.1
1131.9	1.9	27	1.4	27	380	1.7	27	2.5	42	435	1.3
1132.6	2.3	27	1.7	30	359	1.4	34	3.2	46	411	1.0
1133.3	1.9	24	1.4	27	371	1.0	28	2.5	42	425	0.759
1134.0	2.6	28	2.1	26	396	1.3	37	3.9	40	452	0.972
1134.7	1.7	30	1.9	29	357	1.6	24	3.4	44	408	1.2
1135.4	2.3	28	2.0	30	415	1.6	33	3.7	46	475	1.2
1136.1	2.2	29	2.0	29	420	1.1	32	3.6	44	481	0.790
1136.8	2.5	32	2.0	25	434	1.5	36	3.6	39	496	1.1
1137.5	2.1	34	2.1	31	405	1.5	30	3.9	47	464	1.1
1138.2	2.1	31	1.9	28	397	1.5	30	3.4	43	454	1.1
1138.9	2.1	38	2.2	27	400	1.4	30	3.9	41	457	1.0
1139.6	2.4	37	1.9	27	421	1.6	34	3.5	42	481	1.2
1140.3	2.3	39	2.7	30	419	2.4	34	5.0	46	480	1.7
1141.0	2.4	39	2.8	33	416	2.2	34	5.1	50	476	1.6
1141.7	2.2	44	2.4	29	454	1.9	31	4.4	44	519	1.4
1142.4	2.2	40	2.2	24	445	1.6	32	4.0	36	509	1.1
1143.1	1.9	31	2.2	27	399	1.1	28	4.0	41	457	0.802
1143.8	2.3	46	3.2	25	354	1.3	33	5.8	38	405	0.932
1144.5	1.7	42	4.3	27	356	1.1	24	7.8	41	407	0.807
1145.2	2.0	50	3.3	31	374	1.7	29	6.0	47	428	1.2
1145.9	2.6	42	3.7	28	380	1.1	37	6.8	42	435	0.836
1146.6	2.2	47	5.3	37	439	1.8	32	9.6	57	502	1.3
1147.3	2.2	63	5.8	31	528	1.8	32	11	47	603	1.3
1148.0	2.4	54	20	29	398	1.7	34	36	44	455	1.3
1148.6	2.7	62	11	39	564	1.4	39	20	60	645	1.0
1149.3	2.3	55	6.9	26	415	1.2	33	13	40	474	0.871
1150.0	2.1	69	15	46	398	1.6	31	27	70	455	1.1
1150.7	1.8	69	14	27	410	1.3	27	26	41	469	0.974
1151.4	2.1	72	12	28	388	1.3	30	23	43	444	0.934
1152.1	2.3	71	12	33	391	1.4	33	22	50	447	1.1
1152.8	2.1	70	10	26	333	1.2	30	19	40	381	0.900
1153.5	1.7	65	9.5	27	381	1.4	24	17	41	435	1.0
1154.2	1.7	61	8.2	25	387	1.2	24	15	38	443	0.899
1154.9	2.2	71	7.7	30	398	1.2	32	14	47	455	0.871
1155.6	1.9	66	6.7	28	324	0.849	28	12	43	370	0.620
1156.3	1.8	64	8.1	30	361	1.3	26	15	46	413	0.915
1157.0	2.1	71	8.3	32	432	1.5	30	15	49	494	1.1
1157.7	1.8	65	8.3	36	357	1.3	26	15	56	408	0.928
1158.4	2.3	59	9.0	31	377	0.628	33	16	48	431	0.458
1159.1	1.6	61	6.5	28	324	1.4	23	12	43	371	1.0
1159.8	1.9	50	5.5	25	354	1.2	28	10	38	405	0.877
1160.5	2.2	55	6.2	24	420	1.1	32	11	37	480	0.778
1161.2	2.0	66	6.8	34	375	1.7	28	12	52	429	1.2
1161.9	1.8	60	6.4	28	389	0.898	27	12	43	445	0.655
1162.6	1.8	58	4.9	27	357	1.0	26	9.0	42	408	0.745
1163.3	1.5	56	5.7	32	450	1.3	21	10	49	515	0.914
1164.0	1.7	60	4.8	26	424	1.4	24	8.7	40	485	0.996
1164.7	2.1	62	5.3	30	371	1.7	31	9.8	46	424	1.3
1165.4	1.9	59	5.8	30	387	1.4	28	10	46	443	1.0
1166.1	1.4	57	4.7	28	355	0.748	20	8.6	44	406	0.546
1166.8	2.0	55	4.8	28	454	2.1	29	8.8	43	519	1.5
1167.5	2.0	62	4.7	26	419	1.9	28	8.5	40	479	1.4
1168.2	2.1	55	4.1	30	379	1.5	30	7.5	47	433	1.1
1168.9	2.8	55	4.0	25	367	1.4	40	7.3	39	419	1.0
1169.6	2.0	58	3.8	34	371	1.2	29	6.8	52	425	0.864
1170.3	1.8	44	2.6	21	312	1.1	26	4.8	32	357	0.783
1171.0	2.0	49	3.5	29	428	2.4	29	6.4	45	490	1.7
1171.7	2.1	62	2.6	30	393	1.9	30	4.7	45	450	1.4
1172.4	2.4	54	3.3	28	348	1.2	35	6.0	42	398	0.853
1173.1	1.2	40	2.4	26	401	1.1	18	4.4	39	458	0.835
1173.8	2.1	45	3.1	30	428	1.9	31	5.7	46	489	1.4
1174.5	2.4	43	2.6	31	439	2.1	35	4.8	47	502	1.5
1175.2	2.3	49	2.3	29	377	1.6	34	4.2	44	432	1.2
1175.8	2.2	49	2.1	26	396	1.2	32	3.8	41	453	0.839
1176.5	2.2	38	2.3	27	365	1.4	32	4.2	41	417	1.0
1177.2	2.4	38	2.6	28	397	2.0	34	4.7	43	454	1.4
1177.9	2.7	36	2.6	26	439	1.4	39	4.8	40	501	1.0
1178.6	3.1	51	2.1	30	422	1.6	44	3.9	46	483	1.2
1179.3	2.4	37	2.1	25	391	1.4	35	3.8	38	447	0.991
1180.0	2.3	33	2.1	27	368	2.0	33	3.8	41	421	1.4
1180.7	2.3	34	2.5	27	376	2.2	34	4.5	42	430	1.6
1181.4	2.5	38	2.5	29	348	1.4	37	4.5	44	398	1.0
1182.1	2.0	34	1.9	27	396	1.7	29	3.4	41	453	1.2
1182.8	2.3	35	1.6	28	386	1.3	34	2.8	42	442	0.976
1183.5	2.2	33	1.7	29	441	1.8	31	3.1	44	504	1.3
1184.2	2.3	33	1.7	28	372	1.5	34	3.2	42	425	1.1
1184.9	3.0	33	1.7	31	382	2.0	43	3.1	47	436	1.5
1185.6	2.2	34	3.2	29	420	2.2	31	5.8	45	481	1.6



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1186.3	2.5	38	1.9	26	409	1.7	37	3.5	39	467	1.2
1187.0	1.8	45	2.1	32	438	1.7	27	3.8	49	501	1.3
1187.7	2.9	37	2.6	30	436	1.6	41	4.7	46	499	1.2
1188.4	2.7	34	2.6	30	364	1.0	38	4.8	47	417	0.766
1189.1	1.7	34	1.8	29	389	1.4	25	3.3	44	444	0.985
1189.8	3.1	36	1.8	36	410	1.7	44	3.2	55	468	1.3
1190.5	1.7	34	2.2	30	417	1.8	25	4.0	46	477	1.3
1191.2	2.5	35	2.1	24	358	2.2	37	3.7	37	409	1.6
1191.9	1.9	38	2.2	32	465	1.9	27	4.0	49	532	1.4
1192.6	2.4	36	1.8	31	378	1.0	34	3.3	48	433	0.745
1193.3	2.2	35	42	31	376	0.956	32	77	48	430	0.697
1194.0	2.5	43	1.6	30	411	1.6	36	2.8	46	470	1.2
1194.7	2.6	37	2.3	26	389	1.3	38	4.1	40	445	0.935
1195.4	1.2	36	2.1	30	408	1.0	18	3.9	46	466	0.744
1196.1	3.3	33	2.0	35	418	1.3	48	3.7	54	478	0.924
1196.8	2.7	32	2.2	30	357	1.4	39	4.0	46	409	1.0
1197.5	2.8	36	1.5	32	419	1.7	40	2.8	49	479	1.3
1198.2	2.6	31	1.7	29	371	1.5	37	3.1	45	424	1.1
1198.9	2.3	33	1.5	31	407	1.5	33	2.7	47	466	1.1
1199.6	2.0	34	1.7	34	473	2.2	29	3.0	52	541	1.6
1200.3	1.6	36	1.3	37	397	1.3	23	2.4	56	454	0.985
1200.9	1.9	31	1.6	31	415	1.9	27	2.9	48	475	1.4
1201.6	2.8	27	1.5	32	389	1.6	41	2.8	50	444	1.2
1202.3	2.6	30	1.5	31	371	1.9	37	2.7	47	424	1.4
1203.0	2.3	31	1.7	32	374	1.7	34	3.2	49	428	1.2
1203.7	2.7	29	1.7	35	367	1.4	39	3.1	54	420	0.990
1204.4	2.2	39	1.5	36	386	1.4	32	2.8	56	441	1.0
1205.1	2.7	31	1.6	32	454	1.6	38	3.0	50	520	1.2
1205.8	2.3	31	1.5	36	398	1.5	33	2.7	55	455	1.1
1206.5	2.4	33	1.8	38	391	2.1	35	3.3	58	447	1.5
1207.2	2.0	28	1.4	31	402	1.8	29	2.6	48	460	1.3
1207.9	1.4	26	1.4	32	394	1.1	20	2.6	49	451	0.833
1208.6	2.7	28	1.6	34	374	1.9	39	2.9	53	428	1.4
1209.3	2.9	28	1.7	34	388	1.8	41	3.0	52	444	1.3
1210.0	2.6	30	1.1	36	357	1.6	38	2.0	55	408	1.2
1210.7	3.2	25	1.2	32	398	2.0	47	2.2	50	455	1.5
1211.4	2.5	27	1.2	32	365	1.9	36	2.2	49	418	1.4
1212.1	2.0	25	1.4	36	359	2.0	28	2.6	55	411	1.4
1212.8	2.5	25	1.3	34	390	2.3	36	2.3	52	446	1.7
1213.5	1.8	27	1.4	36	356	1.1	26	2.5	56	407	0.786
1214.2	2.3	26	1.6	33	367	0.887	34	3.0	50	419	0.647
1214.9	2.2	23	1.1	34	353	2.0	32	2.1	51	404	1.4
1215.6	1.9	27	1.6	28	352	1.5	27	2.9	43	403	1.1
1216.3	2.5	27	1.4	34	350	2.1	36	2.6	53	401	1.5
1217.0	2.6	24	1.3	31	353	2.0	37	2.4	48	403	1.4
1217.7	2.5	25	1.2	32	345	1.3	36	2.2	50	395	0.963
1218.4	2.0	18	1.1	33	336	1.5	29	2.0	50	385	1.1
1219.1	2.3	23	1.1	36	345	1.7	34	2.0	55	394	1.2
1219.8	3.0	21	1.2	35	351	2.0	44	2.1	54	402	1.4
1220.5	2.3	24	1.2	36	320	2.5	33	2.1	55	366	1.8
1221.2	2.9	26	1.1	35	366	2.6	42	2.0	53	418	1.9
1221.9	2.1	25	1.4	33	372	1.4	31	2.6	51	425	1.1
1222.6	2.6	23	1.2	31	352	2.0	38	2.2	47	402	1.4
1223.3	3.0	28	1.1	34	323	1.8	44	2.1	51	370	1.3
1224.0	2.5	22	1.4	32	317	2.1	36	2.5	49	362	1.5
1224.7	3.3	23	1.1	34	370	2.6	48	2.0	52	423	1.9
1225.4	2.5	23	1.2	31	344	1.7	36	2.2	47	393	1.2
1226.1	2.4	24	1.4	40	361	1.7	35	2.5	61	413	1.3
1226.8	2.5	20	1.3	31	362	2.2	36	2.3	48	413	1.6
1227.4	2.2	23	1.3	33	333	2.4	32	2.4	51	381	1.8
1228.1	2.6	20	1.1	36	345	2.3	37	2.0	55	395	1.7
1228.8	2.4	21	1.4	33	319	1.8	35	2.5	51	365	1.3
1229.5	2.4	22	1.3	38	348	2.3	35	2.4	58	398	1.7
1230.2	3.0	23	1.3	34	341	1.7	43	2.3	52	390	1.3
1230.9	3.4	23	1.0	39	314	2.6	49	1.9	60	359	1.9
1231.6	3.1	23	1.1	32	318	2.4	44	2.0	50	364	1.7
1232.3	3.1	26	1.4	36	365	2.3	45	2.6	55	417	1.7
1233.0	2.3	22	1.2	34	312	2.0	33	2.1	53	357	1.4
1233.7	3.0	20	1.1	34	289	2.1	44	2.1	51	330	1.6
1234.4	2.4	21	1.2	37	342	1.4	35	2.2	56	391	1.0
1235.1	2.2	22	1.3	37	323	2.3	31	2.3	57	369	1.7
1235.8	2.9	25	1.5	35	329	2.2	41	2.8	54	376	1.6
1236.5	3.0	24	1.3	41	322	2.9	43	2.3	62	369	2.1
1237.2	2.1	20	1.2	32	349	3.3	31	2.1	50	399	2.4
1237.9	2.8	20	0.936	34	314	2.5	41	1.7	52	359	1.8
1238.6	3.3	20	1.3	39	327	2.0	47	2.4	60	374	1.4
1239.3	3.1	21	1.5	40	362	3.0	45	2.7	61	414	2.2
1240.0	2.8	20	1.2	39	313	2.0	41	2.2	60	358	1.5
1240.7	3.0	18	0.894	34	279	1.8	43	1.6	52	319	1.3
1241.4	3.6	18	1.1	35	316	1.3	51	1.9	53	362	0.943
1242.1	2.7	21	1.2	39	346	2.1	39	2.1	60	396	1.6



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1242.8	2.2	22	0.974	42	319	2.1	32	1.8	64	365	1.5
1243.5	3.2	20	1.1	38	323	2.4	46	2.0	59	369	1.8
1244.2	2.4	22	1.0	39	326	2.4	35	1.9	59	372	1.8
1244.9	3.0	20	0.974	41	350	3.0	44	1.8	62	400	2.2
1245.6	3.4	22	0.783	45	305	2.4	48	1.4	68	349	1.8
1246.3	3.0	20	1.3	38	326	2.2	43	2.4	58	373	1.6
1247.0	2.9	19	0.994	41	300	1.6	42	1.8	62	344	1.2
1247.7	2.0	18	0.958	41	307	2.1	29	1.7	63	351	1.6
1248.4	2.9	18	1.2	41	306	1.8	41	2.1	63	350	1.3
1249.1	2.8	19	1.3	40	320	3.1	40	2.4	62	366	2.2
1249.8	3.3	21	0.936	48	335	2.1	48	1.7	73	383	1.5
1250.5	2.9	20	0.919	44	307	1.9	42	1.7	68	351	1.4
1251.2	2.5	18	0.910	40	349	3.0	36	1.7	61	400	2.2
1251.9	2.9	18	1.1	42	311	2.0	42	2.0	64	355	1.4
1252.6	3.1	16	1.1	51	361	2.1	45	2.0	77	413	1.5
1253.3	3.2	19	0.716	48	319	2.2	46	1.3	74	365	1.6
1254.0	2.8	19	1.0	42	307	2.1	41	1.9	65	351	1.5
1254.6	2.6	18	1.0	39	335	2.3	38	1.9	60	383	1.6
1255.3	2.7	19	1.3	40	286	2.6	39	2.4	61	327	1.9
1256.0	2.3	21	0.984	45	294	2.5	33	1.8	69	337	1.8
1256.7	2.7	16	1.2	42	259	2.8	39	2.2	65	296	2.1
1257.4	2.7	14	0.871	41	304	2.3	39	1.6	63	348	1.7
1258.1	2.7	17	1.0	38	281	2.2	39	1.9	58	321	1.6
1258.8	2.6	18	0.879	43	331	2.9	38	1.6	66	378	2.1
1259.5	2.5	20	0.889	52	341	3.5	37	1.6	80	390	2.6
1260.2	2.5	16	1.1	37	294	2.2	37	2.0	57	336	1.6
1260.9	2.3	16	0.887	38	279	2.5	33	1.6	59	319	1.8
1261.6	3.2	19	1.1	45	303	2.7	46	2.0	68	346	2.0
1262.3	3.3	17	1.4	45	307	2.4	47	2.5	69	351	1.7
1263.0	3.5	18	0.919	47	286	2.7	51	1.7	73	327	2.0
1263.7	2.3	15	0.861	40	302	2.6	33	1.6	61	345	1.9
1264.4	3.0	14	0.843	38	290	2.1	43	1.5	58	332	1.5
1265.1	2.9	18	0.931	39	277	2.3	43	1.7	59	317	1.7
1265.8	3.1	17	1.3	50	315	2.3	44	2.4	76	360	1.7
1266.5	2.4	16	1.1	48	299	2.4	35	2.0	73	342	1.8
1267.2	3.2	14	0.979	43	287	1.6	46	1.8	66	328	1.2
1267.9	3.2	17	1.2	40	311	1.9	46	2.1	61	356	1.4
1268.6	3.0	17	0.798	41	262	2.5	43	1.5	63	299	1.8
1269.3	2.3	18	1.1	48	306	3.4	33	1.9	74	350	2.5
1270.0	2.3	16	0.898	44	293	2.0	34	1.6	68	335	1.4
1270.7	3.0	16	1.0	46	356	2.8	43	1.8	70	407	2.0
1271.4	3.2	17	1.0	47	341	2.5	47	1.9	72	390	1.8
1272.1	3.3	16	1.1	45	307	2.4	48	2.0	69	351	1.7
1272.8	2.7	15	1.0	46	280	2.7	39	1.9	71	320	2.0
1273.5	2.4	16	0.910	42	271	1.9	34	1.7	65	310	1.4
1274.2	2.2	14	0.735	39	264	1.9	31	1.3	59	302	1.4
1274.9	3.2	17	0.839	41	324	2.5	46	1.5	63	370	1.8
1275.6	3.4	16	1.1	49	314	2.2	48	2.0	75	359	1.6
1276.3	2.6	16	0.969	48	324	2.1	37	1.8	73	371	1.5
1277.0	2.0	13	0.865	43	271	1.4	29	1.6	65	310	1.0
1277.7	2.3	14	0.878	42	281	2.4	33	1.6	65	322	1.8
1278.4	2.1	16	0.780	44	291	2.8	30	1.4	67	333	2.0
1279.1	2.8	17	0.829	55	302	2.3	40	1.5	84	345	1.7
1279.8	2.2	14	1.1	46	256	2.2	32	2.0	71	293	1.6
1280.5	2.7	14	0.482	47	333	2.3	39	0.879	72	381	1.7
1281.1	1.7	16	0.960	44	296	1.6	24	1.8	68	338	1.2
1281.8	2.7	15	0.842	47	303	2.1	38	1.5	72	346	1.6
1282.5	2.8	15	0.878	48	266	1.8	40	1.6	73	305	1.3
1283.2	2.1	11	0.807	47	257	2.5	30	1.5	72	294	1.8
1283.9	2.3	12	0.926	45	305	1.6	34	1.7	69	349	1.2
1284.6	2.3	14	0.958	44	293	2.5	33	1.7	68	335	1.8
1285.3	2.9	17	1.1	48	285	2.2	41	1.9	74	326	1.6
1286.0	2.1	17	0.681	50	276	2.1	30	1.2	76	316	1.6
1286.7	2.8	14	0.926	43	290	2.2	41	1.7	65	331	1.6
1287.4	2.3	14	0.722	46	267	1.7	33	1.3	70	305	1.3
1288.1	2.0	14	1.1	57	332	2.8	29	2.0	87	379	2.0
1288.8	2.3	15	0.848	44	256	2.0	34	1.5	68	293	1.5
1289.5	2.0	13	0.724	46	261	1.8	29	1.3	70	298	1.3
1290.2	1.4	15	0.770	51	276	2.2	20	1.4	78	316	1.6
1290.9	2.4	15	0.958	50	294	2.8	35	1.7	76	336	2.1
1291.6	2.0	15	1.1	48	275	1.9	28	2.0	73	314	1.4
1292.3	2.1	14	0.793	42	287	2.1	30	1.4	64	328	1.5
1293.0	1.8	13	0.908	41	299	1.9	25	1.7	63	342	1.4
1293.7	2.3	13	0.744	49	292	2.2	33	1.4	75	334	1.6
1294.4	1.8	15	0.923	44	300	2.6	26	1.7	67	343	1.9
1295.1	2.2	15	0.738	47	281	2.6	32	1.3	72	322	1.9
1295.8	1.3	14	0.925	49	304	2.0	19	1.7	75	348	1.5
1296.5	2.0	14	0.578	49	308	1.4	28	1.1	75	352	1.0
1297.2	2.1	15	0.753	45	309	2.1	30	1.4	69	353	1.5
1297.9	2.3	13	0.761	47	289	2.0	33	1.4	71	331	1.4
1298.6	2.2	13	0.863	44	259	1.7	31	1.6	67	296	1.2



Minnow Environmental Sample ID: 002											
Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1299.3	2.3	13	0.459	50	301	2.1	33	0.837	76	344	1.5
1300.0	2.1	13	0.871	45	305	1.5	31	1.6	68	349	1.1
1300.7	2.2	14	0.950	46	281	1.5	31	1.7	71	321	1.1
1301.4	1.6	16	0.610	46	268	1.7	23	1.1	70	307	1.2
1302.1	2.1	13	0.691	47	300	2.6	30	1.3	73	343	1.9
1302.8	1.8	13	0.875	44	296	1.6	26	1.6	67	339	1.2
1303.5	1.9	14	0.638	48	307	0.977	28	1.2	73	351	0.713
1304.2	1.3	15	0.915	46	294	2.1	19	1.7	71	336	1.5
1304.9	1.9	14	0.820	47	290	1.7	27	1.5	72	332	1.2
1305.6	2.0	13	0.676	47	278	1.9	29	1.2	73	318	1.4
1306.3	1.8	12	0.904	46	306	1.4	26	1.6	71	350	0.991
1307.0	2.2	11	1.0	38	295	2.1	31	1.9	59	338	1.5
1307.6	2.1	13	0.801	50	272	1.9	30	1.5	77	311	1.4
1308.3	1.9	14	0.465	45	264	1.7	28	0.849	69	302	1.2
1309.0	2.4	13	0.694	45	270	1.6	35	1.3	69	309	1.2
1309.7	2.1	12	0.631	47	257	1.4	30	1.2	72	294	0.989
1310.4	2.5	13	0.928	46	278	2.1	36	1.7	70	317	1.5
1311.1	1.7	12	0.688	43	264	0.913	25	1.3	66	302	0.666
1311.8	1.5	13	0.651	44	247	2.4	22	1.2	67	282	1.7
1312.5	1.5	11	0.953	50	273	1.5	21	1.7	76	312	1.1
1313.2	1.1	12	0.798	41	301	2.3	16	1.5	62	344	1.7
1313.9	1.7	12	0.613	48	291	2.4	25	1.1	73	333	1.8
1314.6	1.8	13	0.856	47	303	2.4	26	1.6	72	347	1.8
1315.3	1.3	15	0.787	44	304	1.4	19	1.4	67	347	1.0
1316.0	1.8	10	0.588	48	301	1.7	25	1.1	74	344	1.2
1316.7	2.1	13	0.608	45	288	1.3	31	1.1	69	329	0.941
1317.4	2.0	11	0.607	43	290	1.1	29	1.1	65	332	0.775
1318.1	1.3	14	0.766	50	283	2.3	18	1.4	76	324	1.7
1318.8	1.5	12	0.652	46	260	2.2	22	1.2	71	297	1.6
1319.5	1.6	12	0.593	44	292	1.6	23	1.1	67	334	1.2
1320.2	1.3	13	0.596	46	284	1.5	19	1.1	70	324	1.1
1320.9	2.2	13	0.599	43	261	1.3	31	1.1	66	298	0.930
1321.6	1.8	14	1.1	47	307	1.9	26	2.0	72	351	1.4
1322.3	1.8	12	0.784	54	320	1.6	26	1.4	82	365	1.2
1323.0	1.4	11	0.615	48	285	2.2	20	1.1	73	326	1.6
1323.7	1.4	11	0.883	47	290	1.6	20	1.6	72	331	1.2
1324.4	1.6	11	0.825	48	291	1.7	24	1.5	73	332	1.2
1325.1	1.6	11	1.0	52	288	1.9	23	1.9	80	330	1.4
1325.8	2.0	10	0.706	45	247	1.4	28	1.3	69	282	1.0
1326.5	1.9	11	1.0	47	290	1.8	27	1.8	72	331	1.3
1327.2	1.8	12	0.977	48	284	2.2	27	1.8	73	324	1.6
1327.9	1.3	15	0.951	53	273	1.9	19	1.7	81	312	1.4
1328.6	1.9	12	0.971	57	292	2.2	28	1.8	88	334	1.6
1329.3	1.7	11	0.833	51	274	2.0	25	1.5	78	314	1.4
1330.0	1.6	11	1.1	54	278	1.6	23	2.0	83	318	1.2
1330.7	1.6	12	0.997	62	290	2.4	23	1.8	94	332	1.7
1331.4	1.1	13	1.4	56	264	2.2	15	2.5	86	302	1.6
1332.1	1.5	14	1.4	60	282	2.3	22	2.5	93	323	1.6
1332.8	1.2	11	0.979	57	253	1.7	17	1.8	87	289	1.3
1333.5	1.8	12	1.5	62	272	1.6	26	2.7	95	311	1.1
1334.1	2.7	11	1.4	64	268	2.0	39	2.5	98	306	1.5
1334.8	2.1	13	1.1	69	280	2.7	31	2.0	105	321	2.0
1335.5	1.6	11	1.4	63	280	2.4	23	2.6	96	320	1.7
1336.2	1.9	13	1.5	65	276	1.8	27	2.8	99	316	1.3
1336.9	1.7	12	1.2	64	267	2.4	24	2.2	98	306	1.7
1337.6	2.1	14	1.6	70	291	2.3	31	3.0	107	333	1.7
1338.3	1.5	15	1.5	83	266	2.7	22	2.8	127	304	2.0
1339.0	1.5	13	1.5	69	269	2.0	22	2.7	105	308	1.5
1339.7	1.3	11	1.6	67	246	2.5	18	2.9	103	281	1.8
1340.4	1.9	12	1.3	75	283	2.3	27	2.4	115	324	1.7
1341.1	1.6	14	1.5	89	301	1.6	24	2.6	136	344	1.2
1341.8	2.2	15	1.7	88	308	3.0	32	3.1	135	352	2.2
1342.5	1.7	14	1.7	78	278	2.3	25	3.2	119	318	1.7
1343.2	1.6	13	1.5	76	260	2.8	23	2.7	116	298	2.0
1343.9	1.3	12	1.9	72	273	2.4	19	3.4	111	312	1.7
1344.6	1.7	14	1.9	81	260	2.5	24	3.4	125	298	1.8
1345.3	1.6	15	1.4	76	256	2.1	23	2.5	117	293	1.6
1346.0	2.4	13	2.0	78	286	1.9	34	3.7	119	327	1.4
1346.7	1.5	13	1.7	74	276	2.3	22	3.1	113	316	1.7
1347.4	1.9	16	1.6	80	276	2.3	28	3.0	123	316	1.7
1348.1	1.1	16	1.6	90	272	2.3	16	3.0	139	311	1.7
1348.8	1.6	16	1.8	84	286	2.4	23	3.3	128	327	1.8
1349.5	1.5	14	1.9	80	281	2.6	22	3.4	122	321	1.9
1350.2	1.4	15	1.9	83	320	2.6	20	3.4	127	366	1.9
1350.9	1.9	15	1.9	84	270	2.6	27	3.4	129	309	1.9
1351.6	1.8	16	1.6	95	286	2.8	27	3.0	146	327	2.0
1352.3	1.8	15	1.9	88	302	1.9	26	3.4	134	346	1.4
1353.0	1.3	16	1.7	96	281	2.3	19	3.1	147	321	1.7
1353.7	1.8	13	1.8	81	301	2.4	26	3.3	124	344	1.8
1354.4	1.5	18	2.1	82	258	2.3	22	3.8	126	295	1.7
1355.1	1.1	16	2.0	93	290	1.4	16	3.6	143	331	1.0



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1355.8	1.3	16	2.1	99	280	2.6	18	3.7	151	320	1.9
1356.5	1.2	15	1.9	83	269	2.1	17	3.4	127	308	1.5
1357.2	1.2	15	2.0	94	271	1.7	18	3.6	144	310	1.2
1357.9	1.6	13	1.7	93	309	2.1	24	3.0	142	353	1.6
1358.6	1.6	16	2.0	94	250	2.3	23	3.6	144	286	1.7
1359.3	1.7	15	2.6	99	264	1.5	25	4.8	152	302	1.1
1360.0	1.5	16	1.8	92	253	2.3	22	3.3	141	290	1.7
1360.6	1.5	18	2.4	101	296	2.1	22	4.3	154	338	1.5
1361.3	2.1	19	2.6	112	292	3.0	30	4.7	171	334	2.2
1362.0	1.9	15	2.1	88	287	1.4	28	3.9	135	328	1.1
1362.7	1.4	18	2.1	93	294	2.5	20	3.8	142	336	1.8
1363.4	1.6	15	2.6	83	289	2.7	24	4.7	128	330	2.0
1364.1	2.4	17	2.5	105	304	2.0	35	4.6	161	348	1.5
1364.8	2.3	18	2.6	99	337	2.0	33	4.7	152	385	1.4
1365.5	2.0	17	2.2	105	302	2.3	29	4.1	161	345	1.7
1366.2	2.3	19	2.5	96	277	1.4	33	4.6	146	316	0.991
1366.9	1.9	15	2.3	95	287	2.2	28	4.2	146	328	1.6
1367.6	1.8	18	2.5	90	282	2.6	26	4.6	139	323	1.9
1368.3	1.7	18	3.2	98	268	2.0	24	5.8	150	306	1.5
1369.0	2.1	18	2.5	99	278	1.8	31	4.5	152	318	1.3
1369.7	1.7	17	2.9	101	300	2.0	24	5.3	154	343	1.5
1370.4	1.8	17	2.1	84	284	1.5	25	3.9	129	325	1.1
1371.1	2.8	19	2.5	96	270	2.3	41	4.6	147	309	1.7
1371.8	2.2	19	2.7	101	231	1.7	32	4.9	154	264	1.2
1372.5	1.3	16	2.6	99	275	1.9	19	4.8	151	314	1.4
1373.2	1.7	15	2.2	100	264	1.8	24	4.1	153	302	1.3
1373.9	2.0	18	2.4	102	282	1.1	30	4.4	157	322	0.783
1374.6	2.2	18	2.8	100	255	1.3	32	5.1	154	292	0.969
1375.3	1.8	20	2.9	107	264	1.9	26	5.2	164	302	1.4
1376.0	2.0	17	2.8	100	261	1.9	28	5.2	154	299	1.4
1376.7	2.0	16	2.7	92	230	1.2	29	5.0	141	263	0.855
1377.4	1.6	16	2.1	83	231	1.4	22	3.8	127	264	1.0
1378.1	1.5	17	2.6	100	266	1.9	22	4.8	153	304	1.4
1378.8	1.7	21	2.3	114	254	2.3	24	4.2	174	291	1.7
1379.5	2.6	16	2.1	81	261	1.8	38	3.8	124	299	1.3
1380.2	1.9	18	2.4	98	249	0.974	27	4.3	150	284	0.711
1380.9	2.1	18	2.4	95	263	1.5	31	4.4	146	301	1.1
1381.6	1.9	17	2.4	106	240	1.8	28	4.4	163	274	1.3
1382.3	1.9	17	1.9	91	226	1.7	28	3.5	139	258	1.2
1383.0	2.0	16	2.2	105	224	1.7	29	4.0	161	256	1.2
1383.7	1.3	15	2.2	103	263	1.3	18	4.1	157	301	0.927
1384.4	2.0	17	2.5	96	238	1.6	29	4.6	147	272	1.1
1385.1	2.3	22	2.5	122	259	1.6	33	4.5	186	296	1.2
1385.8	1.6	19	2.1	116	233	1.2	23	3.8	178	267	0.853
1386.5	1.9	17	2.2	94	253	1.0	27	4.0	144	290	0.754
1387.1	1.7	19	2.3	113	256	1.4	24	4.3	173	292	1.1
1387.8	1.7	18	2.0	100	242	1.4	25	3.6	153	276	1.0
1388.5	2.4	22	2.2	118	266	0.932	34	4.1	181	304	0.680
1389.2	1.5	17	2.1	102	220	1.4	22	3.8	157	252	0.998
1389.9	2.3	19	2.4	102	233	1.8	33	4.3	157	266	1.3
1390.6	1.4	17	2.6	116	274	1.7	20	4.7	178	314	1.2
1391.3	1.8	20	2.0	95	222	1.2	26	3.7	146	254	0.868
1392.0	2.0	21	2.3	105	238	2.1	29	4.2	161	272	1.6
1392.7	1.4	15	2.0	89	219	1.1	21	3.7	136	250	0.808
1393.4	2.3	17	2.4	109	241	1.8	32	4.4	166	276	1.3
1394.1	1.7	21	2.4	103	267	1.5	24	4.4	157	305	1.1
1394.8	2.2	19	2.7	127	241	1.0	32	4.9	195	276	0.750
1395.5	2.3	19	2.4	98	212	1.5	33	4.3	150	242	1.1
1396.2	1.7	18	2.2	105	226	0.988	24	4.1	160	259	0.721
1396.9	1.4	21	2.3	96	230	1.7	20	4.2	147	263	1.2
1397.6	2.6	18	1.8	98	214	1.4	37	3.2	150	244	1.0
1398.3	1.8	16	1.9	111	213	1.3	27	3.5	170	244	0.942
1399.0	1.6	20	2.3	106	227	1.7	23	4.2	163	260	1.3
1399.7	1.5	18	2.4	108	223	1.4	22	4.3	166	255	1.1
1400.4	1.9	19	2.1	96	222	1.2	27	3.8	148	254	0.844
1401.1	1.5	21	1.8	94	244	1.6	21	3.2	144	279	1.2
1401.8	1.9	18	1.9	99	211	1.2	28	3.5	152	241	0.868
1402.5	2.4	17	1.9	98	215	1.5	35	3.4	150	246	1.1
1403.2	1.3	18	2.0	99	242	1.5	19	3.7	152	277	1.1
1403.9	1.4	16	2.5	94	237	0.942	20	4.6	144	271	0.687
1404.6	2.3	21	2.1	105	243	2.1	34	3.9	161	278	1.5
1405.3	1.4	20	2.0	104	208	1.3	20	3.6	160	238	0.964
1406.0	1.4	18	1.9	100	225	1.6	21	3.4	154	257	1.2
1406.7	1.9	21	2.1	100	246	2.0	28	3.9	153	281	1.5
1407.4	1.3	16	2.1	96	210	0.652	19	3.9	147	240	0.475
1408.1	1.4	18	1.6	109	217	1.3	21	2.8	167	248	0.984
1408.8	1.7	16	2.1	100	205	1.7	24	3.7	153	235	1.3
1409.5	1.7	20	2.0	94	250	1.3	24	3.6	145	286	0.962
1410.2	1.1	16	1.8	82	195	1.3	16	3.4	126	223	0.984
1410.9	1.4	17	2.2	101	219	1.9	20	4.0	155	250	1.4
1411.6	2.1	21	2.1	114	233	2.1	30	3.8	175	267	1.5



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Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1412.3	1.4	16	1.8	102	206	1.7	20	3.3	157	236	1.2
1413.0	1.6	17	2.1	100	234	1.6	23	3.9	152	267	1.2
1413.6	1.7	19	2.3	118	246	1.7	25	4.2	180	281	1.2
1414.3	1.9	17	1.7	96	208	1.4	27	3.2	148	238	1.0
1415.0	1.2	16	1.7	101	214	1.4	17	3.1	155	245	1.0
1415.7	1.4	18	2.2	90	192	1.3	21	4.0	138	219	0.932
1416.4	2.1	18	1.9	93	208	1.6	30	3.5	143	238	1.2
1417.1	1.6	18	2.0	102	219	1.2	23	3.7	157	251	0.847
1417.8	1.3	19	2.3	107	250	1.4	19	4.1	164	285	1.0
1418.5	1.4	19	2.2	109	231	1.2	21	4.0	167	264	0.892
1419.2	1.4	18	2.3	100	215	1.5	20	4.2	153	246	1.1
1419.9	1.2	21	1.9	119	246	2.1	17	3.5	183	281	1.5
1420.6	1.5	19	2.5	115	276	2.8	22	4.6	176	315	2.0
1421.3	1.8	19	2.4	109	237	1.2	26	4.4	166	271	0.860
1422.0	1.5	20	2.1	103	237	1.0	22	3.8	157	271	0.750
1422.7	1.2	17	1.9	93	203	1.6	18	3.5	143	232	1.2
1423.4	1.8	17	2.1	105	260	1.6	26	3.9	161	297	1.1
1424.1	2.1	18	2.6	99	268	1.8	30	4.7	152	307	1.3
1424.8	1.8	20	2.5	109	255	1.5	27	4.5	167	291	1.1
1425.5	2.1	19	2.5	113	264	2.0	31	4.5	173	302	1.5
1426.2	1.8	16	2.5	100	277	1.4	26	4.6	153	317	0.996
1426.9	1.8	22	2.7	104	295	1.9	25	5.0	159	337	1.4
1427.6	1.7	18	3.0	117	312	1.5	24	5.5	179	356	1.1
1428.3	2.0	16	2.2	100	257	1.8	28	3.9	154	294	1.3
1429.0	1.7	19	2.9	103	278	2.2	25	5.2	158	317	1.6
1429.7	1.1	17	2.4	99	283	1.7	16	4.4	152	324	1.3
1430.4	1.6	18	2.3	101	277	1.4	23	4.2	155	317	1.0
1431.1	1.6	21	2.9	100	273	0.923	23	5.3	153	313	0.674
1431.8	1.5	18	2.5	111	313	2.1	22	4.6	170	358	1.5
1432.5	1.4	19	2.1	103	262	1.5	20	3.9	157	300	1.1
1433.2	1.1	18	2.7	94	266	1.5	16	4.8	144	304	1.1
1433.9	1.9	16	2.3	88	263	1.5	27	4.2	135	300	1.1
1434.6	1.1	20	1.9	97	260	0.987	16	3.5	149	297	0.720
1435.3	1.7	21	2.0	98	294	2.1	25	3.6	150	336	1.5
1436.0	1.4	19	2.1	99	307	2.1	21	3.8	152	351	1.5
1436.7	1.2	17	2.1	93	302	1.8	17	3.8	142	345	1.3
1437.4	2.1	20	2.0	89	273	1.7	30	3.7	137	312	1.3
1438.1	1.7	20	2.3	113	290	1.6	24	4.1	173	331	1.1
1438.8	1.7	19	2.0	104	277	1.9	24	3.7	159	317	1.4
1439.4	1.5	20	1.8	89	271	1.2	21	3.2	137	310	0.891
1440.1	1.3	21	2.0	87	296	1.3	19	3.7	134	338	0.927
1440.8	1.3	19	2.1	91	261	1.5	19	3.9	139	298	1.1
1441.5	1.6	18	1.9	100	278	1.7	23	3.4	154	318	1.2
1442.2	1.5	19	2.0	92	284	1.7	22	3.7	140	324	1.2
1442.9	1.4	16	1.8	83	272	1.5	20	3.3	128	311	1.1
1443.6	1.5	21	2.2	89	264	1.3	21	3.9	136	301	0.925
1444.3	1.8	23	2.0	89	276	1.2	27	3.6	136	315	0.874
1445.0	1.9	19	1.6	95	280	1.2	27	3.0	145	320	0.900
1445.7	1.3	19	2.1	87	260	1.5	18	3.7	134	297	1.1
1446.4	1.4	18	2.0	81	287	1.1	21	3.7	124	328	0.800
1447.1	1.6	21	1.9	82	277	1.3	24	3.5	125	316	0.917
1447.8	1.4	20	2.0	87	302	1.8	20	3.6	134	346	1.3
1448.5	1.5	21	1.8	92	282	1.4	22	3.3	140	322	1.0
1449.2	1.8	16	1.4	91	268	1.7	25	2.6	140	306	1.3
1449.9	1.5	18	1.7	82	272	1.6	22	3.1	125	311	1.1
1450.6	1.4	18	1.9	92	298	2.4	20	3.5	141	341	1.7
1451.3	1.4	20	1.9	91	302	2.7	20	3.4	140	345	2.0
1452.0	1.4	19	2.1	83	302	2.0	20	3.8	127	345	1.4
1452.7	1.9	23	2.2	89	362	2.0	27	3.9	137	414	1.5
1453.4	1.2	17	1.9	87	322	1.7	17	3.5	133	368	1.2
1454.1	1.8	19	2.0	85	356	2.0	25	3.6	130	407	1.4
1454.8	1.1	18	1.9	86	339	2.0	15	3.4	132	388	1.5
1455.5	1.4	19	1.6	80	318	2.4	21	3.0	122	364	1.8
1456.2	1.7	17	1.7	78	328	2.6	24	3.0	119	375	1.9
1456.9	1.9	19	1.8	77	318	2.2	27	3.2	117	363	1.6
1457.6	1.3	20	2.0	86	401	3.0	19	3.6	132	458	2.2
1458.3	1.8	21	1.9	82	373	1.6	26	3.5	126	426	1.2
1459.0	1.9	22	1.8	72	346	2.6	28	3.3	111	395	1.9
1459.7	1.6	18	2.0	72	385	2.4	23	3.6	110	440	1.8
1460.4	1.7	21	1.9	81	346	2.5	24	3.4	123	396	1.8
1461.1	1.1	22	2.1	78	336	2.1	15	3.7	120	384	1.5
1461.8	1.3	20	1.9	76	341	2.5	18	3.5	116	390	1.8
1462.5	2.3	18	2.0	79	380	1.9	34	3.7	121	435	1.4
1463.2	1.9	17	1.6	67	340	2.0	27	2.9	102	389	1.5
1463.9	1.8	19	1.3	71	340	2.5	25	2.4	109	389	1.8
1464.6	1.5	20	1.8	78	345	1.8	22	3.2	120	395	1.3
1465.3	1.7	19	2.1	73	324	2.0	25	3.8	112	370	1.5
1466.0	1.5	21	1.5	66	320	2.4	21	2.7	101	365	1.8
1466.6	0.711	18	1.6	71	387	1.8	10	3.0	110	443	1.3
1467.3	2.0	19	1.7	71	352	2.9	29	3.1	109	402	2.1
1468.0	1.7	20	1.7	81	310	2.0	25	3.0	124	354	1.5



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1468.7	1.6	20	1.5	71	384	1.9	22	2.6	108	439	1.4
1469.4	1.5	18	1.8	64	332	1.3	22	3.2	99	379	0.967
1470.1	1.6	18	1.6	71	351	2.4	23	2.9	108	402	1.7
1470.8	1.8	21	1.6	73	384	3.1	26	2.9	113	439	2.2
1471.5	2.2	21	1.8	76	344	1.6	32	3.2	117	393	1.2
1472.2	1.3	18	1.8	63	322	2.2	19	3.2	97	368	1.6
1472.9	0.987	17	1.5	71	359	1.2	14	2.7	110	411	0.876
1473.6	2.4	20	1.7	69	340	2.0	35	3.0	106	389	1.5
1474.3	1.5	21	1.8	65	378	2.6	22	3.2	100	432	1.9
1475.0	1.9	19	1.6	69	338	1.4	28	2.9	106	387	1.0
1475.7	1.1	20	1.8	72	331	2.4	16	3.3	111	378	1.8
1476.4	2.0	20	2.1	68	386	2.0	29	3.9	105	442	1.4
1477.1	1.4	21	1.7	78	333	1.7	21	3.2	119	381	1.3
1477.8	1.6	23	1.6	77	349	1.8	23	2.9	118	399	1.3
1478.5	2.0	21	1.8	73	315	2.2	29	3.2	112	360	1.6
1479.2	1.8	20	1.5	69	329	1.7	26	2.8	106	376	1.2
1479.9	1.2	23	1.6	65	329	1.6	18	3.0	100	377	1.2
1480.6	1.9	23	1.5	70	342	2.1	27	2.7	107	391	1.5
1481.3	1.5	21	1.7	65	322	1.2	21	3.1	99	368	0.891
1482.0	1.6	22	1.2	60	273	1.5	23	2.2	92	312	1.1
1482.7	2.2	23	1.7	70	324	1.2	32	3.1	108	370	0.864
1483.4	1.3	22	1.1	63	324	1.1	19	2.0	97	370	0.818
1484.1	1.9	22	1.5	71	316	1.8	27	2.7	109	362	1.3
1484.8	2.0	24	1.5	69	306	2.1	29	2.6	105	350	1.5
1485.5	1.1	18	1.2	69	304	1.3	15	2.2	105	348	0.934
1486.2	1.1	23	1.5	64	313	1.5	16	2.7	98	358	1.1
1486.9	1.3	22	1.2	66	324	2.4	18	2.3	102	371	1.8
1487.6	1.3	23	1.3	63	273	1.4	18	2.3	97	312	1.0
1488.3	1.2	21	1.1	65	266	1.5	17	2.0	99	304	1.1
1489.0	1.4	21	1.5	66	314	1.2	20	2.8	100	360	0.878
1489.7	1.9	23	1.3	68	280	1.4	27	2.4	104	320	0.987
1490.4	1.3	21	1.2	69	288	1.7	19	2.2	106	330	1.3
1491.1	1.2	22	1.2	64	253	1.3	18	2.1	98	289	0.929
1491.8	1.7	19	1.3	58	266	1.1	24	2.4	89	304	0.786
1492.5	1.8	23	0.969	70	317	1.3	26	1.8	108	362	0.919
1493.1	1.3	22	1.6	63	277	1.2	19	2.9	97	317	0.878
1493.8	2.1	21	1.4	64	268	1.7	30	2.5	98	306	1.2
1494.5	1.6	23	1.4	64	271	1.1	23	2.5	97	310	0.794
1495.2	1.7	19	1.1	64	262	1.4	24	2.0	98	300	0.995
1495.9	1.8	21	1.2	66	272	1.2	26	2.2	101	311	0.911
1496.6	1.9	19	1.4	71	288	1.1	27	2.5	108	329	0.788
1497.3	1.9	18	1.4	69	272	1.5	28	2.5	105	311	1.1
1498.0	2.3	19	0.864	62	276	1.7	33	1.6	95	316	1.3
1498.7	1.7	18	1.1	61	258	0.668	25	1.9	94	295	0.487
1499.4	1.9	17	1.1	63	265	1.3	27	2.1	97	304	0.970
1500.1	1.6	21	1.3	72	271	0.841	23	2.3	110	310	0.614
1500.8	2.1	22	1.2	69	267	1.2	30	2.2	105	305	0.840
1501.5	2.1	20	0.916	69	293	0.541	30	1.7	106	335	0.395
1502.2	1.5	18	0.878	62	267	0.720	22	1.6	94	306	0.526
1502.9	1.1	19	0.852	49	239	0.961	16	1.6	76	274	0.701
1503.6	1.8	19	0.842	66	278	1.3	26	1.5	102	318	0.923
1504.3	1.2	18	0.937	66	288	1.1	18	1.7	101	329	0.784
1505.0	1.5	19	0.906	54	264	1.1	21	1.7	83	301	0.782
1505.7	1.3	19	1.1	65	293	1.1	19	2.1	100	335	0.827
1506.4	1.8	19	1.1	54	277	0.971	26	2.0	83	317	0.708
1507.1	1.8	18	0.934	62	285	1.1	27	1.7	95	326	0.817
1507.8	1.6	19	0.857	56	276	0.466	23	1.6	86	316	0.340
1508.5	1.7	21	0.968	57	249	1.3	25	1.8	88	285	0.966
1509.2	1.4	17	0.888	54	269	0.814	20	1.6	83	307	0.594
1509.9	1.6	18	1.1	57	239	1.1	22	2.0	88	274	0.814
1510.6	2.0	20	0.902	64	277	0.998	29	1.6	99	316	0.728
1511.3	1.6	17	0.831	61	262	1.3	22	1.5	93	300	0.912
1512.0	2.2	20	0.775	51	255	0.790	31	1.4	77	292	0.576
1512.7	1.4	18	0.729	50	264	1.6	20	1.3	77	301	1.1
1513.4	1.8	18	0.749	56	235	0.769	25	1.4	86	269	0.561
1514.1	1.4	20	0.705	59	281	1.3	20	1.3	90	322	0.915
1514.8	1.3	17	0.783	45	292	1.1	19	1.4	69	333	0.825
1515.5	1.7	20	0.710	46	279	0.895	24	1.3	71	318	0.653
1516.2	1.2	18	0.855	49	261	0.900	17	1.6	76	299	0.656
1516.9	1.8	16	0.585	48	213	1.1	27	1.1	73	244	0.823
1517.6	2.2	18	0.955	57	311	1.0	31	1.7	87	356	0.762
1518.3	2.0	16	0.584	43	242	0.748	29	1.1	66	277	0.546
1519.0	1.1	17	0.615	43	273	1.2	17	1.1	65	312	0.854
1519.7	1.0	15	0.772	43	326	1.1	15	1.4	66	373	0.811
1520.3	1.1	15	0.566	36	276	0.951	16	1.0	56	315	0.694
1521.0	1.4	15	0.617	38	276	1.1	21	1.1	59	316	0.788
1521.7	1.2	15	0.846	38	266	1.1	18	1.5	58	304	0.802
1522.4	1.1	14	0.708	35	246	1.3	16	1.3	53	281	0.977
1523.1	1.5	15	0.590	40	272	1.1	21	1.1	62	311	0.781
1523.8	1.1	13	0.406	34	274	0.969	16	0.741	52	313	0.707
1524.5	1.4	14	0.764	29	292	0.860	20	1.4	44	334	0.628



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1525.2	1.1	14	0.557	33	259	1.3	16	1.0	51	296	0.956
1525.9	1.7	13	0.623	26	279	0.665	24	1.1	40	319	0.485
1526.6	2.0	13	0.746	29	277	0.838	28	1.4	45	316	0.611
1527.3	1.8	12	0.535	23	276	0.942	25	0.976	35	316	0.687
1528.0	1.5	12	0.399	22	285	0.824	22	0.727	34	326	0.601
1528.7	1.5	14	0.347	24	279	1.4	21	0.633	36	319	1.0
1529.4	1.7	11	0.532	22	272	1.6	24	0.970	33	311	1.1
1530.1	1.8	13	0.381	23	251	1.1	27	0.694	36	287	0.788
1530.8	1.3	11	0.422	22	285	0.576	19	0.770	34	326	0.421
1531.5	1.0	10	0.336	19	283	1.1	15	0.612	29	324	0.802
1532.2	1.4	12	0.384	22	291	0.709	20	0.701	34	333	0.517
1532.9	1.8	11	0.319	19	267	1.2	26	0.581	30	305	0.861
1533.6	1.1	13	0.347	23	311	1.1	16	0.632	35	356	0.819
1534.3	1.1	10	0.221	16	277	1.4	16	0.403	25	316	1.0
1535.0	1.6	12	0.411	19	286	0.490	23	0.749	29	326	0.358
1535.7	0.948	13	0.413	15	290	0.659	14	0.753	24	331	0.481
1536.4	1.5	9.3	0.193	14	253	1.1	21	0.351	22	290	0.795
1537.1	0.971	12	0.357	17	266	1.5	14	0.651	26	304	1.1
1537.8	1.7	11	0.448	18	274	0.738	25	0.818	27	314	0.538
1538.5	1.4	11	0.335	17	276	1.1	20	0.612	26	315	0.771
1539.2	1.0	12	0.171	16	243	1.3	15	0.312	24	278	0.925
1539.9	1.1	12	0.430	18	265	0.881	16	0.784	27	303	0.643
1540.6	1.7	11	0.381	17	269	1.3	24	0.694	27	307	0.974
1541.3	1.3	8.8	0.340	19	254	1.6	18	0.621	29	291	1.2
1542.0	1.6	11	0.408	17	238	1.3	23	0.744	27	273	0.915
1542.7	1.8	11	0.492	20	277	0.921	27	0.898	31	317	0.672
1543.4	1.3	12	0.441	19	246	1.6	18	0.805	29	281	1.1
1544.1	1.4	11	0.661	19	273	1.5	21	1.2	30	312	1.1
1544.8	1.4	11	0.265	21	251	2.0	21	0.484	32	287	1.4
1545.5	1.2	11	0.520	18	240	0.943	18	0.948	28	275	0.688
1546.2	1.2	11	0.542	19	246	1.9	17	0.988	29	282	1.4
1546.8	1.4	11	0.515	17	220	1.6	20	0.939	26	252	1.2
1547.5	1.1	11	0.437	24	232	0.880	16	0.797	37	265	0.642
1548.2	1.1	11	0.628	21	204	0.720	16	1.1	31	233	0.525
1548.9	1.4	11	0.554	23	230	1.6	20	1.0	35	262	1.2
1549.6	1.3	13	0.544	27	279	2.2	19	0.992	41	319	1.6
1550.3	1.6	14	0.748	25	227	0.919	24	1.4	39	259	0.671
1551.0	1.3	14	0.808	30	224	0.740	18	1.5	46	256	0.540
1551.7	0.692	13	0.583	25	234	1.3	10.0	1.1	39	267	0.927
1552.4	1.0	12	0.670	26	242	1.0	15	1.2	39	277	0.748
1553.1	1.5	13	0.730	30	250	1.3	21	1.3	46	286	0.940
1553.8	1.8	15	0.880	26	223	1.3	25	1.6	40	255	0.923
1554.5	0.889	14	0.834	30	250	0.814	13	1.5	46	285	0.594
1555.2	1.6	12	0.780	27	209	1.5	23	1.4	41	239	1.1
1555.9	1.2	14	0.947	28	221	1.1	17	1.7	42	253	0.838
1556.6	1.2	14	0.691	28	246	1.2	17	1.3	42	281	0.887
1557.3	1.4	14	1.0	33	219	1.9	21	1.8	50	250	1.4
1558.0	1.0	11	0.647	28	207	1.3	15	1.2	42	236	0.935
1558.7	1.2	14	1.1	31	247	1.9	17	1.9	48	283	1.4
1559.4	1.4	16	0.900	30	234	1.1	21	1.6	47	268	0.817
1560.1	1.4	15	1.3	35	226	1.8	21	2.3	54	259	1.3
1560.8	1.4	14	0.870	38	218	1.3	20	1.6	58	249	0.970
1561.5	1.6	14	1.1	35	215	1.3	23	1.9	54	246	0.945
1562.2	0.946	14	0.779	35	213	1.2	14	1.4	53	243	0.910
1562.9	0.902	14	1.3	33	229	1.1	13	2.4	51	262	0.800
1563.6	1.2	15	0.962	39	234	1.3	17	1.8	60	267	0.965
1564.3	1.3	17	1.5	46	218	1.4	18	2.7	71	249	1.0
1565.0	0.979	14	1.3	42	207	1.1	14	2.3	64	237	0.826
1565.7	1.5	15	1.6	45	260	1.7	22	2.9	69	298	1.2
1566.4	1.2	15	1.5	39	208	2.1	17	2.7	59	238	1.5
1567.1	1.2	13	1.4	48	193	1.7	17	2.6	74	220	1.2
1567.8	1.4	15	1.8	45	228	0.901	20	3.3	69	261	0.658
1568.5	0.871	14	1.5	45	224	1.1	13	2.7	68	256	0.816
1569.2	1.3	15	1.5	43	241	1.4	19	2.7	66	276	1.0
1569.9	1.1	14	1.7	50	199	1.3	16	3.1	76	228	0.961
1570.6	1.3	16	1.6	56	219	1.5	18	3.0	85	251	1.1
1571.3	1.3	13	1.8	46	198	0.938	18	3.3	71	227	0.684
1572.0	1.4	14	1.6	46	211	1.4	20	3.0	70	241	1.0
1572.6	1.9	14	1.8	54	232	2.0	28	3.2	83	266	1.5
1573.3	1.5	16	2.4	49	225	1.6	22	4.4	76	258	1.2
1574.0	1.5	17	2.3	49	183	1.5	22	4.2	75	210	1.1
1574.7	1.1	18	2.0	57	227	1.8	16	3.7	87	260	1.3
1575.4	1.3	14	1.8	49	224	1.2	19	3.4	75	256	0.868
1576.1	2.0	18	1.8	56	227	2.1	29	3.2	86	259	1.5
1576.8	1.3	16	2.3	52	208	1.1	18	4.1	79	238	0.788
1577.5	1.1	18	2.1	67	238	1.8	16	3.7	103	272	1.3
1578.2	0.709	14	1.8	52	206	1.7	10	3.2	80	236	1.3
1578.9	0.946	15	2.4	52	190	2.0	14	4.4	79	218	1.4
1579.6	0.993	15	2.3	64	219	1.5	14	4.3	98	250	1.1
1580.3	1.1	15	2.1	60	193	1.9	16	3.9	93	221	1.4
1581.0	0.905	19	3.0	67	213	1.7	13	5.6	102	243	1.2



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1581.7	0.711	14	2.5	60	226	1.2	10	4.5	93	258	0.886
1582.4	1.6	15	2.6	57	201	2.1	22	4.8	88	229	1.5
1583.1	1.4	18	2.9	62	239	2.6	20	5.3	95	273	1.9
1583.8	1.3	17	3.0	66	211	1.8	18	5.5	101	242	1.3
1584.5	1.3	16	3.0	63	221	1.9	19	5.5	96	252	1.4
1585.2	0.740	15	2.4	64	231	1.8	11	4.5	98	265	1.3
1585.9	1.2	16	2.7	54	203	1.4	18	4.9	83	232	1.0
1586.6	1.0	15	2.7	59	212	2.0	15	5.0	90	242	1.5
1587.3	1.1	15	2.7	69	253	2.4	15	5.0	106	289	1.7
1588.0	1.0	15	2.4	63	219	2.1	15	4.4	96	250	1.5
1588.7	1.4	16	2.6	69	240	1.9	20	4.8	105	274	1.4
1589.4	0.798	17	2.6	64	221	1.9	12	4.8	97	252	1.4
1590.1	1.5	18	2.7	70	244	1.8	22	5.0	107	279	1.3
1590.8	0.625	15	2.7	61	219	1.9	9.0	4.9	94	250	1.4
1591.5	0.701	16	3.0	63	237	1.6	10	5.4	97	271	1.2
1592.2	0.920	14	3.0	64	241	1.2	13	5.6	99	275	0.907
1592.9	1.2	18	2.7	79	266	2.7	17	4.8	121	304	2.0
1593.6	0.887	17	3.0	64	226	2.1	13	5.4	98	258	1.5
1594.3	1.2	18	2.7	72	271	2.2	17	4.9	111	310	1.6
1595.0	0.622	16	3.1	63	240	2.5	9.0	5.6	96	274	1.8
1595.7	0.607	15	3.2	69	286	1.8	8.8	5.9	105	327	1.3
1596.4	1.5	15	3.0	71	258	1.7	22	5.5	108	295	1.2
1597.1	1.1	16	3.2	76	284	1.7	16	5.8	117	324	1.2
1597.8	0.819	17	2.9	73	273	1.5	12	5.4	111	312	1.1
1598.4	1.1	15	2.7	72	269	1.8	16	4.9	110	308	1.3
1599.1	0.901	13	2.9	69	312	2.4	13	5.3	106	357	1.7
1599.8	1.1	14	2.5	62	236	1.7	16	4.6	96	270	1.3
1600.5	1.5	18	2.8	80	286	2.2	22	5.1	122	327	1.6
1601.2	1.3	15	2.9	82	271	2.1	19	5.2	126	310	1.5
1601.9	1.2	16	3.0	66	270	2.6	17	5.4	101	309	1.9
1602.6	0.957	16	2.4	72	283	1.9	14	4.4	111	324	1.4
1603.3	1.3	16	2.6	61	285	2.4	18	4.8	94	326	1.8
1604.0	1.4	18	2.6	66	318	1.4	21	4.8	101	364	1.0
1604.7	0.974	17	2.3	87	284	1.9	14	4.2	134	325	1.4
1605.4	0.931	16	2.3	61	284	1.7	13	4.2	93	324	1.3
1606.1	0.741	15	2.4	66	309	3.0	11	4.4	101	353	2.2
1606.8	1.0	13	2.4	68	271	1.8	15	4.4	104	309	1.3
1607.5	1.8	19	2.2	69	287	1.9	26	3.9	106	329	1.4
1608.2	1.5	15	1.8	64	296	1.7	22	3.3	97	339	1.2
1608.9	1.3	14	1.8	63	303	1.9	19	3.2	96	346	1.4
1609.6	1.2	15	1.7	65	279	2.0	17	3.1	100	319	1.5
1610.3	1.0	16	1.9	63	284	1.8	15	3.4	97	324	1.3
1611.0	0.936	16	1.5	61	320	1.7	14	2.8	93	366	1.2
1611.7	0.966	16	1.4	48	292	1.6	14	2.6	73	334	1.1
1612.4	1.3	15	1.1	48	281	1.0	19	2.1	73	321	0.738
1613.1	1.9	16	1.7	49	313	1.8	27	3.1	76	358	1.3
1613.8	1.5	16	1.2	47	271	1.5	22	2.2	72	310	1.1
1614.5	1.3	16	1.1	52	297	0.908	19	2.0	80	340	0.662
1615.2	1.3	14	1.1	42	289	1.4	19	2.0	65	331	0.997
1615.9	1.4	14	0.800	41	312	1.7	20	1.5	63	356	1.3
1616.6	1.3	16	1.1	44	295	1.6	19	2.0	68	337	1.2
1617.3	1.4	15	0.821	45	302	1.3	20	1.5	69	345	0.933
1618.0	1.8	13	0.887	44	298	1.3	26	1.6	68	341	0.913
1618.7	1.5	13	0.846	37	282	1.9	22	1.5	57	323	1.4
1619.4	1.4	15	0.835	42	306	1.4	21	1.5	65	350	1.1
1620.1	2.2	16	1.1	42	310	2.0	32	1.9	64	355	1.5
1620.8	1.8	16	0.801	43	294	0.935	26	1.5	66	336	0.682
1621.5	1.4	15	0.743	39	278	1.7	20	1.4	60	318	1.2
1622.2	1.5	13	0.776	39	290	1.1	21	1.4	59	332	0.803
1622.9	1.2	13	0.852	38	273	1.1	17	1.6	58	312	0.773
1623.6	2.4	14	0.755	36	303	1.7	35	1.4	55	346	1.3
1624.3	1.4	15	0.499	35	272	1.0	20	0.910	53	311	0.762
1624.9	2.2	13	0.816	30	273	1.0	31	1.5	46	312	0.731
1625.6	1.7	13	0.710	34	280	1.3	24	1.3	52	321	0.951
1626.3	1.4	14	0.754	31	262	1.0	21	1.4	48	300	0.743
1627.0	1.5	14	0.718	34	292	0.645	22	1.3	53	333	0.470
1627.7	1.9	15	0.605	37	268	0.926	27	1.1	56	307	0.676
1628.4	1.3	13	0.505	28	275	0.995	18	0.921	43	315	0.726
1629.1	1.8	13	0.586	31	314	1.2	25	1.1	48	359	0.885
1629.8	1.6	14	0.864	27	276	1.3	23	1.6	42	316	0.947
1630.5	1.9	15	0.754	38	276	1.3	27	1.4	58	315	0.971
1631.2	1.6	13	0.606	33	271	1.0	23	1.1	50	310	0.756
1631.9	1.2	13	0.564	30	261	0.822	17	1.0	46	298	0.600
1632.6	1.6	12	0.464	30	266	0.735	23	0.847	46	304	0.536
1633.3	1.8	14	0.713	31	291	1.4	26	1.3	47	333	1.0
1634.0	2.2	13	0.577	36	291	1.4	32	1.1	55	332	1.0
1634.7	1.8	14	0.696	32	266	1.2	26	1.3	48	304	0.893
1635.4	1.8	13	0.633	29	302	1.1	27	1.2	44	346	0.776
1636.1	2.1	13	0.562	31	295	0.978	31	1.0	48	337	0.713
1636.8	1.7	13	0.601	31	278	1.3	25	1.1	48	317	0.960
1637.5	1.5	13	0.635	30	297	0.853	22	1.2	46	339	0.623



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1638.2	2.2	12	0.552	27	270	0.734	32	1.0	42	309	0.535
1638.9	2.2	13	0.451	24	274	1.3	31	0.822	37	313	0.977
1639.6	2.0	14	0.580	28	280	1.9	29	1.1	43	320	1.4
1640.3	1.0	13	0.562	24	260	1.2	15	1.0	37	297	0.895
1641.0	1.6	13	0.531	24	277	0.610	24	0.968	38	317	0.445
1641.7	1.8	13	0.733	26	256	0.841	26	1.3	40	293	0.613
1642.4	2.4	11	0.422	23	275	1.7	35	0.770	35	314	1.3
1643.1	1.7	13	0.510	27	273	1.0	25	0.931	41	313	0.734
1643.8	1.3	13	0.491	24	252	0.627	19	0.895	36	288	0.457
1644.5	1.5	14	0.563	20	305	0.886	21	1.0	31	349	0.646
1645.2	1.9	12	0.760	26	270	1.3	28	1.4	40	308	0.930
1645.9	1.1	14	0.666	24	292	1.7	16	1.2	37	334	1.2
1646.6	1.9	14	0.370	20	265	0.919	27	0.675	30	303	0.670
1647.3	1.9	11	0.490	23	277	0.994	27	0.893	35	317	0.725
1648.0	1.6	11	0.382	17	248	0.979	23	0.697	26	284	0.714
1648.7	0.953	11	0.335	18	268	0.865	14	0.610	27	306	0.631
1649.4	1.4	13	0.541	18	275	0.905	21	0.986	27	315	0.660
1650.1	1.6	12	0.327	14	290	0.432	23	0.597	22	332	0.315
1650.8	1.7	11	0.478	16	269	1.2	25	0.872	25	308	0.850
1651.4	1.3	11	0.402	16	308	0.713	18	0.734	25	352	0.520
1652.1	2.0	12	0.271	15	276	1.2	29	0.495	23	316	0.866
1652.8	1.2	13	0.539	16	271	1.1	17	0.983	25	310	0.804
1653.5	1.3	9.9	0.426	13	274	0.677	18	0.777	21	314	0.494
1654.2	1.2	10	0.281	14	273	1.1	18	0.513	21	312	0.801
1654.9	1.6	11	0.318	12	299	1.1	22	0.580	19	342	0.806
1655.6	1.1	11	0.242	14	264	1.1	16	0.442	22	301	0.773
1656.3	1.2	11	0.267	13	315	0.824	18	0.487	20	361	0.601
1657.0	1.2	10	0.326	13	281	0.877	18	0.594	20	321	0.640
1657.7	0.935	9.8	0.303	8.7	249	1.0	13	0.552	13	285	0.765
1658.4	1.5	10	0.233	11	277	1.0	22	0.426	17	317	0.744
1659.1	0.819	11	0.142	14	290	1.2	12	0.259	21	332	0.874
1659.8	1.3	9.4	0.370	13	281	1.4	19	0.675	20	321	1.0
1660.5	1.3	11	0.307	12	253	1.1	19	0.559	18	289	0.788
1661.2	1.5	11	0.246	10	261	0.805	22	0.449	16	298	0.588
1661.9	1.1	10	0.256	12	289	1.5	16	0.468	18	331	1.1
1662.6	1.3	11	0.428	13	266	1.0	19	0.781	20	304	0.743
1663.3	0.922	9.7	0.267	13	243	1.3	13	0.486	19	278	0.949
1664.0	0.851	8.7	0.259	8.9	236	1.1	12	0.473	14	269	0.788
1664.7	1.5	10	0.284	13	297	0.789	22	0.518	20	339	0.576
1665.4	1.3	10	0.265	12	243	0.798	19	0.484	18	278	0.582
1666.1	1.2	12	0.537	13	254	0.963	17	0.979	19	290	0.702
1666.8	1.2	10.0	0.258	14	242	1.3	17	0.471	21	277	0.916
1667.5	0.887	11	0.432	11	279	1.3	13	0.788	18	319	0.952
1668.2	1.3	11	0.440	17	326	1.2	19	0.803	26	373	0.888
1668.9	1.7	9.6	0.438	11	258	0.575	25	0.798	17	295	0.420
1669.6	1.8	13	0.662	12	215	0.775	26	1.2	18	246	0.566
1670.3	1.3	11	0.685	13	244	1.1	19	1.3	20	279	0.794
1671.0	0.865	11	0.384	12	248	1.1	12	0.700	19	284	0.801
1671.7	0.752	10	0.666	11	241	0.978	11	1.2	17	275	0.713
1672.4	1.5	12	0.592	11	240	1.3	22	1.1	18	275	0.944
1673.1	0.967	11	0.653	16	261	1.3	14	1.2	25	298	0.945
1673.8	0.884	10	0.501	14	242	1.2	13	0.914	21	277	0.864
1674.5	1.2	9.6	0.524	14	223	0.601	17	0.956	21	254	0.439
1675.2	1.8	10	0.704	15	256	0.932	26	1.3	24	293	0.680
1675.9	1.5	14	0.812	14	277	1.8	22	1.5	22	317	1.3
1676.5	1.2	13	0.530	16	250	1.2	17	0.967	25	286	0.890
1677.2	1.6	10	0.460	15	216	1.0	23	0.839	23	246	0.749
1677.9	0.976	12	0.856	16	254	1.1	14	1.6	24	290	0.804
1678.6	1.1	12	0.673	18	212	1.3	16	1.2	27	242	0.927
1679.3	1.2	13	0.875	20	276	1.2	17	1.6	30	316	0.858
1680.0	1.3	13	0.787	18	261	1.0	19	1.4	27	299	0.746
1680.7	1.3	11	0.756	17	202	0.935	19	1.4	26	231	0.682
1681.4	1.1	13	0.638	19	235	0.749	16	1.2	30	268	0.547
1682.1	1.6	12	0.809	22	290	1.5	23	1.5	34	332	1.1
1682.8	1.5	14	0.772	23	257	1.3	22	1.4	35	294	0.952
1683.5	1.4	12	0.879	22	222	0.908	20	1.6	34	254	0.662
1684.2	1.2	9.3	0.699	20	218	0.641	17	1.3	31	249	0.467
1684.9	2.1	13	0.914	24	256	1.2	31	1.7	37	292	0.859
1685.6	1.5	13	0.877	22	237	1.3	21	1.6	33	271	0.948
1686.3	1.3	13	1.0	23	213	0.885	18	1.9	36	244	0.646
1687.0	1.6	14	0.760	25	234	0.933	23	1.4	38	268	0.681
1687.7	1.6	11	1.0	24	223	0.751	23	1.9	37	255	0.548
1688.4	1.1	12	0.921	22	202	0.819	16	1.7	34	231	0.598
1689.1	1.8	11	0.731	28	230	0.723	25	1.3	42	263	0.528
1689.8	1.2	11	0.876	31	234	0.937	17	1.6	48	267	0.683
1690.5	1.3	12	0.744	21	216	0.548	19	1.4	33	247	0.400
1691.2	1.6	9.9	1.1	31	232	0.398	24	2.0	48	265	0.290
1691.9	2.0	11	1.1	30	245	1.1	28	2.0	45	281	0.832
1692.6	1.7	13	1.1	34	238	0.600	24	2.1	53	272	0.437
1693.3	1.7	11	1.1	33	226	1.3	25	2.1	50	259	0.981
1694.0	1.5	11	1.1	30	218	1.1	21	1.9	46	250	0.791



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1694.7	1.9	15	1.1	34	240	1.1	27	2.0	52	274	0.837
1695.4	1.7	12	1.1	37	227	0.831	25	1.9	57	260	0.606
1696.1	1.7	13	0.982	33	222	1.1	24	1.8	50	253	0.821
1696.8	1.5	11	1.1	37	229	0.989	22	2.0	56	261	0.721
1697.5	1.7	9.1	1.1	29	191	0.825	24	2.1	44	218	0.602
1698.2	2.1	14	1.1	40	262	1.2	31	2.0	61	300	0.909
1698.9	1.4	13	0.841	33	228	1.4	20	1.5	51	261	1.0
1699.6	2.5	15	1.1	40	237	1.1	36	2.0	61	271	0.802
1700.3	1.6	12	1.0	39	231	2.0	23	1.8	60	264	1.4
1701.0	1.6	12	1.1	33	236	0.958	23	2.0	51	270	0.699
1701.7	1.6	12	1.5	36	248	1.3	22	2.8	55	283	0.959
1702.4	1.4	13	1.3	40	224	1.2	21	2.4	61	256	0.842
1703.0	1.8	13	1.2	41	239	0.641	26	2.1	62	273	0.468
1703.7	2.0	13	1.5	41	221	0.617	28	2.7	62	252	0.450
1704.4	1.6	12	1.4	38	248	1.1	24	2.5	58	283	0.821
1705.1	1.6	14	1.5	43	266	0.748	23	2.7	66	305	0.546
1705.8	2.0	13	1.5	50	250	0.844	29	2.7	77	286	0.616
1706.5	1.7	12	1.2	50	243	0.527	25	2.1	77	278	0.385
1707.2	1.4	13	1.2	49	250	1.0	20	2.2	75	286	0.752
1707.9	1.7	11	1.1	38	258	0.978	25	2.0	59	295	0.713
1708.6	1.6	13	1.5	43	263	1.7	23	2.8	65	300	1.2
1709.3	2.2	17	1.7	48	239	0.805	31	3.2	73	273	0.587
1710.0	1.2	12	1.3	52	241	1.1	18	2.4	79	276	0.786
1710.7	1.7	12	1.7	51	256	1.1	24	3.0	78	292	0.813
1711.4	1.5	11	1.7	41	215	0.898	21	3.1	62	245	0.655
1712.1	1.7	13	1.9	53	281	1.4	25	3.5	81	321	1.0
1712.8	1.5	15	1.3	51	241	0.951	21	2.3	79	275	0.694
1713.5	1.5	12	1.4	55	236	1.6	21	2.6	85	270	1.2
1714.2	1.4	11	1.2	51	246	1.2	20	2.2	78	282	0.843
1714.9	1.3	11	1.6	53	248	0.787	18	2.9	81	284	0.574
1715.6	1.9	13	1.8	52	267	1.2	28	3.3	80	305	0.851
1716.3	1.3	15	1.4	60	245	0.839	19	2.5	92	280	0.612
1717.0	1.3	14	1.2	57	229	0.953	19	2.1	88	262	0.695
1717.7	1.2	12	1.1	54	244	1.1	18	1.9	83	280	0.783
1718.4	1.9	12	1.1	54	252	0.815	28	1.9	83	289	0.595
1719.1	2.0	14	1.5	68	266	1.3	30	2.7	104	304	0.920
1719.8	1.2	13	1.2	61	238	1.1	17	2.2	94	272	0.773
1720.5	1.3	13	1.2	48	230	1.3	18	2.2	73	263	0.913
1721.2	1.8	12	1.3	57	246	1.3	25	2.3	87	281	0.982
1721.9	1.8	11	0.873	62	232	0.709	26	1.6	96	265	0.518
1722.6	1.3	12	1.2	60	260	0.934	19	2.1	93	297	0.681
1723.3	1.4	11	1.1	60	221	0.967	21	1.9	92	253	0.705
1724.0	1.2	13	0.497	60	269	0.587	17	0.906	92	308	0.428
1724.7	1.4	11	0.934	53	250	1.1	20	1.7	81	286	0.830
1725.4	1.4	12	0.791	53	238	0.660	21	1.4	81	273	0.481
1726.1	1.8	14	0.885	51	221	0.837	25	1.6	78	253	0.610
1726.8	2.1	14	1.1	53	268	1.0	31	1.9	82	307	0.766
1727.5	1.4	14	0.937	53	241	0.552	20	1.7	81	276	0.403
1728.2	1.4	11	0.822	48	260	0.851	20	1.5	73	297	0.621
1728.8	1.6	11	1.0	50	236	0.984	23	1.9	77	270	0.718
1729.5	1.3	15	0.731	46	244	0.620	19	1.3	71	279	0.453
1730.2	1.7	12	0.796	42	197	0.984	24	1.5	65	225	0.718
1730.9	1.1	10	0.445	46	256	0.961	15	0.812	71	293	0.701
1731.6	1.8	13	0.882	39	231	0.513	25	1.6	59	265	0.374
1732.3	2.2	12	0.807	42	232	0.793	31	1.5	64	265	0.579
1733.0	1.7	13	0.641	44	237	1.2	25	1.2	67	271	0.879
1733.7	1.3	13	0.501	42	269	0.527	19	0.914	64	308	0.384
1734.4	1.8	13	0.802	41	233	0.824	26	1.5	62	266	0.601
1735.1	1.4	12	0.592	36	239	0.632	20	1.1	55	273	0.461
1735.8	1.4	13	0.868	40	246	0.770	20	1.6	61	282	0.562
1736.5	2.4	14	0.616	47	260	0.606	35	1.1	72	297	0.442
1737.2	1.4	13	0.496	35	222	0.986	20	0.904	54	254	0.719
1737.9	1.1	11	0.837	34	243	1.1	15	1.5	52	277	0.794
1738.6	2.1	13	0.708	40	242	0.994	30	1.3	61	276	0.725
1739.3	1.8	14	0.681	37	249	0.864	26	1.2	56	285	0.630
1740.0	1.6	15	0.690	41	238	0.703	23	1.3	63	272	0.513
1740.7	1.5	12	0.551	37	223	0.556	22	1.0	57	255	0.405
1741.4	1.3	11	0.822	40	230	1.0	19	1.5	61	263	0.733
1742.1	1.9	12	0.409	32	229	0.808	27	0.746	50	262	0.590
1742.8	2.0	13	0.469	37	253	0.944	28	0.855	56	289	0.689
1743.5	1.6	12	0.685	32	236	0.752	23	1.2	50	270	0.549
1744.2	1.7	12	0.687	29	249	0.603	24	1.3	45	284	0.440
1744.9	1.9	11	0.565	31	243	0.663	28	1.0	47	278	0.484
1745.6	1.9	14	0.545	34	215	0.715	27	0.993	52	245	0.521
1746.3	1.5	15	0.735	35	226	0.902	21	1.3	53	258	0.658
1747.0	1.5	11	0.640	32	223	0.796	22	1.2	49	256	0.581
1747.7	1.7	11	0.644	33	294	0.941	24	1.2	51	336	0.687
1748.4	2.0	16	0.598	28	257	1.0	29	1.1	44	294	0.734
1749.1	1.9	14	0.681	35	260	0.611	27	1.2	54	297	0.446
1749.8	2.5	13	0.718	29	233	0.470	36	1.3	45	267	0.343
1750.5	1.6	12	0.560	31	241	0.772	23	1.0	47	275	0.563



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1751.2	1.3	13	0.654	27	238	0.934	19	1.2	42	272	0.682
1751.9	1.3	13	0.620	25	230	1.1	19	1.1	38	263	0.785
1752.6	1.4	12	0.493	27	214	1.2	20	0.899	41	245	0.851
1753.3	2.0	12	0.716	28	220	0.469	29	1.3	44	252	0.342
1754.0	1.4	15	0.821	25	266	1.2	21	1.5	38	304	0.899
1754.7	1.7	14	0.633	22	245	1.2	25	1.2	34	280	0.876
1755.4	1.1	14	0.821	23	239	1.1	16	1.5	35	273	0.799
1756.0	2.0	13	0.735	31	246	1.1	29	1.3	47	282	0.821
1756.7	1.7	12	0.766	25	245	1.2	24	1.4	38	281	0.871
1757.4	1.2	15	0.820	24	252	1.4	18	1.5	37	288	1.0
1758.1	1.7	15	0.759	24	243	1.0	24	1.4	37	278	0.747
1758.8	2.2	14	0.898	24	241	0.754	32	1.6	37	276	0.550
1759.5	1.7	13	0.769	23	248	1.5	25	1.4	36	284	1.1
1760.2	1.2	13	0.875	21	221	0.700	17	1.6	32	253	0.511
1760.9	1.4	12	0.639	21	248	1.4	21	1.2	33	283	1.0
1761.6	1.8	12	0.686	23	243	0.822	26	1.3	36	277	0.600
1762.3	1.7	12	0.505	23	250	0.820	25	0.921	35	286	0.598
1763.0	1.2	13	0.797	21	261	1.5	18	1.5	32	298	1.1
1763.7	1.5	12	0.709	21	249	1.6	21	1.3	33	285	1.1
1764.4	1.6	14	0.625	23	253	1.9	23	1.1	36	289	1.4
1765.1	1.6	15	0.643	22	264	1.6	23	1.2	34	302	1.2
1765.8	1.1	12	0.508	18	234	1.1	17	0.926	28	268	0.802
1766.5	1.8	11	0.608	16	230	1.5	26	1.1	25	263	1.1
1767.2	1.4	12	0.579	19	248	0.955	20	1.1	30	284	0.697
1767.9	1.1	12	0.811	22	246	1.5	15	1.5	33	281	1.1
1768.6	1.3	13	0.541	20	236	0.892	19	0.986	30	270	0.651
1769.3	1.8	14	0.585	16	228	0.722	26	1.1	24	261	0.526
1770.0	1.4	13	0.593	15	264	1.6	20	1.1	23	302	1.2
1770.7	1.1	13	0.627	19	263	1.3	16	1.1	29	301	0.916
1771.4	1.9	9.8	0.550	17	227	0.843	27	1.0	26	260	0.615
1772.1	1.2	12	0.578	17	244	1.5	18	1.1	26	279	1.1
1772.8	1.2	12	0.715	20	264	2.1	17	1.3	31	302	1.5
1773.5	1.2	11	0.466	16	264	2.4	17	0.849	24	302	1.7
1774.2	1.5	12	0.526	15	236	0.827	22	0.959	22	270	0.603
1774.9	1.0	12	0.580	18	241	1.5	15	1.1	28	275	1.1
1775.6	1.0	13	0.774	19	264	1.3	15	1.4	29	302	0.947
1776.3	1.5	12	0.569	16	231	1.3	22	1.0	24	264	0.980
1777.0	1.1	11	0.770	17	255	1.3	15	1.4	26	292	0.973
1777.7	1.4	11	0.528	19	265	1.5	20	0.962	29	304	1.1
1778.4	0.919	13	0.621	18	239	1.1	13	1.1	27	274	0.804
1779.1	1.7	11	0.583	18	246	1.6	24	1.1	28	281	1.2
1779.8	0.942	12	0.723	19	257	0.996	14	1.3	29	294	0.727
1780.5	0.797	10	0.833	20	226	1.3	12	1.5	31	258	0.945
1781.2	0.802	12	0.552	20	245	1.6	12	1.0	31	280	1.2
1781.9	1.7	12	0.962	24	244	1.1	24	1.8	36	279	0.804
1782.6	1.6	12	0.662	23	228	1.4	24	1.2	36	261	1.0
1783.2	1.4	11	0.711	23	235	1.1	20	1.3	35	269	0.794
1783.9	0.915	11	0.631	20	279	1.5	13	1.2	31	319	1.1
1784.6	0.818	12	0.920	27	256	0.962	12	1.7	42	293	0.702
1785.3	1.5	12	0.755	26	252	1.0	21	1.4	39	288	0.759
1786.0	0.859	12	0.797	27	232	0.664	12	1.5	42	266	0.484
1786.7	1.4	10	0.863	27	237	1.4	21	1.6	42	271	1.0
1787.4	1.5	9.6	0.775	30	213	1.3	22	1.4	46	244	0.944
1788.1	1.4	9.4	1.0	24	236	1.4	20	1.9	37	270	1.0
1788.8	1.6	12	0.662	30	287	1.3	24	1.2	46	328	0.944
1789.5	0.886	10	0.783	28	211	0.838	13	1.4	43	242	0.611
1790.2	1.6	10	0.584	28	190	1.1	24	1.1	43	217	0.783
1790.9	1.6	11	1.1	32	254	1.9	23	2.1	50	291	1.4
1791.6	1.1	13	1.0	35	246	1.1	17	1.9	53	281	0.811
1792.3	1.3	12	0.724	37	223	1.2	19	1.3	57	255	0.859
1793.0	1.6	13	0.695	40	264	1.4	23	1.3	62	302	1.0
1793.7	1.3	11	0.747	37	233	0.856	18	1.4	57	267	0.625
1794.4	1.2	12	0.804	35	223	0.738	18	1.5	53	255	0.538
1795.1	1.6	12	1.000	36	226	0.775	23	1.8	55	259	0.566
1795.8	1.8	11	0.901	38	235	0.910	26	1.6	58	269	0.664
1796.5	1.0	9.8	0.670	34	231	0.917	15	1.2	52	265	0.669
1797.2	1.3	11	0.786	30	200	0.572	18	1.4	47	228	0.417
1797.9	1.6	13	0.986	39	245	1.4	23	1.8	60	280	1.0
1798.6	1.8	13	0.755	40	237	0.932	26	1.4	61	271	0.680
1799.3	1.4	12	0.666	42	196	0.577	20	1.2	64	224	0.421
1800.0	1.5	12	0.797	38	226	1.4	22	1.5	58	258	1.1
1800.7	1.5	12	0.583	38	255	0.776	21	1.1	58	292	0.566
1801.4	1.3	13	0.996	32	247	1.000	19	1.8	49	282	0.730
1802.1	1.2	14	0.765	37	192	0.369	17	1.4	57	220	0.269
1802.8	1.5	12	0.672	47	234	1.4	21	1.2	73	268	1.0
1803.5	1.6	13	0.457	41	230	1.6	23	0.833	63	264	1.1
1804.2	1.6	15	0.806	41	265	0.822	23	1.5	63	303	0.600
1804.9	2.0	14	1.1	45	238	1.7	29	2.0	69	272	1.3
1805.6	1.9	15	1.0	41	212	0.901	28	1.8	62	243	0.658
1806.3	1.7	11	0.875	54	232	1.3	24	1.6	82	265	0.943
1807.0	1.8	12	0.830	37	227	0.798	26	1.5	56	260	0.582



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Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1807.7	2.4	12	0.804	38	227	1.1	34	1.5	58	259	0.802
1808.4	2.5	12	0.643	44	207	0.753	36	1.2	68	237	0.550
1809.1	1.7	14	0.823	46	259	0.871	24	1.5	70	296	0.636
1809.7	1.4	13	0.930	43	231	0.904	21	1.7	66	264	0.660
1810.4	1.7	14	0.998	39	236	0.903	25	1.8	60	269	0.659
1811.1	1.8	12	1.0	36	230	1.4	26	1.9	55	263	0.986
1811.8	1.9	14	0.925	41	249	1.7	28	1.7	63	285	1.2
1812.5	1.8	16	0.841	45	225	0.982	26	1.5	69	257	0.717
1813.2	1.7	12	0.669	42	216	1.2	25	1.2	64	247	0.877
1813.9	2.0	12	0.860	35	275	1.6	29	1.6	54	315	1.2
1814.6	1.4	12	0.895	33	240	0.947	20	1.6	51	274	0.691
1815.3	1.8	16	0.802	41	247	1.5	26	1.5	62	283	1.1
1816.0	1.6	12	0.600	29	191	1.3	24	1.1	45	218	0.913
1816.7	1.7	13	0.698	33	247	1.0	24	1.3	50	282	0.763
1817.4	1.2	14	0.728	34	231	1.1	18	1.3	53	264	0.796
1818.1	2.0	12	0.597	30	205	0.823	28	1.1	45	234	0.600
1818.8	1.7	12	0.411	30	210	0.911	25	0.750	46	241	0.665
1819.5	1.4	9.7	0.734	34	219	1.1	21	1.3	52	251	0.768
1820.2	1.5	13	0.797	32	215	0.620	21	1.5	49	245	0.453
1820.9	1.5	13	0.733	30	229	0.951	22	1.3	46	262	0.694
1821.6	1.3	14	0.584	33	244	1.5	18	1.1	51	279	1.1
1822.3	2.1	11	1.0	30	237	0.717	30	1.8	46	270	0.523
1823.0	1.8	12	0.779	26	253	1.5	25	1.4	39	289	1.1
1823.7	2.2	12	0.698	28	239	1.1	31	1.3	43	273	0.831
1824.4	2.2	13	0.609	30	238	1.3	31	1.1	45	273	0.914
1825.1	1.3	11	0.798	23	233	1.2	18	1.5	35	266	0.873
1825.8	1.7	11	1.0	26	217	1.4	25	1.8	40	248	1.0
1826.5	1.5	9.3	1.0	28	291	1.2	22	1.8	43	333	0.870
1827.2	1.4	12	0.874	29	248	1.5	20	1.6	44	283	1.1
1827.9	1.5	12	0.886	26	237	1.2	22	1.6	40	271	0.847
1828.6	1.1	13	0.798	29	225	1.4	16	1.5	45	258	1.0
1829.3	1.3	11	0.659	28	230	0.922	18	1.2	43	263	0.672
1830.0	1.1	11	0.937	24	227	1.0	16	1.7	37	259	0.734
1830.7	0.894	13	1.1	28	264	1.2	13	2.1	42	301	0.848
1831.4	0.480	12	0.832	25	229	1.1	6.9	1.5	38	262	0.768
1832.1	1.4	14	1.2	31	277	0.883	20	2.1	48	317	0.644
1832.8	1.1	9.7	0.726	22	206	1.5	15	1.3	33	235	1.1
1833.5	1.2	9.9	1.2	26	250	1.2	18	2.1	40	286	0.846
1834.2	1.2	12	1.4	26	229	2.0	18	2.5	40	262	1.5
1834.9	0.816	14	0.804	32	246	1.4	12	1.5	49	282	1.0
1835.6	0.910	10	1.2	29	221	1.1	13	2.2	44	253	0.784
1836.2	1.4	10	0.991	27	234	0.949	21	1.8	42	268	0.692
1836.9	1.4	11	1.0	27	239	1.3	20	1.8	42	274	0.936
1837.6	1.0	11	0.934	28	216	1.5	15	1.7	43	247	1.1
1838.3	0.641	10	1.4	28	246	1.9	9.3	2.5	43	282	1.4
1839.0	1.5	13	1.1	33	242	1.2	21	2.1	51	276	0.887
1839.7	1.5	11	0.792	30	210	1.2	21	1.4	46	241	0.853
1840.4	1.3	12	1.0	26	225	1.5	19	1.9	40	257	1.1
1841.1	1.5	12	1.2	35	221	1.3	21	2.2	53	253	0.913
1841.8	1.5	13	1.3	49	237	0.970	22	2.3	75	271	0.708
1842.5	1.1	11	1.0	35	238	1.8	16	1.9	54	272	1.3
1843.2	0.684	10	1.1	33	214	1.0	9.9	2.0	51	244	0.765
1843.9	1.3	12	0.835	39	250	1.3	18	1.5	60	286	0.968
1844.6	1.4	12	1.1	39	226	1.0	20	2.1	59	258	0.739
1845.3	1.6	14	1.1	42	210	1.0	24	2.0	64	240	0.737
1846.0	0.858	12	0.995	39	197	0.949	12	1.8	59	225	0.693
1846.7	0.999	12	1.0	42	263	1.1	14	1.8	65	301	0.837
1847.4	0.895	11	1.4	38	243	1.5	13	2.5	58	278	1.1
1848.1	1.5	13	1.3	42	234	1.5	21	2.3	64	267	1.1
1848.8	0.948	12	1.1	45	232	1.0	14	2.0	69	265	0.749
1849.5	1.1	12	1.3	43	226	0.896	15	2.3	65	258	0.654
1850.2	1.5	10	1.2	43	234	0.566	21	2.3	66	268	0.413
1850.9	1.1	15	1.1	48	229	0.880	16	1.9	73	262	0.642
1851.6	1.3	12	1.0	42	224	0.931	18	1.8	65	256	0.679
1852.3	1.7	12	1.3	51	221	0.931	24	2.4	78	252	0.680
1853.0	1.4	13	0.681	41	210	0.731	20	1.2	63	240	0.533
1853.7	1.1	11	0.912	50	256	1.1	16	1.7	77	293	0.787
1854.4	1.8	9.9	0.890	48	215	1.1	25	1.6	74	245	0.767
1855.1	1.5	13	1.0	44	197	1.0	21	1.8	67	225	0.737
1855.8	1.5	11	0.925	47	216	0.325	21	1.7	73	247	0.237
1856.5	1.0	13	0.834	50	229	0.721	15	1.5	76	261	0.526
1857.2	1.0	12	0.954	44	205	0.964	15	1.7	68	235	0.703
1857.9	1.3	11	0.856	49	236	1.1	19	1.6	75	270	0.811
1858.6	1.4	12	0.664	48	213	1.2	20	1.2	74	244	0.890
1859.3	1.7	11	0.899	49	234	0.785	25	1.6	75	268	0.572
1860.0	0.680	12	0.786	47	253	0.833	9.8	1.4	72	289	0.607
1860.7	1.5	12	1.0	50	239	1.1	21	1.9	77	273	0.803
1861.4	1.3	13	0.826	49	225	1.1	19	1.5	75	258	0.797
1862.0	1.7	12	0.933	48	233	1.3	25	1.7	73	266	0.975
1862.7	1.3	12	0.672	47	224	0.802	18	1.2	72	256	0.585
1863.4	1.2	10	0.811	45	234	0.717	17	1.5	69	268	0.523



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Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1864.1	1.3	12	1.1	47	234	1.1	19	2.1	72	268	0.768
1864.8	1.2	14	0.749	49	239	1.2	17	1.4	75	273	0.873
1865.5	1.1	13	0.763	48	242	0.786	16	1.4	74	277	0.573
1866.2	1.3	13	0.811	44	202	1.0	19	1.5	68	231	0.751
1866.9	1.5	14	0.818	46	221	1.8	21	1.5	71	253	1.3
1867.6	0.734	12	0.967	45	227	0.773	11	1.8	69	260	0.564
1868.3	1.7	12	1.1	47	234	0.921	24	2.0	72	267	0.672
1869.0	1.9	14	0.841	40	198	1.3	28	1.5	62	226	0.939
1869.7	1.6	11	0.627	40	225	1.0	23	1.1	61	257	0.764
1870.4	0.737	11	0.756	36	232	1.1	11	1.4	55	265	0.779
1871.1	2.1	14	0.766	49	234	1.2	30	1.4	74	268	0.888
1871.8	1.3	12	1.0	42	212	1.1	19	1.9	64	242	0.830
1872.5	1.3	12	0.962	41	225	1.2	19	1.8	63	258	0.877
1873.2	1.2	13	1.2	46	246	0.953	18	2.1	71	282	0.696
1873.9	1.0	11	1.0	42	207	0.706	15	1.9	64	236	0.515
1874.6	1.8	14	1.3	47	251	1.5	25	2.3	72	287	1.1
1875.3	1.0	14	1.1	43	236	1.6	15	2.1	66	270	1.2
1876.0	1.3	13	0.948	44	228	0.724	19	1.7	67	261	0.528
1876.7	1.5	14	1.2	46	270	1.2	22	2.2	71	308	0.856
1877.4	1.7	14	1.0	46	268	0.845	25	1.9	70	306	0.617
1878.1	1.4	15	0.903	44	242	1.1	21	1.6	68	276	0.768
1878.8	1.2	11	0.810	43	217	1.1	17	1.5	66	248	0.809
1879.5	1.3	12	0.874	47	255	1.2	18	1.6	71	291	0.892
1880.2	1.7	12	0.872	41	222	0.698	24	1.6	64	253	0.509
1880.9	1.7	14	0.947	48	271	1.5	24	1.7	74	310	1.1
1881.6	1.4	14	0.758	42	234	1.6	20	1.4	64	267	1.2
1882.3	1.4	14	1.2	40	240	0.954	20	2.3	61	274	0.696
1883.0	1.3	14	0.994	43	231	0.981	19	1.8	66	264	0.716
1883.7	1.2	13	1.2	49	235	0.796	17	2.1	75	269	0.581
1884.4	1.4	13	1.4	48	252	1.3	21	2.6	74	289	0.937
1885.1	1.7	13	1.1	43	241	0.931	25	2.1	66	276	0.679
1885.8	1.1	11	1.0	45	230	1.6	15	1.9	69	263	1.2
1886.5	1.4	12	1.2	47	236	0.848	20	2.1	72	270	0.619
1887.2	1.7	13	1.0	46	231	0.724	25	1.8	70	264	0.529
1887.9	1.4	14	1.3	43	241	1.4	20	2.3	65	276	0.988
1888.6	1.3	12	1.1	46	245	1.2	19	2.0	71	280	0.854
1889.2	1.2	11	1.3	46	238	1.0	17	2.3	70	273	0.754
1889.9	1.3	12	1.2	41	226	0.662	19	2.2	63	258	0.483
1890.6	1.4	12	1.8	39	242	0.990	20	3.2	60	277	0.723
1891.3	1.4	15	1.8	46	250	0.858	20	3.3	70	285	0.626
1892.0	1.4	12	1.2	43	226	0.833	20	2.3	66	259	0.608
1892.7	1.4	15	1.5	43	255	1.3	20	2.7	67	291	0.936
1893.4	1.6	14	1.3	42	246	1.4	23	2.4	65	281	1.0
1894.1	1.6	12	1.4	47	241	1.9	23	2.5	73	275	1.4
1894.8	1.4	12	1.6	42	227	1.1	20	2.9	65	260	0.807
1895.5	1.6	13	1.4	43	236	1.5	22	2.6	66	270	1.1
1896.2	1.1	11	1.3	41	261	1.2	16	2.3	63	298	0.857
1896.9	1.2	12	1.2	37	249	1.3	18	2.2	57	285	0.960
1897.6	0.766	13	1.1	46	238	1.4	11	2.0	71	272	1.0
1898.3	1.0	12	1.4	39	228	1.7	15	2.6	60	261	1.3
1899.0	1.6	13	1.4	44	281	1.0	22	2.6	68	321	0.741
1899.7	1.0	11	1.2	41	241	1.4	15	2.2	64	275	1.0
1900.4	1.3	16	1.8	48	245	2.2	19	3.2	73	280	1.6
1901.1	1.2	10	1.5	40	224	1.5	17	2.8	61	256	1.1
1901.8	1.1	12	1.6	48	238	1.2	16	2.8	74	272	0.884
1902.5	1.3	11	1.9	38	228	1.2	19	3.4	58	261	0.867
1903.2	1.1	13	1.9	45	249	1.6	16	3.5	68	284	1.1
1903.9	1.1	13	1.8	40	224	1.2	16	3.2	61	256	0.882
1904.6	1.4	14	1.5	46	247	1.3	21	2.8	70	283	0.954
1905.3	1.1	12	1.8	50	256	2.5	16	3.4	77	292	1.8
1906.0	0.845	12	1.7	39	259	1.7	12	3.1	60	296	1.2
1906.7	1.6	12	1.5	45	262	1.0	22	2.8	69	299	0.743
1907.4	1.4	12	1.7	41	243	1.3	20	3.0	62	278	0.952
1908.1	0.512	11	1.8	41	237	0.899	7.4	3.2	63	272	0.656
1908.8	1.2	10	1.7	51	248	1.9	18	3.1	79	284	1.4
1909.5	1.2	11	1.8	45	289	1.4	17	3.3	69	330	0.991
1910.2	0.673	11	1.8	47	255	0.617	9.7	3.2	73	291	0.450
1910.9	1.2	11	1.6	45	219	1.5	18	2.9	69	250	1.1
1911.6	0.643	12	1.7	59	261	1.8	9.3	3.1	90	298	1.3
1912.3	1.3	11	1.8	54	254	1.0	18	3.2	83	290	0.765
1913.0	1.0	10	1.9	48	251	1.1	15	3.4	74	287	0.778
1913.7	1.1	12	1.9	55	280	1.7	16	3.5	84	320	1.2
1914.4	0.607	13	1.7	59	279	0.709	8.8	3.1	91	319	0.518
1915.1	1.1	14	1.9	50	260	0.822	15	3.4	77	297	0.599
1915.7	0.952	12	1.5	57	239	0.578	14	2.7	88	273	0.422
1916.4	0.569	12	2.0	56	252	1.5	8.2	3.6	85	288	1.1
1917.1	0.959	12	1.8	51	247	1.4	14	3.3	78	282	0.987
1917.8	1.9	12	1.8	54	220	1.2	27	3.2	83	252	0.882
1918.5	1.3	12	1.8	52	229	1.4	19	3.3	80	262	1.0
1919.2	0.966	12	1.6	54	236	0.456	14	3.0	83	270	0.333
1919.9	1.4	11	1.8	46	217	0.974	20	3.2	71	248	0.711



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1920.6	0.960	12	1.5	57	234	0.933	14	2.8	87	267	0.681
1921.3	1.5	11	1.4	61	257	1.2	21	2.5	94	294	0.871
1922.0	0.972	15	1.4	56	246	1.4	14	2.6	86	281	1.0
1922.7	1.3	12	1.7	63	276	0.863	19	3.0	96	316	0.630
1923.4	1.4	12	1.5	64	237	0.877	20	2.8	97	271	0.640
1924.1	1.1	14	1.7	66	247	1.2	16	3.1	101	282	0.905
1924.8	0.729	12	1.3	59	223	0.889	11	2.4	90	255	0.648
1925.5	0.790	9.5	1.6	74	249	1.2	11	2.8	113	285	0.839
1926.2	1.0	12	1.1	64	250	1.2	15	2.0	99	286	0.876
1926.9	0.763	13	1.4	76	249	0.522	11	2.6	116	285	0.381
1927.6	1.7	13	1.3	70	256	1.5	25	2.3	107	292	1.1
1928.3	1.0	11	1.3	70	230	0.690	15	2.4	107	263	0.503
1929.0	0.612	13	1.2	54	216	0.528	8.8	2.1	83	247	0.385
1929.7	0.885	13	1.5	72	243	1.0	13	2.8	110	278	0.749
1930.4	1.1	14	1.3	74	250	1.2	16	2.4	113	286	0.866
1931.1	0.914	13	1.2	70	264	1.2	13	2.1	108	302	0.901
1931.8	1.5	13	1.1	66	210	0.862	22	2.1	102	241	0.629
1932.5	2.0	13	1.0	70	237	1.2	29	1.9	107	271	0.854
1933.2	1.3	13	1.0	69	267	0.544	19	1.9	105	305	0.397
1933.9	1.6	11	1.1	68	221	1.2	23	2.0	104	253	0.882
1934.6	1.3	13	0.734	67	261	0.648	19	1.3	103	299	0.473
1935.3	1.3	13	1.1	79	245	0.762	18	2.1	121	280	0.556
1936.0	1.7	11	0.792	66	249	0.737	24	1.4	101	285	0.538
1936.7	1.5	13	1.2	83	286	0.779	22	2.2	127	326	0.568
1937.4	2.2	13	1.2	73	251	0.807	32	2.1	112	287	0.589
1938.1	1.4	15	1.3	81	259	1.1	20	2.3	124	296	0.790
1938.8	1.4	14	0.768	79	286	0.865	20	1.4	121	326	0.631
1939.5	1.5	17	0.659	70	226	0.741	21	1.2	107	258	0.541
1940.2	1.7	12	0.868	67	270	0.705	24	1.6	102	309	0.515
1940.9	1.1	14	0.562	69	220	1.0	16	1.0	106	252	0.735
1941.5	1.7	17	1.0	100	287	0.592	25	1.9	153	329	0.432
1942.2	1.5	13	0.647	77	245	0.742	21	1.2	118	280	0.542
1942.9	1.6	13	0.864	63	222	0.574	23	1.6	97	254	0.418
1943.6	0.805	14	0.809	71	265	0.783	12	1.5	109	303	0.571
1944.3	1.9	17	0.743	72	286	0.791	27	1.4	111	328	0.577
1945.0	1.5	16	0.611	83	273	1.2	21	1.1	127	312	0.872
1945.7	0.788	14	0.757	67	220	0.792	11	1.4	103	252	0.578
1946.4	1.2	11	0.921	73	270	0.723	17	1.7	111	309	0.528
1947.1	1.1	12	0.742	68	272	0.648	16	1.4	105	311	0.473
1947.8	1.0	13	0.728	71	230	0.357	15	1.3	108	263	0.261
1948.5	1.5	14	0.586	77	245	1.1	22	1.1	119	280	0.767
1949.2	1.7	12	0.698	73	268	0.757	25	1.3	112	307	0.552
1949.9	1.1	11	0.673	62	238	0.759	16	1.2	95	272	0.553
1950.6	1.3	13	0.807	74	260	0.656	18	1.5	113	297	0.479
1951.3	1.8	11	0.657	82	210	0.568	27	1.2	125	240	0.414
1952.0	0.897	12	0.646	75	227	0.697	13	1.2	114	259	0.509
1952.7	1.7	12	0.635	72	236	0.743	25	1.2	110	270	0.542
1953.4	1.3	12	0.723	78	235	0.491	19	1.3	119	269	0.358
1954.1	1.1	11	0.575	65	241	0.618	17	1.0	100	276	0.451
1954.8	1.2	12	0.795	78	249	0.972	17	1.5	120	285	0.709
1955.5	0.896	12	0.585	65	218	0.698	13	1.1	100	249	0.510
1956.2	1.3	11	0.669	68	236	1.0	19	1.2	105	269	0.733
1956.9	1.1	12	0.731	72	283	0.903	16	1.3	110	323	0.659
1957.6	1.7	14	0.761	76	263	0.548	25	1.4	117	300	0.400
1958.3	1.6	14	0.811	73	253	0.914	23	1.5	112	289	0.667
1959.0	1.7	15	0.627	69	262	0.523	25	1.1	106	299	0.382
1959.7	1.6	13	0.688	68	267	0.805	23	1.3	105	305	0.587
1960.4	1.6	13	0.636	61	224	0.687	23	1.2	94	256	0.501
1961.1	1.4	16	0.772	76	243	1.0	20	1.4	117	278	0.751
1961.8	1.3	16	0.886	67	230	1.1	19	1.6	103	263	0.833
1962.5	1.6	17	1.0	78	279	0.854	23	1.9	120	319	0.623
1963.2	1.6	14	0.597	69	249	1.0	23	1.1	106	285	0.744
1963.9	1.2	13	0.964	76	240	0.883	17	1.8	116	275	0.644
1964.6	1.4	16	0.760	91	266	1.2	20	1.4	139	305	0.901
1965.3	1.9	13	0.768	78	240	0.542	27	1.4	119	275	0.395
1966.0	1.5	16	0.755	63	253	1.2	22	1.4	97	289	0.876
1966.7	2.0	14	0.856	68	231	0.551	28	1.6	104	264	0.402
1967.3	1.9	14	0.925	76	262	0.973	27	1.7	116	299	0.710
1968.0	1.3	16	0.595	64	251	1.1	19	1.1	98	287	0.798
1968.7	2.1	16	0.821	67	254	1.2	30	1.5	102	291	0.883
1969.4	2.1	17	0.610	66	272	0.667	30	1.1	102	310	0.486
1970.1	1.9	16	0.888	63	239	0.876	28	1.6	96	273	0.639
1970.8	1.5	15	0.989	66	265	1.4	21	1.8	101	303	1.1
1971.5	1.7	16	0.896	62	269	1.3	25	1.6	95	307	0.949
1972.2	1.8	16	0.721	53	233	0.891	26	1.3	81	266	0.650
1972.9	1.5	17	0.788	60	283	1.4	21	1.4	92	324	1.1
1973.6	1.7	20	0.875	63	256	1.4	24	1.6	97	292	1.0
1974.3	1.9	19	0.984	64	249	0.775	28	1.8	97	285	0.565
1975.0	1.9	17	0.994	52	283	1.3	27	1.8	79	323	0.963
1975.7	1.6	16	1.1	62	273	1.2	23	2.0	95	312	0.854
1976.4	2.1	16	0.944	59	249	1.6	30	1.7	90	285	1.1



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1977.1	2.3	17	1.1	55	254	0.772	33	1.9	84	291	0.563
1977.8	1.6	16	1.0	54	264	1.1	24	1.8	83	302	0.823
1978.5	1.3	14	1.0	50	221	1.1	19	1.9	77	253	0.810
1979.2	1.5	16	1.3	53	255	1.7	22	2.3	81	292	1.2
1979.9	1.4	15	1.1	57	242	0.862	20	2.0	87	277	0.629
1980.6	2.1	18	1.2	50	286	1.2	30	2.1	77	327	0.876
1981.3	2.0	15	1.1	48	237	1.3	29	2.0	74	271	0.955
1982.0	1.5	15	0.953	49	255	0.760	21	1.7	75	291	0.554
1982.7	1.9	15	1.2	48	248	0.475	27	2.1	73	284	0.347
1983.4	1.8	15	1.2	53	247	0.905	26	2.2	82	283	0.660
1984.1	1.6	16	1.7	46	234	0.959	23	3.2	71	268	0.699
1984.8	1.5	15	1.4	55	240	1.1	21	2.6	84	275	0.780
1985.5	1.6	14	1.5	41	226	1.3	23	2.7	63	259	0.935
1986.2	1.4	14	1.5	49	279	1.2	21	2.7	75	319	0.851
1986.9	2.5	14	1.3	52	269	1.2	36	2.4	80	308	0.893
1987.6	1.2	12	1.4	42	245	0.947	18	2.6	65	280	0.691
1988.3	1.3	12	1.4	36	218	1.2	18	2.5	55	249	0.887
1989.0	1.9	15	1.8	48	280	1.5	27	3.2	74	320	1.1
1989.7	1.2	15	1.6	45	234	1.8	18	2.9	69	268	1.3
1990.4	1.1	14	1.8	41	226	1.3	16	3.2	64	259	0.921
1991.1	2.3	12	1.7	44	258	1.4	33	3.2	68	295	1.0
1991.8	1.4	15	1.5	42	244	1.7	20	2.7	64	279	1.2
1992.5	1.5	14	1.8	37	252	0.880	21	3.3	56	288	0.642
1993.2	2.1	12	1.5	41	268	2.2	31	2.7	63	307	1.6
1993.8	1.5	12	1.9	37	255	2.0	21	3.5	57	292	1.5
1994.5	1.8	13	1.4	39	232	1.5	25	2.6	60	265	1.1
1995.2	1.7	13	2.1	39	241	0.800	25	3.8	59	276	0.583
1995.9	1.3	13	1.7	55	272	1.5	19	3.2	85	311	1.1
1996.6	1.3	14	2.0	35	234	1.8	18	3.7	53	268	1.3
1997.3	0.977	13	2.1	36	251	1.8	14	3.9	55	287	1.3
1998.0	1.2	13	1.9	36	251	1.3	18	3.5	55	287	0.959
1998.7	1.2	11	2.3	32	202	1.4	17	4.1	49	231	1.0
1999.4	1.8	14	2.1	41	250	1.6	26	3.9	63	286	1.1
2000.1	0.759	13	1.6	37	256	1.4	11	3.0	57	293	1.0
2000.8	1.5	13	2.3	38	280	2.1	22	4.3	58	320	1.6
2001.5	1.3	12	2.1	29	253	0.921	19	3.8	45	290	0.672
2002.2	0.767	11	2.0	32	242	1.8	11	3.7	49	277	1.3
2002.9	1.0	12	2.2	38	278	1.4	15	4.0	58	318	1.1
2003.6	0.738	12	2.3	32	223	1.3	11	4.2	50	255	0.974
2004.3	1.2	11	2.3	43	227	1.4	17	4.2	67	260	1.0
2005.0	1.0	11	2.5	33	284	1.3	15	4.6	51	325	0.925
2005.7	0.945	13	2.6	40	250	2.0	14	4.8	61	286	1.5
2006.4	1.8	12	2.3	37	283	1.6	25	4.1	56	323	1.2
2007.1	1.6	12	2.0	35	242	2.6	22	3.6	54	277	1.9
2007.8	0.828	12	2.6	37	237	2.4	12	4.7	57	271	1.8
2008.5	1.0	14	2.0	41	269	1.8	15	3.7	63	308	1.3
2009.2	0.939	12	2.1	43	244	1.7	14	3.9	66	279	1.2
2009.9	1.5	10	2.6	44	257	2.1	22	4.8	67	294	1.5
2010.6	0.929	11	2.2	40	248	2.0	13	4.0	62	284	1.5
2011.3	1.1	11	2.8	41	217	1.2	16	5.1	63	248	0.891
2012.0	0.633	13	2.8	41	255	1.6	9.1	5.1	63	292	1.1
2012.7	1.1	10	2.5	36	239	1.7	16	4.6	56	273	1.2
2013.4	0.801	12	2.4	40	236	1.6	12	4.4	61	270	1.2
2014.1	0.721	11	2.3	41	243	1.9	10	4.3	63	277	1.4
2014.8	1.2	13	2.5	52	251	1.7	17	4.6	80	287	1.2
2015.5	0.846	11	2.4	40	230	1.3	12	4.3	61	263	0.915
2016.2	1.3	12	2.4	40	271	2.0	19	4.4	62	310	1.5
2016.9	1.1	12	2.3	45	242	2.0	16	4.2	69	276	1.5
2017.6	1.8	10	2.1	44	227	2.6	26	3.9	67	259	1.9
2018.3	1.1	11	2.6	42	218	1.9	16	4.7	64	249	1.4
2019.0	1.0	9.5	2.5	38	241	1.7	15	4.6	58	276	1.3
2019.7	1.7	12	2.9	40	268	1.7	25	5.3	62	307	1.3
2020.3	1.2	10	2.4	53	255	1.9	17	4.3	81	291	1.4
2021.0	0.926	9.6	2.4	49	266	2.0	13	4.4	75	304	1.5
2021.7	1.1	10	2.5	48	242	1.9	16	4.5	74	277	1.4
2022.4	0.778	11	2.5	46	247	1.7	11	4.5	70	283	1.3
2023.1	1.6	11	2.4	48	223	1.6	22	4.3	74	255	1.2
2023.8	1.1	11	2.3	48	236	1.9	16	4.1	74	269	1.4
2024.5	0.963	12	2.5	51	241	2.1	14	4.6	78	275	1.5
2025.2	0.613	10.0	2.0	44	238	1.2	8.8	3.7	68	273	0.866
2025.9	0.609	11	2.2	39	233	1.3	8.8	4.0	59	267	0.938
2026.6	0.926	9.8	2.4	46	281	2.2	13	4.5	70	321	1.6
2027.3	1.2	11	2.4	52	244	1.4	18	4.3	80	279	0.996
2028.0	0.772	12	2.2	50	236	1.5	11	3.9	77	270	1.1
2028.7	1.2	10	1.9	41	233	1.7	18	3.4	63	266	1.3
2029.4	1.4	11	2.0	49	235	0.979	20	3.6	75	269	0.714
2030.1	0.984	9.2	1.7	46	266	1.5	14	3.1	70	304	1.1
2030.8	1.2	11	2.2	57	255	1.2	17	4.1	88	292	0.906
2031.5	1.3	11	1.8	55	245	2.0	19	3.2	85	280	1.5
2032.2	1.2	12	2.3	50	255	0.775	17	4.3	77	291	0.566
2032.9	1.1	10	1.7	43	267	1.7	15	3.2	66	305	1.2



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2033.6	0.632	11	1.5	50	254	1.4	9.1	2.8	76	290	0.988
2034.3	1.7	11	1.7	54	229	1.0	25	3.1	83	262	0.744
2035.0	0.773	9.1	1.6	56	218	1.6	11	3.0	86	250	1.1
2035.7	1.4	9.7	1.6	51	244	1.2	21	3.0	78	279	0.841
2036.4	1.3	10	1.9	44	248	0.893	18	3.4	68	283	0.652
2037.1	1.1	11	1.3	57	238	1.3	16	2.5	88	273	0.936
2037.8	1.1	10	1.6	54	255	1.5	15	2.9	84	292	1.1
2038.5	1.4	11	1.6	53	257	1.9	21	2.9	82	294	1.4
2039.2	1.8	12	1.2	59	262	1.3	27	2.3	91	299	0.928
2039.9	1.3	11	1.3	56	251	1.5	19	2.4	85	288	1.1
2040.6	1.0	13	1.1	54	227	1.2	14	2.0	84	259	0.911
2041.3	1.3	10	1.5	58	255	1.4	18	2.8	89	292	1.0
2042.0	0.924	9.7	1.4	55	267	0.811	13	2.6	84	305	0.592
2042.7	1.1	9.9	1.2	62	237	1.1	16	2.3	94	271	0.781
2043.4	1.2	10	1.4	63	263	1.0	17	2.6	96	301	0.736
2044.1	1.0	9.6	1.2	61	253	0.988	15	2.1	94	289	0.721
2044.8	1.5	12	1.3	74	278	1.2	21	2.3	114	318	0.888
2045.5	0.579	12	1.4	62	257	1.0	8.4	2.6	94	294	0.737
2046.1	1.0	10	1.4	62	253	1.1	15	2.6	95	289	0.839
2046.8	1.3	10	1.2	64	314	1.3	19	2.2	99	359	0.922
2047.5	1.1	12	1.2	68	235	0.781	16	2.2	105	268	0.570
2048.2	1.3	11	1.4	74	258	1.4	19	2.6	113	295	1.0
2048.9	1.4	11	1.5	67	322	1.0	21	2.7	103	368	0.765
2049.6	1.5	13	1.3	70	282	0.699	22	2.3	107	323	0.510
2050.3	1.5	11	1.1	71	247	1.0	22	2.1	109	282	0.755
2051.0	1.7	13	1.2	69	236	0.970	24	2.1	105	270	0.708
2051.7	1.5	12	1.000	70	245	0.916	22	1.8	107	280	0.668
2052.4	1.2	11	1.1	71	272	1.6	18	2.1	109	310	1.1
2053.1	2.3	11	1.1	71	241	0.602	34	1.9	108	276	0.439
2053.8	1.7	11	1.1	71	270	1.4	25	1.9	109	309	1.0
2054.5	1.3	13	1.1	66	228	0.959	19	2.0	101	261	0.699
2055.2	1.8	13	0.929	74	255	0.722	26	1.7	113	292	0.527
2055.9	1.8	11	1.0	71	246	0.813	26	1.9	109	281	0.593
2056.6	1.3	12	1.2	69	247	1.4	19	2.2	106	282	0.992
2057.3	1.7	12	0.943	75	248	1.1	25	1.7	115	283	0.801
2058.0	1.7	13	0.734	66	255	1.5	25	1.3	102	292	1.1
2058.7	1.3	12	0.891	74	242	0.856	19	1.6	113	277	0.625
2059.4	1.5	15	1.1	73	246	0.875	21	2.0	112	281	0.639
2060.1	0.720	14	1.1	69	235	0.781	10	2.0	106	269	0.570
2060.8	1.3	11	1.2	81	279	0.811	19	2.2	124	319	0.592
2061.5	1.2	11	0.939	57	219	1.3	17	1.7	87	251	0.946
2062.2	1.2	14	0.857	72	257	0.912	18	1.6	110	294	0.666
2062.9	1.8	14	1.4	68	230	0.550	26	2.5	104	263	0.401
2063.6	1.5	13	1.2	72	245	0.869	21	2.2	110	280	0.634
2064.3	2.0	11	1.2	85	249	1.0	29	2.2	131	285	0.746
2065.0	1.5	11	1.1	72	251	0.497	22	2.0	110	287	0.362
2065.7	1.7	11	1.2	59	231	1.2	24	2.2	90	264	0.881
2066.4	1.6	12	1.2	70	271	1.2	23	2.2	108	310	0.892
2067.1	2.1	14	1.2	70	245	0.598	30	2.2	108	280	0.436
2067.8	1.8	12	1.1	79	262	1.1	26	2.0	121	299	0.836
2068.5	1.9	13	1.2	70	237	1.1	28	2.3	108	271	0.827
2069.2	1.4	13	1.2	65	211	1.1	21	2.3	99	242	0.805
2069.9	2.2	14	1.4	72	254	0.680	32	2.6	111	290	0.496
2070.6	1.9	13	1.2	68	227	0.863	28	2.2	105	260	0.630
2071.3	1.3	9.5	1.2	72	255	1.2	19	2.2	110	291	0.887
2072.0	1.3	12	1.1	59	245	0.840	18	2.0	91	281	0.613
2072.6	1.6	11	1.3	61	220	0.966	23	2.3	94	251	0.705
2073.3	1.6	12	1.5	65	259	1.1	23	2.7	99	296	0.827
2074.0	1.1	13	1.1	67	246	0.875	16	2.1	102	282	0.638
2074.7	1.2	13	1.0	62	236	0.794	18	1.9	95	269	0.579
2075.4	2.0	13	1.2	71	233	1.2	29	2.2	109	266	0.874
2076.1	2.1	12	1.4	70	255	1.2	30	2.5	107	292	0.908
2076.8	2.3	14	1.0	72	257	1.0	34	1.9	110	294	0.754
2077.5	1.0	14	1.2	59	215	0.623	14	2.2	90	246	0.455
2078.2	1.7	16	1.1	68	276	1.1	24	2.0	104	315	0.803
2078.9	1.5	16	1.4	58	243	1.1	22	2.5	89	278	0.815
2079.6	1.7	16	1.0	55	265	1.2	25	1.9	84	302	0.903
2080.3	1.3	16	1.1	58	238	1.0	19	2.1	89	272	0.731
2081.0	1.6	15	1.2	48	252	0.970	23	2.2	73	288	0.707
2081.7	1.0	15	1.1	59	250	1.1	15	2.0	91	286	0.780
2082.4	2.1	17	1.1	57	256	2.2	30	2.1	88	293	1.6
2083.1	1.2	17	1.3	54	238	1.2	18	2.3	82	273	0.857
2083.8	1.6	15	1.1	50	255	0.911	23	2.1	77	291	0.664
2084.5	1.3	17	1.4	53	257	1.8	19	2.6	81	293	1.3
2085.2	1.3	15	1.4	48	269	1.4	18	2.5	74	308	1.1
2085.9	1.0	16	1.1	47	230	1.4	15	2.0	73	264	1.0
2086.6	1.2	15	1.1	49	259	2.0	17	2.0	75	296	1.5
2087.3	0.929	14	0.971	42	240	1.6	13	1.8	64	274	1.1
2088.0	1.7	16	1.4	44	252	1.3	24	2.5	68	288	0.914
2088.7	1.4	15	0.829	40	237	1.7	21	1.5	61	272	1.2
2089.4	1.5	15	1.2	43	257	1.7	22	2.1	66	293	1.2



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.097	0.295	0.139	1.5	0.001	0.005					
Length (µm)											
2090.1	1.0	15	1.4	43	263	1.7	15	2.6	66	301	1.2
2090.8	1.4	15	1.4	42	266	1.7	20	2.6	64	304	1.2
2091.5	1.4	16	1.3	43	259	1.3	21	2.4	66	296	0.951
2092.2	1.4	15	1.5	44	273	1.9	21	2.8	68	313	1.4
2092.9	1.6	15	1.5	42	255	1.2	23	2.7	64	292	0.908
2093.6	0.909	16	1.4	39	232	1.3	13	2.6	59	265	0.936
2094.3	1.5	14	1.1	37	251	0.837	21	2.0	56	288	0.611
2095.0	1.6	17	1.4	43	258	1.6	24	2.5	66	295	1.2
2095.7	1.4	18	1.5	43	294	1.7	20	2.8	65	336	1.2
2096.4	0.820	17	1.4	37	236	1.1	12	2.6	57	269	0.795
2097.1	1.4	15	1.4	40	265	1.9	21	2.5	61	303	1.4
2097.8	0.969	17	1.2	40	276	2.1	14	2.1	61	315	1.6
2098.4	1.0	16	1.2	40	262	1.3	15	2.2	61	300	0.954
2099.1	1.3	17	1.2	36	276	1.9	19	2.1	55	315	1.4
2099.8	1.2	16	1.2	37	243	1.6	17	2.1	57	278	1.1
2100.5	1.2	16	1.0	36	258	1.6	17	1.9	55	295	1.2
2101.2	0.812	16	1.4	45	268	1.5	12	2.6	68	307	1.1
2101.9	1.0	15	1.3	37	261	2.2	15	2.4	56	299	1.6
2102.6	1.6	17	0.985	42	276	0.903	24	1.8	64	316	0.659
2103.3	1.4	17	1.4	39	274	2.4	21	2.6	60	314	1.7
2104.0	0.939	18	1.0	38	291	1.1	14	1.8	58	333	0.809
2104.7	1.5	15	1.3	45	295	2.0	22	2.3	69	337	1.5
2105.4	1.2	16	1.6	38	251	1.0	17	3.0	59	287	0.738
2106.1	1.2	18	1.4	39	275	1.6	17	2.6	60	314	1.1
2106.8	1.4	14	1.3	38	259	1.9	20	2.4	58	296	1.4
2107.5	1.3	15	1.1	38	277	1.5	19	2.0	59	317	1.1
2108.2	0.806	16	1.2	41	249	1.8	12	2.2	62	285	1.3
2108.9	1.2	15	1.5	39	265	1.1	17	2.7	60	303	0.794
2109.6	1.1	16	1.0	38	262	1.3	16	1.9	59	300	0.961
2110.3	0.975	15	1.3	36	246	0.694	14	2.4	55	281	0.507
2111.0	0.944	16	1.7	45	272	1.8	14	3.0	69	311	1.3
2111.7	1.6	15	1.4	43	275	1.0	23	2.5	67	315	0.749
2112.4	1.2	16	1.3	44	288	1.1	18	2.3	67	329	0.796
2113.1	1.2	17	1.5	45	253	1.2	17	2.7	69	290	0.855
2113.8	1.0	19	1.4	45	295	1.7	15	2.5	69	337	1.3
2114.5	0.860	14	1.5	42	294	1.1	12	2.7	64	336	0.834
2115.2	1.3	17	1.1	41	283	1.0	19	2.0	63	324	0.740
2115.9	1.6	16	1.1	44	301	1.3	23	2.1	68	345	0.941
2116.6	1.1	16	1.3	42	281	1.0	16	2.4	64	321	0.762
2117.3	1.6	15	1.3	42	279	1.2	23	2.3	64	319	0.906
2118.0	1.3	14	1.7	47	318	1.4	19	3.1	73	364	1.1
2118.7	1.7	15	1.5	48	372	1.3	25	2.7	73	425	0.955
2119.4	2.3	15	1.7	45	314	0.598	33	3.0	69	359	0.436
2120.1	1.6	16	1.2	49	342	1.2	23	2.3	76	391	0.856
2120.8	1.2	16	1.3	48	344	1.2	17	2.3	74	394	0.862
2121.5	1.2	14	1.2	45	319	1.2	18	2.2	69	365	0.900
2122.2	2.0	17	1.3	52	400	1.4	29	2.3	80	457	1.0
2122.9	1.9	15	0.980	53	388	0.927	27	1.8	81	443	0.676
2123.6	1.8	15	1.2	46	400	1.8	26	2.2	71	458	1.3
2124.2	1.3	14	1.3	46	434	1.7	19	2.4	71	497	1.3
2124.9	1.8	13	1.6	48	480	1.4	27	2.9	73	549	1.0
2125.6	1.9	14	1.7	56	490	1.7	28	3.1	86	560	1.2
2126.3	2.0	13	1.2	52	446	1.4	30	2.2	80	510	0.990
2127.0	1.7	15	1.6	48	491	1.3	25	2.9	73	561	0.975
2127.7	2.8	16	1.3	57	526	1.2	41	2.4	87	601	0.874
2128.4	2.2	14	1.5	53	486	1.6	31	2.7	81	556	1.2
2129.1	1.9	14	1.6	58	558	1.6	27	2.9	89	638	1.2
2129.8	2.6	16	1.9	60	575	1.8	38	3.5	91	657	1.3
2130.5	2.3	15	1.4	60	581	1.1	33	2.6	92	664	0.792
2131.2	2.2	14	1.4	56	623	1.6	32	2.5	86	713	1.1
2131.9	2.7	14	1.5	60	612	2.0	38	2.8	92	700	1.4
2132.6	2.8	15	1.6	64	877	2.2	41	3.0	98	1002	1.6
2133.3	2.1	15	1.7	60	689	1.4	30	3.2	92	788	1.0
2134.0	2.6	16	1.5	67	706	2.0	38	2.7	103	807	1.5
2134.7	2.8	16	1.9	67	793	2.0	40	3.5	103	907	1.4
2135.4	2.5	15	1.6	68	774	1.6	36	3.0	104	885	1.2
2136.1	2.3	14	1.9	72	920	2.1	33	3.5	110	1052	1.5
2136.8	1.9	17	1.8	74	978	2.6	28	3.3	113	1119	1.9
2137.5	3.2	13	2.1	72	880	2.1	46	3.8	111	1006	1.5
2138.2	3.4	14	1.6	78	936	2.0	49	3.0	119	1070	1.4
2138.9	2.7	15	1.8	67	827	2.0	39	3.3	103	945	1.5
2139.6	2.9	14	1.7	71	896	2.4	41	3.1	108	1024	1.7
2140.3	2.8	14	1.9	75	861	1.6	41	3.5	116	985	1.2
2141.0	3.2	14	2.1	71	850	2.3	46	3.9	108	972	1.7
2141.7	2.4	14	2.1	73	899	1.4	35	3.9	113	1028	1.0
2142.4	3.2	17	1.9	84	991	2.2	47	3.5	129	1133	1.6
2143.1	2.8	16	2.4	80	1022	1.7	41	4.3	122	1169	1.2
2143.8	2.9	16	1.9	78	995	1.8	41	3.5	119	1138	1.3
2144.5	2.2	16	2.4	87	1012	1.9	32	4.3	134	1157	1.4
2145.2	3.0	18	2.5	91	1147	2.8	43	4.5	140	1311	2.1
2145.9	3.5	16	2.0	96	1090	2.2	50	3.6	147	1246	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2146.6	3.6	15	2.3	91	1097	2.1	53	4.2	140	1255	1.6
2147.3	3.8	16	2.4	83	1142	2.4	56	4.5	127	1306	1.8
2148.0	3.8	17	2.3	90	1194	1.8	55	4.3	137	1365	1.3
2148.7	3.5	15	2.0	88	1371	2.2	50	3.6	135	1568	1.6
2149.4	3.6	17	2.6	98	1130	2.0	52	4.7	149	1292	1.4
2150.0	3.4	17	2.2	107	1293	2.0	50	4.0	164	1479	1.4
2150.7	3.9	15	2.3	93	1221	2.2	56	4.2	142	1397	1.6
2151.4	3.1	16	2.5	87	1158	1.6	44	4.6	133	1324	1.1
2152.1	5.2	16	2.6	102	1190	2.6	75	4.7	156	1361	1.9
2152.8	3.5	16	2.4	100	1344	1.9	51	4.4	153	1537	1.4
2153.5	3.5	17	2.5	104	1291	2.1	50	4.6	159	1476	1.5
2154.2	4.6	16	2.5	102	1260	2.2	66	4.5	156	1441	1.6
2154.9	3.9	17	3.0	110	1340	2.3	57	5.4	168	1533	1.6
2155.6	4.5	17	2.7	121	1430	2.7	66	4.8	185	1635	1.9
2156.3	4.8	17	2.6	105	1286	1.8	69	4.7	161	1470	1.3
2157.0	4.3	15	2.6	112	1427	2.1	63	4.7	172	1631	1.5
2157.7	3.1	13	2.3	98	1150	2.0	45	4.2	150	1315	1.5
2158.4	5.1	14	3.1	108	1446	2.4	73	5.7	165	1653	1.7
2159.1	4.0	16	2.9	122	1460	2.5	57	5.2	187	1669	1.9
2159.8	4.5	17	3.2	123	1389	2.7	65	5.7	189	1589	2.0
2160.5	3.8	17	2.3	119	1259	2.0	55	4.2	182	1440	1.5
2161.2	5.1	19	3.1	121	1555	2.6	74	5.7	185	1778	1.9
2161.9	5.8	18	3.2	134	1524	2.1	83	5.8	205	1743	1.5
2162.6	3.7	18	2.8	132	1549	2.7	54	5.2	203	1771	2.0
2163.3	3.5	18	2.4	128	1426	2.0	50	4.4	196	1631	1.5
2164.0	4.4	14	2.5	105	1395	1.9	64	4.6	161	1595	1.4
2164.7	4.6	15	3.3	140	1532	2.4	67	5.9	215	1752	1.7
2165.4	5.5	15	3.3	118	1512	2.4	79	5.9	181	1729	1.8
2166.1	4.9	17	2.2	131	1603	3.0	71	4.0	201	1833	2.2
2166.8	4.3	17	3.0	135	1582	2.8	63	5.5	207	1809	2.0
2167.5	3.8	15	2.5	119	1609	1.8	55	4.5	182	1840	1.3
2168.2	4.8	15	2.9	136	1420	1.6	69	5.3	208	1623	1.2
2168.9	4.8	16	2.8	111	1457	1.9	69	5.0	169	1666	1.4
2169.6	4.4	15	2.7	120	1593	1.5	63	5.0	184	1821	1.1
2170.3	4.0	15	2.9	114	1464	2.3	58	5.3	174	1674	1.7
2171.0	4.6	14	3.0	117	1354	2.2	67	5.4	179	1548	1.6
2171.7	4.2	16	3.4	114	1611	2.2	60	6.2	175	1842	1.6
2172.4	4.6	14	3.1	127	1522	1.8	66	5.7	194	1740	1.3
2173.1	6.3	16	3.0	141	1652	3.6	90	5.4	216	1889	2.6
2173.8	4.5	14	2.8	123	1389	2.0	65	5.0	189	1589	1.5
2174.5	4.5	14	2.7	125	1440	1.5	65	5.0	192	1647	1.1
2175.2	3.3	13	2.9	104	1421	2.2	47	5.4	159	1625	1.6
2175.9	4.6	15	3.5	133	1873	2.8	67	6.4	203	2142	2.1
2176.6	5.8	17	2.9	166	1765	3.4	84	5.2	254	2018	2.5
2177.2	4.6	17	3.1	120	1442	2.6	66	5.7	184	1649	1.9
2177.9	3.9	13	3.0	114	1463	2.0	56	5.5	174	1673	1.5
2178.6	5.2	18	3.8	136	1640	2.7	76	6.9	209	1875	2.0
2179.3	4.8	17	3.0	120	1455	2.8	69	5.4	184	1664	2.0
2180.0	5.1	17	2.9	120	1494	2.4	73	5.3	184	1709	1.7
2180.7	4.6	17	3.2	146	1678	2.6	67	5.7	223	1919	1.9
2181.4	4.3	16	3.2	119	1592	2.7	62	5.9	182	1821	2.0
2182.1	4.9	18	3.8	129	1888	2.2	70	6.9	198	2159	1.6
2182.8	5.4	16	3.4	115	1367	1.7	78	6.1	177	1563	1.2
2183.5	4.3	17	3.8	166	1726	2.2	62	6.9	254	1973	1.6
2184.2	4.4	17	3.1	130	1669	2.6	64	5.7	199	1909	1.9
2184.9	4.8	16	3.5	122	1565	2.5	69	6.4	186	1789	1.8
2185.6	4.7	14	3.1	121	1727	2.5	69	5.7	185	1975	1.8
2186.3	5.6	16	3.1	122	1482	2.7	80	5.6	187	1695	2.0
2187.0	5.4	16	2.6	162	1634	2.6	78	4.8	249	1868	1.9
2187.7	4.1	15	3.3	139	1888	2.4	60	6.0	213	2159	1.7
2188.4	4.5	16	3.7	146	1582	2.5	65	6.7	224	1809	1.8
2189.1	5.1	14	3.7	127	1629	2.7	73	6.8	194	1862	2.0
2189.8	4.9	17	3.2	155	1681	2.6	70	5.8	238	1923	1.9
2190.5	3.3	15	3.4	126	1497	2.6	48	6.2	193	1712	1.9
2191.2	4.9	15	3.8	134	1814	2.6	71	6.9	205	2074	1.9
2191.9	5.7	15	3.2	123	1610	2.4	82	5.9	189	1841	1.7
2192.6	4.0	15	4.0	128	1651	2.7	57	7.3	196	1888	2.0
2193.3	4.3	16	4.0	142	1593	2.6	61	7.3	218	1822	1.9
2194.0	3.9	18	3.9	175	1897	2.6	56	7.1	267	2170	1.9
2194.7	4.8	16	3.6	129	1703	2.8	70	6.6	198	1948	2.0
2195.4	4.6	14	3.6	132	1802	2.6	66	6.5	203	2061	1.9
2196.1	4.5	15	3.6	150	1606	1.7	65	6.5	230	1836	1.3
2196.8	6.5	16	3.9	139	1805	2.6	94	7.2	213	2064	1.9
2197.5	4.0	15	4.0	141	1909	4.0	57	7.4	216	2183	3.0
2198.2	3.9	14	3.9	154	1755	2.6	56	7.2	237	2007	1.9
2198.9	4.5	17	3.7	147	1791	2.8	65	6.7	226	2048	2.0
2199.6	3.5	13	4.2	140	1898	2.8	51	7.6	214	2171	2.0
2200.3	3.9	15	3.3	136	1719	2.0	56	6.0	208	1966	1.5
2201.0	3.3	15	4.0	145	1910	2.7	47	7.3	222	2185	1.9
2201.7	4.3	15	3.6	141	2022	2.1	63	6.6	216	2312	1.5
2202.4	3.7	16	3.8	134	2023	2.5	53	6.9	206	2314	1.8



Minnow Environmental  
Sample ID: 002

Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2203.0	3.7	14	3.1	133	1723	2.9	54	5.6	204	1970	2.1
2203.7	3.5	15	3.1	145	1779	2.3	50	5.6	222	2034	1.7
2204.4	3.9	15	3.5	139	1836	2.2	57	6.4	213	2099	1.6
2205.1	3.8	13	3.4	137	1974	3.8	54	6.1	210	2257	2.8
2205.8	4.8	15	2.9	128	1864	1.9	70	5.4	196	2132	1.4
2206.5	4.6	14	3.2	132	1677	2.3	66	5.9	202	1918	1.6
2207.2	4.8	13	3.2	149	1874	2.3	69	5.9	228	2143	1.7
2207.9	4.6	12	2.5	117	1817	1.6	66	4.6	180	2078	1.1
2208.6	4.2	15	2.9	137	2032	3.6	60	5.4	209	2324	2.6
2209.3	4.3	15	2.7	132	1940	2.2	63	5.0	202	2219	1.6
2210.0	3.7	16	2.5	139	1990	2.2	54	4.5	212	2276	1.6
2210.7	4.9	16	2.7	141	1874	1.5	71	4.9	215	2143	1.1
2211.4	4.1	13	3.3	103	1686	2.1	60	6.0	159	1928	1.6
2212.1	4.7	14	3.0	124	1990	2.3	68	5.4	190	2276	1.7
2212.8	5.1	16	3.0	135	1971	3.8	74	5.5	207	2254	2.8
2213.5	5.0	15	2.5	120	1721	1.8	72	4.5	183	1968	1.3
2214.2	5.3	16	2.6	121	1990	2.6	76	4.8	186	2275	1.9
2214.9	4.6	14	2.4	103	2069	1.6	67	4.4	157	2366	1.2
2215.6	4.0	20	2.8	127	2231	1.6	58	5.1	194	2552	1.2
2216.3	4.8	16	2.9	133	2007	2.6	70	5.3	203	2295	1.9
2217.0	4.6	16	3.1	115	1915	2.3	66	5.6	176	2189	1.7
2217.7	3.9	15	2.4	117	2075	1.9	56	4.4	179	2373	1.4
2218.4	3.9	15	2.7	103	2026	3.1	56	4.9	159	2317	2.2
2219.1	3.7	17	2.6	128	1950	2.8	54	4.7	196	2230	2.0
2219.8	5.1	17	2.3	113	2009	2.9	74	4.2	174	2298	2.1
2220.5	4.0	16	2.7	106	1849	2.4	57	4.9	162	2114	1.7
2221.2	3.5	14	2.1	99	1851	2.3	50	3.7	151	2116	1.7
2221.9	3.7	15	2.5	105	2055	2.1	54	4.6	161	2350	1.6
2222.6	5.0	19	2.7	112	2142	2.2	72	5.0	171	2450	1.6
2223.3	3.3	15	2.1	104	2005	2.6	48	3.8	159	2293	1.9
2224.0	3.6	15	2.1	99	2075	1.7	52	3.9	151	2373	1.2
2224.7	4.3	14	2.5	91	1911	2.2	62	4.6	139	2185	1.6
2225.4	4.2	18	2.3	106	1989	2.0	60	4.2	163	2274	1.4
2226.1	4.2	18	2.7	101	2047	2.2	60	4.9	154	2341	1.6
2226.8	3.4	18	2.5	91	2059	2.0	49	4.5	139	2355	1.4
2227.5	3.0	17	2.3	113	1797	1.6	43	4.2	174	2055	1.2
2228.2	3.4	14	2.2	99	1936	1.9	49	4.0	151	2214	1.4
2228.9	3.1	13	2.7	74	1790	1.9	45	4.9	114	2046	1.4
2229.5	4.0	19	2.5	93	1896	2.1	58	4.6	143	2168	1.6
2230.2	3.3	17	1.7	101	2094	2.5	48	3.2	155	2395	1.8
2230.9	4.1	15	2.2	87	2233	1.7	59	4.1	134	2553	1.2
2231.6	3.6	16	2.1	76	1873	0.919	52	3.9	117	2142	0.670
2232.3	3.1	16	2.5	96	2053	2.8	44	4.6	147	2348	2.1
2233.0	3.5	17	2.2	92	1933	2.3	50	4.0	141	2211	1.7
2233.7	2.5	16	2.1	85	2092	2.1	36	3.9	131	2392	1.5
2234.4	2.8	15	2.3	81	2031	2.1	40	4.2	125	2323	1.6
2235.1	3.6	17	2.3	87	2383	2.2	52	4.1	133	2725	1.6
2235.8	2.9	16	2.1	80	2107	2.0	42	3.9	123	2409	1.5
2236.5	2.6	15	2.2	79	1941	1.6	37	4.0	121	2220	1.1
2237.2	2.2	17	2.2	83	1922	2.3	32	4.0	127	2198	1.7
2237.9	3.2	13	2.1	85	2066	1.7	46	3.8	130	2363	1.3
2238.6	2.3	16	1.9	75	1856	2.2	33	3.5	115	2123	1.6
2239.3	3.2	17	2.2	82	1784	1.7	46	4.1	126	2040	1.2
2240.0	3.1	15	2.1	78	1836	1.5	45	3.9	119	2099	1.1
2240.7	3.0	16	1.9	83	1858	1.6	43	3.4	127	2124	1.2
2241.4	3.4	15	2.2	85	1860	1.8	50	4.0	130	2127	1.3
2242.1	2.7	15	1.6	65	1589	0.940	39	2.9	100	1817	0.686
2242.8	2.0	15	2.1	89	1829	1.5	28	3.9	136	2091	1.1
2243.5	2.5	18	1.5	81	1932	2.1	37	2.8	124	2209	1.6
2244.2	2.5	14	1.8	70	1786	2.1	36	3.2	107	2042	1.5
2244.9	2.1	16	2.1	76	1749	2.2	30	3.9	116	2000	1.6
2245.6	2.2	16	1.9	79	2072	2.0	32	3.5	121	2370	1.4
2246.3	1.8	16	2.1	78	1743	2.7	26	3.9	120	1993	2.0
2247.0	2.1	17	1.9	79	1700	1.6	30	3.5	121	1944	1.2
2247.7	2.1	14	1.8	67	1871	2.9	30	3.2	102	2139	2.1
2248.4	1.5	15	1.9	71	1760	2.2	22	3.4	109	2013	1.6
2249.1	2.2	16	2.1	79	1815	2.3	32	3.8	121	2076	1.7
2249.8	1.5	16	1.7	73	1670	1.9	21	3.1	112	1910	1.4
2250.5	1.9	14	1.6	70	1791	2.3	27	3.0	108	2048	1.7
2251.2	1.7	13	1.7	76	1567	2.2	25	3.0	117	1792	1.6
2251.9	1.6	13	1.6	69	1514	2.4	23	3.0	106	1731	1.7
2252.6	1.6	14	1.2	60	1304	2.2	23	2.3	92	1491	1.6
2253.3	1.7	15	1.5	63	1289	2.1	25	2.8	96	1474	1.6
2254.0	1.4	14	1.6	62	1568	2.1	21	2.9	95	1793	1.5
2254.7	1.6	16	1.7	68	1692	2.5	24	3.0	105	1934	1.8
2255.4	1.2	14	1.6	67	1367	2.5	18	3.0	102	1564	1.8
2256.0	1.4	17	1.6	70	1425	2.7	20	2.9	107	1630	1.9
2256.7	1.8	16	1.3	72	1393	1.7	26	2.4	110	1593	1.2
2257.4	1.6	14	1.2	64	1526	1.9	22	2.2	98	1746	1.4
2258.1	1.4	15	1.8	71	1637	2.9	20	3.2	108	1872	2.1
2258.8	1.8	15	1.3	69	1493	2.1	26	2.4	106	1708	1.6



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Sample ID: 002

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.097	0.295	0.139	1.5	0.001	0.005					
Length (µm)											
2259.5	2.0	14	1.4	71	1364	2.3	30	2.6	109	1560	1.7
2260.2	1.4	14	1.1	67	1352	2.3	20	2.1	102	1546	1.7
2260.9	1.6	14	1.2	64	1359	2.2	23	2.2	98	1554	1.6
2261.6	1.1	16	1.1	74	1408	2.8	16	1.9	113	1610	2.0
2262.3	1.6	15	1.6	71	1236	2.6	23	3.0	109	1414	1.9
2263.0	1.3	15	1.3	59	1333	1.8	18	2.4	91	1525	1.3
2263.7	1.6	13	1.1	63	1352	1.9	23	1.9	97	1546	1.4
2264.4	1.8	14	1.1	56	1218	1.7	25	2.1	85	1393	1.2
2265.1	1.1	15	1.2	61	1179	2.3	16	2.2	93	1348	1.7
2265.8	2.4	16	1.2	65	1268	3.4	35	2.2	99	1450	2.5
2266.5	1.2	16	0.970	51	1097	2.2	17	1.8	78	1254	1.6
2267.2	1.6	12	0.932	55	1077	2.9	23	1.7	85	1232	2.1
2267.9	1.3	15	0.984	56	1163	3.2	19	1.8	86	1330	2.3
2268.6	1.6	16	0.994	54	1200	2.0	23	1.8	83	1372	1.4
2269.3	1.8	14	1.1	59	1130	2.9	25	2.1	90	1292	2.1
2270.0	1.8	15	1.1	51	1076	1.6	25	2.1	78	1230	1.2
2270.7	1.9	11	1.0	47	1049	2.7	28	1.9	72	1200	2.0
2271.4	1.8	14	1.5	58	1123	2.8	26	2.7	89	1285	2.1
2272.1	2.0	15	1.3	56	1052	2.1	28	2.3	85	1203	1.5
2272.8	2.3	13	1.5	60	1034	2.7	33	2.7	91	1182	2.0
2273.5	2.4	15	1.1	48	1002	1.8	35	2.0	74	1146	1.3
2274.2	2.9	14	1.3	48	1107	2.7	42	2.4	74	1266	2.0
2274.9	3.6	17	1.6	47	1008	2.7	52	3.0	72	1153	2.0
2275.6	3.1	15	1.9	58	1018	3.3	45	3.4	89	1164	2.4
2276.3	2.6	15	1.3	55	1047	2.9	37	2.4	85	1197	2.1
2277.0	3.1	15	1.1	47	990	1.9	44	2.1	72	1132	1.4
2277.7	3.3	15	1.2	44	978	3.0	48	2.1	67	1119	2.2
2278.4	4.4	14	1.5	51	1030	2.6	64	2.7	78	1177	1.9
2279.1	4.1	16	1.6	48	1004	2.8	60	2.9	74	1149	2.0
2279.8	4.0	16	1.6	48	1099	2.7	58	2.9	74	1256	1.9
2280.5	3.9	14	1.4	49	1172	2.1	57	2.5	75	1340	1.6
2281.2	4.4	14	1.9	45	1023	3.3	64	3.5	68	1170	2.4
2281.9	5.4	15	2.0	47	960	3.3	78	3.7	73	1097	2.4
2282.5	4.1	15	2.1	44	963	2.6	59	3.8	67	1101	1.9
2283.2	4.3	15	1.7	43	920	2.6	62	3.2	66	1053	1.9
2283.9	5.8	14	2.1	45	1147	3.2	83	3.9	68	1311	2.3
2284.6	7.0	16	2.7	42	1101	2.5	102	4.9	65	1259	1.9
2285.3	6.2	17	2.7	57	1135	3.0	89	4.8	87	1298	2.2
2286.0	6.0	14	3.1	52	1101	3.6	86	5.7	80	1259	2.6
2286.7	6.0	15	2.6	45	1051	2.1	87	4.7	68	1202	1.5
2287.4	5.6	14	3.2	40	1307	1.9	81	5.9	62	1495	1.4
2288.1	5.7	16	2.9	50	1089	4.6	82	5.3	77	1245	3.4
2288.8	7.1	17	3.0	43	1111	3.5	102	5.4	66	1271	2.6
2289.5	6.2	15	3.5	45	1131	2.8	90	6.4	69	1293	2.1
2290.2	7.0	15	2.9	49	1246	3.4	101	5.3	75	1425	2.5
2290.9	7.4	15	3.1	47	1154	3.0	107	5.6	72	1320	2.2
2291.6	6.9	15	3.3	40	1125	3.6	99	6.1	62	1287	2.6
2292.3	7.2	15	3.3	45	1208	3.1	103	6.0	68	1381	2.2
2293.0	7.4	13	3.6	47	1210	2.5	107	6.6	72	1383	1.9
2293.7	8.5	17	3.7	56	1339	4.0	123	6.8	86	1531	2.9
2294.4	7.1	14	4.0	49	1150	3.3	103	7.4	75	1314	2.4
2295.1	7.2	18	4.4	58	1350	4.5	104	8.1	89	1544	3.3
2295.8	8.2	17	4.4	50	1304	3.9	119	8.1	77	1492	2.9
2296.5	9.0	15	3.8	49	1287	4.5	130	6.9	75	1471	3.3
2297.2	8.2	18	3.7	51	1427	3.5	119	6.8	78	1632	2.6
2297.9	8.4	17	4.0	57	1321	3.7	121	7.4	87	1510	2.7
2298.6	9.2	16	3.6	63	1377	3.4	133	6.5	96	1575	2.5
2299.3	7.4	17	3.8	58	1468	3.1	107	6.9	89	1679	2.3
2300.0	7.4	14	4.3	55	1171	3.1	107	7.9	84	1339	2.3
2300.7	9.8	16	4.9	57	1565	4.8	142	8.9	88	1790	3.5
2301.4	7.6	19	4.6	69	1478	4.6	109	8.4	106	1690	3.3
2302.1	9.1	16	4.8	66	1469	3.3	131	8.7	101	1680	2.4
2302.8	8.6	16	4.3	66	1290	2.5	123	7.8	101	1475	1.8
2303.5	8.0	15	4.2	60	1390	2.8	115	7.6	92	1590	2.1
2304.2	8.0	18	4.7	64	1407	3.2	115	8.5	99	1609	2.3
2304.9	10	17	5.4	59	1400	3.1	149	9.8	91	1601	2.3
2305.6	9.6	15	5.1	68	1563	3.7	139	9.3	104	1787	2.7
2306.3	8.3	15	4.7	65	1567	4.0	119	8.6	100	1792	2.9
2307.0	8.0	15	5.1	63	1522	3.0	116	9.4	97	1741	2.2
2307.7	7.5	16	5.1	68	1400	3.0	109	9.2	104	1601	2.2
2308.4	8.5	17	5.5	67	1454	3.1	123	10	103	1663	2.2
2309.0	7.9	18	5.2	81	1592	4.7	114	9.5	123	1821	3.4
2309.7	8.5	19	4.7	62	1472	4.0	122	8.6	96	1683	2.9
2310.4	8.6	18	4.9	65	1430	3.4	124	8.9	100	1635	2.5
2311.1	8.3	19	4.9	65	1646	4.2	119	9.0	99	1882	3.1
2311.8	7.4	18	5.1	71	1358	2.9	107	9.3	109	1553	2.1
2312.5	7.2	17	5.2	74	1568	4.2	103	9.5	113	1792	3.1
2313.2	6.8	18	4.8	71	1551	3.8	98	8.7	108	1774	2.8
2313.9	7.7	16	6.3	65	1610	4.1	111	12	100	1841	3.0
2314.6	6.0	19	4.9	70	1503	3.8	87	8.9	107	1718	2.8
2315.3	8.4	18	4.7	98	1760	2.8	121	8.6	150	2012	2.0



Minnow Environmental  
Sample ID: 002

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.097	0.295	0.139	1.5	0.001	0.005					
Length (µm)											
2316.0	7.3	18	5.4	80	1534	3.5	105	9.9	122	1754	2.6
2316.7	6.0	14	4.3	66	1290	2.5	87	7.8	101	1476	1.8
2317.4	7.5	19	4.6	75	1850	3.8	108	8.3	116	2116	2.8
2318.1	6.3	18	5.3	79	1674	4.6	91	9.7	121	1914	3.4
2318.8	7.2	17	4.8	76	1572	3.0	104	8.7	117	1798	2.2
2319.5	5.7	16	5.1	79	1639	2.4	82	9.3	121	1874	1.7
2320.2	6.6	19	4.8	77	1820	3.6	95	8.7	117	2081	2.7
2320.9	5.5	16	4.7	67	1398	3.1	80	8.6	102	1599	2.3
2321.6	4.9	18	4.4	78	1494	3.1	70	8.1	119	1709	2.3
2322.3	5.0	17	4.2	73	1460	3.0	71	7.7	112	1670	2.2
2323.0	4.7	19	4.2	80	1792	3.9	68	7.7	123	2049	2.8
2323.7	6.0	17	4.5	71	1545	2.7	87	8.2	109	1766	2.0
2324.4	4.7	17	4.4	83	1549	3.0	68	8.0	128	1771	2.2
2325.1	4.5	16	3.9	70	1352	3.1	65	7.2	107	1546	2.3
2325.8	5.3	17	3.6	72	1357	3.1	77	6.6	111	1551	2.3
2326.5	4.0	17	4.1	75	1493	3.2	58	7.4	115	1707	2.4
2327.2	5.0	19	4.1	76	1631	2.9	72	7.5	117	1865	2.1
2327.9	5.2	16	4.1	87	1520	2.2	75	7.5	133	1738	1.6
2328.6	3.7	21	4.0	72	1515	3.0	53	7.2	111	1732	2.2
2329.3	3.8	17	3.7	75	1645	2.6	54	6.8	116	1881	1.9
2330.0	3.6	15	3.5	73	1439	2.1	53	6.5	111	1645	1.6
2330.7	4.2	17	3.7	71	1498	3.1	61	6.7	109	1713	2.2
2331.4	3.4	18	3.8	76	1444	2.3	49	6.9	116	1651	1.7
2332.1	3.7	17	3.7	74	1444	2.9	53	6.7	113	1651	2.1
2332.8	3.3	15	2.8	69	1444	2.5	48	5.1	105	1651	1.8
2333.5	3.6	15	2.7	68	1447	1.8	51	5.0	104	1655	1.3
2334.2	3.6	18	3.0	78	1492	2.9	51	5.5	120	1706	2.1
2334.8	4.0	15	3.0	75	1493	1.3	58	5.5	115	1707	0.974
2335.5	3.5	15	3.1	67	1463	2.6	50	5.7	103	1673	1.9
2336.2	2.6	15	2.5	70	1360	2.2	37	4.5	107	1555	1.6
2336.9	2.6	15	2.3	65	1358	3.5	37	4.3	99	1553	2.6
2337.6	2.9	17	2.7	72	1459	2.2	42	4.9	110	1669	1.6
2338.3	2.9	17	2.8	68	1312	2.4	41	5.2	105	1500	1.7
2339.0	2.3	15	2.8	74	1558	2.1	33	5.1	114	1782	1.5
2339.7	2.7	15	2.8	70	1615	2.3	39	5.1	107	1847	1.6
2340.4	2.0	15	2.2	68	1382	2.3	29	4.1	105	1581	1.7
2341.1	2.4	15	2.6	72	1444	2.3	35	4.8	111	1651	1.7
2341.8	2.3	15	2.6	67	1327	1.7	33	4.8	103	1518	1.3
2342.5	2.2	17	2.4	64	1365	3.7	32	4.4	98	1561	2.7
2343.2	2.0	15	2.1	57	1200	1.9	28	3.8	87	1373	1.4
2343.9	1.5	16	2.7	69	1406	2.2	22	5.0	106	1607	1.6
2344.6	2.2	17	3.1	65	1496	2.4	32	5.6	99	1711	1.8
2345.3	2.0	17	2.4	73	1431	3.1	29	4.3	112	1636	2.3
2346.0	1.7	24	2.1	65	1410	2.2	25	3.8	100	1612	1.6
2346.7	1.6	16	2.0	63	1314	2.6	23	3.7	96	1503	1.9
2347.4	1.4	16	2.0	67	1246	2.1	20	3.7	103	1425	1.5
2348.1	1.2	20	2.9	66	1505	2.1	17	5.2	101	1721	1.5
2348.8	1.1	16	2.7	65	1373	3.3	16	4.9	99	1570	2.4
2349.5	1.6	13	2.2	66	1198	2.0	23	4.1	102	1370	1.5
2350.2	1.3	13	2.1	60	1294	2.1	18	3.9	92	1480	1.5
2350.9	1.2	13	1.9	49	971	1.7	17	3.5	75	1111	1.2
2351.6	1.1	16	1.9	72	1351	2.4	16	3.5	110	1545	1.8
2352.3	1.7	15	2.2	63	1373	2.2	24	4.0	96	1570	1.6
2353.0	1.2	15	1.6	53	1139	2.3	17	2.9	81	1303	1.7
2353.7	1.2	15	1.6	63	1221	1.9	17	2.9	97	1396	1.4
2354.4	1.1	16	1.9	60	1230	2.6	16	3.4	92	1407	1.9
2355.1	1.5	14	1.4	55	1117	1.6	22	2.6	84	1278	1.2
2355.8	0.889	15	1.5	58	1126	2.2	13	2.7	89	1288	1.6
2356.5	1.1	13	1.8	60	1133	2.2	16	3.3	92	1296	1.6
2357.2	1.3	16	1.8	58	1076	1.9	18	3.3	89	1230	1.4
2357.9	1.4	14	1.5	64	1066	2.4	20	2.8	98	1219	1.8
2358.6	1.5	15	1.8	56	1138	2.2	22	3.3	86	1301	1.6
2359.3	1.1	15	0.987	53	974	2.4	16	1.8	81	1114	1.8
2360.0	1.0	13	1.3	48	921	1.9	15	2.4	74	1054	1.4
2360.7	1.1	15	1.6	55	1058	2.6	15	2.9	84	1210	1.9
2361.3	1.1	15	1.1	58	977	1.9	16	2.1	89	1117	1.4
2362.0	1.1	15	1.1	51	954	2.2	16	2.0	78	1091	1.6
2362.7	1.2	15	1.0	50	910	1.7	17	1.9	76	1041	1.2
2363.4	1.5	16	0.967	46	1113	2.5	21	1.8	71	1273	1.8
2364.1	1.3	17	1.1	44	896	1.4	18	2.1	67	1024	1.0
2364.8	1.1	17	1.3	56	1078	2.5	15	2.3	85	1232	1.8
2365.5	1.7	16	1.0	50	939	2.0	24	1.9	76	1074	1.5
2366.2	1.4	17	0.811	48	987	2.2	20	1.5	74	1129	1.6
2366.9	1.1	14	0.929	52	928	2.5	15	1.7	80	1062	1.8
2367.6	1.4	18	0.928	46	1019	2.1	20	1.7	71	1165	1.5
2368.3	2.1	19	0.985	47	960	2.2	31	1.8	72	1098	1.6
2369.0	1.0	17	0.913	47	829	1.8	15	1.7	72	948	1.3
2369.7	0.634	14	0.783	43	909	1.9	9.2	1.4	66	1039	1.4
2370.4	1.4	16	0.765	47	956	2.1	20	1.4	73	1093	1.5
2371.1	1.8	16	1.1	42	901	2.2	26	1.9	64	1031	1.6
2371.8	1.8	18	0.877	44	884	2.4	26	1.6	67	1011	1.7



Minnow Environmental  
Sample ID: 002

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.097	0.295	0.139	1.5	0.001	0.005					
Length (µm)											
2372.5	1.8	16	1.0	50	889	1.7	26	1.9	76	1016	1.2
2373.2	2.1	14	0.894	40	839	2.0	30	1.6	62	960	1.5
2373.9	1.3	15	1.1	48	925	1.9	19	2.1	74	1058	1.4
2374.6	1.3	17	0.895	39	856	2.3	19	1.6	59	979	1.7
2375.3	0.887	18	0.828	42	868	2.0	13	1.5	65	993	1.5
2376.0	1.0	13	0.747	43	852	2.3	15	1.4	66	974	1.7
2376.7	1.3	17	0.599	42	945	1.4	19	1.1	65	1081	1.1
2377.4	1.5	14	0.852	42	846	1.5	21	1.6	65	967	1.1
2378.1	0.926	19	0.789	36	906	2.2	13	1.4	56	1036	1.6
2378.8	1.6	16	0.969	36	929	2.0	24	1.8	55	1062	1.5
2379.5	1.7	15	0.649	38	853	1.8	24	1.2	58	976	1.3
2380.2	1.9	17	0.885	36	943	1.4	27	1.6	55	1079	1.0
2380.9	1.2	14	0.547	39	820	1.8	17	0.998	60	937	1.3
2381.6	1.2	16	0.752	36	876	2.4	17	1.4	56	1002	1.8
2382.3	0.765	14	0.827	38	899	1.2	11	1.5	58	1028	0.862
2383.0	1.5	16	0.770	31	991	1.7	22	1.4	48	1133	1.2
2383.7	1.8	13	0.909	33	851	1.6	26	1.7	50	973	1.1
2384.4	1.1	15	0.810	34	983	1.3	16	1.5	52	1124	0.968
2385.1	1.2	13	0.804	36	869	2.2	18	1.5	55	994	1.6
2385.8	1.6	13	0.694	31	922	1.3	23	1.3	47	1054	0.957
2386.5	1.5	14	0.646	31	855	1.8	21	1.2	48	978	1.3
2387.1	1.1	13	0.776	35	868	1.6	15	1.4	54	992	1.1
2387.8	1.5	15	0.609	33	893	1.4	21	1.1	51	1022	0.997
2388.5	1.3	16	0.703	31	880	1.8	19	1.3	47	1006	1.3
2389.2	1.3	13	0.578	29	921	1.7	19	1.1	44	1053	1.2
2389.9	2.0	14	0.610	35	961	1.3	28	1.1	54	1098	0.948
2390.6	0.975	14	0.631	30	852	1.8	14	1.2	46	975	1.3
2391.3	1.7	16	0.784	39	987	1.3	24	1.4	60	1129	0.927
2392.0	1.1	14	0.523	31	858	2.0	15	0.954	48	981	1.5
2392.7	0.934	15	0.660	27	903	1.9	13	1.2	41	1032	1.4
2393.4	1.5	15	0.706	27	923	1.2	21	1.3	41	1056	0.906
2394.1	1.6	16	0.687	32	919	2.4	23	1.3	49	1051	1.8
2394.8	1.2	15	0.695	38	999	1.9	18	1.3	59	1142	1.4
2395.5	1.3	17	0.624	28	877	1.8	18	1.1	43	1002	1.3
2396.2	1.3	17	0.557	24	896	1.8	18	1.0	38	1025	1.3
2396.9	1.4	14	0.664	27	844	2.3	20	1.2	41	965	1.7
2397.6	1.3	14	0.513	24	838	1.8	19	0.935	36	958	1.3
2398.3	1.5	15	0.515	30	856	1.4	21	0.939	46	978	1.0
2399.0	1.2	15	0.699	26	846	0.962	18	1.3	40	967	0.702
2399.7	1.7	15	0.560	31	865	1.9	24	1.0	47	990	1.4
2400.4	1.3	13	0.501	26	788	1.9	18	0.914	40	901	1.4
2401.1	1.3	17	0.604	32	919	2.1	19	1.1	48	1051	1.5
2401.8	1.0	14	0.871	30	890	1.2	14	1.6	47	1018	0.889
2402.5	1.3	15	0.505	31	924	2.0	19	0.921	48	1057	1.5
2403.2	1.6	17	0.620	28	901	1.6	23	1.1	43	1030	1.2
2403.9	1.3	16	0.809	28	831	1.9	19	1.5	43	950	1.4
2404.6	1.5	14	0.498	31	878	1.3	22	0.908	48	1005	0.983
2405.3	1.2	15	0.673	26	915	1.9	18	1.2	40	1046	1.4
2406.0	1.5	16	0.538	28	913	2.1	22	0.982	43	1044	1.5
2406.7	1.2	16	0.848	32	911	1.6	17	1.5	48	1042	1.2
2407.4	1.6	16	0.561	31	942	2.2	23	1.0	47	1077	1.6
2408.1	1.1	14	0.416	30	948	1.9	16	0.758	46	1084	1.4
2408.8	1.4	15	0.809	28	1057	1.7	21	1.5	43	1209	1.3
2409.5	1.4	14	0.390	23	972	1.6	20	0.711	35	1111	1.2
2410.2	1.2	17	0.699	29	917	1.3	17	1.3	45	1049	0.937
2410.9	1.8	14	0.727	34	922	1.7	26	1.3	51	1055	1.2
2411.6	1.4	14	0.508	29	880	1.9	21	0.926	45	1006	1.4
2412.3	1.2	14	0.764	33	1008	1.3	17	1.4	51	1153	0.953
2413.0	1.7	14	0.690	37	955	1.9	25	1.3	57	1093	1.4
2413.6	1.1	15	0.710	32	1009	2.4	16	1.3	49	1154	1.7
2414.3	1.1	14	0.818	31	938	1.8	16	1.5	47	1073	1.3
2415.0	1.6	14	0.681	24	891	1.4	23	1.2	36	1019	1.0
2415.7	1.1	13	0.781	27	1001	2.7	15	1.4	42	1145	1.9
2416.4	1.9	14	0.611	33	980	2.7	27	1.1	50	1121	2.0
2417.1	1.5	15	0.715	29	919	1.8	21	1.3	45	1051	1.3
2417.8	2.1	15	0.659	35	890	2.1	31	1.2	53	1018	1.5
2418.5	1.7	15	0.361	30	1035	2.1	24	0.658	46	1184	1.5
2419.2	1.4	15	0.650	39	1174	2.2	20	1.2	59	1342	1.6
2419.9	1.8	15	0.720	36	950	1.1	26	1.3	55	1087	0.770
2420.6	2.0	14	0.710	39	1085	2.4	29	1.3	60	1241	1.7
2421.3	1.4	14	0.786	35	1007	2.5	20	1.4	53	1151	1.8
2422.0	1.5	14	0.607	31	1029	2.3	22	1.1	47	1177	1.7
2422.7	1.1	15	0.558	36	1024	2.6	16	1.0	55	1171	1.9
2423.4	2.3	16	0.995	42	1116	2.5	33	1.8	65	1276	1.8
2424.1	2.1	17	0.594	36	1024	2.5	30	1.1	55	1171	1.8
2424.8	1.9	13	0.813	41	1114	2.6	28	1.5	63	1274	1.9
2425.5	1.3	15	0.739	37	1028	1.9	19	1.3	57	1175	1.4
2426.2	1.6	17	0.638	38	1185	2.4	24	1.2	59	1355	1.7
2426.9	1.5	15	0.972	41	1250	2.6	21	1.8	62	1430	1.9
2427.6	1.4	18	0.748	36	1038	2.8	20	1.4	55	1187	2.0
2428.3	2.4	17	0.940	42	1148	2.2	35	1.7	65	1313	1.6



Minnow Environmental  
Sample ID: 002

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.097	0.295	0.139	1.5	0.001	0.005					
Length (µm)											
2429.0	1.9	18	0.787	41	1154	3.3	27	1.4	63	1320	2.4
2429.7	1.3	19	1.2	42	1274	3.9	18	2.2	64	1457	2.9
2430.4	2.0	18	0.850	41	1257	2.9	29	1.5	63	1438	2.1
2431.1	2.0	19	0.716	41	1129	2.9	28	1.3	62	1291	2.1
2431.8	2.3	19	0.651	46	1330	3.6	33	1.2	71	1521	2.6
2432.5	1.4	16	0.751	37	1199	2.5	20	1.4	57	1371	1.8
2433.2	1.5	16	0.764	44	1199	2.7	22	1.4	67	1371	2.0
2433.9	2.2	15	0.849	42	1234	2.1	31	1.5	65	1411	1.5
2434.6	1.7	18	0.950	41	1118	2.5	24	1.7	62	1279	1.8
2435.3	1.8	16	0.686	48	1261	3.4	26	1.3	73	1442	2.5
2436.0	1.6	17	1.0	47	1216	3.3	24	1.9	71	1391	2.4
2436.7	1.7	16	0.892	43	1164	2.7	25	1.6	65	1331	2.0
2437.4	1.8	16	0.823	44	1141	2.5	26	1.5	67	1305	1.8
2438.1	1.9	15	1.1	52	1158	3.6	27	2.1	79	1324	2.7
2438.8	1.9	17	0.979	42	1150	2.8	28	1.8	64	1315	2.1
2439.5	1.8	15	0.709	46	1144	2.5	26	1.3	70	1308	1.8
2440.1	2.3	17	0.921	48	1397	3.7	33	1.7	73	1597	2.7
2440.8	1.5	17	0.744	50	1299	3.8	21	1.4	77	1486	2.8
2441.5	1.4	16	0.734	40	1036	2.1	21	1.3	62	1184	1.5
2442.2	1.4	17	1.1	45	1339	3.5	20	2.0	69	1531	2.5
2442.9	1.3	17	1.1	49	1449	4.1	19	2.0	75	1657	3.0
2443.6	2.0	17	0.927	52	1123	2.6	29	1.7	80	1284	1.9
2444.3	1.5	17	0.737	50	1311	4.6	22	1.3	77	1499	3.4
2445.0	1.5	16	0.651	44	1280	3.8	22	1.2	67	1464	2.8
2445.7	1.4	16	0.881	48	1279	2.9	21	1.6	74	1463	2.1
2446.4	2.1	17	1.2	49	1381	3.9	30	2.1	75	1579	2.9
2447.1	1.8	17	0.876	47	1269	3.0	26	1.6	72	1451	2.2
2447.8	1.6	16	0.945	56	1318	3.6	23	1.7	86	1507	2.7
2448.5	2.2	15	0.927	46	1192	3.8	32	1.7	71	1363	2.8
2449.2	0.903	17	0.975	46	1408	3.4	13	1.8	71	1610	2.4
2449.9	1.8	15	0.856	48	1217	3.4	27	1.6	73	1391	2.5
2450.6	2.2	18	0.917	59	1388	4.4	31	1.7	91	1587	3.2
2451.3	1.9	16	0.884	52	1329	3.4	28	1.6	79	1520	2.5
2452.0	1.2	17	1.3	51	1269	3.4	17	2.3	78	1451	2.5
2452.7	1.7	16	1.0	52	1425	3.1	24	1.9	80	1630	2.3
2453.4	1.6	16	0.897	47	1182	3.1	22	1.6	72	1352	2.2
2454.1	1.8	15	0.816	53	1254	3.8	26	1.5	82	1434	2.8
2454.8	1.7	16	0.721	49	1344	4.4	25	1.3	75	1537	3.2
2455.5	2.2	15	0.908	45	1215	4.1	31	1.7	69	1389	3.0
2456.2	1.7	16	1.1	51	1317	2.9	24	2.0	78	1506	2.1
2456.9	1.5	19	0.669	52	1291	4.2	22	1.2	80	1477	3.1
2457.6	1.5	19	0.890	53	1237	3.5	22	1.6	82	1414	2.5
2458.3	2.5	17	0.878	48	1298	3.5	36	1.6	74	1485	2.6
2459.0	2.2	16	1.0	49	1243	4.9	31	1.9	75	1421	3.6
2459.7	1.7	19	1.0	46	1338	4.2	24	1.9	71	1530	3.1
2460.4	1.6	19	0.988	48	1284	3.5	23	1.8	74	1469	2.5
2461.1	1.7	16	0.829	50	1227	3.5	25	1.5	77	1403	2.6
2461.8	2.0	16	0.787	52	1243	3.1	29	1.4	79	1421	2.2
2462.5	2.0	15	0.788	45	1144	3.4	29	1.4	70	1308	2.5
2463.2	1.7	17	1.1	43	1158	3.6	24	2.1	66	1324	2.6
2463.9	2.5	18	1.0	48	1145	3.2	36	1.8	73	1309	2.3
2464.6	2.3	16	0.945	50	1214	3.4	33	1.7	76	1389	2.5
2465.3	3.0	18	1.1	46	1130	3.1	43	2.0	71	1292	2.3
2465.9	2.0	16	0.922	48	1215	3.6	29	1.7	74	1390	2.7
2466.6	1.8	17	0.812	49	1188	3.1	26	1.5	75	1359	2.3
2467.3	2.9	17	0.930	49	1169	2.5	42	1.7	74	1336	1.8
2468.0	2.5	16	0.936	43	1138	3.2	37	1.7	66	1302	2.3
2468.7	2.6	19	0.998	44	1153	3.1	38	1.8	67	1318	2.2
2469.4	4.1	19	0.950	50	1073	2.4	59	1.7	76	1228	1.8
2470.1	3.8	18	1.1	45	1119	3.7	55	2.0	69	1279	2.7
2470.8	2.6	17	0.904	46	1033	3.2	38	1.6	71	1181	2.3
2471.5	3.0	18	1.1	43	1025	2.5	43	2.1	66	1172	1.8
2472.2	2.9	17	0.884	44	985	2.3	41	1.6	67	1126	1.7
2472.9	4.1	15	0.983	43	1107	3.1	59	1.8	65	1266	2.3
2473.6	4.1	18	0.759	43	972	2.3	59	1.4	66	1112	1.7
2474.3	4.3	17	1.0	42	975	2.4	62	1.9	65	1115	1.7
2475.0	3.9	15	0.884	43	903	3.1	56	1.6	66	1033	2.2
2475.7	4.4	15	0.868	43	931	3.0	64	1.6	66	1065	2.2
2476.4	6.2	16	1.1	49	971	2.4	89	2.1	75	1110	1.7
2477.1	5.2	18	0.901	53	1065	2.2	75	1.6	82	1217	1.6
2477.8	6.9	14	1.0	43	1041	2.8	99	1.9	67	1191	2.1
2478.5	6.0	16	1.2	38	936	1.5	86	2.2	59	1070	1.1
2479.2	6.7	14	1.3	45	1001	2.8	97	2.4	69	1144	2.0
2479.9	8.1	18	1.2	50	1029	2.7	116	2.2	76	1176	2.0
2480.6	7.8	16	1.2	48	1034	2.3	113	2.1	74	1183	1.7
2481.3	6.7	15	1.1	42	1027	2.5	97	2.1	65	1174	1.8
2482.0	8.6	17	1.7	48	1098	1.8	124	3.1	73	1255	1.3
2482.7	8.9	17	1.8	45	1004	3.0	128	3.2	69	1149	2.2
2483.4	9.5	19	1.8	51	1110	2.5	137	3.4	79	1269	1.8
2484.1	8.2	16	1.5	51	999	2.9	118	2.8	78	1142	2.1
2484.8	8.8	14	1.9	51	1073	2.2	128	3.6	79	1228	1.6



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.097	0.295	0.139	1.5	0.001	0.005					
Length (µm)											
2485.5	9.6	16	1.9	52	1119	3.4	139	3.4	80	1279	2.5
2486.2	11	17	2.5	59	1202	3.4	157	4.5	90	1375	2.5
2486.9	10	16	1.9	54	1007	3.0	151	3.4	83	1151	2.2
2487.6	8.4	16	2.1	56	1035	3.0	121	3.7	86	1184	2.2
2488.3	11	19	2.3	65	1151	2.9	164	4.3	100	1317	2.1
2489.0	11	16	2.2	62	1180	1.8	156	4.1	95	1349	1.3
2489.7	10	19	2.5	65	1299	3.3	150	4.6	99	1486	2.4
2490.4	10	18	2.4	61	1218	2.9	146	4.3	93	1393	2.1
2491.1	8.8	16	2.4	59	1114	2.3	128	4.4	91	1273	1.6
2491.7	9.4	16	2.2	66	1350	2.4	135	4.1	101	1543	1.8
2492.4	9.1	19	2.6	63	1300	2.9	131	4.7	96	1486	2.1
2493.1	9.5	17	3.4	68	1282	3.8	137	6.2	105	1466	2.8
2493.8	8.1	18	2.5	74	1330	3.0	117	4.6	114	1521	2.2
2494.5	11	18	2.8	72	1370	3.2	152	5.1	111	1567	2.3
2495.2	11	21	2.9	70	1387	2.7	162	5.2	108	1587	2.0
2495.9	9.5	18	3.3	67	1348	3.1	137	6.0	102	1541	2.3
2496.6	11	18	3.2	67	1353	3.3	158	5.9	103	1548	2.4
2497.3	9.0	18	3.2	71	1255	2.5	131	5.9	109	1435	1.8
2498.0	9.1	18	3.1	75	1584	3.4	131	5.7	115	1812	2.5
2498.7	9.2	17	3.0	69	1376	3.6	132	5.5	106	1573	2.6
2499.4	9.2	19	3.4	71	1450	4.1	132	6.3	108	1658	3.0
2500.1	10	20	2.8	75	1464	3.1	148	5.2	115	1675	2.2
2500.8	10	19	3.0	95	1763	3.8	150	5.5	145	2016	2.8
2501.5	7.4	19	2.5	77	1370	3.7	107	4.5	117	1566	2.7
2502.2	8.5	17	3.9	81	1539	3.4	123	7.2	124	1760	2.5
2502.9	10	19	3.5	79	1442	3.4	149	6.5	121	1649	2.5
2503.6	8.6	18	3.6	84	1587	3.6	124	6.6	128	1814	2.7
2504.3	8.5	20	3.1	82	1431	2.5	122	5.6	125	1637	1.8
2505.0	7.0	20	2.9	79	1590	3.2	102	5.3	121	1818	2.3
2505.7	6.8	18	3.0	83	1586	3.2	98	5.5	127	1814	2.3
2506.4	6.6	17	3.8	82	1650	4.2	96	6.8	126	1887	3.1
2507.1	7.0	18	3.6	90	1551	4.3	101	6.5	137	1773	3.2
2507.8	5.5	19	3.5	95	1651	3.4	80	6.4	146	1888	2.5
2508.5	5.0	17	3.1	79	1487	4.0	73	5.6	121	1700	2.9
2509.2	5.3	17	3.0	73	1593	3.2	77	5.6	112	1821	2.3
2509.9	7.0	20	3.7	78	1640	3.1	102	6.8	120	1875	2.3
2510.6	5.9	21	3.5	87	1681	3.5	85	6.3	134	1923	2.6
2511.3	4.9	18	2.7	81	1612	3.7	71	4.9	125	1844	2.7
2512.0	4.5	15	2.9	79	1550	3.3	65	5.3	121	1773	2.4
2512.7	5.0	17	3.1	80	1655	3.9	73	5.7	123	1893	2.9
2513.4	4.0	18	3.3	91	1759	3.5	57	6.0	140	2011	2.6
2514.1	4.3	20	3.3	91	1835	3.6	62	5.9	140	2099	2.7
2514.8	3.8	18	3.3	87	1605	2.2	54	5.9	133	1835	1.6
2515.5	3.2	15	2.4	78	1762	2.7	46	4.5	119	2014	2.0
2516.2	4.1	16	2.8	76	1706	2.8	59	5.1	116	1951	2.0
2516.9	4.3	20	2.7	79	1743	3.1	62	4.9	121	1993	2.3
2517.6	3.5	17	2.3	81	1570	3.2	51	4.2	124	1795	2.4
2518.2	3.9	17	2.2	84	1745	3.2	57	4.0	129	1995	2.3
2518.9	3.0	15	2.8	80	1821	2.5	44	5.2	123	2082	1.8
2519.6	2.6	16	2.2	86	1638	2.2	37	3.9	132	1873	1.6
2520.3	2.8	16	2.2	86	1656	3.2	40	3.9	131	1894	2.3
2521.0	3.2	16	2.4	87	1620	3.2	46	4.3	133	1853	2.4
2521.7	2.8	17	2.0	86	1767	2.8	40	3.7	131	2021	2.1
2522.4	2.6	14	2.3	79	1635	3.2	37	4.2	122	1869	2.4
2523.1	2.9	17	2.9	77	1859	3.6	42	5.3	118	2126	2.6
2523.8	3.7	17	2.2	86	1854	3.0	54	4.1	132	2120	2.2
2524.5	2.9	17	2.1	79	1814	3.3	41	3.8	121	2074	2.4
2525.2	1.7	12	1.9	76	1612	2.9	25	3.5	117	1843	2.1
2525.9	2.0	13	1.9	78	1816	3.0	29	3.5	119	2077	2.2
2526.6	1.6	14	1.9	76	1738	3.5	23	3.4	116	1987	2.5
2527.3	1.8	15	2.1	69	1638	3.0	26	3.8	106	1873	2.2
2528.0	1.6	15	1.7	76	1644	2.3	23	3.1	117	1880	1.7
2528.7	1.4	14	1.5	81	1631	2.6	20	2.8	124	1865	1.9
2529.4	1.5	13	1.5	76	1682	2.7	21	2.8	116	1923	2.0
2530.1	0.988	14	1.6	73	1997	2.8	14	2.9	112	2283	2.0
2530.8	1.5	15	1.4	78	1754	3.6	21	2.6	120	2005	2.6
2531.5	1.5	14	1.5	78	1649	2.9	21	2.7	119	1886	2.1
2532.2	1.3	15	1.6	73	1698	3.0	18	2.9	112	1942	2.2
2532.9	0.679	14	1.5	66	1586	2.6	9.8	2.7	101	1814	1.9
2533.6	1.8	19	1.5	73	1683	3.4	26	2.7	112	1925	2.5
2534.3	0.970	14	1.5	80	1703	3.0	14	2.7	122	1947	2.2
2535.0	1.0	13	1.6	69	1471	2.5	15	2.9	105	1682	1.9
2535.7	0.800	14	1.2	66	1558	3.7	12	2.2	100	1782	2.7
2536.4	1.4	15	1.7	78	1599	2.3	20	3.0	119	1829	1.6
2537.1	1.0	14	1.4	82	1663	2.7	15	2.5	125	1902	2.0
2537.8	0.668	13	1.3	63	1363	3.3	9.6	2.4	97	1559	2.4
2538.5	0.897	13	1.5	68	1605	2.3	13	2.8	104	1836	1.7
2539.2	0.816	14	1.6	64	1736	3.3	12	2.8	98	1985	2.4
2539.9	1.1	13	1.3	71	1587	2.3	16	2.3	108	1815	1.7
2540.6	0.913	15	1.3	68	1396	2.8	13	2.3	104	1596	2.0
2541.3	0.666	13	1.2	63	1302	3.0	9.6	2.1	96	1489	2.2



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Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2542.0	0.966	13	1.2	59	1210	2.2	14	2.2	91	1383	1.6
2542.7	0.548	15	1.1	59	1354	3.3	7.9	2.0	91	1548	2.4
2543.4	0.904	14	1.2	60	1344	3.2	13	2.2	93	1537	2.3
2544.0	1.1	15	1.1	56	1260	2.9	16	2.0	86	1441	2.1
2544.7	1.4	16	1.1	63	1420	3.2	20	1.9	96	1624	2.3
2545.4	1.1	13	0.959	58	1285	2.8	16	1.7	88	1469	2.0
2546.1	0.640	14	1.4	59	1402	2.8	9.2	2.6	91	1603	2.0
2546.8	0.550	15	0.756	61	1304	2.8	7.9	1.4	93	1491	2.0
2547.5	1.2	14	0.790	60	1183	1.6	17	1.4	92	1353	1.2
2548.2	1.2	12	0.737	57	1066	2.1	18	1.3	87	1219	1.5
2548.9	1.4	13	0.873	54	1225	2.2	21	1.6	83	1401	1.6
2549.6	1.7	13	0.863	54	1030	3.1	24	1.6	82	1178	2.3
2550.3	1.9	15	0.818	55	1031	2.4	27	1.5	84	1179	1.7
2551.0	1.1	12	0.775	60	1142	2.1	15	1.4	91	1305	1.5
2551.7	0.799	11	0.795	50	1043	2.2	12	1.4	76	1193	1.6
2552.4	0.911	11	0.693	52	893	1.5	13	1.3	79	1021	1.1
2553.1	1.5	13	0.681	53	1147	2.7	22	1.2	81	1312	2.0
2553.8	1.3	14	0.601	53	1007	2.0	19	1.1	82	1152	1.5
2554.5	1.4	13	0.780	54	936	2.0	20	1.4	83	1070	1.4
2555.2	1.7	13	0.774	51	974	2.4	25	1.4	78	1114	1.8
2555.9	0.762	12	0.701	52	906	1.8	11	1.3	79	1037	1.3
2556.6	0.894	12	0.433	52	950	2.4	13	0.789	79	1087	1.7
2557.3	1.5	14	0.667	56	871	2.1	21	1.2	86	997	1.5
2558.0	1.5	12	0.436	44	861	1.3	21	0.795	67	984	0.946
2558.7	1.6	12	0.415	41	870	1.3	22	0.757	64	995	0.915
2559.4	1.6	13	0.405	44	829	1.5	24	0.739	68	948	1.1
2560.1	1.1	14	0.594	49	918	2.2	16	1.1	76	1049	1.6
2560.8	1.2	12	0.451	50	915	1.6	17	0.823	76	1046	1.2
2561.5	1.3	10.0	0.448	42	805	1.3	18	0.816	65	921	0.972
2562.2	1.4	11	0.323	45	781	1.5	21	0.589	69	893	1.1
2562.9	1.5	13	0.569	49	842	2.2	22	1.0	75	962	1.6
2563.6	1.5	12	0.468	44	783	1.2	21	0.853	68	896	0.905
2564.3	1.7	13	0.461	50	931	1.9	25	0.841	77	1064	1.4
2565.0	1.1	11	0.653	41	762	1.5	15	1.2	62	872	1.1
2565.7	1.4	9.6	0.378	36	807	2.3	21	0.690	55	923	1.7
2566.4	1.6	13	0.486	41	837	1.0	23	0.887	62	957	0.738
2567.1	1.4	12	0.401	41	820	2.3	21	0.731	63	937	1.6
2567.8	1.1	13	0.492	39	747	1.0	16	0.898	59	854	0.734
2568.5	1.7	12	0.362	43	851	2.1	25	0.660	67	973	1.6
2569.2	1.6	11	0.326	38	888	2.1	22	0.594	58	1015	1.5
2569.8	1.8	13	0.369	46	888	1.3	26	0.673	71	1016	0.962
2570.5	0.919	14	0.245	33	750	1.4	13	0.446	51	858	1.0
2571.2	1.6	13	0.347	39	808	1.7	22	0.632	60	924	1.2
2571.9	1.8	10	0.300	35	730	1.5	26	0.548	53	834	1.1
2572.6	1.6	13	0.481	34	916	1.2	23	0.877	51	1047	0.886
2573.3	1.6	12	0.268	38	877	2.3	24	0.489	59	1003	1.7
2574.0	1.1	14	0.364	32	780	1.8	16	0.664	49	892	1.3
2574.7	1.7	13	0.394	27	890	0.979	25	0.719	42	1017	0.714
2575.4	1.5	12	0.291	26	777	1.4	22	0.531	39	888	1.0
2576.1	2.1	13	0.261	27	776	1.3	31	0.475	42	888	0.930
2576.8	0.924	12	0.369	22	761	1.4	13	0.673	33	871	1.0
2577.5	1.3	11	0.180	21	823	1.1	19	0.328	32	942	0.818
2578.2	1.2	13	0.240	21	789	1.8	18	0.438	32	902	1.3
2578.9	1.6	12	0.243	23	831	0.915	23	0.442	36	950	0.668
2579.6	1.8	15	0.413	21	840	1.3	26	0.753	32	961	0.985
2580.3	1.1	11	0.390	19	848	1.3	16	0.711	29	970	0.972
2581.0	1.2	13	0.376	16	762	1.7	17	0.686	24	871	1.3
2581.7	1.7	12	0.139	20	1000	2.6	24	0.253	30	1143	1.9
2582.4	1.8	13	0.236	19	894	1.9	26	0.431	29	1022	1.4
2583.1	1.3	14	0.325	20	829	1.3	19	0.593	30	948	0.925
2583.8	1.6	11	0.156	18	823	1.3	24	0.284	28	941	0.962
2584.5	1.3	10	0.258	17	817	2.0	19	0.470	26	935	1.5
2585.2	2.1	14	0.269	19	856	1.7	31	0.490	30	979	1.2
2585.9	1.8	13	0.325	19	888	1.9	26	0.592	28	1015	1.4
2586.6	1.5	14	0.187	22	798	1.7	22	0.342	33	912	1.2
2587.3	1.7	12	0.275	18	782	1.1	24	0.502	28	894	0.837
2588.0	1.6	13	0.323	20	888	2.0	23	0.589	30	1016	1.5
2588.7	2.5	14	0.416	23	831	1.9	36	0.758	36	950	1.4
2589.4	1.6	13	0.250	21	930	1.9	24	0.457	32	1063	1.4
2590.1	2.2	12	0.342	18	800	1.6	32	0.625	28	915	1.2
2590.8	2.3	11	0.523	20	783	2.4	33	0.954	30	895	1.8
2591.5	2.6	12	0.573	20	920	1.6	38	1.0	31	1052	1.1
2592.2	2.0	13	0.449	21	824	1.9	29	0.818	33	942	1.4
2592.9	2.6	14	0.421	23	931	2.2	37	0.767	35	1065	1.6
2593.6	2.7	13	0.403	28	941	2.0	40	0.734	42	1076	1.4
2594.3	3.5	14	0.560	28	1030	2.0	50	1.0	43	1178	1.5
2595.0	3.2	14	0.543	26	993	3.4	46	0.991	40	1136	2.5
2595.7	2.9	14	0.590	32	1156	2.5	41	1.1	50	1322	1.8
2596.3	3.1	15	0.529	27	1053	3.0	45	0.965	42	1204	2.2
2597.0	4.2	16	0.668	32	1065	2.5	61	1.2	49	1217	1.8
2597.7	2.2	15	0.429	35	1092	1.8	32	0.782	54	1248	1.3



Minnow Environmental  
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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.097	0.295	0.139	1.5	0.001	0.005					
Length (µm)											
2598.4	3.5	15	0.593	35	1124	2.3	50	1.1	54	1285	1.6
2599.1	3.6	15	0.735	29	1086	3.0	52	1.3	45	1241	2.2
2599.8	3.2	14	0.565	43	1287	2.6	47	1.0	66	1471	1.9
2600.5	3.5	14	0.672	41	1202	2.1	50	1.2	62	1374	1.6
2601.2	2.7	14	0.771	33	1166	2.4	39	1.4	51	1333	1.8
2601.9	3.3	14	0.801	36	1310	2.6	48	1.5	56	1498	1.9
2602.6	4.1	17	1.3	40	1269	2.2	59	2.3	61	1451	1.6
2603.3	2.8	13	0.810	43	1402	3.2	41	1.5	65	1603	2.3
2604.0	3.7	17	0.937	40	1340	2.4	54	1.7	61	1532	1.8
2604.7	2.3	16	0.922	44	1435	2.6	34	1.7	68	1641	1.9
2605.4	3.9	17	0.815	42	1521	2.8	56	1.5	64	1740	2.0
2606.1	3.1	20	0.954	41	1414	1.8	45	1.7	62	1617	1.3
2606.8	2.6	17	0.975	45	1469	2.4	37	1.8	69	1680	1.7
2607.5	2.6	14	1.1	47	1496	2.6	37	2.0	72	1711	1.9
2608.2	2.9	16	1.1	44	1762	3.2	41	2.0	67	2015	2.3
2608.9	2.9	16	1.1	45	1659	4.3	42	2.0	68	1897	3.1
2609.6	1.8	18	1.2	51	1560	3.0	26	2.3	78	1784	2.2
2610.3	1.4	14	1.1	46	1556	3.3	20	2.0	71	1780	2.4
2611.0	2.0	15	1.2	46	1565	2.6	29	2.2	71	1789	1.9
2611.7	2.2	19	0.804	54	2062	4.6	32	1.5	82	2358	3.3
2612.4	2.1	16	1.3	43	1804	3.1	31	2.3	65	2063	2.3
2613.1	2.0	19	0.879	46	1604	2.3	29	1.6	70	1834	1.7
2613.8	1.4	16	1.4	53	1737	3.5	20	2.6	81	1987	2.6
2614.5	0.891	15	0.893	43	1662	2.3	13	1.6	66	1901	1.7
2615.2	1.5	19	1.1	41	1650	4.1	21	2.0	63	1887	3.0
2615.9	1.2	18	1.3	41	1612	3.4	18	2.4	63	1843	2.5
2616.6	1.0	16	0.941	51	1583	4.1	15	1.7	79	1810	3.0
2617.3	1.8	18	1.1	53	1758	3.7	27	2.1	81	2010	2.7
2618.0	0.834	17	0.778	36	1552	3.0	12	1.4	55	1775	2.2
2618.7	1.1	18	1.2	43	1719	4.3	16	2.1	65	1965	3.2
2619.4	1.0	18	1.2	53	1737	3.4	15	2.2	81	1986	2.5
2620.1	0.432	19	0.919	48	1466	2.7	6.2	1.7	74	1677	2.0
2620.8	1.2	21	0.930	45	1571	4.0	18	1.7	70	1797	2.9
2621.5	1.1	19	0.783	46	1490	3.3	16	1.4	71	1704	2.4
2622.2	1.0	18	1.4	40	1336	3.0	15	2.5	62	1528	2.2
2622.9	0.746	17	1.0	48	1538	3.6	11	1.9	73	1759	2.6
2623.5	1.3	18	1.1	46	1435	1.8	19	2.0	71	1640	1.3
2624.2	1.1	17	0.745	37	1229	2.6	16	1.4	57	1406	1.9
2624.9	1.3	19	0.881	33	1231	2.2	18	1.6	51	1407	1.6
2625.6	0.898	19	1.1	37	1417	3.5	13	2.0	56	1621	2.6
2626.3	0.807	22	0.786	34	1106	2.0	12	1.4	53	1265	1.5
2627.0	1.1	28	0.940	37	1113	2.8	15	1.7	57	1273	2.1
2627.7	0.961	16	0.827	27	1052	1.8	14	1.5	41	1203	1.3
2628.4	1.1	22	0.686	35	1111	1.6	15	1.3	54	1270	1.2
2629.1	0.888	22	0.612	31	1008	1.4	13	1.1	47	1152	1.1
2629.8	1.5	20	0.754	32	1038	2.0	22	1.4	49	1187	1.5
2630.5	1.6	20	0.704	33	996	2.5	23	1.3	51	1139	1.8
2631.2	0.985	20	0.612	25	922	1.3	14	1.1	39	1055	0.979
2631.9	1.1	21	0.697	26	910	1.8	16	1.3	40	1040	1.3
2632.6	1.4	21	0.576	28	897	1.9	20	1.1	42	1026	1.4
2633.3	0.970	21	0.599	25	917	2.4	14	1.1	39	1048	1.7
2634.0	1.2	21	0.509	21	755	1.3	18	0.929	32	863	0.964
2634.7	1.4	20	0.255	22	777	1.1	21	0.465	34	889	0.815
2635.4	1.2	22	0.791	20	895	1.6	17	1.4	30	1024	1.2
2636.1	1.0	24	0.601	18	824	2.1	15	1.1	27	942	1.5
2636.8	1.3	33	1.3	21	821	1.3	19	2.3	32	939	0.962
2637.5	1.7	47	0.568	21	763	1.2	24	1.0	33	873	0.857
2638.2	1.1	34	0.636	20	730	1.3	16	1.2	31	835	0.977
2638.9	1.1	34	0.822	16	729	1.4	16	1.5	25	834	0.996
2639.6	1.2	33	0.618	19	656	1.1	17	1.1	29	750	0.837
2640.3	1.1	36	0.871	31	658	1.5	15	1.6	47	753	1.1
2641.0	1.3	41	0.496	19	600	0.691	19	0.904	29	687	0.504
2641.7	0.839	43	0.842	17	580	1.3	12	1.5	26	664	0.940
2642.4	1.7	65	0.753	27	731	1.3	24	1.4	41	836	0.975
2643.1	1.3	56	0.967	17	627	1.6	19	1.8	26	717	1.1
2643.8	1.6	52	0.800	19	574	2.3	23	1.5	29	656	1.7
2644.5	0.695	63	0.686	24	597	1.2	10	1.3	36	683	0.896
2645.2	1.4	59	0.691	14	604	0.920	21	1.3	22	690	0.671
2645.9	0.733	52	1.1	17	562	1.6	11	2.0	25	642	1.1
2646.6	1.2	60	0.719	16	626	1.4	18	1.3	24	715	1.0
2647.3	0.732	58	1.0	21	580	1.4	11	1.9	32	663	1.0
2648.0	1.1	64	1.2	17	505	1.1	15	2.3	27	578	0.813
2648.7	0.912	56	1.5	18	563	1.1	13	2.7	27	643	0.820
2649.3	2.3	55	1.6	12	525	0.948	33	2.9	18	601	0.692
2650.0	0.540	61	1.4	13	517	0.904	7.8	2.5	20	591	0.660
2650.7	1.6	67	0.841	14	592	1.8	23	1.5	21	677	1.3
2651.4	1.1	88	0.951	17	507	1.4	17	1.7	26	580	1.0
2652.1	0.610	74	1.0	14	442	1.5	8.8	1.9	22	506	1.1
2652.8	0.630	68	1.2	20	584	2.4	9.1	2.2	30	668	1.8
2653.5	0.425	57	1.1	17	400	1.9	6.1	2.0	26	457	1.4
2654.2	1.2	78	0.632	20	436	2.2	17	1.2	30	499	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.097	24Mg 0.295	55Mn 0.139	66Zn 1.5	88Sr 0.001	137Ba 0.005	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2654.9	0.754	117	2.1	28	570	3.6	11	3.8	43	652	2.6
2655.6	0.562	108	1.9	24	445	1.3	8.1	3.5	36	509	0.977
2656.3	0.138	102	1.3	18	349	1.3	2.0	2.3	28	399	0.949
2657.0	1.6	113	2.0	21	502	2.2	24	3.7	32	574	1.6
2657.7	2.4	169	2.5	34	545	2.9	35	4.6	52	623	2.1
2658.4	0.097	113	2.4	20	466	1.1	1.4	4.5	31	533	0.781
2659.1	0.236	117	0.456	31	813	2.2	3.4	0.832	48	930	1.6
2659.8	0.535	57	0.496	13	230	0.696	7.7	0.904	20	263	0.508
2660.5	0.501	98	1.6	25	411	2.4	7.2	3.0	39	470	1.7
2661.2	2.0	107	1.7	30	438	1.7	30	3.2	45	500	1.3
2661.9	1.1	172	0.930	39	455	1.3	15	1.7	59	520	0.916
2662.6	0.335	152	3.4	25	576	4.0	4.8	6.2	39	659	2.9
2663.3	0.097	116	2.9	42	681	0.881	1.4	5.3	65	778	0.643
2664.0	1.6	118	3.0	26	690	1.4	23	5.5	40	789	1.0
2664.7	0.097	120	0.947	70	515	2.3	1.4	1.7	107	589	1.6
2665.4	0.097	108	2.3	18	407	1.4	1.4	4.1	27	465	1.0
2666.1	0.097	108	3.3	28	443	2.3	1.4	6.0	44	507	1.7
2666.8	3.4	125	3.7	28	820	0.805	49	6.8	44	937	0.587
2667.5	0.097	58	0.781	16	247	0.362	1.4	1.4	24	282	0.264
2668.2	0.245	87	2.2	30	392	2.9	3.5	4.1	46	448	2.1
2668.9	4.2	92	1.1	14	597	0.572	61	2.0	21	683	0.417
2669.6	0.918	62	0.675	13	271	0.394	13	1.2	20	310	0.287
2670.3	0.575	85	0.808	19	430	2.7	8.3	1.5	29	492	2.0
2671.0	0.097	92	2.0	32	584	0.707	1.4	3.6	49	668	0.516
2671.7	0.247	98	1.1	23	496	0.576	3.6	2.0	35	567	0.420
2672.4	0.097	89	1.9	21	508	2.5	1.4	3.5	33	581	1.8
2673.1	0.097	108	2.1	14	468	1.8	1.4	3.8	21	535	1.3
2673.8	0.097	75	1.0	27	407	1.1	1.4	1.9	42	466	0.789
2674.5	0.298	95	3.0	23	618	1.4	4.3	5.6	35	707	1.0
2675.1	0.097	102	2.0	33	592	2.0	1.4	3.7	51	677	1.5
2675.8	1.6	63	1.1	14	1031	0.453	24	2.0	22	1179	0.330
2676.5	0.097	70	1.4	16	490	0.917	1.4	2.5	25	560	0.669
2677.2	2.8	75	0.917	11	472	1.1	41	1.7	18	540	0.779
2677.9	0.121	64	0.420	25	356	0.567	1.7	0.766	38	407	0.414
2678.6	1.8	56	0.479	24	303	1.3	25	0.873	37	347	0.947
2679.3	1.2	75	3.0	27	545	1.1	18	5.5	42	623	0.775
2680.0	1.7	59	1.2	17	542	0.005	25	2.1	25	620	0.003
2680.7	0.910	107	0.328	16	570	0.857	13	0.597	24	652	0.625
2681.4	5.1	98	2.2	33	495	0.835	74	4.0	51	565	0.609
2682.1	0.397	101	0.560	26	511	0.926	5.7	1.0	40	584	0.676
2682.8	0.097	125	1.5	24	579	0.791	1.4	2.8	36	662	0.577
2683.5	4.6	105	0.365	42	1090	0.956	67	0.666	64	1247	0.697
2684.2	0.097	91	0.806	39	557	3.9	1.4	1.5	59	637	2.9
2684.9	0.097	96	0.374	50	724	0.978	1.4	0.682	76	828	0.714



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
0.3	0.269	1837	17	184	338	1.9	3.9	31	282	387	1.4
1.0	0.269	2475	25	206	587	0.006	3.9	45	315	671	0.004
1.6	0.269	2279	25	203	472	2.1	3.9	46	312	540	1.5
2.3	6.6	1744	21	135	440	7.7	95	38	207	503	5.6
3.0	3.2	2164	14	103	561	4.0	46	26	158	642	2.9
3.7	3.4	1099	9.0	62	493	3.8	50	16	95	564	2.7
4.4	0.269	990	9.3	77	475	2.7	3.9	17	118	543	2.0
5.1	0.269	1247	8.0	64	508	4.5	3.9	15	98	581	3.3
5.8	1.1	803	5.4	47	392	3.0	16	9.9	73	448	2.2
6.5	0.269	798	5.3	53	397	6.4	3.9	9.7	82	454	4.7
7.2	0.269	1045	8.5	63	576	2.9	3.9	16	97	659	2.1
7.9	0.269	745	6.7	67	378	6.8	3.9	12	102	432	5.0
8.6	1.2	734	6.1	36	375	3.8	17	11	55	429	2.8
9.3	0.945	979	7.1	67	486	6.8	14	13	103	556	4.9
10.0	0.269	781	6.1	57	559	2.8	3.9	11	87	639	2.0
10.7	0.446	851	4.9	59	432	6.3	6.4	9.0	91	494	4.6
11.4	2.6	744	5.0	35	424	3.7	38	9.1	54	485	2.7
12.1	1.1	645	5.2	37	405	19	16	9.6	56	463	14
12.8	0.269	609	4.4	33	419	2.2	3.9	8.1	51	480	1.6
13.5	0.926	529	7.9	44	634	4.3	13	14	67	725	3.1
14.2	0.591	416	5.0	22	369	2.9	8.5	9.1	34	422	2.1
14.9	1.5	538	2.8	35	527	2.5	22	5.0	54	603	1.9
15.6	0.269	376	2.4	16	303	1.7	3.9	4.4	25	346	1.2
16.3	0.269	478	3.0	26	549	1.9	3.9	5.5	40	628	1.4
17.0	0.292	450	5.2	22	612	2.4	4.2	9.5	34	700	1.8
17.7	0.269	438	2.8	31	490	1.4	3.9	5.1	47	560	0.995
18.4	0.269	443	2.5	25	521	0.833	3.9	4.5	39	596	0.607
19.1	0.269	391	2.8	28	557	2.0	3.9	5.1	42	637	1.5
19.8	0.269	351	2.5	26	557	2.0	3.9	4.6	40	637	1.4
20.5	1.3	284	2.1	15	479	1.7	19	3.8	22	547	1.3
21.2	1.7	342	1.8	15	594	2.7	24	3.2	23	679	2.0
21.9	0.759	261	1.6	16	551	1.8	11	2.9	24	630	1.3
22.6	0.413	241	2.2	13	514	1.5	6.0	4.0	21	587	1.1
23.3	0.792	185	1.5	12	456	1.2	11	2.7	18	522	0.847
24.0	0.606	228	1.7	17	496	1.5	8.7	3.1	25	567	1.1
24.7	0.542	190	1.8	13	402	1.3	7.8	3.4	19	460	0.932
25.4	0.269	237	1.5	10	541	1.6	3.9	2.8	16	618	1.2
26.1	0.659	201	1.2	14	597	2.2	9.5	2.1	21	682	1.6
26.8	0.425	203	1.7	18	538	2.8	6.1	3.0	27	615	2.0
27.4	1.1	200	1.1	19	559	2.3	16	2.0	30	639	1.7
28.1	0.395	171	1.4	13	528	2.1	5.7	2.5	20	604	1.5
28.8	0.889	191	1.2	11	559	0.933	13	2.3	17	639	0.681
29.5	0.696	158	1.5	15	584	2.3	10	2.7	23	668	1.7
30.2	0.401	171	0.827	14	571	1.2	5.8	1.5	22	653	0.870
30.9	1.0	145	0.983	8.5	584	2.5	15	1.8	13	667	1.8
31.6	0.897	131	0.496	10	553	2.3	13	0.904	16	632	1.7
32.3	0.393	146	0.867	8.3	599	1.2	5.7	1.6	13	685	0.851
33.0	0.839	136	1.2	9.3	631	2.2	12	2.1	14	721	1.6
33.7	0.560	117	0.824	6.4	710	1.1	8.1	1.5	9.7	812	0.771
34.4	0.269	111	0.895	6.3	610	1.9	3.9	1.6	9.6	698	1.4
35.1	1.2	105	0.749	12	762	2.2	17	1.4	18	871	1.6
35.8	0.353	100	1.2	9.7	638	3.0	5.1	2.1	15	730	2.2
36.5	0.836	76	0.639	10	705	1.9	12	1.2	16	806	1.4
37.2	0.917	78	0.795	9.3	646	1.9	13	1.4	14	738	1.4
37.9	0.269	79	0.650	8.5	635	1.9	3.9	1.2	13	726	1.4
38.6	0.912	68	0.604	8.3	726	1.4	13	1.1	13	830	1.0
39.3	0.281	60	0.578	9.5	732	1.4	4.1	1.1	14	837	1.0
40.0	0.582	63	0.620	8.1	744	1.7	8.4	1.1	12	851	1.3
40.7	1.2	63	0.679	13	877	1.8	17	1.2	20	1003	1.3
41.4	0.336	58	0.863	9.2	849	2.3	4.8	1.6	14	971	1.7
42.1	0.373	66	0.744	12	831	2.6	5.4	1.4	19	950	1.9
42.8	0.507	51	0.780	9.4	783	2.0	7.3	1.4	14	895	1.4
43.5	0.373	49	0.890	7.4	783	2.6	5.4	1.6	11	895	1.9
44.2	0.840	65	0.672	9.0	934	2.6	12	1.2	14	1069	1.9
44.9	0.851	41	0.972	12	965	1.6	12	1.8	19	1104	1.1
45.6	0.530	43	0.991	12	1098	2.3	7.7	1.8	18	1256	1.7
46.3	0.390	46	0.752	9.5	1232	2.0	5.6	1.4	15	1409	1.5
47.0	0.269	42	0.963	12	1059	2.9	3.9	1.8	18	1211	2.1
47.7	0.570	46	0.821	11	1005	2.0	8.2	1.5	17	1149	1.5
48.4	0.764	39	0.842	11	1112	3.1	11	1.5	17	1271	2.2
49.1	0.488	43	0.685	14	1187	2.1	7.1	1.2	21	1358	1.5
49.8	0.655	46	0.911	16	1257	2.1	9.5	1.7	24	1438	1.5
50.5	0.269	33	0.918	14	1098	3.0	3.9	1.7	22	1255	2.2
51.2	0.623	34	0.845	18	1186	2.3	9.0	1.5	28	1356	1.7
51.9	0.380	39	1.1	18	1251	3.8	5.5	2.1	27	1431	2.8
52.5	0.511	40	0.854	19	1205	2.1	7.4	1.6	30	1378	1.5
53.2	0.793	32	1.0	15	1179	2.5	11	1.9	23	1348	1.8
53.9	1.1	34	1.0	17	1277	2.6	16	1.8	26	1460	1.9
54.6	0.548	37	1.0	19	1380	2.6	7.9	1.9	29	1578	1.9
55.3	1.1	24	0.695	15	1418	2.2	16	1.3	23	1621	1.6
56.0	1.0	28	0.958	18	1283	1.9	15	1.7	28	1467	1.4



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
56.7	0.944	25	1.4	19	1417	3.1	14	2.5	30	1621	2.3
57.4	0.674	25	0.875	19	1363	2.3	9.7	1.6	29	1558	1.7
58.1	0.510	21	0.952	20	1202	2.0	7.4	1.7	31	1374	1.5
58.8	0.879	22	0.922	19	1287	2.1	13	1.7	28	1471	1.6
59.5	0.904	23	1.1	22	1400	2.2	13	2.1	34	1601	1.6
60.2	0.868	25	0.989	23	1329	2.9	13	1.8	36	1520	2.2
60.9	0.842	21	0.997	20	1180	3.4	12	1.8	30	1349	2.4
61.6	1.1	20	0.932	20	1346	2.4	16	1.7	31	1539	1.7
62.3	0.633	20	0.828	19	1325	2.6	9.1	1.5	29	1515	1.9
63.0	1.7	28	0.971	22	1523	2.4	24	1.8	34	1741	1.8
63.7	1.2	18	0.870	27	1530	3.5	17	1.6	41	1750	2.6
64.4	1.1	18	0.968	27	1460	2.8	16	1.8	41	1670	2.0
65.1	0.923	17	1.0	19	1221	1.9	13	1.9	29	1397	1.4
65.8	1.2	15	1.0	22	1480	2.8	18	1.8	33	1692	2.0
66.5	1.2	19	1.2	26	1465	2.5	18	2.3	39	1675	1.8
67.2	1.2	15	0.968	20	1297	2.8	17	1.8	31	1484	2.0
67.9	1.2	14	1.2	23	1351	3.0	18	2.2	36	1545	2.2
68.6	1.2	13	0.894	20	1210	2.0	18	1.6	30	1383	1.4
69.3	1.2	13	1.1	23	1571	2.9	17	2.0	35	1797	2.1
70.0	2.1	17	0.993	21	1360	2.8	30	1.8	32	1555	2.0
70.7	1.5	15	1.1	25	1447	2.5	22	2.1	38	1655	1.8
71.4	1.1	13	1.1	21	1214	2.2	17	2.1	32	1388	1.6
72.1	2.0	12	1.1	19	1397	2.4	28	2.1	29	1597	1.8
72.8	1.8	16	1.0	24	1371	2.9	26	1.9	36	1568	2.1
73.5	1.5	15	1.5	21	1393	2.0	22	2.8	33	1592	1.5
74.2	1.5	13	1.1	20	1151	2.2	21	2.0	31	1316	1.6
74.9	1.5	17	1.0	23	1261	2.6	22	1.9	36	1442	1.9
75.6	2.6	14	1.2	21	1305	2.7	37	2.1	32	1493	2.0
76.3	2.3	14	1.1	22	1259	3.0	33	2.1	33	1440	2.2
77.0	1.6	13	0.862	19	1130	2.8	23	1.6	29	1292	2.1
77.7	1.7	12	1.2	21	1089	1.7	24	2.1	32	1246	1.2
78.4	1.3	11	0.741	18	1069	1.6	19	1.4	28	1222	1.1
79.0	2.5	13	1.1	18	1087	2.7	36	2.0	27	1243	1.9
79.7	1.5	11	0.968	19	1210	3.5	21	1.8	29	1384	2.5
80.4	2.4	15	0.792	21	1073	2.7	35	1.4	33	1227	2.0
81.1	1.6	13	0.794	19	1062	1.9	22	1.4	29	1215	1.4
81.8	1.3	13	0.746	20	1004	2.4	18	1.4	31	1148	1.8
82.5	1.7	14	1.3	20	1218	2.3	24	2.3	30	1393	1.7
83.2	2.2	12	0.752	16	956	2.8	31	1.4	24	1093	2.0
83.9	1.7	13	1.0	23	957	2.7	25	1.9	35	1095	2.0
84.6	1.6	14	1.0	17	1044	2.2	23	1.8	26	1193	1.6
85.3	1.4	12	0.799	15	1072	1.5	20	1.5	23	1225	1.1
86.0	1.7	11	0.874	15	1027	2.4	24	1.6	23	1174	1.8
86.7	1.6	15	0.903	18	1007	2.7	23	1.6	27	1152	1.9
87.4	2.2	14	0.855	20	1065	2.5	32	1.6	31	1218	1.8
88.1	1.8	16	0.580	18	1051	1.7	27	1.1	27	1202	1.3
88.8	0.805	9.7	0.676	14	909	2.2	12	1.2	21	1039	1.6
89.5	1.3	14	0.760	18	1108	1.8	18	1.4	27	1267	1.3
90.2	1.7	14	0.550	17	932	1.8	24	1.0	26	1066	1.3
90.9	1.6	13	0.732	18	1009	1.8	23	1.3	27	1154	1.3
91.6	1.7	11	0.598	15	885	1.4	25	1.1	22	1012	1.0
92.3	1.0	12	0.857	12	971	1.9	15	1.6	19	1110	1.4
93.0	1.0	14	0.678	15	971	2.1	15	1.2	23	1111	1.5
93.7	1.4	14	0.545	14	757	2.8	21	0.994	21	865	2.0
94.4	0.839	12	0.786	12	829	1.6	12	1.4	19	947	1.2
95.1	0.659	14	0.758	13	892	2.6	9.5	1.4	20	1019	1.9
95.8	1.3	15	0.579	17	915	1.7	18	1.1	25	1047	1.2
96.5	1.4	14	0.636	16	800	2.9	20	1.2	25	915	2.1
97.2	0.909	14	0.458	17	994	2.6	13	0.835	26	1137	1.9
97.9	1.4	15	0.517	19	806	1.7	20	0.943	29	922	1.3
98.6	1.1	13	0.477	13	973	1.7	16	0.870	20	1112	1.3
99.3	0.794	14	0.535	16	882	2.2	11	0.976	25	1009	1.6
100.0	0.940	16	0.769	19	760	2.6	14	1.4	29	870	1.9
100.7	0.691	14	0.582	19	776	2.4	10.0	1.1	30	887	1.7
101.4	1.1	17	0.507	21	806	3.1	16	0.925	32	922	2.3
102.1	0.666	14	0.327	17	826	2.2	9.6	0.596	26	944	1.6
102.8	1.2	13	0.911	18	857	2.8	17	1.7	28	980	2.0
103.5	0.537	18	0.592	22	874	2.4	7.7	1.1	33	999	1.8
104.2	1.1	15	0.722	24	870	3.4	16	1.3	37	995	2.5
104.9	0.599	14	0.754	22	857	2.7	8.6	1.4	34	980	2.0
105.5	1.3	16	0.663	18	918	3.6	18	1.2	28	1050	2.6
106.2	1.1	18	0.954	21	908	1.4	16	1.7	32	1039	1.0
106.9	0.779	18	0.993	19	972	2.5	11	1.8	29	1112	1.8
107.6	0.396	15	0.598	22	938	2.7	5.7	1.1	33	1072	2.0
108.3	1.1	14	0.817	20	849	3.0	16	1.5	30	971	2.2
109.0	0.593	14	0.788	19	1013	3.0	8.6	1.4	30	1158	2.2
109.7	0.948	16	0.928	23	1044	3.7	14	1.7	35	1194	2.7
110.4	0.750	18	1.4	27	1053	3.4	11	2.5	41	1204	2.5
111.1	1.0	16	0.974	24	841	2.7	15	1.8	37	961	2.0
111.8	0.599	15	0.967	23	851	2.6	8.6	1.8	35	973	1.9
112.5	1.2	15	1.3	25	947	3.0	18	2.4	39	1083	2.2



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.2	1.4	17	1.3	25	960	3.2	20	2.3	38	1098	2.3
113.9	1.5	18	1.2	32	1012	3.4	21	2.3	50	1157	2.5
114.6	1.3	15	1.2	26	953	2.6	18	2.2	40	1089	1.9
115.3	1.1	14	1.1	21	1005	3.0	16	2.0	32	1149	2.2
116.0	1.3	16	1.5	28	1117	2.3	19	2.7	43	1277	1.7
116.7	1.3	18	1.5	29	1045	3.8	19	2.7	45	1195	2.7
117.4	1.4	22	1.6	29	1103	3.1	21	2.8	44	1261	2.3
118.1	1.1	14	1.4	26	1047	2.1	16	2.5	39	1198	1.5
118.8	1.5	17	1.6	26	1123	2.5	22	3.0	39	1284	1.8
119.5	2.5	18	1.8	30	1172	3.8	37	3.3	46	1340	2.8
120.2	1.8	16	1.9	35	1233	3.1	26	3.4	54	1410	2.3
120.9	1.8	16	1.7	28	1085	3.7	26	3.1	42	1241	2.7
121.6	1.5	14	1.4	31	1077	1.9	22	2.5	47	1232	1.4
122.3	2.1	14	1.6	22	979	2.2	31	2.8	34	1119	1.6
123.0	2.9	20	2.0	31	1163	2.8	41	3.7	48	1330	2.1
123.7	1.6	16	1.9	31	1117	2.6	22	3.5	47	1277	1.9
124.4	2.5	15	1.7	31	1227	3.0	36	3.2	48	1403	2.2
125.1	2.2	15	1.7	27	1236	2.5	32	3.1	41	1413	1.8
125.8	2.5	17	1.9	31	1165	2.9	36	3.5	48	1332	2.1
126.5	2.9	16	1.9	31	1152	2.9	41	3.4	47	1318	2.1
127.2	2.0	16	2.3	31	1240	3.7	29	4.2	48	1418	2.7
127.9	2.7	15	2.0	31	1133	2.9	39	3.6	47	1296	2.1
128.6	2.7	15	1.9	28	1287	3.9	39	3.5	42	1472	2.8
129.3	2.6	17	2.9	30	1169	2.9	38	5.2	46	1337	2.1
130.0	2.2	17	1.7	31	1170	3.5	32	3.0	47	1338	2.5
130.7	3.1	17	1.7	32	1080	2.9	45	3.2	48	1234	2.1
131.4	2.3	15	1.9	29	1126	2.6	33	3.4	45	1288	1.9
132.0	3.6	15	2.3	32	1225	1.9	52	4.3	49	1401	1.4
132.7	3.5	16	2.5	28	1353	3.6	50	4.5	42	1547	2.7
133.4	3.0	16	2.1	29	1175	2.9	44	3.9	45	1344	2.1
134.1	2.7	15	2.3	32	1272	3.1	39	4.2	48	1455	2.3
134.8	3.6	16	2.2	30	1357	3.2	52	4.0	45	1551	2.4
135.5	4.8	17	2.3	29	1256	2.7	69	4.3	45	1436	2.0
136.2	2.9	18	2.0	28	1152	2.9	42	3.6	44	1318	2.1
136.9	3.9	17	1.6	32	1137	4.0	57	3.0	50	1301	2.9
137.6	3.4	16	2.1	30	1092	1.9	49	3.9	46	1249	1.4
138.3	3.8	12	2.1	22	1022	2.4	55	3.9	34	1168	1.8
139.0	4.0	15	1.9	27	1118	4.0	57	3.5	41	1279	2.9
139.7	3.1	18	1.8	25	1215	1.7	44	3.3	38	1389	1.2
140.4	4.6	15	2.1	24	1094	2.5	66	3.8	37	1251	1.8
141.1	3.5	20	1.8	27	1170	3.3	51	3.3	41	1338	2.4
141.8	3.4	13	2.1	25	1079	2.3	49	3.9	38	1233	1.7
142.5	4.5	15	1.3	27	1125	2.9	65	2.4	42	1287	2.2
143.2	3.6	15	1.8	26	1093	2.0	52	3.3	40	1250	1.5
143.9	4.5	16	1.5	22	1017	2.4	65	2.8	34	1163	1.7
144.6	3.5	17	1.6	27	1077	3.0	50	2.8	41	1232	2.2
145.3	4.0	14	1.7	22	1014	2.9	58	3.0	33	1160	2.1
146.0	3.7	14	1.7	24	1130	2.9	54	3.2	37	1292	2.1
146.7	3.8	16	1.5	28	1004	2.7	56	2.7	44	1148	2.0
147.4	3.7	12	1.5	24	972	2.5	54	2.7	36	1111	1.8
148.1	3.0	12	1.6	19	906	2.4	43	2.9	29	1036	1.8
148.8	3.4	15	1.4	21	1026	2.3	49	2.6	32	1174	1.7
149.5	2.9	17	1.9	22	992	2.6	43	3.4	34	1135	1.9
150.2	2.4	15	1.5	21	916	2.2	35	2.7	33	1047	1.6
150.9	3.5	18	1.4	21	1020	2.3	51	2.5	32	1166	1.7
151.6	2.8	16	1.8	25	1024	1.3	40	3.3	38	1171	0.952
152.3	3.0	15	1.2	20	885	2.4	43	2.2	31	1012	1.7
153.0	2.8	17	1.6	24	1005	2.5	41	2.9	37	1149	1.9
153.7	4.3	17	1.3	21	949	3.0	62	2.3	33	1085	2.2
154.4	3.7	15	1.7	21	1014	2.6	54	3.1	32	1160	1.9
155.1	3.3	15	1.4	24	1053	2.1	48	2.6	36	1204	1.5
155.8	4.3	17	1.5	16	877	2.7	61	2.7	24	1003	1.9
156.5	3.0	18	1.3	19	929	2.3	44	2.4	28	1062	1.7
157.2	4.2	16	1.3	23	902	2.1	61	2.4	35	1032	1.5
157.9	2.8	17	1.2	18	857	1.7	40	2.2	28	980	1.2
158.5	3.1	14	1.7	18	1092	3.4	44	3.0	27	1249	2.5
159.2	3.3	16	1.5	22	914	1.8	48	2.7	34	1045	1.3
159.9	2.6	17	1.5	20	969	1.9	38	2.6	31	1108	1.4
160.6	2.3	15	1.5	17	1035	2.3	33	2.8	26	1183	1.7
161.3	3.2	14	1.0	21	936	1.7	46	1.9	32	1070	1.3
162.0	3.6	16	1.5	21	908	2.4	52	2.7	32	1038	1.8
162.7	3.8	16	1.7	18	1045	2.7	55	3.1	28	1195	1.9
163.4	2.3	15	0.901	18	1055	2.7	33	1.6	27	1207	2.0
164.1	3.0	14	1.2	17	842	1.2	44	2.2	26	963	0.886
164.8	3.1	15	1.4	19	1022	2.0	44	2.6	29	1169	1.4
165.5	3.0	17	1.2	20	939	2.3	44	2.1	31	1073	1.7
166.2	2.2	19	1.5	21	968	2.5	31	2.7	32	1107	1.9
166.9	3.2	18	1.1	22	861	2.6	47	1.9	34	985	1.9
167.6	2.7	16	1.3	20	757	2.1	39	2.4	30	865	1.5
168.3	3.3	14	0.912	18	839	1.9	48	1.7	28	959	1.4
169.0	3.2	17	1.1	18	894	2.3	46	1.9	27	1022	1.7



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
169.7	3.1	15	1.1	19	934	2.2	45	1.9	29	1068	1.6
170.4	3.3	15	1.0	18	801	2.7	48	1.8	28	916	2.0
171.1	2.2	13	1.1	15	791	1.5	32	2.0	23	905	1.1
171.8	2.7	17	0.939	15	865	2.3	39	1.7	24	989	1.7
172.5	2.3	17	1.0	21	816	2.6	33	1.8	32	933	1.9
173.2	1.7	16	0.893	16	745	3.5	25	1.6	25	852	2.5
173.9	2.2	14	1.2	18	800	3.2	32	2.2	28	915	2.3
174.6	2.1	14	0.741	14	745	1.8	31	1.4	22	852	1.3
175.3	2.5	15	0.937	17	875	2.3	36	1.7	26	1000	1.6
176.0	2.4	15	1.0	20	799	1.7	34	1.9	30	914	1.3
176.7	2.2	17	1.2	17	815	2.8	31	2.2	26	932	2.0
177.4	1.5	12	0.938	16	769	1.7	22	1.7	25	879	1.2
178.1	1.4	14	0.899	17	878	1.5	20	1.6	26	1004	1.1
178.8	1.8	16	0.904	15	793	2.7	25	1.6	23	907	2.0
179.5	2.0	18	0.917	19	906	2.7	29	1.7	29	1036	2.0
180.2	1.3	17	0.792	18	799	1.6	18	1.4	28	913	1.1
180.9	1.4	15	0.980	16	816	1.9	20	1.8	24	933	1.4
181.6	2.0	14	0.498	16	805	2.8	28	0.908	24	920	2.0
182.3	1.0	15	0.925	13	739	2.0	15	1.7	21	845	1.5
183.0	0.872	14	0.624	16	805	1.4	13	1.1	24	921	1.1
183.7	1.6	16	0.845	19	880	2.4	23	1.5	30	1006	1.7
184.3	1.2	17	0.660	18	969	3.0	18	1.2	28	1108	2.2
185.0	1.5	18	0.859	19	894	2.6	22	1.6	29	1023	1.9
185.7	1.1	15	0.915	21	953	2.6	16	1.7	32	1090	1.9
186.4	1.5	17	0.879	20	768	2.3	21	1.6	30	878	1.7
187.1	1.0	14	0.912	15	730	2.0	15	1.7	23	835	1.5
187.8	1.3	14	1.3	18	937	1.5	18	2.3	27	1071	1.1
188.5	1.1	17	1.1	17	923	3.0	16	2.0	25	1055	2.2
189.2	1.1	18	1.2	20	800	2.9	16	2.1	31	915	2.1
189.9	0.511	16	1.1	18	879	2.7	7.4	1.9	28	1005	2.0
190.6	0.805	14	0.634	18	844	2.2	12	1.2	27	965	1.6
191.3	0.786	17	1.3	18	1104	2.5	11	2.3	28	1262	1.8
192.0	1.8	19	1.3	18	952	2.9	26	2.3	27	1088	2.1
192.7	1.4	16	1.3	20	1035	2.7	20	2.3	31	1183	2.0
193.4	1.3	17	1.1	20	1009	2.7	19	1.9	31	1153	1.9
194.1	0.661	14	1.2	19	879	2.1	9.5	2.2	29	1005	1.5
194.8	0.796	17	1.3	17	1028	2.9	11	2.4	26	1176	2.1
195.5	1.5	16	1.4	18	1060	2.8	21	2.6	27	1213	2.1
196.2	1.2	16	1.0	20	1045	3.1	18	1.9	30	1195	2.2
196.9	1.2	16	1.2	20	1011	2.9	17	2.2	30	1156	2.2
197.6	0.807	14	1.3	18	1045	3.0	12	2.3	27	1195	2.2
198.3	0.770	16	1.1	15	1146	2.9	11	2.0	23	1310	2.1
199.0	1.3	17	1.2	22	1151	2.7	19	2.1	34	1316	2.0
199.7	1.0	17	0.997	20	909	2.6	15	1.8	30	1040	1.9
200.4	1.9	18	1.3	20	1143	3.2	28	2.3	31	1307	2.4
201.1	1.2	15	1.2	20	1012	3.0	18	2.2	31	1158	2.2
201.8	1.7	15	1.5	22	1126	4.2	25	2.8	34	1288	3.1
202.5	1.2	16	1.1	20	981	3.2	17	2.0	31	1121	2.3
203.2	1.5	16	1.3	22	1124	3.3	21	2.4	34	1285	2.4
203.9	1.5	15	1.3	19	1192	4.3	21	2.4	29	1363	3.2
204.6	1.4	14	1.3	18	1073	3.2	20	2.4	28	1226	2.3
205.3	1.7	19	1.4	22	1118	3.7	24	2.6	33	1279	2.7
206.0	1.7	15	1.3	18	1026	3.7	25	2.4	27	1174	2.7
206.7	1.5	15	1.4	19	1035	4.0	22	2.5	30	1183	2.9
207.4	0.825	14	1.0	17	1009	3.8	12	1.9	26	1154	2.8
208.1	2.1	16	1.5	17	1069	3.0	30	2.7	25	1222	2.2
208.8	1.2	15	1.4	18	1065	3.3	17	2.6	27	1218	2.4
209.5	1.8	19	1.4	24	1153	3.7	27	2.5	37	1318	2.7
210.2	1.4	15	1.3	20	1113	2.7	21	2.3	31	1273	2.0
210.8	1.7	16	1.4	17	1115	3.4	24	2.6	27	1275	2.5
211.5	1.8	16	1.4	23	1195	3.4	26	2.6	35	1367	2.5
212.2	1.6	18	1.7	23	1243	3.1	23	3.1	35	1421	2.3
212.9	0.765	18	1.2	20	1102	2.8	11	2.3	31	1260	2.1
213.6	2.0	15	1.2	20	1092	3.1	29	2.2	31	1249	2.2
214.3	1.0	16	1.0	21	1234	2.3	15	1.9	32	1411	1.7
215.0	1.8	16	1.3	21	1177	3.0	26	2.5	32	1346	2.2
215.7	0.915	17	1.2	20	1141	3.1	13	2.2	30	1305	2.3
216.4	1.3	13	0.955	20	1018	2.3	19	1.7	30	1164	1.7
217.1	1.8	13	0.970	21	1104	2.2	26	1.8	32	1263	1.6
217.8	2.0	15	1.1	20	1184	2.8	29	1.9	31	1354	2.0
218.5	1.8	15	1.3	22	1337	3.7	26	2.4	33	1529	2.7
219.2	1.4	18	0.940	21	1158	2.4	20	1.7	31	1324	1.8
219.9	1.5	13	0.756	21	972	2.6	21	1.4	31	1111	1.9
220.6	1.8	15	0.442	18	1115	3.3	26	0.807	27	1275	2.4
221.3	2.0	13	0.571	19	1005	2.9	29	1.0	29	1150	2.1
222.0	1.9	17	0.541	17	1047	3.3	28	0.987	26	1197	2.4
222.7	2.2	14	1.0	21	1050	3.3	31	1.8	32	1201	2.4
223.4	1.3	12	0.767	17	966	2.5	19	1.4	26	1105	1.8
224.1	0.953	12	0.918	17	935	2.3	14	1.7	27	1069	1.7
224.8	1.6	14	0.672	18	1027	2.2	23	1.2	27	1174	1.6
225.5	1.4	14	0.835	20	954	3.5	21	1.5	31	1091	2.5



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.2	1.2	14	0.815	21	1164	2.6	17	1.5	32	1331	1.9
226.9	1.0	14	0.498	15	830	2.1	15	0.907	23	949	1.5
227.6	1.3	13	0.718	12	969	1.8	18	1.3	18	1108	1.3
228.3	1.5	12	0.706	16	932	1.8	21	1.3	24	1066	1.3
229.0	1.6	16	0.891	19	1023	2.6	24	1.6	29	1169	1.9
229.7	1.7	15	0.510	18	995	1.7	25	0.930	27	1138	1.3
230.4	1.3	13	0.690	16	837	1.5	19	1.3	25	957	1.1
231.1	1.3	14	0.412	15	942	2.3	19	0.752	24	1078	1.7
231.8	0.824	13	0.756	16	829	2.2	12	1.4	25	948	1.6
232.5	1.5	14	0.906	18	945	2.6	21	1.7	28	1080	1.9
233.2	0.963	16	0.540	16	985	2.3	14	0.984	25	1127	1.7
233.9	1.4	11	0.679	11	736	1.8	20	1.2	16	841	1.3
234.6	0.880	13	0.462	16	780	2.6	13	0.843	24	892	1.9
235.3	0.860	15	0.580	15	883	2.2	12	1.1	24	1010	1.6
236.0	1.2	14	0.897	13	1026	1.6	18	1.6	19	1173	1.2
236.7	0.678	11	0.560	11	784	2.2	9.8	1.0	17	896	1.6
237.3	0.719	11	0.637	12	832	2.2	10	1.2	18	951	1.6
238.0	0.846	13	0.670	14	867	2.4	12	1.2	22	991	1.7
238.7	1.1	14	0.503	11	812	1.9	17	0.917	17	929	1.4
239.4	0.998	12	0.520	13	778	2.0	14	0.947	19	890	1.5
240.1	0.465	13	0.342	13	738	1.4	6.7	0.624	20	844	1.0
240.8	0.528	13	0.340	11	847	2.0	7.6	0.620	18	969	1.5
241.5	1.3	14	0.210	15	759	2.5	18	0.384	22	868	1.8
242.2	0.469	14	0.105	12	827	1.9	6.8	0.191	19	945	1.4
242.9	0.767	14	0.514	11	612	3.0	11	0.938	17	700	2.2
243.6	1.0	15	0.455	11	687	3.1	15	0.830	17	785	2.2
244.3	0.948	19	0.258	10	815	2.1	14	0.470	16	931	1.5
245.0	0.602	16	0.443	14	758	2.5	8.7	0.808	21	867	1.8
245.7	0.651	16	0.258	12	859	2.2	9.4	0.471	19	982	1.6
246.4	1.1	14	0.272	9.7	689	1.8	16	0.496	15	788	1.3
247.1	1.4	17	0.190	10	731	1.1	21	0.346	16	836	0.788
247.8	0.520	13	0.303	9.9	671	1.4	7.5	0.553	15	767	1.0
248.5	0.685	11	0.445	9.4	662	1.6	9.9	0.811	14	757	1.2
249.2	0.495	14	0.249	11	691	2.5	7.1	0.454	17	790	1.8
249.9	0.636	16	0.360	12	784	1.6	9.2	0.657	18	897	1.2
250.6	0.775	15	0.303	11	705	1.6	11	0.553	17	807	1.2
251.3	0.355	11	0.362	8.3	609	1.2	5.1	0.661	13	696	0.903
252.0	0.621	13	0.375	8.8	645	2.6	9.0	0.684	13	738	1.9
252.7	1.0	15	0.236	10	624	1.6	15	0.430	16	714	1.2
253.4	0.318	15	0.302	8.1	614	1.7	4.6	0.550	12	702	1.2
254.1	0.714	16	0.371	11	680	2.1	10	0.677	17	778	1.5
254.8	0.618	16	0.455	10	645	1.9	8.9	0.830	15	738	1.4
255.5	0.654	16	0.344	11	724	1.3	9.4	0.628	16	828	0.958
256.2	0.781	13	0.473	13	636	2.5	11	0.863	20	728	1.8
256.9	0.619	15	0.374	8.1	673	2.7	8.9	0.683	12	770	2.0
257.6	0.601	15	0.442	8.9	680	1.1	8.7	0.807	14	778	0.837
258.3	0.941	14	0.527	11	662	1.7	14	0.962	16	757	1.2
259.0	0.976	18	0.530	9.8	680	2.2	14	0.966	15	777	1.6
259.7	1.1	15	0.533	13	613	1.8	16	0.971	20	701	1.3
260.4	0.759	17	0.525	9.8	661	2.2	11	0.958	15	755	1.6
261.1	0.670	15	0.475	13	727	2.1	9.7	0.867	19	831	1.6
261.8	1.3	16	0.279	8.4	631	2.0	19	0.508	13	722	1.4
262.5	0.801	18	0.497	12	630	2.2	12	0.907	19	721	1.6
263.2	0.670	17	0.624	9.0	622	3.0	9.7	1.1	14	712	2.2
263.8	0.731	14	0.641	9.0	635	2.2	11	1.2	14	727	1.6
264.5	0.595	16	0.488	11	665	2.5	8.6	0.891	17	760	1.8
265.2	0.806	18	0.625	11	655	1.9	12	1.1	18	749	1.4
265.9	0.775	16	0.386	9.9	633	2.3	11	0.704	15	724	1.7
266.6	1.1	15	0.584	13	618	1.9	16	1.1	20	707	1.4
267.3	1.1	15	0.404	14	662	2.2	16	0.736	21	758	1.6
268.0	1.2	14	0.461	11	650	1.8	17	0.840	16	743	1.3
268.7	0.658	16	0.635	13	608	2.2	9.5	1.2	20	696	1.6
269.4	0.823	17	0.875	13	639	2.1	12	1.6	21	731	1.5
270.1	0.853	17	0.610	13	614	2.7	12	1.1	21	702	2.0
270.8	0.527	15	0.613	12	629	1.5	7.6	1.1	18	719	1.1
271.5	0.774	15	0.419	9.3	603	2.0	11	0.763	14	689	1.5
272.2	1.0	16	0.764	13	656	2.1	15	1.4	20	751	1.5
272.9	0.625	18	0.755	14	614	2.1	9.0	1.4	22	702	1.5
273.6	0.569	17	0.835	14	625	2.0	8.2	1.5	21	714	1.5
274.3	0.694	16	0.589	15	590	3.2	10	1.1	23	675	2.3
275.0	1.5	17	0.643	14	665	2.0	22	1.2	21	761	1.5
275.7	0.669	20	0.681	18	633	2.6	9.7	1.2	27	724	1.9
276.4	0.896	14	0.745	13	610	2.0	13	1.4	19	698	1.5
277.1	0.766	17	0.788	16	714	2.5	11	1.4	24	817	1.8
277.8	0.781	17	0.735	13	597	2.3	11	1.3	21	682	1.7
278.5	0.690	15	0.815	15	654	2.9	10.0	1.5	23	747	2.1
279.2	0.623	19	0.881	15	589	2.1	9.0	1.6	22	673	1.5
279.9	0.949	15	0.976	15	582	2.7	14	1.8	23	665	2.0
280.6	0.777	17	0.979	18	666	2.2	11	1.8	27	761	1.6
281.3	0.696	18	0.695	14	599	2.6	10	1.3	22	685	1.9
282.0	0.592	17	0.870	15	640	2.4	8.5	1.6	23	732	1.8



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
282.7	0.269	21	0.684	18	667	3.2	3.9	1.2	28	762	2.3
283.4	0.490	16	0.775	15	690	1.9	7.1	1.4	24	789	1.4
284.1	1.1	15	1.1	20	692	3.6	16	2.0	31	791	2.6
284.8	0.310	17	0.929	15	682	2.3	4.5	1.7	23	780	1.7
285.5	1.0	20	0.909	19	716	4.1	15	1.7	30	818	3.0
286.2	0.651	18	1.1	18	663	2.5	9.4	2.0	28	758	1.8
286.9	0.797	14	0.832	15	538	2.6	12	1.5	24	615	1.9
287.6	0.552	13	0.624	15	598	3.3	8.0	1.1	24	684	2.4
288.3	0.522	15	1.1	16	611	3.2	7.5	1.9	25	698	2.4
289.0	0.555	19	1.1	22	744	2.8	8.0	1.9	34	851	2.0
289.7	0.977	17	1.1	19	821	3.0	14	2.0	30	939	2.2
290.4	0.429	17	1.1	16	742	3.0	6.2	2.0	25	848	2.2
291.0	0.649	17	0.885	17	680	3.4	9.4	1.6	27	777	2.5
291.7	0.750	18	1.2	22	735	3.6	11	2.1	34	840	2.7
292.4	0.897	16	1.2	20	855	3.5	13	2.2	31	978	2.6
293.1	0.799	18	1.3	20	775	4.3	12	2.3	30	886	3.1
293.8	0.390	20	1.7	22	900	4.3	5.6	3.1	33	1029	3.1
294.5	0.269	16	2.3	23	804	4.7	3.9	4.2	35	919	3.4
295.2	0.479	16	1.4	21	807	3.5	6.9	2.6	33	923	2.5
295.9	0.971	18	1.7	27	882	4.3	14	3.2	41	1008	3.1
296.6	0.796	17	1.2	24	845	5.3	11	2.3	36	966	3.8
297.3	0.796	19	1.9	18	856	4.2	11	3.5	27	979	3.0
298.0	0.781	19	2.3	24	1060	3.8	11	4.3	36	1212	2.8
298.7	1.3	17	1.6	27	978	4.2	19	2.9	41	1118	3.0
299.4	0.871	17	2.0	24	933	3.6	13	3.6	37	1067	2.7
300.1	1.0	17	2.0	29	1083	3.9	14	3.6	45	1238	2.8
300.8	0.331	15	2.2	30	1096	4.2	4.8	4.0	46	1253	3.1
301.5	0.905	16	2.0	25	955	3.7	13	3.7	39	1092	2.7
302.2	0.900	16	2.1	28	952	3.0	13	3.9	43	1088	2.2
302.9	1.3	16	3.0	29	1073	5.3	18	5.4	44	1227	3.9
303.6	0.767	16	2.8	28	993	2.9	11	5.1	42	1135	2.1
304.3	1.6	17	3.2	28	1110	2.6	24	5.9	42	1269	1.9
305.0	1.0	19	3.3	28	1178	3.4	15	6.0	43	1348	2.5
305.7	1.8	19	2.6	29	1422	2.7	26	4.8	45	1626	1.9
306.4	0.719	16	2.3	28	1058	3.3	10	4.2	43	1209	2.4
307.1	2.7	19	2.9	31	1320	3.6	39	5.4	47	1509	2.6
307.8	2.0	18	3.7	33	1479	3.7	29	6.8	51	1691	2.7
308.5	2.7	15	3.5	38	1214	3.9	38	6.4	58	1389	2.8
309.2	1.1	15	3.1	36	1208	3.5	16	5.7	55	1382	2.5
309.9	2.7	19	4.0	34	1240	3.8	39	7.2	51	1418	2.7
310.6	1.2	21	3.3	30	1484	3.4	18	6.0	46	1697	2.5
311.3	1.8	18	4.0	28	1280	3.7	26	7.3	43	1464	2.7
312.0	2.1	17	4.0	35	1414	4.7	30	7.3	54	1616	3.4
312.7	2.4	16	2.9	33	1226	2.0	34	5.3	50	1402	1.5
313.4	1.7	15	3.8	39	1272	2.3	24	6.9	60	1455	1.7
314.1	2.1	15	4.1	41	1302	2.7	30	7.4	62	1489	2.0
314.8	2.7	20	4.5	40	1566	5.1	38	8.2	61	1791	3.7
315.5	3.5	17	4.5	38	1309	3.3	51	8.2	59	1497	2.4
316.2	3.4	16	4.3	32	1221	2.7	48	7.8	48	1396	2.0
316.9	2.5	16	4.0	32	1199	2.0	35	7.3	49	1371	1.5
317.5	1.6	16	3.8	32	1304	3.5	23	6.8	49	1491	2.5
318.2	2.3	19	4.5	33	1506	3.3	33	8.3	50	1722	2.4
318.9	2.3	18	4.3	32	1156	4.4	33	7.9	49	1322	3.2
319.6	3.2	15	4.2	35	1325	2.9	46	7.7	54	1515	2.1
320.3	3.5	18	4.6	35	1346	3.0	51	8.3	53	1539	2.2
321.0	2.6	13	4.2	28	1368	3.5	38	7.7	43	1565	2.5
321.7	2.7	13	4.7	28	1231	3.7	39	8.6	43	1408	2.7
322.4	2.9	16	4.7	37	1248	2.6	42	8.7	57	1427	1.9
323.1	2.6	15	5.2	36	1365	3.2	38	9.5	56	1561	2.3
323.8	2.9	17	5.0	39	1373	3.2	41	9.0	59	1571	2.3
324.5	3.9	20	5.4	38	1418	3.6	56	9.9	58	1621	2.6
325.2	3.8	16	5.3	40	1330	3.1	54	9.6	62	1521	2.2
325.9	3.5	18	5.4	36	1355	4.2	51	9.9	56	1549	3.1
326.6	4.2	16	5.0	37	1326	2.3	61	9.2	56	1517	1.6
327.3	3.4	18	4.4	31	1357	3.0	49	8.0	48	1552	2.2
328.0	5.1	18	6.0	37	1265	3.4	73	11	56	1447	2.5
328.7	5.8	22	7.9	44	1393	4.2	83	14	68	1593	3.0
329.4	4.9	19	5.5	40	1435	2.8	71	10.0	62	1641	2.0
330.1	5.7	16	4.4	29	1347	2.4	82	8.0	44	1540	1.7
330.8	4.8	15	5.6	36	1493	2.5	70	10	56	1708	1.8
331.5	5.7	16	5.5	33	1368	3.5	82	10.0	51	1565	2.5
332.2	8.1	17	5.5	35	1303	3.8	116	10.0	54	1490	2.8
332.9	6.8	17	6.1	40	1457	2.8	98	11	62	1666	2.0
333.6	7.8	18	5.2	40	1494	3.5	112	9.5	61	1708	2.5
334.3	7.2	16	6.4	35	1301	3.5	104	12	54	1488	2.6
335.0	6.9	15	4.1	27	1064	2.9	100	7.6	41	1217	2.1
335.7	5.7	15	5.6	35	1392	2.3	82	10	53	1592	1.7
336.4	6.8	15	5.7	32	1475	2.2	98	10	49	1687	1.6
337.1	7.7	16	5.1	34	1396	2.2	111	9.2	52	1596	1.6
337.8	7.7	17	5.3	30	1336	2.7	111	9.7	45	1528	2.0
338.5	9.4	16	4.7	32	1269	2.7	135	8.6	48	1452	2.0



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.2	8.1	14	4.7	29	1339	3.0	117	8.7	44	1531	2.2
339.9	8.2	14	5.2	31	1142	2.7	118	9.5	47	1306	2.0
340.6	7.5	15	5.7	34	1327	2.6	108	10	52	1518	1.9
341.3	7.3	15	5.1	29	1259	3.0	105	9.3	45	1439	2.2
342.0	7.6	15	3.8	30	1354	2.9	110	6.9	46	1548	2.1
342.7	10	16	4.4	30	1271	3.1	146	8.1	45	1454	2.3
343.4	9.9	14	5.1	29	1329	3.3	143	9.4	45	1519	2.4
344.1	12	16	3.8	31	1158	5.3	168	6.9	48	1324	3.9
344.7	9.8	15	5.1	31	1175	3.6	141	9.3	48	1344	2.6
345.4	9.9	14	4.8	36	1298	3.1	143	8.8	55	1485	2.2
346.1	9.6	15	4.9	25	1184	2.1	139	8.9	38	1354	1.5
346.8	12	15	5.1	30	1190	3.3	173	9.3	46	1361	2.4
347.5	10	17	4.9	31	1312	2.2	146	8.9	47	1500	1.6
348.2	11	15	4.7	26	1165	3.4	157	8.6	39	1333	2.5
348.9	12	14	4.4	29	1257	2.5	167	8.1	45	1437	1.8
349.6	10	15	4.0	24	1153	3.2	149	7.2	36	1319	2.4
350.3	10	14	4.0	22	1231	3.2	150	7.4	34	1408	2.3
351.0	10	13	3.8	29	1216	2.7	148	6.9	44	1391	2.0
351.7	13	14	4.0	23	1067	3.6	193	7.2	36	1220	2.6
352.4	9.4	14	3.6	24	1019	3.3	135	6.5	37	1166	2.4
353.1	8.2	14	3.6	21	935	2.4	119	6.6	32	1069	1.7
353.8	8.8	14	3.1	18	1016	4.0	127	5.6	27	1162	2.9
354.5	12	16	3.2	26	1184	2.9	174	5.8	40	1354	2.1
355.2	12	15	3.3	20	1006	2.7	167	6.1	31	1150	2.0
355.9	12	17	3.4	21	1198	2.0	168	6.2	33	1370	1.5
356.6	8.9	15	3.3	20	1007	2.7	128	6.0	30	1152	2.0
357.3	11	13	2.9	21	1015	2.2	152	5.4	32	1161	1.6
358.0	8.2	11	3.6	19	960	1.7	118	6.5	30	1098	1.3
358.7	12	13	3.0	22	992	2.2	176	5.5	34	1134	1.6
359.4	11	14	3.0	22	1097	2.5	166	5.5	34	1254	1.8
360.1	11	12	2.4	16	1093	2.2	152	4.3	25	1250	1.6
360.8	11	14	3.2	18	1052	3.6	154	5.8	27	1203	2.7
361.5	11	14	2.8	17	1126	2.7	159	5.1	26	1288	2.0
362.2	8.9	16	2.4	18	923	2.5	128	4.3	28	1055	1.8
362.9	9.6	14	1.7	15	1087	1.7	139	3.2	23	1243	1.3
363.6	10	12	2.5	15	997	2.4	150	4.6	23	1141	1.7
364.3	10	16	1.8	17	1022	2.8	145	3.3	27	1168	2.0
365.0	9.9	15	2.0	16	958	2.3	143	3.6	24	1095	1.7
365.7	9.5	14	1.6	17	1055	1.6	137	3.0	26	1207	1.1
366.4	7.2	12	1.5	14	859	1.9	104	2.7	22	983	1.4
367.1	8.9	13	1.9	13	990	1.5	129	3.4	19	1132	1.1
367.8	8.5	13	1.4	14	917	2.2	122	2.6	21	1048	1.6
368.5	9.7	13	1.4	12	865	2.7	141	2.6	18	989	1.9
369.2	7.8	13	1.5	12	874	2.4	113	2.7	18	999	1.8
369.9	6.7	16	1.3	13	844	1.9	97	2.4	20	965	1.4
370.5	8.0	13	1.3	11	887	1.8	115	2.4	17	1014	1.3
371.2	8.4	15	1.5	17	887	2.8	121	2.7	26	1015	2.0
371.9	7.3	15	0.967	14	767	2.2	106	1.8	21	878	1.6
372.6	6.8	13	1.2	13	806	2.3	98	2.1	19	922	1.7
373.3	6.5	15	1.2	12	850	2.1	94	2.1	19	972	1.5
374.0	7.7	14	0.787	12	915	2.4	111	1.4	19	1046	1.8
374.7	9.2	15	0.883	13	845	1.7	133	1.6	20	966	1.3
375.4	8.4	15	0.712	10	937	2.4	121	1.3	16	1071	1.7
376.1	5.6	13	0.759	10	773	2.7	81	1.4	16	884	1.9
376.8	5.3	17	0.816	11	918	2.3	76	1.5	17	1049	1.7
377.5	5.2	15	0.644	13	800	1.7	75	1.2	21	914	1.2
378.2	4.9	16	0.818	11	828	2.1	70	1.5	17	947	1.5
378.9	4.1	16	0.803	13	827	2.2	60	1.5	19	946	1.6
379.6	4.4	17	0.641	12	906	2.6	63	1.2	19	1035	1.9
380.3	2.7	16	0.621	11	743	2.3	39	1.1	17	850	1.7
381.0	3.1	17	0.545	12	824	2.3	44	0.994	19	942	1.7
381.7	3.2	16	0.866	14	791	3.4	46	1.6	21	905	2.5
382.4	3.1	20	0.770	14	953	2.6	45	1.4	21	1089	1.9
383.1	3.3	18	0.839	13	964	2.7	48	1.5	20	1103	2.0
383.8	1.9	19	0.761	13	778	1.8	27	1.4	19	890	1.3
384.5	2.7	20	0.461	15	836	3.1	38	0.840	22	956	2.2
385.2	1.6	18	0.778	12	787	2.3	24	1.4	18	900	1.7
385.9	1.8	18	0.604	16	801	2.6	26	1.1	25	916	1.9
386.6	0.966	19	0.598	15	890	3.1	14	1.1	23	1018	2.3
387.3	1.7	20	0.652	20	969	3.0	25	1.2	31	1108	2.2
388.0	2.4	23	0.970	17	906	3.6	35	1.8	26	1036	2.6
388.7	1.3	19	1.1	19	925	3.3	19	1.9	28	1058	2.4
389.4	1.1	19	1.1	19	888	1.7	15	2.0	28	1015	1.2
390.1	1.5	20	0.866	16	951	3.6	21	1.6	24	1088	2.7
390.8	1.6	20	1.1	19	1012	2.5	23	1.9	29	1158	1.9
391.5	0.953	19	0.928	18	964	1.9	14	1.7	27	1103	1.4
392.2	1.3	19	1.5	21	916	3.3	19	2.7	32	1048	2.4
392.9	1.1	22	1.3	19	1081	2.9	17	2.4	30	1236	2.1
393.6	0.714	17	1.1	17	1008	2.0	10	2.1	26	1152	1.4
394.3	0.887	25	1.1	22	1195	3.1	13	2.0	34	1367	2.3
395.0	1.0	21	1.3	20	1113	2.6	15	2.4	31	1272	1.9



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
395.7	0.844	20	1.4	20	934	2.2	12	2.5	30	1068	1.6
396.4	1.2	18	1.2	19	1045	2.2	17	2.3	30	1195	1.6
397.0	1.0	19	1.6	19	1002	2.0	15	3.0	29	1145	1.5
397.7	1.1	17	1.6	19	1026	3.2	16	2.9	30	1174	2.4
398.4	1.3	23	1.6	25	1286	2.5	18	3.0	38	1470	1.8
399.1	1.1	20	1.6	24	1089	2.1	15	2.8	36	1245	1.6
399.8	0.935	17	1.8	20	1108	2.4	14	3.3	31	1267	1.7
400.5	0.269	20	2.0	25	1145	1.9	3.9	3.7	38	1310	1.4
401.2	1.3	20	1.6	22	1109	2.1	18	2.8	34	1269	1.5
401.9	1.2	21	1.5	19	1065	2.7	17	2.8	29	1217	2.0
402.6	0.804	16	1.5	25	1181	2.4	12	2.7	38	1351	1.7
403.3	1.1	20	1.7	27	1112	2.3	16	3.2	41	1272	1.7
404.0	0.847	17	2.1	27	1597	2.3	12	3.8	41	1826	1.7
404.7	1.5	19	1.9	21	1072	2.3	22	3.5	33	1225	1.7
405.4	1.3	21	1.9	25	1194	2.7	19	3.4	38	1365	2.0
406.1	1.4	20	1.8	23	1145	2.0	20	3.2	35	1309	1.5
406.8	1.3	21	2.1	25	1183	2.4	18	3.9	38	1353	1.7
407.5	1.5	26	1.9	22	1181	3.2	22	3.4	34	1351	2.3
408.2	1.0	20	1.6	25	1143	2.7	15	3.0	38	1307	2.0
408.9	1.5	24	2.1	30	1344	3.7	22	3.9	46	1537	2.7
409.6	0.995	19	1.8	24	1191	2.6	14	3.4	36	1362	1.9
410.3	1.4	20	2.3	28	1285	3.2	20	4.1	42	1470	2.3
411.0	1.3	23	2.3	30	1503	3.3	19	4.2	47	1719	2.4
411.7	1.6	22	2.5	31	1283	1.9	23	4.6	48	1467	1.4
412.4	1.6	18	1.9	28	1381	2.7	23	3.5	42	1579	2.0
413.1	1.7	17	2.0	26	1192	2.3	25	3.6	40	1363	1.7
413.8	1.9	22	2.2	26	1295	3.6	27	4.1	40	1480	2.6
414.5	0.793	21	2.2	28	1291	2.7	11	4.0	42	1476	2.0
415.2	1.5	23	1.9	30	1248	2.9	21	3.4	46	1427	2.1
415.9	1.4	22	2.3	26	1246	2.3	20	4.1	39	1424	1.6
416.6	2.3	20	2.5	28	1296	2.6	33	4.5	43	1482	1.9
417.3	1.1	23	2.3	33	1428	3.6	16	4.2	51	1633	2.6
418.0	2.1	21	2.4	31	1349	2.9	31	4.5	47	1543	2.1
418.7	1.8	20	3.0	31	1373	1.6	26	5.5	47	1571	1.2
419.4	1.6	21	3.2	34	1419	2.5	23	5.7	52	1622	1.8
420.1	1.4	23	2.5	30	1339	3.2	20	4.6	45	1531	2.3
420.8	2.3	19	2.7	34	1496	3.1	33	5.0	52	1711	2.3
421.5	1.0	19	3.5	34	1476	2.6	15	6.4	52	1688	1.9
422.2	1.7	21	2.5	30	1476	3.5	25	4.5	46	1688	2.5
422.8	1.7	22	2.7	31	1507	1.8	24	5.0	48	1723	1.3
423.5	1.7	21	3.9	29	1309	2.0	24	7.0	45	1497	1.5
424.2	2.1	23	3.6	38	1402	2.3	30	6.6	58	1603	1.7
424.9	2.6	20	3.6	34	1398	2.5	37	6.5	52	1598	1.8
425.6	1.6	21	3.1	32	1252	2.2	23	5.7	49	1432	1.6
426.3	1.4	21	2.6	34	1502	3.8	20	4.7	52	1718	2.8
427.0	1.8	20	3.0	40	1374	3.7	26	5.4	62	1571	2.7
427.7	2.8	20	3.7	36	1378	2.2	40	6.7	56	1576	1.6
428.4	2.9	24	4.0	35	1511	2.5	41	7.2	54	1728	1.8
429.1	2.6	23	3.6	41	1708	2.3	37	6.6	64	1953	1.7
429.8	2.7	19	3.4	38	1434	3.2	39	6.3	58	1640	2.3
430.5	4.1	19	3.9	46	1615	3.5	60	7.1	70	1847	2.5
431.2	2.0	21	4.0	41	1502	3.7	28	7.3	63	1717	2.7
431.9	2.5	18	3.6	39	1516	3.1	36	6.6	59	1734	2.3
432.6	3.7	21	4.4	40	1510	2.2	53	8.1	62	1727	1.6
433.3	3.1	20	4.0	36	1505	2.9	45	7.3	55	1720	2.1
434.0	2.7	22	3.7	33	1364	2.9	40	6.8	50	1560	2.1
434.7	3.0	19	3.9	40	1323	2.4	44	7.2	61	1513	1.7
435.4	3.4	19	4.4	43	1290	2.8	49	8.0	66	1475	2.1
436.1	3.8	17	4.7	38	1243	3.6	54	8.6	58	1421	2.6
436.8	3.5	17	3.8	38	1446	4.5	50	7.0	58	1654	3.3
437.5	4.0	19	5.6	44	1579	4.3	57	10	67	1806	3.1
438.2	4.7	21	4.8	52	1690	2.5	68	8.8	80	1933	1.8
438.9	2.6	19	4.7	43	1568	3.3	38	8.6	67	1793	2.4
439.6	4.3	22	5.1	46	1611	3.7	63	9.3	71	1842	2.7
440.3	4.4	20	5.8	48	1682	3.4	64	11	74	1923	2.5
441.0	4.6	19	5.5	40	1566	4.1	66	9.9	61	1791	3.0
441.7	3.8	19	5.2	43	1431	3.4	56	9.5	66	1637	2.5
442.4	3.9	18	5.7	44	1459	3.2	56	10	67	1668	2.3
443.1	3.9	21	5.2	52	1715	4.6	57	9.5	79	1961	3.4
443.8	4.6	22	5.2	40	1581	3.0	67	9.6	61	1808	2.2
444.5	3.8	21	5.4	39	1325	2.5	55	9.9	59	1515	1.8
445.2	4.9	20	5.1	52	1644	3.4	70	9.4	80	1880	2.5
445.9	4.8	20	5.9	54	1632	3.9	69	11	83	1867	2.9
446.6	4.1	19	5.6	50	1539	3.0	59	10	76	1760	2.2
447.3	5.1	23	6.2	51	1772	4.0	74	11	78	2027	2.9
448.0	4.1	19	6.1	50	1511	2.1	59	11	76	1728	1.5
448.6	5.0	20	6.0	54	1593	3.8	71	11	83	1822	2.8
449.3	4.1	22	6.3	45	1426	2.8	59	11	69	1631	2.0
450.0	5.2	21	8.2	55	1747	3.0	75	15	85	1997	2.2
450.7	3.4	18	5.8	43	1463	3.7	49	11	67	1673	2.7
451.4	5.3	20	6.4	53	1495	3.4	77	12	80	1709	2.5



Minnow Environmental  
Sample ID: 003

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
452.1	5.2	21	6.6	52	1790	3.9	75	12	80	2047	2.8
452.8	4.8	18	6.7	47	1498	3.1	69	12	72	1713	2.3
453.5	5.1	21	6.9	49	1673	2.1	73	13	75	1914	1.5
454.2	5.9	20	6.7	52	1513	3.3	85	12	79	1730	2.4
454.9	4.9	17	6.6	47	1560	2.8	70	12	73	1784	2.0
455.6	5.6	20	6.5	43	1550	2.9	80	12	66	1773	2.1
456.3	5.6	19	7.1	49	1684	1.2	81	13	76	1926	0.910
457.0	6.4	23	8.2	55	1808	2.5	93	15	84	2068	1.8
457.7	5.8	21	5.7	60	1662	3.4	84	10	93	1901	2.5
458.4	4.9	15	5.5	41	1265	2.0	70	10	63	1447	1.4
459.1	5.0	18	7.2	52	1598	2.7	72	13	79	1827	1.9
459.8	5.7	18	7.1	52	1710	3.2	82	13	79	1955	2.3
460.5	6.2	18	6.5	53	1612	2.5	89	12	80	1843	1.8
461.2	5.7	19	6.3	47	1461	3.5	83	11	72	1671	2.5
461.9	5.9	18	6.7	51	1658	3.4	85	12	78	1896	2.4
462.6	4.8	15	5.8	53	1573	3.7	69	11	81	1799	2.7
463.3	5.5	17	7.0	47	1667	3.0	79	13	72	1906	2.2
464.0	7.4	20	6.6	49	1811	2.3	107	12	76	2071	1.7
464.7	5.4	18	5.7	51	1658	2.9	77	10	77	1896	2.1
465.4	5.7	20	5.2	48	1414	2.2	83	9.5	74	1617	1.6
466.1	4.8	16	6.5	44	1509	2.9	69	12	67	1726	2.1
466.8	6.9	18	5.9	44	1397	3.2	100	11	67	1597	2.4
467.5	5.7	16	6.0	50	1419	2.7	82	11	77	1622	2.0
468.2	5.9	18	5.5	49	1414	3.4	84	10	74	1617	2.5
468.9	7.9	20	5.9	51	1476	3.2	113	11	78	1688	2.4
469.6	7.4	17	5.1	41	1375	2.7	106	9.4	62	1572	2.0
470.3	6.8	16	5.8	48	1425	3.7	99	11	73	1629	2.7
471.0	7.0	16	5.2	41	1268	2.2	101	9.5	62	1450	1.6
471.7	7.5	19	4.7	48	1376	3.0	108	8.5	74	1574	2.2
472.4	6.5	15	4.2	41	1328	2.8	93	7.7	63	1519	2.0
473.1	9.9	20	4.8	45	1536	2.0	142	8.7	69	1757	1.5
473.8	7.7	18	5.5	50	1359	2.7	112	9.9	76	1554	2.0
474.4	7.4	18	5.2	43	1213	1.9	108	9.4	65	1387	1.4
475.1	8.3	17	5.3	41	1362	2.9	119	9.6	63	1557	2.1
475.8	7.1	13	4.4	35	1292	2.6	103	8.0	53	1477	1.9
476.5	8.8	16	5.1	43	1203	2.3	127	9.3	66	1376	1.7
477.2	6.9	18	4.3	43	1301	2.6	99	7.8	67	1488	1.9
477.9	8.0	16	5.6	43	1258	2.2	116	10	66	1439	1.6
478.6	6.9	16	4.3	33	1296	2.3	99	7.9	51	1481	1.7
479.3	8.1	15	4.5	36	1139	2.6	117	8.2	55	1303	1.9
480.0	7.5	14	3.6	36	1116	2.0	109	6.5	56	1276	1.5
480.7	8.1	19	4.6	36	1294	3.1	117	8.4	55	1480	2.2
481.4	8.3	16	3.7	33	1067	1.6	119	6.8	50	1220	1.1
482.1	8.4	15	3.9	36	1095	1.6	121	7.2	56	1252	1.2
482.8	7.7	18	3.8	40	1145	1.9	111	7.0	61	1310	1.4
483.5	8.4	16	4.1	43	1308	3.1	121	7.5	65	1496	2.2
484.2	6.4	16	3.3	27	1036	1.6	92	6.0	42	1185	1.2
484.9	9.0	17	4.0	29	1087	1.8	130	7.4	45	1243	1.3
485.6	7.8	13	3.4	23	1159	2.6	112	6.2	36	1326	1.9
486.3	7.4	13	3.6	27	929	3.1	107	6.6	41	1062	2.3
487.0	7.2	16	3.3	31	1127	2.3	104	6.0	47	1288	1.6
487.7	9.3	17	3.3	29	988	1.8	134	6.0	45	1130	1.3
488.4	6.3	14	3.4	28	1141	2.0	91	6.2	42	1305	1.4
489.1	8.2	15	3.2	30	974	2.6	118	5.8	47	1114	1.9
489.8	8.5	15	2.8	26	1074	2.4	123	5.0	39	1228	1.7
490.5	8.2	13	2.5	24	905	2.4	118	4.6	37	1035	1.7
491.2	8.0	16	2.5	29	851	1.2	115	4.6	44	973	0.907
491.9	6.8	16	2.8	30	825	2.1	98	5.1	45	943	1.5
492.6	7.9	15	2.5	24	935	2.2	114	4.6	38	1069	1.6
493.3	9.3	15	3.0	26	1053	2.0	135	5.4	41	1205	1.5
494.0	6.7	15	2.6	22	860	2.1	96	4.7	33	983	1.6
494.7	5.8	13	2.0	21	941	1.6	84	3.7	33	1076	1.2
495.4	7.3	14	2.7	22	857	2.5	105	4.9	34	980	1.8
496.1	6.6	15	3.3	22	906	2.6	96	6.0	34	1036	1.9
496.8	6.6	13	2.3	22	779	2.0	95	4.2	34	891	1.5
497.5	6.8	16	2.1	22	937	2.0	99	3.8	34	1072	1.4
498.2	6.7	17	2.6	22	871	2.0	97	4.8	34	996	1.5
498.9	5.2	14	2.1	20	829	1.2	75	3.9	31	948	0.907
499.6	7.8	14	2.7	20	907	1.7	113	4.9	31	1037	1.3
500.3	7.0	16	2.6	23	936	2.4	100	4.8	35	1070	1.7
501.0	6.6	16	2.4	22	936	3.2	95	4.4	33	1070	2.3
501.6	7.0	15	2.0	23	835	2.1	101	3.6	36	955	1.5
502.3	5.0	13	2.1	19	801	2.6	73	3.8	29	916	1.9
503.0	6.3	13	2.3	25	849	2.4	91	4.2	39	970	1.7
503.7	7.7	14	1.9	25	788	2.0	112	3.4	39	901	1.4
504.4	5.5	14	1.3	19	910	1.9	80	2.4	30	1040	1.4
505.1	5.7	12	1.9	20	725	1.3	82	3.5	30	829	0.962
505.8	4.5	15	2.2	22	811	2.7	65	4.1	33	927	2.0
506.5	5.9	15	1.5	18	787	2.1	86	2.8	27	900	1.5
507.2	5.3	14	1.7	15	615	1.7	77	3.1	23	703	1.2
507.9	4.4	13	2.1	22	751	1.5	63	3.8	34	859	1.1



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.6	4.9	14	1.4	19	763	2.0	70	2.5	29	872	1.5
509.3	5.6	13	1.4	18	718	2.0	81	2.6	27	821	1.4
510.0	4.5	16	1.4	23	742	2.9	64	2.5	36	849	2.1
510.7	4.9	14	1.4	18	755	2.6	70	2.5	27	863	1.9
511.4	5.3	14	1.1	18	794	1.8	76	1.9	27	908	1.3
512.1	5.0	14	1.3	13	669	2.0	73	2.4	20	764	1.4
512.8	4.6	13	1.4	15	592	1.4	66	2.6	24	677	1.0
513.5	6.1	11	1.1	13	626	2.7	89	2.0	19	716	2.0
514.2	4.1	14	1.1	16	585	2.0	59	2.1	24	669	1.5
514.9	4.9	12	0.870	15	711	2.3	71	1.6	23	813	1.6
515.6	4.7	13	1.2	21	593	2.1	68	2.2	33	678	1.6
516.3	8.2	12	1.8	19	660	1.4	119	3.2	29	754	1.0
517.0	4.3	15	1.4	18	736	2.1	62	2.6	28	841	1.6
517.7	4.9	13	1.8	17	704	2.5	71	3.3	26	805	1.8
518.4	5.1	13	1.4	22	671	2.0	74	2.6	34	768	1.4
519.1	4.0	11	0.891	17	542	1.6	57	1.6	26	620	1.2
519.8	3.9	11	0.887	19	650	2.2	57	1.6	29	743	1.6
520.5	4.9	12	1.0	22	759	2.4	70	1.8	33	868	1.8
521.2	4.9	16	1.5	18	667	2.2	70	2.8	28	763	1.6
521.9	4.4	14	1.2	20	663	1.2	63	2.1	31	758	0.900
522.6	3.5	13	1.2	22	690	1.3	50	2.2	33	789	0.958
523.3	4.1	13	1.7	21	729	1.7	60	3.1	33	834	1.2
524.0	4.2	13	1.2	19	638	1.5	60	2.3	29	730	1.1
524.7	4.0	11	0.999	19	567	1.9	57	1.8	30	648	1.4
525.4	3.4	13	1.4	22	626	1.5	48	2.6	34	715	1.1
526.1	4.2	13	1.3	20	763	2.3	60	2.3	31	872	1.7
526.8	3.4	17	1.0	21	832	2.3	49	1.9	33	951	1.7
527.4	2.4	13	1.4	22	903	1.7	35	2.5	34	1033	1.3
528.1	3.4	13	1.2	20	733	2.5	49	2.1	30	838	1.8
528.8	2.8	15	1.4	24	956	2.4	40	2.6	36	1093	1.7
529.5	2.1	16	1.2	22	834	1.9	30	2.1	33	954	1.4
530.2	2.9	14	1.3	22	741	2.5	42	2.4	34	847	1.8
530.9	3.3	9.9	1.4	20	772	2.0	48	2.6	30	883	1.4
531.6	2.5	14	0.855	23	710	2.0	36	1.6	36	812	1.5
532.3	2.6	14	1.1	20	762	2.2	37	2.0	31	872	1.6
533.0	3.2	12	0.986	21	782	2.1	46	1.8	33	894	1.5
533.7	3.0	15	1.2	21	757	1.6	43	2.3	32	866	1.2
534.4	2.2	16	1.2	30	826	2.6	32	2.2	46	944	1.9
535.1	2.7	12	1.5	25	836	2.3	39	2.7	38	956	1.7
535.8	1.8	12	1.1	20	680	1.5	26	2.1	31	778	1.1
536.5	2.5	13	1.2	27	848	2.4	36	2.1	41	970	1.7
537.2	1.9	15	1.4	26	822	2.2	27	2.6	39	939	1.6
537.9	1.8	14	1.6	23	776	2.7	26	3.0	35	887	2.0
538.6	1.5	11	1.4	19	718	2.3	22	2.5	29	821	1.7
539.3	3.6	15	1.9	32	912	2.2	52	3.5	49	1043	1.6
540.0	2.4	13	1.6	26	878	1.5	34	2.9	40	1004	1.1
540.7	2.1	14	1.5	22	813	2.6	30	2.7	34	930	1.9
541.4	1.8	14	1.5	30	817	2.4	26	2.8	45	934	1.7
542.1	2.1	15	1.5	27	1047	1.9	30	2.7	42	1197	1.4
542.8	2.1	14	1.3	26	958	2.1	30	2.3	40	1096	1.5
543.5	1.8	14	1.1	29	902	2.1	26	2.0	45	1031	1.6
544.2	1.7	16	1.2	32	826	2.0	25	2.1	50	945	1.4
544.9	1.9	15	1.8	29	1118	2.3	27	3.2	45	1279	1.7
545.6	1.0	13	1.5	28	992	2.6	15	2.8	43	1134	1.9
546.3	1.7	17	1.7	28	1114	2.4	24	3.2	43	1274	1.8
547.0	1.4	12	1.4	27	1071	2.0	20	2.5	41	1225	1.5
547.7	2.1	15	1.9	35	934	2.4	31	3.5	54	1069	1.7
548.4	1.7	13	1.6	26	899	2.5	24	2.8	40	1028	1.8
549.1	2.3	13	1.7	28	1070	2.2	33	3.2	43	1223	1.6
549.8	1.6	15	1.4	30	1158	2.9	23	2.6	45	1325	2.1
550.5	1.9	20	1.9	31	1216	2.3	28	3.6	48	1391	1.7
551.2	1.2	13	1.6	27	859	2.0	18	2.9	41	982	1.4
551.9	1.4	12	1.6	24	1049	1.6	20	2.9	37	1199	1.1
552.6	1.2	12	2.4	31	1215	1.5	18	4.4	47	1389	1.1
553.3	1.2	15	2.6	31	1126	2.1	17	4.7	48	1288	1.5
553.9	1.1	13	2.1	28	967	2.3	15	3.8	43	1106	1.6
554.6	1.1	14	2.1	32	1025	1.7	17	3.9	49	1172	1.2
555.3	1.6	13	2.0	34	1067	1.8	23	3.6	52	1220	1.3
556.0	1.2	13	1.9	27	906	1.3	17	3.5	41	1037	0.942
556.7	1.5	14	2.1	29	1076	1.9	21	3.9	44	1230	1.4
557.4	1.5	13	2.8	33	1208	2.3	22	5.1	51	1381	1.7
558.1	2.2	15	2.0	38	1127	2.0	31	3.6	58	1289	1.5
558.8	1.7	12	2.3	27	1048	1.0	24	4.1	42	1199	0.763
559.5	1.9	12	1.9	32	1213	1.4	28	3.5	49	1387	1.0
560.2	1.1	12	2.2	26	1002	1.6	16	4.1	40	1146	1.2
560.9	2.0	14	2.6	31	1092	1.9	29	4.7	48	1249	1.4
561.6	2.4	13	2.0	35	1143	1.8	34	3.7	53	1307	1.3
562.3	2.2	13	2.4	30	1004	2.0	31	4.4	45	1148	1.4
563.0	2.6	16	2.6	33	1073	1.9	38	4.7	50	1227	1.4
563.7	2.2	18	2.4	34	1138	2.3	32	4.4	52	1301	1.7
564.4	1.8	15	2.6	37	1345	2.4	26	4.8	57	1538	1.8



Minnow Environmental  
Sample ID: 003

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
565.1	2.1	16	3.1	35	1608	2.0	30	5.7	54	1839	1.4
565.8	2.4	16	3.4	33	1185	1.5	34	6.1	50	1355	1.1
566.5	1.9	12	2.8	36	1196	2.4	28	5.1	55	1367	1.7
567.2	3.0	14	2.5	38	1160	2.2	43	4.6	58	1327	1.6
567.9	3.2	16	2.6	33	1217	2.2	47	4.8	51	1392	1.6
568.6	2.7	12	2.6	29	1136	1.3	39	4.7	45	1299	0.941
569.3	2.8	14	2.6	36	1295	2.1	41	4.8	55	1481	1.5
570.0	3.7	14	3.2	32	1141	2.4	54	5.8	49	1305	1.7
570.7	3.1	14	2.7	31	1204	1.5	44	4.9	48	1377	1.1
571.4	2.8	17	2.4	36	1335	1.8	40	4.3	56	1526	1.3
572.1	2.7	13	2.3	31	1047	2.0	39	4.2	47	1197	1.4
572.8	4.1	14	2.3	29	1571	1.9	59	4.3	45	1797	1.4
573.5	3.2	14	2.9	29	1140	1.7	46	5.3	45	1304	1.3
574.2	4.2	13	2.7	37	1089	1.8	60	4.9	57	1245	1.3
574.9	2.9	11	2.3	31	1051	2.3	42	4.1	48	1202	1.7
575.6	4.2	13	2.5	32	1177	2.6	60	4.5	49	1346	1.9
576.3	4.6	15	2.8	30	991	2.2	67	5.1	46	1133	1.6
577.0	5.3	19	3.2	29	1301	2.7	76	5.9	45	1488	1.9
577.7	3.5	14	3.1	32	1031	2.4	50	5.6	49	1179	1.7
578.4	4.3	12	2.0	27	1014	1.9	62	3.7	41	1159	1.4
579.1	4.1	16	2.4	30	1159	2.4	59	4.3	46	1325	1.7
579.8	4.4	12	2.2	28	953	2.3	64	4.1	42	1090	1.6
580.5	4.9	13	2.7	29	978	1.7	71	4.9	44	1118	1.2
581.1	2.7	14	2.4	27	976	1.4	39	4.3	42	1116	1.0
581.8	4.1	14	2.1	28	999	1.7	60	3.9	42	1142	1.2
582.5	3.4	12	2.8	25	977	1.1	49	5.1	39	1117	0.825
583.2	2.7	15	2.6	29	843	2.0	40	4.7	45	964	1.4
583.9	3.1	14	2.3	26	898	2.4	44	4.2	39	1027	1.8
584.6	3.7	13	1.9	22	908	2.1	54	3.6	34	1039	1.5
585.3	3.9	13	2.6	20	947	2.6	57	4.7	31	1083	1.9
586.0	2.8	12	2.4	20	988	2.0	41	4.4	31	1130	1.5
586.7	3.7	13	2.2	22	787	1.9	53	4.0	34	900	1.4
587.4	4.1	15	2.3	20	925	2.1	59	4.3	30	1058	1.5
588.1	2.4	11	1.8	21	825	1.5	35	3.4	33	943	1.1
588.8	3.0	13	1.8	23	932	1.2	44	3.3	36	1065	0.854
589.5	3.3	15	2.3	25	952	1.9	48	4.2	38	1089	1.4
590.2	2.9	15	2.0	23	832	1.6	42	3.6	35	951	1.2
590.9	3.3	12	2.4	20	825	2.3	48	4.4	30	944	1.7
591.6	4.3	15	2.5	23	1226	2.3	63	4.5	36	1402	1.7
592.3	2.6	14	2.0	24	989	1.9	38	3.7	36	1131	1.4
593.0	2.3	14	1.8	22	924	2.2	34	3.3	34	1057	1.6
593.7	2.0	13	1.9	21	791	1.8	28	3.5	33	905	1.3
594.4	2.1	12	2.2	18	730	1.6	30	4.0	28	834	1.1
595.1	2.7	13	2.0	21	886	1.0	39	3.6	32	1014	0.751
595.8	2.2	12	2.4	22	918	2.4	32	4.4	34	1050	1.7
596.5	2.3	15	2.6	22	805	2.4	33	4.7	33	920	1.7
597.2	2.3	12	2.5	19	658	1.8	33	4.5	30	752	1.3
597.9	2.8	13	2.3	20	655	1.0	41	4.2	31	749	0.764
598.6	1.9	13	2.3	23	927	2.1	28	4.1	36	1061	1.6
599.3	1.6	12	2.4	19	675	2.5	22	4.3	29	772	1.8
600.0	2.8	16	2.3	20	812	1.8	41	4.2	31	928	1.3
600.7	1.9	13	2.2	23	658	1.2	27	3.9	35	752	0.864
601.4	2.1	10	1.9	18	677	1.6	31	3.5	28	774	1.1
602.1	2.8	11	2.7	22	765	2.6	40	4.9	33	875	1.9
602.8	1.9	12	2.0	18	691	1.8	28	3.7	28	790	1.3
603.5	1.9	16	1.7	28	804	2.4	27	3.1	43	919	1.8
604.2	1.7	13	2.9	22	610	1.7	24	5.2	34	697	1.3
604.9	1.6	14	2.0	17	595	1.1	23	3.6	26	680	0.784
605.6	1.9	13	2.5	18	613	1.2	27	4.6	27	701	0.890
606.3	2.0	13	2.0	19	634	1.2	29	3.6	29	725	0.898
606.9	1.4	13	2.1	15	519	1.2	20	3.8	24	593	0.841
607.6	2.4	12	1.8	19	566	1.7	35	3.3	28	647	1.3
608.3	1.2	12	1.8	19	472	1.3	18	3.2	29	540	0.958
609.0	1.8	13	2.0	18	620	1.5	26	3.7	28	709	1.1
609.7	1.4	12	2.0	22	452	1.8	20	3.7	33	516	1.3
610.4	2.0	12	2.3	21	452	1.4	29	4.2	32	517	1.1
611.1	1.7	12	2.3	19	537	1.2	24	4.2	29	614	0.846
611.8	1.8	15	1.9	16	472	1.4	26	3.5	24	539	1.0
612.5	0.959	12	1.6	21	497	1.2	14	2.8	32	568	0.881
613.2	1.1	12	1.9	20	371	1.7	16	3.5	30	424	1.2
613.9	1.1	9.0	1.7	16	368	0.908	15	3.0	25	420	0.663
614.6	0.846	10	1.8	21	455	1.7	12	3.3	32	520	1.2
615.3	0.939	11	1.7	17	378	1.8	14	3.1	25	433	1.3
616.0	1.0	11	1.6	15	374	1.2	15	2.9	23	428	0.888
616.7	1.4	10.0	1.6	20	402	2.1	21	2.8	30	460	1.5
617.4	1.2	12	1.9	20	421	1.2	17	3.5	31	482	0.900
618.1	0.693	14	1.7	17	397	1.6	10	3.0	26	454	1.1
618.8	0.756	13	1.4	20	347	1.5	11	2.6	30	397	1.1
619.5	1.2	14	1.6	20	370	2.0	18	3.0	31	423	1.5
620.2	1.0	11	1.2	14	353	1.6	15	2.2	22	404	1.2
620.9	0.943	9.8	1.5	18	324	1.0	14	2.8	27	370	0.758



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.6	0.958	11	1.3	17	289	1.6	14	2.4	26	330	1.2
622.3	1.3	11	1.5	15	345	1.4	18	2.7	23	395	1.0
623.0	0.711	15	1.7	17	283	1.3	10	3.0	26	323	0.919
623.7	1.2	11	1.4	17	294	0.870	17	2.5	27	336	0.635
624.4	0.880	11	1.4	16	252	1.8	13	2.6	25	289	1.3
625.1	0.687	13	1.5	16	259	1.3	9.9	2.7	24	296	0.939
625.8	0.386	11	1.5	15	252	0.957	5.6	2.7	23	289	0.699
626.5	0.832	11	1.5	19	296	1.4	12	2.7	29	338	1.0
627.2	0.758	12	1.6	18	244	0.884	11	2.9	27	279	0.645
627.9	0.721	12	1.4	16	235	1.2	10	2.6	25	268	0.870
628.6	0.977	9.8	1.4	15	252	1.5	14	2.6	23	288	1.1
629.3	0.432	13	1.8	17	253	0.951	6.2	3.3	27	290	0.694
630.0	0.353	12	1.5	18	262	1.2	5.1	2.7	28	300	0.850
630.7	0.551	10	1.6	19	245	1.8	8.0	3.0	29	280	1.3
631.4	0.721	11	1.2	17	253	1.1	10	2.1	27	290	0.811
632.1	0.474	11	1.3	16	219	1.8	6.8	2.3	24	251	1.3
632.8	1.6	12	1.3	16	260	1.2	23	2.4	25	297	0.842
633.4	0.649	13	1.6	17	267	0.906	9.4	2.9	27	306	0.661
634.1	0.296	12	1.6	16	222	1.6	4.3	2.8	24	254	1.1
634.8	0.644	11	1.8	18	281	1.1	9.3	3.3	27	321	0.836
635.5	0.686	11	1.7	16	235	1.6	9.9	3.1	25	268	1.2
636.2	0.856	9.0	1.5	15	273	0.967	12	2.8	23	312	0.706
636.9	0.269	13	1.8	16	274	1.4	3.9	3.3	24	313	1.0
637.6	0.757	12	1.7	17	255	1.6	11	3.1	26	292	1.2
638.3	1.0	11	1.6	13	255	0.828	14	3.0	20	292	0.604
639.0	0.717	10	1.7	12	231	1.3	10	3.1	18	264	0.967
639.7	0.495	14	1.8	17	245	1.8	7.1	3.3	26	281	1.3
640.4	0.541	12	1.4	16	288	2.1	7.8	2.5	24	330	1.5
641.1	0.595	10	1.3	13	204	1.2	8.6	2.3	19	234	0.861
641.8	0.425	13	1.8	16	284	1.7	6.1	3.4	25	325	1.3
642.5	0.828	10	1.6	12	252	1.3	12	2.9	19	288	0.946
643.2	0.667	11	1.3	13	191	1.2	9.6	2.4	20	218	0.855
643.9	0.319	11	1.7	13	220	0.979	4.6	3.1	19	251	0.714
644.6	0.269	13	1.9	12	250	1.1	3.9	3.4	19	286	0.779
645.3	0.535	9.3	1.6	11	238	1.4	7.7	2.9	17	272	1.1
646.0	0.638	12	1.5	14	298	2.3	9.2	2.7	21	341	1.7
646.7	0.286	10	1.3	11	219	2.0	4.1	2.4	17	250	1.5
647.4	0.387	12	1.4	13	272	1.6	5.6	2.5	20	311	1.2
648.1	0.269	11	1.3	13	225	1.5	3.9	2.4	21	257	1.1
648.8	0.511	10	1.7	13	247	1.8	7.4	3.1	19	282	1.3
649.5	0.269	11	1.1	12	239	2.1	3.9	2.0	19	273	1.5
650.2	0.855	12	1.5	13	216	1.4	12	2.7	20	248	1.0
650.9	0.518	9.7	1.1	11	233	1.6	7.5	2.0	18	267	1.2
651.6	0.492	10	1.2	8.2	264	1.2	7.1	2.3	13	302	0.890
652.3	0.576	10	1.1	9.7	233	1.7	8.3	2.0	15	266	1.3
653.0	0.369	10	1.2	9.5	233	1.4	5.3	2.1	15	266	1.0
653.7	0.756	12	1.2	9.5	242	1.2	11	2.2	15	277	0.858
654.4	1.2	11	1.4	7.5	240	1.6	17	2.6	11	275	1.2
655.1	0.327	11	1.0	9.2	255	1.5	4.7	1.8	14	292	1.1
655.8	0.654	9.6	0.995	8.8	204	1.5	9.4	1.8	13	233	1.1
656.5	1.1	11	1.0	9.4	225	1.2	16	1.9	14	258	0.893
657.2	0.505	12	1.1	8.7	279	1.6	7.3	2.0	13	319	1.2
657.9	0.651	11	0.956	8.5	244	1.9	9.4	1.7	13	279	1.4
658.6	0.553	9.5	0.965	7.4	258	2.1	8.0	1.8	11	295	1.6
659.3	0.398	13	1.0	9.4	229	1.2	5.7	1.9	14	262	0.900
659.9	0.690	12	0.811	7.3	241	0.760	10.0	1.5	11	275	0.554
660.6	0.827	11	1.4	8.9	213	0.863	12	2.5	14	244	0.630
661.3	0.269	9.5	0.699	5.9	209	1.1	3.9	1.3	9.0	239	0.799
662.0	0.480	9.6	0.913	8.4	225	1.6	6.9	1.7	13	257	1.2
662.7	0.425	14	1.0	9.1	285	1.9	6.1	1.9	14	326	1.4
663.4	0.347	10	0.973	8.4	237	1.7	5.0	1.8	13	271	1.3
664.1	0.794	11	1.1	6.8	236	0.737	11	2.0	10	270	0.538
664.8	0.590	11	1.1	8.0	239	1.2	8.5	2.0	12	273	0.875
665.5	0.557	11	0.750	7.0	233	1.5	8.0	1.4	11	266	1.1
666.2	0.374	12	0.855	9.5	235	1.6	5.4	1.6	15	269	1.2
666.9	0.827	11	0.719	6.8	230	1.0	12	1.3	10	264	0.734
667.6	0.898	12	0.742	9.2	236	1.6	13	1.4	14	269	1.1
668.3	0.725	12	0.705	7.1	262	0.684	10	1.3	11	300	0.499
669.0	0.947	8.8	0.731	5.9	270	1.3	14	1.3	9.0	309	0.914
669.7	0.741	9.2	0.765	8.1	263	1.4	11	1.4	12	301	1.0
670.4	0.269	12	1.0	6.7	256	0.937	3.9	1.9	10	292	0.683
671.1	0.789	12	0.902	8.2	225	1.7	11	1.6	13	257	1.3
671.8	0.659	12	0.969	8.7	278	1.3	9.5	1.8	13	318	0.917
672.5	0.839	11	0.870	7.8	305	2.0	12	1.6	12	348	1.4
673.2	0.593	9.0	0.989	9.0	236	1.7	8.6	1.8	14	270	1.3
673.9	1.2	11	1.1	8.4	228	1.1	17	2.1	13	261	0.800
674.6	0.509	12	0.805	7.1	253	1.7	7.4	1.5	11	289	1.2
675.3	0.505	7.9	0.896	7.7	263	1.4	7.3	1.6	12	301	1.0
676.0	0.694	11	0.765	6.4	248	1.3	10	1.4	9.8	283	0.936
676.7	0.702	11	0.946	6.5	246	1.3	10	1.7	10	281	0.960
677.4	0.910	11	0.700	7.0	225	1.6	13	1.3	11	257	1.1



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
678.1	0.772	9.3	0.746	7.0	222	1.1	11	1.4	11	254	0.833
678.8	0.391	11	0.917	8.4	264	1.9	5.7	1.7	13	302	1.4
679.5	0.895	11	0.871	7.4	233	0.887	13	1.6	11	267	0.647
680.2	0.699	11	0.668	5.8	223	0.692	10	1.2	8.9	255	0.505
680.9	0.476	12	0.720	6.4	269	1.0	6.9	1.3	9.9	308	0.765
681.6	0.454	8.8	0.933	5.8	215	1.0	6.6	1.7	8.9	246	0.766
682.3	0.696	9.8	0.682	7.5	252	1.1	10	1.2	12	288	0.784
683.0	0.400	13	1.3	8.5	254	1.2	5.8	2.3	13	290	0.904
683.7	0.573	10	0.667	9.6	244	1.1	8.3	1.2	15	279	0.806
684.3	0.537	12	0.843	7.3	224	1.5	7.8	1.5	11	256	1.1
685.0	0.842	9.4	0.837	9.2	258	1.2	12	1.5	14	295	0.896
685.7	1.2	11	0.870	8.7	232	2.5	17	1.6	13	266	1.8
686.4	1.2	13	0.875	10	237	1.4	17	1.6	15	271	0.997
687.1	0.964	11	0.739	8.3	207	1.4	14	1.3	13	237	1.0
687.8	0.700	9.5	0.900	9.4	307	1.1	10	1.6	14	351	0.784
688.5	0.712	11	0.817	6.9	280	1.5	10	1.5	11	321	1.1
689.2	1.1	12	0.815	9.1	240	1.3	15	1.5	14	275	0.964
689.9	0.504	9.5	1.0	8.7	245	1.5	7.3	1.9	13	280	1.1
690.6	0.768	11	0.830	9.1	225	1.1	11	1.5	14	257	0.817
691.3	0.799	12	0.789	11	260	1.3	12	1.4	16	298	0.963
692.0	0.957	13	1.3	8.7	244	1.5	14	2.3	13	279	1.1
692.7	0.341	13	0.949	12	227	1.5	4.9	1.7	19	260	1.1
693.4	0.636	11	0.784	8.5	212	1.6	9.2	1.4	13	242	1.2
694.1	0.696	11	0.750	9.6	234	1.2	10	1.4	15	267	0.839
694.8	0.269	11	0.976	10	261	1.4	3.9	1.8	16	299	1.0
695.5	0.473	11	0.816	10	274	1.3	6.8	1.5	15	313	0.969
696.2	0.662	10	0.759	10	213	1.0	9.5	1.4	15	243	0.748
696.9	0.269	9.9	0.742	11	222	1.2	3.9	1.4	17	254	0.863
697.6	0.654	11	0.652	12	242	1.0	9.4	1.2	18	277	0.732
698.3	0.820	13	1.0	11	277	1.3	12	1.9	17	317	0.934
699.0	0.816	15	1.1	11	273	1.3	12	1.9	17	312	0.984
699.7	0.656	15	0.671	10	263	1.2	9.5	1.2	16	301	0.847
700.4	0.752	11	1.0	9.9	265	1.2	11	1.9	15	303	0.906
701.1	0.765	11	0.873	12	228	0.999	11	1.6	19	261	0.729
701.8	0.424	12	0.951	12	260	1.7	6.1	1.7	18	297	1.2
702.5	0.507	14	0.982	12	238	1.6	7.3	1.8	19	272	1.2
703.2	1.1	13	1.1	13	250	1.1	16	2.0	20	286	0.802
703.9	0.573	9.5	0.716	11	220	0.758	8.3	1.3	17	252	0.553
704.6	0.949	12	0.863	12	222	0.896	14	1.6	18	254	0.654
705.3	1.2	12	1.2	12	241	1.3	18	2.1	18	276	0.947
706.0	0.577	14	1.0	12	256	1.4	8.3	1.9	18	293	1.0
706.7	0.483	12	0.994	14	271	1.5	7.0	1.8	21	310	1.1
707.4	0.269	15	1.1	12	231	1.0	3.9	1.9	19	264	0.755
708.1	0.758	11	1.1	11	215	1.4	11	2.1	17	246	1.0
708.8	0.668	14	1.2	14	314	0.826	9.6	2.2	22	359	0.603
709.5	0.381	11	1.0	11	227	1.4	5.5	1.8	17	260	1.0
710.2	1.2	12	1.3	14	242	1.9	17	2.3	21	276	1.4
710.9	0.371	10	0.715	11	217	1.1	5.3	1.3	17	248	0.782
711.5	0.272	11	1.1	9.7	231	1.1	3.9	2.0	15	264	0.820
712.2	0.749	13	1.1	14	278	2.3	11	2.0	22	317	1.7
712.9	1.2	14	1.2	14	241	1.8	17	2.3	21	276	1.3
713.6	0.269	13	1.2	12	272	1.8	3.9	2.1	18	311	1.3
714.3	0.596	11	1.0	8.6	235	0.833	8.6	1.8	13	269	0.608
715.0	0.325	10	0.784	12	244	2.0	4.7	1.4	19	279	1.5
715.7	0.390	13	1.2	13	242	2.1	5.6	2.2	20	277	1.5
716.4	0.729	11	1.1	15	252	1.8	11	2.0	23	288	1.3
717.1	0.878	12	1.3	11	271	1.5	13	2.3	16	310	1.1
717.8	0.329	9.1	0.920	8.4	252	1.2	4.7	1.7	13	288	0.842
718.5	0.926	12	1.1	11	254	1.8	13	2.0	17	291	1.3
719.2	0.269	12	1.4	12	248	1.1	3.9	2.5	19	284	0.779
719.9	0.269	11	1.4	10	283	2.1	3.9	2.6	15	323	1.5
720.6	0.576	8.6	1.3	8.8	208	1.4	8.3	2.4	13	238	0.992
721.3	0.271	11	1.1	9.9	217	2.2	3.9	2.0	15	248	1.6
722.0	0.542	12	1.3	9.5	271	1.4	7.8	2.3	15	309	1.0
722.7	0.608	15	1.1	8.3	259	1.4	8.8	2.0	13	296	1.0
723.4	0.375	14	1.2	8.4	253	1.5	5.4	2.2	13	289	1.1
724.1	0.364	12	1.1	9.9	248	1.4	5.3	2.0	15	284	1.0
724.8	0.667	11	1.1	6.9	254	1.5	9.6	2.0	11	290	1.1
725.5	0.453	13	1.5	8.1	250	1.2	6.5	2.8	12	285	0.850
726.2	0.480	11	1.4	8.1	256	2.1	6.9	2.6	12	292	1.5
726.9	1.1	16	1.2	7.8	266	1.5	16	2.2	12	305	1.1
727.6	0.269	10	1.2	9.6	252	1.5	3.9	2.1	15	288	1.1
728.3	0.593	12	1.3	8.8	231	1.2	8.6	2.3	13	264	0.880
729.0	0.671	10	0.845	7.4	234	1.3	9.7	1.5	11	267	0.925
729.7	0.269	13	1.0	8.6	235	2.5	3.9	1.9	13	269	1.8
730.4	0.408	11	1.4	8.4	257	1.3	5.9	2.5	13	293	0.983
731.1	0.409	10.0	1.4	9.3	295	2.4	5.9	2.6	14	338	1.8
731.8	0.269	12	1.3	7.1	256	1.4	3.9	2.4	11	293	1.0
732.5	0.424	11	1.1	6.1	238	2.5	6.1	1.9	9.3	272	1.8
733.2	0.351	12	0.886	6.3	223	1.2	5.1	1.6	9.7	255	0.900
733.9	0.812	11	1.1	6.6	244	1.9	12	1.9	10	279	1.4



Minnow Environmental  
Sample ID: 003

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
734.6	0.707	9.0	1.0	5.5	296	2.0	10	1.9	8.5	339	1.5
735.3	0.626	12	1.2	7.3	236	2.0	9.0	2.2	11	270	1.5
736.0	0.824	12	0.860	6.2	239	1.9	12	1.6	9.6	273	1.4
736.7	0.818	11	0.777	6.3	224	1.9	12	1.4	9.6	256	1.4
737.3	0.663	12	0.887	7.7	223	2.2	9.6	1.6	12	255	1.6
738.0	0.551	12	0.920	6.8	254	1.2	8.0	1.7	10	290	0.846
738.7	0.766	11	0.663	4.8	217	1.3	11	1.2	7.3	248	0.979
739.4	0.470	9.6	0.898	7.7	248	1.9	6.8	1.6	12	284	1.4
740.1	0.269	10	1.0	6.7	240	2.0	3.9	1.9	10	274	1.5
740.8	0.304	11	0.911	5.0	244	1.9	4.4	1.7	7.7	279	1.4
741.5	0.667	9.6	0.797	4.1	202	1.8	9.6	1.5	6.4	231	1.3
742.2	0.484	8.2	0.771	6.0	203	1.9	7.0	1.4	9.2	232	1.4
742.9	0.547	11	1.0	5.2	222	2.2	7.9	1.9	7.9	254	1.6
743.6	0.580	8.9	0.557	5.2	209	1.3	8.4	1.0	8.0	240	0.968
744.3	0.751	12	0.650	6.9	227	1.7	11	1.2	11	259	1.2
745.0	0.870	9.3	0.687	5.5	237	1.9	13	1.3	8.4	270	1.4
745.7	0.333	11	0.770	7.1	218	2.0	4.8	1.4	11	250	1.4
746.4	1.1	10	1.1	4.4	232	1.3	16	2.0	6.8	266	0.968
747.1	0.347	12	0.686	6.5	236	2.0	5.0	1.3	10	270	1.5
747.8	0.407	9.8	1.1	5.5	231	1.9	5.9	2.0	8.4	264	1.4
748.5	0.548	11	1.1	6.6	233	2.3	7.9	2.0	10	266	1.7
749.2	0.568	14	0.818	7.0	246	1.4	8.2	1.5	11	281	1.0
749.9	0.322	12	0.642	4.9	232	1.7	4.6	1.2	7.5	265	1.3
750.6	0.453	12	0.922	3.9	195	1.7	6.5	1.7	6.0	223	1.2
751.3	0.696	11	0.750	6.2	247	1.6	10	1.4	9.4	283	1.2
752.0	0.787	12	0.675	6.7	248	2.2	11	1.2	10	284	1.6
752.7	0.587	12	0.764	7.6	217	1.7	8.5	1.4	12	248	1.3
753.4	0.843	12	0.692	7.4	281	2.8	12	1.3	11	321	2.0
754.1	0.943	12	0.762	5.4	241	1.7	14	1.4	8.3	275	1.3
754.8	0.558	7.4	0.629	3.5	212	1.6	8.1	1.1	5.4	243	1.2
755.5	0.488	12	0.636	6.2	226	1.7	7.0	1.2	9.5	258	1.2
756.2	0.379	10	0.506	5.7	242	2.0	5.5	0.922	8.7	277	1.5
756.9	1.0	11	0.611	6.9	247	1.7	15	1.1	11	283	1.2
757.6	0.427	12	0.663	6.0	247	1.8	6.2	1.2	9.2	282	1.3
758.3	0.832	10	0.440	6.9	292	1.5	12	0.803	11	334	1.1
759.0	0.707	13	0.714	8.0	243	1.9	10	1.3	12	277	1.4
759.7	0.467	11	0.601	9.0	263	2.4	6.7	1.1	14	301	1.7
760.4	0.903	10.0	0.543	6.5	188	1.1	13	0.991	9.9	215	0.792
761.1	0.368	11	1.1	5.9	216	1.8	5.3	2.0	9.1	247	1.3
761.8	0.340	14	0.909	8.7	242	1.4	4.9	1.7	13	277	1.1
762.5	0.386	12	0.887	6.3	283	1.2	5.6	1.6	9.7	324	0.874
763.2	0.749	11	0.809	8.2	217	1.8	11	1.5	13	248	1.3
763.8	0.751	10	1.6	7.4	215	1.7	11	2.9	11	246	1.2
764.5	1.0	12	0.736	7.4	267	1.6	14	1.3	11	306	1.1
765.2	0.600	9.9	0.662	7.9	275	1.8	8.7	1.2	12	314	1.3
765.9	0.269	12	0.723	9.0	223	1.8	3.9	1.3	14	255	1.3
766.6	0.593	9.4	0.465	8.4	250	2.0	8.6	0.848	13	286	1.4
767.3	0.460	12	0.643	12	252	2.1	6.6	1.2	19	289	1.6
768.0	0.764	13	0.439	11	262	1.0	11	0.801	17	300	0.749
768.7	0.591	9.9	0.751	10	247	2.3	8.5	1.4	16	283	1.7
769.4	0.677	12	0.781	8.8	255	2.1	9.8	1.4	13	291	1.5
770.1	0.448	9.5	0.642	7.7	248	2.1	6.5	1.2	12	283	1.5
770.8	0.692	11	0.795	8.3	242	2.1	10.0	1.4	13	277	1.5
771.5	0.919	10	0.772	8.2	235	2.1	13	1.4	12	269	1.5
772.2	0.571	12	0.674	9.5	231	1.1	8.2	1.2	15	265	0.836
772.9	0.977	13	0.752	9.8	245	2.0	14	1.4	15	280	1.5
773.6	0.647	12	0.508	7.9	231	1.4	9.3	0.926	12	264	0.989
774.3	0.622	11	0.879	10	237	1.3	9.0	1.6	16	271	0.981
775.0	0.761	13	0.438	9.1	222	1.5	11	0.798	14	254	1.1
775.7	0.269	12	0.753	11	227	1.7	3.9	1.4	17	260	1.2
776.4	0.465	9.9	0.650	12	231	1.3	6.7	1.2	18	264	0.954
777.1	1.0	11	0.802	11	273	1.5	15	1.5	16	312	1.1
777.8	1.1	11	0.867	11	269	1.5	16	1.6	17	307	1.1
778.5	0.439	9.9	0.485	8.9	203	1.1	6.3	0.884	14	232	0.795
779.2	0.624	10	0.670	14	250	1.5	9.0	1.2	22	286	1.1
779.9	0.694	12	0.983	12	234	1.7	10	1.8	19	267	1.3
780.6	0.410	12	0.905	14	259	1.4	5.9	1.6	21	296	1.1
781.3	0.795	9.7	0.766	12	253	1.3	11	1.4	18	290	0.958
782.0	0.415	11	0.382	15	283	1.4	6.0	0.697	22	324	1.0
782.7	0.269	11	0.836	15	240	1.3	3.9	1.5	22	275	0.934
783.4	0.561	11	0.481	10	215	1.5	8.1	0.878	16	246	1.1
784.1	0.926	13	1.0	17	260	1.4	13	1.9	26	297	0.992
784.8	0.756	12	1.1	11	236	1.3	11	2.1	17	269	0.973
785.5	0.962	11	0.982	20	291	2.4	14	1.8	31	333	1.7
786.2	0.813	8.9	0.692	13	195	1.1	12	1.3	21	223	0.802
786.9	0.892	11	1.0	14	227	2.1	13	1.9	21	259	1.6
787.6	0.517	13	1.0	14	273	1.7	7.5	1.9	22	312	1.2
788.3	0.473	10	0.822	16	240	0.995	6.8	1.5	24	275	0.726
789.0	0.912	9.3	0.635	11	243	1.5	13	1.2	17	277	1.1
789.7	0.804	12	1.0	18	285	1.9	12	1.9	28	325	1.4
790.3	0.828	11	0.875	15	252	1.9	12	1.6	23	288	1.4



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
791.0	0.506	11	1.0	16	284	1.1	7.3	1.8	24	325	0.777
791.7	0.721	11	0.997	13	251	1.5	10	1.8	20	288	1.1
792.4	0.975	13	1.0	15	238	1.5	14	1.9	23	272	1.1
793.1	0.269	10	1.1	14	240	0.955	3.9	2.0	22	275	0.696
793.8	0.649	11	1.0	14	254	1.8	9.4	1.8	21	291	1.3
794.5	0.435	8.5	1.1	15	212	1.6	6.3	1.9	23	242	1.1
795.2	0.467	11	1.1	11	228	1.9	6.7	1.9	17	261	1.4
795.9	0.674	13	1.2	13	268	1.4	9.7	2.2	21	307	1.0
796.6	0.430	11	1.1	12	250	1.2	6.2	2.0	18	286	0.897
797.3	0.415	11	1.3	12	258	1.9	6.0	2.4	19	295	1.4
798.0	0.454	12	1.4	14	296	1.1	6.6	2.6	22	339	0.767
798.7	0.269	13	1.3	16	265	2.1	3.9	2.4	24	303	1.5
799.4	0.269	12	1.2	13	259	0.663	3.9	2.2	20	296	0.484
800.1	0.269	12	1.2	12	221	1.7	3.9	2.2	18	253	1.2
800.8	0.269	12	0.989	13	261	2.0	3.9	1.8	20	299	1.4
801.5	0.503	12	1.3	12	216	1.4	7.3	2.3	19	247	1.0
802.2	0.467	12	0.995	12	240	1.8	6.7	1.8	18	274	1.3
802.9	0.980	12	1.3	13	223	1.9	14	2.4	19	255	1.4
803.6	0.671	11	1.2	12	246	2.8	9.7	2.2	18	281	2.1
804.3	0.612	11	1.6	12	324	1.1	8.8	2.8	18	370	0.799
805.0	0.316	12	1.0	10	216	2.4	4.6	1.8	15	247	1.7
805.7	0.609	12	1.9	14	239	2.7	8.8	3.4	21	273	2.0
806.4	0.269	9.6	1.3	13	210	2.1	3.9	2.4	19	240	1.6
807.1	0.665	9.6	1.0	12	216	1.7	9.6	1.9	18	247	1.2
807.8	0.269	11	1.6	12	256	2.9	3.9	2.9	19	293	2.1
808.5	0.311	14	1.8	10	230	2.3	4.5	3.3	15	263	1.7
809.2	0.435	13	1.5	9.8	254	1.8	6.3	2.7	15	290	1.3
809.9	0.482	12	1.3	10.0	232	1.6	7.0	2.4	15	265	1.2
810.6	0.618	12	1.6	10	313	2.0	8.9	3.0	15	358	1.5
811.3	0.385	9.7	1.3	10	234	2.7	5.6	2.4	16	268	2.0
812.0	0.269	12	1.3	8.3	223	2.4	3.9	2.4	13	255	1.8
812.7	0.378	10	1.6	8.9	197	1.9	5.5	2.9	14	225	1.4
813.4	0.424	12	1.4	9.3	255	2.5	6.1	2.6	14	292	1.8
814.1	0.801	12	1.7	8.5	243	3.6	12	3.1	13	277	2.6
814.8	0.495	9.3	1.2	9.2	229	2.8	7.1	2.2	14	262	2.0
815.5	0.427	12	1.4	9.0	213	3.1	6.2	2.5	14	243	2.3
816.2	0.273	10	1.5	8.7	224	1.9	3.9	2.7	13	257	1.4
816.9	0.903	12	1.4	8.0	254	2.5	13	2.6	12	291	1.8
817.5	0.269	10	1.0	7.9	197	2.5	3.9	1.9	12	226	1.8
818.2	0.593	9.7	1.1	8.1	205	2.9	8.6	2.0	12	234	2.1
818.9	0.819	10	1.3	7.6	243	3.3	12	2.4	12	278	2.4
819.6	0.269	10.0	1.2	8.5	224	2.5	3.9	2.1	13	256	1.8
820.3	0.557	12	1.3	8.3	242	2.5	8.0	2.3	13	277	1.8
821.0	0.647	13	1.2	11	196	1.8	9.3	2.3	17	224	1.3
821.7	0.848	12	1.3	6.9	248	3.2	12	2.4	11	284	2.4
822.4	0.648	12	1.1	11	212	3.1	9.3	1.9	17	243	2.2
823.1	0.500	12	1.4	7.4	210	3.2	7.2	2.5	11	240	2.3
823.8	0.827	12	1.1	5.9	205	2.8	12	2.0	9.0	234	2.1
824.5	0.691	11	1.3	6.7	209	3.2	10.0	2.3	10	239	2.3
825.2	0.513	12	1.4	7.5	217	4.3	7.4	2.5	11	248	3.2
825.9	0.601	11	1.1	5.3	227	3.1	8.7	2.0	8.1	260	2.2
826.6	0.377	8.7	1.2	5.8	182	3.7	5.4	2.2	9.0	208	2.7
827.3	0.454	9.3	1.3	5.8	216	4.1	6.6	2.4	8.9	246	3.0
828.0	0.958	11	1.2	5.1	194	4.5	14	2.2	7.8	222	3.3
828.7	0.651	11	1.2	6.1	167	3.5	9.4	2.2	9.3	191	2.5
829.4	0.700	11	1.1	5.3	210	4.3	10	2.1	8.1	240	3.1
830.1	0.269	11	1.2	4.6	211	4.6	3.9	2.1	7.1	241	3.4
830.8	0.436	13	1.3	5.7	191	4.8	6.3	2.3	8.7	219	3.5
831.5	0.269	9.1	1.1	4.6	160	3.6	3.9	2.0	7.1	182	2.6
832.2	0.957	12	0.898	4.5	214	4.8	14	1.6	6.8	245	3.5
832.9	0.900	10	1.1	3.6	199	3.2	13	2.0	5.6	228	2.4
833.6	0.482	7.8	0.867	4.3	190	3.9	7.0	1.6	6.5	218	2.9
834.3	0.323	12	1.1	4.5	188	3.7	4.7	2.0	6.9	215	2.7
835.0	0.817	11	0.900	4.5	184	3.6	12	1.6	6.9	211	2.6
835.7	0.543	13	1.3	4.5	189	4.2	7.8	2.4	6.9	216	3.0
836.4	0.561	9.7	0.824	3.4	156	2.9	8.1	1.5	5.3	179	2.1
837.1	0.511	11	0.733	5.1	179	4.2	7.4	1.3	7.8	205	3.1
837.8	0.269	11	1.0	4.6	188	3.4	3.9	1.9	7.0	216	2.5
838.5	0.506	8.3	0.743	3.7	190	4.6	7.3	1.4	5.6	218	3.4
839.2	0.659	11	0.864	4.0	176	3.4	9.5	1.6	6.2	201	2.5
839.9	0.269	9.4	0.797	3.8	182	4.5	3.9	1.5	5.8	208	3.3
840.6	0.562	11	0.689	4.1	186	4.6	8.1	1.3	6.3	213	3.3
841.3	0.443	13	0.886	2.3	190	4.6	6.4	1.6	3.5	218	3.3
842.0	0.421	13	0.877	3.9	174	3.8	6.1	1.6	6.0	199	2.8
842.7	0.281	10	0.895	3.5	181	3.6	4.1	1.6	5.4	207	2.6
843.3	0.335	11	0.687	2.4	161	3.9	4.8	1.3	3.7	184	2.8
844.0	0.269	8.9	0.759	2.5	152	3.7	3.9	1.4	3.8	174	2.7
844.7	0.432	11	0.759	2.2	172	4.3	6.2	1.4	3.4	196	3.1
845.4	0.751	11	0.442	3.5	222	5.3	11	0.806	5.4	254	3.9
846.1	0.530	12	0.876	3.3	185	3.8	7.6	1.6	5.0	212	2.7
846.8	0.278	8.7	0.596	4.6	174	2.1	4.0	1.1	7.1	199	1.6



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
847.5	0.450	10	0.699	1.5	171	4.5	6.5	1.3	2.3	196	3.3
848.2	1.0	11	0.949	3.0	175	4.7	14	1.7	4.6	200	3.4
848.9	0.862	11	0.555	2.4	177	5.2	12	1.0	3.6	202	3.8
849.6	0.391	11	0.755	3.9	164	4.5	5.6	1.4	6.0	188	3.3
850.3	1.3	13	0.611	2.7	195	6.1	19	1.1	4.1	223	4.4
851.0	0.678	10	0.576	3.1	186	6.7	9.8	1.0	4.7	212	4.9
851.7	0.568	12	0.892	3.6	174	5.1	8.2	1.6	5.6	199	3.7
852.4	0.339	9.7	0.623	3.1	175	5.2	4.9	1.1	4.7	201	3.8
853.1	0.396	9.5	0.419	4.1	176	4.6	5.7	0.764	6.4	201	3.3
853.8	1.5	10	0.678	4.4	188	4.6	21	1.2	6.8	214	3.4
854.5	0.731	12	0.901	2.5	197	4.6	11	1.6	3.9	225	3.3
855.2	0.637	12	0.415	1.5	159	3.8	9.2	0.756	2.3	181	2.8
855.9	0.698	12	0.849	3.2	186	5.2	10	1.5	4.9	212	3.8
856.6	0.664	11	0.732	4.6	173	4.9	9.6	1.3	7.1	198	3.6
857.3	0.576	12	0.673	3.3	161	5.3	8.3	1.2	5.1	184	3.9
858.0	0.453	11	0.647	4.1	170	5.4	6.5	1.2	6.3	194	3.9
858.7	0.837	11	0.539	2.9	199	4.3	12	0.983	4.4	228	3.2
859.4	1.1	13	0.494	3.2	196	6.0	16	0.900	4.9	224	4.4
860.1	0.269	11	0.716	2.7	159	6.0	3.9	1.3	4.2	182	4.4
860.8	0.839	11	0.472	3.0	163	5.9	12	0.861	4.7	186	4.3
861.5	0.482	14	0.689	4.6	168	6.4	7.0	1.3	7.1	192	4.7
862.2	0.517	17	0.697	2.9	168	8.7	7.5	1.3	4.4	192	6.3
862.9	1.1	14	0.408	3.8	167	7.6	16	0.744	5.8	192	5.6
863.6	0.619	13	0.874	3.5	164	6.3	8.9	1.6	5.3	187	4.6
864.3	0.633	13	0.501	2.7	149	6.4	9.1	0.915	4.1	170	4.6
865.0	0.535	10	0.492	3.8	150	5.9	7.7	0.897	5.8	171	4.3
865.7	0.607	12	0.669	4.4	162	7.3	8.8	1.2	6.7	185	5.3
866.4	0.992	12	0.499	3.3	153	7.5	14	0.911	5.1	175	5.5
867.1	0.384	12	0.826	3.7	176	6.0	5.5	1.5	5.7	201	4.4
867.8	0.925	11	1.2	4.5	185	7.7	13	2.1	6.9	212	5.6
868.5	0.714	15	0.749	4.3	149	7.6	10	1.4	6.5	170	5.5
869.2	0.550	11	0.529	4.3	151	5.7	7.9	0.965	6.6	173	4.1
869.8	0.518	14	0.780	4.1	172	6.2	7.5	1.4	6.3	197	4.5
870.5	0.707	11	0.706	4.3	143	8.5	10	1.3	6.7	164	6.2
871.2	0.979	15	0.381	5.2	135	8.0	14	0.694	7.9	155	5.8
871.9	0.845	14	0.787	4.7	139	7.0	12	1.4	7.2	159	5.1
872.6	0.550	11	0.680	4.0	134	9.3	7.9	1.2	6.1	153	6.8
873.3	0.342	13	0.771	5.0	138	8.2	4.9	1.4	7.6	157	6.0
874.0	0.590	11	0.926	4.5	143	7.5	8.5	1.7	6.9	163	5.4
874.7	0.269	12	0.987	4.7	129	11	3.9	1.8	7.1	148	8.2
875.4	0.439	14	0.984	5.0	128	7.1	6.3	1.8	7.6	147	5.2
876.1	1.3	14	0.890	4.9	134	8.0	19	1.6	7.5	153	5.9
876.8	1.0	13	1.2	5.1	131	9.6	15	2.1	7.9	150	7.0
877.5	0.587	13	0.898	5.0	153	9.1	8.5	1.6	7.6	175	6.6
878.2	0.649	11	0.842	5.6	121	7.0	9.4	1.5	8.7	139	5.1
878.9	0.407	13	0.878	6.1	126	8.4	5.9	1.6	9.3	144	6.1
879.6	0.635	12	1.2	7.3	136	7.8	9.2	2.2	11	155	5.7
880.3	1.1	14	1.3	4.9	138	10	16	2.4	7.5	158	7.4
881.0	0.365	12	1.5	8.1	128	9.4	5.3	2.8	12	147	6.9
881.7	0.351	14	1.3	7.6	134	9.2	5.1	2.3	12	153	6.7
882.4	0.269	14	1.1	4.4	131	10.0	3.9	2.0	6.7	150	7.3
883.1	0.412	12	1.1	8.0	131	10	5.9	2.0	12	150	7.5
883.8	0.824	11	1.0	5.5	123	9.7	12	1.8	8.4	140	7.1
884.5	0.269	13	1.2	7.3	131	10	12	2.1	11	149	7.3
885.2	0.269	14	1.2	5.8	117	8.6	3.9	2.1	8.8	134	6.3
885.9	0.382	12	0.961	5.3	124	9.1	5.5	1.8	8.1	142	6.7
886.6	0.430	12	1.4	9.6	129	7.5	6.2	2.5	15	148	5.5
887.3	0.365	15	1.4	8.9	134	9.9	5.3	2.6	14	153	7.2
888.0	0.396	14	1.5	7.2	128	9.6	5.7	2.7	11	146	7.0
888.7	0.703	15	1.9	9.5	133	10	10	3.4	15	152	7.4
889.4	0.546	14	1.7	9.6	120	9.8	7.9	3.2	15	137	7.1
890.1	0.556	10	2.0	9.3	121	11	8.0	3.6	14	138	7.8
890.8	1.2	13	2.1	7.8	117	10	17	3.8	12	133	7.4
891.5	0.567	12	1.2	12	145	8.9	8.2	2.3	18	166	6.5
892.2	0.269	16	1.8	11	117	12	3.9	3.2	17	133	8.4
892.9	0.308	13	2.0	12	133	8.9	4.4	3.6	18	152	6.5
893.6	0.828	11	1.8	8.6	115	10	12	3.3	13	131	7.6
894.3	0.970	13	1.9	8.9	106	11	14	3.4	14	121	7.9
895.0	0.568	13	1.8	9.7	114	8.3	8.2	3.2	15	131	6.0
895.7	0.687	12	2.3	10	127	10	9.9	4.1	16	146	7.5
896.4	0.269	12	2.0	14	114	11	3.9	3.7	21	130	8.0
897.0	0.784	13	2.3	12	112	10	11	4.2	18	128	7.6
897.7	0.325	11	2.0	9.9	108	11	4.7	3.6	15	123	7.9
898.4	0.269	12	2.2	10	106	8.1	3.9	4.0	16	122	5.9
899.1	0.564	12	2.1	11	109	9.2	8.1	3.8	17	124	6.7
899.8	0.597	13	2.3	14	118	9.6	8.6	4.1	21	135	7.0
900.5	0.683	13	1.9	9.1	116	9.6	9.9	3.4	14	133	7.0
901.2	0.675	13	1.9	11	113	11	9.7	3.4	17	129	8.1
901.9	0.514	14	2.1	14	114	11	7.4	3.9	21	131	8.3
902.6	0.853	12	2.0	10	119	9.0	12	3.7	16	136	6.5
903.3	0.507	14	2.7	9.9	124	10	7.3	5.0	15	141	7.6



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
904.0	0.401	13	2.5	11	119	10.0	5.8	4.6	16	136	7.3
904.7	0.831	12	2.0	12	113	9.7	12	3.6	18	129	7.1
905.4	0.758	11	2.1	9.5	116	9.8	11	3.8	15	132	7.1
906.1	0.739	13	2.1	10	131	8.6	11	3.9	16	149	6.3
906.8	0.915	13	2.1	8.3	135	10	13	3.8	13	154	7.6
907.5	0.463	16	2.6	12	131	8.7	6.7	4.7	19	150	6.3
908.2	0.891	13	1.6	9.6	120	8.4	13	3.0	15	137	6.2
908.9	0.269	13	1.8	9.3	127	9.2	3.9	3.3	14	145	6.7
909.6	0.436	11	2.1	8.9	146	9.7	6.3	3.8	14	167	7.1
910.3	0.269	12	1.7	12	122	8.6	3.9	3.1	18	139	6.3
911.0	0.269	13	1.9	7.9	145	9.7	3.9	3.5	12	166	7.1
911.7	0.893	13	1.9	8.4	132	7.8	13	3.6	13	151	5.7
912.4	0.269	12	2.0	8.9	143	8.8	3.9	3.7	14	164	6.4
913.1	0.741	13	2.2	9.9	125	9.7	11	4.0	15	143	7.1
913.8	0.415	13	2.0	10	132	7.9	6.0	3.7	16	151	5.8
914.5	0.657	12	1.8	7.1	119	7.7	9.5	3.3	11	136	5.6
915.2	0.399	12	1.6	9.3	131	7.9	5.8	2.9	14	150	5.8
915.9	0.690	15	1.8	10	134	8.3	10.0	3.3	16	153	6.0
916.6	0.600	11	1.4	7.8	140	7.9	8.7	2.5	12	161	5.8
917.3	0.800	12	1.8	8.6	125	7.2	12	3.2	13	143	5.3
918.0	0.457	14	1.8	10	135	7.7	6.6	3.2	16	154	5.6
918.7	0.431	14	1.4	7.3	116	7.8	6.2	2.6	11	133	5.7
919.4	0.294	12	1.6	7.3	138	7.5	4.2	2.8	11	157	5.5
920.1	0.734	12	1.8	7.9	139	7.6	11	3.3	12	159	5.5
920.8	0.378	11	1.3	8.3	120	6.9	5.5	2.3	13	137	5.1
921.5	0.649	13	1.3	8.0	141	7.8	9.4	2.4	12	161	5.7
922.2	0.578	12	1.7	9.3	153	7.7	8.3	3.1	14	175	5.7
922.9	0.269	10	1.3	6.6	142	8.0	3.9	2.4	10	162	5.9
923.5	0.642	13	1.2	5.6	132	7.7	9.3	2.2	8.5	151	5.6
924.2	0.369	12	0.969	6.2	145	8.1	5.3	1.8	9.5	165	5.9
924.9	0.660	14	1.4	5.3	143	6.8	9.5	2.5	8.2	164	5.0
925.6	0.409	11	1.2	8.8	143	7.0	5.9	2.1	14	164	5.1
926.3	0.309	14	1.2	8.9	143	7.1	4.5	2.2	14	164	5.2
927.0	0.391	13	1.5	7.2	146	7.4	5.6	2.7	11	166	5.4
927.7	0.700	13	1.4	4.8	141	5.5	10	2.6	7.3	161	4.0
928.4	0.757	12	1.3	6.8	148	7.0	11	2.3	10	170	5.1
929.1	0.458	11	1.0	8.0	130	5.9	6.6	1.8	12	148	4.3
929.8	0.330	12	1.5	6.9	159	7.5	4.8	2.8	11	182	5.4
930.5	1.1	12	1.4	5.1	167	5.8	16	2.6	7.9	191	4.2
931.2	0.778	13	1.3	4.4	140	6.0	11	2.3	6.7	160	4.4
931.9	0.330	12	1.1	5.5	158	6.5	4.8	2.1	8.5	181	4.7
932.6	0.532	12	1.2	7.6	152	6.6	7.7	2.2	12	173	4.8
933.3	0.632	13	1.3	6.2	142	5.2	9.1	2.4	9.6	162	3.8
934.0	1.2	13	1.1	6.9	144	5.6	17	2.0	11	165	4.1
934.7	0.954	12	1.2	5.6	143	6.7	14	2.2	8.6	164	4.9
935.4	0.855	11	1.2	6.1	149	7.4	12	2.2	9.4	171	5.4
936.1	1.6	12	1.1	5.8	148	6.3	23	2.0	8.9	170	4.6
936.8	0.269	11	1.1	5.0	161	5.3	3.9	2.0	7.7	185	3.9
937.5	0.543	15	1.5	7.0	168	5.1	7.8	2.8	11	193	3.7
938.2	0.597	11	0.986	6.8	143	5.4	8.6	1.8	10	163	4.0
938.9	0.983	12	1.2	5.0	168	6.7	14	2.1	7.7	193	4.9
939.6	0.452	12	1.0	5.6	142	5.0	6.5	1.8	8.6	162	3.7
940.3	0.411	14	1.2	4.4	142	6.0	5.9	2.2	6.8	163	4.4
941.0	0.981	13	1.2	5.7	156	5.5	14	2.2	8.8	178	4.0
941.7	0.678	13	1.1	5.1	183	5.0	9.8	2.0	7.8	210	3.7
942.4	0.575	11	0.669	3.9	169	4.9	8.3	1.2	6.0	193	3.6
943.1	1.4	14	1.1	3.7	170	4.8	21	2.0	5.7	194	3.5
943.8	1.2	15	0.654	4.8	180	4.7	17	1.2	7.3	205	3.4
944.5	1.0	13	0.900	5.9	149	5.7	15	1.6	9.0	170	4.2
945.2	0.749	12	0.787	3.8	167	5.5	11	1.4	5.8	191	4.0
945.9	0.574	13	0.844	6.4	161	4.8	8.3	1.5	9.7	184	3.5
946.6	0.472	11	0.693	5.3	140	5.3	6.8	1.3	8.2	160	3.9
947.3	0.269	12	0.637	4.9	176	5.5	3.9	1.2	7.5	201	4.0
948.0	0.985	11	1.0	3.2	166	4.7	14	1.8	4.9	190	3.4
948.7	0.734	11	0.771	5.6	158	4.3	11	1.4	8.5	181	3.1
949.4	0.736	13	0.776	6.5	173	5.5	11	1.4	10.0	198	4.0
950.0	0.330	13	0.588	4.6	136	4.8	4.8	1.1	7.0	156	3.5
950.7	0.474	12	0.658	4.7	174	5.6	6.8	1.2	7.1	199	4.1
951.4	0.269	16	0.668	5.9	170	4.2	3.9	1.2	9.0	194	3.1
952.1	0.896	14	0.717	5.4	163	4.7	13	1.3	8.2	186	3.4
952.8	0.988	12	0.867	5.1	155	5.4	14	1.6	7.8	177	3.9
953.5	0.269	12	0.682	5.8	184	4.4	3.9	1.2	8.9	211	3.2
954.2	0.673	14	0.722	4.6	177	4.5	9.7	1.3	7.0	202	3.3
954.9	0.489	13	0.504	5.6	169	5.7	7.1	0.919	8.6	194	4.2
955.6	0.630	13	0.588	6.2	175	5.3	9.1	1.1	9.5	201	3.9
956.3	0.762	10	0.593	6.1	159	5.6	11	1.1	9.3	182	4.1
957.0	0.598	13	0.696	4.8	174	5.4	8.6	1.3	7.4	199	3.9
957.7	0.864	12	0.374	5.2	162	3.4	12	0.683	7.9	185	2.5
958.4	0.727	13	0.935	4.9	179	4.6	10	1.7	7.6	204	3.3
959.1	0.269	12	0.592	3.4	208	6.4	3.9	1.1	5.3	238	4.7
959.8	0.767	12	0.665	4.7	161	5.4	11	1.2	7.2	184	3.9



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.5	0.269	13	0.817	5.5	187	5.5	3.9	1.5	8.5	214	4.0
961.2	0.944	13	0.567	4.6	142	6.3	14	1.0	7.1	162	4.6
961.9	0.614	13	0.677	4.6	153	4.1	8.9	1.2	7.0	174	3.0
962.6	0.401	13	0.645	6.5	171	5.6	5.8	1.2	10	195	4.1
963.3	0.534	14	0.749	4.8	166	6.4	7.7	1.4	7.4	190	4.7
964.0	0.269	14	0.718	3.9	152	5.8	3.9	1.3	6.0	173	4.2
964.7	0.477	13	0.371	6.0	148	6.5	6.9	0.676	9.2	169	4.7
965.4	0.334	15	0.920	6.8	202	7.6	4.8	1.7	10	231	5.6
966.1	0.550	13	0.573	5.6	156	5.8	7.9	1.0	8.5	179	4.2
966.8	0.573	15	0.899	6.9	152	5.6	8.3	1.6	11	173	4.1
967.5	0.768	14	1.0	7.0	183	5.9	11	1.8	11	209	4.3
968.2	0.321	14	0.766	7.0	174	7.1	4.6	1.4	11	199	5.2
968.9	0.705	12	0.567	5.4	145	5.8	10	1.0	8.2	165	4.3
969.6	0.653	13	1.1	5.7	166	8.5	9.4	2.0	8.7	190	6.2
970.3	0.700	15	0.826	7.4	147	6.0	10	1.5	11	168	4.3
971.0	0.898	12	1.0	5.2	153	5.9	13	1.9	7.9	175	4.3
971.7	0.438	13	0.840	5.9	157	7.4	6.3	1.5	9.1	179	5.4
972.4	0.704	11	0.663	4.6	161	8.2	10	1.2	7.0	184	6.0
973.1	0.320	13	0.872	8.9	151	7.4	4.6	1.6	14	173	5.4
973.8	0.269	14	1.5	9.9	147	9.1	3.9	2.8	15	168	6.7
974.5	0.717	14	0.843	5.7	133	8.2	10	1.5	8.8	152	6.0
975.2	0.302	13	1.2	9.0	147	9.2	4.4	2.2	14	169	6.7
975.9	0.615	14	1.2	9.2	141	8.6	8.9	2.2	14	162	6.3
976.5	0.304	13	1.0	7.8	150	8.1	4.4	1.9	12	171	5.9
977.2	1.5	17	1.1	9.2	153	10	21	2.0	14	175	7.7
977.9	0.343	14	1.0	7.2	135	8.4	4.9	1.9	11	155	6.1
978.6	0.704	12	0.935	7.8	156	11	10	1.7	12	178	8.0
979.3	0.499	15	1.3	11	146	15	7.2	2.4	17	167	11
980.0	0.906	13	1.8	9.8	142	11	13	3.3	15	162	8.3
980.7	1.1	15	1.6	11	143	11	16	2.9	17	163	8.0
981.4	0.612	13	1.4	8.9	133	11	8.8	2.5	14	152	8.0
982.1	0.477	14	1.6	15	132	13	6.9	2.9	24	151	9.7
982.8	0.327	12	1.4	10	135	11	4.7	2.5	16	154	7.8
983.5	0.288	14	1.2	11	147	13	4.2	2.2	17	168	9.5
984.2	0.506	14	1.9	13	145	15	7.3	3.5	20	166	11
984.9	0.339	12	1.8	13	127	11	4.9	3.3	20	145	8.0
985.6	0.269	13	1.7	13	136	10	3.9	3.1	20	155	7.5
986.3	0.617	15	2.2	15	135	13	8.9	4.0	23	155	9.4
987.0	0.269	13	2.2	15	130	14	3.9	4.0	23	148	10.0
987.7	0.462	13	2.2	14	112	9.3	6.7	4.1	22	128	6.8
988.4	0.269	13	1.8	13	114	9.7	3.9	3.3	20	131	7.1
989.1	0.464	13	1.7	16	129	11	6.7	3.1	24	147	7.7
989.8	0.269	15	2.3	13	140	16	3.9	4.3	20	160	12
990.5	0.977	15	2.9	17	135	15	14	5.3	27	155	11
991.2	0.719	14	2.1	16	142	13	10	3.9	24	162	9.2
991.9	0.390	14	2.2	17	125	12	5.6	4.0	26	143	9.1
992.6	0.269	12	2.7	19	129	15	3.9	5.0	28	147	11
993.3	0.489	11	2.5	21	126	13	7.1	4.6	33	145	9.3
994.0	0.269	15	2.8	18	124	13	3.9	5.1	27	141	9.3
994.7	0.447	17	2.9	21	117	12	6.5	5.3	32	134	8.4
995.4	0.269	14	3.8	26	127	13	3.9	7.0	40	146	9.4
996.1	0.364	13	3.4	19	98	11	5.3	6.2	29	112	7.9
996.8	0.815	17	3.5	25	128	13	12	6.3	39	146	9.8
997.5	0.438	17	3.4	22	119	12	6.3	6.3	33	136	8.6
998.2	0.269	14	3.4	16	111	12	3.9	6.1	24	127	8.6
998.9	0.609	14	3.2	23	114	13	8.8	5.9	36	130	9.6
999.6	0.269	15	3.0	21	128	14	3.9	5.4	32	146	11
1000.3	0.895	14	4.1	23	118	15	13	7.5	35	135	11
1001.0	0.269	15	3.8	22	112	12	3.9	7.0	34	128	8.8
1001.7	0.529	11	2.9	17	96	12	7.6	5.3	26	110	8.7
1002.4	0.783	15	4.1	21	110	15	11	7.5	32	126	11
1003.0	0.370	13	3.7	21	114	14	5.3	6.8	33	130	9.9
1003.7	0.269	16	4.2	24	102	16	3.9	7.7	36	117	11
1004.4	0.336	16	4.0	23	113	16	4.9	7.2	35	129	12
1005.1	0.331	11	3.1	25	111	14	4.8	5.7	38	127	9.9
1005.8	0.673	17	4.2	25	117	14	9.7	7.6	39	134	10
1006.5	0.571	14	4.0	24	117	13	8.2	7.3	36	134	9.5
1007.2	0.494	16	3.5	25	119	15	7.1	6.4	39	136	11
1007.9	0.378	14	3.7	23	110	14	5.5	6.8	36	126	10
1008.6	0.269	14	3.9	23	97	13	3.9	7.1	35	111	9.4
1009.3	0.373	15	4.0	26	120	15	5.4	7.3	40	137	11
1010.0	0.324	16	4.3	25	140	15	4.7	7.9	38	160	11
1010.7	0.269	14	3.5	22	94	12	3.9	6.4	34	108	9.1
1011.4	0.385	17	4.3	25	121	13	5.6	7.8	39	138	9.3
1012.1	0.269	15	3.9	25	110	14	3.9	7.2	38	126	10
1012.8	0.269	16	3.7	25	108	14	3.9	6.7	39	124	10
1013.5	0.269	14	3.7	21	112	13	3.9	6.8	32	128	9.3
1014.2	0.269	17	4.4	22	106	15	3.9	8.0	34	122	11
1014.9	0.269	12	3.6	20	96	11	3.9	6.5	30	110	7.9
1015.6	0.396	14	3.8	25	99	13	5.7	7.0	38	114	9.5
1016.3	0.378	16	4.8	24	119	13	5.5	8.8	36	136	9.4



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1017.0	0.269	16	4.6	25	118	12	3.9	8.5	38	135	8.5
1017.7	0.766	15	4.0	24	107	13	11	7.4	37	123	9.7
1018.4	0.287	14	4.3	25	129	12	4.1	7.8	38	147	8.9
1019.1	0.454	14	3.6	24	107	11	6.6	6.5	36	122	8.1
1019.8	0.326	14	4.3	23	99	10	4.7	7.9	36	113	7.5
1020.5	0.672	22	3.8	22	123	10	9.7	7.0	34	141	7.6
1021.2	0.369	16	4.1	22	113	11	5.3	7.4	33	129	7.7
1021.9	0.269	15	3.8	26	121	9.4	3.9	6.9	40	138	6.8
1022.6	0.472	14	3.0	17	111	9.3	6.8	5.5	27	127	6.8
1023.3	0.699	18	3.2	22	123	12	10	5.9	33	141	8.6
1024.0	0.385	17	3.8	20	121	9.4	5.6	6.9	31	139	6.8
1024.7	0.269	13	2.9	19	115	10	3.9	5.3	29	132	7.4
1025.4	0.269	14	3.8	22	105	8.3	3.9	6.9	34	120	6.0
1026.1	0.612	14	3.3	20	123	12	8.8	5.9	30	141	8.9
1026.8	0.269	15	3.4	19	131	11	3.9	6.2	29	150	8.1
1027.5	0.536	15	2.9	17	118	8.3	7.7	5.2	25	135	6.1
1028.2	0.390	15	2.8	19	125	10	5.6	5.2	29	143	7.5
1028.9	0.447	16	2.7	18	122	8.4	6.4	5.0	27	139	6.1
1029.5	0.544	18	3.0	19	147	10	7.8	5.4	29	169	7.5
1030.2	0.269	13	2.5	16	123	6.6	3.9	4.5	25	141	4.8
1030.9	0.577	18	2.8	18	132	8.4	8.3	5.1	28	151	6.1
1031.6	0.423	15	2.5	13	130	8.0	6.1	4.6	19	149	5.8
1032.3	0.568	15	2.9	17	136	9.1	8.2	5.4	26	155	6.7
1033.0	0.269	12	3.1	16	150	8.8	3.9	5.6	24	171	6.4
1033.7	0.269	16	2.7	13	133	6.7	3.9	4.9	20	152	4.9
1034.4	0.269	18	2.5	14	121	7.4	3.9	4.6	22	139	5.4
1035.1	0.448	14	1.9	15	128	5.9	6.5	3.5	23	146	4.3
1035.8	0.438	16	2.3	14	149	8.5	6.3	4.1	22	170	6.2
1036.5	0.329	14	1.9	12	124	6.1	4.7	3.5	19	142	4.5
1037.2	0.278	13	2.2	12	109	6.1	4.0	4.1	19	124	4.5
1037.9	0.298	14	2.3	15	147	7.7	4.3	4.2	23	169	5.6
1038.6	0.269	13	1.8	13	133	9.2	3.9	3.3	19	153	6.7
1039.3	0.495	12	1.8	12	136	5.3	7.1	3.3	19	156	3.9
1040.0	0.876	13	2.3	13	123	5.3	13	4.2	20	140	3.9
1040.7	0.463	15	2.2	12	139	5.8	6.7	3.9	18	159	4.2
1041.4	1.3	14	1.6	13	145	5.2	19	3.0	21	166	3.8
1042.1	0.473	14	1.7	13	134	7.3	6.8	3.1	20	153	5.3
1042.8	0.466	14	1.6	11	133	5.5	6.7	3.0	17	152	4.0
1043.5	0.531	14	1.9	13	140	5.1	7.7	3.4	20	161	3.7
1044.2	0.269	14	1.3	12	133	4.3	3.9	2.3	18	152	3.2
1044.9	0.795	14	1.3	13	158	5.4	11	2.5	19	181	3.9
1045.6	0.774	15	1.9	13	170	5.6	11	3.5	20	194	4.1
1046.3	0.269	15	1.5	13	143	4.3	3.9	2.7	20	163	3.1
1047.0	0.433	15	1.7	11	148	4.9	6.2	3.1	16	169	3.6
1047.7	0.324	12	1.3	11	167	6.3	4.7	2.3	17	190	4.6
1048.4	0.946	17	1.1	11	138	4.8	14	2.1	17	157	3.5
1049.1	0.837	13	1.6	12	137	4.6	12	2.9	19	156	3.4
1049.8	0.480	12	1.1	12	147	4.8	6.9	2.1	19	168	3.5
1050.5	0.461	13	1.4	10	144	4.5	6.7	2.5	16	164	3.3
1051.2	0.710	12	0.994	13	132	4.0	10	1.8	19	151	2.9
1051.9	0.351	9.9	1.0	12	129	3.8	5.1	1.9	18	147	2.8
1052.6	0.522	15	1.2	13	135	3.5	7.5	2.1	20	155	2.5
1053.3	0.342	11	1.4	13	149	4.1	4.9	2.6	19	171	3.0
1054.0	0.434	13	1.3	13	158	4.8	6.3	2.4	21	181	3.5
1054.7	0.991	12	1.4	14	152	5.2	14	2.5	21	173	3.8
1055.4	0.304	9.5	1.1	10	140	4.4	4.4	2.0	16	160	3.2
1056.0	0.610	12	1.1	11	161	5.0	8.8	2.0	17	184	3.6
1056.7	0.562	14	1.0	12	148	5.8	8.1	1.9	18	169	4.2
1057.4	0.750	15	1.2	11	134	4.1	11	2.2	16	153	3.0
1058.1	0.508	11	1.1	13	131	4.0	7.3	2.0	21	149	2.9
1058.8	0.442	11	0.830	13	139	4.8	6.4	1.5	19	159	3.5
1059.5	0.515	15	0.739	13	137	4.5	7.4	1.3	20	157	3.3
1060.2	0.460	11	1.1	10	131	4.7	6.6	2.1	16	150	3.4
1060.9	0.555	13	0.834	14	132	4.3	8.0	1.5	21	150	3.1
1061.6	0.269	10	0.917	14	133	4.0	3.9	1.7	21	152	2.9
1062.3	0.900	14	1.1	16	138	4.9	13	1.9	25	158	3.6
1063.0	0.311	12	0.951	11	130	3.9	4.5	1.7	16	148	2.8
1063.7	0.327	13	1.2	18	122	5.2	4.7	2.2	28	139	3.8
1064.4	0.820	24	1.3	17	130	5.0	12	2.4	27	149	3.7
1065.1	0.506	13	0.930	16	114	4.3	7.3	1.7	24	130	3.1
1065.8	0.269	12	1.0	20	123	4.5	3.9	1.9	30	141	3.3
1066.5	0.713	9.6	1.0	16	126	4.1	10	1.8	25	144	3.0
1067.2	0.356	11	0.671	18	114	4.6	5.1	1.2	28	130	3.4
1067.9	0.771	13	1.1	16	113	3.4	11	2.0	25	130	2.5
1068.6	1.1	11	1.2	18	129	6.5	16	2.2	27	148	4.7
1069.3	0.269	11	1.1	17	120	3.5	3.9	2.1	26	137	2.5
1070.0	0.755	15	1.5	19	130	5.5	11	2.8	29	149	4.0
1070.7	0.305	13	1.4	21	138	5.5	4.4	2.6	32	158	4.0
1071.4	0.309	11	0.966	18	119	5.7	4.5	1.8	27	136	4.2
1072.1	0.355	12	1.4	17	125	5.0	5.1	2.5	26	143	3.7
1072.8	0.616	11	1.3	18	121	6.1	8.9	2.4	28	139	4.5



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Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.5	0.446	11	1.3	19	100	4.8	6.4	2.5	29	115	3.5
1074.2	0.614	13	1.5	20	113	4.8	8.9	2.8	31	129	3.5
1074.9	0.296	15	1.2	19	108	4.8	4.3	2.3	29	123	3.5
1075.6	0.556	12	1.2	21	109	5.8	8.0	2.2	32	125	4.2
1076.3	0.269	12	1.1	17	104	6.4	3.9	2.0	27	119	4.7
1077.0	0.698	15	2.0	25	127	6.2	10	3.7	38	146	4.5
1077.7	0.269	12	1.5	26	115	5.1	3.9	2.7	39	131	3.7
1078.4	0.523	12	1.4	19	105	5.5	7.6	2.5	29	121	4.0
1079.1	0.400	13	1.5	22	113	5.7	5.8	2.7	34	129	4.2
1079.8	0.808	15	1.3	27	119	6.2	12	2.3	41	136	4.5
1080.5	0.269	13	1.4	38	116	5.4	3.9	2.5	58	132	3.9
1081.2	0.625	13	1.5	27	103	5.9	9.0	2.8	41	118	4.3
1081.9	0.269	12	1.3	24	105	5.8	3.9	2.4	37	120	4.2
1082.6	1.0	11	1.4	26	108	6.2	15	2.5	39	123	4.5
1083.2	0.322	14	1.9	29	103	5.8	4.6	3.4	44	118	4.2
1083.9	0.670	16	1.2	29	104	4.9	9.7	2.2	44	119	3.6
1084.6	0.817	14	1.7	26	97	5.0	12	3.0	39	110	3.7
1085.3	0.409	14	1.3	34	107	6.3	5.9	2.3	51	123	4.6
1086.0	0.408	11	1.4	33	101	5.0	5.9	2.5	50	115	3.6
1086.7	0.269	13	2.1	30	107	5.0	3.9	3.8	46	123	3.6
1087.4	0.323	15	1.4	29	96	6.4	4.7	2.5	45	110	4.7
1088.1	0.782	12	1.7	27	96	6.0	11	3.2	42	109	4.3
1088.8	0.269	12	1.5	30	94	6.5	3.9	2.8	46	108	4.7
1089.5	0.557	13	2.2	36	116	6.2	8.0	4.0	56	133	4.6
1090.2	0.269	12	1.8	32	95	7.8	3.9	3.2	49	109	5.7
1090.9	0.269	13	1.9	38	104	6.4	3.9	3.5	58	119	4.6
1091.6	0.458	14	2.3	36	98	7.4	6.6	4.1	55	113	5.4
1092.3	0.418	13	2.0	41	96	8.0	6.0	3.7	63	110	5.8
1093.0	0.269	13	2.1	34	98	6.5	3.9	3.8	52	112	4.7
1093.7	0.287	15	2.5	46	102	6.7	4.1	4.6	70	117	4.9
1094.4	0.334	12	2.4	43	84	6.6	4.8	4.4	66	96	4.8
1095.1	0.269	15	2.5	47	111	11	3.9	4.6	71	127	7.7
1095.8	0.269	14	2.7	39	110	8.6	3.9	4.9	60	126	6.3
1096.5	0.269	15	2.4	46	98	9.2	3.9	4.3	70	112	6.7
1097.2	0.413	14	2.9	52	92	7.5	6.0	5.3	79	105	5.5
1097.9	0.351	14	2.6	42	89	6.7	5.1	4.8	65	101	4.9
1098.6	0.503	12	2.0	47	88	8.7	7.3	3.6	72	101	6.4
1099.3	0.353	15	3.4	62	103	9.4	5.1	6.1	95	117	6.9
1100.0	0.269	14	3.4	57	111	15	3.9	6.2	87	126	11
1100.7	0.347	15	3.2	55	88	8.8	5.0	5.9	84	101	6.4
1101.4	0.316	15	3.1	61	90	9.4	4.6	5.7	93	103	6.9
1102.1	0.611	13	3.6	51	107	11	8.8	6.5	78	122	7.9
1102.8	0.525	15	3.8	54	96	12	7.6	7.0	82	110	8.4
1103.5	0.269	14	3.0	61	99	9.9	3.9	5.5	93	113	7.2
1104.2	0.269	15	3.3	56	81	8.9	3.9	6.0	86	92	6.5
1104.9	0.552	16	3.1	60	94	11	8.0	5.6	92	108	7.9
1105.6	0.269	15	3.4	60	112	11	3.9	6.1	92	128	7.9
1106.3	0.636	15	4.0	66	98	10	9.2	7.3	100	112	7.3
1107.0	0.439	14	3.6	62	85	7.5	6.3	6.6	95	98	5.5
1107.7	0.478	13	3.5	65	95	9.3	6.9	6.4	100	108	6.8
1108.4	0.325	14	3.7	59	87	8.3	4.7	6.8	91	100	6.1
1109.0	0.269	15	4.5	63	101	11	3.9	8.2	96	115	8.0
1109.7	0.269	14	3.8	61	99	13	3.9	6.9	94	113	9.2
1110.4	0.269	14	3.8	64	100	12	3.9	6.9	98	114	8.9
1111.1	0.269	16	4.3	71	97	9.4	3.9	7.8	108	111	6.9
1111.8	0.269	15	3.5	55	82	11	3.9	6.4	85	94	7.8
1112.5	0.269	13	3.6	62	88	11	3.9	6.6	95	101	8.1
1113.2	0.269	15	3.0	61	87	9.7	3.9	5.5	93	100	7.1
1113.9	0.349	18	3.9	69	100	10	5.0	7.1	105	115	7.4
1114.6	0.269	12	3.2	62	94	8.7	3.9	5.8	95	108	6.3
1115.3	0.312	16	3.7	71	115	12	4.5	6.7	110	131	8.5
1116.0	0.503	14	3.4	71	100	10	7.3	6.3	109	115	7.4
1116.7	0.476	17	3.8	73	95	13	6.9	6.9	112	109	9.6
1117.4	0.269	17	3.5	68	96	9.3	3.9	6.5	104	109	6.8
1118.1	0.428	12	3.4	71	98	8.6	6.2	6.2	108	113	6.3
1118.8	0.281	14	4.8	72	105	8.7	4.1	8.7	110	120	6.3
1119.5	0.637	14	3.3	71	106	10	9.2	5.9	108	122	7.6
1120.2	0.574	14	4.1	93	98	9.8	8.3	7.5	143	112	7.1
1120.9	0.416	15	4.2	73	92	9.0	6.0	7.6	113	106	6.6
1121.6	0.529	14	4.3	68	102	8.6	7.6	7.9	104	117	6.3
1122.3	0.269	14	4.5	68	94	8.1	3.9	8.2	104	108	5.9
1123.0	0.269	16	3.9	68	103	8.0	3.9	7.2	104	118	5.9
1123.7	1.1	19	4.8	80	107	11	15	8.8	123	123	7.8
1124.4	0.269	17	4.3	72	116	10	3.9	7.9	111	133	7.4
1125.1	0.269	16	4.6	73	109	9.2	3.9	8.4	111	125	6.7
1125.8	0.269	19	4.4	86	113	8.3	3.9	7.9	132	129	6.0
1126.5	0.269	16	5.0	69	98	7.9	3.9	9.1	106	112	5.8
1127.2	0.269	17	4.8	86	102	7.9	3.9	8.7	132	117	5.8
1127.9	0.269	14	4.4	69	102	8.9	3.9	8.0	105	116	6.5
1128.6	0.351	15	4.4	62	106	10	5.1	8.1	95	122	7.5
1129.3	0.269	15	4.1	69	101	8.2	3.9	7.4	106	116	6.0



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1130.0	0.483	15	4.2	93	128	11	7.0	7.6	142	146	8.3
1130.7	0.269	23	5.0	80	111	11	3.9	9.2	123	127	8.1
1131.4	0.269	16	3.7	72	111	9.8	3.9	6.8	110	127	7.1
1132.1	0.269	20	4.5	70	123	9.3	3.9	8.2	107	141	6.8
1132.8	0.504	17	4.3	80	112	8.6	7.3	7.9	123	128	6.3
1133.5	0.476	18	4.8	66	104	7.6	6.9	8.7	101	119	5.6
1134.2	0.269	17	4.9	71	109	6.2	3.9	8.9	109	125	4.5
1134.9	0.269	14	4.6	71	103	7.9	3.9	8.5	109	117	5.7
1135.5	0.269	21	4.1	77	125	9.0	3.9	7.6	119	143	6.6
1136.2	0.577	16	4.9	79	112	8.8	8.3	8.9	121	128	6.4
1136.9	0.269	16	4.8	74	107	7.7	3.9	8.8	114	123	5.6
1137.6	0.269	15	4.9	65	108	5.9	3.9	8.9	100	124	4.3
1138.3	0.269	16	4.3	66	97	6.8	3.9	7.9	101	111	5.0
1139.0	0.269	16	4.8	72	126	9.1	3.9	8.8	111	144	6.6
1139.7	0.714	17	5.4	69	120	7.7	10	9.8	105	138	5.6
1140.4	0.269	17	4.4	73	128	7.4	3.9	8.1	112	146	5.4
1141.1	0.664	16	4.5	71	126	7.7	9.6	8.3	109	144	5.6
1141.8	0.269	16	4.2	59	116	5.9	3.9	7.7	90	133	4.3
1142.5	0.269	16	4.4	64	113	7.6	3.9	8.0	98	129	5.6
1143.2	0.269	18	4.2	60	101	6.4	3.9	7.6	92	116	4.6
1143.9	0.269	13	4.0	78	112	6.8	3.9	7.3	119	128	4.9
1144.6	0.660	16	4.5	65	109	5.8	9.5	8.2	100	125	4.3
1145.3	0.269	20	4.7	67	135	5.5	3.9	8.7	103	154	4.0
1146.0	0.269	16	4.6	58	116	5.5	3.9	8.4	89	133	4.0
1146.7	0.686	18	4.4	74	134	7.2	9.9	7.9	114	153	5.2
1147.4	0.300	16	3.9	64	138	6.2	4.3	7.1	98	158	4.5
1148.1	0.269	16	4.0	57	126	4.7	3.9	7.3	87	144	3.4
1148.8	0.269	17	3.7	65	149	6.0	3.9	6.8	99	170	4.4
1149.5	0.269	19	4.3	63	154	6.1	3.9	7.8	97	176	4.5
1150.2	0.269	18	3.7	57	131	4.9	3.9	6.7	87	150	3.5
1150.9	0.523	18	4.1	58	117	4.2	7.6	7.5	89	134	3.0
1151.6	0.269	13	3.4	49	123	5.8	3.9	6.1	75	141	4.2
1152.3	0.548	16	3.7	56	139	4.5	7.9	6.7	86	159	3.3
1153.0	0.555	15	4.0	55	143	5.0	8.0	7.2	85	164	3.6
1153.7	0.269	18	3.5	50	140	4.7	3.9	6.5	76	160	3.5
1154.4	0.269	13	3.2	48	151	4.3	3.9	5.8	74	173	3.1
1155.1	0.484	12	2.9	45	144	4.1	7.0	5.3	69	165	3.0
1155.8	0.269	14	4.0	53	161	3.4	3.9	7.3	82	184	2.5
1156.5	0.487	16	2.8	51	145	4.3	7.0	5.2	78	166	3.1
1157.2	0.269	15	2.2	42	139	3.8	3.9	4.0	64	159	2.8
1157.9	0.288	13	2.2	45	153	3.3	4.2	3.9	69	175	2.4
1158.6	0.269	15	2.6	39	175	3.0	3.9	4.7	59	200	2.2
1159.3	0.718	14	2.6	38	165	3.4	10	4.7	58	189	2.5
1160.0	0.269	18	2.8	40	181	6.4	3.9	5.2	62	207	4.6
1160.7	0.269	14	1.8	37	195	3.3	3.9	3.2	56	223	2.4
1161.4	0.269	14	2.2	38	178	4.3	3.9	4.0	58	203	3.1
1162.0	0.269	13	2.2	32	172	2.7	3.9	4.0	49	196	2.0
1162.7	0.618	17	2.0	35	184	2.7	8.9	3.7	53	210	2.0
1163.4	0.269	15	2.2	41	193	3.5	3.9	4.0	62	221	2.5
1164.1	0.269	13	1.9	29	165	2.2	3.9	3.5	45	189	1.6
1164.8	0.269	16	1.6	32	173	2.6	3.9	2.9	49	198	1.9
1165.5	0.269	14	1.5	30	194	3.6	3.9	2.7	45	222	2.6
1166.2	0.299	13	1.6	29	189	2.3	4.3	2.9	45	216	1.7
1166.9	0.269	13	2.3	34	191	2.1	3.9	4.1	52	219	1.6
1167.6	0.388	14	1.6	33	219	2.4	5.6	2.9	50	251	1.7
1168.3	0.269	14	1.4	27	192	2.6	3.9	2.6	41	219	1.9
1169.0	0.269	13	1.5	27	206	3.5	3.9	2.8	41	236	2.5
1169.7	0.269	13	1.4	29	200	3.0	3.9	2.6	44	228	2.2
1170.4	0.269	15	1.6	30	194	2.9	3.9	2.8	46	222	2.1
1171.1	0.269	12	1.5	24	202	2.4	3.9	2.7	37	232	1.8
1171.8	0.269	12	1.2	32	233	2.3	3.9	2.1	48	266	1.7
1172.5	0.567	15	1.2	28	242	3.5	8.2	2.3	43	277	2.5
1173.2	0.269	13	0.929	25	213	2.4	3.9	1.7	39	243	1.8
1173.9	0.269	13	1.1	24	251	3.3	3.9	2.0	37	287	2.4
1174.6	0.441	14	1.0	24	236	2.8	6.4	1.8	37	270	2.0
1175.3	0.269	14	0.857	25	228	1.4	3.9	1.6	39	261	0.997
1176.0	0.272	14	1.2	18	222	1.7	3.9	2.1	28	254	1.2
1176.7	0.269	13	0.862	22	243	2.7	3.9	1.6	33	278	1.9
1177.4	0.269	12	1.5	23	235	2.3	3.9	2.7	35	269	1.7
1178.1	0.612	15	0.999	26	259	1.1	8.8	1.8	40	296	0.819
1178.8	0.269	11	0.797	24	285	2.5	3.9	1.5	36	326	1.8
1179.5	0.637	12	0.468	20	241	2.6	9.2	0.854	31	275	1.9
1180.2	0.518	10	0.777	16	220	1.3	7.5	1.4	25	252	0.937
1180.9	0.572	13	0.840	18	248	1.6	8.3	1.5	28	283	1.2
1181.6	0.269	11	0.822	20	238	2.1	3.9	1.5	30	272	1.6
1182.3	0.847	15	0.889	18	240	1.8	12	1.6	28	274	1.3
1183.0	0.671	12	0.762	17	276	1.4	9.7	1.4	26	315	1.0
1183.7	0.534	10	0.962	18	231	2.6	7.7	1.8	27	264	1.9
1184.4	0.618	12	0.925	19	258	2.1	8.9	1.7	30	294	1.5
1185.1	0.417	17	0.939	15	233	2.2	6.0	1.7	23	267	1.6
1185.8	0.970	13	1.0	22	224	2.4	14	1.8	34	256	1.8



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
1186.5	0.468	14	0.649	22	247	1.3	6.8	1.2	34	283	0.940
1187.2	1.1	15	0.804	22	237	1.3	16	1.5	33	271	0.947
1187.9	0.564	12	0.871	23	225	1.4	8.1	1.6	35	257	1.0
1188.5	0.294	11	0.684	20	213	1.5	4.2	1.2	30	243	1.1
1189.2	0.691	12	0.743	18	260	1.8	10.0	1.4	28	297	1.3
1189.9	0.269	15	1.0	23	228	2.7	3.9	1.9	35	261	1.9
1190.6	0.644	12	0.801	18	228	1.1	9.3	1.5	28	261	0.836
1191.3	0.520	12	0.678	21	247	1.7	7.5	1.2	32	282	1.3
1192.0	1.1	14	1.0	21	248	2.9	16	1.9	33	284	2.1
1192.7	0.679	11	0.606	25	194	1.7	9.8	1.1	38	222	1.2
1193.4	0.557	13	0.859	26	249	1.9	8.0	1.6	40	285	1.4
1194.1	0.471	11	0.769	23	203	1.5	6.8	1.4	35	232	1.1
1194.8	0.487	13	0.962	30	223	2.2	7.0	1.8	45	255	1.6
1195.5	1.1	14	1.2	26	234	2.3	16	2.1	39	268	1.7
1196.2	0.302	16	0.843	26	245	1.1	4.4	1.5	40	280	0.800
1196.9	0.817	12	1.2	29	237	2.1	12	2.1	44	271	1.5
1197.6	0.420	14	0.750	31	220	1.1	6.1	1.4	48	251	0.795
1198.3	4.7	12	0.896	29	215	1.5	67	1.6	45	246	1.1
1199.0	0.269	12	1.1	32	233	1.8	3.9	2.0	49	266	1.3
1199.7	0.269	15	0.855	36	215	2.1	3.9	1.6	55	246	1.6
1200.4	0.292	15	0.709	34	209	1.5	4.2	1.3	52	239	1.1
1201.1	0.310	14	0.638	27	203	1.7	4.5	1.2	42	232	1.3
1201.8	0.323	15	1.0	40	235	1.7	4.7	1.9	62	269	1.2
1202.5	0.666	13	0.913	37	201	2.0	9.6	1.7	56	229	1.5
1203.2	0.585	16	0.860	37	188	1.7	8.4	1.6	57	215	1.3
1203.9	0.409	12	1.1	42	186	1.5	5.9	2.0	65	212	1.1
1204.6	0.269	13	1.2	41	206	2.0	3.9	2.3	63	236	1.5
1205.3	0.309	15	1.4	43	207	2.9	4.5	2.6	66	236	2.1
1206.0	0.269	16	0.984	47	225	2.2	3.9	1.8	72	257	1.6
1206.7	0.344	15	0.905	47	196	0.851	5.0	1.7	73	225	0.621
1207.4	0.385	13	1.4	42	183	1.5	5.6	2.5	65	210	1.1
1208.1	0.334	15	1.1	46	187	2.5	4.8	2.0	71	214	1.8
1208.8	0.379	16	1.1	42	182	2.2	5.5	2.1	64	209	1.6
1209.5	0.269	15	1.6	47	178	1.4	3.9	2.9	72	203	1.0
1210.2	0.714	15	1.2	47	201	1.3	10	2.2	71	230	0.923
1210.9	0.269	15	1.1	51	197	1.5	3.9	2.1	79	225	1.1
1211.6	0.318	15	1.3	52	206	1.7	4.6	2.3	80	235	1.2
1212.3	0.366	15	1.6	53	192	1.6	5.3	2.8	81	220	1.1
1213.0	0.483	14	1.9	50	208	1.3	7.0	3.4	76	238	0.971
1213.7	0.294	16	1.5	46	172	1.1	4.2	2.7	70	197	0.826
1214.4	0.269	16	1.7	57	213	0.742	3.9	3.0	87	244	0.541
1215.1	0.520	15	1.4	50	219	1.2	7.5	2.5	77	251	0.912
1215.7	0.980	15	1.8	54	209	2.5	14	3.3	83	239	1.8
1216.4	0.269	20	1.2	60	175	1.6	3.9	2.2	92	200	1.1
1217.1	0.269	12	1.7	59	192	1.6	3.9	3.1	90	219	1.2
1217.8	0.378	15	1.8	62	195	2.3	5.5	3.3	95	223	1.7
1218.5	0.269	18	1.5	46	175	1.8	3.9	2.8	70	200	1.3
1219.2	0.643	17	1.7	55	197	1.4	9.3	3.2	84	225	1.0
1219.9	0.646	15	1.7	56	195	1.5	9.3	3.1	86	223	1.1
1220.6	0.399	18	1.6	63	214	2.0	5.8	2.9	97	244	1.4
1221.3	0.423	14	1.6	49	195	1.2	6.1	2.9	76	224	0.851
1222.0	0.273	17	2.1	60	181	1.4	3.9	3.8	92	207	1.1
1222.7	0.524	19	1.5	78	235	1.3	7.6	2.8	120	268	0.983
1223.4	0.616	19	2.0	69	200	2.0	8.9	3.6	106	229	1.4
1224.1	0.968	20	1.4	61	187	1.7	14	2.6	93	214	1.2
1224.8	0.704	18	1.6	68	172	1.1	10	3.0	104	196	0.783
1225.5	0.957	18	1.5	71	189	0.836	14	2.8	109	216	0.610
1226.2	0.778	17	1.7	79	179	1.0	11	3.2	120	205	0.750
1226.9	0.320	17	2.2	68	227	1.6	4.6	4.0	104	259	1.2
1227.6	0.821	16	1.7	58	166	0.958	12	3.1	88	190	0.699
1228.3	0.595	16	1.7	73	186	1.9	8.6	3.2	111	213	1.4
1229.0	0.471	17	2.1	67	182	1.3	6.8	3.9	103	208	0.946
1229.7	0.818	19	2.4	71	175	1.7	12	4.3	109	200	1.2
1230.4	0.269	18	1.6	72	159	0.975	3.9	2.9	110	182	0.712
1231.1	0.915	15	1.9	58	160	1.1	13	3.5	88	183	0.772
1231.8	0.684	17	2.0	79	162	1.3	9.9	3.6	122	185	0.943
1232.5	0.568	17	1.7	72	158	1.2	8.2	3.2	110	181	0.855
1233.2	0.664	19	2.0	79	178	1.7	9.6	3.7	121	204	1.3
1233.9	0.347	17	2.1	75	180	1.2	5.0	3.9	115	206	0.906
1234.6	0.892	18	2.5	90	192	0.953	13	4.6	138	219	0.695
1235.3	1.3	20	2.3	82	182	1.5	19	4.2	126	208	1.1
1236.0	0.884	19	1.9	74	168	0.772	13	3.5	114	192	0.563
1236.7	0.561	15	1.7	83	154	1.1	8.1	3.1	127	176	0.800
1237.4	1.0	16	2.1	78	206	0.919	15	3.8	120	235	0.670
1238.1	0.882	19	2.0	76	185	1.4	13	3.7	117	212	1.0
1238.8	1.1	17	2.5	83	161	1.2	16	4.5	128	185	0.853
1239.5	1.0	18	1.9	86	209	1.1	15	3.5	132	239	0.771
1240.2	1.1	19	2.0	86	184	0.765	16	3.6	132	210	0.558
1240.9	1.2	21	2.4	81	174	1.3	17	4.4	124	199	0.914
1241.6	0.683	18	2.3	81	165	1.8	9.9	4.2	124	188	1.3
1242.2	0.543	15	2.0	79	167	2.2	7.8	3.7	120	191	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1242.9	0.531	17	2.7	81	163	0.965	7.7	4.9	125	186	0.704
1243.6	0.564	19	1.8	77	167	0.592	8.1	3.4	118	191	0.432
1244.3	0.822	17	2.3	88	164	0.542	12	4.1	136	187	0.395
1245.0	0.725	16	2.1	99	183	1.2	10	3.9	151	209	0.874
1245.7	1.1	16	2.0	77	150	1.1	17	3.6	118	172	0.831
1246.4	0.727	18	2.5	79	149	1.1	10	4.6	121	171	0.818
1247.1	0.269	17	2.3	83	151	0.875	3.9	4.3	127	173	0.638
1247.8	0.805	18	2.1	71	151	0.468	12	3.8	109	173	0.342
1248.5	0.676	17	2.3	89	149	1.0	9.8	4.3	136	170	0.752
1249.2	0.693	16	1.9	76	140	1.2	10	3.5	117	160	0.905
1249.9	0.472	13	2.6	70	134	0.605	6.8	4.7	107	154	0.442
1250.6	0.875	16	2.8	85	152	0.903	13	5.1	130	173	0.659
1251.3	1.4	19	2.9	85	164	1.4	20	5.3	130	188	1.0
1252.0	0.754	20	2.7	81	161	0.747	11	4.9	125	184	0.545
1252.7	1.2	18	2.8	92	162	1.5	18	5.2	141	185	1.1
1253.4	0.823	21	3.0	112	167	1.9	12	5.4	172	191	1.4
1254.1	0.639	16	2.3	82	146	1.7	9.2	4.3	126	166	1.3
1254.8	0.775	22	2.9	92	141	1.4	11	5.2	142	161	1.0
1255.5	0.800	20	2.2	87	152	1.3	12	4.0	134	174	0.964
1256.2	0.960	18	2.5	89	140	1.2	14	4.6	136	160	0.868
1256.9	0.887	16	2.8	87	167	1.4	13	5.2	134	191	0.998
1257.6	0.269	16	2.2	85	143	1.4	3.9	3.9	131	163	0.994
1258.3	0.654	18	3.3	101	163	1.4	9.4	6.0	154	186	1.0
1259.0	0.878	20	3.3	99	150	1.2	13	5.9	151	172	0.872
1259.7	1.2	16	2.8	101	163	1.6	18	5.2	154	186	1.1
1260.4	1.1	16	2.6	85	150	1.5	15	4.7	130	172	1.1
1261.1	0.269	17	3.4	89	135	1.5	3.9	6.2	136	155	1.1
1261.8	1.1	16	2.8	94	171	1.8	15	5.2	143	196	1.3
1262.5	0.269	17	3.7	99	149	0.791	3.9	6.8	151	171	0.577
1263.2	0.359	15	3.3	84	143	1.4	5.2	6.1	129	164	0.990
1263.9	0.524	17	3.3	90	153	1.6	7.6	6.1	139	175	1.2
1264.6	0.269	16	3.3	84	150	2.3	3.9	6.0	129	172	1.7
1265.3	0.555	18	2.9	79	131	1.4	8.0	5.2	122	150	1.0
1266.0	0.444	19	3.3	88	142	1.4	6.4	6.0	134	162	1.0
1266.7	0.605	15	3.3	95	143	1.3	8.7	6.0	146	164	0.929
1267.4	0.366	17	2.5	89	126	1.6	5.3	4.6	136	144	1.1
1268.1	0.555	19	3.3	87	142	2.3	8.0	6.0	133	163	1.7
1268.7	0.653	18	3.0	80	130	1.8	9.4	5.5	123	149	1.3
1269.4	0.269	17	3.2	100	125	1.5	3.9	5.8	153	143	1.1
1270.1	0.403	19	3.5	89	147	2.2	5.8	6.3	136	168	1.6
1270.8	0.730	18	3.6	87	158	2.0	11	6.6	133	181	1.5
1271.5	0.269	17	3.4	85	153	2.1	3.9	6.1	130	175	1.6
1272.2	0.787	17	2.9	88	150	1.2	11	5.3	135	171	0.889
1272.9	0.951	19	2.6	84	152	1.2	14	4.8	128	174	0.877
1273.6	0.799	18	3.2	105	169	2.1	12	5.7	160	194	1.5
1274.3	0.326	16	3.1	84	153	2.2	4.7	5.7	129	174	1.6
1275.0	0.325	18	3.2	80	172	1.3	4.7	5.9	123	197	0.980
1275.7	0.972	16	3.2	91	155	1.8	14	5.9	140	177	1.3
1276.4	0.774	17	2.5	84	158	1.6	11	4.5	129	181	1.2
1277.1	0.538	16	2.7	75	166	1.8	7.8	5.0	115	190	1.3
1277.8	0.490	18	2.8	80	154	1.6	7.1	5.1	123	177	1.2
1278.5	0.700	17	3.0	71	134	2.2	10	5.4	109	153	1.6
1279.2	0.283	16	2.5	81	166	1.3	4.1	4.6	125	189	0.956
1279.9	0.527	15	2.9	81	169	2.1	7.6	5.2	124	193	1.5
1280.6	0.269	15	2.9	76	173	1.8	3.9	5.2	116	198	1.3
1281.3	0.999	19	3.1	75	166	1.7	14	5.6	115	189	1.3
1282.0	0.577	17	3.1	81	167	2.4	8.3	5.6	123	191	1.7
1282.7	0.471	17	2.9	88	146	2.0	6.8	5.3	136	167	1.5
1283.4	0.566	19	3.3	101	180	3.5	8.2	6.0	154	206	2.6
1284.1	0.499	14	2.8	89	181	2.4	7.2	5.1	136	207	1.7
1284.8	0.638	17	3.1	85	167	1.8	9.2	5.6	130	191	1.3
1285.5	0.307	18	2.7	71	160	2.8	4.4	4.9	109	183	2.0
1286.2	0.668	17	3.2	80	176	2.5	9.6	5.8	122	201	1.8
1286.9	0.374	18	2.9	81	161	3.2	5.4	5.3	125	184	2.3
1287.6	0.269	20	3.0	84	185	2.2	3.9	5.5	129	212	1.6
1288.3	0.271	14	3.7	92	202	2.0	3.9	6.7	141	231	1.4
1289.0	0.331	20	3.3	90	171	2.5	4.8	6.0	138	196	1.8
1289.7	0.281	15	3.3	93	180	2.1	4.1	5.9	143	206	1.6
1290.4	0.986	16	2.7	80	167	2.1	14	5.0	122	191	1.5
1291.1	0.437	18	2.8	79	158	1.8	6.3	5.1	121	181	1.3
1291.8	0.323	17	3.8	97	173	3.3	4.7	6.9	149	197	2.4
1292.5	0.416	18	3.1	85	149	2.0	6.0	5.6	130	171	1.4
1293.2	0.758	16	2.7	98	171	2.2	11	4.9	150	195	1.6
1293.9	0.471	18	2.4	84	166	2.3	6.8	4.4	129	190	1.6
1294.5	0.269	15	3.4	82	152	2.1	3.9	6.3	126	174	1.6
1295.2	0.270	17	3.1	83	144	2.4	3.9	5.6	128	164	1.8
1295.9	0.618	17	3.0	90	165	2.5	8.9	5.4	138	188	1.8
1296.6	0.269	19	3.1	82	146	2.4	3.9	5.6	125	167	1.7
1297.3	0.269	17	2.6	73	135	1.4	3.9	4.7	112	154	1.0
1298.0	0.325	21	3.1	88	163	2.7	4.7	5.6	135	187	2.0
1298.7	0.309	17	4.1	88	160	2.0	4.5	7.5	135	183	1.5



Minnow Environmental  
Sample ID: 003

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
1299.4	0.312	18	2.8	87	173	2.0	4.5	5.1	133	198	1.4
1300.1	0.977	19	2.8	93	179	3.0	14	5.1	142	204	2.2
1300.8	0.370	19	2.2	72	144	2.8	5.3	4.1	111	164	2.0
1301.5	0.269	20	3.5	96	152	2.4	3.9	6.4	147	174	1.7
1302.2	0.269	15	2.4	83	138	2.3	3.9	4.4	127	158	1.7
1302.9	0.805	18	2.8	77	142	1.9	12	5.0	118	163	1.4
1303.6	0.802	17	3.1	75	145	1.6	12	5.7	115	166	1.2
1304.3	0.552	18	2.9	82	148	1.8	8.0	5.3	126	169	1.3
1305.0	0.697	18	3.2	77	165	2.4	10	5.9	118	189	1.8
1305.7	0.721	17	3.0	94	172	3.2	10	5.5	144	196	2.3
1306.4	0.269	15	3.1	90	143	2.9	3.9	5.7	139	164	2.1
1307.1	0.493	17	3.6	95	179	3.7	7.1	6.5	146	205	2.7
1307.8	0.906	18	3.4	85	178	3.0	13	6.2	131	204	2.2
1308.5	0.775	21	3.8	96	174	1.9	11	7.0	148	199	1.4
1309.2	0.269	16	3.4	85	193	1.8	3.9	6.2	130	220	1.3
1309.9	0.269	20	3.5	77	144	4.2	3.9	6.3	118	165	3.1
1310.6	0.311	15	3.7	89	171	3.2	4.5	6.7	136	195	2.3
1311.3	0.566	17	3.5	78	175	3.3	8.2	6.3	120	200	2.4
1312.0	0.349	17	3.7	66	171	3.0	5.0	6.7	101	196	2.2
1312.7	0.269	13	2.8	75	167	2.4	3.9	5.1	116	191	1.8
1313.4	0.533	16	3.6	75	182	2.1	7.7	6.6	115	208	1.5
1314.1	0.708	17	3.4	59	185	2.9	10	6.2	91	212	2.1
1314.8	0.899	16	2.8	66	203	2.9	13	5.1	102	233	2.1
1315.5	1.1	18	3.5	69	250	3.8	15	6.4	106	286	2.8
1316.2	0.332	16	2.7	64	187	2.0	4.8	4.9	97	214	1.5
1316.9	0.269	17	2.9	66	239	2.6	3.9	5.3	102	273	1.9
1317.6	0.544	16	3.7	65	209	4.1	7.9	6.8	100	239	3.0
1318.3	0.316	16	2.3	49	175	2.8	4.6	4.2	75	200	2.0
1319.0	0.724	19	2.5	61	188	5.0	10	4.5	93	214	3.6
1319.7	0.428	15	2.7	61	218	5.0	6.2	4.9	94	249	3.6
1320.4	1.1	15	2.4	60	197	5.4	16	4.4	92	225	3.9
1321.0	0.757	16	2.2	51	235	4.7	11	4.1	79	269	3.5
1321.7	0.720	16	2.5	58	200	4.2	10	4.5	89	229	3.1
1322.4	0.501	16	2.5	55	233	6.5	7.2	4.6	84	266	4.8
1323.1	0.269	15	2.0	60	204	5.4	3.9	3.7	93	234	3.9
1323.8	0.742	15	2.2	57	242	3.6	11	3.9	87	277	2.6
1324.5	0.551	14	2.2	52	208	4.7	8.0	4.1	79	237	3.4
1325.2	1.2	18	2.2	54	223	3.8	17	4.0	83	255	2.8
1325.9	0.827	14	2.0	55	213	4.3	12	3.6	84	243	3.2
1326.6	1.0	16	2.2	47	189	3.3	15	4.1	73	216	2.4
1327.3	0.986	15	2.3	48	193	4.2	14	4.3	74	220	3.1
1328.0	0.945	19	1.9	52	223	3.7	14	3.4	80	255	2.7
1328.7	0.613	15	2.2	45	221	4.1	8.9	4.1	69	253	3.0
1329.4	0.952	12	1.6	48	235	4.3	14	2.9	73	269	3.1
1330.1	0.964	17	1.7	56	227	5.4	14	3.1	86	260	3.9
1330.8	0.745	16	1.6	50	242	4.5	11	2.9	77	276	3.3
1331.5	1.5	14	1.4	45	212	3.0	22	2.6	69	242	2.2
1332.2	1.2	14	1.6	46	208	3.4	18	2.9	70	237	2.5
1332.9	0.945	14	1.8	46	211	3.1	14	3.3	70	241	2.3
1333.6	1.3	14	1.5	43	228	2.6	18	2.8	67	261	1.9
1334.3	1.2	16	1.2	44	228	2.6	18	2.2	67	261	1.9
1335.0	1.0	17	1.6	41	216	2.6	15	3.0	63	247	1.9
1335.7	1.6	15	1.4	41	236	2.0	23	2.5	63	269	1.4
1336.4	0.980	13	1.5	42	232	3.0	14	2.7	64	265	2.2
1337.1	1.5	16	1.5	52	239	2.4	22	2.8	79	274	1.7
1337.8	1.9	15	1.6	36	214	2.3	27	2.9	56	245	1.7
1338.5	1.3	17	1.3	42	255	3.0	19	2.3	64	292	2.2
1339.2	1.7	15	1.3	39	227	2.3	24	2.4	60	260	1.7
1339.9	1.2	17	1.5	36	242	2.2	17	2.7	55	277	1.6
1340.6	1.3	17	1.1	40	225	2.5	18	2.0	62	258	1.8
1341.3	1.3	12	1.3	37	211	2.2	19	2.4	57	241	1.6
1342.0	1.3	14	0.964	42	259	1.2	18	1.8	64	296	0.894
1342.7	1.4	16	0.999	35	276	2.4	20	1.8	53	316	1.8
1343.4	1.9	15	1.3	47	271	3.0	28	2.3	73	310	2.2
1344.1	1.9	14	1.3	37	251	2.0	27	2.4	57	287	1.4
1344.8	1.7	14	1.2	35	258	2.9	24	2.2	54	295	2.1
1345.5	1.0	14	1.1	34	252	1.6	15	1.9	53	288	1.2
1346.2	0.980	15	1.0	34	284	2.4	14	1.8	53	325	1.8
1346.8	1.0	14	1.1	38	274	1.7	15	2.0	59	314	1.2
1347.5	1.2	14	1.0	32	278	1.8	17	1.9	48	318	1.3
1348.2	1.5	15	0.909	38	261	1.9	22	1.7	58	299	1.4
1348.9	0.776	18	1.2	34	258	1.9	11	2.2	53	295	1.4
1349.6	1.5	14	0.804	31	257	1.8	21	1.5	48	294	1.3
1350.3	1.2	15	1.2	44	296	1.7	18	2.2	68	338	1.2
1351.0	2.0	15	0.791	32	269	2.4	28	1.4	49	307	1.8
1351.7	1.2	14	1.2	31	266	2.1	18	2.1	48	304	1.6
1352.4	1.3	13	1.0	28	256	1.3	19	1.8	43	293	0.963
1353.1	2.0	15	1.0	38	289	2.3	29	1.8	58	331	1.7
1353.8	1.5	14	1.0	32	267	1.7	21	1.8	49	306	1.2
1354.5	1.0	14	1.1	35	279	1.9	15	1.9	54	319	1.4
1355.2	1.4	15	1.1	31	294	1.9	20	2.0	48	336	1.4



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1355.9	1.3	15	0.954	31	283	2.1	19	1.7	47	323	1.6
1356.6	2.1	15	1.1	33	310	2.2	31	2.0	51	354	1.6
1357.3	1.5	16	1.1	31	295	2.3	22	1.9	47	338	1.7
1358.0	1.8	14	0.905	33	335	2.0	25	1.7	51	383	1.5
1358.7	0.890	13	1.1	31	285	2.0	13	1.9	48	326	1.5
1359.4	1.2	14	0.953	33	347	1.7	18	1.7	50	396	1.3
1360.1	0.931	15	1.1	26	305	2.0	13	2.0	41	349	1.5
1360.8	1.4	15	0.725	33	298	2.3	21	1.3	51	341	1.7
1361.5	1.1	14	1.2	32	316	3.1	16	2.3	49	361	2.2
1362.2	0.920	15	0.794	28	254	1.9	13	1.4	44	291	1.4
1362.9	1.0	14	0.927	29	303	2.0	15	1.7	45	346	1.5
1363.6	1.5	18	1.6	33	350	2.0	21	2.9	50	400	1.5
1364.3	1.9	15	1.4	34	304	2.1	28	2.5	53	348	1.5
1365.0	1.5	15	1.3	32	308	2.3	22	2.3	49	353	1.7
1365.7	1.4	17	0.898	31	294	2.0	21	1.6	48	336	1.4
1366.4	1.9	15	1.0	28	293	2.8	27	1.9	42	335	2.1
1367.1	1.1	13	1.2	31	343	2.7	16	2.1	48	392	1.9
1367.8	1.7	13	1.2	28	277	2.6	25	2.2	43	317	1.9
1368.5	1.8	18	1.4	30	310	2.7	26	2.5	46	354	2.0
1369.2	1.8	15	1.3	33	298	3.2	26	2.3	50	341	2.3
1369.9	1.1	15	1.1	27	269	2.0	16	2.1	42	308	1.5
1370.6	1.3	16	0.881	35	284	1.7	19	1.6	53	325	1.3
1371.3	1.7	13	1.2	29	320	2.7	25	2.2	44	366	2.0
1372.0	1.5	16	0.955	32	299	2.9	22	1.7	49	342	2.1
1372.7	1.1	13	1.2	27	307	2.9	15	2.1	41	351	2.1
1373.3	1.2	14	1.0	30	289	2.0	18	1.8	46	330	1.5
1374.0	1.5	16	1.1	30	301	2.8	22	2.0	47	344	2.1
1374.7	2.4	15	1.2	34	289	1.6	34	2.2	52	331	1.2
1375.4	1.5	15	1.3	33	312	2.7	22	2.3	50	356	2.0
1376.1	1.1	15	1.1	29	331	2.2	16	2.1	45	378	1.6
1376.8	2.4	13	1.2	30	315	2.6	35	2.1	46	360	1.9
1377.5	1.8	12	1.1	30	292	2.4	26	2.1	46	334	1.7
1378.2	0.714	17	0.787	28	263	1.7	10	1.4	44	301	1.3
1378.9	1.0	16	1.0	27	286	2.9	15	1.9	41	327	2.1
1379.6	2.3	15	1.0	32	275	2.0	33	1.9	49	314	1.5
1380.3	2.3	13	1.2	31	296	3.1	33	2.3	48	338	2.3
1381.0	1.8	16	1.2	30	286	2.3	26	2.2	46	327	1.7
1381.7	2.0	15	1.1	31	314	2.8	29	2.1	47	359	2.0
1382.4	1.3	13	1.2	29	314	3.1	19	2.2	45	359	2.3
1383.1	1.6	17	1.3	31	328	3.2	24	2.4	48	375	2.4
1383.8	2.0	18	1.3	32	336	3.0	30	2.4	48	384	2.2
1384.5	1.7	14	1.0	29	304	4.4	25	1.9	44	348	3.2
1385.2	1.6	15	1.1	26	329	2.1	23	2.0	40	376	1.6
1385.9	1.7	20	1.0	29	333	3.5	24	1.8	45	380	2.6
1386.6	2.3	15	0.924	25	338	2.3	33	1.7	38	386	1.7
1387.3	1.7	14	1.2	26	276	3.0	24	2.2	39	315	2.2
1388.0	1.3	14	0.966	33	348	3.1	18	1.8	51	398	2.2
1388.7	1.7	15	1.1	26	282	2.7	25	1.9	40	323	2.0
1389.4	2.7	15	1.1	27	367	3.3	39	2.0	41	419	2.4
1390.1	1.5	17	1.1	29	325	2.6	21	2.0	45	372	1.9
1390.8	1.9	18	1.1	30	376	3.6	27	2.0	47	430	2.6
1391.5	1.9	16	1.3	27	306	1.9	28	2.3	41	349	1.4
1392.2	2.3	16	1.4	28	317	2.6	34	2.5	43	363	1.9
1392.9	2.0	15	1.1	27	305	2.9	29	1.9	41	348	2.1
1393.6	2.2	17	1.4	26	326	2.2	32	2.5	40	373	1.6
1394.3	1.7	21	1.4	29	339	3.9	25	2.5	45	388	2.9
1395.0	1.9	15	1.2	25	309	3.5	28	2.1	38	353	2.5
1395.7	1.9	19	1.2	30	373	3.9	27	2.3	46	427	2.8
1396.4	1.9	16	1.2	26	330	2.1	27	2.1	40	377	1.5
1397.1	1.8	14	1.2	29	319	5.0	26	2.1	45	364	3.6
1397.8	2.1	18	1.1	22	329	3.9	30	1.9	34	376	2.8
1398.5	2.7	15	1.0	24	326	2.7	40	1.8	37	372	2.0
1399.2	2.1	18	1.3	30	340	3.4	30	2.3	46	389	2.5
1399.8	1.8	12	1.1	24	316	3.8	27	2.1	37	361	2.7
1400.5	2.0	18	1.0	30	325	3.3	29	1.9	47	372	2.4
1401.2	1.1	17	1.5	33	336	2.7	16	2.8	50	384	2.0
1401.9	2.1	17	1.5	32	360	2.6	31	2.7	50	412	1.9
1402.6	1.8	18	1.5	27	390	3.1	26	2.8	42	446	2.3
1403.3	1.8	16	1.4	24	314	3.5	27	2.5	37	359	2.5
1404.0	1.4	15	1.5	30	337	4.2	21	2.8	46	385	3.0
1404.7	2.2	20	1.3	30	357	4.0	32	2.3	47	408	2.9
1405.4	1.4	15	1.3	27	317	3.0	21	2.3	42	363	2.2
1406.1	1.5	17	1.2	25	317	3.1	22	2.2	38	363	2.3
1406.8	1.6	18	1.6	26	347	3.6	23	2.9	40	397	2.6
1407.5	1.8	18	1.4	28	394	4.6	26	2.5	42	451	3.4
1408.2	2.1	18	1.5	31	340	3.8	30	2.7	47	389	2.8
1408.9	2.2	18	1.5	26	345	3.7	31	2.7	39	394	2.7
1409.6	2.2	16	1.1	25	336	3.7	32	2.0	39	385	2.7
1410.3	3.4	17	1.3	27	351	3.2	49	2.5	42	401	2.3
1411.0	2.6	19	1.4	28	341	3.4	38	2.6	43	390	2.5
1411.7	2.4	18	1.4	19	327	3.5	34	2.5	28	374	2.6



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1412.4	1.5	20	1.2	23	321	2.8	22	2.2	36	368	2.1
1413.1	2.7	17	1.4	27	339	3.7	39	2.6	41	388	2.7
1413.8	2.0	24	1.5	28	353	3.8	29	2.8	42	403	2.8
1414.5	2.2	23	1.7	24	354	4.8	32	3.2	36	405	3.5
1415.2	2.5	19	1.6	22	354	3.1	35	2.9	34	405	2.3
1415.9	2.6	20	1.2	24	286	4.0	38	2.2	37	328	2.9
1416.6	2.3	19	2.5	25	370	3.2	33	4.6	39	423	2.4
1417.3	2.8	28	1.3	21	327	2.3	40	2.4	32	374	1.7
1418.0	2.4	21	2.0	25	352	2.7	35	3.7	38	403	2.0
1418.7	1.8	27	2.1	21	312	3.0	26	3.8	32	356	2.2
1419.4	2.4	22	1.7	22	351	2.7	34	3.1	34	402	2.0
1420.1	1.5	22	1.8	21	337	2.3	22	3.3	33	385	1.7
1420.8	1.6	25	2.1	17	347	2.9	22	3.8	26	397	2.1
1421.5	1.9	24	1.9	16	340	2.4	28	3.4	25	389	1.7
1422.2	2.5	23	2.0	21	349	1.6	36	3.6	32	399	1.1
1422.9	2.7	25	1.3	18	363	2.1	39	2.5	28	415	1.6
1423.6	1.7	22	2.0	17	316	1.8	25	3.6	26	361	1.3
1424.3	2.4	30	1.7	20	382	2.0	35	3.1	31	437	1.5
1425.0	2.2	22	1.8	19	327	2.8	32	3.3	29	374	2.0
1425.6	1.4	21	1.3	18	396	2.1	20	2.4	28	453	1.5
1426.3	2.3	26	1.8	18	339	1.9	33	3.3	28	388	1.4
1427.0	2.3	24	1.8	17	329	2.8	34	3.4	26	376	2.0
1427.7	1.6	19	2.0	19	371	2.1	23	3.7	29	425	1.5
1428.4	1.6	21	2.0	16	330	2.0	24	3.6	25	377	1.5
1429.1	1.7	24	2.0	18	398	2.5	24	3.7	28	456	1.8
1429.8	1.9	23	1.5	19	365	1.8	27	2.8	28	417	1.3
1430.5	2.3	24	2.1	16	409	2.4	34	3.7	25	468	1.8
1431.2	0.826	25	1.9	19	346	2.6	12	3.5	30	395	1.9
1431.9	1.7	26	1.9	22	406	3.2	24	3.5	34	464	2.3
1432.6	1.6	25	2.3	19	405	3.1	23	4.1	29	463	2.3
1433.3	1.5	25	1.3	19	405	2.7	22	2.5	29	463	2.0
1434.0	2.1	22	1.8	19	339	1.7	31	3.3	29	387	1.2
1434.7	1.9	27	1.6	19	349	1.2	28	2.9	29	399	0.840
1435.4	1.4	29	1.9	21	425	2.7	20	3.5	33	486	2.0
1436.1	1.6	26	1.7	19	434	2.1	23	3.0	29	496	1.5
1436.8	2.2	24	2.0	22	370	1.8	32	3.6	33	423	1.3
1437.5	2.0	26	2.6	21	411	2.6	29	4.8	33	470	1.9
1438.2	1.7	25	2.4	20	423	1.5	25	4.4	31	483	1.1
1438.9	1.6	24	2.0	22	425	2.5	23	3.7	34	486	1.8
1439.6	1.6	32	2.2	24	452	2.4	24	4.0	38	517	1.8
1440.3	2.1	22	1.9	20	365	1.5	30	3.4	31	417	1.1
1441.0	1.8	23	2.2	16	404	2.2	26	4.0	24	462	1.6
1441.7	1.4	24	1.8	17	338	2.0	20	3.3	27	387	1.5
1442.4	1.4	22	2.1	19	337	2.0	21	3.9	28	385	1.4
1443.1	0.821	21	1.3	14	319	1.8	12	2.3	22	365	1.3
1443.8	2.2	26	2.6	20	420	3.1	32	4.8	31	480	2.2
1444.5	1.4	20	2.4	20	393	1.7	20	4.4	31	449	1.3
1445.2	0.933	24	3.0	22	434	2.0	13	5.4	34	496	1.5
1445.9	2.0	28	2.4	21	417	2.1	28	4.3	32	477	1.5
1446.6	1.2	21	2.4	17	368	1.6	18	4.4	27	421	1.2
1447.3	1.8	21	2.3	17	410	2.4	27	4.2	26	468	1.7
1448.0	1.6	23	2.6	19	397	1.3	23	4.8	29	453	0.959
1448.7	1.7	28	2.1	19	417	1.6	25	3.8	29	476	1.2
1449.4	1.3	24	2.3	19	413	1.6	19	4.2	30	472	1.2
1450.1	1.6	28	2.5	16	432	2.5	23	4.6	24	494	1.8
1450.8	1.9	28	2.6	21	444	2.1	27	4.7	33	508	1.5
1451.5	1.8	30	2.9	20	352	1.6	26	5.2	30	403	1.1
1452.1	1.6	30	2.5	19	445	2.4	23	4.6	29	508	1.8
1452.8	1.0	31	2.8	23	398	1.8	15	5.2	35	455	1.3
1453.5	2.0	24	2.4	14	356	2.0	29	4.4	22	407	1.5
1454.2	0.997	33	2.7	17	354	1.7	14	4.9	26	405	1.3
1454.9	1.5	29	2.8	19	353	1.4	22	5.2	30	403	1.0
1455.6	2.0	36	3.2	22	374	2.0	29	5.8	34	428	1.5
1456.3	1.4	31	3.3	18	373	0.948	20	6.0	27	426	0.692
1457.0	1.3	33	4.2	19	451	2.2	19	7.6	29	516	1.6
1457.7	1.7	36	3.5	18	395	1.2	25	6.5	28	452	0.895
1458.4	1.1	35	3.1	18	375	1.9	16	5.6	27	429	1.4
1459.1	1.7	35	2.9	18	378	1.9	25	5.2	28	432	1.4
1459.8	0.556	36	4.2	20	403	1.6	8.0	7.7	30	460	1.1
1460.5	1.0	35	4.2	18	335	1.6	15	7.6	27	383	1.2
1461.2	1.7	35	3.6	21	375	1.6	24	6.6	32	428	1.2
1461.9	1.1	46	3.4	21	386	1.4	16	6.3	33	441	1.0
1462.6	0.799	50	4.0	18	438	1.3	12	7.2	28	501	0.963
1463.3	1.3	47	5.0	20	365	1.7	19	9.2	31	417	1.2
1464.0	0.741	38	3.2	19	309	1.8	11	5.8	28	354	1.3
1464.7	1.8	48	4.5	22	404	2.6	26	8.2	34	461	1.9
1465.4	1.0	43	4.7	28	382	1.5	15	8.5	43	436	1.1
1466.1	0.577	43	5.1	21	362	1.9	8.3	9.3	32	415	1.4
1466.8	1.7	55	7.5	28	435	2.6	24	14	43	497	1.9
1467.5	1.6	47	12	29	377	1.4	23	23	44	431	1.0
1468.2	1.7	52	20	31	351	2.1	24	36	48	401	1.5



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Sample ID: 003

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
1468.9	2.0	64	19	38	428	1.6	29	35	59	490	1.2
1469.6	1.3	90	95	51	401	1.5	19	173	79	458	1.1
1470.3	1.0	90	102	57	392	1.2	15	187	87	448	0.849
1471.0	1.6	104	82	59	368	1.8	23	149	91	420	1.3
1471.7	1.8	98	78	62	408	1.8	26	143	95	467	1.3
1472.4	1.8	120	91	55	378	1.1	26	166	85	432	0.803
1473.1	1.5	179	54	55	354	1.2	22	99	85	405	0.882
1473.8	1.9	77	48	47	424	1.7	27	88	72	485	1.2
1474.5	1.6	67	35	35	387	1.5	23	64	53	443	1.1
1475.2	2.0	72	23	34	477	1.7	29	43	52	546	1.3
1475.9	1.3	48	19	31	470	2.2	19	34	47	537	1.6
1476.6	1.7	57	14	29	401	1.9	25	26	45	459	1.4
1477.3	0.893	41	12	25	397	1.2	13	23	38	454	0.907
1478.0	2.0	41	9.8	25	425	2.0	28	18	38	486	1.4
1478.6	1.5	41	11	19	383	2.0	22	20	30	438	1.5
1479.3	1.5	47	14	25	456	2.2	22	26	38	521	1.6
1480.0	1.1	42	10	21	371	1.8	16	19	32	424	1.3
1480.7	1.6	37	12	22	383	1.9	24	22	33	437	1.4
1481.4	1.9	47	11	19	377	1.3	28	19	29	431	0.921
1482.1	1.6	38	7.5	22	392	1.9	23	14	34	448	1.4
1482.8	1.7	38	6.5	19	385	1.4	24	12	30	441	1.0
1483.5	1.6	32	5.0	20	399	1.4	24	9.0	31	456	1.0
1484.2	1.7	45	5.3	19	403	1.4	25	9.7	29	461	1.0
1484.9	2.0	35	3.7	24	415	1.8	29	6.7	36	475	1.3
1485.6	0.921	34	7.4	21	420	2.3	13	14	32	480	1.7
1486.3	1.8	38	4.2	23	444	2.2	26	7.7	35	508	1.6
1487.0	1.8	37	3.6	18	403	2.2	27	6.6	27	461	1.6
1487.7	1.9	37	9.4	26	426	1.7	28	17	40	488	1.3
1488.4	1.9	42	4.6	20	394	1.7	27	8.3	30	450	1.2
1489.1	1.8	31	5.1	19	352	1.7	27	9.3	30	402	1.2
1489.8	2.0	31	3.4	18	358	2.2	29	6.2	27	410	1.6
1490.5	1.7	40	5.5	19	405	1.9	24	10	29	464	1.4
1491.2	1.8	37	4.3	21	420	1.9	26	7.8	33	480	1.4
1491.9	1.8	53	3.0	18	407	1.7	25	5.4	28	466	1.2
1492.6	2.1	34	22	19	395	2.1	31	39	29	452	1.5
1493.3	1.3	34	3.8	19	368	1.9	19	6.9	29	421	1.4
1494.0	2.0	41	3.6	21	405	1.9	29	6.7	32	463	1.4
1494.7	1.0	37	3.2	21	458	2.3	15	5.8	32	524	1.7
1495.4	1.6	33	3.7	19	384	1.4	24	6.7	28	439	0.990
1496.1	1.3	34	3.3	16	388	2.6	19	6.0	25	444	1.9
1496.8	1.4	40	3.0	20	395	1.9	21	5.5	30	452	1.4
1497.5	2.1	39	3.1	21	389	2.1	30	5.7	32	444	1.5
1498.2	1.4	31	2.7	22	366	1.9	21	4.8	33	418	1.4
1498.9	2.0	32	3.5	21	438	1.7	29	6.3	33	501	1.2
1499.6	1.5	35	3.3	18	385	1.7	22	6.1	28	440	1.2
1500.3	2.4	40	3.1	19	402	1.6	34	5.6	29	460	1.2
1501.0	1.3	35	3.3	19	421	2.3	19	6.0	28	482	1.7
1501.7	2.2	33	2.8	19	414	1.9	31	5.0	29	474	1.4
1502.4	2.5	32	2.8	23	369	2.3	36	5.1	36	422	1.7
1503.1	1.8	36	2.9	21	448	1.6	26	5.3	32	512	1.1
1503.8	1.9	36	2.1	21	460	1.7	28	3.8	33	526	1.3
1504.5	1.4	35	3.1	20	374	1.4	20	5.6	30	427	1.0
1505.2	1.4	28	3.0	18	344	2.0	20	5.6	28	393	1.5
1505.8	2.1	28	2.4	16	419	1.6	30	4.3	24	479	1.2
1506.5	2.2	31	3.2	17	381	2.3	32	5.8	26	436	1.7
1507.2	1.2	40	2.3	18	354	1.2	17	4.1	27	405	0.839
1507.9	1.5	26	2.6	21	392	2.4	22	4.7	32	449	1.7
1508.6	1.2	29	2.5	18	395	1.6	17	4.5	27	452	1.1
1509.3	2.3	28	2.1	20	407	1.5	33	3.9	30	466	1.1
1510.0	1.8	26	2.3	14	394	1.9	26	4.2	21	450	1.4
1510.7	1.4	30	2.4	17	412	1.8	21	4.4	26	471	1.3
1511.4	1.6	25	2.1	20	346	1.7	24	3.8	30	396	1.2
1512.1	1.1	31	2.5	15	413	2.2	16	4.6	24	472	1.6
1512.8	1.5	28	2.9	18	409	1.7	21	5.2	27	467	1.2
1513.5	1.8	29	1.7	20	383	1.7	25	3.1	30	438	1.2
1514.2	1.6	28	1.8	19	355	2.2	24	3.4	30	406	1.6
1514.9	1.9	24	1.8	17	312	1.5	27	3.3	27	357	1.1
1515.6	1.2	24	1.9	14	381	3.2	18	3.5	22	435	2.3
1516.3	1.8	22	1.7	14	325	1.9	26	3.0	22	371	1.4
1517.0	1.8	28	1.7	19	351	2.8	26	3.0	29	401	2.0
1517.7	1.4	28	1.3	17	342	1.2	20	2.3	26	392	0.865
1518.4	1.9	23	1.9	19	340	1.5	28	3.5	29	389	1.1
1519.1	2.0	23	1.7	16	413	1.5	29	3.1	25	472	1.1
1519.8	1.7	24	1.5	19	366	2.0	25	2.7	29	419	1.4
1520.5	1.4	25	1.6	17	374	2.3	20	2.8	26	427	1.7
1521.2	1.9	27	1.8	24	395	3.1	28	3.3	37	451	2.2
1521.9	1.7	26	1.7	17	334	2.5	25	3.0	26	381	1.8
1522.6	2.2	22	1.6	18	327	2.4	31	3.0	28	374	1.7
1523.3	1.9	24	1.3	20	351	2.2	28	2.3	31	401	1.6
1524.0	1.9	24	2.0	20	381	2.2	27	3.6	30	435	1.6
1524.7	2.0	25	1.7	18	357	3.0	29	3.0	28	409	2.2



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1525.4	2.2	25	1.9	23	408	2.1	31	3.4	36	467	1.5
1526.1	2.2	23	1.4	21	432	2.4	32	2.6	32	494	1.7
1526.8	2.1	25	1.5	22	364	2.7	31	2.7	33	416	2.0
1527.5	2.0	25	1.9	21	394	3.2	28	3.4	32	451	2.3
1528.2	1.0	21	1.7	23	381	2.2	15	3.1	36	436	1.6
1528.9	3.1	22	1.8	24	364	2.3	45	3.2	38	416	1.7
1529.6	1.6	21	1.4	20	356	2.8	24	2.5	31	407	2.0
1530.3	2.1	22	1.4	21	397	3.6	31	2.6	32	454	2.6
1531.0	1.3	22	1.7	21	336	2.5	19	3.2	32	384	1.8
1531.7	1.2	23	1.7	20	338	2.9	18	3.1	31	386	2.1
1532.3	1.8	23	1.3	23	357	2.6	26	2.3	35	408	1.9
1533.0	2.3	20	1.9	20	368	2.7	33	3.4	31	421	2.0
1533.7	2.3	22	1.5	22	363	3.1	34	2.8	33	416	2.3
1534.4	2.2	20	1.7	22	328	2.0	31	3.0	34	375	1.5
1535.1	1.5	20	1.4	28	352	3.1	22	2.5	43	402	2.3
1535.8	2.1	20	1.7	24	376	2.6	30	3.1	37	430	1.9
1536.5	1.6	19	1.4	20	343	2.2	22	2.5	31	392	1.6
1537.2	2.4	20	1.3	23	359	3.2	34	2.4	35	410	2.3
1537.9	1.3	20	1.4	22	316	3.1	19	2.5	34	361	2.3
1538.6	2.2	17	1.4	19	349	2.6	32	2.6	30	399	1.9
1539.3	1.9	16	1.3	23	340	2.6	28	2.4	35	389	1.9
1540.0	2.9	20	1.4	23	406	3.8	41	2.6	35	465	2.8
1540.7	2.4	20	1.5	23	337	2.7	35	2.7	35	386	2.0
1541.4	2.0	17	1.2	20	324	2.3	29	2.2	31	370	1.7
1542.1	1.8	17	1.5	22	327	2.5	26	2.8	34	374	1.8
1542.8	2.1	17	1.1	18	303	2.3	31	2.1	28	346	1.7
1543.5	1.5	17	1.2	24	307	2.3	22	2.2	37	351	1.7
1544.2	1.6	19	1.5	23	312	2.0	23	2.8	35	356	1.5
1544.9	2.7	18	1.3	26	350	1.9	39	2.4	41	400	1.4
1545.6	1.3	15	1.3	27	334	3.0	19	2.3	41	382	2.2
1546.3	2.0	18	1.4	24	319	2.4	29	2.6	36	365	1.7
1547.0	1.6	17	1.1	20	306	2.4	24	2.1	31	350	1.7
1547.7	1.6	17	1.1	29	339	1.8	24	2.0	44	388	1.3
1548.4	1.7	19	1.1	26	347	2.2	24	2.1	39	397	1.6
1549.1	2.2	15	1.4	22	311	2.6	32	2.5	34	355	1.9
1549.8	1.8	15	1.0	22	327	2.9	27	1.8	34	373	2.1
1550.5	1.8	16	1.3	29	321	2.6	26	2.4	44	367	1.9
1551.2	1.3	18	1.1	24	314	2.4	18	2.0	37	359	1.8
1551.9	1.8	13	1.3	20	271	1.9	27	2.4	31	310	1.4
1552.6	1.4	15	1.5	23	310	2.5	20	2.7	36	354	1.8
1553.3	1.8	15	1.3	24	317	3.0	26	2.3	37	362	2.2
1554.0	1.9	17	1.2	26	292	2.9	27	2.3	40	334	2.1
1554.7	2.8	16	1.5	25	348	2.8	40	2.7	38	398	2.0
1555.4	1.9	16	1.4	22	290	3.0	27	2.5	34	332	2.2
1556.1	1.4	15	1.2	24	312	3.4	20	2.1	37	357	2.5
1556.8	1.7	15	1.2	23	284	2.7	24	2.3	35	324	1.9
1557.5	1.4	16	1.1	29	272	2.7	20	2.0	44	310	2.0
1558.2	1.6	16	1.3	26	305	3.1	24	2.3	40	349	2.3
1558.8	1.6	13	1.2	25	288	3.1	23	2.3	39	329	2.2
1559.5	2.3	17	1.4	27	362	2.5	33	2.5	42	414	1.9
1560.2	1.3	15	1.3	29	308	2.7	18	2.4	45	352	1.9
1560.9	1.5	14	1.3	29	290	2.5	21	2.4	44	332	1.8
1561.6	1.4	15	1.3	33	322	3.3	21	2.3	51	369	2.4
1562.3	1.2	14	1.1	33	286	2.5	17	2.0	50	327	1.8
1563.0	1.3	14	1.4	24	258	2.6	19	2.5	37	295	1.9
1563.7	1.4	14	1.3	30	295	2.3	20	2.4	46	338	1.7
1564.4	1.6	16	1.6	31	280	2.7	23	2.8	48	320	2.0
1565.1	1.7	13	1.5	33	284	3.0	25	2.7	51	325	2.2
1565.8	1.1	14	1.4	26	289	2.6	16	2.5	40	330	1.9
1566.5	1.6	15	1.3	31	269	3.0	24	2.4	48	308	2.2
1567.2	2.0	16	1.0	30	265	4.0	28	1.9	46	304	2.9
1567.9	1.8	13	1.5	33	266	2.7	26	2.7	50	304	2.0
1568.6	1.4	13	1.4	28	303	2.4	20	2.5	43	347	1.8
1569.3	1.6	15	1.4	32	285	2.9	23	2.5	48	326	2.1
1570.0	1.4	16	1.4	34	263	3.0	20	2.6	52	301	2.2
1570.7	1.6	14	1.4	31	319	3.2	22	2.5	48	364	2.3
1571.4	1.4	12	1.3	31	249	3.0	20	2.3	48	285	2.2
1572.1	1.6	14	1.6	44	246	2.9	22	2.9	67	281	2.1
1572.8	1.4	15	1.6	35	279	4.0	20	2.9	54	319	2.9
1573.5	1.4	16	1.8	34	306	4.0	21	3.3	52	350	2.9
1574.2	1.2	15	1.1	38	252	2.0	17	2.0	58	288	1.5
1574.9	1.6	15	1.8	38	242	3.4	23	3.2	58	277	2.5
1575.6	1.4	15	1.7	34	264	3.1	20	3.1	51	302	2.3
1576.3	1.5	14	1.7	39	251	3.0	22	3.2	59	287	2.2
1577.0	0.805	14	1.6	38	270	2.6	12	2.9	58	309	1.9
1577.7	0.813	15	1.5	41	288	3.8	12	2.8	63	329	2.8
1578.4	1.2	14	1.5	36	285	2.9	17	2.8	56	326	2.1
1579.1	1.1	13	1.9	35	255	3.5	16	3.4	53	291	2.6
1579.8	1.5	16	2.0	39	269	2.5	21	3.7	60	308	1.8
1580.5	0.900	14	2.0	39	235	3.2	13	3.6	60	269	2.3
1581.2	0.825	17	2.6	39	273	2.2	12	4.7	60	312	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1581.9	1.1	14	1.7	47	249	3.4	16	3.1	71	285	2.5
1582.6	1.0	12	1.7	30	224	2.4	15	3.1	46	256	1.7
1583.3	1.3	18	1.7	40	281	4.5	18	3.0	61	321	3.3
1584.0	1.3	16	2.0	40	252	3.8	19	3.6	61	289	2.8
1584.7	1.3	15	2.1	45	231	2.3	19	3.9	68	264	1.7
1585.3	0.890	13	1.8	37	265	2.8	13	3.2	57	303	2.0
1586.0	1.4	17	1.7	40	255	4.6	20	3.1	62	292	3.4
1586.7	1.3	18	2.0	41	222	2.8	18	3.7	62	254	2.1
1587.4	0.602	15	2.0	44	255	3.1	8.7	3.6	67	291	2.3
1588.1	0.921	14	1.6	37	219	2.8	13	2.8	57	251	2.1
1588.8	1.0	17	1.8	42	245	3.1	15	3.4	65	280	2.3
1589.5	0.895	17	1.9	39	227	3.2	13	3.5	59	260	2.3
1590.2	0.289	14	1.6	49	249	2.7	4.2	2.9	75	285	2.0
1590.9	0.869	16	2.0	45	227	2.8	13	3.6	68	260	2.0
1591.6	0.892	13	1.6	41	211	2.5	13	3.0	63	242	1.9
1592.3	1.1	14	2.0	45	234	4.2	15	3.6	69	268	3.0
1593.0	1.1	15	2.3	51	220	3.1	17	4.2	79	251	2.2
1593.7	0.891	17	1.9	46	231	3.0	13	3.4	70	264	2.2
1594.4	0.744	14	1.8	48	217	2.2	11	3.4	73	249	1.6
1595.1	1.0	14	2.5	51	217	2.9	15	4.5	78	248	2.1
1595.8	0.832	18	1.8	44	222	3.9	12	3.3	67	254	2.9
1596.5	0.715	14	2.2	42	234	2.1	10	4.1	64	268	1.6
1597.2	0.558	17	2.2	49	200	2.9	8.1	4.1	75	228	2.1
1597.9	0.834	16	1.8	50	209	2.4	12	3.3	77	239	1.7
1598.6	1.8	16	1.8	45	206	2.0	26	3.3	69	235	1.5
1599.3	0.872	16	2.2	48	223	3.2	13	4.1	74	255	2.3
1600.0	0.554	15	2.5	48	218	3.3	8.0	4.5	74	249	2.4
1600.7	1.0	16	2.3	58	224	2.7	15	4.1	89	256	1.9
1601.4	0.872	19	2.1	43	202	2.1	13	3.9	66	231	1.5
1602.1	0.829	17	2.5	50	207	3.0	12	4.6	77	237	2.2
1602.8	0.832	15	2.1	54	209	2.5	12	3.8	83	239	1.8
1603.5	0.688	14	2.5	49	201	2.5	9.9	4.6	75	230	1.8
1604.2	0.866	16	2.6	57	232	3.0	13	4.7	87	265	2.2
1604.9	0.603	14	2.6	55	210	2.5	8.7	4.7	84	240	1.8
1605.6	0.352	15	2.6	48	197	2.3	5.1	4.7	74	226	1.6
1606.3	1.1	16	2.1	52	175	1.9	15	3.8	79	201	1.4
1607.0	0.944	14	2.3	56	181	2.8	14	4.1	86	207	2.1
1607.7	0.723	16	2.2	55	188	2.8	10	4.0	84	214	2.0
1608.4	0.792	16	2.2	58	194	2.3	11	4.0	88	222	1.7
1609.1	0.918	16	2.6	57	201	3.2	13	4.7	87	230	2.3
1609.8	0.510	16	2.1	51	188	3.2	7.4	3.8	79	215	2.4
1610.5	1.1	17	2.2	64	203	2.7	16	4.1	98	233	1.9
1611.1	1.0	15	2.3	51	185	3.2	15	4.2	79	211	2.3
1611.8	0.652	16	2.6	55	185	3.1	9.4	4.7	85	211	2.3
1612.5	0.751	17	2.4	57	214	3.4	11	4.3	87	245	2.5
1613.2	1.1	15	1.8	56	182	2.7	16	3.3	87	209	2.0
1613.9	1.3	15	2.3	56	190	3.4	18	4.1	86	218	2.5
1614.6	0.553	13	2.5	50	173	2.7	8.0	4.6	77	197	2.0
1615.3	0.379	15	2.5	48	175	2.9	5.5	4.6	74	200	2.1
1616.0	0.701	18	3.0	56	187	2.8	10	5.4	86	214	2.0
1616.7	0.340	19	2.7	62	185	3.6	4.9	5.0	95	211	2.6
1617.4	0.519	17	3.3	63	177	3.6	7.5	6.0	96	202	2.6
1618.1	0.808	14	2.6	56	188	2.6	12	4.8	85	215	1.9
1618.8	1.1	15	3.2	59	183	3.4	17	5.9	90	209	2.5
1619.5	0.449	17	2.9	63	173	2.8	6.5	5.3	96	198	2.1
1620.2	0.723	18	2.5	63	231	2.6	10	4.6	96	264	1.9
1620.9	0.803	17	3.2	62	177	2.0	12	5.8	94	203	1.5
1621.6	0.269	18	2.8	63	179	2.5	3.9	5.1	97	205	1.8
1622.3	0.866	18	2.9	61	202	3.4	13	5.2	93	231	2.5
1623.0	1.3	18	3.2	67	184	3.9	18	5.8	102	211	2.8
1623.7	0.761	14	2.3	58	173	2.7	11	4.2	89	197	1.9
1624.4	0.558	15	3.0	63	177	2.9	8.1	5.5	96	202	2.1
1625.1	0.738	14	3.1	59	190	2.3	11	5.7	90	218	1.7
1625.8	0.774	16	2.7	65	188	1.8	11	4.9	99	215	1.3
1626.5	0.373	17	3.6	60	182	2.8	5.4	6.5	93	208	2.0
1627.2	0.441	17	3.2	56	192	1.5	6.4	5.8	86	219	1.1
1627.9	0.269	16	3.1	58	159	2.2	3.9	5.6	89	182	1.6
1628.6	0.869	15	2.5	68	147	2.4	13	4.6	104	168	1.8
1629.3	1.0	16	3.0	67	173	1.7	15	5.4	103	198	1.2
1630.0	0.560	16	2.5	63	153	2.7	8.1	4.6	96	175	2.0
1630.7	0.573	16	2.6	67	172	2.3	8.3	4.7	102	197	1.7
1631.4	0.543	17	2.9	64	169	2.7	7.8	5.3	99	194	2.0
1632.1	0.519	19	2.8	59	170	2.0	7.5	5.2	91	194	1.4
1632.8	0.918	16	2.8	69	175	2.6	13	5.1	105	200	1.9
1633.5	0.745	17	3.1	64	172	3.1	11	5.7	98	197	2.3
1634.2	0.625	15	2.7	64	156	2.1	9.0	5.0	98	179	1.5
1634.9	0.470	18	2.5	68	178	2.4	6.8	4.6	104	203	1.8
1635.6	0.358	17	3.1	61	150	2.9	5.2	5.7	93	171	2.1
1636.3	0.990	18	2.8	72	178	2.5	14	5.1	110	203	1.8
1637.0	0.788	19	3.1	75	173	2.5	11	5.6	114	198	1.8
1637.6	0.424	14	2.6	63	145	2.0	6.1	4.7	97	166	1.5



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1638.3	0.618	16	3.0	66	145	1.6	8.9	5.5	102	166	1.2
1639.0	1.1	17	3.2	64	153	1.5	15	5.8	98	175	1.1
1639.7	0.609	18	3.1	58	151	2.3	8.8	5.6	89	173	1.7
1640.4	0.424	18	2.9	65	148	2.7	6.1	5.3	100	170	1.9
1641.1	0.813	16	2.8	65	148	2.2	12	5.2	100	169	1.6
1641.8	1.2	17	3.0	65	154	2.6	17	5.4	100	176	1.9
1642.5	0.484	17	3.2	65	167	1.8	7.0	5.8	100	191	1.3
1643.2	0.694	16	3.0	72	171	2.8	10	5.4	111	196	2.1
1643.9	0.462	18	2.8	74	162	2.2	6.7	5.2	113	185	1.6
1644.6	0.505	18	3.2	68	188	1.4	7.3	5.7	103	215	0.997
1645.3	0.622	16	2.5	64	159	1.5	9.0	4.6	98	182	1.1
1646.0	0.459	18	2.9	73	155	1.7	6.6	5.2	112	177	1.3
1646.7	0.634	17	2.4	67	158	2.5	9.1	4.5	103	181	1.8
1647.4	0.685	16	3.3	72	150	2.3	9.9	5.9	111	172	1.7
1648.1	0.314	15	2.8	65	152	1.6	4.5	5.1	100	174	1.1
1648.8	0.525	17	3.1	65	171	2.4	7.6	5.7	100	195	1.8
1649.5	0.416	14	3.1	63	152	1.9	6.0	5.7	96	174	1.4
1650.2	0.571	18	2.6	68	174	1.5	8.2	4.7	104	199	1.1
1650.9	0.594	14	3.0	61	148	1.5	8.6	5.5	94	170	1.1
1651.6	0.705	19	3.4	68	177	1.5	10	6.2	104	203	1.1
1652.3	0.288	18	3.0	75	171	2.1	4.2	5.5	115	195	1.5
1653.0	0.610	18	2.8	82	164	1.9	8.8	5.1	126	187	1.4
1653.7	0.454	17	2.7	66	150	1.9	6.6	4.9	101	172	1.4
1654.4	0.430	15	2.6	74	167	2.2	6.2	4.8	114	191	1.6
1655.1	0.484	17	2.8	64	166	1.6	7.0	5.1	98	190	1.2
1655.8	0.697	16	2.8	69	185	2.1	10	5.1	106	212	1.5
1656.5	0.919	19	3.4	72	164	2.2	13	6.2	110	188	1.6
1657.2	0.497	16	2.9	74	185	1.6	7.2	5.3	113	212	1.2
1657.9	0.713	17	2.7	68	173	1.5	10	4.9	104	197	1.1
1658.6	0.575	16	2.9	58	144	1.8	8.3	5.3	89	165	1.3
1659.3	0.269	17	3.0	66	157	1.2	3.9	5.6	102	180	0.843
1660.0	0.760	18	2.9	76	168	2.3	11	5.3	117	192	1.7
1660.7	0.703	16	2.6	64	157	1.7	10	4.8	97	180	1.2
1661.4	0.738	15	3.3	61	162	1.6	11	6.0	94	186	1.2
1662.1	0.988	18	2.8	63	159	1.9	14	5.0	96	182	1.4
1662.8	0.856	16	2.8	60	152	1.5	12	5.1	92	174	1.1
1663.5	0.813	19	2.8	64	154	1.1	12	5.1	98	176	0.817
1664.2	0.496	16	2.8	63	153	1.3	7.2	5.1	97	175	0.925
1664.8	0.584	16	2.6	61	153	1.2	8.4	4.8	94	175	0.905
1665.5	0.514	19	2.7	71	157	1.3	7.4	4.9	108	180	0.958
1666.2	0.506	18	2.5	63	175	1.9	7.3	4.6	97	200	1.4
1666.9	2.6	16	2.4	66	154	0.889	38	4.4	101	176	0.649
1667.6	0.882	19	2.9	64	158	0.843	13	5.2	97	180	0.615
1668.3	0.841	16	2.5	67	172	1.4	12	4.6	103	197	1.0
1669.0	0.658	20	3.5	71	201	1.1	9.5	6.4	109	229	0.793
1669.7	0.496	20	2.8	68	172	1.6	7.2	5.2	105	197	1.1
1670.4	0.715	18	2.4	70	160	1.4	10	4.4	107	183	1.0
1671.1	1.1	18	2.4	63	169	1.5	15	4.4	96	193	1.1
1671.8	0.747	20	3.1	72	190	1.3	11	5.7	110	217	0.961
1672.5	0.812	18	3.0	69	168	1.3	12	5.5	105	192	0.922
1673.2	0.626	16	2.6	70	164	1.4	9.0	4.7	107	187	1.0
1673.9	0.472	19	2.8	84	166	1.3	6.8	5.2	129	190	0.968
1674.6	0.525	16	2.5	65	153	1.4	7.6	4.5	100	175	1.1
1675.3	0.932	18	2.8	69	156	1.5	13	5.2	106	179	1.1
1676.0	0.639	18	2.8	62	165	1.1	9.2	5.1	95	189	0.771
1676.7	0.538	18	2.5	72	163	1.3	7.8	4.5	111	187	0.920
1677.4	0.378	14	2.5	67	143	1.3	5.5	4.5	103	163	0.913
1678.1	1.0	16	3.1	55	163	1.2	15	5.6	85	186	0.911
1678.8	0.269	17	2.8	60	159	0.976	3.9	5.0	91	181	0.712
1679.5	0.757	17	2.8	71	177	1.2	11	5.2	109	203	0.855
1680.2	0.617	17	2.9	65	160	0.940	8.9	5.3	99	183	0.686
1680.9	0.562	18	2.4	67	169	1.2	8.1	4.4	103	193	0.887
1681.6	0.722	17	2.4	62	159	0.842	10	4.3	94	182	0.614
1682.3	0.471	17	2.9	61	148	1.6	6.8	5.3	94	169	1.1
1683.0	0.325	19	2.7	60	160	1.7	4.7	5.0	93	183	1.2
1683.7	1.0	18	2.6	63	163	1.4	15	4.8	96	186	1.0
1684.4	0.331	18	2.1	63	170	1.3	4.8	3.9	97	194	0.968
1685.1	0.832	18	2.8	67	186	1.2	12	5.0	102	213	0.892
1685.8	0.659	18	2.8	60	158	1.1	9.5	5.2	92	181	0.795
1686.5	0.371	16	2.8	69	155	1.3	5.3	5.1	106	178	0.950
1687.2	0.407	18	2.2	63	166	0.897	5.9	4.1	96	190	0.654
1687.9	0.551	15	2.6	67	163	1.4	7.9	4.7	103	186	1.1
1688.6	1.3	16	2.5	61	166	1.8	19	4.5	94	190	1.3
1689.3	0.525	19	2.5	62	174	1.6	7.6	4.5	95	199	1.2
1690.0	0.895	17	2.3	74	176	1.6	13	4.3	113	202	1.1
1690.7	0.620	17	2.4	66	167	0.804	8.9	4.4	101	190	0.587
1691.3	0.529	17	2.5	73	184	1.4	7.6	4.6	112	210	0.986
1692.0	1.3	18	2.6	73	189	0.861	19	4.7	112	216	0.628
1692.7	0.362	17	1.6	59	148	1.1	5.2	2.9	90	170	0.824
1693.4	0.471	15	2.5	60	183	1.7	6.8	4.5	91	210	1.3
1694.1	0.981	19	2.3	57	156	1.3	14	4.2	87	178	0.926



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1694.8	0.533	1640	2.2	60	202	3.8	7.7	4.1	93	231	2.8
1695.5	0.612	19	2.2	62	185	1.7	8.8	4.0	95	212	1.3
1696.2	0.592	17	2.2	55	216	1.2	8.5	4.1	85	247	0.879
1696.9	0.683	15	2.0	56	169	1.4	9.9	3.6	86	193	1.0
1697.6	0.452	17	2.1	60	175	1.0	6.5	3.9	92	200	0.763
1698.3	0.769	16	2.2	55	177	1.3	11	4.1	84	202	0.978
1699.0	0.600	16	1.8	56	172	1.5	8.7	3.3	85	197	1.1
1699.7	0.744	15	1.9	53	161	1.4	11	3.5	82	184	1.1
1700.4	0.691	16	2.0	55	172	1.1	10.0	3.7	84	196	0.834
1701.1	0.553	16	1.7	57	179	1.2	8.0	3.1	87	205	0.889
1701.8	0.388	16	1.7	57	177	1.6	5.6	3.2	87	202	1.1
1702.5	0.604	16	2.1	53	160	0.783	8.7	3.8	81	183	0.571
1703.2	1.0	20	1.7	59	195	1.1	15	3.1	90	223	0.775
1703.9	0.309	16	1.7	57	184	0.875	4.5	3.0	88	210	0.639
1704.6	0.811	15	1.8	50	173	0.705	12	3.3	77	198	0.514
1705.3	1.1	15	2.1	58	196	1.5	16	3.8	89	224	1.1
1706.0	0.269	17	1.6	54	182	1.0	3.9	2.9	83	208	0.750
1706.7	0.682	17	1.7	51	185	1.2	9.8	3.1	79	211	0.877
1707.4	0.666	14	1.8	49	166	1.4	9.6	3.3	75	190	1.0
1708.1	0.280	16	1.5	51	195	1.4	4.0	2.8	78	223	1.0
1708.8	0.269	15	2.1	57	202	1.1	3.9	3.8	88	231	0.783
1709.5	0.688	16	1.8	47	184	1.1	9.9	3.2	73	210	0.830
1710.2	0.269	15	1.8	57	205	1.3	3.9	3.2	87	234	0.923
1710.9	0.488	16	1.7	45	177	0.733	7.1	3.1	69	202	0.535
1711.6	0.273	15	1.5	45	189	0.903	3.9	2.7	69	216	0.659
1712.3	0.707	16	2.2	50	199	1.2	10	3.9	77	228	0.910
1713.0	0.850	16	1.4	50	168	1.8	12	2.6	77	192	1.3
1713.7	0.479	17	2.0	50	192	1.3	6.9	3.7	77	219	0.981
1714.4	0.317	15	1.8	52	195	1.3	4.6	3.3	79	223	0.928
1715.1	0.326	16	1.6	45	209	1.2	4.7	2.9	69	239	0.842
1715.8	0.418	16	1.5	50	194	1.8	6.0	2.7	76	221	1.3
1716.5	0.522	14	1.8	46	183	0.934	7.5	3.3	71	209	0.681
1717.2	0.431	13	1.5	47	224	1.5	6.2	2.8	72	256	1.1
1717.8	0.805	16	1.7	51	206	1.3	12	3.2	78	236	0.913
1718.5	0.279	14	1.4	45	165	0.990	4.0	2.6	69	189	0.722
1719.2	0.269	14	1.6	44	212	1.3	3.9	2.9	67	242	0.972
1719.9	0.741	15	1.1	44	191	1.1	11	2.0	68	219	0.782
1720.6	0.641	15	1.8	46	212	1.1	9.3	3.3	70	242	0.773
1721.3	0.545	14	1.2	39	185	1.5	7.9	2.1	59	211	1.1
1722.0	0.269	17	1.4	47	230	1.2	3.9	2.6	72	263	0.877
1722.7	0.269	17	1.5	36	211	1.4	3.9	2.7	55	241	0.990
1723.4	0.558	14	1.5	37	195	0.690	8.1	2.7	57	224	0.504
1724.1	1.1	13	1.2	33	216	1.1	15	2.2	51	247	0.786
1724.8	0.477	17	1.2	37	199	1.7	6.9	2.1	57	228	1.3
1725.5	0.269	15	1.2	42	232	1.3	3.9	2.3	64	265	0.957
1726.2	0.463	13	1.2	35	201	1.5	6.7	2.3	54	230	1.1
1726.9	0.858	14	1.2	43	208	1.8	12	2.1	66	238	1.3
1727.6	0.476	11	1.4	38	206	1.4	6.9	2.6	58	236	1.0
1728.3	0.528	13	1.1	39	233	1.4	7.6	2.1	60	266	1.0
1729.0	0.488	14	1.2	43	236	1.2	7.0	2.3	66	270	0.883
1729.7	0.317	13	0.882	32	198	1.9	4.6	1.6	50	226	1.4
1730.4	0.503	12	1.6	39	220	0.983	7.3	3.0	59	252	0.717
1731.1	0.681	14	1.4	30	236	1.6	9.8	2.6	46	270	1.2
1731.8	0.567	11	1.3	30	208	1.0	8.2	2.3	46	237	0.740
1732.5	0.321	12	1.1	25	200	0.909	4.6	2.0	38	228	0.663
1733.2	0.269	13	1.1	29	210	1.3	3.9	2.0	44	240	0.981
1733.9	0.325	11	1.1	30	206	0.998	4.7	2.0	46	236	0.728
1734.6	0.399	11	1.1	29	213	1.5	5.8	2.0	44	243	1.1
1735.3	0.272	12	1.2	33	205	1.4	3.9	2.2	51	235	0.985
1736.0	0.701	12	0.773	24	215	1.1	10	1.4	37	246	0.789
1736.7	0.676	13	1.1	27	219	0.894	9.8	2.0	41	250	0.652
1737.4	0.603	14	1.0	24	230	1.1	8.7	1.8	37	264	0.782
1738.1	0.449	11	1.0	27	221	1.5	6.5	1.8	42	253	1.1
1738.8	0.549	12	1.3	32	241	1.3	7.9	2.4	48	276	0.963
1739.5	0.532	14	0.853	29	269	1.5	7.7	1.6	44	308	1.1
1740.2	0.433	12	1.1	29	245	0.635	6.3	2.0	45	280	0.464
1740.9	0.610	10	0.976	27	218	0.935	8.8	1.8	41	249	0.683
1741.6	0.566	14	1.1	23	255	1.6	8.2	2.0	36	292	1.1
1742.3	0.836	11	0.975	25	242	1.3	12	1.8	38	277	0.949
1743.0	0.455	12	0.852	31	232	1.7	6.6	1.6	48	265	1.2
1743.7	0.599	11	0.770	24	216	1.1	8.6	1.4	37	247	0.774
1744.4	0.439	11	0.612	24	232	1.2	6.3	1.1	37	266	0.846
1745.0	0.496	13	0.795	23	248	1.5	7.2	1.5	36	283	1.1
1745.7	0.571	14	0.782	28	238	1.5	8.2	1.4	43	272	1.1
1746.4	0.274	11	1.0	22	219	1.3	4.0	1.9	33	250	0.935
1747.1	0.558	11	0.961	24	208	1.3	8.0	1.8	37	238	0.931
1747.8	0.541	12	0.633	23	254	1.9	7.8	1.2	35	291	1.4
1748.5	0.269	13	0.726	22	257	0.733	3.9	1.3	33	294	0.535
1749.2	0.289	10	0.866	26	251	2.3	4.2	1.6	40	287	1.7
1749.9	0.719	12	0.529	21	235	1.7	10	0.965	32	269	1.2
1750.6	0.638	13	0.919	28	254	0.973	9.2	1.7	43	291	0.710



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
1751.3	0.269	12	1.1	21	242	1.1	3.9	1.9	32	277	0.797
1752.0	0.301	12	0.829	24	251	1.3	4.3	1.5	37	287	0.967
1752.7	0.314	12	0.708	24	221	1.5	4.5	1.3	37	253	1.1
1753.4	0.472	10	0.538	21	220	1.4	6.8	0.981	32	251	1.0
1754.1	1.0	13	0.790	27	252	1.2	15	1.4	41	288	0.846
1754.8	0.269	12	0.749	25	226	1.7	3.9	1.4	38	258	1.2
1755.5	0.805	14	0.997	27	255	1.7	12	1.8	41	291	1.2
1756.2	0.406	12	0.745	24	229	1.5	5.9	1.4	37	262	1.1
1756.9	0.276	11	0.779	24	232	2.0	4.0	1.4	37	266	1.4
1757.6	0.790	12	0.973	27	247	2.0	11	1.8	41	283	1.5
1758.3	0.406	13	0.813	27	240	1.4	5.9	1.5	42	274	1.0
1759.0	0.434	12	0.780	35	225	2.5	6.3	1.4	54	257	1.8
1759.7	0.269	12	1.2	24	227	1.9	3.9	2.1	37	260	1.4
1760.4	0.269	10	1.1	23	222	1.1	3.9	2.0	36	254	0.830
1761.1	0.269	11	1.0	24	224	2.7	3.9	1.9	36	256	2.0
1761.8	0.269	13	1.3	28	237	2.1	3.9	2.4	42	271	1.5
1762.5	0.599	14	1.4	25	235	1.4	8.6	2.5	39	269	1.0
1763.2	0.312	11	1.0	25	213	2.1	4.5	1.9	38	243	1.5
1763.9	0.314	13	1.0	27	211	1.9	4.5	1.8	41	242	1.4
1764.6	0.298	12	1.5	31	247	2.2	4.3	2.7	48	282	1.6
1765.3	0.421	13	1.8	31	194	2.8	6.1	3.2	47	222	2.0
1766.0	0.351	12	2.1	29	209	2.2	5.1	3.8	44	239	1.6
1766.7	0.414	10	0.996	31	204	2.5	6.0	1.8	47	234	1.8
1767.4	0.612	11	1.3	29	235	3.3	8.8	2.4	45	269	2.4
1768.1	0.269	11	1.5	37	213	2.0	3.9	2.8	56	243	1.5
1768.8	0.298	13	1.7	34	202	2.3	4.3	3.0	52	231	1.6
1769.5	0.693	11	1.4	29	172	2.3	10.0	2.5	44	197	1.7
1770.2	0.510	12	1.6	36	203	3.5	7.4	2.9	55	232	2.6
1770.9	0.269	14	2.3	33	183	2.6	3.9	4.3	51	210	1.9
1771.5	0.660	13	1.9	35	208	2.7	9.5	3.5	53	238	1.9
1772.2	0.269	15	2.0	32	203	3.0	3.9	3.7	50	232	2.2
1772.9	0.269	13	1.7	30	181	2.9	3.9	3.2	46	207	2.1
1773.6	0.396	11	1.6	30	174	2.2	5.7	2.9	47	199	1.6
1774.3	0.269	12	1.7	37	205	3.3	3.9	3.1	57	235	2.4
1775.0	0.540	14	2.3	36	186	3.0	7.8	4.2	55	212	2.2
1775.7	0.388	14	1.9	43	193	4.8	5.6	3.4	65	221	3.5
1776.4	0.629	13	1.9	39	176	4.0	9.1	3.5	60	201	2.9
1777.1	0.340	14	1.8	40	191	3.2	4.9	3.3	61	218	2.3
1777.8	0.340	11	2.3	35	179	3.7	4.9	4.2	53	205	2.7
1778.5	0.269	14	2.5	39	186	4.5	3.9	4.5	60	212	3.3
1779.2	0.331	15	2.0	43	185	5.0	4.8	3.7	65	212	3.7
1779.9	0.269	14	2.4	40	167	4.8	3.9	4.3	61	191	3.5
1780.6	0.269	14	2.4	41	165	3.6	3.9	4.4	63	188	2.6
1781.3	0.628	13	2.2	39	166	3.7	9.1	4.0	60	190	2.7
1782.0	0.274	15	2.4	41	148	4.3	4.0	4.4	63	169	3.1
1782.7	0.294	13	2.8	44	181	5.2	4.2	5.1	68	207	3.8
1783.4	0.269	11	2.4	43	149	4.1	3.9	4.4	65	170	3.0
1784.1	0.269	12	2.6	37	152	4.1	3.9	4.8	56	174	3.0
1784.8	0.269	14	2.8	47	151	4.3	3.9	5.1	72	173	3.2
1785.5	0.618	16	2.4	46	156	4.1	8.9	4.4	71	179	3.0
1786.2	0.333	14	2.7	48	155	5.5	4.8	5.0	73	177	4.0
1786.9	0.269	12	2.7	53	161	4.1	3.9	4.9	81	184	3.0
1787.6	0.725	16	2.4	46	168	5.0	10	4.4	71	193	3.7
1788.3	0.269	15	2.5	47	154	6.1	3.9	4.6	72	176	4.5
1789.0	0.269	15	2.8	43	149	5.9	3.9	5.1	66	170	4.3
1789.7	0.269	14	2.4	44	144	4.5	3.9	4.3	68	165	3.3
1790.4	0.269	14	3.0	43	161	3.3	3.9	5.4	66	184	2.4
1791.1	0.727	13	3.6	48	179	5.2	10	6.5	73	205	3.8
1791.8	0.269	14	2.9	51	159	4.3	3.9	5.2	78	182	3.1
1792.5	0.269	15	3.2	46	146	4.6	3.9	5.8	71	167	3.4
1793.2	0.269	15	2.4	45	133	4.7	3.9	4.3	68	152	3.4
1793.9	0.413	17	3.4	48	161	6.8	6.0	6.2	73	185	5.0
1794.6	0.371	16	3.2	51	139	6.1	5.4	5.9	78	159	4.5
1795.3	0.450	16	3.8	55	148	5.3	6.5	6.9	84	169	3.9
1796.0	0.324	14	3.0	49	141	5.0	4.7	5.5	75	162	3.6
1796.7	0.372	16	3.5	54	147	5.8	5.4	6.4	82	168	4.2
1797.4	0.269	14	3.4	47	145	5.5	3.9	6.2	73	166	4.0
1798.0	0.625	15	3.7	49	138	6.2	9.0	6.8	74	158	4.5
1798.7	0.312	15	3.0	51	138	7.8	4.5	5.6	78	158	5.7
1799.4	0.269	14	3.4	46	132	4.7	3.9	6.1	70	151	3.4
1800.1	0.269	17	3.2	48	142	6.5	3.9	5.9	73	162	4.8
1800.8	0.269	14	3.5	55	137	6.8	3.9	6.4	84	156	4.9
1801.5	0.269	15	2.9	47	141	6.8	3.9	5.4	71	161	5.0
1802.2	0.491	15	3.0	47	133	6.4	7.1	5.6	73	152	4.6
1802.9	0.269	14	3.3	60	129	6.0	3.9	6.1	92	147	4.4
1803.6	0.530	15	3.3	47	123	5.1	7.7	6.0	72	141	3.7
1804.3	0.269	15	3.6	51	136	8.3	3.9	6.5	78	156	6.0
1805.0	0.269	17	3.5	52	120	6.5	3.9	6.3	80	137	4.7
1805.7	0.269	17	3.8	56	122	8.1	3.9	6.9	85	140	5.9
1806.4	0.701	15	3.5	52	117	6.4	10	6.3	80	134	4.7
1807.1	0.315	14	3.3	49	123	5.6	4.6	6.1	75	141	4.1



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1807.8	0.589	18	3.8	51	131	7.4	8.5	6.9	78	150	5.4
1808.5	0.269	18	3.4	56	151	6.4	3.9	6.3	86	173	4.7
1809.2	0.353	16	3.4	53	108	5.8	5.1	6.1	81	123	4.2
1809.9	0.269	15	2.7	57	108	5.7	3.9	5.0	87	123	4.1
1810.6	0.280	15	3.6	53	128	9.0	4.0	6.6	81	146	6.5
1811.3	0.326	19	3.9	54	118	9.3	4.7	7.2	83	135	6.8
1812.0	0.269	16	3.7	51	107	8.7	3.9	6.7	78	123	6.3
1812.7	0.285	17	4.3	66	113	6.5	4.1	7.8	101	129	4.8
1813.4	0.269	17	3.6	54	113	7.1	3.9	6.6	83	129	5.2
1814.1	0.590	15	3.6	55	117	7.7	8.5	6.6	84	133	5.7
1814.8	0.475	19	4.3	65	112	9.8	6.9	7.8	99	128	7.1
1815.5	0.269	15	4.3	57	104	8.3	3.9	7.8	88	119	6.1
1816.2	0.269	15	3.8	60	108	7.1	3.9	6.9	91	124	5.2
1816.9	0.269	13	3.5	53	101	7.3	3.9	6.4	82	115	5.4
1817.6	0.269	16	3.7	47	97	7.4	3.9	6.7	73	110	5.4
1818.3	0.269	18	3.8	46	113	9.6	3.9	6.9	70	129	7.0
1819.0	0.409	18	3.8	58	117	10	5.9	6.9	88	134	7.4
1819.7	0.269	18	4.3	62	108	8.7	3.9	7.9	94	123	6.3
1820.4	0.637	15	3.8	63	105	9.1	9.2	7.0	97	120	6.7
1821.1	0.353	14	4.4	53	114	9.7	5.1	8.0	82	130	7.1
1821.8	0.631	16	4.3	54	96	8.5	9.1	7.8	83	110	6.2
1822.5	0.269	15	4.1	51	100	8.8	3.9	7.4	78	114	6.4
1823.2	0.277	16	3.7	54	104	8.4	4.0	6.8	83	119	6.1
1823.9	0.269	14	3.9	56	102	10	3.9	7.1	86	117	7.4
1824.5	0.269	16	4.5	60	114	10	3.9	8.2	92	130	7.4
1825.2	0.416	17	3.7	55	102	9.2	6.0	6.8	84	117	6.7
1825.9	0.269	17	3.7	62	107	11	3.9	6.7	96	123	8.4
1826.6	0.269	16	3.8	57	105	9.9	3.9	6.9	87	120	7.2
1827.3	0.762	14	4.0	56	105	9.1	11	7.2	86	120	6.7
1828.0	0.607	14	3.7	60	98	9.0	8.8	6.8	92	112	6.5
1828.7	0.269	18	3.5	61	104	12	3.9	6.3	94	119	8.7
1829.4	0.488	16	4.2	72	97	11	7.0	7.7	110	110	8.0
1830.1	0.298	17	3.5	56	99	8.7	4.3	6.5	86	113	6.3
1830.8	0.409	15	4.1	56	100	8.0	5.9	7.4	86	114	5.8
1831.5	0.269	15	4.1	51	97	11	3.9	7.6	79	111	7.7
1832.2	0.269	18	4.7	66	113	11	3.9	8.6	102	129	8.4
1832.9	0.269	15	3.8	59	102	10	3.9	7.0	90	117	7.6
1833.6	0.269	18	3.5	53	102	9.5	3.9	6.5	81	117	7.0
1834.3	0.274	17	4.0	56	107	11	4.0	7.2	86	123	7.8
1835.0	0.817	17	4.3	64	114	13	12	7.8	98	130	9.4
1835.7	0.269	20	3.8	59	111	11	3.9	7.0	90	127	7.8
1836.4	0.399	17	4.2	60	108	9.8	5.8	7.6	91	123	7.2
1837.1	0.269	14	4.1	50	104	9.9	3.9	7.5	77	118	7.2
1837.8	0.357	14	4.0	67	108	10.0	5.2	7.3	102	123	7.3
1838.5	0.269	14	3.6	56	91	10	3.9	6.6	86	104	7.6
1839.2	0.269	17	3.9	55	93	9.7	3.9	7.2	85	106	7.1
1839.9	0.345	17	4.0	59	113	10	5.0	7.4	90	129	7.4
1840.6	0.549	14	3.5	45	78	9.5	7.9	6.3	68	89	7.0
1841.3	0.270	16	3.8	60	108	13	3.9	7.0	93	123	9.5
1842.0	0.347	16	4.3	61	111	9.8	5.0	7.8	94	127	7.1
1842.7	0.269	17	3.2	53	97	10	3.9	5.8	82	111	7.5
1843.4	0.322	13	3.8	51	99	9.3	4.6	6.9	78	113	6.8
1844.1	0.329	16	3.6	59	103	13	4.8	6.5	90	118	9.8
1844.8	0.362	18	3.2	59	106	12	5.2	5.8	90	121	8.6
1845.5	0.269	16	4.3	62	93	12	3.9	7.9	95	106	8.7
1846.2	0.537	14	3.5	61	93	8.7	7.7	6.4	94	106	6.4
1846.9	0.269	18	3.4	62	107	12	3.9	6.2	96	122	8.6
1847.6	0.269	14	3.7	56	99	10	3.9	6.8	86	113	7.4
1848.3	0.587	16	3.5	46	95	9.2	8.5	6.4	70	109	6.7
1849.0	0.597	16	4.0	59	117	11	8.6	7.3	91	134	8.3
1849.7	0.350	16	3.2	56	92	9.8	5.1	5.9	85	105	7.1
1850.4	0.269	16	2.9	46	88	8.4	3.9	5.4	70	101	6.1
1851.0	0.269	14	3.7	64	99	11	3.9	6.7	98	113	7.7
1851.7	0.325	16	3.9	61	94	13	4.7	7.2	93	108	9.3
1852.4	0.432	16	3.8	62	97	12	6.2	6.9	95	111	8.7
1853.1	0.375	14	3.2	61	98	11	5.4	5.8	93	112	7.8
1853.8	0.426	17	3.9	55	95	10	6.2	7.1	84	108	7.4
1854.5	0.269	14	3.4	51	96	10	3.9	6.3	78	110	7.3
1855.2	0.269	14	3.5	52	86	10.0	3.9	6.4	79	98	7.3
1855.9	0.269	13	3.5	50	88	10	3.9	6.4	77	101	7.4
1856.6	0.269	15	2.8	49	92	9.5	3.9	5.0	75	105	6.9
1857.3	0.269	14	3.4	53	99	9.7	3.9	6.2	82	113	7.1
1858.0	0.269	14	3.5	51	93	9.8	3.9	6.4	79	107	7.2
1858.7	0.298	16	2.7	48	93	9.9	4.3	4.9	73	106	7.2
1859.4	0.269	17	3.9	56	108	13	3.9	7.0	86	123	9.6
1860.1	0.661	15	3.0	48	90	8.8	9.5	5.5	74	103	6.4
1860.8	0.269	12	3.2	60	97	9.3	3.9	5.9	92	111	6.8
1861.5	0.269	15	3.7	49	104	12	3.9	6.8	74	119	8.5
1862.2	0.765	17	3.6	52	97	11	11	6.6	80	111	8.3
1862.9	0.763	15	2.9	56	99	11	11	5.3	85	113	8.0
1863.6	0.417	13	3.3	48	103	11	6.0	6.0	73	118	8.2



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1864.3	0.361	15	3.2	54	103	11	5.2	5.8	83	118	8.2
1865.0	0.269	19	3.2	51	106	11	3.9	5.8	77	121	8.3
1865.7	0.269	16	2.7	51	100	8.4	3.9	5.0	79	114	6.1
1866.4	0.269	14	2.6	47	98	8.2	3.9	4.8	72	113	6.0
1867.1	0.269	15	2.3	47	113	7.9	3.9	4.1	72	130	5.8
1867.8	0.269	15	2.3	42	98	8.9	3.9	4.1	65	112	6.5
1868.5	0.269	13	2.6	44	94	11	3.9	4.7	68	108	7.8
1869.2	0.269	15	3.1	46	100	9.3	3.9	5.6	70	114	6.8
1869.9	0.269	14	2.2	43	86	8.0	3.9	3.9	66	99	5.8
1870.6	0.559	12	2.7	40	87	7.0	8.1	4.9	62	99	5.1
1871.3	0.311	14	2.7	41	96	10	4.5	4.9	62	110	7.6
1872.0	0.269	13	2.3	46	99	7.7	3.9	4.2	70	113	5.6
1872.7	0.269	12	2.8	42	91	11	3.9	5.0	65	104	7.8
1873.4	0.269	11	2.1	41	89	9.5	3.9	3.8	63	101	6.9
1874.1	0.269	13	1.9	43	90	7.4	3.9	3.4	66	103	5.4
1874.8	0.339	15	2.5	38	99	9.6	4.9	4.6	58	113	7.0
1875.5	0.269	16	2.5	45	98	8.1	3.9	4.5	70	112	5.9
1876.2	0.269	16	2.0	42	98	7.8	3.9	3.7	65	112	5.7
1876.9	0.269	13	2.2	41	85	7.6	3.9	4.1	63	97	5.5
1877.5	0.269	16	2.4	41	97	6.0	3.9	4.4	63	111	4.4
1878.2	0.386	13	2.4	43	92	7.0	5.6	4.4	66	105	5.1
1878.9	0.490	14	2.2	38	90	8.1	7.1	4.0	58	103	5.9
1879.6	0.649	19	2.2	38	100	7.7	9.4	4.1	59	114	5.6
1880.3	0.269	16	2.2	40	101	6.3	3.9	4.0	61	116	4.6
1881.0	0.269	13	2.0	42	91	7.3	3.9	3.7	64	104	5.3
1881.7	0.269	15	2.3	45	98	9.4	3.9	4.2	69	112	6.9
1882.4	0.269	13	1.6	44	82	5.1	3.9	2.8	68	94	3.7
1883.1	0.269	19	2.5	47	95	8.5	3.9	4.5	72	109	6.2
1883.8	0.430	16	2.3	38	83	7.3	6.2	4.3	59	95	5.3
1884.5	0.341	16	2.1	39	101	6.4	4.9	3.8	59	116	4.7
1885.2	0.415	14	1.9	44	108	7.2	6.0	3.4	68	124	5.2
1885.9	0.269	15	2.0	44	101	8.7	3.9	3.7	68	116	6.4
1886.6	0.269	14	1.8	40	85	6.0	3.9	3.4	61	98	4.4
1887.3	0.318	13	1.7	39	92	5.2	4.6	3.2	60	106	3.8
1888.0	0.269	13	1.8	40	95	5.0	3.9	3.4	61	109	3.7
1888.7	0.269	14	2.1	36	90	5.9	3.9	3.8	55	103	4.3
1889.4	0.269	11	1.3	33	83	5.9	3.9	2.4	51	95	4.3
1890.1	0.379	14	1.9	37	97	7.0	5.5	3.5	56	111	5.1
1890.8	0.269	12	2.1	32	97	5.7	3.9	3.8	50	111	4.2
1891.5	0.269	12	2.1	34	87	6.3	3.9	3.9	51	100	4.6
1892.2	0.269	14	2.2	32	83	6.2	3.9	4.0	49	95	4.5
1892.9	0.269	15	1.8	40	104	8.0	3.9	3.2	62	119	5.8
1893.6	0.386	14	2.0	35	93	7.5	5.6	3.6	54	106	5.5
1894.3	0.269	12	1.9	35	104	6.1	3.9	3.4	53	118	4.4
1895.0	0.464	14	1.9	35	125	5.8	6.7	3.4	53	143	4.2
1895.7	0.779	14	1.9	29	91	6.1	11	3.4	45	104	4.4
1896.4	0.269	15	1.8	35	105	6.7	3.9	3.3	53	120	4.9
1897.1	0.269	12	1.4	29	91	5.3	3.9	2.5	45	104	3.9
1897.8	0.269	14	1.6	31	108	4.4	3.9	3.0	47	124	3.2
1898.5	0.488	16	1.7	34	106	6.1	7.0	3.1	52	121	4.5
1899.2	0.269	13	1.4	26	105	5.1	3.9	2.6	40	120	3.7
1899.9	0.747	14	1.3	23	102	5.3	11	2.4	36	116	3.9
1900.6	0.668	16	1.5	35	123	6.1	9.6	2.8	54	140	4.5
1901.3	0.371	15	1.7	28	110	6.5	5.4	3.0	43	126	4.8
1902.0	0.269	15	1.4	30	113	6.2	3.9	2.5	46	129	4.6
1902.7	0.291	16	1.8	33	120	5.7	4.2	3.2	51	137	4.2
1903.4	0.286	13	1.0	25	119	6.7	4.1	1.8	38	136	4.9
1904.0	0.358	11	0.970	29	125	5.8	5.2	1.8	45	142	4.2
1904.7	0.711	11	0.735	26	119	4.0	10	1.3	40	136	2.9
1905.4	0.483	13	1.0	23	117	5.2	7.0	1.9	36	134	3.8
1906.1	0.269	13	1.1	28	127	5.4	3.9	2.0	42	145	3.9
1906.8	0.454	14	0.868	24	119	5.7	6.6	1.6	37	136	4.2
1907.5	0.269	11	0.957	22	116	5.0	3.9	1.7	34	132	3.7
1908.2	0.269	12	0.938	22	136	5.4	3.9	1.7	34	155	3.9
1908.9	0.429	12	1.2	23	125	5.9	6.2	2.1	35	142	4.3
1909.6	0.459	10	1.1	21	128	4.0	6.6	2.0	33	147	2.9
1910.3	0.769	11	0.954	21	134	4.3	11	1.7	33	154	3.1
1911.0	0.269	11	1.0	23	174	5.4	3.9	1.8	35	199	3.9
1911.7	0.269	10	0.864	24	142	6.4	3.9	1.6	37	162	4.7
1912.4	0.269	13	0.959	22	135	4.6	3.9	1.7	34	154	3.4
1913.1	0.269	13	0.697	21	144	3.1	3.9	1.3	32	165	2.3
1913.8	0.269	11	0.980	23	149	3.9	3.9	1.8	35	171	2.8
1914.5	0.269	11	1.0	20	136	3.2	3.9	1.8	31	156	2.3
1915.2	0.946	12	0.695	18	131	4.2	14	1.3	28	149	3.0
1915.9	0.269	11	0.730	19	145	3.8	3.9	1.3	28	165	2.8
1916.6	0.269	9.2	0.671	17	114	3.1	3.9	1.2	27	131	2.3
1917.3	0.389	11	0.683	20	152	4.7	5.6	1.2	30	174	3.4
1918.0	0.269	11	0.695	21	158	3.3	3.9	1.3	32	180	2.4
1918.7	0.866	11	0.670	21	173	3.3	12	1.2	33	198	2.4
1919.4	0.394	8.9	0.820	20	151	3.0	5.7	1.5	30	173	2.2
1920.1	0.458	12	0.723	16	167	3.7	6.6	1.3	24	191	2.7



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1920.8	0.269	10	0.864	17	146	3.9	3.9	1.6	26	167	2.8
1921.5	0.574	12	0.825	21	150	3.4	8.3	1.5	32	172	2.5
1922.2	0.552	9.3	0.693	20	148	3.1	8.0	1.3	31	169	2.3
1922.9	0.269	8.9	0.886	21	148	4.1	3.9	1.6	32	169	3.0
1923.6	0.367	8.8	0.910	21	148	3.9	5.3	1.7	32	169	2.9
1924.3	0.269	11	0.956	18	163	4.0	3.9	1.7	27	187	2.9
1925.0	0.398	12	0.915	21	156	4.1	5.8	1.7	32	178	3.0
1925.7	0.553	9.4	0.999	21	150	3.9	8.0	1.8	33	172	2.8
1926.4	0.311	11	0.359	20	155	2.5	4.5	0.655	31	177	1.8
1927.1	0.706	9.7	0.843	17	154	4.5	10	1.5	26	176	3.3
1927.8	0.275	9.4	0.606	19	148	3.8	4.0	1.1	29	170	2.8
1928.5	0.269	11	0.707	22	154	4.2	3.9	1.3	34	176	3.1
1929.2	0.359	9.2	0.758	20	142	4.2	5.2	1.4	31	163	3.0
1929.8	0.478	8.7	0.622	17	166	3.4	6.9	1.1	26	190	2.5
1930.5	0.517	10	0.777	22	160	2.8	7.5	1.4	33	183	2.0
1931.2	0.418	9.9	0.938	19	162	3.2	6.0	1.7	30	185	2.4
1931.9	0.293	12	1.1	22	150	2.3	4.2	2.0	34	172	1.6
1932.6	0.343	10	0.989	25	154	3.2	4.9	1.8	38	176	2.4
1933.3	0.336	10	0.572	20	137	2.5	4.9	1.0	31	157	1.8
1934.0	0.269	12	1.2	24	169	4.3	3.9	2.1	37	194	3.1
1934.7	0.455	12	1.1	23	163	2.9	6.6	1.9	35	186	2.1
1935.4	0.276	11	1.1	25	150	3.5	4.0	1.9	38	172	2.6
1936.1	0.269	9.5	1.2	24	135	2.9	3.9	2.3	37	155	2.1
1936.8	0.689	12	1.2	23	166	3.3	9.9	2.2	35	190	2.4
1937.5	0.290	11	1.1	19	132	3.6	4.2	2.0	29	151	2.7
1938.2	0.365	11	1.2	27	147	3.9	5.3	2.1	41	168	2.8
1938.9	0.469	12	1.7	27	153	4.3	6.8	3.2	41	175	3.2
1939.6	0.269	10	1.5	31	130	2.8	3.9	2.7	47	148	2.0
1940.3	0.319	12	1.5	29	174	4.8	4.6	2.7	44	199	3.5
1941.0	0.269	14	1.9	32	170	4.3	3.9	3.5	49	194	3.1
1941.7	0.721	11	1.5	33	147	5.7	10	2.7	50	169	4.1
1942.4	0.576	12	1.7	28	137	5.2	8.3	3.1	43	157	3.8
1943.1	0.269	9.8	1.8	26	148	4.8	3.9	3.2	40	169	3.5
1943.8	0.498	11	1.8	29	148	4.3	7.2	3.4	45	169	3.2
1944.5	0.440	11	2.2	33	136	5.3	6.4	4.0	51	155	3.9
1945.2	0.601	11	2.2	29	136	6.7	8.7	3.9	44	155	4.9
1945.9	0.562	11	1.7	28	137	7.2	8.1	3.1	42	157	5.3
1946.6	0.269	12	2.3	28	137	4.9	3.9	4.2	43	157	3.6
1947.3	0.654	12	2.0	28	140	6.7	9.4	3.6	43	160	4.9
1948.0	0.367	12	2.1	28	135	7.5	5.3	3.9	42	154	5.5
1948.7	0.269	12	2.3	27	138	7.8	3.9	4.2	41	157	5.7
1949.4	0.547	12	2.0	29	135	6.8	7.9	3.6	45	154	5.0
1950.1	0.269	11	2.2	30	134	7.6	3.9	3.9	46	153	5.6
1950.8	0.269	13	2.6	37	162	8.8	3.9	4.8	56	185	6.5
1951.5	0.269	13	2.2	30	129	9.1	3.9	4.1	45	148	6.7
1952.2	0.269	12	2.6	35	127	9.2	3.9	4.7	53	145	6.7
1952.9	0.467	15	2.9	33	146	9.6	6.7	5.3	51	167	7.0
1953.6	0.465	12	2.5	28	128	9.5	6.7	4.6	43	147	6.9
1954.3	0.269	11	2.3	29	114	8.6	3.9	4.3	44	130	6.3
1955.0	0.686	15	3.4	36	122	9.8	9.9	6.2	56	139	7.2
1955.7	0.292	11	2.8	36	113	9.5	4.2	5.1	55	130	6.9
1956.4	0.269	13	2.9	32	130	11	3.9	5.3	50	149	7.8
1957.0	0.426	12	2.8	33	111	11	6.1	5.2	51	126	7.7
1957.7	0.424	12	3.3	37	131	12	6.1	6.1	57	150	9.1
1958.4	0.269	21	3.3	36	135	8.6	3.9	6.0	55	154	6.3
1959.1	0.510	14	3.4	43	119	10	7.4	6.3	65	136	7.6
1959.8	0.402	13	4.2	39	113	13	5.8	7.7	60	129	9.2
1960.5	0.269	12	3.6	33	114	13	3.9	6.6	50	130	9.5
1961.2	0.269	16	3.5	38	107	11	3.9	6.5	59	122	8.3
1961.9	0.422	14	4.3	36	110	12	6.1	7.8	55	126	8.8
1962.6	0.269	14	3.6	34	104	11	3.9	6.6	52	119	8.3
1963.3	0.313	14	2.8	36	121	12	4.5	5.2	55	139	9.1
1964.0	0.403	14	3.6	38	120	15	5.8	6.6	58	137	11
1964.7	0.344	17	3.9	41	126	13	5.0	7.1	63	144	9.7
1965.4	0.472	17	3.1	38	110	16	6.8	5.7	59	125	12
1966.1	0.400	12	3.1	39	111	12	5.8	5.7	59	127	9.1
1966.8	0.269	13	3.9	37	111	13	3.9	7.1	56	127	9.8
1967.5	0.328	15	3.2	33	124	16	4.7	5.9	51	142	12
1968.2	0.596	16	3.3	31	111	17	8.6	6.0	48	127	12
1968.9	0.431	23	2.7	35	94	13	6.2	5.0	53	108	9.2
1969.6	0.415	17	3.0	28	100	16	6.0	5.5	43	114	12
1970.3	0.538	13	3.9	35	104	14	7.8	7.2	54	119	10.0
1971.0	0.269	23	3.8	37	112	16	3.9	7.0	57	128	11
1971.7	0.332	14	3.4	30	100	15	4.8	6.2	46	114	11
1972.4	0.269	16	3.3	35	109	18	3.9	6.0	54	124	13
1973.1	0.314	25	4.0	33	108	17	4.5	7.3	51	124	12
1973.8	0.269	44	3.9	36	114	17	3.9	7.1	55	130	12
1974.5	0.462	21	4.6	28	100	14	6.7	8.4	43	114	10
1975.2	0.601	26	5.0	30	94	15	8.7	9.2	45	107	11
1975.9	0.269	21	4.4	30	94	14	3.9	8.0	46	108	10
1976.6	0.269	28	4.7	31	107	17	3.9	8.5	48	122	12



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1977.3	0.269	42	4.3	36	97	16	3.9	7.8	55	111	12
1978.0	0.373	48	5.9	35	107	16	5.4	11	53	123	12
1978.7	0.292	73	8.0	39	99	15	4.2	15	59	113	11
1979.4	0.375	56	5.5	39	78	13	5.4	10.0	59	89	9.7
1980.1	0.269	57	7.1	39	92	13	3.9	13	60	105	9.6
1980.8	0.403	60	7.1	35	83	12	5.8	13	54	95	9.0
1981.5	0.269	74	6.2	42	87	13	3.9	11	65	100	9.5
1982.2	0.502	59	6.8	44	75	10	7.2	12	67	86	7.5
1982.9	0.269	73	7.1	37	80	10	3.9	13	56	92	7.3
1983.6	0.327	82	8.8	43	82	10	4.7	16	66	94	7.4
1984.2	0.292	104	10	43	81	12	4.2	19	66	93	9.1
1984.9	0.269	95	8.4	46	76	13	3.9	15	71	86	9.3
1985.6	0.604	91	8.8	46	66	11	8.7	16	70	75	7.8
1986.3	0.269	98	9.5	42	73	11	3.9	17	65	84	7.9
1987.0	0.269	110	10	52	76	12	3.9	19	80	86	9.0
1987.7	0.490	130	12	52	71	11	7.1	21	79	81	7.8
1988.4	0.723	111	11	49	62	9.8	10	20	75	71	7.2
1989.1	0.722	117	9.3	51	54	6.8	10	17	78	62	5.0
1989.8	0.700	142	13	54	64	8.7	10	24	82	74	6.3
1990.5	0.719	137	20	68	62	9.4	10	36	104	71	6.8
1991.2	0.752	167	15	58	65	6.2	11	28	89	75	4.5
1991.9	0.526	160	13	65	65	10.0	7.6	23	100	74	7.3
1992.6	0.628	139	14	54	53	8.5	9.1	26	83	61	6.2
1993.3	0.390	156	15	57	51	8.0	5.6	28	87	59	5.8
1994.0	0.269	190	16	64	46	9.7	3.9	29	98	53	7.1
1994.7	0.505	173	15	72	39	5.5	7.3	28	110	45	4.0
1995.4	0.419	182	16	72	43	5.6	6.0	29	110	49	4.1
1996.1	0.293	181	16	72	50	6.9	4.2	29	111	57	5.0
1996.8	0.333	189	17	66	41	5.8	4.8	31	101	47	4.2
1997.5	0.540	200	16	78	37	6.1	7.8	30	120	42	4.4
1998.2	0.688	220	16	90	43	6.1	9.9	29	139	49	4.4
1998.9	0.800	209	17	78	33	4.7	12	32	120	38	3.4
1999.6	0.682	202	18	78	34	3.4	9.8	34	120	39	2.5
2000.3	1.3	233	20	81	28	4.3	19	37	124	32	3.2
2001.0	1.2	255	22	100	31	3.4	17	40	153	36	2.5
2001.7	0.287	227	20	93	23	3.8	4.1	37	143	26	2.8
2002.4	0.888	250	22	101	27	3.8	13	39	155	31	2.8
2003.1	0.716	245	24	103	21	1.5	10	44	159	23	1.1
2003.8	0.798	287	23	108	19	1.6	12	43	166	22	1.1
2004.5	1.0	303	26	124	21	1.7	15	48	190	25	1.2
2005.2	1.0	263	25	116	17	1.5	15	45	178	19	1.1
2005.9	0.895	260	23	109	15	1.5	13	41	167	17	1.1
2006.6	0.630	250	24	114	14	1.2	9.1	44	174	17	0.877
2007.3	0.761	299	28	121	15	0.897	11	52	186	17	0.654
2008.0	0.908	305	24	128	13	1.2	13	44	196	15	0.851
2008.7	0.708	261	24	140	16	1.4	10	43	215	18	1.0
2009.4	0.851	268	26	117	14	0.781	12	47	179	16	0.570
2010.0	1.1	291	26	138	13	1.2	16	47	212	15	0.883
2010.7	1.0	294	27	132	12	0.804	15	49	203	14	0.587
2011.4	1.0	269	27	135	12	1.2	15	48	208	14	0.900
2012.1	1.0	253	26	126	11	1.1	15	47	193	13	0.824
2012.8	0.961	281	27	128	13	1.8	14	50	197	15	1.3
2013.5	1.0	281	29	145	13	1.3	15	52	222	15	0.924
2014.2	1.5	306	28	161	14	1.4	22	51	246	16	1.1
2014.9	1.8	276	32	199	12	1.5	27	58	305	14	1.1
2015.6	1.1	272	28	158	12	1.1	16	51	243	14	0.772
2016.3	1.2	290	31	183	13	1.9	17	57	281	15	1.4
2017.0	0.977	272	34	191	14	1.2	14	63	293	16	0.868
2017.7	1.3	271	31	169	12	1.3	19	56	258	13	0.919
2018.4	1.2	265	31	162	10	1.0	17	57	248	12	0.733
2019.1	1.2	256	35	188	12	0.934	17	63	287	14	0.681
2019.8	1.2	270	38	188	11	0.854	17	70	289	13	0.623
2020.5	1.2	312	41	204	13	1.5	18	75	313	15	1.1
2021.2	1.4	295	39	248	12	0.653	20	71	381	13	0.476
2021.9	1.1	279	40	215	12	1.2	16	73	329	13	0.893
2022.6	0.763	277	45	191	12	0.741	11	82	292	13	0.540
2023.3	1.7	288	43	207	11	0.989	24	79	318	12	0.721
2024.0	1.6	286	49	232	12	1.1	23	89	356	14	0.835
2024.7	1.8	278	43	231	11	0.659	26	79	354	13	0.481
2025.4	1.3	258	40	213	11	0.992	19	74	327	12	0.723
2026.1	1.3	260	47	197	11	0.937	18	86	302	12	0.683
2026.8	1.8	273	49	230	12	1.7	27	89	353	14	1.3
2027.5	1.8	294	45	225	12	1.0	26	81	345	13	0.735
2028.2	0.965	260	42	199	11	0.606	14	76	305	13	0.442
2028.9	1.3	213	37	169	11	1.0	19	67	259	13	0.762
2029.6	1.7	265	47	197	13	0.492	24	86	301	14	0.359
2030.3	1.3	261	41	194	12	0.712	19	75	298	14	0.520
2031.0	1.4	296	38	208	11	0.414	20	70	319	13	0.302
2031.7	2.1	243	35	202	11	1.2	30	64	309	12	0.902
2032.4	1.1	259	37	181	11	0.900	16	67	278	12	0.656
2033.1	2.0	256	36	194	11	0.654	29	66	297	13	0.477



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
2033.8	2.0	258	35	196	12	1.0	28	64	301	13	0.747
2034.5	1.9	273	33	207	12	0.587	27	60	316	14	0.428
2035.2	1.8	240	32	206	12	0.955	26	59	316	13	0.697
2035.9	1.3	232	34	190	12	0.710	19	61	291	14	0.518
2036.6	1.8	255	33	194	12	1.3	26	61	297	14	0.924
2037.2	2.1	259	33	215	12	2.1	31	61	329	14	1.5
2037.9	1.8	252	32	224	12	1.1	26	58	343	14	0.783
2038.6	1.1	219	30	182	9.6	0.508	16	55	279	11	0.371
2039.3	2.3	224	32	206	11	0.625	33	59	315	13	0.456
2040.0	2.1	230	34	208	11	0.467	30	62	319	13	0.341
2040.7	2.3	244	34	221	12	1.2	33	61	338	13	0.848
2041.4	1.6	233	32	219	10.0	1.1	22	59	336	11	0.784
2042.1	1.8	215	31	205	12	0.897	26	57	315	13	0.654
2042.8	1.2	228	30	203	13	0.947	18	55	311	14	0.691
2043.5	2.1	252	31	199	12	0.987	30	57	304	13	0.720
2044.2	1.7	237	32	229	11	0.807	24	58	351	13	0.589
2044.9	2.0	229	26	225	12	0.702	29	47	344	14	0.512
2045.6	1.7	227	30	208	11	0.641	25	56	319	13	0.468
2046.3	1.7	222	29	203	13	0.645	25	52	310	14	0.471
2047.0	2.0	247	28	205	12	0.321	29	50	315	14	0.235
2047.7	1.5	241	25	215	14	0.660	22	46	329	16	0.481
2048.4	1.5	218	24	205	13	0.640	21	44	314	14	0.467
2049.1	1.3	205	25	201	13	0.666	19	46	308	15	0.486
2049.8	2.0	204	26	185	12	0.376	28	47	284	13	0.274
2050.5	2.6	238	26	204	12	0.728	38	48	313	14	0.531
2051.2	1.6	226	22	220	12	1.0	23	39	336	14	0.749
2051.9	2.2	207	20	195	13	0.616	32	37	298	15	0.449
2052.6	1.9	204	23	202	12	0.993	27	42	309	14	0.724
2053.3	2.0	221	24	206	14	0.725	29	44	316	17	0.529
2054.0	1.4	232	24	239	14	0.492	21	44	366	16	0.359
2054.7	1.3	229	24	232	12	0.791	19	43	355	14	0.577
2055.4	1.6	201	20	213	13	0.228	23	37	326	15	0.166
2056.1	2.2	191	21	196	13	0.288	32	38	300	15	0.210
2056.8	1.9	230	23	218	13	0.503	28	42	334	15	0.367
2057.5	2.3	244	22	238	13	0.854	34	40	365	15	0.623
2058.2	1.3	221	20	214	13	0.298	18	37	327	15	0.217
2058.9	1.4	205	19	223	14	0.676	20	34	342	16	0.493
2059.6	1.7	207	20	219	14	0.920	25	36	335	16	0.671
2060.3	1.7	215	19	214	14	0.372	24	35	329	15	0.271
2061.0	1.6	215	21	243	14	0.309	23	38	373	16	0.226
2061.7	2.2	209	19	254	14	0.236	32	35	389	17	0.172
2062.4	1.9	189	17	200	12	0.476	27	31	306	14	0.347
2063.1	2.4	201	19	227	14	0.215	34	34	347	16	0.157
2063.8	1.5	243	24	251	15	0.318	21	44	384	17	0.232
2064.4	2.1	233	19	258	16	0.613	30	34	395	19	0.448
2065.1	1.5	212	17	237	14	0.594	22	31	364	16	0.434
2065.8	1.5	197	16	212	15	0.448	22	29	325	17	0.327
2066.5	1.6	215	18	232	16	0.471	23	33	356	18	0.344
2067.2	1.9	238	18	261	15	0.467	27	32	400	17	0.340
2067.9	1.7	226	17	241	14	0.151	25	31	369	16	0.110
2068.6	1.3	204	17	246	13	0.147	18	31	377	15	0.107
2069.3	2.2	190	17	212	14	0.138	32	31	325	15	0.101
2070.0	2.3	212	17	238	15	0.633	33	31	365	18	0.462
2070.7	1.8	229	17	234	15	0.157	26	30	358	17	0.114
2071.4	2.1	226	15	255	14	0.079	30	27	390	16	0.058
2072.1	1.4	188	15	215	12	0.494	20	27	330	14	0.360
2072.8	2.1	212	16	221	16	0.235	30	29	339	18	0.171
2073.5	1.4	227	16	247	15	0.564	20	28	379	17	0.412
2074.2	1.9	227	14	223	14	0.295	28	26	342	16	0.215
2074.9	1.7	240	17	264	15	0.079	24	31	404	17	0.058
2075.6	1.7	231	14	240	15	0.382	25	26	367	17	0.279
2076.3	1.6	223	16	236	15	0.302	23	30	361	17	0.220
2077.0	1.9	243	15	236	16	0.402	27	27	362	18	0.293
2077.7	2.1	235	14	252	15	0.244	30	26	386	18	0.178
2078.4	1.6	211	14	217	14	0.297	24	25	333	16	0.217
2079.1	1.8	240	15	217	16	0.242	26	26	332	18	0.176
2079.8	1.6	221	15	238	14	0.672	23	28	364	17	0.490
2080.5	1.2	237	15	228	15	0.245	17	28	349	17	0.179
2081.2	1.9	231	14	220	13	0.301	28	26	337	15	0.220
2081.9	2.1	211	13	224	15	0.226	30	23	343	18	0.165
2082.6	2.0	231	15	217	17	0.466	29	28	333	20	0.340
2083.3	1.8	217	14	223	14	0.315	26	26	342	16	0.230
2084.0	1.3	245	14	253	14	0.167	19	26	388	16	0.122
2084.7	1.7	237	15	237	15	0.082	24	27	363	18	0.060
2085.4	1.2	205	14	218	16	0.372	18	26	334	18	0.271
2086.1	1.6	225	15	198	14	0.526	24	27	304	16	0.384
2086.8	2.0	246	17	226	15	0.006	29	30	347	18	0.004
2087.5	2.1	241	15	230	15	0.390	31	27	352	17	0.285
2088.2	1.8	212	15	212	15	0.222	26	28	325	17	0.162
2088.9	1.8	229	16	211	16	0.797	26	29	323	18	0.582
2089.6	1.7	235	15	186	14	0.291	25	28	285	16	0.212



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2090.3	1.4	252	18	185	14	0.593	21	32	283	16	0.432
2090.9	2.8	258	17	206	14	0.419	40	32	315	16	0.306
2091.6	1.6	231	17	184	14	0.433	23	31	281	16	0.316
2092.3	1.5	242	18	193	15	0.317	22	32	295	18	0.231
2093.0	1.4	248	19	192	15	0.394	20	35	294	17	0.287
2093.7	2.0	245	20	208	15	0.630	29	36	319	17	0.460
2094.4	1.0	260	19	196	14	0.076	15	35	301	15	0.056
2095.1	1.5	246	18	177	15	0.231	22	32	272	17	0.169
2095.8	1.5	233	20	173	15	0.231	22	37	266	18	0.169
2096.5	1.9	269	20	188	15	0.418	27	36	289	17	0.305
2097.2	2.3	286	20	199	15	0.331	33	36	305	17	0.241
2097.9	1.3	257	20	186	14	0.408	19	36	285	16	0.298
2098.6	1.7	240	20	175	13	0.150	25	37	268	15	0.109
2099.3	1.9	262	22	157	14	0.955	27	41	240	16	0.697
2100.0	2.2	285	22	185	16	0.441	32	41	283	18	0.322
2100.7	1.8	268	22	201	15	0.421	27	40	308	17	0.307
2101.4	2.2	270	21	162	14	0.393	32	38	248	16	0.287
2102.1	0.734	239	19	144	14	0.141	11	34	221	17	0.103
2102.8	2.3	299	22	162	14	0.642	34	41	248	16	0.469
2103.5	1.7	306	25	174	15	0.349	25	45	266	17	0.255
2104.2	1.6	299	22	166	14	0.707	23	41	254	16	0.516
2104.9	1.7	269	21	160	15	0.624	25	39	246	17	0.455
2105.6	1.8	268	24	155	15	0.884	26	45	238	17	0.645
2106.3	1.1	286	25	157	17	0.744	15	46	241	19	0.543
2107.0	1.9	309	23	154	16	0.512	27	42	235	18	0.374
2107.7	1.5	292	22	152	13	0.461	22	41	233	15	0.336
2108.4	1.5	266	23	139	14	0.231	21	42	213	16	0.169
2109.1	1.6	257	25	137	14	0.383	23	46	210	16	0.279
2109.8	1.8	293	24	146	14	0.745	26	44	224	16	0.544
2110.5	2.5	314	24	155	16	0.861	35	44	238	18	0.628
2111.2	2.3	282	24	146	16	0.407	33	44	225	18	0.297
2111.9	1.7	253	23	135	14	0.719	25	41	207	16	0.524
2112.6	2.3	282	26	136	14	0.330	33	47	209	16	0.241
2113.3	1.7	298	23	125	13	0.319	25	42	192	15	0.233
2114.0	1.7	328	25	134	13	0.432	25	46	206	15	0.315
2114.7	1.4	309	25	133	14	1.0	20	45	204	16	0.753
2115.4	1.3	287	25	145	14	0.409	19	46	222	16	0.299
2116.1	1.6	270	26	144	14	0.548	23	48	221	16	0.400
2116.8	1.8	309	27	153	14	0.323	26	49	235	16	0.235
2117.4	1.3	304	24	143	14	0.782	19	44	219	16	0.571
2118.1	1.9	264	26	156	14	0.306	27	47	239	16	0.223
2118.8	2.4	294	28	141	16	0.849	35	52	217	18	0.619
2119.5	2.0	299	29	146	14	0.929	29	53	224	16	0.678
2120.2	1.3	307	27	144	15	0.393	19	49	221	17	0.287
2120.9	0.995	295	27	151	15	1.1	14	49	231	17	0.779
2121.6	0.958	273	25	142	15	0.394	14	46	217	17	0.288
2122.3	1.3	261	27	139	14	0.705	19	49	214	16	0.515
2123.0	2.4	300	29	153	14	0.494	34	53	235	16	0.361
2123.7	1.0	311	28	164	15	0.407	15	51	251	17	0.297
2124.4	1.4	278	28	164	14	0.722	20	51	252	16	0.527
2125.1	1.7	269	25	143	14	0.453	25	45	218	16	0.330
2125.8	1.4	256	26	133	13	0.597	20	47	203	15	0.436
2126.5	1.9	305	28	154	16	0.893	28	52	235	18	0.651
2127.2	1.8	317	28	163	16	0.340	26	51	249	18	0.248
2127.9	1.8	277	26	144	15	0.973	26	47	220	17	0.710
2128.6	1.7	275	26	140	14	0.524	25	47	215	16	0.382
2129.3	1.8	274	27	134	14	0.670	25	50	206	16	0.489
2130.0	1.5	265	27	142	13	0.441	21	48	217	15	0.322
2130.7	1.3	295	29	156	15	0.978	19	52	239	17	0.714
2131.4	1.6	276	24	149	13	0.777	22	44	228	15	0.567
2132.1	1.6	278	25	144	15	0.468	23	46	220	17	0.341
2132.8	1.7	287	32	150	14	0.458	24	59	229	16	0.334
2133.5	2.0	340	29	163	16	0.589	29	52	250	18	0.429
2134.2	1.6	295	26	154	14	0.801	23	48	236	16	0.584
2134.9	1.3	265	25	152	13	0.816	19	46	233	15	0.596
2135.6	1.6	254	27	133	15	0.372	24	48	203	17	0.272
2136.3	2.2	314	30	153	16	0.745	31	54	235	18	0.544
2137.0	2.4	304	27	152	15	0.320	34	50	232	17	0.233
2137.7	1.7	304	28	154	15	0.825	25	50	236	17	0.602
2138.4	1.1	289	29	156	14	0.674	16	54	239	16	0.492
2139.1	1.5	273	29	149	14	0.306	22	53	228	16	0.224
2139.8	1.4	299	29	154	14	0.603	20	53	237	16	0.440
2140.5	1.4	310	27	157	14	0.743	20	49	240	16	0.542
2141.2	1.7	278	28	144	14	0.308	24	51	220	16	0.225
2141.9	1.4	266	26	132	13	0.536	20	47	202	14	0.391
2142.6	2.1	280	29	154	15	0.830	30	53	237	17	0.605
2143.3	0.798	309	28	153	14	0.619	12	51	234	16	0.452
2144.0	1.4	295	27	157	13	0.747	20	50	240	15	0.545
2144.6	1.3	291	27	150	13	0.644	19	48	230	15	0.470
2145.3	1.3	286	28	143	15	0.386	19	51	219	17	0.282
2146.0	1.5	291	31	145	14	0.546	21	56	222	16	0.399



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2146.7	1.5	312	31	159	15	0.387	21	56	244	18	0.283
2147.4	1.6	278	28	152	15	0.909	23	51	233	17	0.663
2148.1	0.666	281	28	138	15	0.628	9.6	52	211	17	0.458
2148.8	1.4	281	31	146	14	0.391	21	56	223	16	0.285
2149.5	1.7	298	29	162	15	0.635	25	52	248	17	0.463
2150.2	2.4	294	30	150	13	0.471	35	54	230	15	0.344
2150.9	1.4	294	28	158	14	0.486	20	51	242	16	0.355
2151.6	1.7	271	26	167	15	0.891	24	48	256	17	0.650
2152.3	1.4	285	30	159	14	0.598	20	55	243	16	0.437
2153.0	1.9	318	30	165	14	0.883	28	55	252	16	0.644
2153.7	1.5	306	29	159	14	0.224	22	53	244	16	0.164
2154.4	1.7	255	25	157	13	0.572	25	46	240	15	0.418
2155.1	1.5	276	29	148	14	0.520	22	52	227	16	0.380
2155.8	1.6	317	31	151	15	0.547	23	57	232	17	0.399
2156.5	2.0	306	29	159	14	0.226	29	52	243	16	0.165
2157.2	1.1	303	29	159	13	0.631	15	54	243	15	0.461
2157.9	1.4	296	30	159	13	0.718	20	54	244	15	0.524
2158.6	1.3	263	28	150	13	0.562	19	51	229	15	0.410
2159.3	1.7	307	32	157	14	0.859	25	59	240	16	0.626
2160.0	1.4	323	33	167	14	0.474	20	61	256	16	0.346
2160.7	1.5	324	32	170	15	0.308	22	58	260	17	0.225
2161.4	1.7	253	24	147	12	0.383	25	43	225	14	0.279
2162.1	1.8	294	32	156	16	0.833	26	59	239	18	0.608
2162.8	2.1	326	34	168	14	0.946	30	62	257	16	0.690
2163.5	2.1	299	31	182	13	0.980	31	57	279	15	0.715
2164.2	1.8	317	28	140	12	0.690	27	51	215	14	0.503
2164.9	1.2	299	32	158	13	0.527	18	58	243	15	0.384
2165.6	1.2	293	32	152	15	0.830	18	58	233	17	0.606
2166.3	1.3	291	33	150	13	0.739	18	60	230	15	0.539
2167.0	2.0	328	30	154	12	0.230	28	55	236	14	0.168
2167.7	1.7	305	29	153	13	0.820	24	53	234	14	0.598
2168.4	1.7	295	31	167	13	0.442	25	57	255	15	0.322
2169.1	2.2	316	35	152	14	0.686	31	63	232	16	0.501
2169.8	1.6	299	29	138	12	0.213	23	53	212	13	0.156
2170.5	1.5	336	33	163	14	0.229	22	59	250	15	0.167
2171.2	1.3	283	30	142	12	0.356	19	55	218	13	0.259
2171.8	1.8	281	33	145	13	0.866	26	61	222	15	0.632
2172.5	1.4	289	33	137	14	0.438	20	59	210	15	0.319
2173.2	1.4	350	37	160	14	1.1	21	68	245	16	0.832
2173.9	2.1	332	33	158	13	0.460	31	60	242	15	0.336
2174.6	1.6	319	31	148	13	1.1	23	57	226	15	0.780
2175.3	0.833	308	32	147	14	1.1	12	59	226	16	0.781
2176.0	1.2	292	34	144	14	0.608	17	62	221	16	0.444
2176.7	1.4	268	26	122	10	0.714	20	48	187	12	0.521
2177.4	1.4	328	33	142	13	0.879	20	61	217	14	0.642
2178.1	1.9	314	30	142	12	0.532	28	55	218	14	0.388
2178.8	1.6	288	34	131	13	0.700	24	62	201	15	0.511
2179.5	1.4	328	32	136	14	0.846	20	58	208	16	0.617
2180.2	1.9	341	30	139	12	0.321	27	54	213	14	0.234
2180.9	1.1	312	28	130	11	0.727	16	51	200	13	0.531
2181.6	1.9	333	32	131	13	0.550	28	57	201	14	0.401
2182.3	1.7	330	32	127	14	0.932	24	58	195	16	0.680
2183.0	1.2	324	31	118	12	0.851	18	57	180	14	0.621
2183.7	1.2	341	28	113	13	0.681	17	52	174	15	0.497
2184.4	1.4	305	27	118	12	0.454	21	49	181	14	0.331
2185.1	1.3	268	26	105	12	0.647	19	47	161	14	0.472
2185.8	1.5	319	29	106	13	0.542	22	53	162	15	0.395
2186.5	1.1	319	28	130	13	0.553	16	50	199	15	0.404
2187.2	1.7	323	26	126	12	0.690	25	47	193	14	0.503
2187.9	1.8	302	27	98	13	0.614	26	49	150	14	0.448
2188.6	0.922	282	24	81	11	0.529	13	43	124	12	0.386
2189.3	2.0	332	28	92	12	0.527	28	50	140	14	0.384
2190.0	1.7	310	26	86	11	0.443	24	47	132	13	0.323
2190.7	1.1	289	21	85	11	0.367	16	39	131	13	0.268
2191.4	0.939	281	23	79	12	0.493	14	42	121	14	0.359
2192.1	1.9	344	25	82	13	0.706	27	45	126	15	0.515
2192.8	1.4	304	23	76	11	0.681	21	42	117	13	0.497
2193.5	1.3	334	21	82	12	0.442	18	38	126	14	0.322
2194.2	0.704	307	20	74	12	0.309	10	37	113	13	0.225
2194.9	1.2	299	20	72	11	0.600	17	37	111	13	0.438
2195.6	1.3	285	23	71	12	1.1	19	41	109	13	0.777
2196.3	1.5	312	23	70	12	0.888	21	42	108	13	0.648
2197.0	1.3	302	20	71	11	0.738	19	37	109	13	0.538
2197.7	1.1	296	18	67	12	0.802	15	32	103	14	0.585
2198.3	1.3	280	19	67	13	0.292	19	34	102	15	0.213
2199.0	1.6	301	21	61	13	0.614	23	39	93	15	0.448
2199.7	1.4	314	19	91	12	0.527	20	35	140	13	0.384
2200.4	1.4	302	20	67	13	0.807	20	36	103	14	0.589
2201.1	1.2	301	19	67	12	0.399	17	35	103	14	0.291
2201.8	1.3	285	20	62	14	0.326	19	36	96	16	0.238
2202.5	1.4	319	18	53	12	0.797	21	33	81	14	0.582



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2203.2	0.750	308	18	48	10	0.436	11	33	73	12	0.318
2203.9	1.2	311	16	57	13	0.304	17	29	87	15	0.222
2204.6	1.3	274	15	48	11	0.455	19	28	73	13	0.332
2205.3	1.4	269	18	43	12	0.756	20	33	66	13	0.551
2206.0	1.1	295	18	48	12	0.241	16	32	74	14	0.176
2206.7	1.2	300	15	45	11	0.533	17	28	68	13	0.389
2207.4	0.684	274	14	46	11	0.149	9.9	25	70	12	0.109
2208.1	0.682	271	16	40	11	0.525	9.8	29	62	13	0.383
2208.8	1.5	255	15	41	11	0.923	22	28	63	13	0.673
2209.5	1.7	293	15	41	12	0.658	25	27	63	13	0.480
2210.2	1.6	267	17	44	11	0.714	23	30	67	13	0.521
2210.9	0.606	249	14	36	9.3	0.213	8.8	25	55	11	0.155
2211.6	1.4	278	14	35	11	0.936	20	25	54	13	0.683
2212.3	1.3	282	14	33	12	0.669	18	25	51	13	0.488
2213.0	0.916	291	14	38	12	0.680	13	26	58	14	0.496
2213.7	1.5	302	13	36	11	0.373	22	24	55	13	0.272
2214.4	1.1	312	15	37	12	0.317	16	27	56	14	0.231
2215.1	0.653	275	15	37	11	0.616	9.4	27	57	12	0.449
2215.8	1.4	281	16	31	12	0.733	20	28	47	14	0.535
2216.5	1.8	268	14	36	11	0.512	25	26	55	12	0.374
2217.2	0.859	266	14	36	12	0.416	12	26	56	13	0.303
2217.9	1.2	255	13	33	11	0.554	17	24	50	13	0.404
2218.6	1.7	250	15	28	11	0.711	24	28	43	13	0.519
2219.3	1.3	263	13	28	12	0.963	19	24	42	13	0.702
2220.0	1.7	284	14	31	12	0.864	24	26	47	13	0.630
2220.7	1.6	246	12	26	11	1.0	23	22	40	13	0.743
2221.4	0.867	243	14	33	12	0.500	13	25	50	14	0.365
2222.1	1.2	248	14	26	12	0.565	17	25	39	13	0.412
2222.8	0.625	253	12	25	11	0.367	9.0	22	39	12	0.268
2223.5	1.7	297	15	29	12	0.868	24	28	44	14	0.634
2224.1	1.4	246	13	29	10	0.704	21	24	44	12	0.514
2224.8	1.1	238	13	24	13	0.488	16	23	38	15	0.356
2225.5	1.3	257	13	28	13	0.319	18	25	43	14	0.232
2226.2	1.1	276	13	26	12	0.579	15	23	40	14	0.423
2226.9	1.5	268	14	25	13	0.745	22	25	38	15	0.543
2227.6	1.6	248	13	24	11	0.388	24	24	36	12	0.283
2228.3	1.2	236	13	24	12	0.452	17	23	36	14	0.330
2229.0	1.2	240	15	29	12	0.405	18	28	44	13	0.295
2229.7	0.777	248	13	29	11	0.528	11	24	44	12	0.385
2230.4	1.5	271	13	29	11	0.680	22	24	44	13	0.496
2231.1	1.0	229	12	22	10	0.290	15	22	34	11	0.212
2231.8	0.581	198	12	20	11	0.685	8.4	22	31	12	0.500
2232.5	2.0	272	16	29	11	0.637	29	29	44	13	0.465
2233.2	1.8	279	14	27	13	0.582	26	25	42	15	0.425
2233.9	1.2	245	14	27	12	0.881	17	25	41	13	0.643
2234.6	0.885	252	14	30	12	0.692	13	25	45	13	0.505
2235.3	1.6	241	18	34	13	0.741	23	32	52	15	0.540
2236.0	2.3	265	16	33	12	0.683	34	29	50	14	0.498
2236.7	1.5	278	16	38	12	0.968	21	30	58	13	0.706
2237.4	1.9	225	14	36	10	0.879	28	26	56	12	0.641
2238.1	0.967	227	14	39	12	0.455	14	25	59	14	0.332
2238.8	1.1	263	16	36	11	0.810	16	28	55	12	0.591
2239.5	1.7	258	14	30	9.4	0.663	24	26	46	11	0.484
2240.2	2.1	262	14	37	11	0.706	30	25	56	13	0.515
2240.9	1.5	220	14	37	11	0.926	22	25	56	12	0.676
2241.6	1.5	237	14	38	13	0.297	22	26	58	14	0.217
2242.3	1.8	246	15	34	12	0.624	26	28	52	14	0.456
2243.0	1.8	281	15	45	12	0.485	26	28	69	13	0.354
2243.7	1.5	260	16	35	10	0.311	21	29	53	11	0.227
2244.4	1.2	239	14	39	11	0.657	18	25	59	13	0.479
2245.1	1.7	233	16	40	12	0.394	24	29	62	14	0.287
2245.8	1.9	263	15	35	12	0.726	27	27	54	14	0.530
2246.5	1.6	294	15	43	11	0.502	23	27	67	13	0.366
2247.2	1.5	243	14	39	9.8	0.615	22	26	60	11	0.449
2247.9	1.8	229	13	40	12	0.498	26	24	61	14	0.363
2248.6	1.4	222	15	40	11	0.360	21	27	62	12	0.263
2249.3	2.4	264	15	43	12	0.738	35	28	66	14	0.539
2250.0	1.6	267	14	48	11	0.557	24	26	73	13	0.406
2250.7	1.8	220	14	45	12	0.545	26	26	69	13	0.398
2251.3	1.6	209	13	38	10	0.573	23	24	58	12	0.418
2252.0	1.3	268	14	38	12	0.563	18	25	58	14	0.411
2252.7	1.7	270	14	43	12	0.682	24	26	67	14	0.497
2253.4	1.4	257	14	46	11	0.822	21	26	70	13	0.600
2254.1	1.8	244	13	44	12	0.887	25	24	68	14	0.647
2254.8	2.0	234	13	41	12	0.848	29	24	62	14	0.619
2255.5	1.6	265	14	46	12	0.749	23	26	71	14	0.547
2256.2	1.4	268	13	44	11	0.721	20	24	68	13	0.526
2256.9	1.8	227	13	44	11	0.832	26	23	67	13	0.607
2257.6	1.6	225	12	40	11	0.659	23	23	62	12	0.481
2258.3	2.2	270	16	43	13	0.416	32	29	66	15	0.304
2259.0	1.4	255	13	44	11	0.802	20	24	68	13	0.585



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2259.7	1.1	267	14	42	11	0.319	15	25	64	13	0.233
2260.4	1.8	236	14	40	12	0.636	26	25	62	14	0.464
2261.1	1.1	232	13	41	11	1.1	16	24	62	13	0.817
2261.8	2.1	241	14	48	14	0.817	30	25	74	16	0.596
2262.5	1.8	271	14	44	12	0.466	26	25	68	13	0.340
2263.2	1.9	250	15	46	11	0.571	27	27	71	12	0.417
2263.9	1.6	233	13	42	10	0.223	24	23	64	12	0.163
2264.6	1.8	211	12	39	11	0.649	26	23	60	12	0.473
2265.3	1.9	237	12	43	12	0.689	27	22	66	13	0.503
2266.0	1.7	232	14	40	11	0.313	25	25	62	12	0.228
2266.7	1.2	252	12	40	10	0.864	18	22	61	12	0.631
2267.4	1.7	223	12	46	11	0.710	25	23	70	13	0.518
2268.1	1.8	214	13	44	10	0.728	25	24	68	12	0.531
2268.8	1.3	230	13	50	12	0.248	19	24	76	14	0.181
2269.5	1.6	237	13	51	11	0.499	23	24	78	13	0.364
2270.2	1.5	227	12	45	11	0.691	22	22	69	13	0.504
2270.9	1.5	202	13	44	10	0.450	22	23	68	11	0.328
2271.6	1.8	228	14	46	12	0.580	25	26	71	14	0.423
2272.3	2.3	225	15	49	12	0.392	34	28	75	14	0.286
2273.0	1.8	216	14	51	12	0.818	26	26	79	14	0.597
2273.7	1.5	198	12	45	10.0	0.728	22	23	70	11	0.531
2274.4	0.960	185	12	41	9.5	0.329	14	23	64	11	0.240
2275.1	1.6	189	15	42	9.7	0.565	23	27	64	11	0.412
2275.8	1.1	229	14	46	11	1.1	15	26	71	13	0.807
2276.5	0.617	199	14	58	10	0.728	8.9	26	89	12	0.531
2277.2	1.1	203	15	52	11	0.720	16	27	80	12	0.525
2277.8	1.6	207	14	52	11	0.661	22	26	80	12	0.482
2278.5	1.3	217	17	57	12	0.795	19	31	88	14	0.580
2279.2	1.2	211	18	59	12	0.493	18	32	91	14	0.360
2279.9	1.9	187	15	59	11	0.447	27	28	91	13	0.326
2280.6	1.5	184	14	56	11	0.288	22	26	86	12	0.210
2281.3	1.0	203	17	64	12	0.220	15	31	98	14	0.160
2282.0	1.3	233	19	63	12	1.3	19	34	96	13	0.940
2282.7	1.4	210	16	75	12	0.711	20	30	115	14	0.519
2283.4	1.6	198	15	65	12	0.598	23	27	99	13	0.437
2284.1	1.1	184	15	64	12	0.509	15	27	99	14	0.372
2284.8	1.7	205	15	66	13	0.444	24	28	101	15	0.324
2285.5	1.2	211	16	73	13	0.563	18	30	112	14	0.411
2286.2	1.9	217	17	86	14	0.646	27	30	131	16	0.471
2286.9	1.9	193	15	90	14	0.507	27	28	138	16	0.370
2287.6	1.9	203	16	97	13	0.516	27	29	148	15	0.377
2288.3	1.8	196	16	106	13	0.349	26	29	163	15	0.255
2289.0	1.6	219	17	124	14	0.071	23	30	190	17	0.051
2289.7	1.5	219	16	140	14	0.298	22	29	215	16	0.218
2290.4	1.9	191	14	141	14	0.351	27	26	217	16	0.256
2291.1	1.6	181	15	144	15	0.497	22	27	221	18	0.363
2291.8	1.6	201	15	155	14	0.425	24	28	237	16	0.310
2292.5	1.4	237	16	186	16	0.323	21	29	284	18	0.236
2293.2	1.9	205	15	183	14	0.298	27	27	280	16	0.218
2293.9	1.1	188	12	172	15	0.440	15	23	264	17	0.321
2294.6	1.4	206	13	169	16	0.295	20	24	259	18	0.216
2295.3	2.3	208	15	158	14	0.449	33	27	242	15	0.328
2296.0	1.7	211	14	178	14	0.377	24	25	273	16	0.275
2296.7	1.2	207	12	162	12	0.216	17	22	249	14	0.158
2297.4	2.1	172	11	162	13	0.132	30	20	249	15	0.096
2298.1	2.2	194	14	156	15	0.216	32	26	239	17	0.157
2298.8	2.2	222	14	172	15	0.238	31	25	264	18	0.174
2299.5	2.4	238	14	181	15	0.156	35	25	277	17	0.114
2300.2	1.3	192	13	180	15	0.234	19	23	276	17	0.171
2300.9	1.6	187	13	162	15	0.294	23	23	249	17	0.215
2301.6	1.9	191	12	146	15	0.556	27	22	224	18	0.406
2302.3	1.9	223	14	164	16	0.166	27	26	251	18	0.121
2303.0	1.8	216	14	181	16	0.251	26	26	277	18	0.183
2303.7	1.2	182	14	172	15	0.383	17	25	263	17	0.280
2304.3	2.0	189	14	152	15	0.214	29	26	233	17	0.156
2305.0	2.1	202	16	152	16	0.321	30	29	233	18	0.234
2305.7	1.8	218	20	160	17	0.411	26	36	245	19	0.300
2306.4	2.4	198	20	158	16	0.306	34	36	242	19	0.223
2307.1	1.4	183	20	141	16	0.301	20	37	216	18	0.219
2307.8	1.4	185	24	143	17	0.076	21	43	219	20	0.056
2308.5	1.7	204	23	140	17	0.076	24	42	215	19	0.055
2309.2	1.9	212	25	135	16	0.006	27	45	207	18	0.004
2309.9	1.2	187	23	130	15	0.148	18	41	200	17	0.108
2310.6	2.2	190	25	127	17	0.236	32	46	195	19	0.173
2311.3	1.4	199	27	130	18	0.225	20	50	200	20	0.164
2312.0	1.8	205	30	121	16	0.294	27	55	185	19	0.215
2312.7	1.4	214	35	130	18	0.163	21	63	199	20	0.119
2313.4	0.933	186	30	113	17	0.145	13	54	174	19	0.106
2314.1	1.6	173	28	91	15	0.133	23	51	140	17	0.097
2314.8	2.0	199	32	96	18	0.462	29	59	147	21	0.337
2315.5	1.7	217	36	116	20	0.428	24	65	178	23	0.312



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2316.2	1.7	204	33	116	19	0.006	24	61	178	22	0.004
2316.9	1.4	187	30	100	17	0.141	21	54	153	20	0.103
2317.6	1.7	185	31	92	18	0.230	24	57	141	20	0.168
2318.3	1.6	206	34	98	19	0.081	23	62	150	21	0.059
2319.0	2.1	227	34	114	19	0.419	31	63	174	22	0.305
2319.7	2.1	197	32	93	17	0.234	31	58	142	19	0.171
2320.4	0.976	178	30	95	17	0.218	14	55	146	19	0.159
2321.1	1.7	200	41	115	21	0.159	24	75	176	24	0.116
2321.8	1.5	218	37	99	22	0.710	21	68	152	25	0.518
2322.5	1.1	202	30	99	18	0.148	16	55	152	20	0.108
2323.2	1.4	186	29	93	18	0.380	20	53	142	20	0.277
2323.9	0.997	196	31	89	17	0.213	14	57	136	19	0.156
2324.6	1.6	199	33	88	21	0.076	23	60	135	24	0.055
2325.3	1.3	223	31	90	21	0.153	18	57	138	24	0.112
2326.0	1.2	227	30	99	19	0.318	17	54	152	22	0.232
2326.7	1.3	193	27	87	18	0.068	19	49	133	20	0.050
2327.4	1.6	211	26	83	20	0.075	23	48	127	23	0.054
2328.1	1.4	182	24	81	17	0.139	21	43	124	19	0.101
2328.8	1.8	230	27	95	21	0.329	26	49	146	24	0.240
2329.5	1.7	212	22	101	19	0.150	24	41	154	22	0.109
2330.1	1.3	183	21	79	19	0.072	18	39	120	22	0.053
2330.8	1.6	180	20	71	19	0.285	23	37	108	22	0.208
2331.5	1.5	220	24	87	24	0.075	22	44	134	27	0.055
2332.2	2.3	207	19	88	19	0.006	34	35	135	21	0.004
2332.9	1.9	212	19	82	18	0.006	27	34	125	21	0.004
2333.6	1.5	205	17	82	20	0.072	21	31	125	22	0.052
2334.3	1.6	192	17	67	19	0.069	23	31	103	22	0.050
2335.0	1.1	200	18	87	22	0.073	16	33	133	25	0.053
2335.7	1.5	237	17	86	22	0.006	21	30	132	25	0.004
2336.4	2.1	212	16	85	21	0.305	30	29	131	24	0.222
2337.1	1.4	215	15	93	21	0.153	20	28	143	24	0.112
2337.8	1.3	198	13	76	22	0.074	19	23	117	25	0.054
2338.5	1.5	208	13	67	21	0.073	22	24	103	24	0.053
2339.2	1.1	206	14	81	19	0.152	15	26	124	22	0.111
2339.9	1.3	200	12	85	19	0.513	19	21	130	22	0.374
2340.6	0.841	201	12	80	21	0.230	12	21	123	25	0.168
2341.3	1.4	225	13	75	20	0.152	20	23	116	23	0.111
2342.0	0.985	205	12	80	24	0.006	14	22	122	27	0.004
2342.7	1.2	200	11	87	23	0.215	17	21	134	26	0.157
2343.4	1.3	204	11	78	22	0.144	19	21	120	25	0.105
2344.1	1.2	198	10	77	21	0.140	17	18	118	24	0.102
2344.8	1.8	209	12	84	23	0.238	26	22	128	26	0.174
2345.5	1.4	198	12	80	21	0.006	20	22	123	24	0.004
2346.2	0.960	217	12	90	22	0.225	14	22	138	25	0.164
2346.9	1.3	195	9.6	81	19	0.266	19	18	123	22	0.194
2347.6	1.4	205	13	83	21	0.289	20	24	127	24	0.211
2348.3	1.9	226	13	86	22	0.072	27	23	131	25	0.053
2349.0	1.5	239	11	85	22	0.321	21	19	130	25	0.234
2349.7	0.894	228	12	87	21	0.231	13	22	134	24	0.169
2350.4	1.6	230	11	84	24	0.077	23	20	128	27	0.056
2351.1	1.4	206	13	86	24	0.288	20	23	131	27	0.210
2351.8	1.9	247	12	92	26	0.245	28	22	141	30	0.179
2352.5	1.1	253	11	96	21	0.319	16	20	147	24	0.233
2353.2	2.1	225	10	90	21	0.073	31	19	139	24	0.053
2353.9	1.3	217	11	92	23	0.073	18	19	141	26	0.053
2354.6	1.7	228	12	83	23	0.158	25	22	127	26	0.115
2355.3	1.9	241	13	93	26	0.082	28	24	142	30	0.060
2356.0	1.8	247	11	93	24	0.166	26	21	142	27	0.121
2356.7	1.1	206	12	94	22	0.148	16	23	144	25	0.108
2357.3	1.4	213	11	87	23	0.217	20	21	133	27	0.158
2358.0	1.9	236	12	95	23	0.073	27	22	145	27	0.053
2358.7	1.4	240	15	100	25	0.160	20	27	153	28	0.116
2359.4	1.2	221	13	92	25	0.069	18	24	141	29	0.051
2360.1	1.3	222	11	96	25	0.432	18	21	147	28	0.315
2360.8	1.2	227	13	90	22	0.268	18	24	138	25	0.195
2361.5	1.8	222	13	92	25	0.215	27	24	140	28	0.157
2362.2	1.9	221	13	85	23	0.135	28	24	131	27	0.099
2362.9	0.960	229	13	87	21	0.064	14	23	133	24	0.047
2363.6	1.5	234	12	87	24	0.312	22	22	133	28	0.228
2364.3	2.1	212	15	86	25	0.069	30	27	133	28	0.051
2365.0	2.0	223	12	87	25	0.145	29	22	133	28	0.105
2365.7	1.7	250	14	96	26	0.161	25	25	146	30	0.118
2366.4	1.9	261	14	93	24	0.217	28	25	142	27	0.158
2367.1	3.6	217	12	92	23	0.064	51	22	141	26	0.047
2367.8	2.2	268	13	84	23	0.074	31	24	129	26	0.054
2368.5	1.8	265	14	96	26	0.147	26	25	147	29	0.107
2369.2	1.6	282	14	90	28	0.256	22	25	139	32	0.186
2369.9	2.0	245	13	80	22	0.204	28	23	123	26	0.149
2370.6	1.7	248	14	101	32	0.081	25	25	154	37	0.059
2371.3	1.6	277	13	98	27	0.006	24	24	150	31	0.004
2372.0	1.7	276	12	91	23	0.006	24	22	140	26	0.004



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2372.7	1.6	246	12	90	22	0.068	23	22	138	25	0.050
2373.4	1.7	257	12	88	24	0.074	24	22	135	27	0.054
2374.1	2.5	268	11	108	28	0.085	37	20	166	32	0.062
2374.8	1.9	278	13	117	28	0.164	27	24	180	32	0.120
2375.5	1.4	273	12	116	27	0.077	21	21	177	30	0.056
2376.2	2.3	270	10	106	22	0.136	33	19	162	25	0.100
2376.9	2.3	254	13	99	25	0.149	33	24	152	29	0.109
2377.6	1.5	261	14	102	24	0.152	22	26	157	27	0.111
2378.3	1.6	284	14	103	24	0.006	23	26	157	28	0.004
2379.0	1.3	288	15	106	26	0.157	19	27	162	29	0.115
2379.7	1.9	264	16	101	26	0.229	27	29	154	30	0.167
2380.4	1.5	252	14	95	25	0.006	22	25	146	29	0.004
2381.1	2.3	274	14	102	24	0.073	33	25	157	28	0.053
2381.8	1.6	278	15	88	25	0.232	24	27	135	29	0.169
2382.5	1.3	274	13	87	24	0.071	19	23	133	27	0.052
2383.2	1.4	257	13	97	22	0.363	20	23	149	25	0.265
2383.8	2.8	259	11	104	23	0.241	41	20	160	26	0.176
2384.5	2.2	229	12	102	20	0.072	32	22	157	23	0.053
2385.2	1.7	269	14	135	24	0.170	24	26	207	27	0.124
2385.9	1.4	266	15	115	25	0.152	20	27	176	28	0.111
2386.6	1.4	258	15	99	20	0.137	21	27	152	23	0.100
2387.3	2.4	237	13	99	20	0.142	34	24	151	23	0.104
2388.0	2.0	221	16	110	21	0.082	29	28	168	24	0.060
2388.7	1.9	255	14	118	24	0.085	28	26	181	27	0.062
2389.4	1.9	237	14	124	21	0.164	28	26	190	24	0.120
2390.1	2.0	208	13	122	21	0.070	28	24	187	24	0.051
2390.8	2.3	211	15	145	23	0.148	33	27	222	27	0.108
2391.5	2.0	232	17	127	22	0.006	28	31	194	25	0.004
2392.2	1.9	220	21	138	22	0.073	27	38	212	26	0.053
2392.9	1.7	236	20	145	22	0.308	24	37	222	25	0.224
2393.6	1.6	210	20	133	20	0.151	23	36	203	23	0.110
2394.3	2.1	199	27	147	23	0.244	30	50	225	27	0.178
2395.0	2.2	248	26	153	22	0.079	32	47	235	25	0.057
2395.7	1.7	245	24	154	21	0.159	25	45	236	24	0.116
2396.4	2.6	244	24	155	22	0.079	37	44	238	25	0.058
2397.1	1.9	207	24	143	22	0.386	28	44	219	25	0.282
2397.8	1.3	212	24	128	20	0.006	19	44	197	23	0.004
2398.5	1.9	193	25	140	19	0.288	27	45	214	22	0.210
2399.2	1.5	183	23	146	19	0.141	22	41	224	21	0.103
2399.9	1.6	205	24	130	20	0.076	22	43	200	23	0.055
2400.6	2.4	221	26	129	20	0.232	35	47	198	23	0.169
2401.3	1.3	204	24	126	23	0.165	18	44	194	26	0.120
2402.0	1.7	229	26	119	22	0.083	25	48	183	25	0.061
2402.7	1.6	205	24	115	21	0.162	24	43	176	24	0.118
2403.4	1.3	194	22	104	20	0.073	19	39	159	22	0.054
2404.1	1.8	210	24	112	22	0.163	25	44	172	25	0.119
2404.8	1.1	183	22	106	23	0.006	16	41	162	26	0.004
2405.5	1.3	224	24	113	23	0.167	18	44	173	26	0.122
2406.2	1.4	180	21	114	21	0.077	20	38	175	24	0.056
2406.9	1.2	182	22	109	20	0.070	17	40	166	23	0.051
2407.6	0.979	205	22	125	24	0.006	14	41	191	27	0.004
2408.3	1.8	200	24	121	22	0.157	26	43	185	25	0.115
2409.0	2.0	247	23	127	24	0.006	29	42	195	28	0.004
2409.7	1.5	206	23	112	21	0.306	22	42	172	24	0.223
2410.4	1.0	193	22	106	19	0.132	15	40	162	22	0.096
2411.0	0.955	206	23	124	23	0.148	14	43	191	26	0.108
2411.7	1.9	212	24	108	20	0.068	28	44	165	22	0.050
2412.4	1.7	226	22	119	20	0.228	25	41	183	23	0.166
2413.1	2.1	211	21	103	22	0.156	30	38	158	25	0.114
2413.8	1.8	203	21	97	24	0.006	26	38	149	28	0.004
2414.5	1.6	211	20	100	21	0.313	23	36	153	25	0.229
2415.2	1.2	228	17	102	22	0.006	17	32	156	26	0.004
2415.9	1.7	218	18	89	21	0.006	25	32	136	24	0.004
2416.6	1.4	221	17	90	22	0.006	20	30	138	25	0.004
2417.3	2.1	218	16	82	22	0.077	30	30	126	25	0.057
2418.0	1.5	218	17	81	21	0.315	21	30	124	25	0.230
2418.7	1.2	231	15	84	22	0.243	18	28	128	26	0.178
2419.4	1.6	215	15	82	23	0.073	23	27	126	26	0.054
2420.1	2.2	211	13	76	22	0.006	31	24	117	25	0.004
2420.8	1.5	217	15	74	23	0.363	22	27	113	26	0.265
2421.5	1.3	237	16	84	25	0.241	19	29	129	29	0.176
2422.2	1.8	237	15	82	24	0.078	27	28	125	28	0.057
2422.9	1.4	211	13	74	22	0.218	20	23	114	25	0.159
2423.6	1.8	240	15	77	25	0.006	26	27	117	29	0.004
2424.3	1.7	232	16	78	24	0.233	25	29	119	27	0.170
2425.0	1.6	274	15	92	26	0.006	24	28	141	29	0.004
2425.7	1.6	229	14	88	23	0.006	23	25	135	27	0.004
2426.4	2.0	244	14	95	25	0.076	29	25	145	29	0.056
2427.1	1.0	243	14	89	25	0.075	15	25	136	29	0.055
2427.8	1.3	261	14	94	28	0.082	19	25	144	32	0.060
2428.5	1.9	280	14	94	25	0.396	27	25	145	29	0.289



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2429.2	1.5	251	14	91	25	0.162	22	26	140	28	0.118
2429.9	2.0	252	13	78	25	0.157	29	23	120	28	0.115
2430.6	2.2	276	14	83	25	0.153	32	26	127	29	0.112
2431.3	1.1	270	14	89	24	0.006	16	25	137	28	0.004
2432.0	1.8	271	11	96	22	0.232	26	21	147	25	0.169
2432.7	2.4	260	12	81	24	0.006	34	22	124	27	0.004
2433.4	1.7	233	12	68	22	0.220	25	21	104	26	0.161
2434.1	1.6	264	11	68	26	0.078	22	20	104	29	0.057
2434.8	2.3	266	12	65	24	0.240	33	22	99	28	0.175
2435.5	2.2	290	11	64	20	0.156	31	20	98	23	0.114
2436.2	1.8	304	11	61	24	0.006	26	20	94	28	0.004
2436.8	1.5	246	9.2	51	23	0.225	21	17	78	27	0.164
2437.5	2.0	280	11	57	25	0.256	29	20	88	28	0.187
2438.2	1.7	297	9.0	59	24	0.159	25	16	91	27	0.116
2438.9	1.6	287	8.5	52	23	0.244	24	16	80	27	0.178
2439.6	1.5	251	9.0	43	23	0.075	22	16	65	26	0.055
2440.3	1.6	246	8.3	42	21	0.006	23	15	65	24	0.004
2441.0	1.8	308	9.2	49	27	0.082	26	17	74	30	0.060
2441.7	1.3	288	7.8	38	23	0.080	19	14	59	26	0.059
2442.4	1.8	291	9.1	46	21	0.154	26	17	71	24	0.112
2443.1	1.1	272	8.3	37	25	0.076	16	15	57	28	0.055
2443.8	1.7	286	9.6	40	24	0.081	25	18	62	28	0.059
2444.5	1.5	305	7.3	47	23	0.006	21	13	72	27	0.004
2445.2	2.4	338	9.1	43	23	0.161	35	17	66	27	0.117
2445.9	1.3	282	8.8	41	22	0.006	19	16	63	25	0.004
2446.6	1.6	282	9.1	41	24	0.225	24	17	63	27	0.164
2447.3	1.9	300	8.2	36	25	0.148	27	15	55	28	0.108
2448.0	1.7	312	7.4	44	22	0.151	25	13	68	25	0.110
2448.7	1.6	317	8.7	40	23	0.077	24	16	61	26	0.056
2449.4	1.8	268	7.7	35	22	0.069	26	14	54	25	0.050
2450.1	1.3	301	8.5	38	23	0.152	19	16	58	27	0.111
2450.8	1.4	305	8.8	37	23	0.074	20	16	56	26	0.054
2451.5	1.8	351	8.9	50	24	0.006	26	16	77	28	0.004
2452.2	1.9	336	8.9	49	21	0.154	27	16	76	24	0.112
2452.9	2.0	294	7.9	46	25	0.006	29	14	71	29	0.004
2453.6	1.7	321	9.0	48	25	0.006	25	16	73	29	0.004
2454.3	1.6	356	11	48	25	0.239	22	19	74	28	0.174
2455.0	1.7	340	11	53	24	0.312	25	19	81	27	0.228
2455.7	1.5	342	10	52	26	0.077	22	19	79	30	0.056
2456.4	2.1	317	9.0	49	22	0.006	30	16	75	26	0.004
2457.1	1.8	339	11	55	26	0.075	25	20	84	29	0.055
2457.8	1.6	355	12	59	24	0.075	23	21	90	28	0.055
2458.5	1.1	328	13	72	23	0.218	16	23	110	26	0.159
2459.2	2.0	328	12	72	23	0.208	29	23	110	26	0.152
2459.9	1.9	297	15	76	22	0.254	28	27	116	25	0.185
2460.6	1.5	318	17	97	24	0.067	22	31	149	27	0.049
2461.3	1.9	341	21	100	24	0.217	28	39	153	27	0.158
2462.0	1.5	311	21	112	22	0.006	21	39	172	26	0.004
2462.7	1.7	304	22	103	21	0.006	24	40	158	24	0.004
2463.4	1.5	270	24	104	22	0.138	21	43	159	25	0.101
2464.0	2.3	298	27	100	21	0.006	33	50	154	24	0.004
2464.7	1.9	309	26	90	22	0.154	28	47	138	25	0.112
2465.4	1.4	266	25	86	23	0.149	20	45	132	27	0.109
2466.1	1.9	273	24	81	21	0.069	27	44	124	24	0.051
2466.8	1.8	266	30	80	23	0.150	26	55	123	27	0.109
2467.5	1.6	260	27	80	21	0.069	23	50	123	24	0.050
2468.2	1.5	287	29	94	23	0.161	22	53	145	27	0.117
2468.9	2.1	269	26	90	21	0.231	31	48	138	24	0.169
2469.6	1.4	241	28	77	23	0.074	20	51	118	26	0.054
2470.3	1.7	247	29	75	24	0.158	24	53	114	27	0.115
2471.0	1.9	262	28	78	23	0.487	28	52	119	26	0.355
2471.7	2.3	258	30	80	23	0.082	33	55	123	26	0.060
2472.4	1.9	234	28	82	20	0.163	27	50	126	22	0.119
2473.1	1.5	220	30	64	21	0.224	22	55	98	24	0.164
2473.8	0.841	248	29	73	22	0.407	12	53	111	26	0.297
2474.5	1.4	240	30	76	21	0.160	20	54	117	24	0.117
2475.2	1.2	240	25	66	20	0.073	17	46	101	23	0.053
2475.9	1.1	209	27	71	22	0.074	16	48	108	25	0.054
2476.6	1.8	206	28	79	24	0.006	25	52	121	28	0.004
2477.3	1.7	231	28	69	22	0.075	24	50	105	25	0.054
2478.0	2.0	260	26	77	21	0.078	29	47	119	24	0.057
2478.7	1.6	231	25	78	20	0.150	23	45	120	23	0.110
2479.4	0.748	194	22	69	19	0.071	11	40	105	22	0.052
2480.1	1.4	210	25	77	23	0.075	20	45	119	27	0.055
2480.8	1.8	248	27	78	23	0.081	26	49	119	26	0.059
2481.5	1.5	252	22	82	22	0.161	21	41	125	25	0.118
2482.2	1.4	205	19	67	20	0.138	20	35	103	23	0.101
2482.9	1.8	232	22	81	25	0.006	25	41	124	29	0.004
2483.6	1.7	242	22	77	22	0.149	24	40	118	25	0.109
2484.3	1.3	233	22	89	24	0.006	19	39	136	27	0.004
2485.0	1.3	233	21	88	23	0.074	19	39	134	26	0.054



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2485.7	1.5	242	19	84	23	0.006	21	34	129	27	0.004
2486.4	1.5	210	18	71	19	0.061	22	33	109	22	0.044
2487.1	1.7	243	20	81	24	0.159	24	36	124	28	0.116
2487.8	1.4	254	19	86	28	0.165	20	35	131	32	0.120
2488.5	2.4	254	17	80	21	0.075	35	31	123	25	0.055
2489.2	2.3	226	16	82	25	0.076	33	30	126	28	0.055
2489.9	1.7	238	15	72	22	0.073	25	28	110	25	0.053
2490.5	2.4	265	17	68	26	0.080	34	31	103	30	0.058
2491.2	1.5	264	15	78	26	0.006	22	28	119	29	0.004
2491.9	2.1	276	15	73	24	0.222	31	27	111	27	0.162
2492.6	1.9	270	16	64	25	0.230	27	29	98	29	0.168
2493.3	2.1	233	13	61	21	0.006	30	24	94	24	0.004
2494.0	1.9	288	15	64	25	0.006	27	27	98	28	0.004
2494.7	1.3	299	14	65	26	0.167	19	25	100	30	0.122
2495.4	1.2	260	13	59	24	0.149	17	23	90	27	0.109
2496.1	1.7	250	13	55	21	0.207	25	23	85	24	0.151
2496.8	2.1	280	13	49	25	0.232	30	24	75	29	0.169
2497.5	2.2	321	15	51	26	0.160	31	28	79	30	0.117
2498.2	1.9	299	13	56	22	0.073	27	24	86	25	0.053
2498.9	1.1	295	12	55	24	0.156	16	22	85	27	0.114
2499.6	2.2	261	13	47	22	0.072	32	24	73	25	0.052
2500.3	1.7	319	15	47	23	0.156	25	27	72	27	0.114
2501.0	1.9	322	14	52	24	0.315	28	25	80	27	0.230
2501.7	1.3	296	14	60	25	0.006	18	26	92	29	0.004
2502.4	1.7	275	12	43	23	0.288	24	23	66	26	0.210
2503.1	1.4	299	14	49	26	0.006	21	26	75	30	0.004
2503.8	2.4	326	15	52	26	0.164	35	27	80	29	0.120
2504.5	2.6	358	15	53	24	0.245	37	27	81	28	0.179
2505.2	1.3	335	15	48	21	0.075	18	27	74	25	0.055
2505.9	1.8	321	16	47	25	0.318	27	28	72	29	0.232
2506.6	2.3	334	16	44	26	0.160	33	30	68	30	0.116
2507.3	2.3	349	15	41	25	0.079	33	28	63	28	0.058
2508.0	1.2	372	16	45	22	0.077	18	29	69	26	0.056
2508.7	1.5	328	15	39	22	0.160	21	27	60	25	0.117
2509.4	2.1	319	15	39	24	0.006	30	28	60	27	0.004
2510.1	1.8	332	16	42	28	0.163	26	29	64	32	0.119
2510.8	1.5	347	15	34	22	0.149	22	28	53	25	0.108
2511.5	2.3	356	15	37	21	0.156	34	27	57	25	0.114
2512.2	2.1	331	15	39	23	0.006	31	26	60	26	0.004
2512.9	2.5	322	17	34	23	0.228	36	31	52	26	0.166
2513.6	2.3	350	17	36	27	0.082	33	32	56	31	0.060
2514.3	1.4	365	16	35	22	0.006	21	29	54	25	0.004
2515.0	2.8	342	14	43	24	0.233	40	25	66	27	0.170
2515.7	1.9	341	16	36	22	0.148	27	29	56	25	0.108
2516.3	2.1	343	16	38	23	0.157	30	29	58	26	0.115
2517.0	1.5	310	18	34	22	0.006	21	32	52	25	0.004
2517.7	1.5	327	16	38	24	0.231	22	29	58	27	0.168
2518.4	1.1	322	17	35	23	0.006	16	32	53	26	0.004
2519.1	1.8	304	17	36	24	0.151	27	32	55	27	0.110
2519.8	1.8	302	20	36	24	0.078	27	37	55	27	0.057
2520.5	2.0	319	19	44	22	0.239	29	34	67	25	0.175
2521.2	1.6	336	21	49	24	0.006	23	38	74	27	0.004
2521.9	2.1	313	22	46	25	0.323	30	39	71	29	0.236
2522.6	1.6	290	23	48	22	0.073	23	42	74	25	0.054
2523.3	2.0	284	24	53	25	0.225	29	44	82	28	0.164
2524.0	1.9	282	25	65	24	0.006	28	45	99	27	0.004
2524.7	2.0	303	26	82	22	0.299	29	48	125	25	0.218
2525.4	1.4	273	26	94	23	0.215	20	48	145	26	0.157
2526.1	2.6	245	31	94	23	0.070	37	57	145	27	0.051
2526.8	4.2	261	35	106	25	0.232	61	64	163	29	0.169
2527.5	5.1	278	34	111	26	0.230	73	61	170	29	0.168
2528.2	4.5	260	32	128	23	0.148	65	58	196	27	0.108
2528.9	6.3	249	33	112	24	0.073	91	60	171	27	0.053
2529.6	8.3	237	35	119	30	0.148	120	65	182	34	0.108
2530.3	13	259	35	120	32	0.075	187	64	184	36	0.055
2531.0	13	275	31	126	35	0.006	185	57	193	41	0.004
2531.7	13	251	31	121	36	0.078	183	57	185	41	0.057
2532.4	15	227	29	108	43	0.073	213	53	165	49	0.054
2533.1	16	241	31	113	50	0.156	224	57	173	57	0.114
2533.8	17	280	27	103	48	0.237	247	49	158	55	0.173
2534.5	19	293	23	95	59	0.159	268	41	145	67	0.116
2535.2	16	223	19	78	48	0.133	224	34	120	54	0.097
2535.9	19	260	19	75	69	0.006	272	35	116	79	0.004
2536.6	21	267	19	72	78	0.156	307	34	110	89	0.114
2537.3	20	311	17	66	76	0.401	289	31	101	87	0.292
2538.0	18	301	16	64	83	0.079	255	28	97	95	0.058
2538.7	16	268	14	50	82	0.006	235	26	77	93	0.004
2539.4	18	309	16	57	104	0.157	266	29	87	119	0.115
2540.1	19	304	13	52	105	0.155	278	24	80	120	0.113
2540.8	14	334	15	57	109	0.325	202	27	87	125	0.237
2541.5	12	303	14	52	103	0.227	177	25	79	118	0.166



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Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2542.2	13	311	15	50	97	0.006	188	27	77	111	0.004
2542.8	13	335	15	57	132	0.240	189	28	87	151	0.175
2543.5	12	331	15	54	132	0.308	176	28	82	151	0.225
2544.2	12	334	16	61	135	0.154	170	29	94	154	0.112
2544.9	12	330	17	62	136	0.247	171	31	95	156	0.180
2545.6	11	330	14	56	121	0.067	155	26	86	138	0.049
2546.3	9.4	312	16	59	132	0.074	136	29	90	151	0.054
2547.0	9.1	313	18	56	128	0.071	131	32	85	146	0.052
2547.7	11	318	18	70	137	0.080	154	33	107	157	0.058
2548.4	10	303	19	65	126	0.235	149	34	99	144	0.172
2549.1	8.4	283	18	60	124	0.006	122	32	92	142	0.004
2549.8	7.7	336	21	64	137	0.006	111	39	98	157	0.004
2550.5	8.6	293	22	70	133	0.006	124	41	107	152	0.004
2551.2	7.2	299	20	75	133	0.153	104	37	115	152	0.112
2551.9	6.9	270	20	75	134	0.006	99	37	115	154	0.004
2552.6	7.3	244	20	70	121	0.217	105	36	107	139	0.158
2553.3	7.4	272	22	69	146	0.163	107	40	105	167	0.119
2554.0	7.1	279	20	79	145	0.251	102	36	121	166	0.183
2554.7	5.0	291	23	98	143	0.082	72	42	150	164	0.060
2555.4	5.8	274	23	77	131	0.154	84	41	118	150	0.112
2556.1	5.0	234	21	78	124	0.146	73	39	120	142	0.106
2556.8	5.0	268	23	82	124	0.076	72	42	126	141	0.056
2557.5	4.9	283	22	83	122	0.163	71	39	127	139	0.119
2558.2	4.2	270	21	80	132	0.077	60	38	123	151	0.056
2558.9	3.9	247	21	77	113	0.068	56	38	119	129	0.050
2559.6	4.1	254	23	79	131	0.006	60	41	121	150	0.004
2560.3	4.4	254	24	95	132	0.006	63	44	146	151	0.004
2561.0	4.8	288	23	95	144	0.340	69	42	145	165	0.248
2561.7	2.7	232	19	86	121	0.508	39	35	132	138	0.371
2562.4	3.3	238	20	91	125	0.217	48	37	140	143	0.159
2563.1	4.3	249	22	96	129	0.234	62	39	147	147	0.171
2563.8	3.8	286	23	98	139	0.493	55	42	150	159	0.360
2564.5	3.8	265	22	108	127	0.226	54	40	165	145	0.165
2565.2	3.9	246	20	91	113	0.370	56	37	140	130	0.270
2565.9	4.1	244	20	93	131	0.427	59	36	142	149	0.311
2566.6	3.3	268	21	104	123	0.232	48	39	160	141	0.169
2567.3	4.3	285	20	99	127	0.076	62	36	152	145	0.056
2568.0	3.4	298	19	111	128	0.006	49	35	171	146	0.004
2568.7	2.8	260	17	95	130	0.229	41	31	146	149	0.167
2569.3	2.9	250	17	87	126	0.006	42	32	133	144	0.004
2570.0	3.5	269	18	93	123	0.150	51	33	142	141	0.109
2570.7	3.6	328	19	103	129	0.246	52	34	158	148	0.180
2571.4	3.1	276	17	108	133	0.380	45	30	165	152	0.277
2572.1	3.6	262	18	90	116	0.069	52	33	137	132	0.051
2572.8	3.6	299	19	94	130	0.160	52	35	144	149	0.116
2573.5	4.2	308	20	94	121	0.475	60	36	145	139	0.346
2574.2	3.6	310	18	102	125	0.158	52	33	156	143	0.115
2574.9	3.5	282	17	86	118	0.006	51	31	132	135	0.004
2575.6	3.7	285	17	93	136	0.388	54	31	143	155	0.283
2576.3	2.9	316	19	89	135	0.483	42	34	137	155	0.352
2577.0	4.4	302	19	97	120	0.156	63	34	148	137	0.114
2577.7	2.8	315	19	105	121	0.006	40	35	161	138	0.004
2578.4	3.9	294	17	101	134	0.078	56	31	156	153	0.057
2579.1	3.8	281	18	97	118	0.307	55	34	149	135	0.224
2579.8	3.5	311	18	92	117	0.078	50	34	141	133	0.057
2580.5	3.5	318	20	103	118	0.250	50	36	157	135	0.183
2581.2	3.4	303	17	101	116	0.415	50	31	155	133	0.303
2581.9	2.4	285	17	89	113	0.155	34	31	137	130	0.113
2582.6	2.6	266	18	89	104	0.073	38	33	136	119	0.053
2583.3	2.8	293	17	78	111	0.304	41	31	120	127	0.222
2584.0	3.8	341	17	93	99	0.006	55	31	142	114	0.004
2584.7	2.9	281	17	88	101	0.215	42	31	134	116	0.157
2585.4	2.4	268	15	79	94	0.284	35	28	121	107	0.207
2586.1	3.4	298	18	78	89	0.369	49	32	119	101	0.269
2586.8	2.5	316	17	80	91	0.077	37	31	123	104	0.056
2587.5	2.9	312	17	92	89	0.166	42	31	141	102	0.121
2588.2	2.3	283	18	88	86	0.394	34	33	135	98	0.288
2588.9	2.5	270	15	78	80	0.294	36	27	119	92	0.214
2589.6	2.9	305	14	83	77	0.156	41	26	128	88	0.114
2590.3	2.8	322	16	92	75	0.420	40	29	142	86	0.306
2591.0	2.6	308	14	93	72	0.160	37	25	142	83	0.117
2591.7	2.1	298	13	90	63	0.154	31	23	137	72	0.113
2592.4	2.0	265	13	76	75	0.457	29	24	117	86	0.334
2593.1	2.8	297	14	86	71	0.006	40	26	132	81	0.004
2593.8	2.9	307	13	92	62	0.228	42	23	141	71	0.166
2594.5	2.0	308	12	107	70	0.153	28	21	164	80	0.112
2595.2	2.3	289	13	103	59	0.070	33	23	158	68	0.051
2595.8	3.0	293	13	110	61	0.231	43	23	168	70	0.169
2596.5	3.5	306	14	126	57	0.328	51	25	193	66	0.240
2597.2	4.1	342	12	122	56	0.006	59	22	187	64	0.004
2597.9	6.2	301	12	144	55	0.158	89	23	221	63	0.115



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2598.6	7.1	263	13	122	55	0.428	102	24	187	63	0.312
2599.3	12	295	14	144	62	0.152	168	25	221	71	0.111
2600.0	12	332	14	157	59	0.402	180	26	241	67	0.294
2600.7	13	340	12	150	59	0.396	194	23	230	67	0.289
2601.4	12	283	13	148	55	0.287	179	24	227	63	0.209
2602.1	15	311	12	140	62	0.143	218	23	214	71	0.104
2602.8	18	303	14	142	65	0.232	254	26	218	75	0.169
2603.5	16	335	16	154	67	0.326	237	30	237	76	0.238
2604.2	17	324	14	156	64	0.228	246	26	239	74	0.166
2604.9	17	305	15	141	67	0.069	243	27	217	77	0.051
2605.6	19	313	15	133	76	0.073	281	28	203	87	0.053
2606.3	21	334	17	148	78	0.409	310	31	227	89	0.298
2607.0	18	318	15	123	70	0.217	254	28	188	80	0.159
2607.7	17	332	15	133	77	0.145	252	28	204	88	0.106
2608.4	18	340	15	134	76	0.289	258	28	206	87	0.211
2609.1	18	317	16	126	89	0.072	266	30	194	102	0.053
2609.8	22	346	18	120	83	0.006	314	33	184	95	0.004
2610.5	23	391	18	132	92	0.160	328	33	203	105	0.117
2611.2	18	334	17	107	84	0.070	265	31	165	96	0.051
2611.9	18	326	17	94	87	0.366	266	30	144	99	0.267
2612.6	19	340	20	100	105	0.308	274	36	154	120	0.225
2613.3	20	393	19	98	95	0.390	296	35	150	109	0.284
2614.0	17	376	19	106	109	0.155	243	34	162	125	0.113
2614.7	19	390	19	90	106	0.152	280	35	138	122	0.111
2615.4	17	342	18	82	104	0.215	249	32	125	119	0.157
2616.1	15	340	17	77	108	0.274	215	32	118	123	0.200
2616.8	14	365	17	74	110	0.215	208	31	113	125	0.157
2617.5	15	427	17	87	110	0.230	210	31	133	126	0.168
2618.2	12	360	16	78	115	0.284	177	30	119	132	0.207
2618.9	15	368	20	79	130	0.006	215	36	122	149	0.004
2619.6	16	399	23	92	148	0.239	228	42	141	169	0.174
2620.3	15	449	20	78	123	0.217	216	37	120	141	0.159
2621.0	13	381	21	89	132	0.300	189	38	136	151	0.219
2621.7	14	379	21	76	134	0.152	203	39	117	154	0.111
2622.3	15	405	23	71	146	0.311	219	42	109	167	0.227
2623.0	14	412	25	81	148	0.160	203	45	125	169	0.117
2623.7	14	408	25	81	153	0.243	202	46	124	175	0.177
2624.4	14	417	29	91	151	0.318	196	52	139	172	0.232
2625.1	13	388	28	76	147	0.006	183	50	116	168	0.004
2625.8	14	421	33	79	156	0.078	198	60	120	178	0.057
2626.5	13	426	29	77	157	0.158	193	53	118	180	0.115
2627.2	12	407	29	85	154	0.245	173	54	131	176	0.179
2627.9	12	436	29	80	153	0.242	175	52	123	174	0.176
2628.6	12	373	31	72	164	0.391	175	57	110	188	0.285
2629.3	14	418	35	74	156	0.074	198	64	113	178	0.054
2630.0	14	416	37	82	152	0.006	204	67	125	173	0.004
2630.7	14	445	34	80	157	0.155	204	63	123	179	0.113
2631.4	12	392	35	82	167	0.237	173	63	126	191	0.173
2632.1	11	383	33	75	161	0.223	160	60	115	184	0.162
2632.8	13	431	38	87	191	0.505	193	69	133	218	0.369
2633.5	12	411	34	85	166	0.249	167	62	130	189	0.181
2634.2	11	406	31	79	154	0.159	152	56	121	176	0.116
2634.9	9.0	339	31	63	144	0.337	130	57	96	164	0.246
2635.6	10	392	33	73	178	0.163	151	61	112	203	0.119
2636.3	11	410	36	75	194	0.335	166	66	116	222	0.244
2637.0	12	411	32	83	192	0.316	169	58	128	219	0.230
2637.7	9.4	376	31	78	150	0.075	136	57	119	172	0.054
2638.4	9.7	359	34	67	156	0.219	140	61	103	178	0.160
2639.1	11	384	33	71	170	0.380	161	60	109	195	0.277
2639.8	13	425	35	68	171	0.309	188	63	104	195	0.226
2640.5	11	428	35	82	177	0.322	160	64	125	203	0.235
2641.2	10	367	33	69	158	0.230	149	60	106	181	0.168
2641.9	11	374	37	74	176	0.322	156	67	114	202	0.235
2642.6	13	361	41	69	169	0.233	191	75	105	193	0.170
2643.3	12	402	38	76	183	0.328	178	70	117	209	0.239
2644.0	11	388	40	80	173	0.152	156	73	122	198	0.111
2644.7	11	354	37	67	155	0.211	155	67	103	178	0.154
2645.4	11	377	36	79	181	0.293	158	66	121	207	0.214
2646.1	13	389	37	69	168	0.215	183	67	106	192	0.157
2646.8	12	419	37	82	183	0.410	175	67	125	209	0.299
2647.5	11	419	36	76	166	0.318	164	66	117	190	0.232
2648.1	12	376	31	67	166	0.300	175	57	103	190	0.219
2648.8	14	381	34	76	173	0.482	198	61	116	198	0.352
2649.5	17	414	37	83	175	0.482	246	67	127	200	0.352
2650.2	16	423	34	84	190	0.241	225	62	129	218	0.176
2650.9	12	351	34	77	141	0.221	176	61	118	162	0.161
2651.6	10	333	31	76	152	0.368	145	56	116	174	0.268
2652.3	11	362	33	74	167	0.151	155	59	113	191	0.110
2653.0	13	420	34	81	175	0.247	181	62	124	200	0.180
2653.7	10	401	36	77	166	0.160	147	65	119	190	0.117
2654.4	10	365	31	82	160	0.294	150	57	125	183	0.214



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2655.1	8.2	329	33	65	155	0.496	118	59	99	178	0.362
2655.8	8.7	379	31	73	158	0.746	125	56	111	180	0.545
2656.5	9.7	393	32	77	176	0.557	139	58	117	201	0.406
2657.2	8.4	430	31	76	165	0.421	122	56	116	188	0.307
2657.9	6.8	417	28	69	142	0.073	98	51	106	163	0.054
2658.6	6.8	348	27	65	144	0.142	99	49	99	165	0.104
2659.3	6.5	394	32	74	143	0.231	94	57	113	164	0.169
2660.0	8.0	438	30	86	155	0.744	116	56	132	178	0.543
2660.7	7.3	406	28	80	149	0.078	105	51	123	170	0.057
2661.4	6.2	380	27	71	129	0.439	90	49	108	148	0.320
2662.1	5.3	399	27	63	137	0.286	76	48	97	157	0.209
2662.8	6.1	446	24	72	142	0.478	88	44	110	162	0.349
2663.5	5.5	427	26	77	146	0.801	79	47	118	167	0.585
2664.2	4.2	413	27	72	135	0.237	61	49	110	155	0.173
2664.9	4.9	402	24	69	123	0.279	71	44	106	140	0.203
2665.6	5.5	410	28	74	134	0.304	79	50	113	154	0.222
2666.3	7.2	470	27	73	118	0.231	104	50	113	135	0.169
2667.0	6.2	430	23	77	122	0.465	89	43	118	140	0.339
2667.7	5.8	435	24	86	127	0.158	83	44	132	145	0.115
2668.4	6.6	389	23	76	122	0.068	95	41	117	140	0.049
2669.1	6.4	397	25	76	117	0.209	93	45	116	134	0.153
2669.8	5.2	460	23	82	119	0.517	75	42	125	136	0.377
2670.5	6.3	461	25	86	122	0.309	92	46	132	139	0.225
2671.2	6.5	398	24	85	125	0.073	94	44	131	143	0.054
2671.9	5.5	385	20	73	118	0.068	80	36	112	134	0.050
2672.6	6.7	425	22	84	125	0.611	97	40	128	143	0.446
2673.3	7.1	463	21	92	121	0.151	102	37	141	138	0.110
2674.0	5.7	427	20	87	120	0.222	82	37	133	137	0.162
2674.6	7.2	443	23	87	128	0.390	104	41	134	146	0.284
2675.3	6.4	425	24	93	127	0.512	92	44	143	145	0.374
2676.0	8.2	477	22	94	143	0.151	119	41	144	163	0.110
2676.7	7.2	494	21	101	158	0.154	104	38	155	181	0.113
2677.4	6.2	496	19	90	140	0.155	89	35	138	160	0.113
2678.1	5.4	437	20	86	125	0.288	79	36	132	143	0.210
2678.8	6.0	513	24	99	151	0.163	87	43	152	173	0.119
2679.5	6.3	487	23	101	138	0.078	91	41	155	158	0.057
2680.2	5.2	462	22	109	129	0.071	76	40	167	147	0.052
2680.9	5.1	441	21	101	134	0.412	73	38	154	153	0.300
2681.6	5.7	496	24	95	140	0.220	83	43	146	160	0.160
2682.3	4.9	527	23	113	163	0.396	71	43	174	187	0.289
2683.0	4.7	523	23	101	142	0.206	68	42	155	162	0.150
2683.7	3.9	522	21	99	128	0.068	57	39	152	146	0.050
2684.4	3.5	480	21	97	139	0.006	50	38	149	159	0.004
2685.1	3.5	462	22	91	137	0.281	51	39	140	156	0.205
2685.8	3.9	435	23	91	134	0.386	56	43	140	153	0.282
2686.5	4.1	544	23	98	136	0.373	59	42	150	155	0.272
2687.2	2.6	490	20	87	122	0.347	38	37	134	140	0.253
2687.9	2.8	486	23	94	152	0.394	40	43	144	174	0.287
2688.6	3.5	518	25	92	152	0.853	51	46	140	174	0.622
2689.3	2.5	538	23	92	148	0.232	36	41	141	170	0.169
2690.0	2.6	500	25	101	151	0.152	38	45	154	172	0.111
2690.7	3.6	502	24	97	149	0.472	52	43	149	170	0.344
2691.4	2.8	474	22	95	146	0.221	40	41	146	167	0.161
2692.1	2.8	482	25	90	157	0.398	40	46	138	180	0.291
2692.8	2.3	462	21	86	133	0.290	34	39	132	152	0.211
2693.5	3.3	508	25	110	147	0.163	48	45	169	168	0.119
2694.2	2.4	473	22	97	143	0.310	34	41	149	164	0.226
2694.9	3.2	474	21	95	153	0.154	46	38	146	175	0.112
2695.6	2.3	422	21	90	155	0.297	33	39	139	178	0.217
2696.3	2.8	515	21	88	146	0.421	40	38	134	167	0.307
2697.0	2.3	566	20	96	146	0.253	33	36	147	167	0.185
2697.7	2.4	429	17	76	118	0.287	35	32	116	135	0.209
2698.4	2.4	465	19	79	135	0.145	35	35	121	155	0.105
2699.1	2.6	520	20	79	144	0.315	37	37	122	165	0.230
2699.8	2.8	545	18	87	135	0.416	41	33	134	155	0.304
2700.5	2.0	472	17	91	122	0.230	28	31	139	139	0.168
2701.1	2.1	448	16	78	122	0.072	30	29	119	139	0.053
2701.8	2.3	453	17	80	113	0.228	33	31	123	129	0.166
2702.5	2.4	486	17	82	120	0.157	34	30	125	137	0.115
2703.2	2.6	543	16	96	116	0.165	37	29	147	132	0.121
2703.9	2.3	470	16	98	115	0.157	33	29	150	132	0.114
2704.6	2.7	435	17	77	102	0.145	39	30	118	117	0.106
2705.3	1.9	424	14	79	102	0.072	27	25	121	117	0.052
2706.0	1.9	484	15	89	111	0.251	27	27	137	127	0.183
2706.7	1.9	501	13	91	114	0.166	28	24	140	130	0.121
2707.4	2.1	461	11	77	85	0.206	30	20	119	97	0.150
2708.1	1.8	377	10	79	104	0.311	25	18	121	119	0.227
2708.8	2.7	449	9.5	74	85	0.291	39	17	114	97	0.213
2709.5	2.4	422	9.7	76	86	0.154	35	18	116	99	0.112
2710.2	2.2	438	9.3	77	89	0.074	31	17	118	102	0.054
2710.9	2.6	449	7.8	83	100	0.315	37	14	127	114	0.229



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2711.6	2.4	395	9.0	68	77	0.279	34	16	105	88	0.203
2712.3	1.9	433	9.7	79	95	0.330	27	18	121	108	0.240
2713.0	2.8	444	9.9	85	90	0.327	41	18	131	103	0.239
2713.7	2.8	419	8.5	77	92	0.384	40	16	118	105	0.280
2714.4	2.6	379	8.3	80	88	0.524	37	15	122	101	0.382
2715.1	2.6	410	7.7	74	88	0.301	37	14	114	101	0.220
2715.8	2.4	388	7.7	71	81	0.225	34	14	109	92	0.164
2716.5	2.0	432	7.9	81	84	0.244	29	14	125	96	0.178
2717.2	2.2	399	7.2	80	78	0.156	32	13	122	89	0.114
2717.9	2.5	372	7.2	70	77	0.006	36	13	107	88	0.004
2718.6	2.2	368	6.6	77	87	0.153	32	12	117	100	0.111
2719.3	2.7	437	6.9	77	78	0.155	39	13	118	89	0.113
2720.0	1.7	388	6.8	81	79	0.469	25	12	124	91	0.342
2720.7	1.3	389	6.1	70	78	0.305	19	11	107	89	0.223
2721.4	1.9	437	5.9	70	77	0.290	27	11	107	88	0.211
2722.1	3.1	396	5.8	80	78	0.155	45	10	123	89	0.113
2722.8	3.0	405	7.4	73	72	0.238	43	13	112	83	0.174
2723.5	2.4	367	6.1	84	72	0.305	34	11	129	82	0.222
2724.2	2.2	350	6.6	73	74	0.071	32	12	111	85	0.052
2724.9	3.1	342	6.5	78	80	0.228	44	12	119	91	0.166
2725.6	2.6	377	6.8	88	83	0.237	38	12	135	95	0.173
2726.3	2.2	382	6.3	96	79	0.006	32	12	148	90	0.004
2727.0	3.4	375	6.2	97	74	0.393	50	11	148	85	0.287
2727.6	2.4	352	6.9	100	77	0.396	35	13	154	88	0.289
2728.3	2.6	340	6.2	98	80	0.536	38	11	149	92	0.391
2729.0	2.8	376	7.0	102	73	0.152	40	13	156	83	0.111
2729.7	2.7	363	6.6	109	70	0.152	39	12	166	80	0.111
2730.4	2.9	335	7.2	101	75	0.075	43	13	155	86	0.055
2731.1	2.7	345	6.0	103	67	0.374	39	11	157	77	0.273
2731.8	2.1	298	6.6	91	66	0.068	31	12	139	76	0.049
2732.5	4.0	347	6.0	92	68	0.447	58	11	140	78	0.326
2733.2	3.9	367	6.4	96	70	0.155	56	12	147	80	0.113
2733.9	3.3	324	5.6	86	68	0.006	47	10	131	78	0.004
2734.6	2.8	294	5.0	79	66	0.006	41	9.1	121	75	0.004
2735.3	2.3	305	5.5	71	66	0.142	33	10.0	109	75	0.103
2736.0	1.9	302	5.3	76	62	0.292	27	9.7	116	71	0.213
2736.7	2.9	317	4.9	72	67	0.149	42	8.9	111	76	0.109
2737.4	3.3	319	5.5	73	66	0.078	47	10	112	76	0.057
2738.1	3.3	292	5.4	78	67	0.148	47	9.9	119	76	0.108
2738.8	4.1	346	7.2	84	72	0.237	60	13	128	82	0.173
2739.5	3.5	330	7.2	96	66	0.079	51	13	146	76	0.058
2740.2	3.3	327	9.0	116	69	0.315	48	16	178	79	0.230
2740.9	4.1	298	11	115	64	0.075	59	20	176	73	0.055
2741.6	4.1	284	15	140	64	0.073	60	27	214	74	0.053
2742.3	6.8	321	20	162	67	0.463	99	37	248	77	0.338
2743.0	9.4	330	27	213	71	0.153	135	49	327	81	0.112
2743.7	8.6	295	32	206	73	0.149	124	58	315	83	0.109
2744.4	13	303	45	221	79	0.006	186	81	339	91	0.004
2745.1	13	308	54	242	105	0.006	192	99	370	120	0.004
2745.8	13	351	54	257	86	0.149	183	98	394	98	0.109
2746.5	12	363	56	274	87	0.076	179	102	420	99	0.055
2747.2	11	352	63	272	99	0.006	158	115	417	113	0.004
2747.9	13	345	61	240	102	0.071	182	111	368	116	0.052
2748.6	14	407	69	265	113	0.154	205	126	407	129	0.112
2749.3	12	381	72	263	114	0.151	177	131	403	131	0.110
2750.0	11	381	70	303	123	0.326	163	128	465	140	0.238
2750.7	9.3	364	66	255	118	0.302	134	120	391	135	0.221
2751.4	9.1	367	71	257	121	0.152	132	130	395	139	0.111
2752.1	10	357	71	293	125	0.074	151	129	450	143	0.054
2752.8	9.5	428	70	267	125	0.157	137	127	408	143	0.115
2753.5	9.2	390	67	274	125	0.006	133	122	420	143	0.004
2754.2	7.9	371	64	269	120	0.149	115	117	412	137	0.109
2754.8	8.2	396	68	269	129	0.530	119	124	412	147	0.387
2755.5	8.6	399	71	299	135	0.417	124	130	458	155	0.304
2756.2	6.6	342	66	311	124	0.355	95	121	477	142	0.259
2756.9	7.5	392	62	308	134	0.306	109	112	472	153	0.223
2757.6	8.0	437	59	326	132	0.404	116	107	499	151	0.294
2758.3	5.5	369	56	297	117	0.214	80	103	455	134	0.156
2759.0	6.8	383	55	309	118	0.235	98	100	474	134	0.171
2759.7	5.4	442	50	330	110	0.146	77	91	506	125	0.106
2760.4	5.3	395	49	337	112	0.153	76	90	516	128	0.111
2761.1	4.3	375	47	327	111	0.006	62	86	500	127	0.004
2761.8	4.1	381	44	308	100	0.365	59	80	472	115	0.266
2762.5	4.4	419	41	346	98	0.384	63	75	530	112	0.280
2763.2	3.2	420	36	367	91	0.230	47	66	563	105	0.168
2763.9	3.0	389	31	329	89	0.220	43	56	505	102	0.160
2764.6	2.3	391	29	297	74	0.140	33	52	455	84	0.102
2765.3	3.3	411	29	317	81	0.079	47	53	485	93	0.058
2766.0	3.3	388	29	318	80	0.322	48	54	488	91	0.235
2766.7	2.7	415	27	310	70	0.076	40	48	475	80	0.056
2767.4	2.9	389	25	285	73	0.305	42	46	437	83	0.223



Minnow Environmental  
Sample ID: 003

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2768.1	3.1	365	23	290	72	0.143	44	41	445	82	0.104
2768.8	3.7	416	22	296	67	0.455	53	41	454	76	0.332
2769.5	4.1	419	22	292	69	0.226	59	39	447	79	0.165
2770.2	3.7	420	21	282	67	0.375	53	38	433	76	0.274
2770.9	3.3	379	24	252	58	0.141	48	43	387	66	0.103
2771.6	3.6	375	22	256	67	0.286	51	40	392	76	0.208
2772.3	2.9	422	25	242	70	0.006	42	45	371	80	0.004
2773.0	3.6	437	23	296	77	0.006	52	41	454	88	0.004
2773.7	3.4	419	25	276	61	0.006	49	46	423	70	0.004
2774.4	3.2	405	25	243	64	0.131	46	45	372	74	0.096
2775.1	3.4	439	30	298	74	0.071	49	54	457	85	0.052
2775.8	4.1	483	30	286	72	0.366	60	55	438	83	0.267
2776.5	4.3	511	31	300	75	0.306	62	56	460	86	0.223
2777.2	3.2	534	31	250	73	0.073	46	56	383	83	0.053
2777.9	4.0	524	27	258	81	0.079	57	49	395	92	0.058
2778.6	3.5	480	31	242	70	0.150	50	56	372	80	0.110
2779.3	3.5	489	30	229	66	0.234	51	54	351	75	0.170
2780.0	3.5	489	33	234	67	0.078	50	60	359	77	0.057
2780.7	3.4	533	32	262	67	0.275	49	59	401	77	0.201
2781.3	3.4	496	30	230	69	0.186	49	55	352	79	0.135
2782.0	1.6	595	35	257	84	0.442	23	64	394	96	0.322
2782.7	4.5	601	39	257	80	0.218	66	71	394	91	0.159
2783.4	3.1	535	37	225	76	0.097	44	67	345	87	0.071
2784.1	3.4	536	37	231	71	0.205	49	67	353	81	0.149
2784.8	3.5	553	35	216	65	0.096	51	63	331	75	0.070
2785.5	3.1	569	38	211	76	0.628	45	70	324	87	0.458
2786.2	3.2	514	36	201	75	0.207	47	65	308	86	0.151
2786.9	4.8	599	44	212	78	0.366	69	80	325	90	0.267
2787.6	2.6	619	39	228	77	0.124	38	71	349	88	0.091
2788.3	4.2	601	39	231	75	0.136	61	71	354	86	0.099
2789.0	4.1	577	37	219	66	0.281	60	68	336	76	0.205
2789.7	3.9	610	36	234	69	0.298	57	65	359	78	0.217
2790.4	3.8	652	39	239	75	0.006	54	71	367	86	0.004
2791.1	3.9	652	34	227	70	0.174	56	62	348	80	0.127
2791.8	4.6	708	40	234	80	0.006	67	72	358	92	0.004
2792.5	3.9	644	41	228	105	0.207	56	75	349	120	0.151
2793.2	3.1	675	41	249	79	0.447	45	76	382	90	0.326
2793.9	3.2	678	38	301	70	0.270	46	70	461	81	0.197
2794.6	3.1	674	43	284	87	0.671	44	79	435	100	0.489



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
0.1	0.535	22	1.0	28	361	4.6	7.7	1.8	43	413	3.4
0.8	0.495	21	1.5	23	366	3.7	7.1	2.7	35	419	2.7
1.5	0.981	23	1.2	25	349	2.9	14	2.2	38	399	2.1
2.2	0.534	23	1.4	22	344	4.5	7.7	2.6	34	393	3.3
2.9	0.763	25	1.7	27	364	4.2	11	3.0	41	416	3.1
3.6	1.1	23	1.6	22	327	3.7	16	3.0	33	374	2.7
4.3	0.554	20	1.2	21	338	3.4	8.0	2.2	33	386	2.5
5.0	0.585	22	1.3	25	324	4.2	8.4	2.4	38	371	3.0
5.7	0.791	25	1.7	25	348	4.3	11	3.2	38	398	3.1
6.4	0.752	23	1.4	23	321	4.2	11	2.5	36	367	3.1
7.1	0.572	25	1.3	28	327	3.7	8.3	2.3	43	374	2.7
7.8	0.421	23	1.3	21	316	3.2	6.1	2.3	31	361	2.3
8.5	0.791	21	1.4	23	341	4.1	11	2.5	35	390	3.0
9.2	0.788	22	1.4	24	326	4.3	11	2.5	36	373	3.1
9.9	0.785	22	1.7	23	334	4.5	11	3.1	35	382	3.3
10.6	0.716	22	1.1	24	322	3.2	10	2.0	37	368	2.3
11.3	1.1	23	1.6	22	322	3.4	16	2.9	33	368	2.5
12.0	0.516	23	1.5	25	363	4.6	7.4	2.7	39	415	3.3
12.7	0.285	23	1.6	26	298	4.3	4.1	3.0	40	341	3.2
13.4	0.434	21	1.2	23	280	3.4	6.3	2.1	35	321	2.4
14.1	0.604	21	1.2	25	318	2.6	8.7	2.2	39	364	1.9
14.8	0.424	22	1.6	28	361	4.6	6.1	2.9	42	413	3.4
15.5	0.757	23	1.3	25	349	3.9	11	2.5	38	399	2.8
16.1	0.315	25	1.4	23	343	5.4	4.5	2.5	35	393	3.9
16.8	0.543	22	1.2	22	338	3.3	7.8	2.2	33	387	2.4
17.5	0.718	20	1.4	23	355	3.1	10	2.6	35	406	2.3
18.2	1.1	22	1.4	22	337	3.0	15	2.6	34	385	2.2
18.9	0.564	21	1.5	24	345	3.3	8.1	2.7	36	395	2.4
19.6	0.588	26	1.5	29	353	3.5	8.5	2.7	44	404	2.6
20.3	0.272	23	1.4	28	348	3.3	3.9	2.5	43	398	2.4
21.0	0.615	23	1.5	24	344	3.9	8.9	2.8	36	393	2.8
21.7	0.880	24	1.6	26	372	4.0	13	2.9	40	426	2.9
22.4	0.274	27	1.4	25	342	3.9	4.0	2.6	39	391	2.9
23.1	0.470	22	1.0	25	340	4.3	6.8	1.9	38	389	3.1
23.8	0.647	20	1.5	25	309	4.1	9.3	2.7	38	353	3.0
24.5	0.578	20	1.3	24	317	3.3	8.3	2.3	36	363	2.4
25.2	1.1	20	1.5	28	327	3.7	15	2.7	43	373	2.7
25.9	0.852	23	1.5	26	349	4.0	12	2.7	40	399	2.9
26.6	0.593	22	1.7	27	356	3.5	8.6	3.1	41	407	2.6
27.3	0.516	21	1.2	20	334	4.0	7.4	2.3	31	382	2.9
28.0	0.276	22	1.4	23	358	3.8	4.0	2.5	35	410	2.7
28.7	0.512	23	1.5	26	349	3.2	7.4	2.7	40	400	2.4
29.4	0.428	25	1.3	24	383	4.9	6.2	2.4	37	439	3.5
30.1	0.433	24	1.3	24	335	4.6	6.3	2.4	38	383	3.4
30.8	0.847	22	1.2	23	330	4.0	12	2.3	35	377	2.9
31.5	0.755	23	1.6	25	328	3.9	11	2.9	39	375	2.9
32.2	0.314	25	1.3	24	347	3.6	4.5	2.5	36	397	2.6
32.9	0.356	22	1.3	26	337	2.5	5.1	2.4	40	385	1.9
33.6	0.388	23	1.7	24	312	3.8	5.6	3.0	36	357	2.8
34.3	0.828	24	1.4	23	316	4.5	12	2.6	35	362	3.3
35.0	0.820	21	1.3	24	345	4.7	12	2.4	36	395	3.4
35.7	0.638	22	1.4	25	324	2.9	9.2	2.5	39	371	2.1
36.4	0.302	22	1.3	23	268	3.4	4.4	2.4	36	307	2.4
37.1	0.566	22	1.4	25	361	4.0	8.2	2.6	38	413	2.9
37.8	0.739	22	1.4	23	306	4.5	11	2.5	36	350	3.3
38.5	0.581	24	1.3	26	342	4.0	8.4	2.4	39	391	2.9
39.2	0.562	24	1.3	25	350	4.1	8.1	2.4	39	400	3.0
39.9	1.2	24	0.951	28	335	4.5	17	1.7	43	383	3.3
40.6	0.514	22	1.5	25	368	3.7	7.4	2.8	39	420	2.7
41.3	0.714	21	1.5	26	353	4.1	10	2.7	40	404	3.0
41.9	1.0	22	1.3	26	329	3.9	15	2.4	40	377	2.9
42.6	0.626	21	1.3	28	323	5.0	9.0	2.3	42	370	3.6
43.3	0.478	20	1.1	29	313	4.1	6.9	2.0	45	358	3.0
44.0	0.859	20	1.3	26	308	4.1	12	2.4	39	352	3.0
44.7	1.1	20	1.3	27	338	4.1	16	2.4	41	386	3.0
45.4	0.991	21	1.2	28	317	3.4	14	2.1	43	362	2.5
46.1	1.0	22	0.996	29	327	4.3	15	1.8	44	374	3.1
46.8	0.581	20	1.4	26	313	3.6	8.4	2.6	39	357	2.6
47.5	0.892	19	1.3	32	344	4.6	13	2.4	49	393	3.3
48.2	0.642	19	1.1	29	317	3.6	9.3	2.0	45	363	2.7
48.9	0.658	22	1.9	30	320	4.3	9.5	3.5	46	366	3.2
49.6	0.836	21	1.5	31	342	4.0	12	2.7	48	391	2.9
50.3	0.512	18	1.2	28	282	4.2	7.4	2.2	43	322	3.1
51.0	0.988	18	1.3	27	323	3.9	14	2.4	42	369	2.9
51.7	0.767	19	1.4	26	309	3.7	11	2.6	39	353	2.7
52.4	0.388	20	1.3	29	300	3.3	5.6	2.3	45	343	2.4
53.1	0.563	19	1.1	33	302	4.2	8.1	2.0	51	346	3.0
53.8	0.766	21	1.3	29	319	3.9	11	2.4	45	364	2.8
54.5	0.987	16	1.1	28	306	3.2	14	1.9	43	350	2.3
55.2	1.2	22	1.2	37	357	4.9	18	2.3	57	408	3.6
55.9	0.269	23	1.5	31	301	5.6	3.9	2.7	47	344	4.1



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Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
56.6	0.617	19	1.2	32	290	4.1	8.9	2.3	50	331	3.0
57.3	0.748	18	1.2	31	319	4.6	11	2.2	48	365	3.4
58.0	1.1	17	1.2	28	312	4.1	15	2.2	43	357	3.0
58.7	0.951	22	1.3	33	312	3.9	14	2.3	51	357	2.8
59.4	0.381	18	1.2	38	286	3.8	5.5	2.1	58	327	2.8
60.1	0.677	17	1.3	29	279	3.9	9.8	2.4	45	319	2.8
60.8	0.434	17	1.2	31	340	3.7	6.3	2.2	47	388	2.7
61.5	0.481	21	1.4	37	332	4.2	6.9	2.5	57	379	3.1
62.2	0.802	19	1.1	36	304	3.5	12	2.1	55	348	2.5
62.9	0.938	18	1.2	35	277	3.6	14	2.2	54	317	2.6
63.6	0.481	18	1.0	32	274	4.0	6.9	1.8	48	313	2.9
64.3	0.647	15	1.6	41	308	5.7	9.3	2.9	64	353	4.2
65.0	0.665	20	1.4	42	360	4.7	9.6	2.6	64	412	3.5
65.7	0.741	22	1.1	38	285	4.1	11	2.0	59	326	3.0
66.4	0.353	17	0.907	37	326	4.2	5.1	1.7	57	373	3.0
67.1	0.341	17	0.955	31	231	2.9	4.9	1.7	48	264	2.1
67.8	0.585	18	1.2	31	292	3.3	8.5	2.3	47	334	2.4
68.4	0.819	20	1.8	37	331	4.7	12	3.3	57	379	3.5
69.1	1.4	20	1.2	45	310	4.3	20	2.3	68	355	3.2
69.8	0.569	15	1.4	36	266	3.0	8.2	2.5	56	305	2.2
70.5	0.571	15	0.984	35	258	2.7	8.2	1.8	54	295	2.0
71.2	0.925	19	1.4	38	272	5.6	13	2.5	59	312	4.1
71.9	0.548	18	1.2	31	271	4.5	7.9	2.2	48	310	3.2
72.6	0.269	19	1.0	39	309	3.9	3.9	1.9	59	353	2.8
73.3	0.360	15	1.0	38	397	4.7	5.2	1.8	59	454	3.4
74.0	0.789	17	1.2	32	282	2.8	11	2.1	48	322	2.1
74.7	0.926	21	1.3	41	315	4.2	13	2.4	62	360	3.1
75.4	0.635	21	1.1	40	287	3.9	9.2	2.0	61	329	2.8
76.1	0.518	18	1.1	38	289	3.1	7.5	2.0	59	331	2.3
76.8	0.816	19	1.2	33	226	2.1	12	2.1	50	258	1.5
77.5	0.325	19	1.1	31	273	3.9	4.7	2.0	47	312	2.9
78.2	0.482	19	1.1	29	270	3.0	7.0	1.9	45	309	2.2
78.9	0.565	21	1.0	38	236	3.4	8.2	1.8	58	270	2.5
79.6	0.592	17	1.0	38	265	3.8	8.6	1.9	59	303	2.8
80.3	0.503	14	0.859	30	237	2.2	7.3	1.6	46	271	1.6
81.0	0.399	17	1.1	30	250	2.7	5.8	2.1	46	286	2.0
81.7	0.436	18	1.3	50	354	3.0	6.3	2.3	77	405	2.2
82.4	0.269	16	1.0	36	287	2.9	3.9	1.9	54	329	2.1
83.1	0.606	13	1.1	32	208	2.1	8.7	1.9	49	238	1.5
83.8	0.397	14	1.0	28	259	2.9	5.7	1.9	43	296	2.1
84.5	0.945	18	1.2	35	330	4.5	14	2.2	54	378	3.3
85.2	0.614	19	1.0	41	262	3.4	8.9	1.9	63	300	2.4
85.9	0.650	13	1.1	34	229	2.1	9.4	1.9	52	262	1.6
86.6	0.342	13	0.717	29	228	2.8	4.9	1.3	44	261	2.1
87.3	0.455	17	1.0	33	288	3.3	6.6	1.9	51	330	2.4
88.0	0.633	20	1.1	39	345	4.1	9.1	2.0	60	394	3.0
88.7	0.631	18	1.1	41	249	3.2	9.1	2.0	62	285	2.3
89.4	0.506	16	0.733	29	209	2.4	7.3	1.3	45	239	1.8
90.1	0.571	14	0.924	33	330	2.3	8.2	1.7	50	377	1.7
90.8	0.691	14	0.904	29	286	2.2	10.0	1.6	45	327	1.6
91.5	0.673	18	1.1	41	319	3.7	9.7	2.1	62	365	2.7
92.2	0.448	18	0.646	36	239	3.5	6.5	1.2	55	273	2.6
92.9	0.269	13	0.742	37	270	3.0	3.9	1.4	57	309	2.2
93.6	0.778	13	0.860	35	282	2.8	11	1.6	53	323	2.0
94.3	0.696	18	0.835	39	343	3.8	10	1.5	60	393	2.8
95.0	0.408	19	0.850	47	318	3.9	5.9	1.6	73	363	2.8
95.6	0.269	18	0.655	34	256	2.2	3.9	1.2	52	293	1.6
96.3	0.718	15	0.561	40	300	3.2	10	1.0	61	343	2.3
97.0	0.616	13	0.963	33	270	2.7	8.9	1.8	51	308	1.9
97.7	0.888	17	0.689	46	268	3.1	13	1.3	70	306	2.2
98.4	0.891	18	0.920	39	250	3.4	13	1.7	60	286	2.5
99.1	0.295	14	0.732	30	192	2.4	4.3	1.3	45	220	1.8
99.8	0.471	13	0.801	33	275	2.8	6.8	1.5	51	314	2.0
100.5	0.481	14	0.601	31	259	3.1	6.9	1.1	48	296	2.3
101.2	1.1	18	1.3	46	308	2.9	16	2.3	70	352	2.1
101.9	0.346	17	0.651	38	250	3.2	5.0	1.2	58	286	2.3
102.6	0.269	14	0.642	39	257	2.2	3.9	1.2	59	294	1.6
103.3	0.269	13	0.985	28	230	2.9	3.9	1.8	43	263	2.1
104.0	0.466	13	0.999	35	290	2.7	6.7	1.8	54	332	2.0
104.7	0.428	15	1.0	43	264	3.9	6.2	1.8	66	302	2.8
105.4	0.602	18	0.699	35	249	3.8	8.7	1.3	54	285	2.7
106.1	0.309	14	0.668	32	237	2.5	4.5	1.2	49	271	1.9
106.8	0.269	12	0.794	29	254	2.7	3.9	1.4	44	290	1.9
107.5	0.789	14	1.1	38	329	3.5	11	2.0	58	376	2.6
108.2	0.639	17	0.758	44	277	5.4	9.2	1.4	67	316	3.9
108.9	0.269	16	0.764	43	263	3.1	3.9	1.4	66	301	2.2
109.6	0.269	12	0.779	36	258	3.0	3.9	1.4	55	295	2.2
110.3	0.455	13	0.713	31	270	3.6	6.6	1.3	47	309	2.6
111.0	0.919	19	0.886	37	292	5.9	13	1.6	57	334	4.3
111.7	0.647	18	0.623	37	246	4.9	9.3	1.1	56	281	3.6
112.4	0.458	13	0.881	33	234	2.9	6.6	1.6	51	267	2.1



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.1	0.424	11	0.823	32	264	4.1	6.1	1.5	50	302	3.0
113.8	0.608	13	0.851	34	221	4.7	8.8	1.6	52	253	3.5
114.5	0.788	19	0.872	43	322	6.0	11	1.6	65	369	4.4
115.2	0.453	18	0.683	40	226	4.2	6.5	1.2	61	258	3.1
115.9	0.886	15	0.770	41	260	5.0	13	1.4	63	298	3.7
116.6	0.624	11	0.758	30	235	4.6	9.0	1.4	46	269	3.4
117.3	0.844	14	0.786	31	272	4.0	12	1.4	48	311	3.0
118.0	0.495	18	0.911	46	290	8.1	7.1	1.7	71	332	5.9
118.7	0.856	14	0.620	31	191	3.2	12	1.1	47	218	2.3
119.4	0.439	9.7	0.621	34	221	3.3	6.3	1.1	52	252	2.4
120.1	0.363	12	0.854	26	271	3.6	5.2	1.6	40	310	2.7
120.8	0.431	14	0.793	32	260	4.1	6.2	1.4	50	297	3.0
121.4	1.0	20	0.855	45	322	7.2	15	1.6	69	369	5.3
122.1	0.368	16	0.499	39	250	3.4	5.3	0.910	60	285	2.5
122.8	0.488	12	0.774	32	258	3.0	7.0	1.4	50	294	2.2
123.5	0.371	13	0.615	29	234	3.2	5.4	1.1	44	267	2.3
124.2	0.719	19	1.3	41	350	5.1	10	2.4	62	400	3.7
124.9	0.691	17	0.892	41	241	4.6	10.0	1.6	63	276	3.3
125.6	0.479	18	1.1	48	240	3.9	6.9	1.9	74	274	2.8
126.3	0.269	10	0.759	29	250	2.9	3.9	1.4	44	286	2.1
127.0	0.558	17	0.755	34	306	4.2	8.1	1.4	52	350	3.1
127.7	0.432	16	0.867	36	204	4.3	6.2	1.6	55	234	3.2
128.4	0.269	16	0.637	37	253	5.0	3.9	1.2	56	290	3.6
129.1	0.487	11	0.813	35	234	3.3	7.0	1.5	53	268	2.4
129.8	0.407	10	0.489	26	233	2.8	5.9	0.893	40	267	2.1
130.5	0.730	12	0.591	27	247	3.3	11	1.1	42	283	2.4
131.2	0.747	18	0.872	34	247	2.9	11	1.6	52	282	2.1
131.9	0.686	17	0.556	38	263	3.0	9.9	1.0	58	300	2.2
132.6	0.642	12	0.670	31	231	2.8	9.3	1.2	47	264	2.0
133.3	0.269	8.6	0.643	24	201	3.1	3.9	1.2	36	229	2.3
134.0	0.444	14	0.752	35	311	4.2	6.4	1.4	54	355	3.1
134.7	0.438	15	0.853	34	229	4.2	6.3	1.6	52	262	3.1
135.4	0.881	14	1.1	36	235	3.9	13	2.0	55	269	2.8
136.1	0.357	12	0.656	38	250	2.9	5.1	1.2	59	286	2.1
136.8	0.269	9.3	0.639	24	224	3.8	3.9	1.2	36	256	2.7
137.5	0.824	13	0.845	34	287	4.1	12	1.5	51	328	3.0
138.2	0.269	12	0.918	34	225	4.4	3.9	1.7	52	258	3.2
138.9	0.436	14	0.596	35	248	3.9	6.3	1.1	53	283	2.8
139.6	0.745	11	0.681	32	250	4.1	11	1.2	50	286	3.0
140.3	0.380	14	0.598	19	236	4.3	5.5	1.1	30	270	3.2
141.0	0.620	15	1.2	36	318	6.4	9.0	2.1	55	364	4.6
141.7	0.488	13	0.753	32	296	6.4	7.0	1.4	49	339	4.7
142.4	0.337	12	0.840	30	255	4.9	4.9	1.5	46	292	3.6
143.1	0.422	10	0.580	26	254	7.1	6.1	1.1	40	291	5.2
143.8	0.269	14	0.726	21	261	8.0	3.9	1.3	33	299	5.8
144.5	0.676	16	1.2	33	302	10	9.8	2.1	51	345	7.5
145.2	0.527	15	0.729	37	234	8.7	7.6	1.3	57	268	6.3
145.9	0.269	9.3	0.833	32	217	9.1	3.9	1.5	49	248	6.7
146.6	0.502	10	1.1	24	216	10.0	7.2	2.1	37	247	7.3
147.2	0.771	13	1.6	33	262	13	11	2.9	50	300	9.5
147.9	0.473	11	1.5	35	260	15	6.8	2.7	54	297	11
148.6	0.289	12	1.2	36	290	11	4.2	2.1	55	332	7.9
149.3	0.269	10	1.4	34	239	11	3.9	2.6	52	273	8.4
150.0	0.611	12	1.4	26	251	13	8.8	2.5	40	287	9.6
150.7	0.361	12	1.7	31	233	14	5.2	3.0	48	266	10
151.4	0.380	14	1.8	37	218	16	5.5	3.2	57	249	12
152.1	0.269	12	1.8	33	225	12	3.9	3.2	50	257	9.0
152.8	0.811	11	2.0	35	234	15	12	3.6	54	268	11
153.5	0.459	12	1.8	34	281	18	6.6	3.3	52	321	13
154.2	0.518	15	2.3	41	292	22	7.5	4.2	64	334	16
154.9	0.276	19	2.1	46	243	20	4.0	3.8	71	278	14
155.6	0.357	12	1.8	40	193	14	5.2	3.2	62	221	10
156.3	0.539	15	1.9	41	291	18	7.8	3.5	62	333	13
157.0	0.796	13	2.2	37	245	17	11	4.0	56	281	12
157.7	0.821	15	2.1	50	258	18	12	3.8	76	295	13
158.4	0.643	15	2.1	42	267	17	9.3	3.8	64	305	13
159.1	0.305	10	1.9	42	259	17	4.4	3.4	64	297	12
159.8	0.692	12	2.1	32	209	14	10.0	3.8	49	239	9.9
160.5	0.889	14	2.2	39	228	17	13	4.0	60	261	12
161.2	0.396	14	2.3	43	259	18	5.7	4.2	66	296	13
161.9	0.739	14	1.9	39	237	15	11	3.5	60	271	11
162.6	0.941	14	2.3	42	282	19	14	4.3	64	323	14
163.3	0.579	13	2.3	39	222	16	8.4	4.2	60	253	12
164.0	0.420	14	2.8	50	334	24	6.1	5.1	77	382	17
164.7	0.547	15	2.5	50	290	27	7.9	4.6	77	331	20
165.4	0.697	14	2.4	45	263	21	10	4.3	70	301	15
166.1	0.831	12	2.7	46	238	18	12	4.9	70	272	13
166.8	0.640	15	2.4	41	246	18	9.2	4.3	63	281	13
167.5	0.902	16	2.3	39	230	19	13	4.2	60	263	14
168.2	0.712	18	2.8	58	382	30	10	5.1	89	436	22
168.9	0.439	17	2.3	42	252	16	6.3	4.2	65	289	12



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
169.6	0.761	13	2.9	44	246	19	11	5.3	68	281	14
170.3	0.639	15	2.5	42	279	24	9.2	4.5	65	319	17
171.0	0.817	18	3.3	60	363	27	12	6.1	92	415	20
171.7	0.905	19	2.4	52	268	22	13	4.3	80	306	16
172.4	0.646	15	2.4	49	326	19	9.3	4.4	75	373	14
173.1	0.466	14	2.3	46	332	26	6.7	4.3	70	380	19
173.7	1.1	17	2.9	44	328	23	16	5.2	68	375	17
174.4	1.4	19	3.2	49	283	22	21	5.9	75	324	16
175.1	0.616	19	2.4	48	295	24	8.9	4.3	73	337	17
175.8	0.890	17	2.5	44	270	20	13	4.5	68	309	15
176.5	0.933	15	2.6	44	260	20	13	4.8	67	297	15
177.2	1.2	19	3.3	48	374	31	18	6.0	74	428	23
177.9	0.470	17	2.9	44	250	27	6.8	5.2	67	286	20
178.6	0.898	20	2.6	59	339	32	13	4.7	91	387	23
179.3	0.489	19	2.5	47	326	27	7.1	4.5	72	373	19
180.0	0.978	18	2.8	41	301	29	14	5.2	63	344	21
180.7	0.754	18	3.5	48	337	28	11	6.3	74	385	21
181.4	0.906	21	2.8	47	303	26	13	5.1	73	347	19
182.1	0.786	20	2.8	49	331	27	11	5.2	75	379	19
182.8	0.334	18	2.4	44	330	23	4.8	4.4	67	377	16
183.5	0.770	16	3.1	44	291	23	11	5.7	67	332	17
184.2	0.780	21	3.6	50	353	28	11	6.6	76	404	21
184.9	0.653	20	2.6	41	292	19	9.4	4.8	63	334	14
185.6	0.509	20	2.7	45	290	21	7.3	4.9	69	331	15
186.3	0.837	18	2.4	42	303	24	12	4.4	65	346	18
187.0	1.0	22	2.5	38	347	23	15	4.6	59	397	17
187.7	0.959	21	2.6	45	327	26	14	4.8	69	373	19
188.4	0.608	24	2.4	47	306	22	8.8	4.4	73	350	16
189.1	0.520	19	2.3	46	325	23	7.5	4.3	70	371	17
189.8	1.0	23	2.4	41	339	20	15	4.3	63	387	15
190.5	0.676	23	2.5	46	327	21	9.8	4.6	70	374	15
191.2	0.584	21	2.6	45	362	21	8.4	4.8	69	414	15
191.9	0.547	23	1.8	45	311	24	7.9	3.3	68	355	18
192.6	0.697	18	2.4	41	330	21	10	4.5	63	377	16
193.3	0.669	17	2.2	36	321	19	9.7	4.0	56	367	14
194.0	0.906	21	2.7	41	368	24	13	5.0	64	420	17
194.7	0.637	23	2.6	44	352	21	9.2	4.7	67	402	15
195.4	0.295	22	2.3	42	314	21	4.3	4.1	64	359	15
196.1	0.375	19	2.1	38	335	20	5.4	3.8	58	383	14
196.8	0.699	20	2.1	41	329	17	10	3.7	63	376	12
197.5	0.535	21	2.7	44	380	24	7.7	5.0	67	434	17
198.2	0.539	22	2.1	40	364	20	7.8	3.9	61	417	15
198.9	0.858	20	2.0	37	333	19	12	3.6	57	381	14
199.5	0.311	20	2.0	41	348	22	4.5	3.6	63	398	16
200.2	0.656	21	2.1	41	331	18	9.5	3.8	63	378	13
200.9	0.634	21	2.0	41	357	18	9.1	3.7	63	408	13
201.6	0.326	22	2.2	45	338	15	4.7	4.0	68	387	11
202.3	0.344	17	2.1	40	344	14	5.0	3.8	61	393	10
203.0	0.758	19	2.2	39	373	15	11	4.0	60	427	11
203.7	0.873	20	2.4	38	364	17	13	4.4	58	417	12
204.4	0.339	24	2.2	52	386	20	4.9	4.0	80	442	15
205.1	0.778	23	2.2	43	357	16	11	4.1	65	408	12
205.8	0.806	19	2.2	39	308	14	12	4.0	59	352	10
206.5	0.424	18	2.3	37	307	15	6.1	4.2	57	351	11
207.2	0.754	20	1.8	38	324	16	11	3.3	58	370	12
207.9	0.708	22	2.3	45	350	16	10	4.2	69	400	11
208.6	0.296	18	2.1	42	349	12	4.3	3.8	64	400	9.1
209.3	0.841	19	1.9	32	281	13	12	3.5	49	322	9.5
210.0	0.662	20	2.1	38	323	17	9.6	3.8	58	369	12
210.7	0.604	21	2.4	43	319	15	8.7	4.3	65	365	11
211.4	0.550	20	2.1	36	254	12	7.9	3.9	55	290	9.0
212.1	0.496	19	1.9	40	297	13	7.2	3.4	61	340	9.4
212.8	0.695	15	2.1	35	333	15	10	3.8	54	381	11
213.5	0.803	17	2.4	41	370	18	12	4.4	63	423	13
214.2	0.443	22	1.8	37	301	13	6.4	3.3	56	344	9.5
214.9	0.310	18	1.8	36	268	16	4.5	3.3	55	307	11
215.6	0.588	17	2.0	35	280	16	8.5	3.6	54	320	12
216.3	1.1	20	2.6	37	320	18	16	4.8	56	366	13
217.0	0.302	20	2.3	38	323	24	4.4	4.2	58	369	18
217.7	0.625	19	2.5	48	318	25	9.0	4.5	73	364	18
218.4	0.441	19	2.1	46	325	21	6.4	3.9	71	371	16
219.1	0.339	17	2.7	41	296	22	4.9	4.9	63	338	16
219.8	0.585	15	2.8	43	296	29	8.4	5.1	66	339	21
220.5	0.660	23	2.6	41	262	35	9.5	4.8	63	300	26
221.2	0.472	22	2.8	49	317	50	6.8	5.1	75	363	36
221.9	0.609	22	2.8	52	305	50	8.8	5.1	80	349	36
222.6	0.269	16	3.2	44	314	56	3.9	5.9	67	359	41
223.3	0.698	18	3.8	49	283	56	10	7.0	76	324	41
224.0	0.269	20	3.0	45	282	65	3.9	5.4	68	322	47
224.7	0.868	20	3.0	53	271	60	13	5.5	81	310	44
225.4	0.750	18	3.4	49	314	67	11	6.3	76	360	49



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.1	0.567	21	3.1	42	281	68	8.2	5.7	64	321	50
226.7	0.720	21	3.9	48	340	83	10	7.0	74	389	61
227.4	0.269	24	4.3	66	328	96	3.9	7.9	101	375	70
228.1	0.344	21	3.1	47	271	64	5.0	5.6	71	310	47
228.8	0.674	20	3.6	52	325	83	9.7	6.5	80	372	60
229.5	0.618	20	3.5	50	332	75	8.9	6.3	76	379	55
230.2	0.532	25	3.4	58	387	95	7.7	6.2	89	443	69
230.9	0.297	25	4.3	53	302	76	4.3	7.8	81	345	55
231.6	0.452	22	3.4	47	264	66	6.5	6.3	72	302	48
232.3	0.269	19	3.3	47	299	63	3.9	6.0	72	342	46
233.0	0.497	18	2.5	44	286	56	7.2	4.6	68	327	41
233.7	0.314	20	3.5	49	363	70	4.5	6.3	75	415	51
234.4	0.466	21	2.5	44	289	62	6.7	4.6	67	330	45
235.1	0.400	24	2.5	47	307	56	5.8	4.6	72	351	41
235.8	0.269	20	2.9	47	298	48	3.9	5.2	72	341	35
236.5	0.397	21	2.7	41	364	53	5.7	4.9	63	417	38
237.2	0.772	26	2.7	44	327	50	11	5.0	67	374	37
237.9	0.736	25	2.6	52	294	49	11	4.7	79	336	36
238.6	0.750	22	2.8	48	319	44	11	5.1	73	365	32
239.3	0.395	21	2.2	38	276	39	5.7	4.0	59	315	29
240.0	0.269	22	2.9	41	322	43	3.9	5.4	62	368	32
240.7	0.772	25	2.6	42	297	45	11	4.8	64	339	33
241.4	0.439	25	2.2	40	274	34	6.3	3.9	61	313	25
242.1	0.467	18	1.6	36	279	30	6.7	3.0	55	319	22
242.8	0.269	16	2.0	30	285	29	3.9	3.7	47	326	21
243.5	0.533	19	1.9	34	263	32	7.7	3.5	53	300	23
244.2	0.587	23	2.3	44	316	34	8.5	4.2	67	362	25
244.9	0.313	18	2.0	31	265	25	4.5	3.7	47	303	18
245.6	0.269	19	2.0	30	300	24	3.9	3.7	47	343	18
246.3	0.311	17	1.9	23	254	23	4.5	3.4	35	291	17
247.0	0.678	19	2.0	28	307	28	9.8	3.6	43	351	21
247.7	0.418	19	1.9	30	279	26	6.0	3.6	47	319	19
248.4	0.413	20	1.6	30	287	21	6.0	2.8	46	328	15
249.1	0.364	19	1.6	26	237	17	5.2	2.8	39	271	12
249.8	0.367	19	1.9	24	308	22	5.3	3.4	36	352	16
250.5	0.315	17	1.7	24	259	19	4.5	3.1	37	296	14
251.2	0.558	21	1.7	31	281	17	8.0	3.1	47	321	13
251.9	0.273	17	1.7	25	250	17	3.9	3.1	39	285	12
252.6	0.393	17	1.5	24	288	16	5.7	2.6	37	329	12
253.2	0.360	20	1.7	26	306	18	5.2	3.1	40	350	13
253.9	0.418	20	1.2	26	245	15	6.0	2.2	39	280	11
254.6	0.328	15	1.6	20	233	11	4.7	2.9	30	266	7.8
255.3	0.269	17	1.3	24	325	11	3.9	2.3	37	371	8.2
256.0	0.369	13	1.4	17	233	10	5.3	2.6	26	266	7.3
256.7	0.269	16	1.6	25	312	13	3.9	3.0	38	357	9.8
257.4	0.269	19	1.2	25	252	14	3.9	2.2	39	288	10
258.1	0.407	15	0.966	22	235	10	5.9	1.8	33	268	7.3
258.8	0.269	15	1.6	22	266	10	3.9	2.9	34	304	7.4
259.5	0.566	19	1.4	19	304	13	8.2	2.6	29	348	9.6
260.2	0.543	19	2.1	22	280	14	7.8	3.8	34	321	11
260.9	0.269	17	1.1	20	275	10	3.9	2.1	31	314	7.5
261.6	0.416	16	1.2	19	238	8.5	6.0	2.1	29	272	6.2
262.3	0.269	16	1.1	14	293	9.6	3.9	2.1	22	335	7.0
263.0	0.581	14	1.3	18	306	12	8.4	2.4	27	350	9.1
263.7	0.358	21	1.5	27	264	12	5.2	2.7	41	302	9.0
264.4	0.425	19	1.4	19	227	9.4	6.1	2.5	30	259	6.8
265.1	0.269	15	1.1	16	227	6.2	3.9	2.1	25	260	4.5
265.8	0.357	13	0.905	12	217	8.1	5.2	1.7	19	249	5.9
266.5	0.725	16	1.1	16	285	12	10	1.9	24	326	8.8
267.2	0.382	19	0.642	16	221	10	5.5	1.2	24	252	7.4
267.9	0.380	13	0.616	15	191	7.8	5.5	1.1	23	219	5.7
268.6	0.448	11	0.660	12	230	6.6	6.5	1.2	18	263	4.8
269.3	0.269	12	0.849	8.8	222	6.6	3.9	1.5	13	254	4.8
270.0	0.295	16	1.2	11	239	11	4.3	2.1	17	273	7.9
270.7	0.269	21	0.887	12	219	9.7	3.9	1.6	19	250	7.1
271.4	0.544	15	0.851	13	297	6.7	7.8	1.6	19	340	4.9
272.1	0.269	11	0.662	9.4	246	5.3	3.9	1.2	14	281	3.9
272.8	0.274	13	0.917	8.4	265	7.3	4.0	1.7	13	303	5.3
273.5	0.341	17	0.824	11	259	12	4.9	1.5	18	296	8.6
274.2	0.269	20	0.736	11	260	7.2	3.9	1.3	17	298	5.3
274.9	0.269	13	0.714	9.2	252	5.9	3.9	1.3	14	288	4.3
275.6	0.269	8.6	0.667	5.7	239	6.4	3.9	1.2	8.7	273	4.7
276.3	0.269	15	0.618	10	357	7.7	3.9	1.1	16	409	5.7
277.0	0.345	17	0.636	11	241	9.1	5.0	1.2	16	276	6.7
277.7	0.269	16	0.371	11	233	5.0	3.9	0.677	17	266	3.6
278.4	0.269	11	0.715	9.1	290	6.1	3.9	1.3	14	331	4.5
279.1	0.313	9.7	0.552	5.9	245	6.4	4.5	1.0	9.1	280	4.6
279.7	0.269	14	0.911	8.7	334	7.1	3.9	1.7	13	382	5.2
280.4	0.269	19	0.722	7.8	255	7.0	3.9	1.3	12	292	5.1
281.1	0.269	13	0.427	6.5	198	5.0	3.9	0.779	10.0	227	3.6
281.8	0.269	14	0.629	5.9	330	7.5	3.9	1.1	9.0	378	5.5



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
282.5	0.400	11	0.603	6.2	232	5.9	5.8	1.1	9.5	265	4.3
283.2	0.473	18	0.526	8.0	325	7.3	6.8	0.959	12	371	5.3
283.9	0.269	15	0.792	7.9	231	7.5	3.9	1.4	12	264	5.5
284.6	0.269	15	0.967	7.7	223	5.0	3.9	1.8	12	256	3.6
285.3	0.331	11	0.609	5.6	207	6.1	4.8	1.1	8.6	236	4.5
286.0	0.571	14	1.1	6.1	308	8.5	8.2	2.0	9.4	352	6.2
286.7	0.269	17	1.0	7.9	250	7.1	3.9	1.9	12	286	5.2
287.4	0.269	19	0.795	9.2	214	6.1	3.9	1.5	14	244	4.5
288.1	0.269	16	1.0	6.8	252	6.4	3.9	1.8	10	288	4.6
288.8	0.320	16	0.836	8.6	254	5.7	4.6	1.5	13	291	4.2
289.5	0.614	15	0.799	8.0	233	6.7	8.9	1.5	12	266	4.9
290.2	0.269	17	1.1	10	240	6.9	3.9	2.0	16	275	5.0
290.9	0.269	20	0.932	7.7	178	5.8	3.9	1.7	12	203	4.2
291.6	0.285	20	1.1	6.6	246	6.1	4.1	1.9	10	282	4.5
292.3	0.332	15	0.880	9.6	214	6.5	4.8	1.6	15	245	4.8
293.0	0.269	18	1.2	7.2	242	6.1	3.9	2.3	11	276	4.5
293.7	0.657	21	1.4	12	277	7.6	9.5	2.6	18	317	5.5
294.4	0.468	19	1.1	9.2	226	5.4	6.7	2.0	14	258	3.9
295.1	0.528	18	1.1	11	221	5.3	7.6	2.0	17	252	3.9
295.8	0.336	18	1.4	8.8	217	6.1	4.9	2.5	14	248	4.5
296.5	0.345	19	1.6	10	241	7.0	5.0	2.9	16	276	5.1
297.2	0.349	21	1.7	8.5	238	7.9	5.0	3.1	13	272	5.8
297.9	0.269	15	1.4	6.9	205	4.7	3.9	2.5	11	235	3.4
298.6	0.269	17	1.5	8.7	173	4.3	3.9	2.8	13	198	3.1
299.3	0.455	15	1.4	8.3	211	5.4	6.6	2.6	13	241	3.9
300.0	0.279	21	2.2	11	228	5.9	4.0	4.0	17	261	4.3
300.7	0.508	19	1.5	12	191	5.0	7.3	2.7	18	219	3.7
301.4	0.269	17	1.6	12	217	5.8	3.9	3.0	18	248	4.2
302.1	0.400	18	1.7	11	247	8.4	5.8	3.0	17	283	6.1
302.8	0.674	19	1.6	9.4	209	5.9	9.7	3.0	14	239	4.3
303.5	0.677	21	1.8	15	262	9.3	9.8	3.4	23	300	6.8
304.2	0.269	17	1.8	13	194	6.4	3.9	3.3	20	222	4.7
304.9	0.269	18	1.5	11	201	5.7	3.9	2.8	16	230	4.1
305.6	0.535	17	2.0	13	280	9.6	7.7	3.6	20	320	7.0
306.2	0.450	19	2.1	15	274	9.8	6.5	3.9	23	313	7.1
306.9	0.590	20	1.7	15	259	8.9	8.5	3.1	23	297	6.5
307.6	0.488	18	1.7	15	204	7.9	7.0	3.0	22	233	5.8
308.3	0.269	15	1.6	13	220	6.8	3.9	2.9	19	251	4.9
309.0	0.269	19	1.6	11	248	7.4	3.9	2.9	17	283	5.4
309.7	0.760	21	2.6	15	285	13	11	4.7	23	325	9.4
310.4	0.269	21	1.7	15	214	8.7	3.9	3.1	23	245	6.3
311.1	0.269	17	1.7	19	248	9.3	3.9	3.1	29	284	6.8
311.8	0.269	16	1.7	11	230	6.3	3.9	3.0	17	263	4.6
312.5	0.505	17	1.8	13	249	9.2	7.3	3.2	19	285	6.7
313.2	0.332	22	2.0	13	246	7.6	4.8	3.6	20	281	5.5
313.9	0.544	20	2.1	19	238	15	7.9	3.8	29	272	11
314.6	0.269	17	2.1	15	216	8.2	3.9	3.8	23	247	6.0
315.3	0.459	18	2.0	15	243	7.6	6.6	3.7	23	278	5.5
316.0	0.355	21	1.9	14	235	9.7	5.1	3.4	21	269	7.0
316.7	0.398	19	2.3	17	245	10	5.8	4.1	25	280	7.5
317.4	0.287	18	1.9	17	218	9.9	4.1	3.4	25	250	7.2
318.1	0.445	16	2.2	19	280	9.3	6.4	4.1	29	320	6.8
318.8	0.269	18	2.1	13	265	9.3	3.9	3.8	20	303	6.8
319.5	0.617	18	2.8	17	250	8.7	8.9	5.2	25	286	6.4
320.2	1.0	20	2.3	17	234	9.7	15	4.2	27	267	7.1
320.9	0.269	21	1.7	17	256	9.2	3.9	3.1	26	293	6.7
321.6	0.311	15	2.2	18	227	8.4	4.5	3.9	27	259	6.1
322.3	0.457	17	1.7	13	225	8.3	6.6	3.1	20	257	6.0
323.0	0.335	17	2.8	19	271	8.8	4.8	5.1	29	310	6.4
323.7	0.269	21	1.5	18	230	11	3.9	2.7	27	263	8.0
324.4	0.269	18	1.6	18	190	4.6	3.9	3.0	27	218	3.4
325.1	0.269	18	1.9	15	269	8.7	3.9	3.5	23	307	6.4
325.8	0.337	18	1.9	15	247	6.1	4.9	3.5	23	282	4.5
326.5	0.360	22	2.3	21	335	12	5.2	4.1	32	383	8.9
327.2	0.455	21	2.1	16	206	6.2	6.6	3.8	25	236	4.6
327.9	0.313	20	2.1	17	233	7.6	4.5	3.9	26	266	5.5
328.6	0.269	13	2.0	13	219	7.0	3.9	3.7	20	251	5.1
329.3	0.320	21	2.4	18	273	8.0	4.6	4.3	27	313	5.8
330.0	0.386	25	1.7	17	241	10	5.6	3.1	27	276	7.6
330.7	0.763	19	1.9	17	242	7.3	11	3.4	26	277	5.4
331.4	0.278	17	1.7	16	284	9.0	4.0	3.1	25	325	6.6
332.0	0.312	14	1.4	13	183	5.1	4.5	2.6	19	209	3.7
332.7	0.684	23	1.9	17	385	9.2	9.9	3.4	26	440	6.7
333.4	0.543	20	1.8	15	237	7.3	7.8	3.3	23	271	5.3
334.1	0.269	24	2.0	24	260	7.6	3.9	3.7	37	298	5.5
334.8	0.394	19	1.6	19	304	6.0	5.7	2.9	28	348	4.3
335.5	0.528	18	1.5	13	292	7.6	7.6	2.8	21	334	5.6
336.2	0.698	23	1.9	17	297	8.2	10	3.4	26	339	6.0
336.9	0.500	19	1.7	21	247	6.9	7.2	3.1	33	283	5.1
337.6	0.748	17	1.4	16	265	4.7	11	2.6	25	303	3.5
338.3	0.349	18	1.8	19	296	5.3	5.0	3.4	29	338	3.9



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.0	0.725	15	2.0	15	256	4.2	10	3.7	23	293	3.1
339.7	0.520	23	1.4	17	285	8.5	7.5	2.6	26	326	6.2
340.4	0.634	19	1.3	18	278	5.9	9.2	2.4	28	317	4.3
341.1	0.269	16	1.4	15	265	4.3	3.9	2.6	24	303	3.2
341.8	0.447	16	1.4	15	241	4.6	6.5	2.6	23	276	3.4
342.5	0.269	20	1.5	20	320	5.9	3.9	2.7	30	366	4.3
343.2	0.611	26	1.8	15	258	4.2	8.8	3.4	22	295	3.0
343.9	0.269	18	1.5	17	254	3.6	3.9	2.8	27	290	2.6
344.6	0.269	19	1.4	15	248	3.3	3.9	2.6	24	284	2.4
345.3	0.489	17	1.2	13	280	3.0	7.1	2.2	20	320	2.2
346.0	0.615	23	2.0	22	353	3.7	8.9	3.7	34	403	2.7
346.7	0.269	18	1.3	19	252	4.7	3.9	2.3	30	288	3.5
347.4	0.502	17	1.2	16	259	3.4	7.2	2.1	24	296	2.5
348.1	0.269	13	0.967	16	256	3.1	3.9	1.8	24	293	2.3
348.8	0.592	15	1.2	14	280	4.4	8.5	2.2	22	320	3.2
349.5	0.269	20	1.7	16	274	3.7	3.9	3.1	24	313	2.7
350.2	0.648	22	0.923	16	275	5.3	9.3	1.7	25	314	3.9
350.9	1.0	15	0.982	16	270	2.9	15	1.8	24	309	2.1
351.6	0.488	18	1.2	15	329	4.5	7.0	2.2	23	376	3.3
352.3	0.437	16	1.3	15	253	4.4	6.3	2.5	23	290	3.2
353.0	0.269	24	2.0	19	375	5.1	3.9	3.7	29	428	3.7
353.7	0.463	18	1.0	19	261	2.8	6.7	1.9	30	299	2.0
354.4	0.664	18	1.1	19	304	4.0	9.6	2.1	29	348	2.9
355.1	0.399	19	1.6	15	307	3.4	5.8	2.9	23	351	2.5
355.8	0.269	20	1.1	15	318	4.0	3.9	2.0	22	363	2.9
356.5	0.269	21	1.3	15	291	4.9	3.9	2.3	24	333	3.6
357.2	0.293	21	1.2	19	306	3.2	4.2	2.1	30	350	2.3
357.9	0.622	15	1.1	14	316	3.8	9.0	2.0	22	361	2.8
358.6	0.269	16	1.2	15	275	3.4	3.9	2.1	23	315	2.5
359.2	0.269	17	1.3	13	297	3.2	3.9	2.4	21	340	2.3
359.9	0.446	19	0.880	14	236	4.3	6.4	1.6	22	270	3.2
360.6	0.324	16	0.965	13	238	4.0	4.7	1.8	20	272	2.9
361.3	0.433	17	1.2	13	292	3.6	6.3	2.1	20	334	2.6
362.0	0.476	18	0.774	14	289	4.6	6.9	1.4	22	331	3.3
362.7	0.309	20	1.3	18	315	4.4	4.5	2.3	28	360	3.2
363.4	0.288	20	0.815	14	230	3.6	4.2	1.5	22	263	2.7
364.1	0.395	20	0.828	17	252	2.7	5.7	1.5	25	288	2.0
364.8	0.269	13	0.887	11	217	2.4	3.9	1.6	16	249	1.7
365.5	0.458	14	0.842	10	236	2.6	6.6	1.5	16	270	1.9
366.2	0.560	21	1.0	19	301	4.5	8.1	1.9	29	344	3.3
366.9	0.581	18	1.0	15	265	3.9	8.4	1.8	22	303	2.8
367.6	0.269	15	0.920	12	221	3.1	3.9	1.7	19	253	2.3
368.3	0.269	15	0.939	8.1	267	2.5	3.9	1.7	12	305	1.8
369.0	0.269	20	1.1	11	292	3.0	3.9	2.1	17	334	2.2
369.7	0.768	22	0.851	12	300	3.6	11	1.6	19	343	2.6
370.4	0.600	19	0.837	13	272	3.2	8.7	1.5	19	311	2.3
371.1	0.269	16	0.753	7.6	224	3.2	3.9	1.4	12	257	2.4
371.8	0.269	16	0.738	9.4	309	3.4	3.9	1.3	14	353	2.5
372.5	0.375	22	1.1	11	316	4.6	5.4	2.0	17	361	3.4
373.2	0.304	20	0.986	13	248	3.9	4.4	1.8	19	283	2.9
373.9	0.338	23	0.760	11	271	2.7	4.9	1.4	18	310	2.0
374.6	0.410	14	0.728	9.4	259	3.6	5.9	1.3	14	296	2.6
375.3	0.269	17	0.671	8.4	220	2.1	3.9	1.2	13	252	1.5
376.0	0.502	19	0.648	11	294	4.0	7.2	1.2	18	336	2.9
376.7	0.269	20	0.866	8.4	238	2.9	3.9	1.6	13	272	2.1
377.4	0.674	18	0.829	12	297	3.5	9.7	1.5	18	339	2.5
378.1	0.695	14	0.796	10	227	2.2	10	1.5	16	260	1.6
378.8	0.285	15	0.707	7.9	267	3.6	4.1	1.3	12	305	2.6
379.5	0.599	19	0.749	10	294	3.5	8.6	1.4	16	336	2.5
380.2	0.551	18	0.828	9.2	260	3.1	8.0	1.5	14	297	2.2
380.9	0.353	17	0.820	9.2	257	2.7	5.1	1.5	14	294	2.0
381.6	0.377	17	0.763	6.0	273	2.4	5.4	1.4	9.2	312	1.7
382.3	0.269	15	0.568	6.1	290	3.1	3.9	1.0	9.4	331	2.3
383.0	0.343	21	0.833	9.0	266	3.3	4.9	1.5	14	305	2.4
383.7	0.269	15	0.749	6.6	208	3.0	3.9	1.4	10	238	2.2
384.4	0.269	15	0.724	8.8	330	2.3	3.9	1.3	13	377	1.7
385.1	0.464	15	0.769	6.0	312	3.9	6.7	1.4	9.2	357	2.8
385.8	0.269	15	0.765	5.9	273	3.0	3.9	1.4	9.1	312	2.2
386.4	0.488	15	0.833	7.3	261	2.6	7.0	1.5	11	298	1.9
387.1	0.368	13	0.458	4.9	219	1.9	5.3	0.835	7.5	251	1.4
387.8	0.647	14	0.406	6.0	314	2.9	9.3	0.741	9.2	359	2.1
388.5	0.550	15	0.596	4.9	222	3.3	7.9	1.1	7.4	254	2.4
389.2	0.427	19	0.827	6.8	282	3.0	6.2	1.5	10	322	2.2
389.9	0.270	18	0.662	7.5	248	4.4	3.9	1.2	12	284	3.2
390.6	0.518	18	0.874	6.3	242	2.4	7.5	1.6	9.6	276	1.8
391.3	0.269	16	0.942	5.9	239	2.6	3.9	1.7	9.1	274	1.9
392.0	0.330	15	1.1	3.9	216	3.3	4.8	2.0	5.9	247	2.4
392.7	0.606	18	1.4	5.8	300	5.1	8.7	2.5	8.9	343	3.7
393.4	0.269	17	0.948	6.7	221	2.8	3.9	1.7	10	252	2.0
394.1	0.269	17	0.911	4.6	201	2.8	3.9	1.7	7.0	229	2.0
394.8	0.269	14	1.0	4.2	234	2.4	3.9	1.9	6.4	267	1.7



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
395.5	0.323	15	1.1	5.6	227	3.3	4.7	2.0	8.6	260	2.4
396.2	0.658	17	1.3	8.2	252	4.3	9.5	2.3	13	288	3.1
396.9	0.358	16	0.855	7.1	230	4.4	5.2	1.6	11	263	3.2
397.6	0.410	19	0.949	6.2	218	4.1	5.9	1.7	9.6	250	3.0
398.3	0.502	17	1.3	4.3	193	4.3	7.2	2.3	6.5	221	3.2
399.0	0.269	19	1.9	6.4	204	3.6	3.9	3.4	9.7	233	2.7
399.7	0.503	18	1.6	6.2	173	3.4	7.3	3.0	9.5	197	2.5
400.4	0.269	20	1.5	9.5	181	4.7	3.9	2.8	15	206	3.4
401.1	0.433	17	1.3	6.9	159	4.0	6.2	2.4	11	182	2.9
401.8	0.574	20	1.1	9.1	169	5.5	8.3	2.1	14	193	4.0
402.5	0.323	18	1.8	7.6	179	5.4	4.7	3.3	12	204	3.9
403.2	0.849	18	1.5	6.7	148	5.7	12	2.7	10	170	4.1
403.9	0.778	20	1.6	7.9	158	6.2	11	2.8	12	180	4.5
404.6	0.336	18	1.6	7.9	157	5.2	4.8	2.9	12	179	3.8
405.3	0.567	19	1.6	6.0	156	5.5	8.2	2.9	9.2	178	4.0
406.0	0.789	18	1.1	9.0	158	5.1	11	1.9	14	181	3.7
406.7	0.342	18	1.5	6.7	161	6.2	4.9	2.8	10	184	4.5
407.4	0.629	19	1.2	5.9	154	5.3	9.1	2.3	9.1	176	3.8
408.1	0.911	17	1.4	7.5	156	6.4	13	2.5	11	179	4.7
408.8	0.323	20	1.5	7.3	165	8.2	4.7	2.8	11	188	6.0
409.5	0.429	20	1.3	6.8	166	9.3	6.2	2.4	10	189	6.8
410.2	0.315	20	1.2	5.6	140	11	4.6	2.2	8.6	160	7.8
410.9	0.330	18	1.4	7.4	138	9.9	4.8	2.6	11	158	7.2
411.6	0.364	17	1.1	6.6	153	9.4	5.3	2.0	10	175	6.8
412.3	0.476	16	1.7	6.6	182	16	6.9	3.0	10	208	12
412.9	0.700	20	1.9	8.4	162	15	10	3.4	13	185	11
413.6	0.474	19	1.4	6.0	128	8.9	6.8	2.5	9.1	146	6.5
414.3	0.392	16	1.5	8.0	143	12	5.7	2.7	12	163	8.8
415.0	0.390	15	1.5	6.7	149	12	5.6	2.7	10	170	8.9
415.7	0.269	20	1.4	8.9	180	12	3.9	2.6	14	205	9.0
416.4	0.335	22	1.4	6.7	179	13	4.8	2.5	10	204	9.4
417.1	0.269	19	1.7	8.3	158	11	3.9	3.1	13	181	7.9
417.8	0.271	21	1.0	6.3	139	8.2	3.9	1.9	9.6	159	6.0
418.5	0.353	19	1.5	7.4	152	7.5	5.1	2.7	11	174	5.5
419.2	0.342	22	1.2	8.4	160	14	4.9	2.2	13	183	10
419.9	0.269	20	1.4	10.0	152	9.5	3.9	2.6	15	173	6.9
420.6	0.269	17	1.3	7.5	146	9.2	3.9	2.3	11	167	6.7
421.3	0.269	17	1.5	6.5	176	13	3.9	2.8	9.9	202	9.7
422.0	0.369	23	1.5	5.9	177	12	5.3	2.6	9.0	203	9.1
422.7	0.269	19	1.4	7.5	147	13	3.9	2.5	11	168	9.3
423.4	0.452	15	1.0	8.2	143	11	6.5	1.8	13	163	7.9
424.1	0.703	18	1.3	6.4	150	12	10	2.4	9.8	172	9.1
424.8	0.443	18	0.918	4.5	141	10	6.4	1.7	6.9	161	7.4
425.5	0.269	20	1.1	9.0	166	16	3.9	2.0	14	190	11
426.2	0.269	18	1.6	7.2	148	13	3.9	3.0	11	169	9.3
426.9	0.269	15	1.1	6.7	156	12	3.9	2.0	10	178	8.9
427.6	0.393	19	1.3	6.3	164	12	5.7	2.4	9.7	187	8.8
428.3	0.269	19	1.6	5.9	145	12	3.9	2.9	9.0	165	8.4
429.0	0.583	23	1.4	11	156	13	8.4	2.6	17	178	9.3
429.7	0.269	20	1.1	6.6	143	15	3.9	2.0	10	164	11
430.4	0.613	16	1.3	6.6	136	13	8.9	2.4	10	156	9.5
431.1	0.269	12	1.0	4.3	133	12	3.9	1.9	6.5	152	8.8
431.8	0.336	18	1.3	6.5	166	16	4.9	2.3	9.9	190	12
432.5	0.269	21	1.1	8.2	149	18	3.9	2.0	13	170	13
433.2	0.334	16	0.966	6.7	129	13	4.8	1.8	10	147	9.1
433.9	0.269	17	1.1	6.2	134	14	3.9	2.0	9.5	154	10
434.6	0.455	19	1.3	7.6	149	15	6.6	2.3	12	170	11
435.3	0.460	18	1.1	7.8	145	16	6.6	2.1	12	166	12
436.0	0.310	18	1.2	7.3	169	17	4.5	2.2	11	193	12
436.7	0.269	19	0.834	6.5	162	13	3.9	1.5	10.0	185	9.6
437.4	0.269	15	1.2	8.4	169	13	3.9	2.2	13	193	9.5
438.1	0.269	14	1.1	6.0	157	15	3.9	2.0	9.2	180	11
438.7	0.290	22	1.4	5.7	183	17	4.2	2.6	8.8	209	12
439.4	0.355	21	0.986	7.9	176	15	5.1	1.8	12	202	11
440.1	0.295	15	0.758	6.3	131	9.3	4.3	1.4	9.7	150	6.8
440.8	0.476	15	1.0	6.5	160	9.2	6.9	1.9	9.9	183	6.7
441.5	0.380	19	1.1	5.9	219	11	5.5	2.1	9.0	250	7.9
442.2	0.269	21	1.2	8.4	177	11	3.9	2.2	13	202	8.2
442.9	0.294	20	1.0	8.5	156	10	4.2	1.9	13	178	7.6
443.6	0.269	17	1.1	7.0	177	9.8	3.9	2.0	11	202	7.2
444.3	0.269	13	0.956	7.7	162	10	3.9	1.7	12	185	7.6
445.0	0.535	17	1.1	5.6	168	8.5	7.7	2.0	8.6	192	6.2
445.7	0.396	18	0.931	7.6	166	6.6	5.7	1.7	12	190	4.8
446.4	0.420	21	0.535	5.4	176	9.1	6.1	0.977	8.3	201	6.7
447.1	0.269	15	0.844	4.9	193	7.4	3.9	1.5	7.6	221	5.4
447.8	0.269	19	0.856	6.6	223	6.4	3.9	1.6	10	255	4.6
448.5	0.579	20	1.2	5.0	195	5.1	8.4	2.3	7.7	223	3.7
449.2	0.269	20	0.933	6.8	242	6.6	3.9	1.7	10	277	4.8
449.9	0.304	17	1.0	8.0	234	4.6	4.4	1.9	12	267	3.4
450.6	0.367	19	1.6	6.8	271	5.7	5.3	3.0	10	310	4.2
451.3	0.509	15	0.817	4.4	200	4.9	7.3	1.5	6.8	229	3.5



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
452.0	0.329	14	1.4	5.3	264	6.0	4.8	2.5	8.2	301	4.4
452.7	0.293	14	1.1	3.9	243	4.7	4.2	1.9	6.0	278	3.4
453.4	0.269	15	0.741	5.1	226	4.9	3.9	1.4	7.8	259	3.6
454.1	0.269	10	0.851	5.0	208	2.9	3.9	1.6	7.7	238	2.1
454.8	0.269	12	0.916	3.9	248	5.2	3.9	1.7	6.0	283	3.8
455.5	0.560	14	0.983	5.8	240	5.7	8.1	1.8	8.9	274	4.1
456.2	0.269	15	0.783	4.6	241	5.7	3.9	1.4	7.0	276	4.1
456.9	0.340	14	0.734	4.2	216	3.6	4.9	1.3	6.4	247	2.6
457.6	0.277	12	0.682	3.3	209	3.6	4.0	1.2	5.0	239	2.6
458.3	0.269	13	0.854	3.8	225	4.1	3.9	1.6	5.8	258	3.0
459.0	0.325	14	0.909	5.4	212	3.7	4.7	1.7	8.2	242	2.7
459.7	0.269	11	0.601	3.5	213	4.0	3.9	1.1	5.4	244	2.9
460.4	0.615	13	0.874	4.5	234	3.5	8.9	1.6	6.8	267	2.5
461.1	0.343	10	0.882	3.0	231	4.8	5.0	1.6	4.6	264	3.5
461.8	0.374	11	0.901	3.4	231	4.3	5.4	1.6	5.2	264	3.1
462.5	0.269	13	0.971	3.6	253	4.2	3.9	1.8	5.5	290	3.1
463.2	0.605	18	0.671	4.6	230	6.2	8.7	1.2	7.0	263	4.5
463.9	0.269	13	1.0	2.7	205	3.6	3.9	1.9	4.2	234	2.6
464.6	0.371	12	0.788	3.7	213	4.7	5.4	1.4	5.7	244	3.5
465.2	0.477	13	0.980	4.4	203	5.3	6.9	1.8	6.7	232	3.9
465.9	0.422	13	1.2	4.3	235	4.4	6.1	2.2	6.6	268	3.2
466.6	0.269	14	1.1	4.2	224	5.7	3.9	2.1	6.4	256	4.1
467.3	0.269	15	0.927	3.4	228	3.9	3.9	1.7	5.3	261	2.8
468.0	0.809	13	2.0	4.2	221	4.6	12	3.7	6.5	252	3.4
468.7	0.502	14	0.924	4.8	218	4.4	7.2	1.7	7.4	249	3.2
469.4	0.269	15	1.1	2.7	222	3.4	3.9	2.0	4.2	254	2.5
470.1	0.395	12	1.1	3.5	216	6.1	5.7	2.0	5.3	247	4.5
470.8	0.479	14	1.1	2.3	209	3.8	6.9	2.0	3.5	239	2.8
471.5	0.269	13	1.2	2.8	227	3.9	3.9	2.2	4.3	260	2.8
472.2	0.269	13	1.2	3.3	213	4.1	3.9	2.2	5.0	244	3.0
472.9	0.373	14	1.0	2.9	200	6.3	5.4	1.9	4.5	229	4.6
473.6	0.269	14	1.4	2.9	197	3.4	3.9	2.5	4.5	225	2.5
474.3	0.305	12	1.1	3.9	210	5.3	4.4	2.0	5.9	241	3.8
475.0	0.269	17	1.0	3.0	237	5.6	3.9	1.9	4.7	271	4.1
475.7	0.595	14	1.0	3.6	197	4.0	8.6	1.9	5.6	226	2.9
476.4	0.269	14	1.1	3.8	221	4.8	3.9	2.1	5.9	253	3.5
477.1	0.269	13	0.985	4.1	243	4.8	3.9	1.8	6.3	277	3.5
477.8	0.318	14	1.2	3.1	211	4.5	4.6	2.3	4.8	242	3.3
478.5	0.269	14	1.0	3.2	224	4.4	3.9	1.8	4.9	256	3.2
479.2	0.269	14	1.0	3.9	227	4.0	3.9	1.9	5.9	260	2.9
479.9	0.269	10.0	1.1	2.7	173	3.0	3.9	2.1	4.1	198	2.2
480.6	0.439	11	0.999	3.9	199	2.8	6.3	1.8	5.9	228	2.1
481.3	0.700	13	0.997	3.2	219	4.5	10	1.8	4.9	251	3.3
482.0	0.588	16	0.821	4.0	182	5.6	8.5	1.5	6.1	208	4.1
482.7	0.270	16	0.889	2.3	175	4.3	3.9	1.6	3.5	200	3.1
483.4	0.269	13	1.2	2.8	191	3.0	3.9	2.1	4.3	218	2.2
484.1	0.288	13	0.741	2.4	213	4.5	4.2	1.4	3.8	244	3.3
484.8	0.401	11	1.6	4.1	240	5.3	5.8	2.9	6.3	274	3.9
485.5	0.269	14	1.3	5.2	218	5.5	3.9	2.4	8.0	250	4.0
486.2	0.269	14	1.0	3.6	169	3.4	3.9	1.8	5.5	193	2.5
486.9	0.269	12	1.1	3.9	178	4.9	3.9	2.0	5.9	203	3.6
487.6	0.269	13	1.2	1.9	211	3.9	3.9	2.3	2.9	241	2.8
488.3	0.296	16	1.5	4.5	252	6.0	4.3	2.8	7.0	288	4.3
489.0	0.566	14	1.3	2.7	216	4.7	8.2	2.4	4.1	247	3.5
489.7	0.347	13	0.905	2.2	164	3.5	5.0	1.7	3.4	187	2.6
490.4	0.363	12	1.3	3.4	199	4.0	5.2	2.3	5.3	227	2.9
491.1	0.375	13	1.3	4.0	180	6.9	5.4	2.4	6.2	206	5.0
491.7	0.269	17	1.7	6.0	181	5.5	3.9	3.1	9.2	207	4.0
492.4	0.269	17	1.4	4.8	155	6.3	3.9	2.5	7.3	177	4.6
493.1	0.269	14	1.6	6.5	169	5.4	3.9	2.9	10	194	3.9
493.8	0.269	13	1.2	5.4	170	4.3	3.9	2.2	8.3	195	3.2
494.5	0.460	13	1.4	4.1	155	5.1	6.6	2.6	6.2	177	3.7
495.2	0.269	22	2.1	6.5	239	8.4	3.9	3.9	10.0	273	6.1
495.9	0.269	14	1.6	8.4	149	7.2	3.9	2.9	13	171	5.3
496.6	0.269	14	1.5	6.8	128	3.7	3.9	2.7	10	147	2.7
497.3	0.407	13	1.4	3.8	160	5.3	5.9	2.5	5.9	183	3.9
498.0	0.269	15	1.5	6.3	137	4.8	3.9	2.8	9.7	156	3.5
498.7	0.709	20	1.9	7.6	165	9.0	10	3.4	12	188	6.6
499.4	0.269	20	1.6	6.3	173	4.9	3.9	2.9	9.7	197	3.6
500.1	0.269	14	1.4	7.8	154	4.1	3.9	2.5	12	176	3.0
500.8	0.269	17	1.8	7.7	178	4.7	3.9	3.2	12	204	3.4
501.5	0.443	13	1.7	4.7	207	6.2	6.4	3.1	7.2	237	4.5
502.2	0.271	17	1.9	9.1	214	6.5	3.9	3.5	14	245	4.8
502.9	0.482	21	1.6	9.0	167	4.5	7.0	2.8	14	191	3.3
503.6	0.439	17	1.5	9.9	171	5.3	6.3	2.7	15	196	3.9
504.3	0.285	18	1.8	7.6	168	4.3	4.1	3.2	12	192	3.1
505.0	0.513	18	1.8	7.5	171	6.0	7.4	3.2	11	195	4.4
505.7	0.281	18	1.7	7.6	149	3.7	4.1	3.0	12	171	2.7
506.4	0.566	18	1.8	8.7	187	4.2	8.2	3.2	13	213	3.1
507.1	0.504	16	1.7	9.9	186	5.0	7.3	3.0	15	213	3.7
507.8	0.425	17	1.5	9.2	151	3.6	6.1	2.7	14	173	2.6



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.5	0.450	19	1.5	10	169	4.1	6.5	2.7	16	193	3.0
509.2	0.363	16	1.7	10	174	5.9	5.2	3.1	16	199	4.3
509.9	0.269	16	1.5	7.6	169	3.4	3.9	2.7	12	193	2.5
510.6	0.285	12	1.5	9.0	174	3.1	4.1	2.7	14	199	2.3
511.3	0.835	19	1.6	7.9	240	4.7	12	2.9	12	275	3.4
512.0	0.269	20	2.2	10	240	3.5	3.9	4.1	16	275	2.6
512.7	0.345	23	1.6	8.4	209	3.6	5.0	3.0	13	239	2.6
513.4	0.612	17	1.8	7.3	188	3.0	8.8	3.2	11	215	2.2
514.1	0.269	17	1.4	6.9	260	3.9	3.9	2.5	11	298	2.8
514.8	0.452	21	1.9	7.6	314	3.9	6.5	3.5	12	359	2.9
515.5	0.287	21	1.1	8.5	197	2.8	4.1	2.1	13	225	2.0
516.2	0.545	19	1.8	8.3	206	2.6	7.9	3.3	13	235	1.9
516.9	0.269	16	1.8	6.1	221	2.7	3.9	3.3	9.4	252	2.0
517.6	0.269	15	1.8	5.8	222	3.5	3.9	3.4	8.8	254	2.5
518.2	0.323	21	2.2	7.5	252	3.1	4.7	4.0	12	288	2.3
518.9	0.306	21	1.6	7.8	210	3.5	4.4	2.9	12	240	2.5
519.6	0.347	15	1.9	9.9	226	2.1	5.0	3.5	15	259	1.5
520.3	0.437	13	1.5	7.4	186	2.0	6.3	2.7	11	213	1.4
521.0	0.535	14	1.5	5.7	195	1.8	7.7	2.8	8.8	222	1.3
521.7	0.702	20	2.1	10	290	3.2	10	3.9	16	331	2.3
522.4	0.278	18	1.5	8.8	222	2.7	4.0	2.7	14	254	1.9
523.1	0.382	17	1.7	9.4	235	2.6	5.5	3.0	14	269	1.9
523.8	0.290	15	1.3	8.5	263	3.0	4.2	2.4	13	301	2.2
524.5	0.269	18	1.5	6.3	233	3.1	3.9	2.8	9.6	266	2.3
525.2	0.398	19	1.8	8.4	254	3.2	5.7	3.3	13	290	2.3
525.9	0.509	20	1.6	9.9	253	2.9	7.3	2.8	15	290	2.1
526.6	0.269	17	1.5	7.7	219	3.1	3.9	2.7	12	250	2.3
527.3	0.599	18	1.5	9.0	261	2.6	8.7	2.8	14	298	1.9
528.0	0.347	21	1.2	7.8	272	3.6	5.0	2.2	12	311	2.6
528.7	0.313	21	1.5	10	270	3.2	4.5	2.7	16	309	2.4
529.4	0.269	18	1.3	9.8	264	3.2	3.9	2.4	15	302	2.3
530.1	0.444	15	1.3	7.4	213	2.9	6.4	2.3	11	244	2.1
530.8	0.562	14	1.3	7.3	281	2.7	8.1	2.4	11	322	2.0
531.5	0.286	21	1.7	7.2	248	3.6	4.1	3.1	11	284	2.6
532.2	0.418	22	1.3	8.0	258	3.4	6.0	2.5	12	295	2.5
532.9	0.269	18	1.0	7.9	217	2.1	3.9	1.9	12	248	1.5
533.6	0.542	18	1.0	8.4	284	4.0	7.8	1.9	13	325	3.0
534.3	0.545	20	0.973	7.8	269	3.5	7.9	1.8	12	307	2.5
535.0	0.458	19	1.5	6.3	273	4.6	6.6	2.7	9.7	313	3.4
535.7	0.492	21	1.1	8.1	234	4.3	7.1	2.0	12	267	3.1
536.4	0.333	17	1.2	5.9	229	3.6	4.8	2.2	9.0	262	2.7
537.1	0.269	19	1.3	6.6	267	7.1	3.9	2.4	10	305	5.2
537.8	0.383	19	1.5	6.2	281	6.2	5.5	2.7	9.5	322	4.5
538.5	0.269	18	1.0	7.4	256	7.0	3.9	1.8	11	293	5.1
539.2	0.317	20	1.1	6.5	205	6.2	4.6	2.0	9.9	234	4.6
539.9	0.269	20	1.3	6.8	288	6.8	3.9	2.3	10	329	5.0
540.6	0.455	18	1.2	6.2	243	5.8	6.6	2.2	9.5	278	4.2
541.3	0.341	20	1.3	4.2	275	6.4	4.9	2.3	6.4	315	4.6
542.0	0.327	21	1.2	6.8	239	6.2	4.7	2.2	10	274	4.5
542.7	0.269	23	1.1	9.1	232	5.0	3.9	2.1	14	266	3.7
543.4	0.330	15	0.996	6.5	213	4.8	4.8	1.8	9.9	244	3.5
544.1	0.498	14	1.4	5.7	211	5.9	7.2	2.5	8.7	241	4.3
544.7	0.356	22	1.2	4.9	288	6.6	5.1	2.2	7.5	329	4.8
545.4	0.418	20	1.3	5.8	285	7.0	6.0	2.3	8.9	326	5.1
546.1	0.397	14	0.783	5.9	209	4.4	5.7	1.4	9.0	239	3.2
546.8	0.610	14	1.2	5.3	266	4.1	8.8	2.3	8.1	305	3.0
547.5	0.269	17	1.5	6.6	254	5.2	3.9	2.7	10	291	3.8
548.2	0.586	22	1.2	6.8	258	5.2	8.5	2.1	10	294	3.8
548.9	0.513	19	1.1	5.8	211	4.2	7.4	1.9	8.8	241	3.1
549.6	0.269	17	1.2	7.5	228	3.4	3.9	2.1	11	261	2.5
550.3	0.294	19	1.1	4.9	277	2.7	4.2	2.0	7.5	317	2.0
551.0	0.518	16	1.1	5.5	296	3.5	7.5	2.0	8.4	338	2.6
551.7	0.395	19	1.5	4.7	230	4.5	5.7	2.8	7.3	263	3.3
552.4	0.349	15	0.671	5.7	206	3.9	5.0	1.2	8.8	236	2.8
553.1	0.269	12	0.598	4.4	215	2.7	3.9	1.1	6.8	246	2.0
553.8	0.472	14	0.895	4.2	243	2.6	6.8	1.6	6.4	278	1.9
554.5	0.600	18	1.3	3.4	353	5.9	8.7	2.3	5.2	404	4.3
555.2	0.390	17	1.0	4.2	242	4.2	5.6	1.9	6.4	276	3.1
555.9	0.548	17	1.0	4.2	249	3.6	7.9	1.9	6.5	285	2.6
556.6	0.571	13	0.776	4.0	216	2.4	8.2	1.4	6.2	247	1.7
557.3	0.269	14	0.814	4.7	222	2.9	3.9	1.5	7.2	254	2.1
558.0	0.482	17	1.3	3.4	213	2.3	7.0	2.3	5.3	244	1.7
558.7	0.269	18	0.717	4.7	224	3.7	3.9	1.3	7.1	256	2.7
559.4	0.751	15	0.938	4.0	231	1.9	11	1.7	6.1	265	1.4
560.1	0.478	13	0.967	4.0	262	2.0	6.9	1.8	6.2	300	1.5
560.8	0.366	14	1.0	2.2	240	2.2	5.3	1.9	3.3	275	1.6
561.5	0.269	20	1.0	4.1	264	3.8	3.9	1.9	6.2	302	2.8
562.2	0.442	18	1.0	3.8	217	2.5	6.4	1.9	5.8	248	1.9
562.9	0.468	16	0.819	4.0	220	2.5	6.8	1.5	6.1	252	1.8
563.6	0.353	12	0.842	1.9	246	2.2	5.1	1.5	3.0	281	1.6
564.3	0.500	16	0.539	4.6	255	2.0	7.2	0.984	7.0	291	1.4



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
565.0	0.269	19	0.850	2.1	229	2.9	3.9	1.6	3.2	262	2.1
565.7	0.392	16	1.0	3.7	206	2.2	5.7	1.8	5.7	236	1.6
566.4	0.269	12	0.689	2.5	213	2.1	3.9	1.3	3.9	243	1.6
567.1	0.269	11	0.799	2.4	211	1.8	3.9	1.5	3.7	241	1.3
567.8	0.450	15	1.1	2.6	285	3.1	6.5	2.0	3.9	325	2.3
568.5	0.684	19	1.1	2.2	242	3.0	9.9	2.1	3.4	276	2.2
569.2	0.463	17	0.683	4.1	205	2.1	6.7	1.2	6.2	235	1.5
569.9	0.426	14	0.869	3.3	216	2.1	6.2	1.6	5.1	247	1.5
570.6	0.398	13	0.811	1.2	239	1.8	5.7	1.5	1.8	274	1.3
571.3	0.446	21	1.0	3.0	326	2.2	6.4	1.9	4.7	372	1.6
571.9	0.617	19	1.1	2.7	227	2.9	8.9	2.0	4.2	260	2.1
572.6	0.269	20	0.670	3.0	221	2.0	3.9	1.2	4.7	253	1.5
573.3	0.330	12	0.702	2.9	195	1.3	4.8	1.3	4.4	223	0.967
574.0	0.269	11	0.800	1.4	200	1.8	3.9	1.5	2.2	228	1.3
574.7	0.269	19	1.4	1.7	253	3.0	3.9	2.5	2.6	289	2.2
575.4	0.707	22	1.0	1.2	194	2.3	10	1.9	1.8	222	1.7
576.1	0.393	18	0.939	2.8	197	2.4	5.7	1.7	4.2	225	1.7
576.8	0.383	14	1.0	2.0	264	2.2	5.5	1.9	3.1	302	1.6
577.5	0.269	14	0.818	2.0	260	2.8	3.9	1.5	3.1	298	2.0
578.2	0.517	18	1.3	2.8	321	3.0	7.5	2.4	4.4	367	2.2
578.9	0.352	19	0.729	2.5	260	2.6	5.1	1.3	3.8	297	1.9
579.6	0.284	19	0.864	3.2	251	2.3	4.1	1.6	4.9	287	1.7
580.3	0.269	13	0.601	2.4	234	2.1	3.9	1.1	3.7	268	1.5
581.0	0.399	17	1.1	2.6	273	2.3	5.8	1.9	4.0	312	1.7
581.7	0.269	22	1.2	1.4	249	4.3	3.9	2.2	2.2	285	3.1
582.4	0.383	16	0.720	3.2	193	2.5	5.5	1.3	4.9	221	1.8
583.1	0.375	12	0.616	2.2	199	2.2	5.4	1.1	3.4	227	1.6
583.8	0.603	14	0.668	1.3	221	2.3	8.7	1.2	2.0	253	1.7
584.5	0.467	15	0.760	1.5	247	1.9	6.7	1.4	2.3	283	1.4
585.2	0.269	18	0.725	3.1	242	2.7	3.9	1.3	4.7	277	2.0
585.9	0.269	18	0.853	2.7	230	2.0	3.9	1.6	4.2	263	1.4
586.6	0.269	13	0.768	1.7	197	1.8	3.9	1.4	2.6	226	1.3
587.3	0.455	15	0.887	1.2	214	2.2	6.6	1.6	1.9	245	1.6
588.0	0.269	19	1.3	1.1	276	3.0	3.9	2.3	1.7	316	2.2
588.7	0.318	20	0.719	3.2	225	2.9	4.6	1.3	4.9	257	2.1
589.4	0.438	14	1.1	3.0	225	2.0	6.3	2.0	4.6	257	1.5
590.1	0.269	14	0.800	3.3	256	2.5	3.9	1.5	5.0	293	1.8
590.8	0.269	13	0.751	2.2	222	1.8	3.9	1.4	3.3	254	1.3
591.5	0.271	17	0.845	0.675	238	3.0	3.9	1.5	1.0	273	2.2
592.2	0.269	17	0.915	3.5	210	2.6	3.9	1.7	5.4	240	1.9
592.9	0.269	12	0.902	2.1	220	2.5	3.9	1.6	3.2	252	1.8
593.6	0.314	9.6	1.1	2.8	238	1.9	4.5	2.0	4.4	272	1.4
594.3	0.269	15	1.1	1.0	272	3.3	3.9	2.0	1.6	311	2.4
595.0	0.859	16	0.888	2.6	244	2.3	12	1.6	3.9	280	1.7
595.7	0.269	17	0.853	2.4	217	2.0	3.9	1.6	3.7	248	1.5
596.4	0.352	11	0.890	2.8	219	1.9	5.1	1.6	4.3	251	1.4
597.1	0.269	11	0.832	0.523	207	2.1	3.9	1.5	0.801	236	1.5
597.8	0.269	15	1.3	1.6	271	2.7	3.9	2.3	2.5	310	2.0
598.4	0.269	16	1.1	2.5	253	1.7	3.9	1.9	3.8	289	1.2
599.1	0.269	13	0.897	2.2	208	1.8	3.9	1.6	3.4	238	1.3
599.8	0.406	10	1.0	1.7	196	2.6	5.9	1.9	2.6	224	1.9
600.5	0.405	13	1.1	1.4	244	2.0	5.8	2.0	2.2	279	1.5
601.2	0.269	14	1.3	1.6	327	1.8	3.9	2.4	2.5	374	1.3
601.9	0.403	16	1.1	1.7	205	2.5	5.8	2.0	2.5	235	1.8
602.6	0.376	13	0.845	2.0	234	2.1	5.4	1.5	3.1	268	1.6
603.3	0.269	9.6	0.840	1.9	194	1.3	3.9	1.5	3.0	222	0.972
604.0	0.269	17	1.7	1.6	247	2.4	3.9	3.0	2.4	282	1.7
604.7	0.539	16	1.8	1.4	292	2.8	7.8	3.2	2.1	334	2.1
605.4	0.338	14	1.1	1.6	234	1.8	4.9	2.1	2.4	268	1.3
606.1	0.455	13	1.4	2.3	227	2.1	6.6	2.6	3.5	260	1.5
606.8	0.269	10	1.3	1.9	200	1.8	3.9	2.4	2.9	229	1.3
607.5	0.269	11	1.4	2.4	251	2.0	3.9	2.6	3.7	287	1.5
608.2	0.269	16	1.2	0.956	234	2.3	3.9	2.2	1.5	267	1.7
608.9	0.269	16	1.1	1.2	205	2.7	3.9	1.9	1.9	235	2.0
609.6	0.269	11	1.4	2.3	200	0.994	3.9	2.5	3.6	228	0.726
610.3	0.329	11	1.6	1.7	248	2.0	4.7	2.8	2.6	283	1.4
611.0	1.0	17	2.0	2.1	292	2.3	15	3.7	3.2	334	1.7
611.7	0.269	14	1.4	2.6	208	2.6	3.9	2.5	3.9	238	1.9
612.4	0.269	15	1.5	3.0	219	2.4	3.9	2.8	4.6	250	1.7
613.1	0.269	13	1.6	1.7	214	2.1	3.9	2.9	2.6	244	1.6
613.8	0.269	12	1.7	2.6	220	1.5	3.9	3.2	4.0	252	1.1
614.5	0.594	14	1.9	2.1	230	2.7	8.6	3.5	3.3	263	1.9
615.2	0.338	16	1.4	3.2	198	1.7	4.9	2.6	5.0	227	1.2
615.9	0.269	12	1.3	2.8	202	0.909	3.9	2.4	4.3	231	0.663
616.6	0.370	9.1	1.4	0.952	198	1.2	5.3	2.5	1.5	226	0.848
617.3	0.269	13	2.0	3.7	320	1.5	3.9	3.7	5.7	366	1.1
618.0	0.370	15	1.6	1.9	241	2.6	5.3	2.9	2.9	275	1.9
618.7	0.269	15	1.6	2.1	217	1.6	3.9	2.9	3.2	248	1.2
619.4	0.269	11	1.3	2.7	183	0.763	3.9	2.5	4.1	210	0.556
620.1	0.269	8.5	1.4	1.2	213	1.2	3.9	2.6	1.9	244	0.878
620.8	0.651	15	1.6	2.7	275	2.8	9.4	2.9	4.1	315	2.1



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.5	0.269	16	1.6	5.3	226	1.4	3.9	2.9	8.2	259	1.0
622.2	0.269	16	1.4	6.2	177	1.5	3.9	2.5	9.4	202	1.1
622.9	0.384	11	1.5	2.7	190	1.1	5.5	2.8	4.1	217	0.828
623.6	0.269	11	1.3	2.0	182	1.4	3.9	2.4	3.0	208	0.996
624.2	0.269	14	1.9	6.0	313	1.5	3.9	3.4	9.1	358	1.1
624.9	0.577	16	1.3	5.5	222	1.4	8.3	2.4	8.5	254	1.0
625.6	0.269	11	1.4	4.0	208	0.852	3.9	2.5	6.1	238	0.622
626.3	0.269	11	1.6	5.1	223	2.0	3.9	3.0	7.8	255	1.4
627.0	0.408	11	1.2	4.2	224	1.5	5.9	2.2	6.4	256	1.1
627.7	0.380	13	2.3	4.8	259	1.6	5.5	4.1	7.4	296	1.1
628.4	0.384	19	1.5	7.0	254	1.7	5.5	2.8	11	291	1.3
629.1	0.308	13	1.3	6.3	239	0.630	4.4	2.5	9.7	274	0.460
629.8	0.269	12	1.4	5.5	223	1.3	3.9	2.6	8.4	255	0.917
630.5	0.393	15	1.8	5.5	307	0.838	5.7	3.3	8.5	351	0.611
631.2	0.455	17	1.6	6.2	312	1.9	6.6	2.9	9.5	357	1.4
631.9	0.269	17	1.8	7.7	195	1.4	3.9	3.3	12	223	0.995
632.6	0.269	15	1.4	8.4	254	0.866	3.9	2.5	13	290	0.632
633.3	0.269	12	1.7	5.9	235	1.1	3.9	3.1	9.0	269	0.795
634.0	0.269	14	1.7	5.5	222	0.972	3.9	3.0	8.5	254	0.709
634.7	0.667	18	2.1	5.7	224	1.6	9.6	3.7	8.7	256	1.2
635.4	0.324	19	1.4	7.5	258	1.1	4.7	2.6	12	295	0.775
636.1	0.287	12	1.4	6.8	238	0.942	4.1	2.6	10	272	0.687
636.8	0.269	13	1.8	6.7	242	1.4	3.9	3.3	10	277	1.0
637.5	0.355	15	1.6	5.7	240	0.907	5.1	2.9	8.7	275	0.662
638.2	0.379	17	1.8	8.9	219	1.5	5.5	3.3	14	251	1.1
638.9	0.321	16	1.4	6.6	238	1.1	4.6	2.5	10	272	0.769
639.6	0.269	12	1.2	6.1	240	1.5	3.9	2.3	9.4	274	1.1
640.3	0.269	13	1.2	4.4	248	0.850	3.9	2.2	6.8	283	0.620
641.0	0.683	17	1.6	7.6	295	1.7	9.9	3.0	12	337	1.2
641.7	0.269	19	1.2	7.2	248	0.979	3.9	2.3	11	283	0.714
642.4	0.269	13	1.3	8.1	235	1.2	3.9	2.3	12	268	0.910
643.1	0.438	11	1.4	5.2	272	0.982	6.3	2.6	7.9	311	0.717
643.8	0.269	12	1.3	6.7	275	0.889	3.9	2.4	10	315	0.649
644.5	0.269	18	1.9	9.7	282	1.6	3.9	3.5	15	323	1.2
645.2	0.549	17	1.2	7.1	227	1.9	7.9	2.3	11	259	1.4
645.9	0.505	15	1.1	8.5	209	1.1	7.3	2.0	13	239	0.839
646.6	0.333	12	1.1	5.8	223	0.667	4.8	2.0	8.9	256	0.486
647.3	0.269	13	1.2	8.5	319	1.5	3.9	2.2	13	365	1.1
648.0	0.269	13	1.4	6.1	219	1.0	3.9	2.6	9.4	251	0.763
648.7	0.417	14	0.509	7.0	200	1.1	6.0	0.929	11	228	0.800
649.4	0.269	11	1.1	6.7	213	0.888	3.9	2.0	10	244	0.648
650.1	0.353	14	0.892	5.8	271	0.796	5.1	1.6	8.9	310	0.581
650.7	0.337	15	1.1	5.9	230	0.897	4.9	1.9	9.1	263	0.655
651.4	0.401	19	1.0	7.5	200	0.803	5.8	1.9	11	229	0.586
652.1	0.458	17	0.857	7.7	182	1.0	6.6	1.6	12	208	0.733
652.8	0.269	12	0.769	7.4	207	0.841	3.9	1.4	11	237	0.614
653.5	0.269	12	0.785	4.2	214	0.713	3.9	1.4	6.5	245	0.520
654.2	0.269	12	1.0	7.4	234	0.814	3.9	1.9	11	268	0.594
654.9	0.402	17	0.740	6.9	201	1.1	5.8	1.3	11	230	0.802
655.6	0.446	13	0.672	5.7	209	0.732	6.4	1.2	8.8	240	0.534
656.3	0.269	9.4	0.614	4.5	156	0.590	3.9	1.1	6.8	178	0.431
657.0	0.331	14	0.852	6.2	213	0.883	4.8	1.6	9.5	244	0.644
657.7	0.269	17	1.1	7.8	227	0.820	3.9	2.0	12	259	0.599
658.4	0.300	18	0.647	6.2	191	0.631	4.3	1.2	9.5	219	0.461
659.1	0.269	9.2	0.662	6.1	194	0.804	3.9	1.2	9.4	222	0.586
659.8	0.275	10	0.583	5.1	184	0.621	4.0	1.1	7.8	211	0.453
660.5	0.269	12	0.865	3.5	218	0.613	3.9	1.6	5.4	250	0.447
661.2	0.269	18	0.826	7.8	196	0.939	3.9	1.5	12	224	0.685
661.9	0.284	15	0.509	6.8	189	0.265	4.1	0.928	10	216	0.193
662.6	0.269	9.3	0.396	4.9	166	0.932	3.9	0.722	7.6	189	0.680
663.3	0.453	12	0.970	4.3	232	0.745	6.5	1.8	6.5	266	0.543
664.0	0.269	19	1.2	6.1	304	0.660	3.9	2.1	9.3	348	0.482
664.7	0.269	14	0.652	5.6	190	1.1	3.9	1.2	8.6	217	0.775
665.4	0.375	12	1.1	6.2	220	0.923	5.4	2.0	9.5	252	0.673
666.1	0.269	10	0.718	3.2	182	0.665	3.9	1.3	5.0	208	0.485
666.8	0.269	11	1.1	5.0	194	0.899	3.9	2.1	7.7	222	0.656
667.5	0.831	18	1.2	5.0	232	0.724	12	2.2	7.6	266	0.528
668.2	0.330	18	0.712	4.3	177	1.4	4.8	1.3	6.5	202	1.0
668.9	0.457	12	0.715	5.2	165	0.939	6.6	1.3	8.0	189	0.685
669.6	0.434	9.5	0.718	2.9	163	1.4	6.3	1.3	4.4	187	1.0
670.3	0.313	12	0.962	2.8	220	1.3	4.5	1.8	4.3	252	0.938
671.0	0.807	17	1.5	3.2	309	1.2	12	2.7	4.9	353	0.909
671.7	0.269	14	0.912	5.9	200	1.2	3.9	1.7	9.0	228	0.873
672.4	0.272	12	0.879	7.9	224	1.0	3.9	1.6	12	256	0.756
673.1	0.421	9.6	1.2	3.9	191	1.4	6.1	2.1	5.9	219	1.1
673.8	0.438	16	1.1	2.3	232	1.4	6.3	2.1	3.5	265	1.0
674.5	0.577	14	1.4	3.9	195	1.2	8.3	2.6	6.0	223	0.906
675.2	0.269	13	0.872	3.2	196	1.1	3.9	1.6	4.9	225	0.793
675.9	0.269	10	1.2	3.9	186	0.783	3.9	2.3	5.9	212	0.571
676.6	0.276	10	1.1	2.2	239	1.0	4.0	1.9	3.4	273	0.754
677.2	0.612	13	1.9	2.7	276	1.6	8.8	3.4	4.1	315	1.2



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
677.9	0.390	13	1.3	2.5	217	1.6	5.6	2.3	3.8	249	1.1
678.6	0.288	16	1.1	2.4	194	1.8	4.2	2.1	3.7	221	1.3
679.3	0.581	12	1.4	4.3	216	1.6	8.4	2.5	6.6	247	1.2
680.0	0.551	13	1.4	1.8	281	2.0	7.9	2.5	2.8	322	1.4
680.7	0.269	16	1.5	2.3	288	1.5	3.9	2.7	3.5	329	1.1
681.4	0.330	18	1.2	2.8	240	1.9	4.8	2.3	4.3	275	1.4
682.1	0.269	12	1.3	2.7	240	1.4	3.9	2.3	4.1	274	0.986
682.8	0.269	11	1.3	1.7	197	1.2	3.9	2.4	2.6	226	0.903
683.5	0.269	15	1.6	0.749	233	1.3	3.9	2.9	1.1	266	0.925
684.2	0.277	15	1.5	1.6	246	1.3	4.0	2.8	2.5	281	0.937
684.9	0.340	17	1.0	2.2	203	2.4	4.9	1.9	3.4	232	1.7
685.6	0.433	11	1.2	2.4	217	1.3	6.2	2.3	3.7	248	0.943
686.3	0.326	10.0	0.794	1.1	157	0.925	4.7	1.4	1.7	179	0.675
687.0	0.412	15	1.5	0.982	218	1.5	5.9	2.7	1.5	249	1.1
687.7	0.406	17	1.3	2.8	250	2.4	5.9	2.4	4.2	286	1.7
688.4	0.582	17	1.2	1.9	204	1.7	8.4	2.2	2.9	234	1.3
689.1	0.337	11	1.2	2.8	221	1.6	4.9	2.1	4.3	253	1.2
689.8	0.416	13	1.1	2.2	297	1.6	6.0	2.1	3.4	340	1.1
690.5	0.445	13	0.936	1.6	249	2.1	6.4	1.7	2.4	285	1.5
691.2	0.538	16	1.1	3.6	231	2.3	7.8	2.1	5.4	264	1.7
691.9	0.269	19	1.1	1.9	202	2.6	3.9	2.0	3.0	231	1.9
692.6	0.269	11	0.841	2.4	207	1.2	3.9	1.5	3.7	237	0.864
693.3	0.269	11	0.782	2.6	219	1.8	3.9	1.4	3.9	250	1.3
694.0	0.269	16	0.812	1.9	309	1.9	3.9	1.5	2.9	354	1.4
694.7	0.269	23	0.920	2.1	254	2.6	3.9	1.7	3.2	290	1.9
695.4	0.269	16	0.812	3.4	209	1.7	3.9	1.5	5.2	239	1.2
696.1	0.269	9.8	0.723	2.1	207	1.8	3.9	1.3	3.2	237	1.3
696.8	0.342	15	1.0	2.6	310	1.3	4.9	1.9	4.0	354	0.922
697.5	0.448	18	1.1	3.7	288	1.8	6.5	1.9	5.7	329	1.3
698.2	0.269	18	0.537	2.1	244	2.0	3.9	0.979	3.2	279	1.5
698.9	0.384	14	0.877	3.9	253	1.5	5.5	1.6	6.0	289	1.1
699.6	0.269	9.8	0.809	2.3	210	0.982	3.9	1.5	3.5	240	0.717
700.3	0.379	15	0.714	1.7	295	1.9	5.5	1.3	2.7	337	1.4
701.0	0.498	17	1.2	4.2	253	1.8	7.2	2.2	6.4	289	1.3
701.7	0.396	13	0.742	2.4	212	1.5	5.7	1.4	3.6	242	1.1
702.4	0.446	14	0.806	2.2	253	1.3	6.4	1.5	3.4	289	0.924
703.1	0.269	12	0.958	1.4	227	2.0	3.9	1.7	2.1	260	1.5
703.7	0.394	16	1.4	3.1	284	2.4	5.7	2.6	4.7	325	1.7
704.4	0.269	15	1.0	2.3	222	1.4	3.9	1.9	3.5	253	1.0
705.1	0.276	13	1.1	1.9	206	1.9	4.0	2.0	2.9	236	1.4
705.8	0.269	13	1.6	2.6	249	2.0	3.9	3.0	4.0	285	1.5
706.5	0.373	12	1.6	1.5	252	2.1	5.4	2.9	2.2	288	1.6
707.2	0.269	17	1.6	3.4	248	1.7	3.9	3.0	5.2	284	1.3
707.9	0.269	17	1.6	3.2	217	2.5	3.9	2.9	4.9	249	1.8
708.6	0.371	11	1.7	1.7	227	1.4	5.4	3.1	2.6	259	1.0
709.3	0.269	9.4	1.5	1.1	223	1.5	3.9	2.7	1.7	254	1.1
710.0	0.273	12	1.6	1.2	294	2.5	3.9	2.8	1.8	336	1.8
710.7	0.269	14	1.9	1.6	238	1.9	3.9	3.5	2.5	272	1.4
711.4	0.269	13	1.6	1.9	222	1.7	3.9	2.9	2.9	253	1.2
712.1	0.269	9.5	1.5	2.6	221	2.1	3.9	2.7	4.0	253	1.5
712.8	0.269	8.4	1.3	1.1	194	1.4	3.9	2.3	1.7	222	0.988
713.5	0.468	15	2.7	1.6	246	2.3	6.8	4.9	2.5	281	1.7
714.2	0.495	16	1.5	3.4	237	1.7	7.1	2.8	5.2	271	1.2
714.9	0.269	16	1.5	1.9	217	1.9	3.9	2.8	2.9	248	1.4
715.6	0.269	11	1.6	2.5	214	1.2	3.9	3.0	3.8	245	0.904
716.3	0.269	10	1.5	1.3	193	1.1	3.9	2.8	2.0	220	0.795
717.0	0.269	13	2.0	0.992	298	1.4	3.9	3.6	1.5	340	0.989
717.7	0.370	13	2.1	1.4	212	1.7	5.3	3.8	2.2	242	1.2
718.4	0.269	12	1.5	1.4	233	1.2	3.9	2.7	2.1	267	0.900
719.1	0.324	8.6	1.7	1.4	184	0.887	4.7	3.0	2.2	210	0.647
719.8	0.269	10	1.6	1.5	226	1.4	3.9	3.0	2.3	258	1.0
720.5	0.490	13	2.1	1.8	209	1.4	7.1	3.8	2.7	239	1.0
721.2	0.269	14	1.4	2.0	213	1.3	3.9	2.6	3.1	244	0.922
721.9	0.269	13	1.6	2.0	230	1.1	3.9	2.8	3.1	263	0.779
722.6	0.270	9.8	1.7	1.1	211	1.3	3.9	3.0	1.7	241	0.922
723.3	0.269	7.9	1.3	1.1	178	0.942	3.9	2.4	1.6	203	0.687
724.0	0.478	14	1.8	1.8	191	1.000	6.9	3.4	2.8	218	0.729
724.7	0.269	16	1.7	2.1	211	1.5	3.9	3.1	3.2	241	1.1
725.4	0.365	11	1.6	1.7	195	0.798	5.3	3.0	2.6	223	0.582
726.1	0.273	14	1.8	2.4	234	1.2	3.9	3.3	3.6	267	0.868
726.8	0.460	12	1.6	1.6	288	1.2	6.6	2.9	2.5	330	0.853
727.5	0.423	14	1.5	1.6	216	1.1	6.1	2.7	2.4	247	0.830
728.2	0.269	13	1.5	3.1	224	1.1	3.9	2.8	4.7	256	0.766
728.9	0.303	8.3	1.6	2.7	205	1.1	4.4	2.8	4.2	234	0.816
729.6	0.269	8.2	1.1	0.710	186	1.0	3.9	2.0	1.1	213	0.747
730.2	0.430	15	2.1	2.3	253	1.0	6.2	3.8	3.5	289	0.744
730.9	0.269	11	1.4	2.3	228	0.819	3.9	2.6	3.5	261	0.598
731.6	0.588	11	1.2	2.9	210	0.904	8.5	2.2	4.5	240	0.660
732.3	0.269	9.4	1.7	2.1	199	0.355	3.9	3.0	3.3	228	0.259
733.0	0.333	9.4	1.3	1.2	148	0.797	4.8	2.3	1.8	169	0.581
733.7	0.477	11	2.1	2.0	224	0.713	6.9	3.9	3.1	256	0.520



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Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
734.4	0.269	14	1.6	1.3	196	0.528	3.9	2.9	2.0	224	0.385
735.1	0.269	13	1.2	2.2	208	0.426	3.9	2.1	3.4	238	0.311
735.8	0.269	10	1.6	1.9	180	0.602	3.9	2.8	2.9	206	0.440
736.5	0.269	11	2.0	1.3	235	0.920	3.9	3.6	2.0	269	0.671
737.2	0.269	13	1.9	1.8	209	0.801	3.9	3.4	2.8	239	0.585
737.9	0.269	15	1.5	1.5	234	0.759	3.9	2.7	2.3	267	0.553
738.6	0.269	13	1.9	4.9	235	0.852	3.9	3.5	7.4	269	0.622
739.3	0.269	11	1.8	2.4	261	0.722	3.9	3.3	3.7	298	0.527
740.0	0.404	16	1.8	3.5	281	1.2	5.8	3.3	5.4	322	0.907
740.7	0.452	16	2.2	2.7	269	1.2	6.5	4.0	4.2	308	0.902
741.4	0.291	18	1.2	3.6	192	0.816	4.2	2.2	5.6	219	0.595
742.1	0.269	10	1.3	4.0	203	0.656	3.9	2.3	6.1	232	0.479
742.8	0.269	12	1.5	2.6	228	0.441	3.9	2.7	4.0	261	0.322
743.5	0.333	14	1.7	4.0	276	0.388	4.8	3.1	6.1	315	0.283
744.2	0.341	18	1.5	2.1	234	0.877	4.9	2.8	3.3	268	0.640
744.9	0.269	13	1.3	2.9	204	0.615	3.9	2.4	4.5	233	0.448
745.6	0.269	11	0.964	2.9	254	0.528	3.9	1.8	4.5	290	0.385
746.3	0.388	12	1.2	3.5	245	0.495	5.6	2.2	5.4	281	0.361
747.0	0.618	16	1.2	2.7	255	0.468	8.9	2.3	4.2	291	0.341
747.7	0.390	15	0.971	3.5	203	1.2	5.6	1.8	5.4	233	0.882
748.4	0.269	12	0.790	2.1	207	0.495	3.9	1.4	3.3	236	0.361
749.1	0.269	9.0	0.822	0.509	199	0.689	3.9	1.5	0.780	227	0.503
749.8	0.269	12	0.743	1.6	208	0.446	3.9	1.4	2.5	238	0.325
750.5	0.269	16	1.3	3.0	223	0.914	3.9	2.4	4.6	255	0.667
751.2	0.269	15	0.943	3.1	222	0.999	3.9	1.7	4.7	254	0.729
751.9	0.269	14	0.559	2.7	204	0.446	3.9	1.0	4.2	233	0.325
752.6	0.269	12	0.624	2.0	220	0.414	3.9	1.1	3.0	252	0.302
753.3	0.269	13	1.0	3.6	253	0.533	3.9	1.9	5.5	290	0.389
754.0	0.269	14	0.742	3.0	219	1.1	3.9	1.4	4.6	250	0.788
754.7	0.578	17	0.588	2.5	207	0.595	8.3	1.1	3.8	237	0.434
755.4	0.269	13	0.666	3.2	204	0.539	3.9	1.2	4.8	233	0.393
756.1	0.269	11	0.559	2.6	231	1.1	3.9	1.0	4.0	264	0.833
756.7	0.331	18	0.920	1.9	276	0.774	4.8	1.7	2.8	316	0.565
757.4	0.388	16	0.793	2.8	192	0.778	5.6	1.4	4.3	219	0.568
758.1	0.510	14	0.706	2.6	204	0.698	7.4	1.3	4.0	234	0.509
758.8	0.269	11	0.656	1.7	197	0.760	3.9	1.2	2.6	225	0.555
759.5	0.269	12	0.469	2.1	185	0.534	3.9	0.855	3.2	212	0.390
760.2	0.269	15	0.715	2.8	278	0.556	3.9	1.3	4.2	317	0.405
760.9	0.269	13	0.514	1.0	214	0.697	3.9	0.937	1.5	244	0.509
761.6	0.269	9.9	0.535	1.3	182	0.221	3.9	0.976	2.0	209	0.161
762.3	0.438	9.2	0.437	2.0	204	0.498	6.3	0.796	3.1	233	0.364
763.0	0.471	13	0.788	2.3	258	0.421	6.8	1.4	3.4	295	0.307
763.7	0.642	18	0.803	2.2	266	0.487	9.3	1.5	3.3	304	0.355
764.4	0.269	15	0.665	2.2	196	0.965	3.9	1.2	3.4	224	0.704
765.1	0.343	14	0.507	2.5	242	0.703	5.0	0.926	3.9	276	0.513
765.8	0.380	11	0.686	1.3	219	0.561	5.5	1.3	2.0	250	0.410
766.5	0.269	12	0.645	1.4	209	0.673	3.9	1.2	2.1	239	0.491
767.2	0.330	18	0.831	1.2	230	0.926	4.8	1.5	1.9	263	0.676
767.9	0.269	14	0.582	0.989	223	0.749	3.9	1.1	1.5	254	0.546
768.6	0.269	9.9	0.551	1.4	190	0.570	3.9	1.0	2.1	217	0.416
769.3	0.337	9.9	0.559	0.728	215	0.774	4.9	1.0	1.1	246	0.565
770.0	0.500	14	0.722	1.3	256	1.2	7.2	1.3	1.9	293	0.900
770.7	0.433	13	0.419	1.0	205	1.4	6.3	0.764	1.6	235	0.987
771.4	0.279	11	0.629	0.509	207	0.456	4.0	1.1	0.780	237	0.332
772.1	0.269	11	0.822	1.3	238	0.917	3.9	1.5	2.0	272	0.669
772.8	0.835	12	1.2	1.2	223	0.651	12	2.1	1.9	255	0.475
773.5	0.768	15	1.2	0.509	297	1.1	11	2.1	0.780	340	0.807
774.2	0.521	12	1.0	0.509	235	1.3	7.5	1.8	0.780	269	0.965
774.9	0.269	11	0.855	1.8	190	0.418	3.9	1.6	2.8	217	0.305
775.6	0.269	9.0	1.2	1.4	190	0.909	3.9	2.1	2.1	217	0.663
776.3	0.522	13	1.1	1.8	212	1.3	7.5	2.0	2.7	242	0.965
777.0	0.660	13	1.6	1.3	218	1.3	9.5	2.9	2.1	249	0.952
777.7	0.786	14	1.3	1.3	238	1.4	11	2.4	2.0	272	1.1
778.4	0.390	12	1.8	1.2	269	1.1	5.6	3.2	1.9	308	0.779
779.1	0.402	14	1.5	1.4	280	1.6	5.8	2.8	2.2	320	1.2
779.8	0.623	13	1.9	1.4	247	1.6	9.0	3.5	2.1	283	1.1
780.5	0.435	13	1.7	1.9	292	2.0	6.3	3.1	2.9	334	1.5
781.2	0.333	17	1.5	2.6	215	1.5	4.8	2.7	4.0	245	1.1
781.9	0.269	13	1.6	1.1	236	1.1	3.9	2.9	1.7	270	0.837
782.6	0.710	12	1.5	1.6	233	1.2	10	2.8	2.4	266	0.855
783.2	0.269	14	1.5	0.509	278	1.7	3.9	2.8	0.780	318	1.2
783.9	0.370	19	1.8	2.0	236	1.5	5.3	3.3	3.0	270	1.1
784.6	0.548	19	1.3	1.9	276	1.4	7.9	2.3	2.9	315	0.987
785.3	0.269	13	1.5	2.5	239	1.5	3.9	2.7	3.8	273	1.1
786.0	0.269	12	1.7	1.6	230	1.3	3.9	3.1	2.4	263	0.979
786.7	0.269	18	1.4	1.3	253	2.5	3.9	2.6	2.0	289	1.8
787.4	0.269	19	1.2	3.8	281	1.6	3.9	2.3	5.8	321	1.2
788.1	0.269	15	1.0	1.3	285	1.0	3.9	1.8	2.0	326	0.758
788.8	0.269	12	1.0	2.1	224	1.3	3.9	1.9	3.3	257	0.956
789.5	0.269	11	0.697	1.0	227	1.3	3.9	1.3	1.6	259	0.933
790.2	0.605	18	0.908	1.6	274	2.7	8.7	1.7	2.5	313	2.0



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
790.9	0.269	17	0.780	3.1	265	1.0	3.9	1.4	4.7	303	0.762
791.6	0.281	12	0.780	2.5	226	1.5	4.1	1.4	3.9	258	1.1
792.3	0.269	10	0.507	1.1	230	1.5	3.9	0.925	1.7	263	1.1
793.0	0.269	15	0.970	2.1	276	1.7	3.9	1.8	3.1	316	1.2
793.7	0.758	15	0.578	1.2	204	1.0	11	1.1	1.8	233	0.750
794.4	0.339	11	0.531	3.0	242	0.971	4.9	0.969	4.6	277	0.709
795.1	0.478	10	0.545	1.7	230	0.982	6.9	0.994	2.5	262	0.716
795.8	0.488	12	0.541	3.1	249	1.3	7.0	0.987	4.8	285	0.975
796.5	0.530	13	0.749	1.2	243	1.7	7.7	1.4	1.9	278	1.3
797.2	0.347	13	0.214	2.0	214	1.7	5.0	0.390	3.1	245	1.2
797.9	0.322	10	0.677	2.8	269	2.8	4.6	1.2	4.3	308	2.0
798.6	0.269	10	0.527	1.3	240	0.846	3.9	0.962	2.0	275	0.617
799.3	0.269	9.2	0.297	0.749	228	1.1	3.9	0.542	1.1	260	0.789
800.0	0.707	13	0.388	1.5	292	2.1	10	0.707	2.4	334	1.5
800.7	0.296	14	0.402	0.844	239	1.9	4.3	0.734	1.3	273	1.4
801.4	0.312	12	0.433	1.9	257	1.9	4.5	0.790	2.9	294	1.4
802.1	0.269	9.9	0.508	0.783	236	1.4	3.9	0.926	1.2	270	0.998
802.8	0.395	13	0.711	1.1	288	1.9	5.7	1.3	1.7	330	1.4
803.5	0.269	14	0.427	0.509	227	2.3	3.9	0.779	0.780	260	1.7
804.2	0.278	12	0.455	1.4	216	2.0	4.0	0.829	2.1	247	1.5
804.9	0.401	7.5	0.563	1.7	212	1.6	5.8	1.0	2.6	243	1.2
805.6	0.269	8.4	0.582	0.509	235	1.8	3.9	1.1	0.780	269	1.3
806.3	0.269	12	0.864	1.5	353	2.5	3.9	1.6	2.3	403	1.8
807.0	0.269	13	0.703	0.567	241	3.7	3.9	1.3	0.868	275	2.7
807.7	0.269	12	0.981	1.4	303	2.3	3.9	1.8	2.1	347	1.7
808.4	0.269	10	1.3	1.6	278	2.1	3.9	2.4	2.5	318	1.5
809.1	0.269	9.3	0.870	1.6	198	1.6	3.9	1.6	2.5	226	1.2
809.8	0.457	12	0.841	1.5	228	2.2	6.6	1.5	2.2	261	1.6
810.5	0.351	12	1.0	1.1	227	2.4	5.1	1.8	1.7	260	1.7
811.1	0.269	10.0	0.858	2.0	182	1.9	3.9	1.6	3.0	209	1.4
811.8	0.274	11	1.0	1.3	253	1.5	4.0	1.9	2.0	289	1.1
812.5	0.269	8.0	1.1	1.3	178	0.927	3.9	2.0	2.0	204	0.677
813.2	0.269	12	2.2	1.9	286	2.1	3.9	4.1	2.9	327	1.5
813.9	0.269	14	1.5	1.9	209	0.749	3.9	2.7	2.9	239	0.547
814.6	0.269	13	1.1	1.8	202	1.1	3.9	2.0	2.8	231	0.803
815.3	0.269	8.8	1.4	1.8	215	1.1	3.9	2.5	2.8	246	0.769
816.0	0.438	10	1.7	0.774	263	0.917	6.3	3.1	1.2	301	0.669
816.7	0.345	14	2.1	2.0	307	1.5	5.0	3.8	3.1	351	1.1
817.4	0.269	13	1.2	1.8	207	1.1	3.9	2.2	2.8	237	0.781
818.1	0.269	8.9	1.6	1.4	189	0.757	3.9	2.8	2.1	216	0.553
818.8	0.269	9.0	1.6	1.1	180	0.679	3.9	2.8	1.6	205	0.495
819.5	0.269	9.2	1.6	2.5	258	0.971	3.9	2.9	3.8	295	0.709
820.2	0.269	13	2.2	4.5	209	1.4	3.9	3.9	7.0	239	0.991
820.9	0.269	15	1.4	3.4	185	1.5	3.9	2.5	5.2	212	1.1
821.6	0.269	10	1.6	1.3	189	0.343	3.9	2.9	2.0	217	0.250
822.3	0.269	9.3	1.6	0.903	212	0.933	3.9	3.0	1.4	243	0.681
823.0	0.269	15	2.0	1.8	294	1.4	3.9	3.6	2.8	336	1.0
823.7	0.269	11	1.2	2.1	194	0.740	3.9	2.2	3.2	222	0.540
824.4	0.269	12	1.4	1.8	183	0.658	3.9	2.6	2.8	209	0.480
825.1	0.269	8.1	1.2	2.1	172	0.569	3.9	2.2	3.3	196	0.415
825.8	0.269	9.3	1.5	1.8	159	1.1	3.9	2.8	2.7	182	0.804
826.5	0.269	13	2.0	1.8	209	1.5	3.9	3.7	2.8	238	1.1
827.2	0.269	13	1.3	1.9	179	0.817	3.9	2.4	2.9	205	0.596
827.9	0.337	8.5	1.5	2.8	194	0.896	4.9	2.7	4.2	222	0.654
828.6	0.269	8.3	1.3	2.0	228	0.898	3.9	2.4	3.0	260	0.655
829.3	0.269	9.9	1.5	2.2	214	0.613	3.9	2.8	3.4	245	0.447
830.0	0.304	14	2.6	2.9	262	1.5	4.4	4.7	4.4	300	1.1
830.7	0.269	12	1.2	2.3	226	0.754	3.9	2.2	3.5	258	0.550
831.4	0.408	10	1.6	4.5	226	0.803	5.9	2.9	6.9	259	0.586
832.1	0.269	10	1.3	2.8	191	0.294	3.9	2.4	4.4	218	0.214
832.8	0.269	11	1.6	1.9	227	1.0	3.9	2.9	3.0	260	0.741
833.5	0.269	15	1.6	3.6	222	0.899	3.9	2.9	5.5	254	0.656
834.2	0.407	12	1.3	3.7	212	0.741	5.9	2.4	5.6	243	0.541
834.9	0.269	11	1.3	3.4	217	0.313	3.9	2.4	5.1	248	0.228
835.6	0.269	12	1.3	3.4	251	0.694	3.9	2.4	5.2	287	0.506
836.3	0.967	18	1.9	5.1	317	0.754	14	3.4	7.7	363	0.550
836.9	0.556	13	1.5	3.1	247	1.1	8.0	2.8	4.7	282	0.778
837.6	0.269	12	1.2	3.7	222	0.736	3.9	2.2	5.7	253	0.537
838.3	0.269	9.8	1.2	3.3	216	0.932	3.9	2.2	5.1	246	0.680
839.0	0.394	8.8	1.1	2.1	200	0.411	5.7	1.9	3.3	229	0.300
839.7	0.274	14	1.8	3.3	272	1.6	4.0	3.3	5.1	311	1.1
840.4	0.269	12	1.2	4.2	178	0.719	3.9	2.3	6.5	203	0.525
841.1	0.269	12	1.1	1.9	216	0.635	3.9	2.0	2.9	247	0.463
841.8	0.269	9.7	1.1	2.3	175	0.661	3.9	2.1	3.6	200	0.482
842.5	0.269	11	0.956	3.3	188	0.868	3.9	1.7	5.1	215	0.633
843.2	0.314	15	1.1	4.4	186	0.661	4.5	2.1	6.8	213	0.482
843.9	0.343	13	0.802	2.5	185	0.842	4.9	1.5	3.9	211	0.614
844.6	0.473	9.9	1.2	5.5	251	1.1	6.8	2.2	8.5	287	0.794
845.3	0.269	8.1	0.902	2.1	189	0.392	3.9	1.6	3.2	216	0.286
846.0	0.269	11	1.1	3.4	207	0.614	3.9	2.0	5.2	237	0.448
846.7	0.332	15	1.1	2.7	197	0.310	4.8	2.0	4.1	225	0.226



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
847.4	0.269	11	0.700	3.4	204	0.652	3.9	1.3	5.2	233	0.476
848.1	0.269	9.4	0.722	3.5	208	0.753	3.9	1.3	5.3	238	0.550
848.8	0.269	7.9	0.886	3.4	204	0.453	3.9	1.6	5.2	233	0.330
849.5	0.269	12	1.1	3.2	262	0.423	3.9	2.0	4.9	300	0.308
850.2	0.338	12	1.1	4.8	199	1.3	4.9	2.0	7.3	228	0.981
850.9	0.269	14	0.785	4.8	234	1.1	3.9	1.4	7.3	267	0.777
851.6	0.269	9.2	0.870	3.4	187	0.712	3.9	1.6	5.2	214	0.520
852.3	0.269	9.2	0.804	3.3	169	0.418	3.9	1.5	5.0	194	0.305
853.0	0.530	12	1.0	2.5	257	1.2	7.6	1.9	3.9	294	0.900
853.7	0.380	15	0.683	4.8	195	1.4	5.5	1.2	7.4	223	1.0
854.4	0.269	15	1.1	4.1	205	0.946	3.9	2.0	6.3	234	0.690
855.1	0.269	8.5	0.606	2.6	181	0.881	3.9	1.1	4.0	207	0.643
855.8	0.396	11	0.842	4.2	261	1.0	5.7	1.5	6.4	299	0.738
856.5	0.323	16	0.981	3.3	225	1.1	4.7	1.8	5.1	257	0.771
857.2	0.269	14	0.679	4.1	194	0.824	3.9	1.2	6.2	222	0.602
857.9	0.269	9.8	0.630	2.9	200	0.735	3.9	1.1	4.4	229	0.536
858.6	0.269	8.2	0.797	1.5	198	0.678	3.9	1.5	2.3	226	0.495
859.3	0.269	12	1.3	5.0	260	1.4	3.9	2.4	7.6	298	1.0
860.0	0.668	15	0.949	4.6	212	1.2	9.6	1.7	7.1	243	0.859
860.7	0.375	15	0.725	6.1	216	0.768	5.4	1.3	9.3	247	0.560
861.4	0.269	8.8	0.945	2.7	181	0.650	3.9	1.7	4.1	207	0.474
862.1	0.269	11	0.936	2.9	220	0.779	3.9	1.7	4.5	252	0.569
862.7	0.269	15	0.770	5.3	326	1.0	3.9	1.4	8.1	373	0.732
863.4	0.269	15	0.920	3.4	187	0.793	3.9	1.7	5.2	214	0.578
864.1	0.269	12	0.885	4.6	217	0.774	3.9	1.6	7.0	248	0.565
864.8	0.269	12	0.868	3.7	187	1.2	3.9	1.6	5.6	214	0.875
865.5	0.348	8.4	0.792	3.7	230	0.628	5.0	1.4	5.6	263	0.458
866.2	0.593	15	1.5	4.9	267	1.3	8.6	2.7	7.5	305	0.948
866.9	0.440	12	0.766	3.9	179	0.657	6.3	1.4	5.9	205	0.479
867.6	0.269	11	0.760	3.4	209	0.881	3.9	1.4	5.1	239	0.643
868.3	0.269	8.2	1.2	3.1	165	0.978	3.9	2.2	4.8	189	0.714
869.0	0.269	11	0.693	2.0	178	1.3	3.9	1.3	3.0	204	0.931
869.7	0.269	13	0.826	3.5	226	1.0	3.9	1.5	5.3	258	0.743
870.4	0.269	14	0.900	3.2	208	0.933	3.9	1.6	4.9	238	0.681
871.1	0.269	8.9	0.733	2.4	197	1.3	3.9	1.3	3.6	226	0.918
871.8	0.269	9.9	0.594	2.5	193	1.5	3.9	1.1	3.9	221	1.1
872.5	0.287	11	1.4	3.6	224	1.5	4.1	2.5	5.5	256	1.1
873.2	0.269	12	0.465	2.2	214	1.4	3.9	0.849	3.3	244	1.0
873.9	0.759	16	0.716	1.9	190	1.3	11	1.3	3.0	217	0.963
874.6	0.269	10	0.769	2.4	226	0.802	3.9	1.4	3.7	258	0.585
875.3	0.269	9.0	0.522	2.9	178	1.2	3.9	0.952	4.4	203	0.907
876.0	0.269	14	0.923	2.4	281	1.6	3.9	1.7	3.6	322	1.1
876.7	0.269	14	0.738	3.0	232	1.5	3.9	1.3	4.6	265	1.1
877.4	0.541	13	0.813	3.0	251	0.684	7.8	1.5	4.6	287	0.499
878.1	0.269	10	0.727	1.6	219	0.901	3.9	1.3	2.5	251	0.658
878.8	0.269	12	0.751	2.0	245	1.4	3.9	1.4	3.0	280	1.0
879.5	0.587	15	0.742	3.1	297	1.4	8.5	1.4	4.8	339	1.1
880.2	0.269	17	0.662	3.2	218	2.2	3.9	1.2	5.0	249	1.6
880.9	0.269	11	0.532	1.9	215	0.742	3.9	0.970	2.9	246	0.541
881.6	0.269	11	0.521	2.2	213	1.4	3.9	0.951	3.4	244	0.986
882.3	0.269	12	0.667	3.3	262	1.1	3.9	1.2	5.0	300	0.777
883.0	0.721	15	0.818	2.6	296	1.8	10	1.5	4.0	339	1.3
883.7	0.299	17	0.396	3.0	219	1.4	4.3	0.722	4.6	250	1.0
884.4	0.343	11	0.460	1.8	224	1.3	4.9	0.838	2.7	256	0.973
885.1	0.269	11	0.433	1.7	236	0.720	3.9	0.790	2.6	270	0.526
885.8	0.269	15	0.549	2.2	335	1.6	3.9	1.0	3.4	383	1.2
886.5	0.567	15	0.574	3.1	241	1.0	8.2	1.0	4.7	276	0.742
887.2	0.406	15	0.255	3.8	220	0.518	5.9	0.465	5.8	252	0.378
887.9	0.269	10	0.248	2.6	221	1.1	3.9	0.452	3.9	253	0.837
888.6	0.269	10	0.368	2.4	217	1.5	3.9	0.671	3.7	248	1.1
889.2	0.269	13	0.522	3.6	315	1.8	3.9	0.952	5.5	360	1.3
889.9	0.587	17	0.404	1.6	194	1.4	8.5	0.737	2.4	222	1.0
890.6	0.447	13	0.285	2.9	253	2.2	6.4	0.520	4.5	290	1.6
891.3	0.269	9.5	0.315	3.1	230	0.965	3.9	0.574	4.8	263	0.704
892.0	0.373	11	0.180	1.9	232	1.1	5.4	0.328	2.9	265	0.814
892.7	0.584	14	0.914	3.4	284	1.0	8.4	1.7	5.2	324	0.758
893.4	0.269	15	0.505	3.5	259	2.5	3.9	0.921	5.4	296	1.8
894.1	0.269	8.1	0.367	2.3	195	1.1	3.9	0.669	3.6	223	0.789
894.8	0.269	8.6	0.498	2.3	266	1.3	3.9	0.908	3.5	305	0.968
895.5	0.269	15	0.523	2.5	207	1.7	3.9	0.953	3.8	236	1.3
896.2	0.345	13	0.671	2.4	292	2.7	5.0	1.2	3.6	334	1.9
896.9	0.269	18	0.837	3.1	242	1.5	3.9	1.5	4.7	277	1.1
897.6	0.269	13	1.1	3.0	178	1.1	3.9	1.9	4.6	203	0.814
898.3	0.375	8.9	0.827	2.1	197	1.5	5.4	1.5	3.2	226	1.1
899.0	0.269	13	1.1	3.1	283	1.5	3.9	1.9	4.8	323	1.1
899.7	0.273	14	1.1	4.4	221	1.9	3.9	2.1	6.7	253	1.4
900.4	0.269	13	0.954	5.2	198	0.905	3.9	1.7	8.0	226	0.660
901.1	0.269	11	1.2	4.6	200	1.8	3.9	2.2	7.1	228	1.3
901.8	0.327	10	0.773	2.4	180	1.3	4.7	1.4	3.7	206	0.913
902.5	0.269	11	1.3	3.6	240	1.5	3.9	2.3	5.5	274	1.1
903.2	0.269	14	1.1	4.5	209	2.2	3.9	2.0	7.0	239	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
903.9	0.269	11	1.0	3.9	179	0.498	3.9	1.9	6.0	205	0.363
904.6	0.269	8.9	0.794	1.9	154	0.611	3.9	1.4	2.9	176	0.446
905.3	0.269	9.0	1.2	4.4	182	0.998	3.9	2.2	6.8	208	0.728
906.0	0.269	13	1.9	5.0	271	1.6	3.9	3.4	7.6	310	1.2
906.7	0.269	17	1.2	2.5	187	1.3	3.9	2.3	3.8	214	0.975
907.4	0.269	12	0.954	4.5	170	1.1	3.9	1.7	6.8	194	0.827
908.1	0.269	9.8	1.3	3.5	190	0.809	3.9	2.4	5.4	217	0.590
908.8	0.590	10	1.2	2.5	164	0.424	8.5	2.2	3.9	188	0.310
909.5	0.269	14	1.4	5.9	213	1.7	3.9	2.6	9.0	243	1.2
910.2	0.269	19	1.3	3.5	169	0.979	3.9	2.4	5.4	194	0.714
910.9	0.269	12	1.1	4.0	154	0.513	3.9	2.1	6.2	176	0.374
911.6	0.320	11	1.2	3.7	197	0.787	4.6	2.3	5.7	225	0.574
912.3	0.269	9.7	1.5	4.3	239	1.6	3.9	2.8	6.7	273	1.1
913.0	0.269	15	1.3	4.1	206	1.9	3.9	2.4	6.3	236	1.4
913.7	0.269	10	1.0	5.4	161	0.670	3.9	1.9	8.3	184	0.489
914.4	0.269	8.1	1.2	4.6	173	0.586	3.9	2.1	7.1	197	0.428
915.1	0.269	12	1.3	3.0	211	0.571	3.9	2.4	4.5	241	0.417
915.8	0.417	12	1.3	6.2	277	0.341	6.0	2.3	9.5	317	0.249
916.4	0.269	13	1.1	4.7	189	1.1	3.9	1.9	7.2	216	0.834
917.1	0.269	13	1.3	5.4	191	0.635	3.9	2.4	8.3	218	0.463
917.8	0.269	9.6	1.2	3.8	168	0.679	3.9	2.1	5.8	192	0.496
918.5	0.269	13	1.2	3.0	224	0.843	3.9	2.1	4.6	256	0.615
919.2	0.269	14	1.5	5.3	200	1.3	3.9	2.7	8.1	229	0.977
919.9	0.356	13	1.3	4.7	161	1.3	5.1	2.4	7.2	185	0.958
920.6	0.269	9.2	1.1	5.8	178	0.533	3.9	2.0	8.9	204	0.389
921.3	0.322	9.3	0.988	5.8	210	0.858	4.6	1.8	8.8	240	0.626
922.0	0.269	9.7	1.2	6.6	231	0.820	3.9	2.3	10	264	0.598
922.7	0.449	14	1.7	5.0	229	1.3	6.5	3.1	7.7	262	0.956
923.4	0.269	12	0.936	5.5	168	0.522	3.9	1.7	8.5	192	0.381
924.1	0.302	11	1.2	5.1	179	0.564	4.4	2.1	7.8	205	0.412
924.8	0.585	9.5	0.912	4.2	178	0.566	8.4	1.7	6.4	203	0.413
925.5	0.291	14	1.2	5.0	254	1.0	4.2	2.3	7.7	290	0.752
926.2	0.269	14	0.959	6.0	185	1.4	3.9	1.7	9.1	211	0.988
926.9	0.457	11	0.840	9.0	206	1.0	6.6	1.5	14	236	0.747
927.6	0.269	11	1.3	6.5	205	1.4	3.9	2.3	9.9	234	1.0
928.3	0.447	11	1.2	5.1	214	0.802	6.5	2.2	7.8	244	0.585
929.0	0.467	13	1.9	4.7	287	1.8	6.7	3.6	7.2	328	1.3
929.7	0.269	13	1.3	7.5	185	1.3	3.9	2.4	12	211	0.918
930.4	0.269	12	0.986	7.3	200	1.1	3.9	1.8	11	229	0.804
931.1	0.269	12	1.3	6.5	216	0.961	3.9	2.3	10	247	0.701
931.8	0.274	13	1.2	5.7	304	1.6	3.9	2.3	8.7	348	1.1
932.5	0.269	13	1.7	4.9	242	1.2	3.9	3.2	7.5	277	0.856
933.2	0.280	16	1.5	5.7	201	0.915	4.0	2.8	8.8	230	0.668
933.9	0.269	11	1.3	5.4	219	1.2	3.9	2.3	8.3	251	0.845
934.6	0.269	13	1.2	5.6	209	1.1	3.9	2.2	8.6	239	0.815
935.3	0.442	14	1.4	5.3	342	1.5	6.4	2.6	8.1	391	1.1
936.0	0.460	17	1.6	6.9	301	1.8	6.6	3.0	11	345	1.3
936.7	0.287	14	0.961	6.8	222	1.2	4.1	1.8	10	254	0.854
937.4	0.334	13	1.4	4.0	197	1.5	4.8	2.6	6.2	226	1.1
938.1	0.269	12	1.4	3.3	250	1.7	3.9	2.5	5.1	286	1.2
938.8	0.328	14	1.2	4.1	263	1.4	4.7	2.1	6.2	301	1.0
939.5	0.269	16	1.4	4.5	266	1.4	3.9	2.5	6.9	304	0.987
940.2	0.269	17	1.1	6.5	211	0.943	3.9	2.1	10.0	242	0.688
940.9	0.338	14	1.1	4.2	224	1.0	4.9	2.0	6.4	256	0.758
941.6	0.348	11	0.831	2.2	195	1.2	5.0	1.5	3.4	223	0.876
942.3	0.637	15	1.5	4.3	249	1.5	9.2	2.7	6.6	285	1.1
942.9	0.450	19	1.3	3.5	266	2.3	6.5	2.3	5.4	304	1.7
943.6	0.455	15	1.0	4.8	275	1.6	6.6	1.8	7.3	314	1.2
944.3	0.283	13	0.890	3.6	242	1.3	4.1	1.6	5.6	277	0.968
945.0	0.289	12	0.821	2.2	223	1.1	4.2	1.5	3.4	256	0.821
945.7	0.465	16	0.940	4.1	251	1.7	6.7	1.7	6.3	287	1.2
946.4	0.269	18	1.0	4.1	208	1.1	3.9	1.8	6.2	238	0.835
947.1	0.314	14	0.562	3.9	241	1.5	4.5	1.0	6.0	275	1.1
947.8	0.397	12	0.652	2.9	248	0.890	5.7	1.2	4.5	284	0.649
948.5	0.588	13	1.2	3.1	245	1.6	8.5	2.1	4.8	280	1.2
949.2	0.486	16	0.771	4.2	273	2.5	7.0	1.4	6.4	313	1.8
949.9	0.269	19	0.781	4.2	248	1.3	3.9	1.4	6.4	283	0.953
950.6	0.269	11	0.718	4.5	300	1.3	3.9	1.3	6.9	343	0.968
951.3	0.373	15	0.778	2.7	294	2.0	5.4	1.4	4.2	336	1.4
952.0	0.794	15	1.1	4.6	368	1.4	11	2.0	7.0	421	1.0
952.7	0.269	13	0.766	4.5	223	1.9	3.9	1.4	6.9	255	1.4
953.4	0.269	13	1.1	4.0	209	1.5	3.9	2.1	6.2	240	1.1
954.1	0.426	13	0.981	3.2	239	1.7	6.1	1.8	4.8	273	1.2
954.8	0.269	10	0.957	2.7	282	1.8	3.9	1.7	4.1	323	1.3
955.5	0.415	14	1.4	2.9	330	3.3	6.0	2.5	4.5	378	2.4
956.2	0.269	18	0.889	4.3	244	2.8	3.9	1.6	6.5	279	2.0
956.9	0.269	12	1.0	4.7	195	1.2	3.9	1.8	7.2	223	0.899
957.6	0.269	11	0.899	1.7	228	1.1	3.9	1.6	2.6	261	0.791
958.3	0.269	9.2	1.1	1.5	282	1.9	3.9	2.0	2.3	323	1.4
959.0	0.269	14	1.6	4.0	302	2.5	3.9	3.0	6.1	345	1.8
959.7	0.269	17	1.3	5.2	234	2.0	3.9	2.3	8.0	267	1.5



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.4	0.269	16	1.3	7.0	241	1.6	3.9	2.3	11	276	1.1
961.1	0.269	11	1.2	4.3	298	1.7	3.9	2.3	6.5	341	1.2
961.8	0.269	15	1.2	6.3	298	1.5	3.9	2.2	9.7	341	1.1
962.5	0.269	12	1.5	3.6	250	2.0	3.9	2.8	5.6	286	1.5
963.2	0.381	13	1.4	4.7	238	0.858	5.5	2.6	7.2	272	0.626
963.9	0.269	14	1.0	6.8	228	1.6	3.9	1.9	10	260	1.2
964.6	0.287	9.7	0.971	4.9	206	1.3	4.1	1.8	7.5	235	0.944
965.3	0.269	12	1.2	6.1	201	1.5	3.9	2.2	9.3	230	1.1
966.0	0.334	16	1.3	5.7	215	1.3	4.8	2.3	8.7	246	0.948
966.7	0.428	11	1.6	10	230	1.2	6.2	2.9	15	263	0.871
967.4	0.362	9.2	0.996	7.1	219	0.772	5.2	1.8	11	250	0.564
968.1	0.269	8.4	0.877	4.4	228	1.0	3.9	1.6	6.7	261	0.738
968.8	0.293	13	1.5	8.8	358	1.5	4.2	2.8	13	409	1.1
969.4	0.269	18	1.2	8.6	274	2.0	3.9	2.2	13	313	1.4
970.1	0.269	11	0.943	8.8	239	0.642	3.9	1.7	14	273	0.469
970.8	0.269	9.7	1.1	7.0	227	2.0	3.9	1.9	11	259	1.5
971.5	0.269	15	1.1	6.0	270	1.4	3.9	1.9	9.2	308	1.1
972.2	0.399	12	1.2	8.6	228	0.581	5.8	2.2	13	261	0.424
972.9	0.269	12	0.888	8.7	240	1.3	3.9	1.6	13	274	0.914
973.6	0.269	11	1.0	5.7	183	0.819	3.9	1.8	8.7	210	0.598
974.3	0.269	9.6	1.1	10	283	1.0	3.9	2.0	16	323	0.755
975.0	0.269	13	1.5	9.0	299	1.5	3.9	2.7	14	342	1.1
975.7	0.269	13	1.3	9.7	224	1.7	3.9	2.4	15	256	1.2
976.4	0.311	13	0.989	11	265	1.4	4.5	1.8	17	303	1.1
977.1	0.269	9.8	0.746	9.6	219	0.718	3.9	1.4	15	251	0.524
977.8	0.269	6.8	1.0	6.0	243	0.557	3.9	1.9	9.2	278	0.406
978.5	0.490	11	1.3	8.2	302	1.2	7.1	2.4	13	346	0.905
979.2	0.269	12	1.1	10	203	0.818	3.9	2.1	15	233	0.597
979.9	0.269	14	0.900	11	237	0.834	3.9	1.6	17	271	0.608
980.6	0.432	11	1.1	8.7	209	0.904	6.2	2.1	13	239	0.660
981.3	0.269	8.2	0.924	8.0	210	0.993	3.9	1.7	12	240	0.725
982.0	0.929	13	1.7	12	331	1.9	13	3.1	19	379	1.4
982.7	0.269	15	1.1	12	255	1.7	3.9	2.0	18	292	1.2
983.4	0.269	10	0.943	15	232	1.1	3.9	1.7	23	265	0.809
984.1	0.269	7.4	0.805	9.2	205	0.436	3.9	1.5	14	234	0.318
984.8	0.269	10	1.1	7.3	181	0.964	3.9	2.0	11	207	0.703
985.5	0.275	13	1.4	14	274	0.975	4.0	2.5	22	314	0.711
986.2	0.269	13	1.3	16	214	1.4	3.9	2.4	25	245	1.0
986.9	0.343	11	1.2	10	215	0.875	4.9	2.2	16	246	0.639
987.6	0.269	8.3	1.5	10	205	0.540	3.9	2.7	16	235	0.394
988.3	0.269	7.7	1.3	6.4	209	0.626	3.9	2.4	9.8	239	0.457
989.0	0.653	13	1.8	13	301	1.4	9.4	3.2	20	344	1.0
989.7	0.269	14	1.4	17	259	0.557	3.9	2.6	26	296	0.406
990.4	0.269	8.9	1.6	12	243	0.692	3.9	2.8	19	277	0.505
991.1	0.277	11	1.6	9.9	274	1.3	4.0	3.0	15	313	0.947
991.8	0.394	14	1.7	12	294	1.2	5.7	3.1	18	336	0.883
992.5	0.358	16	1.8	15	247	1.3	5.2	3.3	23	282	0.978
993.2	0.662	18	1.4	12	246	1.2	9.6	2.5	18	282	0.852
993.9	0.348	8.2	1.3	7.8	189	0.634	5.0	2.3	12	216	0.463
994.6	0.373	9.8	1.0	6.3	217	1.6	5.4	1.8	9.7	248	1.2
995.3	0.415	12	1.9	10	260	1.5	6.0	3.5	16	297	1.1
995.9	0.327	14	0.992	10	219	1.1	4.7	1.8	16	251	0.781
996.6	0.269	15	0.876	10	222	1.6	3.9	1.6	16	254	1.1
997.3	0.286	10	1.3	12	221	1.3	4.1	2.4	18	252	0.975
998.0	0.356	16	0.971	8.5	247	0.908	5.1	1.8	13	283	0.662
998.7	0.456	14	1.6	11	281	2.2	6.6	2.9	17	321	1.6
999.4	0.269	18	1.1	12	256	2.7	3.9	2.0	18	292	1.9
1000.1	0.446	11	0.850	11	248	0.532	6.4	1.5	16	284	0.388
1000.8	0.269	11	0.812	7.8	249	1.5	3.9	1.5	12	285	1.1
1001.5	0.269	11	0.897	6.9	224	1.2	3.9	1.6	11	257	0.904
1002.2	0.360	16	1.4	9.3	224	2.0	5.2	2.5	14	256	1.5
1002.9	0.298	16	0.751	11	201	1.6	4.3	1.4	17	230	1.2
1003.6	0.269	10	0.805	6.8	204	1.2	3.9	1.5	10	234	0.906
1004.3	0.269	11	0.585	5.9	272	2.0	3.9	1.1	9.1	311	1.5
1005.0	0.468	14	0.741	7.6	290	1.5	6.7	1.4	12	332	1.1
1005.7	0.588	15	0.938	9.4	273	1.9	8.5	1.7	14	312	1.4
1006.4	0.557	17	0.587	11	234	1.4	8.0	1.1	17	267	1.0
1007.1	0.269	11	0.643	8.6	232	1.4	3.9	1.2	13	265	1.0
1007.8	0.269	11	0.585	6.8	266	1.8	3.9	1.1	10	304	1.3
1008.5	0.613	15	0.870	5.7	237	2.3	8.9	1.6	8.8	271	1.7
1009.2	0.682	15	0.844	9.0	245	2.0	9.8	1.5	14	280	1.5
1009.9	0.269	15	0.445	9.6	212	1.2	3.9	0.811	15	243	0.903
1010.6	0.269	14	0.645	6.8	255	1.3	3.9	1.2	10	292	0.913
1011.3	0.333	14	0.584	6.2	287	1.4	4.8	1.1	9.6	328	0.997
1012.0	0.555	15	0.745	8.0	246	1.6	8.0	1.4	12	281	1.1
1012.7	0.269	14	0.601	9.6	219	2.4	3.9	1.1	15	250	1.7
1013.4	0.269	11	0.567	9.6	242	1.1	3.9	1.0	15	277	0.803
1014.1	0.269	12	0.470	8.2	235	2.2	3.9	0.857	13	268	1.6
1014.8	0.269	12	0.801	11	316	3.2	3.9	1.5	17	361	2.3
1015.5	0.438	17	1.1	9.1	296	3.0	6.3	2.0	14	339	2.2
1016.2	0.269	19	0.676	8.7	266	2.5	3.9	1.2	13	304	1.8



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1016.9	0.269	11	0.912	12	247	1.7	3.9	1.7	18	283	1.3
1017.6	0.269	9.5	0.658	8.5	221	2.3	3.9	1.2	13	252	1.7
1018.3	0.298	11	0.950	9.1	214	1.7	4.3	1.7	14	245	1.2
1019.0	0.509	14	1.1	8.0	235	2.3	7.4	2.1	12	269	1.7
1019.7	0.487	12	0.880	13	262	2.2	7.0	1.6	20	300	1.6
1020.4	0.347	10	0.588	6.6	196	1.5	5.0	1.1	10	224	1.1
1021.1	0.484	13	1.5	14	359	2.4	7.0	2.7	21	410	1.7
1021.7	0.269	11	1.4	10	285	2.7	3.9	2.5	16	326	2.0
1022.4	0.271	16	1.0	11	262	2.5	3.9	1.9	17	299	1.8
1023.1	0.307	12	1.2	17	279	1.9	4.4	2.1	25	319	1.4
1023.8	0.269	10	0.935	13	297	1.6	3.9	1.7	20	339	1.2
1024.5	0.269	10	1.2	9.4	257	2.0	3.9	2.2	14	294	1.4
1025.2	0.592	15	1.7	20	297	3.2	8.5	3.1	31	339	2.3
1025.9	0.537	20	1.4	19	299	2.3	7.8	2.5	29	342	1.7
1026.6	0.397	10.0	1.0	17	251	1.9	5.7	1.9	27	287	1.4
1027.3	0.402	12	1.3	16	305	2.3	5.8	2.3	24	348	1.7
1028.0	0.526	12	1.7	14	218	1.1	7.6	3.2	21	249	0.812
1028.7	0.269	12	1.0	15	222	1.5	3.9	1.9	23	253	1.1
1029.4	0.269	14	1.1	22	244	1.1	3.9	2.0	34	279	0.787
1030.1	0.269	9.9	1.1	17	279	1.3	3.9	2.1	26	319	0.951
1030.8	0.374	11	0.988	13	251	1.2	5.4	1.8	20	287	0.896
1031.5	0.488	12	1.5	19	333	1.3	7.1	2.7	30	380	0.977
1032.2	0.534	16	1.5	18	227	1.9	7.7	2.8	27	259	1.4
1032.9	0.269	15	1.2	19	221	1.6	3.9	2.3	29	253	1.2
1033.6	0.494	9.2	1.1	18	200	0.639	7.1	2.0	28	228	0.466
1034.3	0.339	10	1.1	14	218	1.3	4.9	2.0	22	249	0.975
1035.0	0.374	12	1.5	22	304	1.6	5.4	2.7	33	348	1.2
1035.7	0.269	15	1.1	19	212	1.6	3.9	2.1	28	242	1.2
1036.4	0.269	15	1.0	22	219	1.2	3.9	1.9	34	250	0.900
1037.1	0.493	12	1.2	17	290	0.883	7.1	2.2	26	331	0.644
1037.8	0.269	13	1.2	16	249	0.730	3.9	2.2	25	284	0.533
1038.5	0.269	14	1.6	25	236	1.4	3.9	2.9	38	270	1.0
1039.2	0.419	14	1.2	26	273	1.3	6.0	2.2	40	313	0.947
1039.9	0.283	13	1.1	23	218	1.3	4.1	2.1	35	250	0.966
1040.6	0.269	12	1.2	21	275	1.1	3.9	2.2	32	314	0.779
1041.3	0.269	13	1.4	24	237	0.853	3.9	2.6	36	271	0.623
1042.0	0.304	16	1.9	28	282	1.2	4.4	3.4	43	323	0.907
1042.7	0.511	14	1.5	26	250	1.5	7.4	2.7	39	286	1.1
1043.4	0.269	13	1.8	28	250	1.1	3.9	3.2	43	286	0.818
1044.1	0.308	11	1.5	21	217	0.884	4.4	2.8	33	248	0.645
1044.8	0.269	17	1.8	25	297	1.2	3.9	3.3	38	339	0.905
1045.5	0.269	15	1.9	29	257	2.0	3.9	3.5	44	293	1.4
1046.2	0.269	16	1.2	25	236	1.4	3.9	2.2	38	270	1.1
1046.9	0.576	12	1.4	28	277	0.874	8.3	2.6	43	317	0.638
1047.6	0.554	14	1.5	19	248	1.2	8.0	2.8	29	284	0.887
1048.3	0.297	14	1.8	24	320	1.3	4.3	3.3	37	366	0.944
1048.9	0.582	18	1.2	28	194	0.958	8.4	2.1	42	222	0.699
1049.6	0.400	14	1.4	26	267	1.0	5.8	2.5	39	305	0.746
1050.3	0.269	12	1.1	22	232	1.2	3.9	1.9	34	266	0.882
1051.0	0.384	12	1.4	21	322	0.770	5.5	2.6	32	368	0.562
1051.7	0.333	15	1.5	29	228	1.2	4.8	2.8	44	261	0.909
1052.4	0.269	12	0.874	22	217	0.795	3.9	1.6	34	248	0.580
1053.1	0.269	14	1.2	26	301	1.9	3.9	2.2	40	344	1.4
1053.8	0.342	13	1.5	22	253	0.810	4.9	2.7	34	289	0.591
1054.5	0.377	14	1.3	21	273	1.2	5.4	2.4	32	313	0.852
1055.2	0.587	17	1.4	27	271	1.3	8.5	2.5	41	310	0.939
1055.9	0.358	16	0.887	19	243	1.2	5.2	1.6	29	278	0.910
1056.6	0.432	13	1.2	22	274	0.851	6.2	2.1	34	313	0.621
1057.3	0.269	9.0	1.0	11	203	0.964	3.9	1.9	17	233	0.703
1058.0	0.664	17	2.0	24	384	1.8	9.6	3.6	36	439	1.3
1058.7	0.269	18	1.3	20	228	2.1	3.9	2.5	30	261	1.5
1059.4	0.269	13	1.3	20	232	0.895	3.9	2.3	31	266	0.653
1060.1	0.269	14	1.1	21	270	1.6	3.9	1.9	32	309	1.2
1060.8	0.269	12	1.2	16	248	2.2	3.9	2.2	25	283	1.6
1061.5	0.269	15	1.3	17	316	1.6	3.9	2.4	26	362	1.1
1062.2	0.493	16	1.0	18	275	1.8	7.1	1.8	28	315	1.3
1062.9	0.653	14	1.3	15	304	1.6	9.4	2.3	23	348	1.2
1063.6	0.269	14	0.988	12	220	0.983	3.9	1.8	18	252	0.717
1064.3	0.722	14	1.3	18	305	1.2	10	2.4	27	349	0.867
1065.0	0.657	16	1.1	18	321	1.7	9.5	2.0	27	367	1.2
1065.7	0.514	16	0.874	18	236	2.0	7.4	1.6	27	270	1.4
1066.4	0.439	15	0.851	15	248	1.6	6.3	1.6	23	283	1.1
1067.1	0.434	12	0.984	13	239	1.6	6.3	1.8	20	273	1.2
1067.8	0.366	15	1.1	15	360	2.4	5.3	2.0	23	412	1.8
1068.5	0.269	18	1.1	15	279	2.6	3.9	2.0	23	319	1.9
1069.2	0.527	19	0.745	19	270	3.3	7.6	1.4	29	309	2.4
1069.9	0.288	12	0.861	17	292	2.3	4.2	1.6	25	334	1.7
1070.6	0.418	13	1.3	14	251	2.5	6.0	2.4	22	287	1.8
1071.3	0.269	12	1.1	11	266	2.1	3.9	2.0	18	304	1.6
1072.0	0.338	16	1.5	21	261	2.2	4.9	2.7	32	299	1.6
1072.7	0.269	21	1.1	20	256	2.7	3.9	2.0	31	292	2.0



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.4	0.318	13	1.2	14	227	1.8	4.6	2.3	21	260	1.3
1074.1	0.429	12	1.1	17	305	3.1	6.2	2.1	25	349	2.3
1074.8	0.774	18	1.5	18	315	3.3	11	2.7	27	361	2.4
1075.4	0.372	19	1.2	23	257	2.6	5.4	2.1	35	294	1.9
1076.1	0.368	15	1.3	22	258	1.8	5.3	2.3	33	295	1.3
1076.8	0.392	15	1.2	21	292	2.3	5.7	2.3	33	334	1.7
1077.5	0.269	11	0.851	15	272	1.2	3.9	1.6	23	311	0.881
1078.2	0.269	18	1.5	20	363	2.6	3.9	2.8	30	415	1.9
1078.9	0.474	17	1.1	25	251	2.0	6.8	2.0	39	287	1.5
1079.6	0.358	19	1.2	26	321	1.7	5.2	2.2	40	367	1.2
1080.3	0.269	13	1.1	16	246	1.9	3.9	1.9	25	281	1.4
1081.0	0.430	12	1.2	17	243	1.4	6.2	2.2	26	278	0.990
1081.7	0.552	16	0.876	23	217	1.9	8.0	1.6	36	248	1.4
1082.4	0.326	18	1.0	24	273	2.3	4.7	1.9	36	312	1.7
1083.1	0.269	20	1.1	27	255	1.7	3.9	2.0	41	292	1.2
1083.8	0.269	12	1.0	22	236	0.988	3.9	1.9	34	269	0.721
1084.5	0.751	17	1.6	28	278	1.9	11	3.0	42	318	1.4
1085.2	0.269	17	1.6	25	287	2.7	3.9	3.0	38	328	2.0
1085.9	0.269	14	1.3	36	274	0.917	3.9	2.3	55	313	0.669
1086.6	0.614	11	1.0	22	260	1.2	8.9	1.9	34	298	0.885
1087.3	0.289	12	1.2	20	245	1.1	4.2	2.2	30	280	0.779
1088.0	0.712	20	1.7	30	309	1.8	10	3.2	45	353	1.3
1088.7	0.406	17	1.4	33	283	2.7	5.9	2.5	51	324	1.9
1089.4	0.405	13	1.3	31	259	1.5	5.8	2.3	48	296	1.1
1090.1	0.269	12	1.0	26	266	1.5	3.9	1.8	40	304	1.1
1090.8	0.497	11	1.4	25	251	1.2	7.2	2.5	38	287	0.871
1091.5	0.566	20	1.3	36	325	1.5	8.2	2.3	56	372	1.1
1092.2	0.455	19	1.4	32	231	1.3	6.6	2.6	49	264	0.982
1092.9	0.393	16	1.4	39	262	1.1	5.7	2.5	60	300	0.823
1093.6	0.415	14	1.4	26	226	2.0	6.0	2.5	39	259	1.4
1094.3	0.269	14	1.5	33	304	1.8	3.9	2.7	50	347	1.3
1095.0	0.444	19	1.7	36	297	1.6	6.4	3.1	54	340	1.2
1095.7	0.269	18	1.3	36	235	0.989	3.9	2.3	56	269	0.722
1096.4	0.269	14	1.4	37	252	1.3	3.9	2.5	56	288	0.928
1097.1	0.269	14	2.0	28	298	0.670	3.9	3.6	42	340	0.488
1097.8	0.269	15	1.8	30	306	1.7	3.9	3.3	46	349	1.2
1098.5	0.269	16	1.6	34	304	2.3	3.9	2.8	52	347	1.7
1099.2	0.428	18	0.996	44	259	0.624	6.2	1.8	67	296	0.455
1099.9	0.379	11	1.5	35	235	0.968	5.5	2.8	53	269	0.706
1100.6	0.269	13	1.2	26	224	1.2	3.9	2.3	41	256	0.879
1101.3	0.470	19	1.5	38	276	1.5	6.8	2.7	58	315	1.1
1101.9	0.270	17	1.7	39	230	2.4	3.9	3.1	60	263	1.7
1102.6	0.269	18	1.2	41	250	0.934	3.9	2.3	63	286	0.682
1103.3	0.269	12	1.1	32	212	1.1	3.9	2.0	49	242	0.822
1104.0	0.269	13	1.4	23	273	1.3	3.9	2.6	36	313	0.953
1104.7	0.742	18	1.8	40	311	1.5	11	3.3	61	356	1.1
1105.4	0.411	18	1.3	37	252	1.5	5.9	2.4	57	288	1.1
1106.1	0.269	14	1.3	38	231	0.811	3.9	2.4	58	265	0.592
1106.8	0.345	14	1.4	30	260	1.3	5.0	2.6	46	297	0.979
1107.5	0.807	15	1.5	28	273	0.997	12	2.7	42	312	0.728
1108.2	0.400	16	1.9	38	264	1.8	5.8	3.5	58	302	1.3
1108.9	0.269	16	1.2	34	223	1.8	3.9	2.3	52	255	1.3
1109.6	0.269	13	1.3	25	254	1.2	3.9	2.4	38	291	0.900
1110.3	0.306	12	1.1	20	227	1.3	4.4	2.1	30	260	0.976
1111.0	0.352	18	1.3	26	262	2.2	5.1	2.3	39	300	1.6
1111.7	0.428	21	1.4	29	258	2.2	6.2	2.5	44	295	1.6
1112.4	0.269	16	1.2	29	268	1.9	3.9	2.3	44	307	1.4
1113.1	0.617	14	1.1	32	282	1.5	8.9	2.0	49	323	1.1
1113.8	0.429	16	1.6	26	277	2.3	6.2	2.9	40	317	1.7
1114.5	0.407	19	1.3	26	306	2.7	5.9	2.5	39	350	2.0
1115.2	0.292	18	1.1	29	257	2.3	4.2	2.0	45	293	1.7
1115.9	0.611	16	0.805	25	282	2.2	8.8	1.5	39	323	1.6
1116.6	0.269	12	0.770	19	238	1.5	3.9	1.4	29	272	1.1
1117.3	0.336	17	0.969	23	359	2.4	4.9	1.8	35	410	1.7
1118.0	0.404	21	1.6	25	323	2.0	5.8	2.9	39	370	1.4
1118.7	0.269	15	0.927	26	282	1.3	3.9	1.7	39	323	0.957
1119.4	0.470	15	0.650	23	226	2.0	6.8	1.2	35	258	1.5
1120.1	0.504	14	0.760	17	302	2.3	7.3	1.4	27	345	1.6
1120.8	0.472	14	0.894	19	251	1.4	6.8	1.6	28	287	1.0
1121.5	0.797	17	1.2	25	309	2.8	12	2.1	38	353	2.0
1122.2	0.269	15	0.701	25	227	2.2	3.9	1.3	38	259	1.6
1122.9	0.459	14	0.722	23	280	1.9	6.6	1.3	36	320	1.4
1123.6	0.467	14	0.944	18	266	1.7	6.7	1.7	28	304	1.3
1124.3	0.444	18	1.2	30	339	1.6	6.4	2.2	46	388	1.2
1125.0	0.437	22	1.3	29	279	1.7	6.3	2.4	45	318	1.2
1125.7	0.373	20	0.687	24	278	2.4	5.4	1.3	36	318	1.7
1126.4	0.298	13	0.781	29	312	1.7	4.3	1.4	45	357	1.3
1127.1	0.269	11	0.953	19	229	1.8	3.9	1.7	29	262	1.3
1127.8	0.364	13	1.3	22	288	2.2	5.3	2.4	33	329	1.6
1128.4	0.824	18	0.776	28	229	1.8	12	1.4	43	261	1.3
1129.1	0.269	13	1.2	25	251	2.0	3.9	2.2	38	287	1.5



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Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1129.8	0.275	12	1.1	22	254	1.3	4.0	2.1	33	291	0.939
1130.5	0.269	12	0.953	17	288	1.4	3.9	1.7	26	329	1.0
1131.2	0.281	18	1.3	32	324	1.9	4.1	2.4	48	370	1.4
1131.9	0.390	17	0.955	31	273	2.1	5.6	1.7	48	313	1.6
1132.6	0.269	15	1.1	31	288	0.784	3.9	2.0	47	330	0.572
1133.3	0.354	15	1.7	22	246	1.0	5.1	3.0	34	282	0.753
1134.0	0.537	15	1.7	27	342	2.6	7.8	3.1	41	391	1.9
1134.7	0.384	21	1.1	26	252	1.5	5.5	2.0	40	288	1.1
1135.4	0.269	14	1.2	27	291	1.6	3.9	2.2	42	333	1.1
1136.1	0.269	14	1.0	33	295	1.4	3.9	1.9	50	337	1.0
1136.8	0.370	13	0.937	22	267	1.3	5.3	1.7	34	305	0.937
1137.5	0.508	16	1.3	30	297	2.1	7.3	2.4	46	340	1.5
1138.2	0.344	16	1.4	27	284	2.3	5.0	2.5	41	325	1.7
1138.9	0.269	13	1.3	26	260	1.7	3.9	2.4	39	297	1.2
1139.6	0.762	13	1.1	26	248	1.6	11	2.0	40	283	1.2
1140.3	0.269	13	1.1	21	245	1.4	3.9	1.9	33	280	1.0
1141.0	0.530	16	1.3	28	268	0.791	7.6	2.4	42	307	0.577
1141.7	0.417	16	1.4	26	274	2.4	6.0	2.6	40	313	1.7
1142.4	0.429	15	1.2	26	273	1.6	6.2	2.2	40	313	1.2
1143.1	0.311	14	1.3	20	294	2.2	4.5	2.4	31	336	1.6
1143.8	0.562	18	1.4	24	330	1.7	8.1	2.5	37	378	1.3
1144.5	0.541	23	1.8	34	353	2.8	7.8	3.2	52	403	2.1
1145.2	0.563	20	1.3	33	280	1.9	8.1	2.3	51	321	1.4
1145.9	0.316	15	1.4	21	258	1.4	4.6	2.6	33	295	1.0
1146.6	0.369	12	1.2	20	252	1.2	5.3	2.1	31	288	0.841
1147.3	0.527	15	1.5	25	260	1.5	7.6	2.8	38	298	1.1
1148.0	0.555	19	1.2	22	277	1.4	8.0	2.2	33	317	1.0
1148.7	0.401	17	1.3	25	237	1.4	5.8	2.4	39	271	1.0
1149.4	0.341	14	1.1	22	294	2.0	4.9	1.9	34	336	1.4
1150.1	0.623	15	1.1	18	283	2.2	9.0	2.0	28	324	1.6
1150.8	0.517	18	1.8	27	456	2.5	7.5	3.3	41	521	1.9
1151.5	0.752	22	1.5	26	274	2.5	11	2.7	40	314	1.8
1152.2	0.883	18	0.875	29	348	2.5	13	1.6	44	397	1.8
1152.9	0.590	14	1.4	24	257	1.7	8.5	2.5	37	293	1.2
1153.6	1.2	13	1.5	21	396	2.5	17	2.8	32	453	1.8
1154.3	1.8	17	1.3	22	515	2.5	26	2.4	34	589	1.8
1154.9	2.2	20	1.5	28	444	1.6	31	2.8	44	508	1.2
1155.6	2.1	19	1.5	33	457	2.0	30	2.6	51	522	1.4
1156.3	2.3	15	1.1	28	404	1.9	33	2.1	43	462	1.4
1157.0	3.1	14	1.8	25	616	1.9	45	3.3	38	705	1.4
1157.7	3.4	18	1.4	27	535	2.6	49	2.5	42	612	1.9
1158.4	4.0	24	1.4	35	569	3.1	58	2.5	54	651	2.3
1159.1	4.1	20	1.8	32	655	2.7	59	3.3	49	749	2.0
1159.8	4.8	17	2.0	31	874	2.5	69	3.6	48	1000	1.8
1160.5	5.1	16	2.6	34	1006	2.8	73	4.7	52	1151	2.1
1161.2	5.4	19	2.2	45	957	3.1	78	4.0	69	1094	2.2
1161.9	6.4	17	1.7	42	1036	2.5	92	3.1	65	1185	1.8
1162.6	6.4	15	2.1	41	859	2.1	92	3.8	63	983	1.5
1163.3	5.8	14	2.2	37	1123	2.5	84	4.0	56	1284	1.8
1164.0	8.8	19	3.8	47	1463	4.4	127	6.9	72	1673	3.2
1164.7	8.9	20	2.6	47	1172	4.9	128	4.8	73	1340	3.6
1165.4	6.9	19	2.7	46	1117	4.1	100	4.9	71	1277	3.0
1166.1	6.5	14	2.4	46	1138	2.9	94	4.4	71	1301	2.1
1166.8	5.6	15	2.5	37	1097	2.5	81	4.5	57	1255	1.8
1167.5	8.2	20	3.6	41	1189	3.3	118	6.6	63	1360	2.4
1168.2	6.8	22	2.9	58	1261	4.8	98	5.2	90	1442	3.5
1168.9	7.7	18	3.0	51	1359	2.9	111	5.5	79	1554	2.1
1169.6	5.2	14	3.3	41	1425	2.7	75	6.1	62	1629	2.0
1170.3	9.0	19	4.1	49	1739	2.9	130	7.5	76	1989	2.1
1171.0	11	20	4.2	52	1607	3.7	157	7.6	80	1838	2.7
1171.7	7.1	24	3.2	66	1436	4.2	103	5.8	101	1642	3.1
1172.4	7.6	17	2.7	52	1357	2.7	110	4.9	80	1552	2.0
1173.1	5.9	11	3.0	39	1129	2.3	86	5.5	59	1291	1.7
1173.8	8.0	16	3.4	51	1893	3.6	115	6.2	78	2165	2.6
1174.5	13	22	3.4	63	1654	3.9	188	6.3	97	1891	2.8
1175.2	7.9	22	3.4	67	1716	3.6	114	6.3	103	1962	2.6
1175.9	8.3	16	3.2	74	1647	2.7	120	5.9	113	1883	2.0
1176.6	6.9	12	3.2	43	1420	3.0	99	5.8	65	1623	2.2
1177.3	10	20	4.5	60	2228	3.2	149	8.2	92	2548	2.3
1178.0	13	21	5.1	71	1829	4.0	187	9.3	108	2092	2.9
1178.7	7.4	20	3.6	76	1623	3.9	107	6.5	116	1856	2.9
1179.4	8.7	16	4.6	64	1796	2.8	126	8.4	98	2054	2.0
1180.1	8.0	14	3.6	51	1646	3.7	116	6.5	79	1883	2.7
1180.7	11	19	5.3	73	2745	4.9	166	9.7	112	3139	3.6
1181.4	9.4	19	4.8	82	2079	3.5	136	8.8	126	2378	2.6
1182.1	7.5	18	3.9	76	2250	3.8	109	7.1	116	2573	2.8
1182.8	8.1	15	4.5	56	1902	3.3	117	8.2	85	2175	2.4
1183.5	7.1	14	4.1	53	1830	2.9	102	7.5	81	2093	2.1
1184.2	10	20	5.9	83	2279	4.0	148	11	127	2606	2.9
1184.9	8.0	20	4.5	79	2274	4.4	116	8.1	121	2601	3.2
1185.6	8.1	14	4.1	67	2478	4.2	118	7.6	103	2834	3.0



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1186.3	10	16	4.9	71	2230	4.8	151	9.0	109	2550	3.5
1187.0	11	19	4.9	67	2307	3.5	153	8.9	102	2638	2.5
1187.7	9.4	20	6.0	84	2572	5.9	135	11	129	2941	4.3
1188.4	8.7	21	4.6	75	2059	4.5	126	8.4	115	2354	3.3
1189.1	7.7	19	4.2	73	2803	3.9	112	7.7	112	3205	2.9
1189.8	9.6	16	5.7	81	2367	4.4	138	10	124	2707	3.2
1190.5	11	21	5.1	73	2497	5.2	153	9.2	112	2855	3.8
1191.2	9.0	17	5.3	74	2008	4.6	130	9.7	113	2297	3.4
1191.9	8.3	16	4.8	68	2066	3.9	120	8.7	105	2362	2.8
1192.6	9.2	15	4.1	70	2666	5.0	132	7.5	108	3048	3.7
1193.3	9.5	13	4.7	67	2311	3.5	138	8.6	103	2643	2.5
1194.0	10	20	5.5	79	2308	4.5	149	10.0	121	2640	3.3
1194.7	9.7	21	4.8	88	2337	7.3	140	8.8	135	2672	5.3
1195.4	7.1	16	4.4	73	2085	3.9	102	8.1	112	2384	2.8
1196.1	8.6	18	4.9	86	2728	5.5	124	8.9	132	3119	4.0
1196.8	9.8	18	5.3	76	2640	5.1	141	9.7	117	3019	3.7
1197.5	11	24	5.0	75	2905	7.0	153	9.2	114	3322	5.1
1198.2	9.0	20	5.4	77	2536	5.0	131	9.8	118	2900	3.6
1198.9	8.9	17	5.1	78	2192	3.9	128	9.4	119	2507	2.8
1199.6	8.7	16	4.7	71	2501	4.7	125	8.6	109	2860	3.4
1200.3	9.3	19	5.4	73	2154	4.9	134	9.8	112	2464	3.6
1201.0	8.9	18	5.2	80	2492	4.2	128	9.5	123	2849	3.1
1201.7	9.1	18	4.4	90	2471	4.8	131	8.0	139	2826	3.5
1202.4	7.5	19	4.3	86	2504	4.4	108	7.8	131	2864	3.2
1203.1	9.4	18	4.9	72	2431	3.9	135	8.9	110	2779	2.8
1203.8	8.9	21	5.2	92	2790	5.7	129	9.4	142	3191	4.2
1204.5	7.8	20	4.3	85	2307	6.4	113	7.9	131	2638	4.7
1205.2	6.7	18	4.9	84	2503	5.5	97	9.0	129	2862	4.0
1205.9	6.3	19	5.2	91	2679	6.5	91	9.5	139	3063	4.7
1206.6	7.5	16	4.8	66	2505	4.6	108	8.8	102	2864	3.4
1207.3	8.1	16	4.5	85	2862	6.1	117	8.2	130	3273	4.4
1207.9	6.7	20	5.8	108	2920	6.4	97	11	165	3339	4.7
1208.6	5.5	16	4.1	68	2123	3.4	79	7.5	104	2427	2.5
1209.3	6.8	18	4.3	83	2650	5.3	99	7.9	128	3030	3.9
1210.0	6.1	19	5.1	79	2842	6.5	88	9.3	122	3250	4.7
1210.7	6.4	18	4.6	69	2225	3.8	93	8.3	106	2544	2.7
1211.4	8.0	18	4.5	93	2276	4.9	116	8.2	142	2603	3.6
1212.1	5.3	17	4.4	89	2728	4.8	76	7.9	136	3120	3.5
1212.8	5.4	15	4.3	76	2327	5.2	78	7.9	116	2661	3.8
1213.5	6.8	19	4.1	69	2113	4.9	98	7.5	105	2416	3.5
1214.2	5.8	22	4.4	91	2691	4.2	83	8.1	139	3078	3.0
1214.9	5.3	18	4.3	81	2541	5.8	76	7.8	125	2905	4.3
1215.6	4.4	18	3.8	66	1964	2.7	64	6.9	102	2245	2.0
1216.3	4.5	18	3.9	65	2215	3.2	65	7.2	99	2533	2.4
1217.0	5.1	18	4.0	70	3024	5.1	74	7.3	107	3458	3.7
1217.7	5.3	19	3.7	65	1965	4.6	77	6.8	100	2247	3.4
1218.4	4.1	20	3.4	89	2336	3.3	58	6.2	136	2671	2.4
1219.1	3.5	17	3.9	60	2077	4.2	51	7.1	91	2375	3.1
1219.8	4.2	17	3.7	62	2420	4.3	60	6.8	94	2767	3.2
1220.5	3.5	19	3.1	57	2148	3.5	50	5.7	88	2457	2.6
1221.2	4.1	21	4.3	80	2358	2.7	60	7.9	123	2696	2.0
1221.9	3.4	19	3.7	89	2431	3.7	50	6.8	137	2780	2.7
1222.6	2.9	13	3.9	66	2195	4.3	42	7.1	102	2510	3.1
1223.3	3.7	16	4.0	50	1981	3.0	53	7.3	76	2265	2.2
1224.0	5.1	21	3.7	69	2328	4.7	74	6.7	106	2662	3.4
1224.7	3.0	20	3.2	68	1985	3.0	43	5.9	105	2270	2.2
1225.4	2.8	17	3.3	65	2510	3.4	40	6.0	99	2870	2.5
1226.1	2.1	16	4.3	55	2298	3.6	30	7.8	85	2628	2.6
1226.8	3.3	18	3.3	52	2186	2.9	47	6.0	79	2499	2.1
1227.5	4.3	18	3.6	65	2526	3.3	63	6.6	100	2889	2.4
1228.2	2.9	19	2.8	62	2087	2.3	42	5.1	94	2386	1.7
1228.9	3.0	20	3.1	64	2290	2.7	43	5.7	98	2619	1.9
1229.6	3.4	18	3.4	60	2168	2.3	50	6.2	92	2479	1.7
1230.3	2.5	23	3.3	57	2329	2.8	36	6.0	88	2663	2.0
1231.0	3.3	21	3.6	72	2334	2.7	47	6.6	111	2669	2.0
1231.7	2.9	17	2.4	62	2060	2.9	42	4.4	95	2356	2.1
1232.4	1.5	16	3.1	64	2396	2.4	22	5.6	97	2740	1.7
1233.1	2.2	15	3.4	59	2147	2.8	32	6.2	91	2455	2.1
1233.8	3.0	18	3.5	67	2412	2.2	43	6.4	102	2758	1.6
1234.5	2.2	21	3.6	61	2188	2.0	32	6.5	94	2502	1.5
1235.1	2.2	22	3.1	58	2020	2.1	32	5.7	89	2310	1.6
1235.8	2.1	17	2.9	80	2360	2.1	31	5.3	122	2699	1.5
1236.5	2.2	13	2.7	48	1725	1.9	31	4.9	74	1973	1.4
1237.2	2.6	23	3.2	66	2525	1.8	38	5.9	101	2888	1.3
1237.9	2.8	20	3.2	65	2177	3.3	41	5.9	99	2489	2.4
1238.6	1.9	19	2.8	60	2054	1.9	27	5.1	92	2348	1.4
1239.3	2.6	19	2.8	56	2188	2.7	37	5.1	85	2502	1.9
1240.0	1.7	17	2.9	49	2102	3.1	25	5.4	76	2404	2.2
1240.7	2.4	20	3.2	65	2274	2.3	35	5.8	100	2600	1.6
1241.4	2.0	20	2.8	59	2124	1.7	30	5.0	91	2429	1.2
1242.1	1.2	17	2.3	52	2086	2.4	18	4.2	79	2385	1.8



Minnow Environmental  
Sample ID: 004

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
1242.8	1.5	20	2.6	55	2196	1.8	22	4.7	84	2511	1.3
1243.5	2.3	22	2.4	50	2080	1.8	33	4.5	77	2379	1.3
1244.2	2.2	19	2.6	61	2161	1.9	31	4.8	94	2471	1.4
1244.9	1.5	18	2.6	49	2048	2.0	21	4.8	76	2342	1.5
1245.6	1.5	16	2.7	52	2169	1.9	22	5.0	79	2480	1.4
1246.3	2.0	16	2.2	43	1823	1.8	29	4.0	66	2084	1.3
1247.0	1.8	23	2.3	42	2000	2.5	26	4.2	65	2287	1.9
1247.7	1.3	19	2.5	56	1903	2.9	19	4.5	86	2177	2.1
1248.4	1.3	18	2.2	56	2201	2.1	19	3.9	85	2517	1.6
1249.1	1.2	19	2.0	44	2073	2.2	17	3.7	67	2371	1.6
1249.8	1.3	18	3.2	46	1907	2.5	19	5.9	70	2181	1.8
1250.5	0.878	18	2.2	53	1881	2.5	13	4.0	81	2151	1.8
1251.2	1.3	18	2.2	51	1525	2.0	19	4.1	79	1744	1.4
1251.9	1.2	21	2.0	51	1784	2.6	18	3.6	79	2040	1.9
1252.6	1.1	16	2.2	44	1975	1.9	16	3.9	67	2258	1.4
1253.3	0.928	18	2.2	48	1700	3.1	13	4.0	73	1945	2.2
1254.0	1.2	23	2.0	49	1545	2.3	17	3.7	76	1766	1.7
1254.7	1.2	19	1.1	46	1417	2.8	17	2.1	71	1620	2.1
1255.4	0.855	17	1.6	44	1375	2.3	12	2.9	68	1573	1.7
1256.1	0.651	16	1.7	41	1394	2.3	9.4	3.1	62	1594	1.7
1256.8	0.713	18	1.4	44	1362	3.0	10	2.5	67	1558	2.2
1257.5	1.1	20	1.9	59	1552	3.0	15	3.6	91	1775	2.2
1258.2	0.640	19	1.6	35	1197	2.6	9.2	3.0	54	1369	1.9
1258.9	0.735	16	1.2	34	1109	2.3	11	2.2	52	1268	1.7
1259.6	0.924	21	1.2	31	1047	2.0	13	2.2	48	1198	1.5
1260.3	1.2	18	0.977	33	1074	2.4	17	1.8	50	1228	1.7
1261.0	0.522	21	1.3	39	1218	2.7	7.5	2.3	60	1393	2.0
1261.6	0.396	19	0.936	35	1068	3.5	5.7	1.7	54	1222	2.5
1262.3	0.849	19	0.979	30	1002	2.3	12	1.8	46	1146	1.6
1263.0	0.479	22	0.809	25	923	2.0	6.9	1.5	38	1056	1.5
1263.7	0.601	20	0.959	28	970	2.8	8.7	1.7	43	1110	2.0
1264.4	0.776	22	0.922	28	939	3.3	11	1.7	42	1074	2.4
1265.1	0.509	17	0.651	26	898	3.7	7.4	1.2	39	1027	2.7
1265.8	1.2	18	0.839	25	1022	2.9	17	1.5	38	1168	2.1
1266.5	0.813	19	0.672	25	966	2.8	12	1.2	38	1104	2.0
1267.2	1.1	22	0.739	24	932	2.7	16	1.3	38	1066	2.0
1267.9	0.860	22	0.831	26	889	2.6	12	1.5	39	1016	1.9
1268.6	0.787	16	0.734	21	920	2.3	11	1.3	32	1053	1.7
1269.3	1.6	17	0.602	19	924	1.6	23	1.1	30	1056	1.2
1270.0	1.1	24	0.941	17	962	2.7	16	1.7	26	1100	2.0
1270.7	1.2	23	0.568	19	997	2.8	17	1.0	29	1141	2.1
1271.4	0.816	20	0.804	22	936	2.0	12	1.5	33	1071	1.5
1272.1	1.6	17	0.689	21	1012	1.6	23	1.3	33	1158	1.2
1272.8	1.9	19	0.700	16	890	2.6	27	1.3	25	1017	1.9
1273.5	2.4	21	0.870	19	1098	3.0	35	1.6	30	1255	2.2
1274.2	2.5	22	0.813	20	957	3.6	36	1.5	31	1095	2.6
1274.9	3.3	21	0.739	18	931	3.0	47	1.3	27	1064	2.2
1275.6	3.7	16	0.879	16	1010	2.8	53	1.6	24	1155	2.1
1276.3	6.6	21	1.3	18	1199	3.2	96	2.3	27	1372	2.3
1277.0	6.7	21	1.5	25	1021	3.3	97	2.7	38	1167	2.4
1277.7	7.4	18	1.4	21	979	2.8	107	2.5	32	1120	2.0
1278.4	8.6	20	1.8	28	1268	3.3	124	3.2	42	1450	2.4
1279.1	7.4	13	1.6	20	1121	3.2	107	2.9	31	1282	2.3
1279.8	9.4	19	1.9	20	1102	2.9	136	3.5	31	1260	2.1
1280.5	13	18	2.6	28	1168	5.9	183	4.7	43	1335	4.3
1281.2	11	21	2.6	26	1192	3.1	161	4.7	40	1363	2.3
1281.9	9.5	15	2.3	26	1312	4.8	138	4.2	39	1500	3.5
1282.6	12	15	2.7	24	1357	3.9	172	4.8	36	1552	2.8
1283.3	10	14	4.3	24	1040	4.4	150	7.8	36	1190	3.2
1284.0	13	21	3.9	35	1495	9.6	190	7.2	53	1710	7.0
1284.7	13	23	3.5	40	1421	5.5	181	6.3	61	1625	4.0
1285.4	13	15	4.2	29	1380	5.9	186	7.6	44	1579	4.3
1286.1	9.7	15	4.0	26	1568	5.4	140	7.2	40	1793	3.9
1286.8	11	17	6.0	39	1695	8.3	160	11	59	1938	6.1
1287.5	16	20	5.3	35	1439	5.5	227	9.7	54	1645	4.0
1288.1	10	18	4.6	39	1630	6.0	149	8.4	60	1864	4.3
1288.8	12	18	5.4	43	2042	7.0	177	9.8	66	2335	5.1
1289.5	14	23	6.8	41	2280	7.5	199	12	63	2608	5.5
1290.2	11	20	5.5	40	1876	8.6	166	10	62	2146	6.2
1290.9	11	20	6.3	54	1909	8.1	161	12	83	2183	5.9
1291.6	10	19	8.4	58	1922	6.7	145	15	88	2198	4.9
1292.3	7.6	19	7.0	36	1901	6.8	109	13	55	2174	5.0
1293.0	9.3	22	11	59	3060	9.2	135	20	90	3499	6.7
1293.7	8.1	24	7.7	62	1907	8.4	117	14	96	2181	6.1
1294.4	6.8	24	7.4	59	2000	7.2	98	13	90	2287	5.2
1295.1	7.2	14	7.8	47	1680	5.4	103	14	72	1921	3.9
1295.8	6.7	13	7.7	40	1699	4.6	97	14	61	1943	3.4
1296.5	6.4	15	8.2	41	1610	5.3	93	15	63	1841	3.8
1297.2	9.1	24	9.1	62	2350	8.5	131	17	96	2688	6.2
1297.9	6.6	23	8.1	67	2276	7.2	96	15	102	2603	5.3
1298.6	5.3	18	7.6	50	1789	5.0	77	14	76	2046	3.6



Minnow Environmental  
Sample ID: 004

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
1299.3	5.7	14	7.1	44	1659	4.5	82	13	68	1898	3.3
1300.0	7.3	20	8.1	60	3007	7.6	106	15	92	3439	5.6
1300.7	8.2	22	9.1	57	2004	6.1	119	17	88	2292	4.4
1301.4	7.6	23	7.8	71	2102	4.5	110	14	109	2404	3.3
1302.1	5.1	15	6.3	51	1954	5.2	74	12	77	2234	3.8
1302.8	7.4	18	7.0	52	2196	5.1	106	13	80	2512	3.7
1303.5	7.5	20	11	70	2548	8.2	108	20	107	2913	6.0
1304.2	8.5	23	6.8	63	1948	7.5	123	12	96	2227	5.4
1304.9	5.4	19	6.8	75	2523	4.0	79	12	115	2885	2.9
1305.6	5.6	16	5.3	44	1796	4.9	81	9.7	67	2054	3.6
1306.3	5.0	18	6.7	52	1941	4.5	73	12	80	2220	3.3
1307.0	6.4	21	8.1	75	2212	7.6	92	15	116	2529	5.5
1307.7	5.0	22	6.1	62	2062	5.5	72	11	95	2358	4.0
1308.4	3.8	15	5.2	53	1723	4.2	55	9.5	82	1970	3.0
1309.1	4.2	15	5.7	45	2301	3.8	60	10	69	2631	2.7
1309.8	5.9	18	7.4	55	2360	5.6	85	13	85	2699	4.1
1310.5	4.8	24	7.8	57	1821	4.1	70	14	88	2082	3.0
1311.2	3.1	20	4.9	92	1907	6.0	44	9.0	141	2180	4.4
1311.9	3.3	16	5.3	68	1920	3.3	47	9.6	104	2196	2.4
1312.6	3.5	13	5.0	37	1984	3.9	50	9.1	56	2268	2.8
1313.3	4.7	24	5.9	59	3057	5.2	68	11	90	3496	3.8
1314.0	5.1	26	5.0	58	2051	5.0	73	9.0	89	2345	3.6
1314.6	3.2	26	4.6	61	2048	3.0	46	8.4	94	2342	2.2
1315.3	3.2	16	4.2	60	2138	4.1	46	7.6	92	2445	3.0
1316.0	2.5	15	3.2	33	1850	3.4	36	5.8	50	2116	2.4
1316.7	2.7	23	5.0	42	2306	3.6	39	9.2	64	2637	2.6
1317.4	2.8	27	4.1	53	2005	4.6	40	7.4	81	2293	3.4
1318.1	2.9	16	3.4	44	2069	3.1	42	6.2	68	2366	2.3
1318.8	2.1	20	3.3	33	1894	2.7	30	6.0	51	2166	2.0
1319.5	1.4	17	3.7	31	1628	2.8	20	6.7	47	1861	2.0
1320.2	2.5	26	3.8	47	1957	4.1	37	7.0	73	2238	3.0
1320.9	2.0	24	3.3	39	1795	3.6	28	6.1	60	2053	2.6
1321.6	0.776	24	3.2	41	1692	3.0	11	5.8	63	1934	2.2
1322.3	1.4	17	3.3	31	1875	2.9	20	6.1	47	2144	2.1
1323.0	1.7	21	2.6	30	1853	3.5	24	4.8	45	2119	2.5
1323.7	1.6	23	3.0	40	1600	3.3	24	5.5	61	1829	2.4
1324.4	0.963	22	2.5	41	1538	2.8	14	4.6	62	1758	2.1
1325.1	1.0	21	2.1	34	1597	3.4	15	3.8	52	1827	2.4
1325.8	0.754	16	2.2	26	1307	2.8	11	3.9	40	1494	2.1
1326.5	1.3	24	2.3	28	1828	3.9	19	4.2	43	2090	2.8
1327.2	0.915	25	2.0	32	1250	4.4	13	3.6	49	1429	3.2
1327.9	0.682	33	1.5	41	1384	2.2	9.8	2.8	62	1582	1.6
1328.6	1.1	21	1.7	32	1258	2.6	16	3.1	49	1439	1.9
1329.3	0.723	18	1.5	20	1381	2.6	10	2.7	31	1580	1.9
1330.0	0.496	25	1.9	39	1618	4.1	7.2	3.4	59	1850	3.0
1330.7	0.753	30	2.1	38	1215	2.9	11	3.9	58	1390	2.1
1331.4	0.269	18	1.4	41	1206	2.5	3.9	2.5	63	1380	1.8
1332.1	0.507	20	1.3	27	1086	2.4	7.3	2.4	42	1242	1.7
1332.8	0.408	17	1.2	24	1208	2.1	5.9	2.1	37	1381	1.5
1333.5	0.950	26	1.5	29	1196	2.6	14	2.6	45	1367	1.9
1334.2	0.547	21	0.922	34	1079	3.0	7.9	1.7	52	1234	2.2
1334.9	0.382	18	1.3	30	1204	2.0	5.5	2.4	46	1377	1.5
1335.6	0.662	15	0.932	22	980	2.0	9.5	1.7	34	1120	1.5
1336.3	0.345	15	0.812	18	804	1.5	5.0	1.5	28	919	1.1
1337.0	0.683	24	1.3	33	956	3.5	9.9	2.4	50	1094	2.6
1337.7	0.269	22	0.752	34	974	2.2	3.9	1.4	51	1114	1.6
1338.4	0.581	16	0.971	32	942	2.0	8.4	1.8	49	1077	1.4
1339.1	0.336	16	0.532	17	780	1.4	4.8	0.971	26	892	1.0
1339.8	0.726	22	0.994	28	1245	3.0	10	1.8	44	1424	2.2
1340.5	0.527	27	0.882	26	856	2.5	7.6	1.6	40	979	1.8
1341.1	0.269	26	0.513	26	851	1.7	3.9	0.936	39	974	1.2
1341.8	0.659	14	0.529	15	795	1.1	9.5	0.964	24	909	0.792
1342.5	0.269	16	0.654	18	884	1.8	3.9	1.2	27	1011	1.3
1343.2	0.736	24	0.471	26	1163	1.8	11	0.858	40	1330	1.3
1343.9	0.446	24	0.349	25	762	1.9	6.4	0.637	39	871	1.4
1344.6	0.269	19	0.642	24	881	1.3	3.9	1.2	36	1007	0.966
1345.3	0.469	17	0.614	23	1002	1.8	6.8	1.1	35	1145	1.3
1346.0	0.315	15	0.504	13	946	1.4	4.6	0.920	20	1082	1.0
1346.7	0.480	26	0.845	21	1062	2.9	6.9	1.5	33	1214	2.1
1347.4	0.828	26	0.311	18	882	2.0	12	0.568	28	1009	1.4
1348.1	0.374	17	0.387	15	929	1.4	5.4	0.705	24	1063	1.0
1348.8	0.465	16	0.595	14	848	1.9	6.7	1.1	22	970	1.4
1349.5	0.634	15	0.701	11	846	1.5	9.1	1.3	17	967	1.1
1350.2	0.906	25	0.584	16	1062	2.7	13	1.1	24	1214	2.0
1350.9	0.683	29	0.524	18	911	1.8	9.9	0.957	28	1042	1.3
1351.6	0.269	16	0.498	11	958	2.1	3.9	0.909	17	1096	1.5
1352.3	0.462	17	0.555	13	920	1.8	6.7	1.0	19	1052	1.3
1353.0	0.926	24	0.804	17	1033	2.4	13	1.5	27	1182	1.7
1353.7	0.677	23	0.642	18	993	1.8	9.8	1.2	27	1135	1.3
1354.4	0.848	23	0.840	18	1008	2.4	12	1.5	27	1153	1.8
1355.1	1.1	17	0.541	16	904	1.4	15	0.986	24	1034	1.1



Minnow Environmental  
Sample ID: 004

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
1355.8	1.1	15	0.423	14	1010	2.1	15	0.771	21	1155	1.5
1356.5	0.849	18	0.744	19	1054	2.7	12	1.4	30	1205	1.9
1357.2	1.2	18	0.428	18	1039	2.7	18	0.780	28	1188	2.0
1357.9	0.726	18	0.632	15	1021	2.8	10	1.2	23	1167	2.1
1358.6	1.9	19	0.771	16	1121	2.1	28	1.4	24	1281	1.6
1359.3	2.0	20	0.808	19	1579	3.2	28	1.5	29	1805	2.4
1360.0	2.1	19	0.912	24	1306	3.6	30	1.7	37	1493	2.6
1360.7	1.8	19	0.829	15	1050	2.2	27	1.5	23	1201	1.6
1361.4	0.884	12	0.600	16	924	2.4	13	1.1	25	1056	1.7
1362.1	1.6	16	0.769	17	1004	2.3	23	1.4	25	1148	1.7
1362.8	2.9	22	1.1	20	1551	2.6	41	2.0	30	1774	1.9
1363.5	3.1	24	0.922	22	1237	4.4	45	1.7	34	1415	3.2
1364.2	1.7	22	0.580	22	1052	2.7	24	1.1	34	1203	2.0
1364.9	1.5	15	0.798	24	1117	2.1	22	1.5	37	1277	1.5
1365.6	1.7	16	0.816	17	1333	2.1	25	1.5	26	1524	1.5
1366.3	3.5	25	0.439	21	1608	3.9	50	0.800	32	1838	2.8
1367.0	2.1	21	0.894	20	1079	4.5	30	1.6	30	1234	3.3
1367.6	2.2	17	0.755	21	1253	2.4	32	1.4	33	1432	1.8
1368.3	2.4	15	0.818	15	1265	2.8	34	1.5	24	1447	2.0
1369.0	1.4	12	0.783	12	1030	2.2	20	1.4	18	1178	1.6
1369.7	3.8	24	1.3	23	1819	4.3	55	2.5	35	2080	3.2
1370.4	2.5	25	0.940	23	1246	3.4	37	1.7	35	1425	2.5
1371.1	2.7	17	0.914	34	1386	3.6	39	1.7	52	1585	2.6
1371.8	2.4	12	0.934	14	1103	2.6	35	1.7	21	1262	1.9
1372.5	1.7	13	0.544	13	939	2.6	24	0.993	20	1074	1.9
1373.2	3.0	25	1.1	25	1504	4.1	43	2.0	39	1720	3.0
1373.9	2.8	26	1.3	27	1530	2.4	40	2.4	42	1749	1.8
1374.6	2.9	16	0.858	23	1523	2.8	41	1.6	35	1742	2.0
1375.3	2.8	15	0.991	14	1650	3.5	40	1.8	22	1886	2.6
1376.0	2.6	14	0.997	14	1179	3.9	37	1.8	21	1348	2.9
1376.7	4.0	28	1.6	23	1574	6.1	58	2.9	36	1800	4.4
1377.4	2.0	32	1.2	23	1373	4.3	29	2.1	36	1571	3.1
1378.1	1.3	18	0.994	17	1412	3.0	19	1.8	26	1615	2.2
1378.8	1.6	17	0.886	17	1299	3.5	23	1.6	26	1486	2.5
1379.5	3.5	26	1.4	24	1363	3.3	51	2.5	37	1559	2.4
1380.2	2.5	22	0.903	22	1695	5.6	37	1.6	34	1939	4.1
1380.9	1.2	19	1.2	23	1412	2.7	18	2.2	35	1615	2.0
1381.6	1.3	16	1.1	18	1291	3.2	18	2.1	28	1476	2.3
1382.3	2.2	21	1.2	23	1793	5.2	32	2.2	35	2050	3.8
1383.0	1.4	23	0.834	18	1546	4.3	20	1.5	27	1768	3.1
1383.7	1.3	28	1.2	28	1440	5.5	19	2.1	43	1647	4.0
1384.4	1.2	20	1.0	26	1315	3.6	17	1.8	41	1503	2.6
1385.1	1.0	22	1.2	20	1510	3.2	15	2.3	31	1726	2.3
1385.8	1.7	20	1.5	25	1501	3.0	25	2.8	38	1716	2.2
1386.5	2.3	19	1.3	24	1496	3.7	33	2.5	36	1711	2.7
1387.2	0.852	18	1.1	27	1303	2.2	12	2.0	42	1490	1.6
1387.9	0.656	13	0.993	19	1049	1.7	9.5	1.8	29	1199	1.3
1388.6	0.833	15	0.990	18	1285	2.2	12	1.8	28	1469	1.6
1389.3	1.6	18	0.898	15	1235	3.4	22	1.6	23	1412	2.5
1390.0	0.971	22	1.1	22	1317	5.0	14	2.0	34	1507	3.6
1390.7	0.807	19	0.924	25	1241	3.6	12	1.7	39	1419	2.7
1391.4	1.2	16	0.931	24	1162	2.3	17	1.7	37	1329	1.7
1392.1	1.0	19	0.848	24	1461	2.2	14	1.5	37	1671	1.6
1392.8	1.2	18	0.939	24	1178	3.5	17	1.7	37	1347	2.6
1393.5	0.724	20	1.0	21	1199	3.0	10	1.9	32	1371	2.2
1394.1	1.1	16	1.3	22	1242	2.9	15	2.3	34	1420	2.1
1394.8	0.870	16	0.856	21	1176	2.2	13	1.6	33	1345	1.6
1395.5	1.2	18	1.3	18	1568	2.8	18	2.4	27	1793	2.0
1396.2	1.9	25	1.6	28	1573	4.2	27	2.9	42	1798	3.1
1396.9	1.8	25	1.3	34	1352	3.5	26	2.4	53	1546	2.5
1397.6	1.5	18	1.1	23	1271	2.8	22	2.0	36	1453	2.1
1398.3	1.2	12	1.1	17	1262	1.8	17	2.0	27	1443	1.3
1399.0	1.2	17	1.2	20	1214	2.5	18	2.3	31	1388	1.8
1399.7	1.4	22	0.962	24	1181	2.3	20	1.8	38	1351	1.7
1400.4	0.949	24	1.1	27	1199	1.9	14	2.0	41	1371	1.4
1401.1	0.608	17	1.6	24	1237	2.4	8.8	2.9	37	1415	1.8
1401.8	0.970	14	1.3	21	1100	2.3	14	2.3	32	1258	1.7
1402.5	2.0	20	1.5	23	1362	2.8	29	2.8	36	1558	2.0
1403.2	1.4	19	1.6	28	1313	2.6	20	2.8	44	1501	1.9
1403.9	1.6	21	1.4	32	1086	2.5	23	2.6	48	1242	1.8
1404.6	1.4	17	1.3	38	1123	2.4	20	2.3	59	1285	1.7
1405.3	1.9	16	1.5	17	1205	1.9	28	2.7	27	1378	1.4
1406.0	2.4	17	1.7	24	1150	2.8	34	3.0	37	1315	2.0
1406.7	1.6	21	1.8	29	1076	3.0	23	3.4	45	1230	2.2
1407.4	1.7	20	1.3	28	1053	2.1	25	2.4	44	1204	1.5
1408.1	1.5	15	1.2	18	991	2.4	21	2.2	27	1133	1.7
1408.8	1.7	15	1.2	18	1053	1.6	25	2.2	27	1204	1.2
1409.5	2.5	21	1.8	28	1648	2.3	35	3.3	43	1885	1.7
1410.2	0.841	21	1.6	33	982	2.4	12	2.9	50	1123	1.8
1410.9	1.1	18	1.6	34	1195	2.7	16	2.9	52	1367	2.0
1411.6	1.5	10	0.940	17	1012	2.2	22	1.7	25	1157	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1412.3	1.3	13	1.1	22	846	1.9	18	2.1	34	968	1.4
1413.0	2.0	18	1.8	38	1219	3.6	29	3.2	58	1394	2.6
1413.7	1.6	23	1.1	27	1021	2.4	23	2.0	41	1167	1.7
1414.4	2.0	13	1.4	21	976	2.3	29	2.6	32	1116	1.7
1415.1	1.8	14	1.4	23	1035	1.7	27	2.5	35	1183	1.2
1415.8	2.7	18	1.6	24	1331	2.6	38	2.9	37	1522	1.9
1416.5	2.4	19	1.5	30	997	3.4	34	2.7	46	1140	2.5
1417.2	1.7	16	1.5	30	1016	1.6	25	2.7	46	1162	1.2
1417.9	1.7	11	1.3	26	1082	1.8	25	2.3	41	1237	1.3
1418.6	3.2	14	1.7	21	982	1.8	46	3.2	33	1122	1.3
1419.3	6.1	22	2.7	28	1554	3.3	89	4.8	44	1777	2.4
1420.0	4.2	22	1.8	32	1105	2.4	60	3.3	49	1263	1.8
1420.6	2.7	19	1.6	29	1118	2.1	39	3.0	44	1279	1.5
1421.3	2.8	13	1.5	23	1121	2.6	40	2.7	36	1282	1.9
1422.0	4.9	14	1.6	21	1128	1.8	71	2.8	33	1290	1.3
1422.7	4.1	19	1.8	30	1378	3.4	60	3.3	46	1576	2.5
1423.4	4.7	21	2.3	35	1281	3.4	68	4.2	54	1465	2.5
1424.1	4.0	17	1.9	27	979	2.2	58	3.5	42	1120	1.6
1424.8	3.4	16	2.1	29	1249	3.5	48	3.8	44	1428	2.6
1425.5	4.0	12	2.4	18	891	2.1	58	4.4	28	1019	1.5
1426.2	6.9	23	3.4	36	1293	4.2	99	6.2	54	1479	3.1
1426.9	5.4	19	2.8	40	1420	2.3	78	5.1	61	1624	1.7
1427.6	4.1	16	2.7	33	1485	2.3	60	4.9	50	1698	1.7
1428.3	5.5	16	3.3	32	1394	2.9	80	6.0	49	1594	2.2
1429.0	6.9	21	3.3	35	1723	3.8	100	6.0	53	1970	2.8
1429.7	5.4	16	3.3	36	1290	3.0	78	6.1	56	1475	2.2
1430.4	5.7	20	3.1	39	1391	2.8	82	5.6	60	1591	2.1
1431.1	7.1	15	2.9	28	1313	2.5	102	5.4	43	1502	1.8
1431.8	5.5	16	3.6	33	1929	3.3	79	6.5	51	2206	2.4
1432.5	6.0	23	4.8	43	1568	4.0	87	8.7	66	1793	2.9
1433.2	5.6	24	3.4	44	1677	3.6	80	6.2	68	1917	2.6
1433.9	4.5	15	3.4	43	1453	2.4	65	6.1	66	1662	1.7
1434.6	4.8	13	3.2	32	1249	2.7	69	5.9	49	1429	2.0
1435.3	4.8	12	3.2	25	1304	2.3	69	5.9	38	1491	1.7
1436.0	10	22	4.9	50	2418	4.6	147	9.0	76	2765	3.3
1436.7	6.5	23	3.2	44	1721	4.3	93	5.8	68	1968	3.2
1437.4	5.4	15	3.6	51	1660	3.6	78	6.6	78	1898	2.6
1438.1	4.8	18	3.8	37	1914	4.8	69	7.0	57	2189	3.5
1438.8	4.3	11	3.9	26	1526	2.6	62	7.0	40	1745	1.9
1439.5	7.6	17	2.8	44	1833	5.5	110	5.1	68	2096	4.0
1440.2	3.4	17	3.3	43	1607	3.6	49	5.9	66	1838	2.6
1440.9	5.4	12	3.8	49	1723	3.1	78	6.9	76	1971	2.2
1441.6	5.2	14	3.6	35	1701	4.6	75	6.6	53	1945	3.4
1442.3	6.3	19	4.3	43	1876	6.0	90	7.8	66	2145	4.4
1443.0	3.2	20	4.6	47	1816	4.5	47	8.4	71	2077	3.3
1443.7	3.8	18	3.2	46	1663	5.2	55	5.8	70	1901	3.8
1444.4	4.5	15	4.0	41	1948	3.9	65	7.2	63	2228	2.9
1445.1	3.7	12	4.1	37	1890	5.1	53	7.5	57	2161	3.7
1445.8	3.0	21	4.3	46	2535	7.7	44	7.8	70	2898	5.6
1446.4	4.0	22	3.5	48	1466	5.5	57	6.4	74	1676	4.0
1447.1	2.4	16	4.1	42	1854	4.6	35	7.5	65	2121	3.4
1447.8	2.0	14	3.4	35	2080	3.8	29	6.1	53	2378	2.8
1448.5	1.4	9.9	3.0	29	1406	3.5	20	5.5	44	1608	2.5
1449.2	3.0	21	4.1	35	1755	6.5	43	7.5	54	2006	4.7
1449.9	2.5	21	2.6	45	1797	5.6	35	4.8	68	2054	4.1
1450.6	2.4	18	2.8	37	1410	4.3	34	5.2	57	1612	3.2
1451.3	1.1	14	2.5	33	1715	4.5	16	4.5	50	1961	3.3
1452.0	1.7	14	3.8	40	2180	4.9	24	6.9	61	2492	3.6
1452.7	2.0	18	3.8	39	1991	7.2	29	6.9	60	2276	5.2
1453.4	0.989	17	1.8	41	1563	5.2	14	3.3	63	1787	3.8
1454.1	0.984	13	2.7	27	1281	2.9	14	4.9	42	1465	2.1
1454.8	1.1	13	2.5	33	1625	3.0	16	4.5	51	1858	2.2
1455.5	1.1	17	2.0	28	1589	3.4	17	3.6	44	1817	2.5
1456.2	1.4	16	2.4	40	1898	5.0	20	4.4	61	2171	3.6
1456.9	0.534	17	2.2	42	1597	4.7	7.7	4.0	65	1826	3.5
1457.6	0.638	12	1.8	32	1661	4.5	9.2	3.2	49	1900	3.3
1458.3	0.432	13	2.0	24	1561	3.4	6.2	3.6	37	1785	2.5
1459.0	0.544	16	2.1	32	1715	5.0	7.9	3.8	50	1961	3.7
1459.7	0.327	17	1.9	35	1358	5.1	4.7	3.4	53	1553	3.7
1460.4	0.361	14	1.5	33	1580	4.0	5.2	2.7	51	1806	2.9
1461.1	0.269	18	1.9	30	1656	5.5	3.9	3.5	46	1893	4.0
1461.8	0.935	18	1.9	23	1366	4.3	14	3.5	36	1563	3.1
1462.5	0.833	18	2.1	30	1472	5.1	12	3.9	47	1683	3.7
1463.2	0.409	16	1.4	29	1364	4.5	5.9	2.6	45	1559	3.3
1463.9	0.269	15	1.2	34	1572	4.8	3.9	2.2	52	1797	3.5
1464.6	0.438	12	1.2	25	1146	3.6	6.3	2.2	38	1310	2.6
1465.3	0.269	14	1.1	20	1145	4.4	3.9	2.0	30	1309	3.2
1466.0	0.349	16	1.7	27	1238	4.4	5.0	3.1	42	1416	3.2
1466.7	0.407	17	1.1	29	1367	3.6	5.9	2.0	44	1563	2.6
1467.4	0.924	14	1.1	27	1203	3.7	13	2.1	42	1376	2.7
1468.1	0.269	12	0.814	17	1275	2.9	3.9	1.5	27	1458	2.1



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
1468.8	0.269	15	1.2	23	1404	6.5	3.9	2.1	35	1605	4.8
1469.5	0.538	18	1.2	29	1371	4.7	7.8	2.1	44	1567	3.4
1470.2	0.269	13	0.788	30	1185	2.6	3.9	1.4	47	1355	1.9
1470.9	0.269	12	0.819	24	1291	3.5	3.9	1.5	37	1476	2.6
1471.6	0.408	11	0.689	19	1206	3.2	5.9	1.3	30	1379	2.4
1472.3	0.269	17	1.2	24	1425	3.8	3.9	2.2	37	1630	2.7
1472.9	0.333	18	1.2	30	1144	4.7	4.8	2.1	45	1308	3.4
1473.6	0.391	13	0.663	23	908	2.4	5.6	1.2	35	1038	1.7
1474.3	0.516	10	0.613	17	885	3.0	7.5	1.1	26	1012	2.2
1475.0	0.746	18	1.1	23	1235	2.9	11	2.0	35	1412	2.2
1475.7	0.695	18	1.4	21	1110	5.2	10	2.6	33	1269	3.8
1476.4	0.397	20	0.859	27	1021	2.8	5.7	1.6	42	1168	2.0
1477.1	0.269	12	0.641	19	964	2.1	3.9	1.2	28	1102	1.5
1477.8	0.460	12	0.651	20	1013	2.1	6.6	1.2	30	1159	1.6
1478.5	0.734	15	0.885	22	1329	3.8	11	1.6	33	1520	2.8
1479.2	0.867	15	0.809	20	962	3.6	13	1.5	31	1100	2.6
1479.9	0.567	16	0.733	24	1058	3.2	8.2	1.3	37	1210	2.3
1480.6	0.654	14	0.762	18	1100	3.1	9.4	1.4	28	1258	2.3
1481.3	0.740	12	1.0	22	1247	2.4	11	1.9	33	1426	1.8
1482.0	1.2	17	0.809	19	1351	5.1	18	1.5	29	1544	3.7
1482.7	1.4	19	1.2	26	1207	3.6	21	2.1	40	1380	2.6
1483.4	1.1	16	0.736	26	1030	3.0	15	1.3	40	1178	2.2
1484.1	0.610	14	0.884	19	1050	3.1	8.8	1.6	29	1201	2.2
1484.8	0.929	15	0.849	15	1066	2.5	13	1.5	23	1219	1.8
1485.5	1.4	15	0.994	19	1211	2.9	20	1.8	29	1385	2.1
1486.2	0.721	19	0.781	25	1104	2.7	10	1.4	38	1263	2.0
1486.9	1.3	14	0.956	21	1277	3.2	19	1.7	32	1460	2.4
1487.6	0.885	17	1.2	26	1639	5.4	13	2.3	41	1874	3.9
1488.3	0.924	19	1.3	21	1242	3.3	13	2.4	33	1421	2.4
1489.0	0.922	15	1.3	24	1063	3.4	13	2.4	36	1215	2.5
1489.7	1.4	15	1.2	23	1228	3.3	21	2.1	35	1404	2.4
1490.4	0.878	12	1.2	21	1289	3.2	13	2.2	33	1474	2.3
1491.1	0.892	8.7	0.960	16	858	2.1	13	1.8	24	981	1.5
1491.8	1.8	15	1.5	18	1358	3.8	25	2.7	28	1553	2.8
1492.5	1.4	16	1.1	24	1102	3.6	21	2.1	36	1260	2.6
1493.2	1.3	15	0.983	25	1235	3.8	19	1.8	38	1412	2.8
1493.9	1.0	11	1.3	20	1214	2.8	15	2.3	31	1388	2.0
1494.6	1.8	15	1.6	18	1842	3.5	26	2.8	28	2106	2.6
1495.3	2.0	19	1.4	24	1703	4.8	29	2.6	36	1947	3.5
1496.0	1.6	16	0.943	22	1280	3.4	23	1.7	34	1464	2.5
1496.7	1.1	12	1.1	21	1219	2.7	16	2.0	32	1394	2.0
1497.4	1.3	11	1.4	17	1314	3.1	19	2.5	26	1503	2.3
1498.1	1.8	14	1.6	21	1635	3.2	26	3.0	33	1869	2.3
1498.7	2.1	16	1.6	21	1316	4.2	30	2.9	32	1505	3.0
1499.4	1.2	13	1.4	24	1506	4.5	17	2.6	37	1722	3.3
1500.1	1.3	14	1.5	19	1383	2.6	19	2.7	30	1581	1.9
1500.8	2.1	11	1.4	18	1521	3.4	30	2.6	27	1739	2.5
1501.5	1.5	12	1.9	23	1800	4.2	22	3.5	36	2058	3.1
1502.2	1.6	14	1.8	26	1460	4.6	23	3.3	40	1669	3.3
1502.9	1.7	15	1.2	23	1468	3.7	25	2.2	35	1679	2.7
1503.6	1.7	13	1.3	26	1613	3.2	24	2.4	40	1844	2.3
1504.3	2.6	13	1.3	20	1451	2.7	38	2.3	31	1660	2.0
1505.0	2.3	17	2.0	26	2218	5.2	33	3.6	39	2536	3.8
1505.7	1.9	16	1.8	27	1892	3.9	27	3.3	42	2163	2.9
1506.4	1.5	15	1.9	26	1534	3.2	22	3.4	40	1754	2.3
1507.1	1.7	15	1.4	25	1681	3.9	24	2.5	38	1922	2.8
1507.8	1.8	15	1.6	19	1530	3.8	26	2.9	28	1749	2.7
1508.5	1.7	17	2.3	24	1540	4.7	25	4.2	36	1762	3.4
1509.2	1.3	18	1.1	23	1514	4.3	18	2.0	36	1732	3.1
1509.9	1.4	18	1.6	22	1404	2.9	20	3.0	34	1605	2.1
1510.6	1.5	14	1.6	25	1368	3.6	22	2.9	38	1564	2.6
1511.3	1.6	13	1.5	20	1884	3.7	23	2.7	30	2154	2.7
1512.0	1.5	16	2.3	25	1812	5.4	21	4.3	38	2073	4.0
1512.7	0.924	17	1.4	24	1553	4.0	13	2.6	37	1776	2.9
1513.4	1.4	12	1.3	26	1444	2.7	21	2.4	40	1652	2.0
1514.1	0.911	12	1.2	17	1443	4.1	13	2.2	27	1650	3.0
1514.8	1.1	16	2.0	18	1683	4.7	15	3.7	27	1925	3.4
1515.5	1.5	19	2.1	21	1978	7.3	21	3.8	33	2262	5.3
1516.2	0.907	19	1.5	21	1423	5.1	13	2.7	33	1627	3.7
1516.9	0.959	18	1.2	25	1494	4.7	14	2.3	38	1709	3.4
1517.6	0.822	13	1.6	20	1393	4.3	12	3.0	30	1593	3.1
1518.3	0.965	13	1.6	18	1550	3.5	14	2.9	27	1772	2.5
1519.0	0.451	16	1.4	20	1390	3.5	6.5	2.6	30	1590	2.5
1519.7	0.651	15	1.7	20	1415	3.5	9.4	3.1	31	1618	2.5
1520.4	0.269	10	1.1	19	1345	3.4	3.9	2.0	29	1538	2.5
1521.1	0.521	12	1.5	17	1103	4.1	7.5	2.8	26	1262	3.0
1521.8	0.269	17	1.7	18	1339	4.5	3.9	3.0	28	1531	3.3
1522.5	0.285	17	1.4	17	1261	6.0	4.1	2.5	25	1442	4.4
1523.2	0.399	18	1.2	16	1241	4.4	5.8	2.3	25	1419	3.2
1523.9	0.269	14	1.2	17	1285	4.0	3.9	2.2	26	1470	2.9
1524.6	0.330	15	1.2	18	1277	3.0	4.8	2.2	27	1460	2.2



Minnow Environmental  
Sample ID: 004

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1525.3	0.269	15	0.847	15	1295	3.4	3.9	1.5	22	1481	2.5
1525.9	0.349	16	1.2	18	1140	4.5	5.0	2.2	28	1303	3.3
1526.6	0.269	16	1.2	21	1241	3.3	3.9	2.1	32	1419	2.4
1527.3	0.269	17	0.890	18	1212	6.5	3.9	1.6	27	1386	4.8
1528.0	0.269	20	1.2	15	1197	4.4	3.9	2.2	23	1368	3.2
1528.7	0.269	16	1.0	13	1144	5.3	3.9	1.9	21	1308	3.9
1529.4	0.269	19	1.1	17	1000	4.6	3.9	2.0	25	1143	3.4
1530.1	0.269	21	1.1	17	1002	3.6	3.9	2.1	25	1145	2.6
1530.8	0.269	16	0.760	15	1054	3.7	3.9	1.4	22	1205	2.7
1531.5	0.269	17	0.844	15	1008	4.9	3.9	1.5	23	1153	3.6
1532.2	0.269	19	0.841	12	995	4.2	3.9	1.5	18	1138	3.0
1532.9	0.387	20	0.854	14	961	5.0	5.6	1.6	22	1099	3.7
1533.6	0.269	20	1.0	14	869	5.4	3.9	1.9	21	994	3.9
1534.3	0.427	17	0.884	13	809	3.5	6.2	1.6	20	926	2.6
1535.0	0.269	17	1.1	11	861	5.7	3.9	2.0	16	985	4.2
1535.7	0.269	20	1.3	12	831	5.3	3.9	2.4	18	950	3.9
1536.4	0.269	28	1.1	14	958	6.1	3.9	2.1	22	1096	4.5
1537.1	0.330	22	0.923	12	780	3.5	4.8	1.7	18	892	2.5
1537.8	0.269	18	0.743	9.7	755	3.6	3.9	1.4	15	863	2.6
1538.5	0.269	22	1.1	9.4	728	4.5	3.9	2.0	14	832	3.2
1539.2	0.269	20	1.3	12	747	4.0	3.9	2.3	19	855	2.9
1539.9	0.269	22	1.2	10	789	5.2	3.9	2.2	16	903	3.8
1540.6	0.269	21	0.929	8.2	717	4.3	3.9	1.7	13	820	3.1
1541.3	0.269	20	0.935	10	776	5.1	3.9	1.7	15	887	3.7
1542.0	0.269	19	1.2	9.5	753	5.1	3.9	2.1	14	861	3.7
1542.7	0.269	22	1.1	9.4	763	5.7	3.9	2.0	14	872	4.2
1543.4	0.269	26	0.748	8.0	728	5.1	3.9	1.4	12	833	3.7
1544.1	0.269	21	1.1	7.9	606	4.5	3.9	2.1	12	693	3.3
1544.8	0.269	23	1.0	5.9	726	5.0	3.9	1.8	9.1	830	3.6
1545.5	0.409	26	1.6	7.3	829	5.3	5.9	2.9	11	948	3.9
1546.2	0.269	28	1.8	7.0	686	6.2	3.9	3.2	11	784	4.5
1546.9	0.269	25	0.984	6.7	593	4.7	3.9	1.8	10	679	3.4
1547.6	0.269	25	1.3	7.5	621	4.4	3.9	2.3	11	710	3.2
1548.3	0.269	23	1.0	5.4	658	5.5	3.9	1.8	8.3	752	4.0
1549.0	0.269	28	0.990	6.0	671	4.3	3.9	1.8	9.3	767	3.2
1549.7	0.269	19	1.2	6.1	623	5.2	3.9	2.3	9.4	712	3.8
1550.4	0.390	26	1.2	4.6	669	4.9	5.6	2.2	7.1	765	3.6
1551.1	0.294	28	1.2	5.0	629	6.3	4.2	2.3	7.7	719	4.6
1551.8	0.356	21	0.958	4.0	482	4.7	5.1	1.7	6.1	551	3.5
1552.4	0.493	33	1.5	5.0	622	4.4	7.1	2.8	7.7	712	3.2
1553.1	0.269	32	1.2	4.8	618	5.3	3.9	2.3	7.3	707	3.8
1553.8	0.359	30	1.1	5.5	669	9.6	5.2	1.9	8.4	766	7.0
1554.5	0.643	33	1.1	7.0	572	8.0	9.3	2.0	11	654	5.8
1555.2	0.269	35	1.6	4.3	672	8.9	3.9	2.9	6.6	768	6.5
1555.9	0.269	25	0.944	5.6	534	5.5	3.9	1.7	8.6	611	4.0
1556.6	0.397	29	1.2	5.4	543	7.3	5.7	2.1	8.2	621	5.3
1557.3	0.269	32	1.2	2.9	626	9.6	3.9	2.3	4.4	715	7.0
1558.0	0.269	33	1.4	3.9	520	6.6	3.9	2.6	6.0	595	4.8
1558.7	0.269	30	1.8	3.9	599	8.8	3.9	3.3	6.0	685	6.4
1559.4	0.269	38	1.4	2.6	522	6.3	3.9	2.5	4.1	596	4.6
1560.1	0.269	28	1.2	4.0	531	9.7	3.9	2.2	6.2	607	7.1
1560.8	0.269	40	2.0	4.3	466	11	3.9	3.6	6.6	533	8.1
1561.5	0.269	46	1.8	7.2	486	8.3	3.9	3.3	11	555	6.0
1562.2	0.269	40	1.3	2.4	468	8.6	3.9	2.4	3.7	535	6.3
1562.9	0.519	52	2.0	6.3	553	11	7.5	3.7	9.7	632	8.0
1563.6	1.4	48	2.9	12	453	14	20	5.3	18	519	10
1564.3	0.269	51	1.8	6.5	444	9.2	3.9	3.4	10	507	6.7
1565.0	0.269	61	1.9	15	538	11	3.9	3.4	23	615	8.2
1565.7	0.269	84	2.6	3.3	514	12	3.9	4.8	5.0	588	8.5
1566.4	0.269	52	2.2	5.0	390	12	3.9	4.0	7.6	446	9.0
1567.1	0.269	62	4.2	6.6	601	14	3.9	7.6	10	687	10
1567.8	0.269	63	5.1	11	713	14	3.9	9.3	16	815	9.9
1568.5	0.269	57	1.4	10	465	13	3.9	2.5	16	532	9.5
1569.2	1.8	58	2.4	1.8	929	15	27	4.4	2.8	1062	11
1569.9	2.1	70	2.6	0.509	622	13	31	4.8	0.780	712	9.5



Minnow Environmental  
Sample ID: 005

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
0.6	8.3	1724	15	283	1152	0.006	120	26	434	1318	0.004
1.3	2.8	337	7.9	42	446	0.006	41	14	64	510	0.004
2.0	5.8	271	4.0	32	703	4.5	83	7.3	49	804	3.3
2.7	0.269	158	2.7	25	618	5.7	3.9	5.0	39	707	4.2
3.4	3.8	101	1.3	22	450	2.5	54	2.4	33	515	1.8
4.1	1.3	69	1.3	14	439	1.2	18	2.4	22	502	0.865
4.8	1.2	58	1.1	4.9	477	1.5	17	1.9	7.5	545	1.1
5.5	0.906	69	0.693	11	520	1.8	13	1.3	17	594	1.3
6.2	0.560	51	0.879	8.0	401	0.563	8.1	1.6	12	458	0.411
6.9	2.9	57	1.3	12	420	1.7	42	2.3	19	480	1.2
7.6	0.269	57	1.2	11	438	1.0	3.9	2.2	17	500	0.755
8.3	0.687	57	0.688	12	443	1.0	9.9	1.3	18	507	0.762
9.0	0.269	51	1.0	8.3	445	1.2	3.9	1.9	13	509	0.860
9.7	2.3	54	0.760	10	470	1.3	34	1.4	15	538	0.918
10.4	1.3	48	0.445	6.8	382	0.504	18	0.812	10	437	0.368
11.1	2.1	45	1.1	6.8	478	0.851	31	2.0	10	547	0.621
11.8	0.505	44	0.679	7.6	503	0.768	7.3	1.2	12	575	0.561
12.5	0.761	38	1.1	6.4	387	0.955	11	2.0	9.8	442	0.697
13.2	2.4	42	0.873	6.8	378	1.4	35	1.6	10	432	1.0
13.9	0.362	43	0.705	7.5	470	0.797	5.2	1.3	11	538	0.582
14.6	1.5	44	0.951	3.9	445	0.260	22	1.7	6.0	509	0.190
15.3	0.605	44	0.830	7.9	419	1.7	8.7	1.5	12	479	1.2
16.0	0.986	43	0.791	12	379	1.6	14	1.4	18	434	1.1
16.7	2.0	39	0.478	7.3	397	2.0	29	0.871	11	454	1.4
17.4	1.2	42	0.398	7.3	460	0.517	17	0.726	11	526	0.377
18.1	0.269	52	0.776	14	465	1.2	3.9	1.4	22	531	0.858
18.8	1.9	52	0.792	4.4	413	0.006	28	1.4	6.8	472	0.004
19.5	0.823	55	0.913	6.2	463	1.3	12	1.7	9.5	529	0.944
20.2	0.702	46	0.681	6.5	382	1.3	10	1.2	9.9	437	0.968
20.9	2.2	54	0.996	6.7	456	1.8	31	1.8	10	521	1.3
21.6	0.785	57	1.8	11	416	1.2	11	3.2	16	476	0.900
22.2	0.283	49	0.925	7.6	362	1.3	4.1	1.7	12	414	0.917
22.9	0.298	62	0.825	7.9	460	1.8	4.3	1.5	12	526	1.3
23.6	0.925	51	0.367	12	467	1.1	13	0.669	18	534	0.767
24.3	0.713	46	0.842	7.2	470	1.6	10	1.5	11	538	1.1
25.0	0.434	56	0.632	9.8	482	1.6	6.3	1.2	15	551	1.1
25.7	1.4	41	0.861	6.8	503	1.8	21	1.6	10	575	1.3
26.4	1.5	46	0.713	9.2	463	1.1	22	1.3	14	530	0.833
27.1	0.969	43	1.1	7.4	471	1.2	14	2.1	11	539	0.883
27.8	1.8	50	1.4	12	440	2.2	27	2.5	19	503	1.6
28.5	0.269	51	1.1	7.9	478	1.3	3.9	2.1	12	546	0.967
29.2	1.7	43	0.278	7.1	440	0.730	24	0.507	11	503	0.532
29.9	2.4	47	0.665	5.4	455	1.1	35	1.2	8.3	520	0.776
30.6	0.835	43	0.416	10	515	0.567	12	0.759	16	589	0.413
31.3	0.756	51	0.348	2.9	502	1.4	11	0.634	4.4	575	1.0
32.0	1.000	51	1.2	7.8	472	0.797	14	2.2	12	540	0.581
32.7	0.912	50	0.684	9.3	457	0.360	13	1.2	14	523	0.262
33.4	1.1	49	0.877	9.1	445	1.5	15	1.6	14	509	1.1
34.1	0.923	47	0.774	10	421	0.736	13	1.4	16	482	0.537
34.8	0.574	50	0.959	9.5	464	1.4	8.3	1.7	14	531	1.1
35.5	1.5	43	0.783	7.4	474	1.1	22	1.4	11	542	0.776
36.2	0.652	41	0.877	10	497	0.513	9.4	1.6	16	569	0.375
36.9	0.833	43	0.476	6.9	470	0.832	12	0.868	11	537	0.607
37.6	2.0	44	0.632	6.0	480	1.3	29	1.2	9.2	549	0.917
38.3	0.786	42	0.764	7.4	432	1.6	11	1.4	11	494	1.1
39.0	1.4	40	0.903	6.9	439	0.309	20	1.6	11	502	0.226
39.7	0.740	44	0.481	8.1	465	1.4	11	0.878	12	532	0.986
40.4	1.1	52	0.966	7.1	504	1.1	15	1.8	11	577	0.831
41.1	2.3	52	0.705	6.8	453	0.670	33	1.3	10	518	0.489
41.8	1.7	48	0.882	6.7	476	1.4	25	1.6	10	544	1.0
42.5	0.826	51	0.472	6.0	478	1.5	12	0.861	9.1	546	1.1
43.2	0.708	45	1.1	6.0	418	0.967	10	2.0	9.2	478	0.705
43.9	1.2	59	0.656	6.6	429	0.991	18	1.2	10	490	0.723
44.6	1.6	52	0.907	11	503	1.1	23	1.7	16	576	0.817
45.3	0.269	60	1.0	9.7	507	2.1	3.9	1.8	15	580	1.5
46.0	0.269	49	0.925	8.8	452	1.7	3.9	1.7	13	517	1.2
46.7	0.713	49	0.681	8.7	445	1.6	10	1.2	13	509	1.2
47.4	1.3	50	1.2	5.3	623	1.4	18	2.1	8.1	713	1.0
48.1	0.486	53	0.812	7.4	439	1.7	7.0	1.5	11	502	1.2
48.7	1.0	50	0.907	8.6	418	0.818	15	1.7	13	478	0.597
49.4	0.673	54	1.1	13	531	1.4	9.7	2.1	20	607	1.0
50.1	0.795	45	1.0	7.9	523	0.954	11	1.9	12	599	0.696
50.8	1.2	45	0.494	7.2	483	1.5	17	0.900	11	552	1.1
51.5	1.2	50	0.434	9.3	496	1.8	18	0.792	14	567	1.3
52.2	0.462	43	0.838	5.5	471	1.5	6.7	1.5	8.4	539	1.1
52.9	1.3	40	0.602	4.5	478	0.681	19	1.1	7.0	547	0.497
53.6	1.0	30	0.746	8.7	422	1.2	15	1.4	13	482	0.853
54.3	0.400	41	0.444	7.7	474	1.4	5.8	0.811	12	542	1.0
55.0	0.819	38	0.723	10	499	2.5	12	1.3	16	571	1.8
55.7	1.5	37	0.497	7.7	496	1.2	21	0.907	12	567	0.881
56.4	1.8	35	0.602	3.8	502	1.4	25	1.1	5.8	574	1.0



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
57.1	1.1	35	0.622	7.0	488	0.740	16	1.1	11	558	0.540
57.8	1.5	38	0.553	6.1	496	1.9	22	1.0	9.3	567	1.4
58.5	2.1	39	0.475	8.3	587	1.5	31	0.866	13	671	1.1
59.2	1.1	36	0.576	6.4	522	2.0	16	1.0	9.8	597	1.5
59.9	0.673	31	0.054	6.3	537	1.8	9.7	0.099	9.7	614	1.3
60.6	0.750	34	0.531	3.4	549	1.3	11	0.968	5.2	628	0.978
61.3	0.379	28	0.394	4.5	520	0.476	5.5	0.719	6.9	594	0.347
62.0	0.750	27	0.412	5.7	524	1.1	11	0.751	8.8	599	0.782
62.7	1.4	30	0.217	5.2	561	1.4	20	0.396	7.9	642	1.0
63.4	1.2	29	0.394	5.4	559	1.7	17	0.719	8.2	639	1.2
64.1	1.3	33	0.518	5.5	504	1.4	18	0.944	8.5	577	1.0
64.8	1.2	40	0.937	4.3	570	2.4	18	1.7	6.6	652	1.8
65.5	0.751	33	0.980	7.7	537	1.6	11	1.8	12	615	1.2
66.2	0.846	42	0.661	6.9	515	1.9	12	1.2	11	589	1.4
66.9	1.4	42	0.880	4.9	545	1.6	21	1.6	7.6	624	1.2
67.6	1.2	93	1.4	5.0	531	3.1	18	2.6	7.6	607	2.2
68.3	1.4	85	2.4	5.9	545	2.6	21	4.3	9.0	623	1.9
69.0	0.534	98	3.3	4.2	466	1.8	7.7	6.0	6.5	533	1.3
69.7	1.6	113	2.8	6.5	548	2.4	23	5.0	10.0	626	1.8
70.4	1.5	124	1.8	5.5	600	2.5	21	3.4	8.4	686	1.8
71.1	1.1	63	1.4	4.9	474	0.884	16	2.5	7.5	542	0.645
71.8	0.822	51	1.0	4.6	546	2.3	12	1.9	7.0	625	1.6
72.5	0.415	41	0.694	6.1	544	2.2	6.0	1.3	9.4	622	1.6
73.2	0.590	51	0.864	7.8	535	2.0	8.5	1.6	12	612	1.5
73.9	0.603	41	0.974	5.5	478	1.4	8.7	1.8	8.4	546	1.0
74.6	0.947	51	0.984	7.1	518	2.4	14	1.8	11	592	1.7
75.2	0.706	40	0.920	7.9	550	1.3	10	1.7	12	629	0.921
75.9	1.9	39	1.2	4.9	521	2.2	28	2.3	7.5	596	1.6
76.6	1.2	45	1.3	3.8	453	1.7	18	2.4	5.9	518	1.2
77.3	1.1	76	1.8	8.7	484	3.2	15	3.2	13	554	2.3
78.0	1.4	55	1.4	4.4	477	1.0	21	2.5	6.7	545	0.765
78.7	1.3	38	0.989	3.4	476	1.1	18	1.8	5.2	545	0.793
79.4	1.2	159	1.0	5.6	518	1.5	18	1.8	8.6	592	1.1
80.1	0.854	34	0.608	7.9	469	2.4	12	1.1	12	536	1.7
80.8	0.525	37	1.1	4.8	451	2.0	7.6	2.0	7.4	515	1.5
81.5	1.8	28	0.444	4.9	500	1.5	26	0.810	7.5	572	1.1
82.2	0.269	28	0.678	4.3	479	1.3	3.9	1.2	6.5	547	0.934
82.9	0.954	34	0.509	3.8	484	1.4	14	0.929	5.8	553	1.0
83.6	0.633	31	0.107	8.3	518	1.8	9.1	0.196	13	592	1.3
84.3	0.789	30	0.334	6.5	499	1.3	11	0.609	9.9	570	0.928
85.0	0.771	32	0.299	5.5	571	1.6	11	0.545	8.4	652	1.2
85.7	1.3	30	0.574	5.0	456	2.2	18	1.0	7.7	522	1.6
86.4	0.628	32	0.415	5.9	511	1.6	9.1	0.757	9.0	584	1.2
87.1	1.3	41	0.447	7.0	457	1.5	19	0.814	11	522	1.1
87.8	0.968	33	0.794	6.2	487	1.2	14	1.4	9.4	557	0.901
88.5	0.387	40	0.782	4.7	509	1.5	5.6	1.4	7.2	582	1.1
89.2	0.664	53	1.6	6.5	527	1.5	9.6	3.0	10.0	602	1.1
89.9	0.828	47	0.915	7.5	512	1.2	12	1.7	11	585	0.897
90.6	0.952	32	0.952	6.8	473	1.2	14	1.7	10	541	0.886
91.3	1.4	47	0.779	3.4	522	1.6	20	1.4	5.2	597	1.2
92.0	0.269	42	1.4	5.6	513	3.2	3.9	2.6	8.6	587	2.3
92.7	0.979	57	1.0	8.7	605	1.4	14	1.9	13	691	0.995
93.4	0.858	59	0.995	6.5	560	1.6	12	1.8	9.9	640	1.2
94.1	1.3	49	1.0	4.0	566	1.4	19	1.9	6.2	647	0.990
94.8	1.5	45	1.7	4.8	587	2.5	21	3.0	7.3	671	1.8
95.5	0.970	75	1.3	5.8	579	2.4	14	2.4	8.9	662	1.7
96.2	0.801	40	0.996	6.3	589	2.5	12	1.8	9.6	673	1.8
96.9	1.6	41	1.3	6.7	568	3.2	23	2.4	10	649	2.3
97.6	0.622	35	1.1	7.5	564	2.6	9.0	2.0	12	645	1.9
98.3	1.2	35	1.3	6.0	581	1.6	18	2.4	9.2	664	1.2
99.0	1.2	33	1.4	7.4	597	1.5	18	2.6	11	683	1.1
99.7	1.1	37	1.3	4.8	595	1.9	16	2.4	7.3	681	1.4
100.4	0.554	36	1.6	6.1	553	2.0	8.0	2.9	9.4	632	1.4
101.1	1.3	29	1.3	6.8	572	2.3	18	2.4	10	654	1.7
101.7	0.872	34	0.794	6.8	568	2.1	13	1.4	10	650	1.5
102.4	1.5	40	1.5	7.3	575	1.5	22	2.7	11	658	1.1
103.1	1.2	32	0.748	7.7	518	1.5	17	1.4	12	593	1.1
103.8	0.993	34	1.1	9.6	539	2.4	14	2.0	15	617	1.7
104.5	1.1	34	1.3	9.0	518	2.0	15	2.4	14	592	1.5
105.2	1.3	31	1.8	9.4	481	1.3	19	3.2	14	550	0.929
105.9	1.2	38	1.5	8.9	542	1.3	17	2.8	14	620	0.980
106.6	1.5	37	1.5	13	562	1.9	22	2.8	19	643	1.4
107.3	0.631	35	1.6	9.6	522	2.5	9.1	3.0	15	597	1.8
108.0	0.269	35	1.9	9.2	525	1.5	3.9	3.5	14	601	1.1
108.7	0.491	44	1.9	13	575	1.6	7.1	3.4	19	657	1.2
109.4	1.0	44	1.9	13	540	2.4	14	3.5	20	618	1.8
110.1	1.0	47	1.8	13	602	2.9	15	3.2	19	688	2.1
110.8	1.0	48	1.9	11	618	1.5	15	3.5	17	707	1.1
111.5	0.741	39	1.6	11	573	1.5	11	3.0	16	656	1.1
112.2	1.7	41	2.0	12	595	2.0	24	3.7	18	681	1.5
112.9	0.505	35	1.8	12	565	2.2	7.3	3.2	18	646	1.6



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.6	1.2	48	2.2	15	660	3.2	18	4.1	23	754	2.3
114.3	0.699	50	2.6	13	598	2.5	10	4.7	19	683	1.8
115.0	1.1	60	2.7	19	598	2.8	16	4.9	29	684	2.0
115.7	1.4	44	2.2	13	578	3.0	21	4.1	20	661	2.2
116.4	0.834	44	2.0	13	599	1.7	12	3.6	19	685	1.3
117.1	1.1	42	1.9	14	588	1.3	16	3.5	22	673	0.923
117.8	0.740	34	1.5	11	586	2.5	11	2.7	17	670	1.8
118.5	0.794	42	2.0	15	599	1.9	11	3.6	24	684	1.4
119.2	1.1	41	1.8	11	600	1.9	16	3.3	16	686	1.4
119.9	0.591	37	2.1	12	653	1.8	8.5	3.8	19	746	1.3
120.6	0.838	36	1.9	16	570	2.4	12	3.5	25	651	1.7
121.3	0.622	38	2.2	12	612	1.4	9.0	4.1	18	699	1.0
122.0	1.5	37	1.8	11	656	27	22	3.3	16	750	20
122.7	0.907	35	1.4	12	597	2.2	13	2.6	19	683	1.6
123.4	1.1	26	1.2	14	591	2.4	15	2.3	21	676	1.7
124.1	1.4	27	1.3	10	602	1.7	21	2.4	15	689	1.2
124.8	0.663	34	1.6	12	631	2.7	9.6	3.0	19	722	2.0
125.5	1.2	31	1.5	12	579	2.0	18	2.7	18	662	1.4
126.2	0.961	34	1.3	11	635	2.6	14	2.4	17	726	1.9
126.9	0.896	35	1.1	12	641	2.4	13	2.1	19	733	1.7
127.6	1.1	30	1.3	12	594	2.1	16	2.4	18	679	1.5
128.2	0.996	38	1.6	12	618	2.4	14	2.9	19	707	1.7
128.9	0.748	32	1.4	13	616	1.9	11	2.5	20	704	1.4
129.6	1.1	31	1.5	14	605	2.1	15	2.8	22	692	1.5
130.3	1.7	32	1.7	14	626	1.9	24	3.1	21	716	1.4
131.0	1.1	30	1.5	13	620	1.8	16	2.7	20	709	1.3
131.7	0.743	29	0.935	14	620	2.3	11	1.7	21	709	1.7
132.4	0.772	33	1.6	13	592	1.6	11	2.9	20	677	1.2
133.1	1.4	27	1.4	12	680	2.0	20	2.6	19	778	1.5
133.8	1.4	25	1.2	13	671	2.7	20	2.2	20	767	2.0
134.5	1.2	26	1.3	12	645	2.3	18	2.4	19	738	1.7
135.2	1.2	25	1.3	13	656	1.7	18	2.5	21	750	1.3
135.9	0.799	24	1.3	10	694	2.3	12	2.4	16	793	1.7
136.6	1.2	26	0.962	13	677	2.1	17	1.8	20	774	1.5
137.3	1.3	23	1.1	11	807	3.3	18	1.9	17	922	2.4
138.0	1.1	22	1.2	11	728	2.0	16	2.2	17	833	1.4
138.7	0.885	26	1.3	12	734	2.3	13	2.3	18	840	1.6
139.4	1.3	22	0.761	12	664	2.6	18	1.4	18	759	1.9
140.1	1.0	20	0.896	13	759	2.5	15	1.6	20	868	1.8
140.8	1.1	19	0.711	13	689	2.3	15	1.3	20	787	1.7
141.5	1.7	28	0.644	12	726	2.0	24	1.2	19	830	1.4
142.2	1.3	21	1.0	11	668	2.3	19	1.9	18	764	1.7
142.9	0.981	20	1.1	14	738	3.0	14	2.0	21	844	2.2
143.6	1.3	21	0.610	14	715	1.6	18	1.1	22	818	1.2
144.3	1.1	20	1.2	14	715	2.4	17	2.2	21	818	1.8
145.0	0.414	20	0.731	13	743	2.5	6.0	1.3	20	850	1.8
145.7	1.5	18	0.677	12	783	2.3	21	1.2	18	896	1.7
146.4	0.911	21	0.566	13	727	2.2	13	1.0	21	831	1.6
147.1	0.919	16	0.806	12	732	2.7	13	1.5	18	837	2.0
147.8	1.3	18	0.658	12	670	2.1	18	1.2	19	767	1.5
148.5	1.6	17	0.688	14	750	2.6	22	1.3	22	858	1.9
149.2	1.7	15	0.650	9.5	731	2.9	24	1.2	15	836	2.2
149.9	1.0	15	0.502	10	742	2.6	15	0.916	16	848	1.9
150.6	1.1	11	0.426	12	822	3.0	15	0.777	18	940	2.2
151.3	1.3	15	0.554	11	744	2.3	18	1.0	17	851	1.7
152.0	1.5	18	0.487	14	807	1.8	21	0.888	21	923	1.3
152.7	0.772	16	0.454	13	681	2.2	11	0.828	21	779	1.6
153.4	1.7	15	0.537	16	826	2.4	24	0.979	25	944	1.8
154.1	1.5	14	0.615	14	702	1.1	22	1.1	21	803	0.800
154.7	1.0	17	0.478	14	725	2.1	15	0.872	21	829	1.5
155.4	1.4	18	0.516	14	709	1.8	20	0.940	22	810	1.3
156.1	1.5	17	0.553	15	740	2.9	21	1.0	23	847	2.1
156.8	0.763	17	0.548	11	743	2.2	11	0.999	17	850	1.6
157.5	0.997	12	0.445	9.9	650	2.7	14	0.811	15	743	2.0
158.2	0.998	14	0.591	11	820	2.4	14	1.1	17	937	1.7
158.9	1.1	13	0.554	12	733	2.3	16	1.0	19	839	1.6
159.6	1.1	13	0.457	15	816	2.5	16	0.834	24	933	1.8
160.3	0.812	11	0.446	14	874	2.2	12	0.814	21	1000	1.6
161.0	1.3	11	0.460	9.9	814	2.2	19	0.839	15	931	1.6
161.7	0.840	11	0.661	12	796	2.8	12	1.2	19	911	2.1
162.4	1.6	10.0	0.563	13	867	2.6	23	1.0	20	992	1.9
163.1	1.0	12	0.709	13	896	4.2	15	1.3	20	1024	3.1
163.8	0.835	13	0.459	12	936	3.1	12	0.837	18	1071	2.3
164.5	1.4	13	0.550	14	920	2.7	20	1.0	21	1052	1.9
165.2	1.2	11	0.913	12	943	3.1	18	1.7	19	1078	2.3
165.9	1.4	11	0.517	18	1049	3.3	21	0.943	27	1200	2.4
166.6	1.2	11	0.753	14	923	3.0	18	1.4	21	1056	2.2
167.3	1.2	11	0.710	17	977	2.7	18	1.3	27	1117	1.9
168.0	1.9	12	0.481	16	1065	1.7	27	0.878	25	1217	1.2
168.7	1.3	12	0.466	13	957	3.0	19	0.849	19	1095	2.2
169.4	1.5	11	0.712	12	1086	2.0	22	1.3	19	1242	1.5



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
170.1	1.7	11	0.746	14	957	2.7	25	1.4	21	1095	1.9
170.8	2.0	10.0	0.582	16	1193	3.0	29	1.1	25	1364	2.2
171.5	1.8	12	0.811	14	995	2.3	26	1.5	21	1138	1.7
172.2	1.4	11	0.676	18	959	2.7	20	1.2	28	1096	1.9
172.9	2.0	12	0.839	18	1045	3.3	29	1.5	28	1195	2.4
173.6	2.3	10	0.848	18	913	2.6	33	1.5	27	1044	1.9
174.3	2.0	12	1.0	16	1054	4.1	29	1.9	25	1205	3.0
175.0	1.9	11	0.586	18	1051	2.9	28	1.1	28	1202	2.1
175.7	1.7	13	1.0	20	1052	3.5	24	1.8	30	1203	2.6
176.4	2.1	9.3	0.976	20	1148	4.6	30	1.8	30	1313	3.4
177.1	2.8	13	1.2	18	1263	3.8	40	2.2	27	1445	2.7
177.8	2.7	13	1.1	25	1417	4.5	39	1.9	39	1621	3.3
178.5	2.6	13	1.5	23	1340	3.6	37	2.7	36	1533	2.6
179.2	2.6	14	1.2	19	1225	3.8	37	2.1	29	1401	2.7
179.9	2.2	13	1.1	22	1361	4.6	32	2.0	34	1557	3.4
180.6	2.5	11	0.964	21	1320	3.6	36	1.8	32	1509	2.6
181.3	2.1	13	1.1	18	1370	3.6	31	2.0	28	1567	2.6
181.9	3.6	15	1.9	25	1503	4.3	52	3.5	38	1719	3.2
182.6	2.7	15	1.5	26	1346	3.5	40	2.7	40	1539	2.5
183.3	4.7	14	1.4	18	1356	3.4	67	2.6	27	1550	2.4
184.0	3.4	13	1.5	18	1291	2.1	49	2.7	27	1476	1.5
184.7	3.0	14	1.6	22	1280	3.1	44	3.0	33	1463	2.3
185.4	4.3	13	1.2	23	1311	3.9	61	2.2	36	1499	2.8
186.1	4.2	16	1.2	25	1365	4.1	60	2.1	38	1560	3.0
186.8	4.4	13	1.4	23	1357	3.0	63	2.6	36	1551	2.2
187.5	5.1	15	1.2	22	1320	4.7	74	2.2	33	1509	3.4
188.2	5.0	10	1.4	22	1387	4.3	72	2.5	34	1586	3.1
188.9	6.1	13	1.3	26	1324	6.1	88	2.4	40	1514	4.5
189.6	4.5	13	0.967	20	1334	5.2	65	1.8	31	1526	3.8
190.3	5.2	12	1.6	23	1395	5.8	75	2.9	35	1595	4.2
191.0	5.2	14	1.8	24	1360	3.7	76	3.2	37	1555	2.7
191.7	6.0	11	1.4	21	1348	5.1	86	2.6	32	1542	3.7
192.4	5.8	16	1.2	22	1374	5.9	84	2.1	34	1572	4.3
193.1	6.2	13	1.4	23	1199	6.4	89	2.6	35	1371	4.7
193.8	6.4	13	1.2	27	1291	4.1	92	2.3	41	1476	3.0
194.5	6.2	13	0.947	23	1277	5.6	89	1.7	35	1460	4.1
195.2	5.5	13	1.3	22	1283	6.0	79	2.3	33	1467	4.3
195.9	6.4	14	1.1	23	1274	5.0	92	1.9	36	1457	3.6
196.6	6.3	13	1.4	21	1288	6.1	91	2.6	32	1473	4.4
197.3	6.3	11	1.4	21	1217	5.1	92	2.5	32	1392	3.7
198.0	7.7	12	1.1	14	1084	5.1	111	2.0	22	1240	3.7
198.7	8.4	10	0.906	18	1108	7.4	121	1.7	27	1267	5.4
199.4	8.6	11	0.723	17	1006	6.6	125	1.3	27	1150	4.8
200.1	8.2	12	0.857	18	908	5.6	118	1.6	27	1039	4.1
200.8	8.6	12	0.801	15	969	5.3	125	1.5	22	1108	3.9
201.5	6.5	11	0.597	13	984	5.4	93	1.1	20	1125	4.0
202.2	8.5	11	0.865	15	853	7.4	122	1.6	23	975	5.4
202.9	7.1	11	0.774	16	937	7.4	103	1.4	25	1071	5.4
203.6	6.2	11	0.564	14	761	6.0	89	1.0	21	871	4.4
204.3	5.4	9.1	0.420	13	882	6.4	77	0.767	20	1009	4.7
205.0	4.7	12	0.664	13	859	7.3	68	1.2	20	983	5.3
205.7	4.5	13	0.493	11	812	6.1	65	0.900	17	928	4.5
206.4	4.1	9.8	0.589	13	847	6.7	60	1.1	20	968	4.9
207.1	4.4	10	0.583	14	794	6.5	63	1.1	21	908	4.8
207.8	5.0	9.7	0.383	13	796	5.6	72	0.699	21	910	4.1
208.4	5.0	11	0.445	9.4	810	6.9	73	0.812	14	927	5.0
209.1	3.9	10.0	0.368	13	891	6.2	56	0.671	21	1019	4.5
209.8	2.8	10	0.368	13	705	5.5	40	0.672	20	806	4.0
210.5	2.6	9.4	0.114	8.0	763	6.2	37	0.209	12	872	4.5
211.2	2.5	9.9	0.571	6.9	712	6.4	36	1.0	11	814	4.7
211.9	3.2	12	0.393	10	792	6.8	45	0.717	15	906	5.0
212.6	2.5	11	0.371	7.9	642	6.4	37	0.676	12	734	4.6
213.3	2.8	9.3	0.348	8.9	697	6.3	40	0.634	14	797	4.6
214.0	2.9	7.4	0.311	9.4	629	7.0	41	0.568	14	720	5.1
214.7	2.2	8.4	0.201	7.1	641	4.9	32	0.367	11	732	3.6
215.4	2.8	11	0.406	13	751	5.9	40	0.740	19	858	4.3
216.1	2.8	9.8	0.243	9.7	656	5.3	40	0.444	15	750	3.9
216.8	2.5	9.4	0.411	6.4	654	6.4	36	0.749	9.9	748	4.7
217.5	2.9	8.7	0.219	9.5	686	6.6	42	0.399	15	785	4.8
218.2	2.9	9.7	0.425	9.9	704	7.2	42	0.776	15	805	5.2
218.9	1.9	10	0.356	9.0	727	8.0	28	0.649	14	832	5.9
219.6	2.1	9.8	0.158	11	704	6.9	30	0.288	17	805	5.1
220.3	2.3	11	0.161	11	758	7.1	33	0.294	16	867	5.2
221.0	1.9	10	0.145	9.4	708	5.3	28	0.264	14	809	3.8
221.7	1.8	8.4	0.051	8.4	597	5.4	26	0.094	13	683	3.9
222.4	1.1	10	0.164	7.7	677	5.7	16	0.299	12	774	4.1
223.1	1.1	9.5	0.218	9.6	621	6.7	16	0.397	15	710	4.9
223.8	1.7	10	0.076	10	656	6.0	24	0.138	15	750	4.4
224.5	1.5	9.7	0.195	8.5	617	5.2	22	0.355	13	705	3.8
225.2	0.706	9.5	0.208	9.2	665	6.7	10	0.379	14	760	4.9
225.9	0.842	9.6	0.138	11	655	8.5	12	0.252	18	749	6.2



Minnow Environmental  
Sample ID: 005

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
226.6	1.4	8.2	0.197	8.7	619	7.5	21	0.359	13	708	5.5
227.3	1.1	9.5	0.195	9.3	658	7.1	16	0.356	14	753	5.2
228.0	0.958	7.2	0.281	8.1	660	6.5	14	0.513	12	755	4.8
228.7	0.914	9.1	0.141	12	651	7.8	13	0.256	18	744	5.7
229.4	0.509	9.3	0.234	11	573	6.0	7.3	0.426	16	656	4.4
230.1	1.0	9.6	0.259	13	666	6.1	15	0.473	20	762	4.5
230.8	0.436	8.5	0.205	9.7	545	5.8	6.3	0.374	15	623	4.2
231.5	1.7	10	0.408	13	670	8.3	25	0.744	20	766	6.1
232.2	0.726	12	0.540	13	744	9.4	10	0.985	19	851	6.9
232.9	0.926	8.8	0.142	15	703	8.6	13	0.260	22	804	6.3
233.6	0.525	9.6	0.562	9.7	632	6.0	7.6	1.0	15	722	4.4
234.3	0.596	8.5	0.336	12	602	7.3	8.6	0.613	18	689	5.4
235.0	1.3	11	0.319	12	661	7.0	19	0.582	19	756	5.1
235.6	0.648	11	0.338	12	638	7.5	9.4	0.617	18	730	5.4
236.3	1.1	11	0.483	13	663	7.6	16	0.880	20	758	5.6
237.0	0.764	8.9	0.498	10	614	5.7	11	0.908	16	702	4.2
237.7	0.657	9.9	0.410	16	699	8.2	9.5	0.748	25	800	6.0
238.4	0.751	9.3	0.732	14	730	5.8	11	1.3	22	835	4.2
239.1	0.269	9.3	0.684	15	642	7.2	3.9	1.2	23	734	5.3
239.8	1.1	12	0.605	13	687	8.2	16	1.1	20	785	6.0
240.5	1.0	11	0.684	17	743	6.6	15	1.2	27	849	4.8
241.2	0.906	10	0.749	17	713	8.0	13	1.4	27	815	5.8
241.9	0.876	9.3	0.630	18	678	8.0	13	1.1	27	775	5.9
242.6	0.566	10	0.889	17	714	7.1	8.2	1.6	26	817	5.2
243.3	0.741	9.0	0.715	22	762	8.3	11	1.3	33	871	6.0
244.0	0.888	9.8	0.779	18	755	8.0	13	1.4	27	863	5.8
244.7	0.998	10	0.654	22	835	7.0	14	1.2	34	955	5.1
245.4	1.4	11	0.921	22	805	7.3	21	1.7	34	921	5.3
246.1	0.619	11	0.866	24	870	7.9	8.9	1.6	37	994	5.8
246.8	0.800	12	1.3	24	873	8.5	12	2.3	37	998	6.2
247.5	0.967	12	0.853	25	834	9.9	14	1.6	38	954	7.2
248.2	0.929	11	0.985	21	943	8.0	13	1.8	33	1079	5.9
248.9	1.8	10	1.1	20	918	7.9	25	2.1	31	1050	5.8
249.6	1.0	11	1.4	28	950	6.5	15	2.5	42	1087	4.7
250.3	1.6	13	1.5	26	1049	6.1	23	2.7	41	1200	4.4
251.0	2.0	11	1.4	25	918	7.4	28	2.5	38	1050	5.4
251.7	1.5	11	1.0	26	1050	6.2	22	1.9	41	1201	4.5
252.4	1.3	12	1.7	30	1104	6.4	19	3.1	46	1262	4.6
253.1	2.3	12	1.7	30	1130	5.6	33	3.1	46	1292	4.1
253.8	1.4	14	1.9	33	1081	7.3	19	3.4	51	1236	5.3
254.5	1.6	12	2.0	32	1167	5.2	23	3.6	49	1334	3.8
255.2	1.8	11	1.8	31	1080	5.4	25	3.4	47	1235	4.0
255.9	2.2	15	2.0	30	1277	6.9	31	3.6	46	1460	5.0
256.6	2.2	12	2.4	32	1163	6.2	31	4.3	49	1330	4.5
257.3	2.6	10	2.2	28	1147	6.2	37	4.1	43	1311	4.5
258.0	3.1	14	2.7	41	1340	7.2	44	5.0	64	1532	5.2
258.7	3.0	12	2.2	40	1336	5.7	44	4.1	62	1528	4.1
259.4	3.2	12	2.2	34	1357	5.2	46	4.0	53	1552	3.8
260.1	2.7	14	3.2	39	1307	4.0	40	5.9	60	1495	2.9
260.8	4.0	11	3.3	36	1384	5.5	58	6.1	55	1583	4.0
261.4	3.4	12	2.3	36	1472	4.4	49	4.1	55	1683	3.2
262.1	3.5	12	2.8	39	1479	5.1	51	5.1	60	1692	3.7
262.8	5.6	13	2.8	39	1457	4.6	81	5.1	60	1666	3.3
263.5	4.7	14	3.2	39	1424	4.0	68	5.8	60	1628	2.9
264.2	5.1	13	3.5	35	1336	5.6	74	6.4	53	1527	4.1
264.9	6.1	13	3.3	39	1473	4.1	88	6.1	59	1685	3.0
265.6	6.0	13	3.4	34	1336	3.7	86	6.2	52	1527	2.7
266.3	6.8	13	3.7	38	1421	3.7	98	6.8	58	1625	2.7
267.0	6.0	10	3.4	38	1250	2.5	87	6.3	58	1430	1.8
267.7	7.6	11	3.2	34	1189	4.2	110	5.8	53	1359	3.1
268.4	7.2	12	2.5	43	1258	5.5	104	4.5	66	1438	4.0
269.1	8.2	12	4.0	39	1316	4.8	119	7.3	60	1505	3.5
269.8	6.7	12	2.6	34	1118	4.7	97	4.8	52	1279	3.4
270.5	6.1	11	2.8	35	1187	4.5	88	5.1	53	1357	3.3
271.2	7.8	11	2.7	31	1223	4.2	113	4.9	48	1399	3.1
271.9	7.9	10.0	2.3	30	1080	4.4	114	4.2	46	1235	3.2
272.6	8.0	10	3.1	31	1071	4.8	116	5.6	48	1224	3.5
273.3	7.4	11	2.5	27	1022	3.9	107	4.6	42	1169	2.9
274.0	8.4	12	2.6	33	1134	4.8	121	4.7	51	1297	3.5
274.7	9.2	11	2.3	23	908	3.9	133	4.1	36	1039	2.9
275.4	6.6	12	2.0	28	937	5.1	95	3.6	43	1072	3.7
276.1	7.5	11	1.8	33	1026	4.5	108	3.2	50	1173	3.3
276.8	7.5	12	1.7	24	904	4.6	108	3.1	37	1034	3.4
277.5	8.0	10	1.4	25	996	4.6	116	2.6	38	1139	3.4
278.2	7.8	10	1.7	20	899	4.3	113	3.1	30	960	3.2
278.9	6.3	11	1.6	23	869	6.8	90	3.0	36	994	5.0
279.6	4.8	9.3	1.7	22	831	4.1	70	3.1	34	950	3.0
280.3	6.6	11	1.4	24	914	7.1	95	2.6	36	1045	5.1
281.0	5.7	14	1.8	24	964	6.5	83	3.4	37	1103	4.8
281.7	6.0	10	1.2	23	884	4.7	86	2.2	35	1011	3.5
282.4	6.6	11	1.2	18	862	4.8	95	2.1	28	985	3.5



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
283.1	5.7	9.8	1.0	19	784	4.7	82	1.8	29	897	3.5
283.8	6.1	9.6	1.1	23	841	4.3	88	2.0	35	962	3.2
284.5	4.7	9.9	0.953	20	946	6.5	68	1.7	31	1082	4.8
285.2	5.6	10	1.3	18	781	4.9	81	2.4	28	893	3.6
285.9	5.4	12	0.915	23	825	4.5	78	1.7	35	943	3.3
286.6	5.2	10	0.908	20	753	4.7	75	1.7	30	861	3.4
287.3	5.3	9.1	1.1	18	726	4.2	76	2.1	27	830	3.1
288.0	4.8	8.8	0.740	19	786	5.0	70	1.3	29	899	3.7
288.6	6.6	10	1.1	19	750	5.6	96	1.9	28	857	4.1
289.3	4.9	11	0.795	16	856	5.4	71	1.5	25	978	3.9
290.0	4.9	10	0.714	15	773	5.1	70	1.3	23	883	3.7
290.7	4.3	9.9	0.607	16	668	5.4	62	1.1	25	763	4.0
291.4	5.2	9.2	0.520	14	741	4.4	75	0.948	22	847	3.2
292.1	5.9	12	0.440	15	743	6.0	86	0.802	23	850	4.4
292.8	2.7	12	0.455	14	762	5.7	39	0.830	21	871	4.1
293.5	3.2	8.7	0.448	13	707	5.2	46	0.817	20	809	3.8
294.2	3.0	10	0.385	15	717	4.8	44	0.702	24	820	3.5
294.9	3.2	8.5	0.426	14	743	5.3	46	0.777	21	849	3.9
295.6	3.5	8.8	0.307	14	673	4.8	51	0.559	21	770	3.5
296.3	2.5	10	0.272	10	674	4.5	37	0.497	16	770	3.3
297.0	2.1	9.2	0.276	13	750	4.0	31	0.504	20	857	2.9
297.7	1.8	9.7	0.472	12	683	6.5	25	0.861	19	781	4.7
298.4	2.3	8.7	0.326	11	655	5.3	33	0.595	18	749	3.9
299.1	1.9	7.9	0.279	13	710	3.7	27	0.509	19	811	2.7
299.8	2.2	8.5	0.381	11	664	4.3	32	0.695	16	759	3.1
300.5	2.0	8.9	0.324	13	652	3.8	29	0.590	19	746	2.8
301.2	1.6	7.5	0.209	9.8	722	5.0	22	0.381	15	826	3.6
301.9	0.977	11	0.266	9.7	728	5.9	14	0.486	15	833	4.3
302.6	1.4	7.4	0.248	11	703	5.8	21	0.452	17	803	4.2
303.3	1.8	9.4	0.146	7.5	778	5.5	27	0.266	11	890	4.0
304.0	2.2	8.1	0.354	10.0	750	5.5	32	0.646	15	858	4.0
304.7	0.818	8.6	0.291	11	768	4.7	12	0.531	17	878	3.4
305.4	1.4	9.7	0.405	8.5	761	5.1	20	0.739	13	870	3.7
306.1	1.2	10	0.399	14	729	4.2	18	0.727	21	833	3.0
306.8	1.4	8.8	0.232	13	838	5.1	19	0.423	19	958	3.7
307.5	0.627	10	0.529	14	779	5.3	9.1	0.965	21	890	3.8
308.2	1.8	9.0	0.309	14	793	4.2	26	0.564	22	906	3.1
308.9	1.2	9.7	0.625	18	835	5.9	17	1.1	27	955	4.3
309.6	1.2	9.1	0.408	14	785	5.3	17	0.745	21	897	3.9
310.3	1.8	8.1	0.625	11	809	5.2	26	1.1	17	925	3.8
311.0	1.9	12	0.759	16	907	5.2	28	1.4	25	1037	3.8
311.7	1.2	8.6	0.454	13	821	5.2	17	0.828	21	939	3.8
312.4	1.5	7.2	0.672	15	857	6.5	21	1.2	24	980	4.7
313.1	2.2	14	0.732	19	932	5.6	32	1.3	29	1065	4.1
313.8	0.956	10	0.655	16	841	3.8	14	1.2	24	962	2.8
314.5	1.4	8.8	0.700	20	959	4.1	20	1.3	31	1097	3.0
315.2	2.1	11	0.829	17	993	6.6	30	1.5	26	1135	4.8
315.8	1.2	10	0.831	21	1109	5.4	17	1.5	32	1268	3.9
316.5	0.828	10	1.1	23	916	4.5	12	2.0	35	1047	3.3
317.2	1.5	9.2	0.875	18	941	5.0	21	1.6	28	1076	3.7
317.9	1.4	9.7	1.1	22	1084	4.3	20	2.0	33	1240	3.1
318.6	3.0	11	1.3	21	1048	4.1	43	2.3	32	1198	3.0
319.3	2.7	11	1.2	15	1056	4.9	39	2.2	23	1207	3.6
320.0	2.3	8.8	1.4	17	981	5.0	34	2.6	27	1122	3.7
320.7	2.8	10	1.0	19	1114	4.8	41	1.9	29	1274	3.5
321.4	1.6	12	0.829	19	1035	5.5	23	1.5	29	1184	4.0
322.1	2.0	11	0.827	17	1053	4.7	30	1.5	27	1204	3.4
322.8	2.5	11	1.2	21	1036	5.0	36	2.2	32	1185	3.7
323.5	2.0	10	0.916	17	973	4.4	28	1.7	27	1113	3.2
324.2	1.8	11	0.646	18	930	4.7	26	1.2	27	1064	3.5
324.9	2.3	11	0.972	17	1011	4.6	33	1.8	25	1157	3.4
325.6	2.1	9.1	1.0	18	1052	4.8	30	1.9	27	1203	3.5
326.3	1.7	9.7	0.741	20	924	3.9	24	1.4	31	1056	2.8
327.0	1.8	11	0.885	17	1004	4.7	26	1.6	25	1149	3.5
327.7	1.3	12	0.656	17	879	4.7	19	1.2	26	1005	3.5
328.4	2.0	11	0.804	18	955	4.2	29	1.5	27	1092	3.1
329.1	1.9	11	1.0	19	1017	3.8	27	1.8	29	1163	2.7
329.8	1.7	12	0.708	13	894	5.3	24	1.3	20	1022	3.8
330.5	1.5	11	0.754	21	930	5.5	21	1.4	32	1064	4.0
331.2	1.5	11	0.723	18	878	4.3	22	1.3	27	1004	3.1
331.9	1.5	12	0.775	20	1004	5.5	22	1.4	31	1148	4.0
332.6	1.3	9.2	0.871	18	902	4.4	18	1.6	28	1031	3.2
333.3	1.9	11	1.1	18	936	4.6	28	2.0	27	1070	3.3
334.0	1.9	12	1.0	21	1161	5.2	27	1.9	31	1328	3.8
334.7	1.8	10	1.0	22	1095	4.7	26	1.9	33	1252	3.4
335.4	2.6	10	0.787	20	985	4.5	38	1.4	31	1126	3.3
336.1	2.3	12	1.2	26	1004	3.3	33	2.1	40	1149	2.4
336.8	1.8	10	1.2	21	1168	4.5	26	2.2	32	1335	3.3
337.5	1.3	11	1.1	26	1188	5.4	19	2.1	40	1359	3.9
338.2	1.9	11	1.3	23	1197	4.1	27	2.4	35	1368	3.0
338.9	3.0	14	1.2	29	1152	5.8	43	2.2	44	1317	4.2



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.6	2.7	11	0.963	24	1082	4.3	39	1.8	37	1238	3.1
340.3	2.3	14	1.1	25	1255	5.6	34	2.0	39	1435	4.1
341.0	2.7	11	1.2	25	1300	4.1	39	2.1	38	1486	3.0
341.6	3.5	12	1.2	28	1258	3.1	51	2.2	43	1439	2.3
342.3	2.8	11	1.6	26	1196	4.4	40	2.9	39	1367	3.2
343.0	2.8	12	1.5	26	1305	4.5	41	2.7	40	1492	3.3
343.7	3.0	12	1.0	25	1252	4.4	44	1.8	39	1432	3.2
344.4	3.8	14	1.2	30	1279	4.9	55	2.1	45	1463	3.6
345.1	3.5	14	1.2	29	1247	4.6	50	2.2	44	1426	3.3
345.8	2.9	12	0.919	27	1211	3.7	41	1.7	41	1385	2.7
346.5	2.7	13	1.2	30	1240	3.5	40	2.2	45	1418	2.6
347.2	3.3	11	1.0	24	1086	3.1	47	1.9	37	1242	2.3
347.9	3.6	11	1.4	29	1290	5.2	53	2.6	45	1475	3.8
348.6	3.3	11	1.0	27	1164	4.0	47	1.8	42	1331	2.9
349.3	3.1	11	1.0	24	1134	3.2	44	1.9	37	1297	2.4
350.0	2.9	10	1.3	28	1236	2.6	41	2.4	43	1414	1.9
350.7	2.1	11	1.1	23	1193	3.1	31	2.0	35	1364	2.2
351.4	3.7	13	1.4	23	1184	3.5	53	2.6	35	1354	2.5
352.1	2.0	9.7	0.862	28	1114	3.3	29	1.6	43	1274	2.4
352.8	2.9	10	1.2	23	1143	3.3	42	2.2	35	1307	2.4
353.5	3.2	11	1.1	25	1192	3.2	46	1.9	38	1363	2.4
354.2	2.6	9.6	0.842	20	1056	2.2	38	1.5	30	1208	1.6
354.9	2.9	11	1.0	23	1189	2.7	42	1.8	36	1360	2.0
355.6	2.8	9.2	1.2	21	1077	2.0	41	2.2	33	1232	1.4
356.3	2.6	11	0.903	25	1123	3.3	38	1.6	38	1284	2.4
357.0	2.2	11	0.756	22	1085	2.4	32	1.4	34	1241	1.8
357.7	3.8	13	1.0	22	1056	2.0	55	1.9	33	1208	1.4
358.4	2.0	9.4	0.729	21	1021	2.9	28	1.3	33	1168	2.1
359.1	2.3	12	0.568	16	1095	2.1	33	1.0	25	1252	1.5
359.8	2.2	11	0.559	19	1075	1.9	31	1.0	29	1229	1.4
360.5	2.2	12	0.792	22	1098	2.9	32	1.4	34	1255	2.1
361.2	2.2	9.2	0.627	19	1115	3.2	31	1.1	29	1275	2.3
361.9	2.0	10	0.666	18	943	2.3	29	1.2	27	1079	1.7
362.6	1.6	9.3	0.452	22	959	2.4	23	0.824	33	1096	1.8
363.3	2.6	12	0.556	18	931	2.2	37	1.0	28	1065	1.6
364.0	2.7	9.7	0.741	18	1086	2.6	40	1.4	28	1242	1.9
364.7	2.2	10	0.672	18	884	1.8	32	1.2	27	1011	1.3
365.4	0.760	9.0	0.501	17	891	1.8	11	0.914	27	1019	1.3
366.1	2.6	10	0.489	18	918	2.7	37	0.891	27	1049	2.0
366.8	2.0	13	0.694	15	986	1.9	28	1.3	22	1127	1.4
367.5	1.9	12	0.770	15	981	3.2	27	1.4	23	1122	2.3
368.2	2.8	9.4	0.548	18	904	1.8	40	1.0	27	1034	1.3
368.8	2.0	9.3	0.636	13	911	1.6	28	1.2	21	1041	1.1
369.5	2.7	8.7	0.562	16	1002	2.5	39	1.0	24	1146	1.8
370.2	1.8	9.9	0.622	16	895	1.7	26	1.1	24	1024	1.2
370.9	2.1	13	0.562	20	970	2.2	31	1.0	31	1109	1.6
371.6	1.7	11	0.684	18	888	2.2	25	1.2	27	1016	1.6
372.3	2.2	12	0.441	20	965	1.9	32	0.805	31	1103	1.4
373.0	2.2	9.4	0.480	21	926	1.5	32	0.875	33	1059	1.1
373.7	1.9	12	0.574	17	921	1.7	27	1.0	26	1054	1.2
374.4	2.2	9.8	0.788	14	923	1.6	32	1.4	22	1055	1.2
375.1	2.7	11	0.579	18	894	1.5	39	1.1	27	1022	1.1
375.8	1.9	10	0.513	20	926	2.1	28	0.936	31	1059	1.5
376.5	1.5	11	0.706	18	1024	2.2	22	1.3	27	1171	1.6
377.2	2.8	11	0.768	15	948	2.6	40	1.4	24	1085	1.9
377.9	2.2	12	1.0	20	994	2.6	32	1.8	30	1137	1.9
378.6	1.9	12	0.678	24	923	2.1	28	1.2	36	1056	1.6
379.3	1.9	9.6	0.670	20	916	2.1	27	1.2	31	1047	1.5
380.0	1.8	11	0.696	19	843	2.5	26	1.3	28	964	1.8
380.7	2.6	10	0.524	22	928	2.2	37	0.955	34	1061	1.6
381.4	1.8	9.1	1.0	22	959	2.7	26	1.9	33	1097	2.0
382.1	1.3	11	0.862	19	995	2.0	19	1.6	30	1138	1.5
382.8	1.7	10	1.1	27	1081	1.6	24	2.0	42	1236	1.2
383.5	2.1	15	1.1	27	1060	1.1	30	1.9	41	1212	0.823
384.2	1.7	13	1.2	23	1096	2.3	25	2.1	35	1253	1.7
384.9	2.5	12	1.1	25	1125	1.7	36	2.1	39	1286	1.2
385.6	2.5	12	1.1	22	1067	2.5	36	2.0	33	1220	1.8
386.3	3.1	12	1.7	26	1148	1.9	44	3.0	40	1313	1.4
387.0	1.9	11	1.3	29	1228	2.7	28	2.4	44	1404	1.9
387.7	2.8	14	1.2	26	1234	2.9	41	2.2	40	1411	2.1
388.4	2.8	13	1.5	23	1161	2.4	40	2.8	36	1327	1.8
389.1	2.4	11	1.6	24	1065	2.2	34	3.0	36	1218	1.6
389.8	2.8	12	1.8	22	1147	2.4	40	3.2	33	1312	1.8
390.5	3.1	12	1.5	26	1071	2.6	44	2.7	40	1225	1.9
391.2	3.7	12	1.8	26	1106	3.8	53	3.3	39	1264	2.8
391.9	4.4	13	1.7	29	1060	2.6	63	3.1	45	1212	1.9
392.6	2.5	13	1.8	31	1089	1.7	36	3.2	48	1245	1.2
393.3	3.2	11	1.8	25	1161	2.6	46	3.3	38	1328	1.9
394.0	3.3	14	1.6	28	1187	3.6	48	3.0	43	1357	2.6
394.7	3.7	14	1.5	25	1031	1.8	54	2.8	38	1179	1.3
395.3	3.0	12	2.1	29	1007	2.2	43	3.8	45	1151	1.6



Minnow Environmental  
Sample ID: 005

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
396.0	3.0	10	1.9	28	973	2.5	43	3.4	43	1112	1.8
396.7	2.4	10	1.6	25	1132	2.1	34	3.0	38	1295	1.5
397.4	3.5	13	1.4	27	1058	2.4	50	2.5	42	1210	1.7
398.1	2.5	13	1.5	27	973	2.7	37	2.7	42	1112	2.0
398.8	2.8	14	1.7	26	955	1.8	40	3.1	40	1092	1.3
399.5	2.9	12	1.5	28	1011	0.982	42	2.8	44	1156	0.717
400.2	3.1	12	1.8	26	1031	2.5	45	3.3	40	1179	1.9
400.9	3.8	14	1.6	29	1035	2.8	55	2.9	44	1183	2.1
401.6	2.5	13	1.9	28	988	2.4	36	3.4	42	1130	1.8
402.3	3.0	11	1.9	30	1009	2.2	43	3.4	45	1154	1.6
403.0	3.1	11	1.5	23	1047	2.8	45	2.7	36	1197	2.0
403.7	3.6	14	2.0	28	1137	2.9	53	3.6	42	1300	2.1
404.4	3.5	12	1.8	23	1071	2.4	51	3.3	35	1225	1.7
405.1	3.3	13	1.4	28	1097	2.9	48	2.6	44	1255	2.1
405.8	2.4	12	1.6	24	962	2.6	34	2.9	37	1100	1.9
406.5	3.2	12	1.6	25	986	1.6	46	3.0	38	1127	1.2
407.2	2.4	14	1.8	23	1084	2.6	35	3.3	35	1239	1.9
407.9	2.9	15	1.8	23	947	2.3	42	3.3	35	1083	1.7
408.6	3.1	12	1.3	22	937	1.7	44	2.3	34	1072	1.2
409.3	2.5	13	1.3	25	907	3.0	36	2.5	39	1038	2.2
410.0	3.2	14	1.9	31	1157	3.3	46	3.5	47	1324	2.4
410.7	2.2	12	1.3	31	1085	2.9	32	2.3	47	1241	2.1
411.4	3.4	14	1.7	27	1006	2.9	50	3.2	41	1150	2.1
412.1	3.1	12	1.3	21	899	2.2	44	2.3	31	1028	1.6
412.8	2.8	13	1.5	25	1115	2.0	40	2.8	38	1274	1.4
413.5	2.8	13	1.3	22	898	3.7	41	2.3	34	1027	2.7
414.2	3.1	13	1.7	22	862	2.7	45	3.0	34	985	2.0
414.9	3.4	16	1.8	28	945	2.9	49	3.3	42	1081	2.1
415.6	2.7	11	1.0	23	848	2.5	40	1.9	35	969	1.8
416.3	3.2	11	1.4	21	830	1.8	46	2.5	31	949	1.3
417.0	2.9	12	1.3	24	938	2.5	41	2.4	36	1072	1.9
417.7	2.4	11	1.4	18	782	1.5	34	2.5	28	894	1.1
418.4	2.9	12	1.2	25	880	2.1	42	2.2	38	1006	1.6
419.1	2.3	12	1.6	24	793	2.1	33	3.0	36	907	1.5
419.8	2.4	10	1.0	22	910	1.8	35	1.8	34	1041	1.3
420.5	3.3	14	1.2	25	900	2.2	47	2.2	38	1029	1.6
421.2	2.3	13	1.4	24	831	2.3	33	2.6	37	951	1.6
421.8	2.1	13	1.0	21	782	1.7	30	1.9	32	894	1.3
422.5	2.7	10	1.1	21	800	1.4	39	2.0	32	915	0.994
423.2	1.3	12	1.3	23	821	2.1	19	2.4	36	939	1.5
423.9	2.3	14	1.3	23	977	1.8	33	2.3	35	1117	1.3
424.6	2.0	13	1.4	18	815	1.7	28	2.5	27	932	1.2
425.3	1.8	14	1.2	23	782	2.8	26	2.2	35	894	2.1
426.0	2.8	11	1.2	19	810	1.1	41	2.2	29	927	0.810
426.7	3.3	11	1.2	21	748	1.8	47	2.2	32	856	1.3
427.4	2.4	11	0.843	18	831	1.4	35	1.5	28	951	1.0
428.1	1.7	9.5	1.2	21	786	1.6	25	2.2	32	899	1.2
428.8	1.5	9.5	0.657	18	712	1.6	21	1.2	28	814	1.2
429.5	1.6	9.6	0.876	17	783	1.8	22	1.6	27	896	1.3
430.2	1.7	10	0.850	13	752	1.4	24	1.6	19	860	1.0
430.9	1.8	9.8	0.840	16	839	2.0	26	1.5	24	960	1.4
431.6	1.7	11	0.660	18	890	2.1	24	1.2	28	1018	1.5
432.3	0.929	9.8	0.626	18	761	1.5	13	1.1	27	870	1.1
433.0	1.5	10.0	0.693	16	750	1.8	22	1.3	25	858	1.3
433.7	1.0	11	0.722	18	821	2.5	14	1.3	27	938	1.8
434.4	1.2	11	0.917	15	795	2.8	18	1.7	23	909	2.1
435.1	1.5	11	0.728	17	778	1.1	22	1.3	26	890	0.822
435.8	1.4	8.1	0.638	14	698	2.4	20	1.2	21	798	1.7
436.5	1.4	8.6	0.227	16	808	1.8	21	0.414	24	924	1.3
437.2	1.4	8.4	0.640	17	767	2.1	20	1.2	26	877	1.5
437.9	1.4	12	0.497	16	860	2.2	20	0.907	25	983	1.6
438.6	1.6	10	0.500	15	765	1.8	23	0.912	24	875	1.3
439.3	1.1	9.0	0.486	13	783	2.1	16	0.887	20	895	1.5
440.0	1.1	9.9	0.848	17	784	2.2	16	1.5	27	896	1.6
440.7	1.3	8.4	0.905	14	797	1.2	18	1.7	21	912	0.862
441.4	1.2	9.3	0.398	22	772	0.994	17	0.726	34	882	0.725
442.1	1.6	11	0.506	19	749	1.9	23	0.923	29	856	1.4
442.8	1.3	11	0.582	15	807	2.0	19	1.1	23	923	1.5
443.5	1.5	10	0.467	21	876	2.2	22	0.852	32	1001	1.6
444.2	1.6	10	0.838	20	784	1.3	23	1.5	31	896	0.965
444.9	1.1	11	0.800	19	851	2.0	16	1.5	29	973	1.4
445.6	1.1	9.7	0.486	16	701	1.9	16	0.887	25	802	1.4
446.3	1.2	10	0.609	18	871	2.1	17	1.1	28	996	1.5
447.0	1.3	10	0.335	20	832	1.9	19	0.611	31	951	1.4
447.7	1.1	10	0.864	17	780	1.5	16	1.6	26	892	1.1
448.3	1.1	11	0.659	19	729	1.4	16	1.2	29	833	1.1
449.0	1.2	11	0.672	22	838	1.3	17	1.2	34	958	0.979
449.7	1.5	9.6	0.475	18	844	2.3	21	0.866	28	965	1.7
450.4	1.0	11	0.837	24	818	1.8	15	1.5	36	936	1.3
451.1	1.4	12	0.810	21	781	1.6	21	1.5	32	893	1.1
451.8	1.8	11	0.740	18	851	1.7	26	1.3	27	973	1.3



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Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
452.5	1.6	9.9	0.747	20	862	2.9	23	1.4	30	985	2.1
453.2	1.4	10	0.828	25	867	1.8	21	1.5	38	991	1.3
453.9	2.3	9.3	0.848	21	860	2.4	33	1.5	33	983	1.8
454.6	2.7	9.2	0.534	26	837	1.6	40	0.974	40	958	1.2
455.3	2.4	9.7	0.724	21	896	2.5	34	1.3	33	1024	1.8
456.0	1.6	9.1	0.527	23	961	2.0	23	0.961	36	1098	1.5
456.7	2.4	11	0.781	24	908	1.5	34	1.4	37	1038	1.1
457.4	2.5	13	0.766	26	986	2.2	36	1.4	39	1128	1.6
458.1	3.0	11	0.969	20	915	1.9	43	1.8	30	1047	1.4
458.8	2.3	9.5	0.937	25	872	2.0	33	1.7	38	997	1.4
459.5	3.1	10	0.632	26	992	1.7	44	1.2	39	1135	1.3
460.2	2.5	8.8	0.989	28	945	2.2	36	1.8	43	1081	1.6
460.9	3.1	11	0.691	24	989	3.1	45	1.3	37	1131	2.3
461.6	3.4	10	0.727	23	932	1.7	49	1.3	35	1066	1.3
462.3	2.7	9.7	0.795	25	886	1.8	39	1.4	38	1013	1.3
463.0	2.9	9.0	0.805	27	809	1.6	41	1.5	41	925	1.1
463.7	2.7	12	0.908	22	861	1.8	39	1.7	34	985	1.3
464.4	2.3	13	0.690	28	946	1.3	33	1.3	43	1082	0.977
465.1	2.3	11	0.563	26	766	2.0	33	1.0	40	876	1.4
465.8	2.8	10	0.880	26	884	1.8	40	1.6	39	1011	1.3
466.5	2.8	12	0.869	28	911	2.0	40	1.6	43	1042	1.4
467.2	2.5	11	1.0	29	858	2.0	35	1.9	44	981	1.5
467.9	2.5	9.4	0.627	26	821	2.7	35	1.1	40	939	1.9
468.6	3.2	11	0.771	29	840	1.9	46	1.4	45	961	1.4
469.3	2.6	11	0.841	30	764	2.2	37	1.5	45	873	1.6
470.0	2.4	12	1.1	30	939	1.6	34	2.1	46	1073	1.2
470.7	3.3	13	1.0	32	886	1.5	47	1.9	48	1013	1.1
471.4	2.5	11	0.934	32	888	2.9	36	1.7	49	1015	2.1
472.1	2.3	13	1.0	26	887	1.6	33	1.9	40	1014	1.2
472.8	1.7	12	1.2	31	919	1.5	25	2.2	47	1050	1.1
473.5	2.4	12	0.993	33	831	1.3	34	1.8	50	950	0.917
474.2	3.8	13	0.984	33	809	2.5	55	1.8	50	925	1.8
474.8	2.4	12	0.956	35	755	2.1	35	1.7	54	864	1.5
475.5	2.7	13	1.1	37	841	1.2	39	2.1	57	962	0.868
476.2	3.0	12	1.3	32	890	2.1	43	2.4	49	1018	1.5
476.9	3.9	16	1.4	38	924	2.3	56	2.6	58	1057	1.7
477.6	2.7	12	1.2	33	797	2.4	39	2.2	50	911	1.8
478.3	4.2	12	1.4	36	866	2.1	61	2.6	55	990	1.6
479.0	3.4	13	1.4	34	843	1.7	50	2.5	52	964	1.2
479.7	2.7	12	1.4	36	817	2.3	39	2.6	55	934	1.7
480.4	3.9	13	1.1	35	855	2.6	56	2.1	53	977	1.9
481.1	3.3	14	1.3	34	785	2.1	47	2.3	52	898	1.6
481.8	3.6	12	1.5	37	802	2.7	52	2.7	57	917	2.0
482.5	4.2	11	1.5	33	764	2.2	61	2.7	51	873	1.6
483.2	4.1	13	1.6	38	738	1.6	59	2.8	59	844	1.2
483.9	4.1	13	1.3	35	774	3.3	59	2.3	53	885	2.4
484.6	3.9	15	1.4	36	664	2.2	56	2.6	55	760	1.6
485.3	3.7	14	1.4	33	702	2.4	53	2.6	51	803	1.7
486.0	3.5	14	1.5	37	729	1.7	50	2.8	57	833	1.3
486.7	4.1	14	1.5	37	638	1.7	59	2.7	57	729	1.2
487.4	3.3	13	1.6	37	627	2.9	48	2.9	56	717	2.1
488.1	3.3	13	1.6	40	553	1.7	47	2.9	61	632	1.2
488.8	3.5	12	1.5	34	542	2.6	51	2.6	52	619	1.9
489.5	4.0	12	1.4	32	483	2.9	57	2.6	49	553	2.1
490.2	2.9	13	1.4	37	466	2.4	42	2.6	56	533	1.8
490.9	2.8	15	1.4	37	550	2.2	40	2.6	57	629	1.6
491.6	2.9	12	1.4	31	455	2.8	42	2.6	47	521	2.0
492.3	3.4	14	1.7	30	515	2.4	49	3.1	47	589	1.7
493.0	2.7	9.9	1.7	25	427	2.7	39	3.2	38	488	2.0
493.7	2.7	10	1.5	29	404	2.1	40	2.7	44	462	1.5
494.4	2.6	12	1.7	24	429	2.3	38	3.1	36	491	1.7
495.1	2.5	11	1.7	28	372	2.8	36	3.1	43	425	2.0
495.8	2.8	11	1.9	25	387	2.0	40	3.5	38	443	1.4
496.5	2.2	11	1.7	26	358	2.6	32	3.1	40	410	1.9
497.2	2.3	11	1.9	24	355	2.3	33	3.5	37	406	1.7
497.9	1.9	11	1.9	26	343	3.0	27	3.4	40	392	2.2
498.6	1.5	9.3	1.4	30	335	2.6	22	2.6	45	383	1.9
499.3	1.5	11	1.6	22	326	2.2	21	2.9	34	373	1.6
500.0	1.4	10	1.6	26	327	2.1	20	3.0	39	374	1.6
500.7	1.7	9.9	1.4	27	364	1.5	24	2.5	42	417	1.1
501.3	1.8	12	1.3	25	316	1.3	26	2.3	39	362	0.958
502.0	1.5	9.9	1.0	19	315	1.7	22	1.9	30	360	1.2
502.7	2.2	11	1.6	25	322	1.9	32	2.9	38	369	1.4
503.4	1.9	11	1.6	28	340	1.4	28	2.9	43	389	1.0
504.1	1.1	10	0.985	31	352	0.756	16	1.8	47	403	0.552
504.8	0.788	12	1.5	25	338	1.4	11	2.7	38	387	0.998
505.5	1.2	12	0.834	30	378	1.4	17	1.5	45	432	1.0
506.2	1.7	14	1.2	27	323	1.3	25	2.2	41	369	0.975
506.9	2.0	12	1.1	35	312	1.6	29	2.0	54	357	1.2
507.6	1.3	11	1.3	35	327	1.8	19	2.3	54	374	1.3
508.3	1.6	10	1.1	32	319	1.3	23	2.0	48	365	0.946



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
509.0	1.2	8.2	1.2	28	307	2.1	18	2.2	43	351	1.6
509.7	1.7	10	1.0	35	307	0.846	25	1.9	54	352	0.618
510.4	1.4	10.0	1.1	32	290	1.6	20	2.0	50	332	1.1
511.1	1.2	8.6	1.2	35	306	1.4	17	2.2	54	350	0.999
511.8	1.5	11	0.849	31	258	0.652	22	1.5	47	295	0.476
512.5	1.7	11	0.788	32	305	1.1	24	1.4	49	349	0.821
513.2	1.2	9.0	0.958	36	309	1.5	17	1.7	55	353	1.1
513.9	0.981	10	1.0	29	299	1.7	14	1.9	45	342	1.2
514.6	1.2	9.9	0.738	29	262	1.5	17	1.3	44	299	1.1
515.3	0.941	9.4	1.3	31	306	1.3	14	2.3	48	350	0.979
516.0	1.5	9.8	1.4	28	296	1.1	22	2.6	43	338	0.836
516.7	2.3	8.1	1.2	26	276	1.5	33	2.2	39	315	1.1
517.4	0.839	11	1.1	29	300	2.2	12	2.0	44	343	1.6
518.1	1.2	10	1.3	26	300	1.4	17	2.4	39	343	1.0
518.8	0.992	9.9	1.4	20	269	2.1	14	2.5	30	307	1.6
519.5	0.668	8.6	1.8	26	315	1.8	9.6	3.2	39	361	1.3
520.2	1.6	9.2	1.6	22	315	1.9	23	3.0	34	360	1.4
520.9	1.4	10	1.2	18	302	1.7	20	2.2	28	346	1.3
521.6	0.974	10.0	1.5	21	317	2.0	14	2.7	33	362	1.5
522.3	0.865	9.5	1.6	22	313	1.9	12	2.9	33	357	1.4
523.0	0.960	9.3	1.2	18	323	2.8	14	2.3	28	370	2.0
523.7	0.728	8.6	0.916	19	262	2.2	11	1.7	29	299	1.6
524.4	1.0	9.3	1.2	17	277	1.8	15	2.1	27	317	1.3
525.1	1.1	8.2	0.873	17	240	1.2	15	1.6	26	275	0.885
525.8	0.844	8.8	0.988	17	277	1.9	12	1.8	26	317	1.4
526.5	1.5	11	0.914	24	301	2.4	22	1.7	36	344	1.8
527.2	0.997	10	0.803	23	259	2.1	14	1.5	36	297	1.5
527.8	0.888	11	0.766	21	309	1.9	13	1.4	32	353	1.4
528.5	1.7	11	1.1	22	297	1.5	24	1.9	33	340	1.1
529.2	1.3	9.3	0.841	23	260	1.5	19	1.5	36	298	1.1
529.9	0.986	9.2	1.0	23	287	1.6	14	1.8	36	329	1.2
530.6	1.8	11	0.656	21	270	1.2	25	1.2	33	309	0.881
531.3	1.5	12	0.845	28	282	0.818	22	1.5	43	322	0.597
532.0	1.3	11	0.777	22	276	1.3	18	1.4	33	315	0.938
532.7	2.0	11	0.982	27	252	1.6	29	1.8	42	288	1.1
533.4	1.8	8.7	0.685	27	290	1.3	27	1.2	41	332	0.970
534.1	1.3	12	0.763	29	295	1.9	19	1.4	44	337	1.4
534.8	2.1	11	0.757	32	279	1.3	31	1.4	49	319	0.972
535.5	1.5	10.0	0.469	29	273	1.6	21	0.855	44	313	1.1
536.2	1.3	11	0.723	29	259	1.6	19	1.3	45	296	1.2
536.9	1.3	12	0.930	27	268	1.5	19	1.7	41	306	1.1
537.6	0.863	9.9	0.542	29	247	1.7	12	0.989	44	283	1.2
538.3	1.7	8.7	0.884	37	286	0.835	25	1.6	57	327	0.609
539.0	1.4	12	1.3	33	299	1.2	21	2.4	50	342	0.895
539.7	1.4	11	0.896	29	274	1.5	20	1.6	45	314	1.1
540.4	1.2	10	1.0	32	296	0.944	17	1.8	50	339	0.689
541.1	1.5	9.2	0.836	29	254	1.5	22	1.5	45	290	1.1
541.8	0.596	12	0.912	29	252	1.1	8.6	1.7	45	288	0.767
542.5	1.0	11	0.985	34	258	1.7	15	1.8	52	295	1.2
543.2	1.1	11	1.1	37	303	2.9	15	2.0	56	346	2.1
543.9	1.3	11	0.498	31	267	2.0	18	0.908	48	305	1.4
544.6	0.989	11	1.0	34	293	1.9	14	1.8	53	336	1.4
545.3	1.3	11	1.0	33	274	2.5	18	1.9	51	314	1.8
546.0	0.759	11	1.2	30	273	1.8	11	2.2	46	312	1.3
546.7	1.1	11	1.1	39	261	1.3	15	2.0	60	299	0.950
547.4	1.5	10	1.4	40	284	1.9	22	2.6	62	325	1.4
548.1	1.0	9.8	0.969	38	311	2.9	15	1.8	58	356	2.1
548.8	1.5	10	1.4	29	295	2.0	22	2.6	44	338	1.5
549.5	0.576	10	1.2	37	299	2.1	8.3	2.1	56	342	1.6
550.2	0.804	9.6	1.5	35	268	1.9	12	2.7	54	306	1.4
550.9	0.924	9.9	1.5	32	274	2.1	13	2.8	49	313	1.5
551.6	0.990	10	1.4	33	271	2.0	14	2.5	50	310	1.4
552.3	0.653	11	1.4	35	297	2.4	9.4	2.6	53	340	1.8
553.0	0.902	10	2.0	28	284	2.2	13	3.6	44	325	1.6
553.7	0.888	9.7	1.9	31	288	3.1	13	3.4	48	329	2.3
554.4	0.796	9.7	1.9	30	295	2.1	11	3.5	46	338	1.5
555.0	1.0	10	1.8	27	290	3.0	15	3.3	42	332	2.2
555.7	1.2	8.5	2.0	30	302	2.1	18	3.7	46	345	1.5
556.4	0.856	10	2.1	31	329	3.4	12	3.8	47	376	2.5
557.1	0.698	9.3	1.9	31	326	2.6	10	3.4	48	372	1.9
557.8	0.811	7.6	2.4	28	311	3.1	12	4.4	43	355	2.3
558.5	1.2	8.2	1.9	27	265	3.2	18	3.4	41	303	2.3
559.2	0.616	9.5	1.9	30	280	2.3	8.9	3.6	47	320	1.7
559.9	1.2	9.6	1.8	29	272	2.6	17	3.3	44	311	1.9
560.6	0.778	9.7	1.9	32	305	2.0	11	3.4	49	349	1.5
561.3	0.890	8.9	1.8	25	269	2.5	13	3.3	38	307	1.8
562.0	0.696	9.1	1.9	25	268	2.3	10	3.4	39	306	1.7
562.7	0.911	8.2	1.8	24	280	1.6	13	3.3	36	320	1.1
563.4	0.658	8.2	2.2	27	276	3.3	9.5	4.0	41	316	2.4
564.1	0.897	9.5	1.8	26	273	3.6	13	3.3	40	313	2.6
564.8	1.2	7.2	2.2	21	282	3.4	18	4.1	33	323	2.5



Minnow Environmental  
Sample ID: 005

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
565.5	0.941	8.9	2.0	23	315	4.5	14	3.6	35	361	3.3
566.2	0.919	9.2	2.2	24	261	2.8	13	4.1	37	298	2.1
566.9	1.0	7.4	2.0	25	293	3.7	14	3.7	38	335	2.7
567.6	1.4	8.2	1.9	22	298	2.6	20	3.5	33	341	1.9
568.3	1.1	10	1.6	26	300	3.5	17	3.0	40	343	2.5
569.0	1.3	9.5	1.9	25	302	4.3	19	3.5	39	345	3.1
569.7	1.1	8.4	1.8	24	284	2.2	16	3.3	37	325	1.6
570.4	1.2	8.1	1.6	23	313	2.9	17	3.0	36	358	2.1
571.1	0.992	7.2	1.5	22	295	2.1	14	2.8	33	338	1.6
571.8	1.0	7.5	1.7	22	326	4.0	15	3.0	34	373	2.9
572.5	1.3	9.6	1.4	23	313	2.1	19	2.6	35	357	1.6
573.2	1.2	8.6	1.7	26	306	3.3	17	3.0	40	349	2.4
573.9	1.2	7.4	1.6	17	284	2.9	17	3.0	27	324	2.1
574.6	0.690	9.6	1.4	21	294	2.5	10.0	2.6	32	337	1.8
575.3	1.3	9.0	1.4	22	321	4.0	19	2.6	34	367	2.9
576.0	0.454	7.7	1.1	19	291	2.2	6.5	2.1	29	333	1.6
576.7	1.2	9.7	1.5	15	294	2.6	17	2.7	23	336	1.9
577.4	1.3	8.4	1.4	19	313	2.6	18	2.5	29	358	1.9
578.1	1.4	8.3	1.3	17	308	3.1	21	2.4	26	352	2.3
578.8	1.6	8.4	1.1	17	290	2.5	22	2.0	27	332	1.8
579.5	1.8	6.9	0.929	18	305	2.7	27	1.7	28	349	1.9
580.2	1.3	8.2	1.0	18	303	3.2	19	1.9	27	346	2.3
580.8	1.2	7.4	0.977	18	320	2.4	17	1.8	28	366	1.7
581.5	0.883	8.4	0.914	17	305	3.2	13	1.7	27	349	2.4
582.2	0.809	9.4	0.853	18	306	2.9	12	1.6	28	350	2.1
582.9	1.0	8.4	1.3	18	338	2.4	15	2.4	28	386	1.8
583.6	1.7	8.7	1.2	19	281	2.0	24	2.1	29	322	1.5
584.3	0.663	8.7	0.852	16	281	2.3	9.6	1.6	25	322	1.7
585.0	0.901	8.4	1.1	18	326	2.3	13	2.0	28	372	1.7
585.7	1.1	8.8	1.2	21	313	2.0	16	2.2	32	358	1.4
586.4	2.1	10	1.3	21	311	1.8	30	2.3	32	356	1.3
587.1	1.2	9.1	0.934	17	259	2.2	17	1.7	26	296	1.6
587.8	1.3	8.7	1.3	21	332	1.6	18	2.3	32	380	1.2
588.5	1.3	9.6	0.867	19	307	2.6	18	1.6	29	351	1.9
589.2	1.3	9.3	1.4	22	288	2.1	19	2.5	34	329	1.5
589.9	1.3	9.7	0.805	18	310	2.0	19	1.5	27	354	1.5
590.6	1.7	8.1	0.687	22	248	1.8	25	1.3	34	283	1.3
591.3	1.1	8.9	0.882	18	289	2.4	15	1.6	27	331	1.7
592.0	1.8	8.4	0.870	19	285	2.1	26	1.6	29	326	1.6
592.7	2.0	11	0.766	20	304	2.3	29	1.4	31	348	1.7
593.4	1.4	11	0.786	18	300	2.0	21	1.4	27	343	1.5
594.1	1.1	8.9	0.653	23	296	1.8	16	1.2	35	339	1.3
594.8	1.9	9.4	0.865	22	323	1.8	27	1.6	33	370	1.3
595.5	2.3	10	0.696	29	319	2.6	33	1.3	44	365	1.9
596.2	1.5	9.4	0.881	24	321	2.2	22	1.6	37	367	1.6
596.9	1.7	11	1.0	25	287	1.9	25	1.8	38	328	1.4
597.6	1.5	8.9	0.826	24	282	1.0	22	1.5	36	323	0.760
598.3	1.3	9.9	0.693	19	272	1.2	19	1.3	29	311	0.904
599.0	1.6	8.8	1.3	28	311	1.6	24	2.3	42	355	1.2
599.7	2.1	9.9	1.1	30	295	2.3	30	2.0	47	338	1.7
600.4	1.4	11	0.928	27	281	1.2	20	1.7	41	321	0.875
601.1	1.6	11	1.1	25	258	1.1	24	2.0	38	295	0.811
601.8	1.8	9.8	0.912	25	268	1.6	26	1.7	39	306	1.2
602.5	1.9	11	1.0	28	337	1.7	27	1.9	43	386	1.2
603.2	2.3	11	0.713	24	249	1.8	34	1.3	37	285	1.3
603.9	1.7	12	0.990	30	285	2.3	24	1.8	47	326	1.7
604.6	1.6	8.4	0.816	25	282	1.6	23	1.5	38	322	1.2
605.3	1.3	8.9	0.558	25	299	1.3	19	1.0	39	342	0.923
606.0	1.9	11	0.712	29	294	1.1	27	1.3	45	336	0.783
606.7	2.6	13	0.885	31	303	1.4	37	1.6	47	346	1.0
607.3	1.2	12	0.730	31	269	1.3	17	1.3	48	308	0.951
608.0	1.3	11	0.820	33	297	1.6	19	1.5	51	340	1.2
608.7	2.0	12	0.645	30	327	1.3	29	1.2	46	374	0.947
609.4	1.8	12	0.529	33	292	1.6	26	0.965	50	334	1.2
610.1	1.5	11	0.589	32	294	1.4	21	1.1	49	336	1.0
610.8	1.5	11	0.878	34	288	1.6	22	1.6	52	329	1.2
611.5	2.2	12	0.751	31	299	1.6	32	1.4	48	342	1.1
612.2	2.3	13	0.799	36	370	1.6	33	1.5	56	423	1.2
612.9	2.3	11	0.681	40	298	1.4	34	1.2	61	341	1.000
613.6	1.3	14	0.926	37	316	1.2	18	1.7	56	361	0.855
614.3	1.8	9.0	0.456	38	271	1.1	26	0.832	58	310	0.813
615.0	1.7	11	0.801	33	292	1.5	24	1.5	51	334	1.1
615.7	2.4	12	0.826	41	305	1.3	35	1.5	63	349	0.954
616.4	1.3	10	0.820	37	290	1.3	19	1.5	57	331	0.944
617.1	2.1	14	0.818	42	282	1.3	30	1.5	65	323	0.964
617.8	1.6	12	0.793	42	303	1.4	23	1.4	64	346	1.0
618.5	1.7	11	0.446	44	286	0.927	25	0.813	67	328	0.676
619.2	2.5	13	0.742	40	332	0.932	36	1.4	61	380	0.680
619.9	1.9	11	0.695	48	285	1.1	27	1.3	74	326	0.809
620.6	1.8	11	1.0	43	259	1.6	26	1.8	66	296	1.2
621.3	2.0	10	0.899	44	296	1.4	29	1.6	67	339	1.0



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
622.0	1.7	11	0.749	40	307	1.7	25	1.4	61	351	1.3
622.7	2.4	13	1.2	47	303	0.265	34	2.3	71	347	0.193
623.4	1.5	12	1.3	45	326	1.0	22	2.5	69	372	0.750
624.1	1.5	11	1.0	43	287	1.5	22	1.8	67	328	1.1
624.8	1.6	12	1.1	46	296	0.946	23	2.0	71	339	0.690
625.5	1.4	13	1.2	48	316	2.0	20	2.2	73	362	1.4
626.2	1.8	11	1.0	39	285	1.5	26	1.8	60	326	1.1
626.9	1.9	11	0.858	44	276	1.2	28	1.6	68	315	0.904
627.6	1.4	13	1.0	39	289	0.745	20	1.8	61	330	0.544
628.3	1.8	11	0.888	40	276	0.959	26	1.6	62	316	0.700
629.0	2.0	14	1.1	43	278	1.0	28	2.0	66	318	0.738
629.7	2.1	11	1.0	46	288	0.895	30	1.9	70	329	0.653
630.4	1.4	11	0.676	51	279	1.7	21	1.2	78	319	1.2
631.1	1.9	11	0.726	52	312	0.938	28	1.3	80	356	0.684
631.8	2.0	13	0.871	50	312	1.4	29	1.6	77	357	1.0
632.5	1.5	12	1.1	47	309	1.2	22	2.0	72	354	0.840
633.2	1.9	10	1.0	48	289	1.4	28	1.9	74	330	0.989
633.8	1.2	12	1.3	47	278	0.558	17	2.4	72	318	0.407
634.5	1.6	12	1.3	42	307	1.6	23	2.3	64	351	1.2
635.2	1.5	12	1.5	43	283	1.0	22	2.7	66	324	0.752
635.9	1.5	11	1.1	46	304	1.6	22	1.9	71	348	1.2
636.6	1.6	13	1.3	48	320	1.3	23	2.3	74	366	0.936
637.3	1.1	10	1.2	51	305	1.9	16	2.2	79	349	1.4
638.0	1.6	14	1.4	44	284	1.4	23	2.5	68	324	0.999
638.7	1.8	12	1.2	39	274	1.4	25	2.1	60	313	0.988
639.4	1.3	13	1.1	43	285	1.8	19	2.0	67	326	1.3
640.1	1.1	13	0.961	41	266	1.3	15	1.8	63	304	0.957
640.8	1.4	14	1.2	43	320	1.4	20	2.2	67	366	1.0
641.5	1.7	11	0.987	44	303	1.5	25	1.8	67	347	1.1
642.2	1.3	13	1.0	49	321	1.1	18	1.8	75	367	0.816
642.9	1.8	11	1.0	45	319	2.4	26	1.9	68	365	1.8
643.6	1.2	9.9	0.859	42	298	1.1	17	1.6	64	341	0.837
644.3	1.9	10	1.3	44	303	0.761	27	2.3	68	347	0.555
645.0	2.2	11	1.1	44	332	1.5	31	2.1	68	379	1.1
645.7	1.4	11	1.0	42	265	2.0	20	1.9	64	303	1.5
646.4	1.4	10	1.2	45	323	2.3	20	2.1	69	370	1.7
647.1	1.3	11	1.1	40	266	1.7	19	2.0	61	304	1.3
647.8	1.4	10	1.1	42	296	1.8	20	2.1	64	338	1.3
648.5	1.7	11	1.2	43	293	1.5	25	2.2	66	335	1.1
649.2	1.4	9.6	1.4	40	324	1.0	21	2.6	61	370	0.732
649.9	1.5	13	0.943	39	287	1.5	21	1.7	60	328	1.1
650.6	1.8	13	1.4	41	314	1.7	25	2.6	62	360	1.2
651.3	1.2	12	1.2	43	283	1.8	17	2.1	66	324	1.3
652.0	1.0	11	1.1	43	296	1.3	15	2.0	66	338	0.917
652.7	1.4	11	1.3	43	308	1.2	20	2.4	66	352	0.888
653.4	1.3	12	1.4	41	296	1.8	18	2.5	63	338	1.3
654.1	1.8	9.9	1.1	41	285	0.849	25	2.1	63	326	0.620
654.8	0.902	10	1.2	40	281	2.2	13	2.3	62	322	1.6
655.5	1.6	13	1.3	49	292	1.9	23	2.4	75	334	1.4
656.2	2.2	13	1.5	44	339	2.1	31	2.8	67	388	1.5
656.9	1.4	11	1.5	43	298	1.4	21	2.7	65	341	1.0
657.6	1.8	11	1.3	45	288	2.0	26	2.3	69	329	1.4
658.3	1.3	11	1.3	36	297	0.730	19	2.4	55	339	0.533
659.0	1.2	11	1.4	41	321	1.7	17	2.6	62	367	1.2
659.7	1.1	11	1.0	40	290	1.6	16	1.8	61	332	1.2
660.3	1.4	11	1.4	46	303	1.4	20	2.6	71	347	0.991
661.0	0.987	10	1.1	40	307	1.3	14	2.0	61	351	0.967
661.7	1.4	8.9	1.6	38	290	1.9	20	2.9	58	331	1.4
662.4	2.0	12	1.4	39	305	1.7	29	2.6	59	348	1.3
663.1	1.2	12	1.4	40	304	1.6	17	2.5	61	348	1.1
663.8	1.4	13	1.4	42	285	1.4	20	2.6	65	326	1.0
664.5	2.0	12	1.4	45	329	1.7	28	2.5	69	376	1.2
665.2	1.2	10	1.6	38	289	1.7	17	3.0	58	330	1.3
665.9	1.9	11	1.6	38	301	2.0	28	2.9	59	344	1.4
666.6	1.3	11	1.5	41	276	1.2	19	2.7	63	316	0.890
667.3	1.9	12	1.4	38	288	1.8	28	2.5	58	329	1.3
668.0	2.1	10	1.3	41	293	1.5	31	2.4	62	335	1.1
668.7	1.5	11	1.4	37	327	1.3	21	2.5	57	374	0.938
669.4	1.7	11	1.3	42	341	1.2	25	2.4	64	390	0.910
670.1	2.0	11	1.4	37	313	2.1	29	2.5	56	358	1.5
670.8	1.9	7.2	1.3	37	287	1.5	28	2.3	57	329	1.1
671.5	1.4	11	1.6	42	303	1.6	21	2.9	64	347	1.2
672.2	1.5	9.8	1.3	42	289	1.6	22	2.5	64	330	1.2
672.9	1.6	11	1.4	36	300	1.9	24	2.5	55	344	1.4
673.6	1.5	12	1.3	46	304	1.7	22	2.4	70	348	1.2
674.3	0.978	8.4	1.1	35	327	2.3	14	1.9	54	374	1.7
675.0	1.4	11	1.6	37	281	1.2	20	2.9	56	321	0.857
675.7	1.3	11	1.5	39	311	2.6	18	2.7	60	356	1.9
676.4	1.2	11	1.5	35	280	1.8	17	2.8	53	320	1.3
677.1	0.970	9.4	1.2	40	297	1.3	14	2.2	61	339	0.973
677.8	1.9	10	0.997	36	311	2.7	27	1.8	55	355	2.0



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
678.5	2.0	9.9	1.9	35	316	2.3	29	3.4	53	361	1.7
679.2	1.3	10	1.5	39	331	2.1	18	2.7	60	378	1.5
679.9	1.5	9.7	1.5	36	284	2.2	21	2.6	55	325	1.6
680.6	1.3	9.2	1.0	42	325	3.2	19	1.8	64	372	2.4
681.3	1.3	10.0	1.6	37	285	1.6	19	2.9	57	326	1.1
682.0	1.6	9.2	1.3	34	297	1.5	23	2.3	52	340	1.1
682.7	1.1	9.9	1.2	43	298	1.9	16	2.1	66	341	1.4
683.4	1.0	10	1.2	38	288	1.6	15	2.1	58	329	1.1
684.1	1.1	10	0.931	37	285	2.0	16	1.7	56	326	1.5
684.8	2.0	9.6	1.2	37	300	1.6	29	2.1	57	343	1.2
685.5	1.5	9.8	1.6	41	307	2.9	22	2.9	63	352	2.1
686.2	1.2	11	1.1	39	301	1.8	17	2.0	60	345	1.3
686.8	0.900	10	1.1	42	323	2.8	13	2.0	64	369	2.0
687.5	1.7	11	1.2	38	327	2.8	24	2.2	58	374	2.0
688.2	1.6	11	1.4	40	316	2.1	24	2.6	62	361	1.5
688.9	1.7	10	1.4	36	322	2.2	25	2.6	56	368	1.6
689.6	1.2	10	1.3	38	329	2.4	17	2.4	58	376	1.8
690.3	0.793	11	1.2	35	280	1.5	11	2.2	54	321	1.1
691.0	1.6	10	0.812	36	322	1.7	23	1.5	56	368	1.2
691.7	1.6	12	0.980	36	323	2.1	23	1.8	56	369	1.5
692.4	0.906	11	1.3	36	327	2.1	13	2.4	55	374	1.5
693.1	1.2	11	1.1	36	306	2.3	18	2.1	55	350	1.7
693.8	1.2	12	1.2	31	280	2.5	18	2.1	47	320	1.8
694.5	1.8	10	1.1	38	344	1.9	26	2.0	59	393	1.4
695.2	1.4	11	1.2	39	310	2.0	20	2.3	60	354	1.4
695.9	1.4	12	1.3	33	307	2.3	21	2.4	51	352	1.7
696.6	1.2	12	1.2	45	301	2.0	18	2.2	68	345	1.5
697.3	1.5	11	1.1	33	295	1.8	21	2.1	50	338	1.3
698.0	1.5	10	1.2	43	330	2.8	22	2.2	66	377	2.1
698.7	1.9	9.7	1.1	35	279	1.9	27	2.0	53	319	1.4
699.4	1.7	11	1.0	37	340	2.0	24	1.9	57	388	1.4
700.1	1.7	12	1.4	37	300	1.9	25	2.5	57	343	1.4
700.8	1.6	10	1.1	34	288	2.5	23	2.0	52	329	1.8
701.5	1.1	12	1.3	39	324	2.0	15	2.4	59	370	1.5
702.2	1.2	11	1.1	38	301	1.9	17	1.9	58	345	1.4
702.9	0.967	13	1.5	42	307	2.5	14	2.7	65	351	1.9
703.6	1.4	11	1.3	33	287	2.6	20	2.3	50	328	1.9
704.3	1.2	12	1.3	36	318	2.2	18	2.3	55	363	1.6
705.0	0.891	11	1.0	31	304	1.7	13	1.8	48	348	1.2
705.7	2.0	11	1.3	37	293	2.3	29	2.3	57	335	1.7
706.4	1.5	11	1.2	41	339	3.3	22	2.3	63	388	2.4
707.1	2.4	11	1.5	37	320	1.6	34	2.7	57	366	1.2
707.8	1.9	10	1.1	41	286	2.0	27	2.1	62	327	1.5
708.5	2.0	10	1.3	35	333	1.4	28	2.3	54	381	1.0
709.2	1.2	10	1.2	39	302	2.1	17	2.2	59	346	1.5
709.9	1.4	12	1.4	40	311	1.3	20	2.6	61	355	0.974
710.6	1.3	9.1	1.3	35	334	2.1	19	2.4	53	382	1.5
711.3	1.4	11	1.3	33	294	1.8	21	2.4	50	336	1.3
712.0	1.7	10	1.3	32	296	2.7	24	2.3	48	339	1.9
712.7	1.4	10	1.1	39	269	1.7	20	2.0	59	308	1.3
713.3	1.3	10	1.1	38	273	1.6	19	2.0	58	313	1.2
714.0	1.7	8.9	1.3	37	303	1.9	25	2.4	56	346	1.4
714.7	2.5	8.9	1.0	38	325	1.9	37	1.8	58	372	1.4
715.4	1.8	11	1.4	38	301	2.3	26	2.6	58	345	1.7
716.1	1.8	11	1.3	39	307	2.5	26	2.4	59	351	1.8
716.8	2.0	12	0.898	33	277	1.7	29	1.6	50	317	1.2
717.5	0.735	10	1.3	35	341	1.7	11	2.4	53	390	1.2
718.2	1.8	9.4	1.3	31	276	1.9	26	2.5	47	315	1.4
718.9	2.1	10	0.961	36	325	2.7	31	1.8	55	372	2.0
719.6	1.2	11	1.2	32	289	2.0	17	2.2	49	331	1.4
720.3	1.8	11	0.889	32	275	1.9	26	1.6	48	314	1.4
721.0	2.0	12	1.3	30	287	1.9	29	2.3	46	328	1.4
721.7	1.2	11	1.5	33	293	2.4	18	2.6	50	335	1.7
722.4	1.3	10.0	0.992	32	248	1.8	19	1.8	49	284	1.3
723.1	1.4	11	0.868	34	298	1.3	20	1.6	52	341	0.914
723.8	1.5	11	1.5	33	325	1.8	21	2.6	50	372	1.3
724.5	2.2	11	1.8	30	314	3.0	32	3.3	47	359	2.2
725.2	1.0	11	1.3	29	324	1.9	15	2.5	44	371	1.4
725.9	1.9	8.7	1.2	26	286	2.1	27	2.1	40	327	1.5
726.6	1.5	10.0	1.2	29	283	1.5	22	2.2	44	324	1.1
727.3	1.4	11	1.3	30	355	2.4	20	2.4	47	406	1.8
728.0	1.7	11	1.3	28	310	1.8	24	2.4	44	355	1.3
728.7	1.8	9.9	1.1	33	314	1.6	26	1.9	51	360	1.2
729.4	0.986	9.0	0.988	29	316	1.7	14	1.8	44	362	1.2
730.1	1.4	9.1	1.2	29	291	2.8	20	2.1	45	333	2.1
730.8	2.4	8.5	0.903	35	315	2.3	35	1.6	54	361	1.7
731.5	1.2	10	1.2	29	310	1.7	17	2.2	45	355	1.3
732.2	0.552	8.1	1.2	33	317	2.1	8.0	2.1	51	362	1.5
732.9	1.4	9.1	1.3	32	303	2.1	21	2.4	49	347	1.5
733.6	1.2	9.0	0.910	32	301	2.2	17	1.7	50	344	1.6
734.3	1.3	7.2	0.921	24	262	2.1	19	1.7	37	300	1.5



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
735.0	1.7	11	1.2	33	341	1.7	24	2.2	50	390	1.2
735.7	2.1	10.0	1.3	29	313	2.7	30	2.3	44	358	2.0
736.4	1.5	12	1.4	33	279	1.9	21	2.5	51	320	1.4
737.1	1.8	9.5	0.972	30	344	2.6	26	1.8	46	394	1.9
737.8	1.9	9.7	1.3	30	280	2.0	27	2.3	46	320	1.4
738.5	2.2	11	1.0	32	309	2.1	32	1.9	49	353	1.5
739.2	1.2	9.4	1.3	32	283	2.0	17	2.3	49	324	1.5
739.8	1.7	10	1.6	33	314	2.4	24	2.9	50	359	1.7
740.5	1.6	9.5	1.2	31	275	1.9	23	2.2	48	315	1.4
741.2	1.7	9.0	1.1	33	329	2.3	24	2.0	50	376	1.6
741.9	1.6	11	1.3	29	318	2.6	23	2.3	44	364	1.9
742.6	0.954	9.7	1.2	31	291	2.6	14	2.1	48	332	1.9
743.3	0.908	9.9	1.3	32	308	2.2	13	2.3	49	353	1.6
744.0	1.4	9.5	1.1	27	306	2.4	20	2.1	41	350	1.7
744.7	1.2	9.3	1.2	31	333	2.2	18	2.2	48	381	1.6
745.4	1.5	9.9	1.3	27	303	2.6	21	2.3	42	346	1.9
746.1	2.0	9.6	1.1	29	301	2.1	29	2.1	44	344	1.5
746.8	0.986	10	1.2	37	295	2.0	14	2.2	56	337	1.5
747.5	2.3	11	1.3	29	275	2.4	33	2.3	45	315	1.7
748.2	1.7	12	1.1	30	331	2.2	25	2.0	45	379	1.6
748.9	2.0	11	1.0	26	317	2.6	28	1.9	40	362	1.9
749.6	1.2	9.2	1.1	29	293	2.2	17	2.0	45	335	1.6
750.3	1.3	9.0	1.1	28	293	1.9	19	2.1	44	335	1.4
751.0	1.4	8.6	0.857	26	329	2.4	21	1.6	41	376	1.8
751.7	2.1	9.6	1.3	32	297	3.1	30	2.4	49	339	2.3
752.4	1.2	10	1.1	30	272	3.6	17	2.0	46	311	2.6
753.1	1.3	11	0.981	31	293	2.4	18	1.8	48	335	1.8
753.8	0.595	10	0.929	24	292	3.2	8.6	1.7	37	334	2.3
754.5	1.4	10	0.870	26	316	2.1	20	1.6	40	361	1.6
755.2	1.5	9.0	1.1	27	308	2.3	22	2.0	41	353	1.7
755.9	1.0	9.5	1.3	35	303	2.9	15	2.3	53	347	2.1
756.6	1.5	9.3	1.4	27	293	1.4	22	2.5	42	335	1.0
757.3	1.2	9.1	1.0	29	286	1.7	17	1.9	44	327	1.3
758.0	1.2	11	1.2	21	314	2.2	17	2.1	33	359	1.6
758.7	1.6	10	1.5	30	294	2.4	23	2.7	46	336	1.8
759.4	1.4	9.0	0.957	30	258	2.1	21	1.7	46	295	1.5
760.1	1.6	12	1.3	29	313	3.0	23	2.3	44	358	2.2
760.8	1.2	9.3	1.2	25	296	2.6	17	2.2	39	339	1.9
761.5	1.1	12	1.3	34	328	2.4	16	2.4	53	375	1.8
762.2	1.7	11	1.1	28	300	1.4	24	2.0	42	343	1.0
762.9	1.8	9.5	1.5	26	266	2.4	26	2.7	40	304	1.8
763.6	1.8	9.5	0.884	28	310	2.7	26	1.6	42	354	2.0
764.3	0.660	11	1.2	32	311	2.0	9.5	2.1	49	355	1.4
765.0	1.6	11	1.1	29	294	2.3	23	2.1	45	337	1.7
765.7	1.8	11	1.3	32	292	1.8	26	2.3	49	334	1.3
766.3	1.6	10	1.4	26	293	1.1	23	2.5	40	335	0.788
767.0	0.750	9.6	1.4	29	294	1.8	11	2.5	45	336	1.3
767.7	1.5	9.2	0.862	29	282	3.2	21	1.6	45	323	2.3
768.4	1.3	9.7	0.961	30	284	2.3	18	1.8	46	325	1.7
769.1	1.5	11	1.4	37	307	2.0	22	2.5	56	351	1.4
769.8	1.3	11	1.2	30	295	2.4	19	2.2	47	338	1.7
770.5	1.6	10	0.943	31	304	2.4	24	1.7	47	348	1.8
771.2	1.2	12	1.4	34	299	1.8	17	2.5	52	342	1.3
771.9	1.5	11	0.816	31	268	1.7	21	1.5	48	307	1.2
772.6	1.9	11	1.0	39	309	2.3	27	1.9	59	354	1.7
773.3	0.918	9.5	1.1	36	307	2.0	13	2.0	55	351	1.5
774.0	0.779	9.6	1.0	31	305	2.5	11	1.9	47	349	1.9
774.7	1.8	10	1.3	35	293	1.0	25	2.3	54	335	0.740
775.4	1.8	12	1.4	30	288	1.6	26	2.6	46	329	1.1
776.1	1.4	12	1.0	32	294	2.4	20	1.8	49	336	1.8
776.8	2.0	11	1.000	32	299	2.0	29	1.8	49	342	1.4
777.5	1.4	11	0.697	31	298	2.0	20	1.3	47	341	1.4
778.2	0.946	13	1.1	34	329	2.2	14	2.0	52	376	1.6
778.9	1.6	11	1.1	35	283	1.4	23	2.0	54	324	1.0
779.6	1.5	12	1.2	33	289	1.9	21	2.2	51	330	1.4
780.3	1.2	11	0.991	34	289	1.7	17	1.8	52	331	1.2
781.0	1.4	13	1.4	39	284	1.6	20	2.6	59	325	1.2
781.7	1.6	13	0.772	39	309	1.2	23	1.4	60	353	0.870
782.4	1.9	12	1.1	44	277	1.5	28	1.9	67	316	1.1
783.1	0.617	13	1.1	42	325	1.6	8.9	2.1	65	372	1.2
783.8	1.3	12	1.1	42	265	1.4	19	1.9	65	303	1.0
784.5	1.0	12	1.1	37	311	1.4	15	2.0	57	356	1.0
785.2	1.1	15	1.3	42	270	0.350	16	2.4	65	309	0.255
785.9	1.3	12	0.905	41	245	1.2	18	1.7	63	281	0.889
786.6	0.935	12	1.0	39	244	0.641	14	1.8	60	279	0.468
787.3	1.1	11	1.1	33	250	1.4	16	1.9	51	286	1.0
788.0	1.6	11	1.4	38	294	1.4	22	2.6	59	336	1.0
788.7	1.5	12	1.5	36	230	0.908	22	2.8	56	264	0.663
789.4	1.6	8.9	1.2	29	224	1.4	23	2.3	44	256	0.996
790.1	0.984	10	1.6	31	249	1.0	14	3.0	48	285	0.740
790.8	1.8	11	1.1	20	225	0.740	25	2.1	31	257	0.540



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
791.5	1.7	11	1.0	29	283	1.4	25	1.9	44	323	1.0
792.1	1.1	11	1.2	29	229	0.924	16	2.2	45	262	0.674
792.8	1.2	12	0.937	27	230	0.920	17	1.7	42	263	0.671
793.5	0.849	9.7	1.7	23	224	1.1	12	3.2	35	256	0.771
794.2	1.0	11	1.2	24	219	1.5	15	2.3	36	251	1.1
794.9	1.4	11	1.3	27	231	1.3	20	2.4	42	264	0.972
795.6	1.1	9.6	1.1	28	284	1.2	17	2.0	43	325	0.847
796.3	1.2	12	1.4	28	226	0.713	17	2.5	44	259	0.520
797.0	1.3	11	0.684	29	230	1.0	19	1.2	45	263	0.753
797.7	2.0	12	0.842	36	231	1.2	29	1.5	55	264	0.906
798.4	1.9	11	1.2	38	224	1.0	27	2.2	58	256	0.736
799.1	1.1	13	0.971	33	228	0.945	16	1.8	50	261	0.690
799.8	1.2	11	1.1	33	220	1.0	17	1.9	51	251	0.750
800.5	1.3	12	0.580	35	221	0.900	19	1.1	54	253	0.657
801.2	1.3	9.5	0.966	36	239	0.544	19	1.8	56	274	0.397
801.9	0.935	13	0.692	42	210	1.4	13	1.3	65	240	0.989
802.6	1.1	9.7	1.3	39	220	0.673	16	2.4	59	251	0.491
803.3	1.2	13	1.1	38	212	0.840	17	2.0	59	242	0.613
804.0	1.2	12	1.1	37	239	1.1	17	2.1	57	273	0.817
804.7	1.3	12	1.3	39	233	0.989	18	2.3	60	266	0.722
805.4	1.6	13	1.5	42	242	0.556	24	2.8	64	277	0.406
806.1	0.901	12	0.993	43	227	0.689	13	1.8	66	260	0.503
806.8	1.2	10	1.0	37	202	0.562	18	1.9	56	231	0.410
807.5	0.671	11	1.1	34	223	0.668	9.7	2.0	52	255	0.488
808.2	1.4	10	0.975	37	210	1.4	20	1.8	57	240	1.1
808.9	1.4	11	1.5	38	242	2.3	20	2.7	58	277	1.7
809.6	1.1	11	1.3	36	237	1.4	16	2.3	56	271	1.0
810.3	0.636	8.0	1.1	30	227	1.3	9.2	2.1	46	260	0.927
811.0	0.647	9.3	1.3	31	227	1.1	9.3	2.3	48	260	0.825
811.7	0.807	9.6	1.3	33	229	1.3	12	2.4	51	262	0.958
812.4	1.1	11	1.2	34	222	0.509	16	2.1	52	253	0.372
813.1	0.960	10	0.931	27	228	1.2	14	1.7	42	261	0.842
813.8	1.2	9.3	1.2	24	229	1.1	17	2.2	36	261	0.835
814.5	0.795	9.7	1.3	26	243	1.5	11	2.4	39	278	1.1
815.2	0.961	10	1.3	27	214	1.5	14	2.3	41	245	1.1
815.9	0.800	9.3	0.842	27	221	1.5	12	1.5	41	253	1.1
816.6	1.1	10	0.813	23	237	2.3	16	1.5	35	271	1.7
817.3	0.862	8.0	0.815	21	231	0.788	12	1.5	32	264	0.575
818.0	1.1	9.1	0.924	23	268	1.1	16	1.7	36	307	0.826
818.7	0.952	8.3	0.990	23	243	1.3	14	1.8	36	278	0.932
819.3	0.912	10	0.773	26	223	1.1	13	1.4	40	255	0.829
820.0	1.0	9.3	0.655	17	239	1.3	15	1.2	26	273	0.919
820.7	1.4	9.7	0.647	20	236	1.7	20	1.2	30	270	1.2
821.4	1.0	9.5	0.563	21	237	1.5	15	1.0	33	271	1.1
822.1	1.2	10	0.618	20	253	1.4	18	1.1	30	289	1.1
822.8	1.6	11	0.914	23	258	1.3	23	1.7	35	295	0.983
823.5	1.4	9.1	0.799	21	229	1.1	20	1.5	32	262	0.839
824.2	1.4	11	0.738	21	239	1.1	21	1.3	32	273	0.791
824.9	0.965	11	0.613	20	232	1.1	14	1.1	31	266	0.810
825.6	1.7	12	1.0	23	248	1.7	24	1.9	36	283	1.3
826.3	1.1	12	0.499	29	264	1.1	17	0.910	45	302	0.790
827.0	1.5	11	0.630	27	266	1.6	21	1.1	41	304	1.1
827.7	1.3	11	0.728	30	271	0.952	19	1.3	46	309	0.695
828.4	1.5	13	0.760	28	258	1.3	21	1.4	43	295	0.965
829.1	1.5	11	0.650	37	266	1.1	21	1.2	57	304	0.780
829.8	1.6	10.0	0.844	32	265	1.1	24	1.5	49	303	0.829
830.5	1.0	9.9	0.862	32	259	0.811	15	1.6	49	296	0.592
831.2	1.6	13	1.1	34	241	1.3	24	1.9	51	276	0.975
831.9	1.1	9.9	0.544	34	229	1.2	15	0.993	52	261	0.872
832.6	1.3	13	0.766	37	274	1.1	19	1.4	57	313	0.802
833.3	1.3	9.4	0.935	36	248	0.974	19	1.7	56	284	0.711
834.0	2.0	11	0.919	37	267	0.931	28	1.7	57	305	0.679
834.7	1.4	9.5	0.821	36	227	0.806	21	1.5	56	259	0.588
835.4	1.8	14	0.963	41	283	1.0	26	1.8	62	324	0.759
836.1	0.744	9.6	1.0	34	220	0.482	11	1.9	53	252	0.352
836.8	1.5	10	0.800	36	274	1.6	22	1.5	55	313	1.1
837.5	0.796	8.4	1.3	45	234	1.1	11	2.4	69	268	0.808
838.2	1.1	12	1.1	43	253	1.2	15	2.0	66	290	0.870
838.9	1.5	13	0.955	39	254	1.2	22	1.7	60	291	0.900
839.6	2.0	12	1.2	39	281	0.683	29	2.2	60	321	0.498
840.3	1.2	8.8	0.899	36	243	1.3	18	1.6	55	278	0.912
841.0	1.0	11	0.952	45	265	1.1	15	1.7	70	303	0.829
841.7	1.3	10	0.939	39	240	1.1	19	1.7	60	275	0.774
842.4	0.924	11	0.666	35	222	0.872	13	1.2	54	254	0.636
843.1	1.4	9.7	0.820	40	238	1.5	20	1.5	61	272	1.1
843.8	1.3	11	0.933	37	266	1.2	19	1.7	56	304	0.844
844.5	0.831	9.9	0.777	42	251	1.6	12	1.4	64	287	1.2
845.2	1.8	9.6	1.2	42	276	1.5	26	2.2	65	316	1.1
845.9	1.1	11	1.1	35	254	1.5	16	2.1	54	290	1.1
846.5	1.7	8.6	1.1	29	235	1.1	24	2.0	44	268	0.781
847.2	1.3	10	0.990	29	270	1.4	19	1.8	44	309	1.0



Minnow Environmental  
Sample ID: 005

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
847.9	0.918	8.9	0.994	33	265	1.6	13	1.8	50	303	1.2
848.6	1.1	10	0.684	34	239	2.0	16	1.2	52	273	1.5
849.3	0.979	8.9	1.1	33	248	2.0	14	2.0	51	284	1.5
850.0	1.6	9.6	1.2	27	262	1.0	24	2.1	42	299	0.734
850.7	1.4	11	0.929	25	273	1.4	20	1.7	39	312	1.0
851.4	0.978	11	1.1	34	259	1.8	14	1.9	52	296	1.3
852.1	0.607	9.8	0.954	36	271	1.3	8.8	1.7	55	310	0.930
852.8	1.5	8.0	0.887	26	255	1.4	22	1.6	40	292	1.0
853.5	1.1	10	1.2	26	271	1.1	15	2.1	40	310	0.835
854.2	0.794	6.8	0.914	24	252	1.4	11	1.7	37	289	1.0
854.9	1.3	11	0.885	25	253	1.9	19	1.6	38	289	1.4
855.6	0.949	8.3	0.720	22	273	1.7	14	1.3	33	312	1.2
856.3	0.841	9.4	0.786	23	301	0.819	12	1.4	36	345	0.598
857.0	1.0	8.5	0.697	22	278	2.0	15	1.3	34	318	1.5
857.7	1.5	11	0.722	23	276	1.5	22	1.3	35	316	1.1
858.4	1.2	9.2	0.949	21	240	1.7	18	1.7	32	274	1.2
859.1	1.5	9.9	0.547	21	253	2.3	22	0.998	32	289	1.7
859.8	1.1	9.9	0.448	22	284	1.3	17	0.817	34	325	0.950
860.5	1.5	9.8	0.576	20	258	0.718	21	1.1	30	295	0.524
861.2	1.3	9.1	0.770	22	272	1.2	19	1.4	34	312	0.847
861.9	1.2	11	0.615	22	242	1.1	17	1.1	34	277	0.825
862.6	1.3	13	0.690	22	260	1.2	19	1.3	33	297	0.872
863.3	2.0	9.8	0.731	17	243	0.782	28	1.3	25	278	0.570
864.0	1.5	9.7	0.625	23	268	1.5	21	1.1	36	306	1.1
864.7	1.2	11	0.681	24	265	1.1	18	1.2	37	303	0.793
865.4	2.1	12	0.768	23	263	2.1	30	1.4	36	301	1.5
866.1	1.6	11	0.577	23	273	1.4	24	1.1	35	313	1.0
866.8	1.3	9.6	0.493	19	220	0.828	19	0.900	28	251	0.604
867.5	1.2	13	0.591	25	263	1.3	18	1.1	39	300	0.943
868.2	1.3	13	0.860	26	248	1.8	19	1.6	40	283	1.3
868.9	1.2	14	0.657	31	246	1.3	18	1.2	47	281	0.921
869.6	0.998	11	0.758	28	259	0.684	14	1.4	43	296	0.499
870.3	1.3	11	0.873	25	254	0.670	19	1.6	39	291	0.489
871.0	1.5	13	0.658	29	279	1.4	22	1.2	44	319	0.993
871.7	1.4	15	1.2	30	249	1.7	20	2.3	47	285	1.3
872.4	1.2	13	1.2	33	245	1.6	17	2.2	50	281	1.2
873.0	1.3	12	1.2	34	272	1.5	19	2.2	52	311	1.1
873.7	1.7	13	1.5	43	318	0.997	24	2.7	66	363	0.727
874.4	1.2	12	1.4	45	319	1.7	17	2.6	69	365	1.2
875.1	1.7	14	1.1	45	263	1.8	24	2.0	68	301	1.3
875.8	1.9	16	1.6	44	262	1.5	28	3.0	67	300	1.1
876.5	2.2	15	1.5	40	287	1.5	32	2.7	61	328	1.1
877.2	1.3	14	1.1	50	265	1.3	19	2.0	76	303	0.982
877.9	2.3	15	1.1	45	309	1.0	33	2.1	69	353	0.741
878.6	1.6	14	1.3	47	254	1.3	23	2.4	72	291	0.914
879.3	2.1	14	1.5	59	255	1.4	30	2.7	90	292	1.0
880.0	1.8	14	1.1	38	253	0.744	26	2.0	59	290	0.542
880.7	1.1	13	1.2	38	282	2.2	16	2.1	59	323	1.6
881.4	1.6	13	1.5	38	267	1.5	24	2.6	58	305	1.1
882.1	1.4	13	1.2	38	235	1.2	20	2.1	59	268	0.899
882.8	2.2	12	1.5	36	248	0.776	32	2.7	55	284	0.566
883.5	1.1	11	0.972	32	244	0.766	16	1.8	49	279	0.559
884.2	1.5	14	1.0	40	290	2.1	22	1.9	61	332	1.5
884.9	1.7	13	0.982	39	289	0.967	24	1.8	60	330	0.706
885.6	1.8	13	1.1	40	266	1.1	26	2.1	61	304	0.828
886.3	1.0	11	1.1	36	248	1.6	15	1.9	55	284	1.2
887.0	1.4	13	0.817	31	278	1.3	20	1.5	48	318	0.958
887.7	1.2	13	0.913	33	247	1.1	17	1.7	51	283	0.766
888.4	1.2	13	0.987	29	256	0.955	18	1.8	44	293	0.697
889.1	1.2	11	1.1	34	264	1.7	18	1.9	51	302	1.2
889.8	1.1	11	0.677	26	233	0.842	16	1.2	40	266	0.614
890.5	1.5	12	0.590	28	288	0.666	21	1.1	43	329	0.486
891.2	1.3	10	0.563	30	293	1.1	19	1.0	46	335	0.780
891.9	1.5	11	0.770	30	266	1.2	21	1.4	46	305	0.887
892.6	1.1	11	0.725	27	267	1.5	16	1.3	41	305	1.1
893.3	1.4	11	0.751	27	288	1.3	20	1.4	41	330	0.913
894.0	0.876	11	0.649	25	263	0.793	13	1.2	38	301	0.579
894.7	0.732	12	1.0	26	271	0.763	11	1.9	40	309	0.557
895.4	0.802	12	0.653	28	263	1.2	12	1.2	43	301	0.888
896.1	0.902	9.9	0.777	30	278	1.6	13	1.4	46	318	1.2
896.8	0.793	13	0.570	29	259	1.3	11	1.0	45	297	0.943
897.5	1.3	11	0.834	25	260	0.584	18	1.5	38	297	0.426
898.2	1.2	12	0.834	27	247	0.964	18	1.5	41	282	0.704
898.9	1.4	14	0.955	30	279	1.3	20	1.7	45	319	0.926
899.6	1.2	13	0.845	26	267	1.1	18	1.5	40	305	0.823
900.2	1.6	13	0.855	30	285	1.3	23	1.6	46	326	0.918
900.9	1.8	14	0.876	28	271	1.1	27	1.6	42	310	0.825
901.6	1.5	16	0.911	29	279	1.1	22	1.7	44	319	0.838
902.3	1.8	13	0.997	30	256	0.900	26	1.8	45	292	0.657
903.0	1.4	11	0.828	28	232	0.976	21	1.5	43	265	0.712
903.7	1.7	14	1.2	32	273	1.7	25	2.2	48	312	1.3



Minnow Environmental  
Sample ID: 005

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
904.4	1.3	14	1.3	30	283	1.4	19	2.3	46	324	1.0
905.1	1.5	15	1.000	35	253	2.4	22	1.8	53	289	1.7
905.8	1.2	13	1.0	31	237	1.7	17	1.9	48	271	1.3
906.5	1.5	12	0.995	35	240	1.1	22	1.8	54	275	0.835
907.2	1.4	15	1.1	37	278	1.7	20	1.9	56	318	1.2
907.9	2.0	17	1.2	41	282	1.1	28	2.2	63	322	0.827
908.6	2.1	17	1.1	42	262	0.947	30	2.0	64	300	0.691
909.3	1.2	14	1.4	41	263	1.4	17	2.5	63	301	1.0
910.0	1.7	17	1.2	38	255	1.1	24	2.2	59	292	0.804
910.7	1.4	17	1.5	43	264	1.1	20	2.8	65	301	0.792
911.4	1.6	14	1.2	43	242	1.7	23	2.2	66	277	1.2
912.1	1.6	16	1.7	41	253	1.2	23	3.0	63	289	0.865
912.8	1.6	11	1.4	38	273	1.3	23	2.6	58	312	0.979
913.5	1.4	16	1.5	38	282	0.940	20	2.7	58	323	0.686
914.2	2.3	16	1.3	45	290	1.2	34	2.4	68	332	0.864
914.9	1.6	16	1.1	41	256	1.3	24	2.0	63	292	0.918
915.6	1.2	12	1.5	42	262	1.4	18	2.8	64	299	1.0
916.3	1.4	12	1.1	50	260	0.886	20	2.0	76	298	0.646
917.0	1.4	13	1.1	45	272	0.726	20	2.0	69	311	0.530
917.7	1.3	16	1.3	46	300	2.3	18	2.3	70	343	1.6
918.4	1.8	13	1.3	51	246	1.1	26	2.4	78	281	0.794
919.1	1.8	13	0.973	53	250	1.8	26	1.8	82	286	1.3
919.8	1.2	12	1.1	40	270	0.815	17	2.0	61	309	0.595
920.5	1.4	16	1.0	40	277	1.6	21	1.9	61	317	1.2
921.2	1.6	15	1.3	44	290	1.6	23	2.3	67	332	1.2
921.9	1.9	15	1.2	43	236	1.1	28	2.2	67	270	0.829
922.6	1.7	12	1.0	46	258	0.831	24	1.9	70	295	0.606
923.3	1.2	13	0.823	48	307	1.7	17	1.5	73	351	1.2
924.0	1.8	14	1.2	52	282	1.2	26	2.1	80	323	0.889
924.7	1.7	16	1.2	58	266	1.2	25	2.1	89	304	0.903
925.4	1.7	14	1.1	55	275	1.5	25	2.0	84	314	1.1
926.0	1.9	13	0.913	54	245	0.428	27	1.7	83	281	0.312
926.7	1.8	12	1.2	50	272	1.0	26	2.2	77	311	0.742
927.4	2.4	16	1.3	48	256	1.4	35	2.3	73	293	1.0
928.1	1.8	15	1.0	46	260	1.1	26	1.9	70	297	0.795
928.8	1.2	14	1.0	49	272	1.3	18	1.9	75	311	0.962
929.5	2.0	12	0.837	53	251	1.6	29	1.5	81	287	1.2
930.2	2.0	14	1.2	50	265	0.998	29	2.2	77	304	0.728
930.9	2.2	15	1.4	58	283	1.6	32	2.5	89	324	1.1
931.6	2.1	17	0.965	49	243	1.5	30	1.8	76	277	1.1
932.3	2.1	12	0.841	53	244	1.8	31	1.5	81	279	1.3
933.0	2.6	13	0.872	49	254	1.1	37	1.6	76	290	0.795
933.7	2.1	15	0.970	52	278	1.3	30	1.8	79	318	0.953
934.4	2.2	15	0.887	55	254	1.2	31	1.6	85	290	0.910
935.1	1.8	15	0.865	63	258	2.3	25	1.6	96	295	1.7
935.8	1.9	13	1.2	59	255	0.821	27	2.2	90	291	0.599
936.5	2.1	13	0.803	60	273	1.7	30	1.5	92	312	1.2
937.2	2.0	13	1.1	64	257	1.1	29	2.1	98	294	0.809
937.9	2.1	14	1.1	61	269	1.4	30	2.1	94	308	1.1
938.6	1.7	11	1.0	60	256	1.2	24	1.8	92	293	0.850
939.3	1.4	12	0.897	47	242	0.674	20	1.6	72	277	0.492
940.0	2.3	13	0.734	56	270	1.5	33	1.3	86	309	1.1
940.7	1.6	13	1.1	61	252	0.938	23	1.9	94	288	0.685
941.4	2.0	16	1.1	59	273	1.4	29	2.0	91	312	1.0
942.1	2.4	13	1.1	64	255	1.5	35	1.9	99	292	1.1
942.8	2.2	12	0.888	53	243	1.3	32	1.6	82	277	0.937
943.5	1.6	12	1.1	57	268	1.6	23	2.0	88	307	1.2
944.2	1.5	16	0.861	63	280	0.972	22	1.6	96	320	0.709
944.9	1.2	14	0.989	61	259	1.4	18	1.8	94	297	1.0
945.6	2.2	13	1.3	57	271	1.1	32	2.3	87	310	0.773
946.3	1.9	13	1.0	58	272	1.2	27	1.9	89	311	0.902
947.0	2.3	13	0.974	64	274	1.4	33	1.8	98	314	1.0
947.7	1.8	14	0.898	67	256	2.1	25	1.6	102	293	1.5
948.4	1.8	14	1.3	61	252	1.7	26	2.4	93	288	1.3
949.1	1.5	15	1.2	62	252	1.0	21	2.2	96	288	0.731
949.8	2.4	14	1.3	62	261	0.958	35	2.4	96	298	0.699
950.5	2.5	14	1.3	65	267	1.4	37	2.3	100	305	1.0
951.2	2.0	12	1.4	66	240	1.4	28	2.6	101	274	1.0
951.9	1.5	13	1.2	61	241	1.2	22	2.2	94	276	0.883
952.5	1.6	13	1.6	66	260	1.1	23	2.9	102	297	0.803
953.2	1.4	14	1.1	68	255	1.5	19	2.1	104	292	1.1
953.9	2.4	13	1.2	56	261	1.5	35	2.2	86	299	1.1
954.6	1.7	13	1.3	67	233	1.3	24	2.4	103	267	0.932
955.3	1.8	11	1.7	63	239	1.1	26	3.1	96	273	0.831
956.0	1.3	11	1.2	63	256	1.2	18	2.2	96	293	0.880
956.7	2.2	14	1.4	61	246	0.664	31	2.5	93	281	0.485
957.4	1.8	14	1.4	60	263	0.882	26	2.6	93	300	0.643
958.1	2.5	13	1.4	62	245	1.6	37	2.5	95	280	1.2
958.8	2.2	14	1.8	73	276	0.589	32	3.3	112	315	0.429
959.5	2.1	12	1.2	58	263	0.893	30	2.3	89	301	0.651
960.2	1.8	13	1.3	63	264	1.1	25	2.4	97	302	0.805



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.9	2.2	13	1.6	72	260	1.7	32	2.9	110	297	1.2
961.6	2.4	16	1.8	67	254	1.2	35	3.3	103	290	0.856
962.3	2.1	16	1.4	63	234	1.2	31	2.5	97	267	0.902
963.0	2.3	15	1.6	63	255	0.860	33	2.9	97	292	0.627
963.7	2.1	13	1.7	65	271	1.2	31	3.0	100	309	0.856
964.4	2.0	12	1.4	66	257	1.2	29	2.6	100	294	0.911
965.1	1.7	14	1.4	65	251	1.2	24	2.6	99	287	0.850
965.8	1.4	12	1.4	65	233	1.5	21	2.6	99	267	1.1
966.5	2.6	12	1.5	59	240	1.6	38	2.8	90	275	1.1
967.2	2.2	13	1.8	66	254	0.993	32	3.4	102	291	0.725
967.9	2.0	13	1.3	68	249	1.7	28	2.4	104	285	1.2
968.6	1.9	13	1.3	64	228	1.0	27	2.3	98	260	0.755
969.3	2.3	11	1.5	60	242	1.3	33	2.7	92	277	0.965
970.0	1.6	12	1.5	62	233	1.1	23	2.7	96	267	0.839
970.7	1.9	11	1.4	59	230	0.985	27	2.5	91	263	0.718
971.4	2.2	13	1.7	63	247	1.3	31	3.2	97	282	0.969
972.1	2.6	12	1.3	62	246	1.8	38	2.4	95	281	1.3
972.8	1.0	13	1.1	57	249	0.965	15	2.0	87	285	0.704
973.5	2.3	14	1.4	60	242	1.3	33	2.5	92	277	0.913
974.2	1.9	14	1.4	63	232	1.6	27	2.6	97	265	1.1
974.9	1.7	14	1.1	63	268	1.3	24	2.1	97	306	0.961
975.6	2.7	15	1.2	66	245	0.728	39	2.2	101	281	0.531
976.3	1.9	14	1.1	63	238	1.7	28	2.0	96	272	1.2
977.0	2.0	13	1.2	59	240	1.3	29	2.2	90	275	0.948
977.7	1.8	15	1.3	66	233	1.1	26	2.3	101	267	0.792
978.4	2.0	13	1.2	65	244	1.6	28	2.1	100	280	1.2
979.1	2.0	11	0.875	58	230	1.3	29	1.6	88	263	0.963
979.7	1.8	11	0.974	53	228	1.4	26	1.8	82	261	1.0
980.4	2.5	12	1.2	62	248	0.804	36	2.2	96	284	0.586
981.1	1.7	15	0.756	62	261	1.5	24	1.4	95	298	1.1
981.8	1.9	13	1.0	60	249	1.8	28	1.9	91	285	1.3
982.5	1.6	12	0.875	56	229	0.925	23	1.6	86	262	0.675
983.2	1.4	13	1.2	59	252	1.8	20	2.1	90	288	1.3
983.9	1.4	12	1.1	57	219	1.2	21	2.0	87	250	0.887
984.6	1.1	14	0.828	61	237	1.7	16	1.5	94	271	1.3
985.3	1.5	13	1.3	59	235	1.3	22	2.3	90	268	0.946
986.0	1.5	10	1.1	55	228	1.4	22	2.0	84	260	1.0
986.7	1.8	12	0.817	56	236	1.1	25	1.5	86	270	0.778
987.4	1.6	13	0.893	48	218	1.5	23	1.6	73	250	1.1
988.1	1.3	12	0.929	56	255	2.0	19	1.7	85	291	1.4
988.8	1.8	13	1.2	50	223	0.783	26	2.2	76	255	0.572
989.5	1.6	13	0.814	52	229	1.7	23	1.5	79	262	1.2
990.2	1.3	13	1.1	53	238	1.3	18	2.0	81	273	0.970
990.9	1.5	15	1.3	54	232	2.2	22	2.3	83	266	1.6
991.6	1.6	13	1.1	52	224	1.9	23	2.0	80	256	1.4
992.3	1.7	11	1.2	47	228	1.2	24	2.1	73	260	0.893
993.0	1.6	10	0.978	49	231	1.4	23	1.8	75	264	1.0
993.7	1.4	12	0.961	49	249	1.7	20	1.8	75	284	1.2
994.4	1.4	12	0.937	51	219	1.0	21	1.7	78	251	0.741
995.1	1.2	14	0.932	47	235	1.8	18	1.7	71	268	1.3
995.8	1.1	11	0.570	48	244	1.9	16	1.0	73	280	1.4
996.5	1.3	11	0.833	41	224	1.3	19	1.5	63	256	0.936
997.2	1.3	12	0.996	46	244	1.9	19	1.8	71	279	1.4
997.9	0.730	13	0.907	51	243	1.9	11	1.7	78	278	1.4
998.6	0.980	11	0.781	44	255	2.1	14	1.4	68	292	1.5
999.3	1.1	12	0.741	42	239	1.8	16	1.4	64	273	1.3
1000.0	1.1	11	0.669	43	240	2.1	16	1.2	66	274	1.5
1000.7	1.2	13	0.608	42	274	1.8	17	1.1	64	313	1.3
1001.4	1.1	10	0.514	36	226	1.4	16	0.938	55	259	1.0
1002.1	0.862	13	0.581	40	249	2.9	12	1.1	62	285	2.1
1002.8	0.910	10	0.570	36	242	1.0	13	1.0	55	276	0.741
1003.5	0.705	10	0.523	32	221	1.8	10	0.954	50	252	1.3
1004.2	1.2	12	0.618	36	257	2.4	17	1.1	55	294	1.7
1004.9	0.966	11	0.844	39	241	2.0	14	1.5	59	276	1.5
1005.6	1.1	11	0.820	32	240	2.1	15	1.5	49	275	1.6
1006.2	0.461	11	0.400	30	235	2.1	6.7	0.729	45	268	1.5
1006.9	0.748	12	0.421	33	264	3.5	11	0.767	50	302	2.5
1007.6	0.656	11	0.586	35	253	2.3	9.5	1.1	53	290	1.7
1008.3	0.738	11	0.605	28	270	1.6	11	1.1	43	309	1.2
1009.0	0.951	11	0.664	28	253	2.1	14	1.2	43	290	1.5
1009.7	1.1	9.9	0.327	30	276	2.5	15	0.596	46	315	1.9
1010.4	0.999	9.2	0.570	30	268	3.0	14	1.0	46	306	2.2
1011.1	0.809	11	0.476	29	271	2.0	12	0.868	44	310	1.4
1011.8	0.694	13	0.475	27	282	2.3	10	0.866	41	322	1.7
1012.5	1.3	13	0.505	27	271	2.5	19	0.920	42	310	1.9
1013.2	0.883	12	0.355	26	266	1.9	13	0.648	40	305	1.4
1013.9	0.928	11	0.688	26	259	2.4	13	1.3	40	296	1.8
1014.6	1.4	11	0.487	29	283	2.0	19	0.888	45	323	1.5
1015.3	1.1	9.2	0.350	30	265	2.7	16	0.638	46	303	2.0
1016.0	1.1	11	0.430	23	268	2.8	15	0.784	35	307	2.1
1016.7	1.3	11	0.640	31	309	2.4	19	1.2	48	353	1.7



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1017.4	1.8	11	0.444	28	261	3.3	26	0.810	43	299	2.4
1018.1	1.3	11	0.234	26	274	2.5	18	0.427	40	313	1.8
1018.8	0.742	7.1	0.497	26	276	2.3	11	0.906	39	315	1.7
1019.5	0.866	8.5	0.407	24	285	2.9	13	0.743	37	326	2.1
1020.2	1.1	9.4	0.282	25	271	2.9	16	0.514	38	309	2.1
1020.9	0.667	9.5	0.476	24	287	2.7	9.6	0.869	37	328	2.0
1021.6	1.1	11	0.439	22	273	2.4	15	0.800	34	312	1.7
1022.3	1.0	8.9	0.192	28	289	2.5	15	0.349	43	331	1.8
1023.0	1.6	9.2	0.722	22	302	1.9	23	1.3	33	346	1.4
1023.7	1.0	9.0	0.442	25	271	2.4	15	0.807	38	310	1.7
1024.4	1.8	9.7	0.556	23	257	2.9	26	1.0	35	294	2.1
1025.1	1.1	8.5	0.664	24	252	3.3	15	1.2	37	288	2.4
1025.8	1.8	12	0.415	25	256	2.4	26	0.756	38	293	1.8
1026.5	1.5	9.2	0.466	25	286	2.2	22	0.850	38	327	1.6
1027.2	1.7	13	0.528	28	283	2.6	24	0.962	43	323	1.9
1027.9	1.3	9.6	0.591	24	285	2.1	18	1.1	37	326	1.5
1028.6	1.5	13	0.709	24	320	2.5	21	1.3	37	366	1.8
1029.3	1.2	9.9	0.645	25	296	3.0	17	1.2	38	338	2.2
1030.0	1.5	10	0.713	30	273	3.2	22	1.3	46	312	2.4
1030.7	1.7	10	0.537	25	274	2.5	25	0.980	38	313	1.8
1031.4	1.2	11	0.483	25	265	2.9	17	0.881	38	303	2.1
1032.0	1.5	10	0.495	27	263	2.5	21	0.903	41	300	1.8
1032.7	1.1	9.8	0.588	28	287	2.6	16	1.1	43	329	1.9
1033.4	1.9	11	0.623	28	260	2.6	27	1.1	42	297	1.9
1034.1	1.7	11	0.596	24	249	2.9	24	1.1	37	285	2.1
1034.8	0.866	9.3	0.623	25	250	2.7	12	1.1	38	286	2.0
1035.5	1.3	9.5	0.609	26	257	2.7	19	1.1	40	293	2.0
1036.2	1.4	9.5	0.666	29	249	2.0	20	1.2	44	285	1.4
1036.9	1.7	12	0.788	27	251	2.0	25	1.4	42	287	1.4
1037.6	2.1	13	0.802	33	277	2.2	30	1.5	51	316	1.6
1038.3	0.872	11	0.768	29	260	3.1	13	1.4	44	298	2.3
1039.0	1.1	11	0.692	28	252	2.8	16	1.3	43	288	2.1
1039.7	1.1	12	0.736	30	249	2.6	16	1.3	47	284	1.9
1040.4	2.0	12	0.913	28	249	3.7	28	1.7	43	284	2.7
1041.1	1.6	10	0.837	38	271	2.3	22	1.5	59	310	1.7
1041.8	1.3	8.8	0.663	28	263	2.1	19	1.2	43	301	1.5
1042.5	0.902	12	0.805	30	252	2.9	13	1.5	47	288	2.1
1043.2	1.3	13	0.838	33	237	2.3	19	1.5	51	271	1.7
1043.9	1.7	10	0.908	43	270	1.9	25	1.7	67	309	1.4
1044.6	1.6	12	1.1	35	263	3.0	23	2.0	53	301	2.2
1045.3	1.9	11	1.1	31	279	3.0	28	2.0	48	319	2.2
1046.0	1.6	12	1.0	37	259	2.9	23	1.9	57	296	2.1
1046.7	1.3	10	1.1	37	234	2.5	19	2.1	57	268	1.8
1047.4	1.5	12	1.3	37	243	2.7	21	2.3	56	278	2.0
1048.1	1.5	12	1.2	43	245	3.4	22	2.3	66	280	2.5
1048.8	1.6	10	1.2	37	234	2.2	24	2.2	56	268	1.6
1049.5	2.5	12	1.1	38	217	2.7	36	2.1	58	248	1.9
1050.2	1.5	12	1.3	40	244	2.4	22	2.4	61	279	1.7
1050.9	1.8	13	1.1	42	261	3.3	26	2.0	64	298	2.4
1051.6	1.5	10	1.0	42	259	3.3	22	1.9	64	296	2.4
1052.3	1.2	11	1.2	40	254	2.2	18	2.1	61	291	1.6
1053.0	1.5	12	1.3	39	256	3.0	21	2.4	59	293	2.2
1053.7	2.5	13	1.1	41	233	2.8	36	2.0	62	266	2.1
1054.4	1.9	12	1.4	37	229	2.9	27	2.6	56	262	2.1
1055.1	2.1	11	1.3	44	257	3.4	31	2.4	68	294	2.5
1055.8	2.2	12	1.4	42	239	2.6	32	2.5	64	274	1.9
1056.5	2.5	12	1.1	46	254	3.1	36	2.1	71	291	2.3
1057.2	3.0	13	1.1	46	274	4.3	43	2.0	70	314	3.1
1057.9	2.6	12	1.2	44	271	3.1	37	2.3	67	310	2.2
1058.5	1.5	11	1.4	41	268	2.9	22	2.6	63	307	2.1
1059.2	2.5	13	1.7	48	264	2.7	36	3.2	73	302	2.0
1059.9	2.3	13	1.6	48	266	3.5	34	2.9	73	304	2.6
1060.6	2.8	12	1.5	47	269	3.2	41	2.8	73	307	2.3
1061.3	1.7	12	1.1	39	249	2.8	24	2.1	60	284	2.0
1062.0	2.1	12	1.1	42	242	3.8	31	2.1	65	277	2.8
1062.7	1.8	11	1.3	40	297	3.8	26	2.3	62	340	2.8
1063.4	3.1	15	1.2	48	297	5.2	45	2.2	73	340	3.8
1064.1	2.6	12	1.4	49	273	3.6	37	2.6	76	312	2.6
1064.8	1.9	11	1.2	47	280	3.1	27	2.2	73	320	2.2
1065.5	1.9	13	1.1	43	280	3.1	27	2.1	66	320	2.3
1066.2	2.4	12	1.2	41	292	3.7	34	2.2	63	334	2.7
1066.9	2.1	13	0.837	52	275	4.7	30	1.5	79	314	3.4
1067.6	3.1	16	1.3	44	275	3.5	45	2.5	67	314	2.5
1068.3	2.6	10	0.963	43	263	3.0	37	1.8	65	300	2.2
1069.0	2.2	13	1.2	40	279	4.3	32	2.2	61	319	3.1
1069.7	2.6	12	1.2	42	308	5.0	38	2.2	64	352	3.6
1070.4	2.3	14	1.4	45	314	3.6	34	2.6	68	359	2.6
1071.1	2.3	11	1.2	51	275	4.0	34	2.1	79	315	2.9
1071.8	2.0	11	1.1	47	261	5.0	29	2.1	72	298	3.6
1072.5	2.7	10	1.1	43	264	4.4	39	2.0	65	302	3.2
1073.2	2.2	12	1.1	46	259	4.0	32	1.9	71	296	2.9



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.9	3.1	11	1.0	45	280	6.1	45	1.9	70	320	4.5
1074.6	3.0	11	1.0	46	262	4.5	43	1.9	70	300	3.3
1075.3	2.9	12	1.0	52	282	5.1	42	1.9	80	323	3.7
1076.0	2.3	12	1.4	49	270	3.8	33	2.6	75	309	2.8
1076.7	2.2	12	1.2	48	295	6.0	32	2.2	74	337	4.4
1077.4	2.9	14	1.5	53	247	3.5	42	2.8	81	282	2.5
1078.1	3.1	9.3	0.816	50	252	3.9	45	1.5	76	288	2.9
1078.8	2.7	12	1.5	47	284	5.0	39	2.7	72	324	3.6
1079.5	3.1	14	1.4	53	306	5.3	45	2.5	81	349	3.9
1080.2	2.0	15	1.1	59	280	5.2	29	2.0	91	321	3.8
1080.9	2.9	11	0.859	52	257	4.6	42	1.6	80	294	3.4
1081.6	2.2	13	1.2	53	283	5.7	32	2.2	81	324	4.2
1082.3	2.8	12	0.988	51	283	5.8	41	1.8	78	323	4.2
1083.0	2.7	13	1.3	60	281	4.8	39	2.3	92	322	3.5
1083.7	1.7	12	1.3	57	268	4.4	24	2.4	87	306	3.2
1084.4	2.0	14	1.0	58	260	5.0	29	1.8	89	298	3.6
1085.0	2.2	11	1.2	56	294	6.1	32	2.2	86	337	4.4
1085.7	2.3	11	1.2	53	271	4.5	33	2.1	81	310	3.3
1086.4	2.0	11	1.3	54	244	5.9	29	2.3	82	279	4.3
1087.1	2.2	13	1.1	62	284	6.3	32	2.0	95	325	4.6
1087.8	1.7	14	1.2	59	266	6.6	24	2.2	90	304	4.8
1088.5	2.1	13	1.5	50	275	5.4	31	2.7	76	314	4.0
1089.2	2.0	11	1.4	69	318	5.1	29	2.6	105	364	3.7
1089.9	2.6	16	1.5	60	311	8.5	38	2.7	92	356	6.2
1090.6	2.6	13	1.5	62	283	6.8	37	2.7	95	324	5.0
1091.3	2.2	13	1.0	65	287	8.5	32	1.9	100	328	6.2
1092.0	2.5	13	1.1	62	295	9.3	36	2.0	96	337	6.8
1092.7	2.0	13	1.4	62	289	6.8	29	2.5	95	331	5.0
1093.4	2.6	14	1.1	60	307	8.1	37	2.1	92	351	5.9
1094.1	2.3	14	1.2	67	307	8.8	33	2.2	102	352	6.4
1094.8	2.1	11	1.3	62	307	9.3	30	2.4	96	351	6.8
1095.5	1.7	13	1.2	59	315	8.6	25	2.1	91	360	6.2
1096.2	2.0	14	1.3	65	288	11	29	2.5	99	330	7.8
1096.9	2.3	13	1.2	57	267	9.6	34	2.1	87	305	7.0
1097.6	2.2	14	1.2	64	299	9.3	31	2.2	99	342	6.8
1098.3	2.0	12	1.0	66	277	8.5	28	1.9	101	317	6.2
1099.0	2.6	13	1.4	66	288	10	38	2.6	100	330	7.5
1099.7	2.1	13	1.1	68	270	13	31	2.0	105	309	9.4
1100.4	2.4	13	1.4	72	275	15	35	2.5	110	315	11
1101.1	2.5	15	1.4	76	285	17	36	2.5	116	326	12
1101.8	2.1	13	1.5	68	289	16	31	2.8	104	331	12
1102.5	2.1	14	1.6	70	299	15	30	3.0	107	342	11
1103.2	1.9	14	1.4	68	273	15	28	2.5	104	312	11
1103.9	2.3	13	0.966	71	266	14	33	1.8	109	304	10
1104.6	2.5	14	1.5	73	278	16	37	2.8	113	318	11
1105.3	2.1	11	1.3	65	287	17	31	2.4	99	328	12
1106.0	1.7	14	1.7	74	311	17	25	3.1	113	355	12
1106.7	1.9	15	1.5	68	345	19	27	2.7	104	394	14
1107.4	2.5	14	1.7	78	311	16	37	3.2	119	355	12
1108.1	2.5	11	1.8	68	274	17	36	3.2	104	314	12
1108.8	2.4	13	1.3	71	303	16	35	2.4	108	347	12
1109.5	2.2	16	1.8	88	304	18	32	3.4	135	347	13
1110.2	2.6	13	1.9	71	293	17	37	3.4	109	335	12
1110.8	2.4	12	1.6	69	308	17	34	2.9	106	352	12
1111.5	1.5	14	1.4	76	312	19	22	2.5	117	357	14
1112.2	1.9	11	1.7	66	276	16	28	3.1	102	315	11
1112.9	2.4	16	1.7	75	301	15	35	3.1	115	344	11
1113.6	2.6	14	1.8	82	339	20	38	3.3	126	388	14
1114.3	2.5	14	1.8	80	297	15	36	3.3	122	340	11
1115.0	2.7	14	1.9	76	296	19	39	3.6	116	338	14
1115.7	3.3	14	1.5	71	271	18	48	2.7	109	310	13
1116.4	2.5	12	1.9	80	315	19	36	3.5	122	361	14
1117.1	2.2	13	1.8	92	296	20	32	3.3	141	339	14
1117.8	2.8	13	1.9	79	285	19	41	3.5	120	326	14
1118.5	1.7	13	2.3	86	339	20	25	4.3	132	388	14
1119.2	2.7	14	2.5	84	371	22	39	4.5	129	425	16
1119.9	2.4	13	1.7	73	316	21	35	3.2	111	361	15
1120.6	2.7	16	2.0	81	297	21	39	3.6	123	340	15
1121.3	2.3	13	1.8	80	304	24	33	3.2	123	348	18
1122.0	2.7	13	2.4	83	365	21	39	4.4	127	417	16
1122.7	2.1	15	2.4	75	314	24	30	4.4	115	359	17
1123.4	2.4	13	2.0	74	338	19	35	3.7	113	387	14
1124.1	2.3	13	1.7	76	302	20	33	3.2	116	345	14
1124.8	2.4	12	2.0	69	275	16	35	3.6	105	314	12
1125.5	2.9	11	2.3	75	364	18	42	4.1	115	416	13
1126.2	1.8	11	2.0	78	329	18	26	3.7	119	377	13
1126.9	3.6	12	2.2	79	307	17	52	4.1	121	351	13
1127.6	3.0	13	2.3	80	331	20	43	4.3	123	378	14
1128.3	2.9	13	2.2	72	292	15	42	4.1	110	333	11
1129.0	3.1	13	2.4	82	318	16	44	4.3	126	364	12
1129.7	2.4	11	2.5	78	315	16	34	4.6	119	360	12



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1130.4	2.4	14	2.2	78	320	16	35	3.9	120	366	12
1131.1	2.5	12	2.1	68	304	19	36	3.8	105	347	14
1131.8	2.8	13	2.5	67	352	19	41	4.5	103	402	14
1132.5	1.9	12	2.3	75	296	15	27	4.2	115	338	11
1133.2	3.1	11	2.1	75	318	15	44	3.9	115	363	11
1133.9	4.1	16	2.6	83	358	19	60	4.8	127	409	14
1134.6	2.9	13	2.3	71	314	16	41	4.2	109	359	12
1135.3	3.1	12	2.0	62	305	14	45	3.7	95	349	10
1136.0	3.3	16	2.5	76	318	19	48	4.6	116	364	14
1136.7	3.9	15	1.9	74	286	18	56	3.5	114	327	13
1137.3	2.9	16	2.1	62	276	15	42	3.7	95	316	11
1138.0	2.8	12	2.3	69	345	18	41	4.3	106	395	13
1138.7	3.4	14	2.0	67	291	17	49	3.6	102	333	12
1139.4	2.6	13	2.0	70	310	18	37	3.6	107	355	13
1140.1	3.1	15	2.0	73	288	16	45	3.7	112	330	12
1140.8	2.5	12	1.8	77	289	18	36	3.2	118	331	13
1141.5	2.7	12	2.0	63	318	18	39	3.7	97	364	13
1142.2	2.0	11	1.7	66	298	19	30	3.1	102	341	14
1142.9	2.8	12	1.9	65	311	20	40	3.4	100	356	14
1143.6	3.1	12	2.2	72	297	16	44	4.0	111	339	12
1144.3	1.6	12	1.8	66	256	19	22	3.3	101	293	14
1145.0	2.4	11	1.8	59	269	16	35	3.3	91	307	11
1145.7	2.6	12	1.8	68	320	18	37	3.3	104	366	13
1146.4	2.7	13	2.3	71	288	18	39	4.2	109	330	13
1147.1	2.7	12	2.2	68	311	20	39	4.0	105	356	15
1147.8	1.6	12	2.2	62	285	20	23	3.9	95	326	15
1148.5	2.9	14	2.0	68	300	19	41	3.6	105	344	14
1149.2	2.1	11	2.0	74	289	18	30	3.7	114	331	13
1149.9	2.8	14	2.3	69	268	20	41	4.1	105	307	14
1150.6	2.3	11	2.0	69	289	20	33	3.7	105	330	14
1151.3	2.4	11	2.0	58	260	21	35	3.7	89	297	15
1152.0	2.1	11	2.1	61	298	22	31	3.8	93	341	16
1152.7	1.9	11	2.0	65	313	25	28	3.7	99	357	18
1153.4	2.3	10	1.9	60	270	23	33	3.5	92	308	17
1154.1	1.9	10	1.8	63	293	24	27	3.4	96	335	18
1154.8	2.1	12	1.8	66	278	24	31	3.3	102	318	17
1155.5	1.7	9.4	1.8	65	284	25	25	3.2	99	324	18
1156.2	2.4	13	2.2	67	293	32	35	4.0	103	336	23
1156.9	2.1	11	1.8	66	265	24	30	3.3	101	303	18
1157.6	2.3	12	2.1	64	304	28	34	3.7	99	347	21
1158.3	1.6	8.9	1.6	51	257	24	23	2.9	78	294	17
1159.0	2.4	11	1.7	58	288	27	35	3.2	88	329	19
1159.7	2.5	12	1.4	64	297	28	36	2.5	98	339	21
1160.4	1.8	8.6	1.7	55	259	24	26	3.1	85	296	18
1161.1	1.9	11	1.6	52	259	25	28	3.0	80	296	18
1161.8	1.8	12	1.7	59	279	24	26	3.1	91	319	18
1162.5	1.8	10	1.6	62	291	24	26	3.0	95	333	17
1163.2	1.4	8.6	1.3	52	256	21	20	2.4	80	292	16
1163.9	1.4	13	1.9	61	300	27	20	3.4	94	343	20
1164.5	1.6	12	1.6	50	250	20	23	3.0	77	286	14
1165.2	1.9	10	1.5	64	267	20	27	2.7	98	305	14
1165.9	2.4	11	1.9	60	328	24	35	3.4	92	375	17
1166.6	2.1	9.0	1.4	51	264	23	31	2.6	78	302	17
1167.3	1.1	11	0.963	58	257	21	16	1.8	89	294	15
1168.0	1.8	12	1.5	55	273	21	26	2.7	84	312	16
1168.7	1.9	11	1.5	55	302	18	28	2.7	85	345	13
1169.4	2.1	11	1.2	58	262	18	30	2.1	90	299	13
1170.1	1.6	11	1.0	53	299	17	23	1.9	81	341	12
1170.8	1.6	12	1.8	54	320	19	23	3.3	83	366	14
1171.5	1.8	11	1.1	53	285	17	26	2.1	81	326	12
1172.2	1.5	11	1.4	49	281	15	22	2.6	75	321	11
1172.9	1.1	11	1.6	50	267	15	16	2.9	77	306	11
1173.6	2.3	12	1.1	55	282	13	33	2.1	85	322	9.6
1174.3	1.5	11	1.3	61	312	14	21	2.4	94	357	9.9
1175.0	1.8	14	1.1	51	296	12	26	2.0	78	338	9.1
1175.7	2.0	12	1.1	53	289	11	29	2.0	81	331	7.7
1176.4	1.7	13	1.2	52	294	13	25	2.1	80	337	9.8
1177.1	1.6	12	0.898	51	290	11	23	1.6	78	332	8.4
1177.8	1.7	13	1.2	49	273	9.9	24	2.1	76	312	7.2
1178.5	1.4	11	0.872	49	282	12	20	1.6	75	323	8.4
1179.2	1.4	14	0.840	61	264	9.0	20	1.5	93	302	6.5
1179.9	2.1	13	0.987	53	270	8.9	30	1.8	81	309	6.5
1180.6	1.2	12	0.940	49	296	7.0	18	1.7	74	338	5.1
1181.3	1.0	11	0.855	43	254	4.6	15	1.6	67	290	3.3
1182.0	2.5	11	0.994	47	315	5.7	36	1.8	72	360	4.2
1182.7	2.1	12	0.636	47	263	6.1	31	1.2	72	300	4.5
1183.4	1.4	12	0.827	48	274	5.9	20	1.5	73	313	4.3
1184.1	1.8	11	0.799	41	287	6.0	27	1.5	63	328	4.4
1184.8	1.6	10	0.736	44	291	5.1	23	1.3	67	333	3.8
1185.5	1.9	11	0.762	43	282	5.0	28	1.4	66	322	3.7
1186.2	1.9	13	0.892	46	300	5.0	28	1.6	70	344	3.6



Minnow Environmental  
Sample ID: 005

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
1186.9	2.1	12	0.832	44	308	7.0	30	1.5	68	352	5.1
1187.6	1.6	13	0.861	41	307	4.2	24	1.6	63	350	3.0
1188.3	2.2	12	0.636	40	274	3.5	32	1.2	62	313	2.6
1189.0	1.9	15	0.796	46	313	4.5	28	1.5	70	358	3.3
1189.7	2.2	14	0.591	40	266	3.9	32	1.1	62	304	2.9
1190.4	1.5	14	0.676	38	301	3.7	22	1.2	59	344	2.7
1191.1	1.9	15	0.697	44	292	3.1	27	1.3	67	334	2.2
1191.7	1.9	15	0.665	39	311	2.7	28	1.2	61	356	2.0
1192.4	1.6	14	0.738	42	267	2.2	23	1.3	64	305	1.6
1193.1	2.2	13	0.694	39	330	2.6	32	1.3	60	378	1.9
1193.8	2.3	13	0.814	37	279	2.2	34	1.5	57	319	1.6
1194.5	1.5	16	0.695	38	289	2.9	21	1.3	58	330	2.1
1195.2	1.6	15	0.966	42	302	2.5	23	1.8	65	345	1.8
1195.9	2.2	14	0.646	41	303	3.5	31	1.2	63	347	2.5
1196.6	2.5	13	0.275	35	277	2.6	36	0.501	54	317	1.9
1197.3	2.5	11	0.938	42	313	2.1	36	1.7	65	358	1.5
1198.0	1.9	18	0.490	38	302	2.5	27	0.894	58	346	1.8
1198.7	1.5	11	0.669	40	306	2.3	22	1.2	61	350	1.7
1199.4	2.6	13	0.793	35	272	3.8	37	1.4	54	311	2.8
1200.1	1.6	13	0.527	41	277	3.3	23	0.961	63	317	2.4
1200.8	1.4	13	0.614	46	326	3.2	20	1.1	70	373	2.4
1201.5	2.0	13	0.486	34	276	1.6	29	0.886	52	315	1.2
1202.2	2.1	11	0.818	36	283	2.9	30	1.5	55	324	2.1
1202.9	2.0	13	0.512	41	312	1.9	29	0.933	63	357	1.4
1203.6	2.0	15	0.809	39	269	3.0	29	1.5	59	307	2.2
1204.3	1.3	13	0.649	37	305	2.2	19	1.2	56	349	1.6
1205.0	1.5	12	0.672	32	283	2.7	22	1.2	48	323	2.0
1205.7	2.3	12	0.903	35	315	2.6	34	1.6	54	360	1.9
1206.4	2.4	12	0.840	40	300	2.2	34	1.5	62	343	1.6
1207.1	1.8	13	0.516	36	277	1.8	25	0.940	55	317	1.3
1207.8	1.4	12	0.461	33	298	2.7	20	0.841	50	341	2.0
1208.5	1.3	12	0.736	38	318	3.5	19	1.3	59	364	2.5
1209.2	1.8	13	0.628	37	300	2.7	26	1.1	56	343	2.0
1209.9	1.8	21	0.738	32	275	2.3	27	1.3	49	315	1.6
1210.6	1.7	12	0.578	33	299	2.2	24	1.1	51	341	1.6
1211.3	2.3	11	0.852	35	315	2.6	34	1.6	54	361	1.9
1212.0	1.9	11	0.627	37	299	1.5	27	1.1	57	342	1.1
1212.7	1.8	13	0.741	37	297	3.0	27	1.4	57	340	2.2
1213.4	1.7	12	0.644	35	291	2.8	25	1.2	53	333	2.0
1214.1	1.7	11	0.502	36	292	1.8	24	0.916	55	334	1.3
1214.8	2.7	10	0.726	32	305	2.7	39	1.3	50	348	2.0
1215.5	2.5	9.7	0.762	33	311	2.6	36	1.4	50	356	1.9
1216.2	1.4	12	0.585	38	309	3.9	20	1.1	57	354	2.8
1216.9	1.8	14	0.897	33	303	1.8	27	1.6	50	346	1.3
1217.6	2.0	14	0.736	30	293	3.0	29	1.3	47	335	2.2
1218.3	1.9	12	0.646	37	310	2.1	28	1.2	57	355	1.5
1218.9	2.4	12	0.700	37	284	2.4	35	1.3	57	324	1.7
1219.6	2.3	17	0.783	34	334	3.6	32	1.4	53	382	2.6
1220.3	1.9	13	0.543	33	287	2.4	28	0.991	51	328	1.7
1221.0	2.2	12	0.794	35	298	2.8	32	1.4	54	341	2.1
1221.7	1.0	13	0.589	34	296	2.4	15	1.1	52	339	1.8
1222.4	1.2	11	0.587	39	307	2.7	18	1.1	60	351	1.9
1223.1	2.6	14	0.617	39	323	3.2	37	1.1	59	369	2.3
1223.8	2.5	11	0.628	39	300	2.8	36	1.1	59	343	2.0
1224.5	2.0	11	0.472	33	296	3.1	29	0.860	51	339	2.2
1225.2	2.1	12	0.881	34	332	2.3	31	1.6	52	379	1.7
1225.9	1.9	11	0.567	32	292	2.4	27	1.0	49	334	1.8
1226.6	2.2	12	0.757	32	298	2.8	32	1.4	50	341	2.0
1227.3	1.6	14	0.601	28	298	2.2	23	1.1	43	341	1.6
1228.0	2.0	12	0.733	35	325	2.4	29	1.3	53	372	1.7
1228.7	1.9	11	0.897	30	277	2.5	27	1.6	46	316	1.8
1229.4	2.1	16	0.713	34	301	2.3	30	1.3	53	344	1.7
1230.1	1.7	13	0.772	36	330	3.2	25	1.4	54	378	2.3
1230.8	1.9	12	0.695	34	295	2.7	28	1.3	53	337	2.0
1231.5	2.2	15	0.801	36	309	3.2	32	1.5	56	354	2.3
1232.2	2.7	16	0.877	39	325	3.4	39	1.6	59	372	2.5
1232.9	2.9	13	0.602	31	282	2.4	42	1.1	47	322	1.7
1233.6	2.3	15	0.516	33	350	2.6	34	0.942	50	400	1.9
1234.3	2.5	14	0.636	36	355	2.4	37	1.2	55	406	1.7
1235.0	2.0	14	0.623	32	322	2.8	29	1.1	49	368	2.1
1235.7	2.3	15	0.753	35	329	2.9	33	1.4	54	376	2.1
1236.4	1.6	14	0.471	37	306	3.1	24	0.859	57	350	2.3
1237.1	2.1	13	0.668	25	280	2.2	30	1.2	38	321	1.6
1237.8	2.2	16	0.695	33	329	3.1	32	1.3	50	376	2.2
1238.5	2.2	13	0.657	33	283	3.0	32	1.2	51	323	2.2
1239.2	1.6	12	0.461	30	310	2.2	23	0.841	46	355	1.6
1239.9	2.8	14	0.738	30	276	2.4	40	1.3	46	316	1.7
1240.6	2.0	13	0.751	35	300	2.9	29	1.4	54	343	2.1
1241.3	2.6	12	1.0	35	318	2.4	38	1.8	54	364	1.8
1242.0	2.8	14	0.602	27	303	2.6	41	1.1	42	346	1.9
1242.7	1.9	15	0.769	35	288	1.8	27	1.4	53	329	1.3



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1243.4	2.3	17	0.875	30	299	2.7	33	1.6	47	342	1.9
1244.1	2.2	13	0.625	28	302	2.2	32	1.1	43	346	1.6
1244.7	2.5	14	0.650	34	328	2.0	37	1.2	52	375	1.5
1245.4	2.4	11	0.620	31	279	2.1	34	1.1	48	319	1.5
1246.1	1.9	13	0.796	30	284	2.3	28	1.5	46	325	1.6
1246.8	2.9	14	0.723	33	338	2.5	42	1.3	50	386	1.8
1247.5	2.7	16	0.731	31	332	2.6	39	1.3	48	380	1.9
1248.2	2.3	15	0.900	33	312	2.1	33	1.6	50	357	1.5
1248.9	2.4	16	0.849	27	293	2.4	35	1.5	41	335	1.7
1249.6	2.8	14	0.712	38	321	3.2	40	1.3	58	367	2.4
1250.3	2.1	14	0.777	27	277	2.2	30	1.4	42	317	1.6
1251.0	2.5	16	0.855	33	332	3.0	35	1.6	51	380	2.2
1251.7	2.3	15	0.752	30	363	2.2	33	1.4	47	415	1.6
1252.4	2.6	13	0.875	28	311	2.4	37	1.6	43	356	1.8
1253.1	2.2	11	0.600	24	274	2.1	32	1.1	37	314	1.6
1253.8	3.1	13	0.824	25	338	3.2	45	1.5	38	387	2.3
1254.5	2.2	12	0.600	25	275	2.3	32	1.1	39	314	1.7
1255.2	1.7	10	0.779	30	337	3.4	25	1.4	46	385	2.5
1255.9	2.6	12	0.759	26	297	2.2	37	1.4	39	340	1.6
1256.6	3.2	12	0.821	28	280	2.3	47	1.5	42	320	1.6
1257.3	2.8	11	0.827	29	346	2.2	40	1.5	45	395	1.6
1258.0	2.7	14	0.768	25	330	2.8	38	1.4	39	378	2.0
1258.7	2.8	12	0.986	28	321	2.7	41	1.8	43	367	2.0
1259.4	2.8	13	0.876	29	278	1.8	41	1.6	44	368	1.3
1260.1	2.6	14	0.781	28	332	3.2	37	1.4	43	380	2.3
1260.8	2.9	14	0.986	26	341	2.9	41	1.8	40	390	2.1
1261.5	1.8	13	0.855	23	299	2.7	27	1.6	35	342	2.0
1262.2	2.3	15	0.690	28	358	2.9	33	1.3	43	409	2.1
1262.9	2.1	14	0.830	27	334	3.1	31	1.5	42	381	2.2
1263.6	2.3	14	0.697	29	356	3.3	34	1.3	44	407	2.4
1264.3	1.8	14	0.803	25	321	2.5	26	1.5	38	367	1.8
1265.0	2.1	15	0.977	26	324	3.0	30	1.8	40	370	2.2
1265.7	2.3	13	0.629	25	309	2.6	33	1.1	38	354	1.9
1266.4	1.6	13	0.880	27	319	2.4	23	1.6	41	365	1.7
1267.1	2.2	12	0.809	28	313	2.5	31	1.5	44	358	1.8
1267.8	1.6	11	0.858	26	326	3.4	23	1.6	39	373	2.5
1268.5	2.0	14	0.745	21	312	2.4	29	1.4	33	357	1.7
1269.2	2.0	12	0.837	26	346	2.4	29	1.5	40	396	1.7
1269.9	2.9	13	0.898	24	359	3.6	42	1.6	37	410	2.6
1270.6	2.2	14	1.0	19	317	2.6	32	1.8	30	363	1.9
1271.2	2.9	16	0.761	31	346	2.7	42	1.4	47	396	1.9
1271.9	2.2	14	0.823	24	341	2.4	32	1.5	37	390	1.7
1272.6	2.1	12	0.900	19	330	2.5	30	1.6	29	377	1.9
1273.3	2.1	17	0.888	29	346	2.7	30	1.6	44	396	2.0
1274.0	2.8	18	1.2	23	341	2.8	40	2.2	35	390	2.1
1274.7	2.5	15	0.889	22	336	2.9	37	1.6	34	384	2.1
1275.4	2.3	15	0.982	20	334	2.6	34	1.8	30	381	1.9
1276.1	2.8	14	0.844	28	357	2.3	41	1.5	43	408	1.7
1276.8	2.6	14	1.1	25	330	2.7	38	1.9	38	377	1.9
1277.5	3.3	16	0.835	21	321	3.2	48	1.5	31	367	2.3
1278.2	1.9	16	1.2	25	338	3.0	27	2.2	38	387	2.2
1278.9	2.0	15	1.1	24	337	2.8	28	1.9	37	386	2.1
1279.6	2.5	16	0.955	25	301	2.2	36	1.7	38	345	1.6
1280.3	2.4	13	0.849	21	284	2.4	35	1.5	33	325	1.8
1281.0	2.4	16	1.1	23	308	3.1	34	1.9	36	353	2.2
1281.7	2.8	13	0.978	28	341	4.1	40	1.8	43	390	3.0
1282.4	2.1	15	0.748	22	291	3.5	31	1.4	34	333	2.5
1283.1	2.1	13	0.658	26	290	2.6	30	1.2	40	332	1.9
1283.8	2.3	13	1.1	22	306	2.0	33	1.9	34	350	1.4
1284.5	2.4	15	0.799	24	325	1.9	35	1.5	37	371	1.4
1285.2	2.3	13	1.2	27	344	3.3	33	2.2	42	394	2.4
1285.9	2.6	13	0.878	24	320	2.6	37	1.6	37	366	1.9
1286.6	3.6	12	1.2	26	295	2.2	51	2.1	39	338	1.6
1287.3	2.2	14	0.901	26	309	2.5	32	1.6	40	354	1.9
1288.0	1.5	14	0.960	21	306	2.9	22	1.8	32	350	2.1
1288.7	2.3	15	1.3	28	349	3.2	34	2.4	43	399	2.3
1289.4	2.0	13	0.944	27	287	2.2	29	1.7	42	328	1.6
1290.1	2.1	14	0.760	24	288	1.8	30	1.4	37	330	1.3
1290.8	2.7	12	0.849	29	318	2.6	39	1.5	44	363	1.9
1291.5	2.5	15	0.832	25	348	3.2	36	1.5	39	398	2.3
1292.2	2.7	14	0.842	25	321	3.2	38	1.5	39	367	2.4
1292.9	2.4	16	1.1	28	322	2.3	35	2.0	42	368	1.7
1293.6	2.5	12	0.887	24	295	1.6	36	1.6	36	337	1.1
1294.3	2.7	12	1.3	24	345	2.8	38	2.3	36	395	2.0
1295.0	2.0	14	0.849	24	339	2.6	29	1.5	37	388	1.9
1295.7	2.4	16	1.2	28	302	3.2	35	2.2	42	345	2.3
1296.4	2.4	14	1.1	27	269	2.9	34	2.0	41	308	2.1
1297.1	2.1	15	0.903	26	328	2.8	30	1.6	39	375	2.0
1297.8	2.9	14	1.1	23	318	2.2	42	2.0	36	364	1.6
1298.4	2.6	15	1.3	22	332	3.4	38	2.4	34	379	2.5
1299.1	2.5	16	1.1	25	342	3.1	36	1.9	39	391	2.2



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1299.8	2.1	14	1.3	24	315	2.0	31	2.4	36	360	1.4
1300.5	2.7	15	1.1	19	306	2.2	39	2.1	29	350	1.6
1301.2	2.5	16	1.1	21	354	1.9	36	2.1	32	405	1.4
1301.9	2.5	18	1.4	21	305	3.1	37	2.6	32	349	2.2
1302.6	1.7	17	1.2	25	335	3.6	25	2.3	38	383	2.6
1303.3	2.3	16	1.0	24	317	2.8	34	1.9	37	362	2.0
1304.0	1.6	16	0.863	24	307	3.4	23	1.6	36	351	2.5
1304.7	2.6	15	1.4	25	357	2.8	38	2.5	39	408	2.1
1305.4	2.3	15	1.4	27	305	3.6	34	2.6	41	349	2.7
1306.1	2.8	18	0.911	23	297	2.7	40	1.7	35	340	1.9
1306.8	1.8	12	1.2	26	318	3.0	25	2.2	40	363	2.2
1307.5	2.0	14	0.863	22	280	3.6	29	1.6	34	320	2.6
1308.2	3.0	17	1.2	27	372	3.9	43	2.1	41	425	2.8
1308.9	2.1	14	1.2	24	289	3.4	30	2.2	36	330	2.5
1309.6	2.1	14	1.2	23	277	3.3	30	2.1	34	317	2.4
1310.3	2.1	13	1.1	23	274	3.3	30	2.0	35	313	2.4
1311.0	2.8	16	1.1	25	354	4.4	40	2.1	39	404	3.2
1311.7	3.0	16	1.2	23	314	3.8	43	2.2	35	359	2.8
1312.4	2.0	14	1.3	28	325	3.8	29	2.4	43	372	2.7
1313.1	1.6	16	1.4	28	323	6.1	24	2.6	42	369	4.4
1313.8	2.4	16	1.3	29	316	4.0	35	2.3	44	361	2.9
1314.5	2.8	15	1.1	24	325	3.5	41	2.0	37	372	2.6
1315.2	2.2	16	1.3	24	308	2.9	32	2.4	37	352	2.1
1315.9	2.6	15	1.3	29	339	3.2	37	2.3	44	387	2.4
1316.6	2.3	14	1.1	25	273	4.2	33	1.9	38	312	3.1
1317.3	2.5	14	1.6	28	358	6.2	36	2.9	42	410	4.5
1318.0	2.6	14	1.4	26	347	4.8	38	2.6	39	397	3.5
1318.7	1.8	13	1.0	26	311	3.9	26	1.8	41	355	2.8
1319.4	2.4	11	1.3	23	275	3.6	35	2.3	35	314	2.6
1320.1	2.9	15	1.2	31	316	4.7	42	2.1	48	361	3.5
1320.8	2.5	13	1.3	33	331	4.6	36	2.3	50	378	3.4
1321.5	2.8	14	1.5	27	308	4.6	40	2.8	42	352	3.4
1322.2	2.4	12	0.780	30	284	5.4	34	1.4	45	324	3.9
1322.9	1.7	13	1.4	26	292	3.9	24	2.5	39	333	2.8
1323.6	2.0	17	1.4	28	324	5.7	29	2.6	44	370	4.2
1324.3	2.6	14	1.4	30	288	5.6	37	2.5	46	330	4.1
1324.9	2.0	15	1.3	29	341	5.4	29	2.4	45	390	4.0
1325.6	2.7	15	1.1	29	280	4.6	39	2.0	45	321	3.4
1326.3	2.6	13	1.5	25	292	5.9	38	2.8	39	334	4.3
1327.0	2.7	15	1.7	30	289	6.3	39	3.1	46	331	4.6
1327.7	2.0	16	1.4	26	305	5.5	29	2.6	40	349	4.0
1328.4	2.3	14	1.4	32	283	7.2	33	2.5	48	324	5.3
1329.1	1.9	15	1.4	30	352	7.6	28	2.6	47	403	5.6
1329.8	1.9	15	1.4	31	297	6.1	28	2.6	48	339	4.5
1330.5	2.5	13	1.2	28	304	6.1	36	2.3	43	348	4.4
1331.2	3.4	17	1.2	33	322	6.1	49	2.1	51	368	4.4
1331.9	1.8	15	1.8	31	321	6.7	26	3.2	48	367	4.9
1332.6	2.2	13	1.2	29	278	5.2	32	2.2	45	318	3.8
1333.3	2.0	15	1.4	32	307	4.8	29	2.6	49	351	3.5
1334.0	2.2	16	1.7	32	348	6.6	32	3.1	49	397	4.8
1334.7	2.5	14	1.4	33	287	7.1	36	2.5	51	328	5.2
1335.4	2.2	14	1.2	32	303	4.5	32	2.2	49	346	3.3
1336.1	2.3	15	1.1	29	284	5.9	33	1.9	44	325	4.3
1336.8	2.5	14	1.4	35	327	5.7	36	2.6	54	373	4.1
1337.5	2.5	16	1.8	31	364	4.4	35	3.3	48	416	3.2
1338.2	2.2	16	1.2	35	310	4.4	32	2.2	54	355	3.2
1338.9	2.1	16	1.3	33	291	3.8	31	2.3	51	333	2.8
1339.6	2.2	14	1.2	28	262	3.9	32	2.1	43	299	2.8
1340.3	3.2	15	1.2	29	313	4.1	46	2.3	45	358	3.0
1341.0	2.9	16	1.4	31	321	4.6	42	2.6	47	367	3.3
1341.7	3.0	15	1.2	31	297	3.5	44	2.3	48	340	2.5
1342.4	2.2	15	1.2	29	290	2.6	31	2.2	45	331	1.9
1343.1	2.5	17	1.1	28	285	3.1	36	2.1	43	326	2.3
1343.8	1.8	15	1.3	26	291	3.6	26	2.5	40	332	2.6
1344.5	2.5	15	1.0	29	303	3.8	36	1.9	44	347	2.7
1345.2	3.1	14	1.2	36	284	4.0	45	2.1	56	325	2.9
1345.9	2.5	13	0.840	32	302	3.5	37	1.5	50	345	2.5
1346.6	1.4	15	1.2	33	297	3.6	21	2.3	50	340	2.6
1347.3	2.5	13	1.1	34	297	3.8	36	2.1	52	340	2.8
1348.0	2.2	17	1.2	30	296	2.4	32	2.1	46	339	1.7
1348.7	2.1	13	1.2	32	294	2.3	30	2.1	49	336	1.7
1349.4	1.4	15	0.851	33	298	2.4	20	1.6	50	341	1.8
1350.1	1.6	12	1.2	34	294	2.2	24	2.2	53	336	1.6
1350.8	1.9	13	0.803	32	340	3.0	27	1.5	49	389	2.2
1351.5	2.2	14	1.2	31	303	2.6	32	2.1	47	347	1.9
1352.1	2.6	13	1.2	35	281	2.4	38	2.2	54	321	1.7
1352.8	2.4	15	0.969	34	351	1.8	34	1.8	51	401	1.3
1353.5	2.6	13	1.1	28	298	2.3	38	2.0	43	341	1.6
1354.2	2.3	19	1.2	28	306	2.7	33	2.3	43	350	1.9
1354.9	2.1	15	1.0	39	362	2.7	30	1.9	59	414	2.0
1355.6	2.5	14	1.1	28	294	2.3	35	2.0	43	336	1.7



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1356.3	1.3	13	0.929	36	308	2.1	19	1.7	55	352	1.6
1357.0	2.3	13	0.898	32	309	2.3	33	1.6	50	354	1.7
1357.7	2.4	12	0.867	39	302	2.0	35	1.6	61	345	1.5
1358.4	2.1	13	0.958	34	299	1.9	31	1.7	52	342	1.4
1359.1	2.3	13	0.791	33	277	1.9	33	1.4	50	317	1.4
1359.8	2.1	12	0.560	34	273	1.5	30	1.0	52	312	1.1
1360.5	2.4	11	0.911	34	300	2.2	35	1.7	52	343	1.6
1361.2	2.2	13	0.859	30	288	1.9	31	1.6	46	329	1.4
1361.9	2.2	13	1.0	31	319	1.4	32	1.9	48	365	0.999
1362.6	2.2	12	1.1	31	286	3.4	31	2.0	47	327	2.5
1363.3	2.5	11	0.646	30	312	2.5	36	1.2	46	357	1.8
1364.0	1.5	12	1.1	31	319	3.1	22	2.0	48	365	2.3
1364.7	2.5	13	1.0	30	309	2.2	36	1.8	45	353	1.6
1365.4	1.1	13	1.3	36	290	2.7	15	2.4	56	331	2.0
1366.1	2.3	15	0.927	28	268	1.6	33	1.7	43	307	1.2
1366.8	2.3	12	1.2	33	311	2.2	33	2.2	51	356	1.6
1367.5	2.7	12	0.934	33	291	2.5	39	1.7	50	333	1.8
1368.2	2.3	13	1.2	34	271	2.1	33	2.1	51	310	1.5
1368.9	2.0	13	0.863	34	284	3.0	29	1.6	52	325	2.2
1369.6	2.0	12	0.972	33	307	3.0	28	1.8	50	351	2.2
1370.3	1.5	11	0.737	22	273	2.4	21	1.3	34	312	1.7
1371.0	2.4	15	1.3	35	301	3.1	34	2.4	53	344	2.3
1371.7	1.8	12	0.821	28	282	2.7	26	1.5	43	323	2.0
1372.4	1.7	11	1.2	31	299	2.6	25	2.3	47	342	1.9
1373.1	2.0	9.6	0.843	28	283	2.1	28	1.5	42	324	1.5
1373.8	1.9	15	1.3	31	291	2.6	28	2.3	48	332	1.9
1374.5	1.5	12	0.967	32	290	2.6	22	1.8	50	332	1.9
1375.2	2.1	14	1.1	33	320	2.1	30	2.0	51	366	1.6
1375.9	1.8	12	1.0	29	286	3.2	26	1.9	45	327	2.3
1376.6	2.0	11	0.905	30	282	1.9	28	1.7	46	323	1.4
1377.3	2.6	14	1.2	33	291	1.9	38	2.1	50	333	1.4
1377.9	1.2	12	0.873	30	284	3.0	17	1.6	46	325	2.2
1378.6	2.2	12	1.0	28	299	2.4	32	1.9	43	341	1.7
1379.3	2.1	11	0.849	32	280	2.3	30	1.5	49	321	1.7
1380.0	1.5	12	1.1	32	294	2.1	22	2.0	49	336	1.5
1380.7	2.0	9.2	1.2	31	315	2.4	29	2.2	48	360	1.8
1381.4	1.7	12	0.803	31	287	3.5	25	1.5	48	329	2.5
1382.1	1.7	11	0.847	27	258	2.9	24	1.5	42	296	2.1
1382.8	2.1	12	1.2	34	329	2.4	30	2.2	53	376	1.8
1383.5	2.4	11	0.611	32	287	2.8	35	1.1	49	328	2.0
1384.2	2.1	12	0.963	34	293	2.5	30	1.8	52	335	1.8
1384.9	2.7	10	1.3	35	278	3.9	38	2.4	53	318	2.8
1385.6	2.2	9.0	1.1	33	298	3.1	32	1.9	51	341	2.3
1386.3	2.4	12	1.0	36	284	3.4	34	1.8	54	325	2.5
1387.0	2.0	14	0.935	36	317	5.3	30	1.7	55	362	3.8
1387.7	2.5	13	1.3	34	310	3.9	36	2.4	52	355	2.8
1388.4	2.6	12	0.948	36	293	3.4	37	1.7	54	334	2.5
1389.1	1.6	12	1.1	30	290	4.9	22	2.0	46	332	3.6
1389.8	1.9	12	1.1	36	265	4.9	28	2.0	55	303	3.6
1390.5	2.1	11	1.1	32	280	6.4	31	2.0	49	321	4.7
1391.2	2.2	11	1.3	33	306	4.2	31	2.4	50	350	3.1
1391.9	2.2	13	0.808	34	281	3.7	32	1.5	52	321	2.7
1392.6	1.9	11	1.5	32	267	5.7	27	2.7	50	305	4.2
1393.3	2.5	11	1.2	29	269	5.3	36	2.1	45	308	3.8
1394.0	2.4	10	1.3	39	290	6.3	35	2.5	60	332	4.6
1394.7	2.2	13	1.4	36	303	7.0	31	2.6	56	346	5.1
1395.4	2.2	12	1.3	31	275	6.6	31	2.3	47	315	4.8
1396.1	1.9	11	1.1	37	300	7.0	27	2.0	57	343	5.1
1396.8	2.0	11	1.3	34	275	5.4	29	2.4	52	314	4.0
1397.5	2.1	13	1.4	34	285	5.6	30	2.5	52	326	4.1
1398.2	1.7	14	1.5	35	286	5.7	25	2.7	54	327	4.2
1398.9	2.2	11	1.5	35	283	8.0	31	2.7	53	324	5.8
1399.6	2.3	12	1.5	36	305	8.5	33	2.7	56	348	6.2
1400.3	1.9	11	1.4	35	281	5.2	27	2.5	54	321	3.8
1401.0	2.3	11	1.3	29	285	7.2	33	2.3	45	326	5.3
1401.7	2.0	11	1.3	34	278	7.5	28	2.4	51	317	5.5
1402.4	1.8	12	1.7	34	305	7.5	26	3.2	52	349	5.5
1403.1	1.9	13	1.1	35	271	8.1	27	2.1	53	310	5.9
1403.8	2.3	9.8	1.4	34	287	8.6	33	2.5	52	329	6.2
1404.5	2.2	12	1.5	34	250	9.1	31	2.7	52	285	6.6
1405.1	2.6	11	1.3	33	260	8.2	37	2.3	51	297	6.0
1405.8	2.1	13	1.7	37	273	9.4	31	3.1	57	312	6.9
1406.5	2.0	11	1.5	30	266	9.8	29	2.6	46	304	7.1
1407.2	1.7	11	1.9	34	277	10	24	3.5	52	317	7.4
1407.9	1.5	12	1.5	38	280	12	22	2.7	59	321	8.9
1408.6	2.4	12	1.5	29	251	14	34	2.8	45	287	10
1409.3	1.7	12	1.7	37	255	15	25	3.0	56	292	11
1410.0	2.1	11	1.3	34	288	16	31	2.4	52	329	11
1410.7	2.5	11	1.6	35	298	16	36	2.8	54	340	12
1411.4	2.0	11	1.8	38	274	18	29	3.2	58	313	13
1412.1	2.1	11	1.4	35	249	17	30	2.6	53	285	12



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1412.8	1.7	11	1.3	35	253	18	25	2.4	54	289	13
1413.5	2.3	12	1.7	35	287	20	33	3.0	53	328	14
1414.2	1.5	13	2.5	40	273	18	21	4.5	61	313	13
1414.9	2.2	11	2.2	35	261	19	32	4.0	53	299	14
1415.6	2.0	13	1.8	35	265	20	28	3.4	54	304	14
1416.3	1.8	11	1.5	33	262	17	27	2.7	50	300	13
1417.0	2.2	11	1.6	32	276	18	32	2.9	49	316	13
1417.7	1.9	12	2.0	41	266	18	27	3.7	63	304	13
1418.4	2.4	10	1.7	37	272	20	34	3.1	57	312	14
1419.1	1.8	12	1.9	32	262	19	26	3.4	49	299	14
1419.8	2.5	9.6	2.0	37	266	17	37	3.7	56	304	13
1420.5	2.0	11	1.9	30	260	19	29	3.5	45	297	14
1421.2	2.7	12	2.0	38	276	20	39	3.7	58	316	14
1421.9	3.0	11	2.0	33	253	18	43	3.6	51	289	13
1422.6	3.0	10	1.9	34	259	19	44	3.5	52	297	14
1423.3	2.3	11	2.0	39	265	18	33	3.7	60	303	13
1424.0	2.6	13	2.0	32	254	19	38	3.7	49	290	14
1424.7	2.3	13	2.3	36	290	19	34	4.1	55	331	14
1425.4	2.7	13	2.1	41	256	17	39	3.9	63	292	12
1426.1	2.2	13	2.5	29	280	17	31	4.6	45	320	12
1426.8	2.5	11	2.0	36	274	17	37	3.6	56	313	12
1427.5	3.5	13	1.7	36	286	18	50	3.1	55	327	13
1428.2	2.2	11	2.2	36	274	21	32	4.0	56	313	15
1428.9	2.0	14	2.7	35	260	15	29	4.9	54	298	11
1429.6	2.2	12	2.2	33	258	16	32	4.0	50	295	11
1430.3	3.3	12	2.2	32	309	16	48	4.1	49	353	12
1431.0	3.4	13	2.3	31	283	15	49	4.3	48	324	11
1431.7	2.1	11	1.8	33	252	18	30	3.4	50	288	13
1432.3	2.0	13	2.3	37	285	19	29	4.2	57	326	14
1433.0	2.3	12	2.4	31	266	19	33	4.5	48	304	14
1433.7	2.2	12	2.1	34	268	18	32	3.8	52	306	13
1434.4	2.9	12	2.3	38	310	19	41	4.1	58	355	14
1435.1	3.2	12	2.2	37	317	21	46	3.9	57	362	15
1435.8	3.0	16	2.3	38	264	19	43	4.1	58	302	14
1436.5	2.6	13	2.0	40	283	16	37	3.6	61	324	11
1437.2	2.3	12	2.1	37	279	19	33	3.9	57	319	14
1437.9	2.8	12	1.8	31	268	18	40	3.2	47	307	13
1438.6	3.3	11	2.2	33	264	17	47	3.9	50	302	13
1439.3	1.8	13	1.8	29	284	16	27	3.2	44	325	12
1440.0	2.2	14	2.4	34	271	19	31	4.3	52	310	14
1440.7	3.4	12	2.4	33	283	18	49	4.4	51	323	13
1441.4	2.2	12	2.0	27	268	21	32	3.7	42	306	16
1442.1	2.5	14	2.0	34	288	19	36	3.7	53	329	14
1442.8	3.0	12	2.0	31	303	16	43	3.6	47	346	12
1443.5	2.0	12	2.2	35	241	14	30	3.9	54	275	10
1444.2	2.7	13	2.3	32	288	18	39	4.2	49	330	13
1444.9	3.2	11	2.4	33	255	15	45	4.3	51	292	11
1445.6	2.3	14	2.1	30	299	17	33	3.8	47	342	12
1446.3	2.7	16	2.2	37	303	18	39	3.9	57	347	13
1447.0	2.0	12	2.1	28	267	16	28	3.8	43	306	11
1447.7	3.7	14	1.9	29	260	17	53	3.5	45	297	12
1448.4	1.9	13	1.9	31	241	17	28	3.5	48	276	13
1449.1	2.7	12	2.4	31	264	17	39	4.4	48	302	12
1449.8	3.0	11	2.0	34	268	15	43	3.7	51	306	11
1450.5	3.3	11	2.4	32	231	16	48	4.4	49	264	12
1451.2	2.7	15	2.1	30	283	17	39	3.8	46	324	12
1451.9	1.9	13	2.0	36	261	17	27	3.7	55	298	13
1452.6	2.4	13	2.5	31	270	16	35	4.5	47	309	12
1453.3	2.1	14	2.1	32	274	16	31	3.8	48	314	11
1454.0	2.1	13	2.0	33	255	13	30	3.7	51	292	9.1
1454.7	2.3	14	2.0	36	289	15	33	3.7	55	330	11
1455.4	2.8	13	1.9	28	272	16	41	3.5	42	311	12
1456.1	2.6	16	2.3	35	288	20	37	4.2	54	329	14
1456.8	3.1	15	2.5	32	251	14	44	4.5	49	287	11
1457.5	2.2	13	2.1	32	286	13	31	3.8	49	327	9.5
1458.1	2.9	15	2.2	28	277	11	42	4.1	42	317	8.3
1458.8	3.1	17	2.1	35	291	15	45	3.9	53	333	11
1459.5	2.9	14	2.7	34	281	14	43	4.9	53	321	10
1460.2	2.8	13	2.5	31	246	14	40	4.5	47	281	10
1460.9	2.3	14	2.3	36	269	15	33	4.3	55	308	11
1461.6	2.3	16	2.6	30	289	21	34	4.7	46	331	15
1462.3	2.7	16	2.7	38	300	16	39	4.9	58	343	11
1463.0	2.3	14	2.4	30	259	16	33	4.4	46	297	11
1463.7	3.1	14	2.3	31	276	17	44	4.2	48	315	12
1464.4	3.4	16	2.5	35	292	17	50	4.6	54	334	12
1465.1	2.7	13	2.5	31	280	17	40	4.6	47	320	13
1465.8	3.4	13	2.9	30	316	21	50	5.3	45	361	15
1466.5	3.4	14	2.6	33	299	20	49	4.8	51	341	15
1467.2	4.1	15	3.0	34	324	21	59	5.4	51	370	16
1467.9	2.6	17	2.8	32	287	21	38	5.1	49	328	15
1468.6	2.6	15	2.1	34	281	20	37	3.9	51	322	15



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1469.3	3.2	15	2.7	33	314	15	46	4.9	51	359	11
1470.0	2.5	16	2.8	31	287	19	37	5.1	48	328	14
1470.7	3.2	14	2.9	36	344	19	46	5.4	55	393	14
1471.4	2.9	15	3.3	36	296	18	42	6.0	55	338	13
1472.1	2.5	16	2.6	32	295	17	36	4.8	49	338	13
1472.8	3.0	18	3.4	30	314	16	43	6.1	46	360	12
1473.5	2.6	15	2.8	33	284	18	37	5.1	50	325	13
1474.2	2.4	15	2.5	26	314	18	34	4.5	39	359	13
1474.9	3.0	15	2.6	28	260	16	43	4.8	43	298	11
1475.6	2.5	15	2.4	30	289	17	35	4.3	46	331	13
1476.3	2.7	15	2.7	24	275	18	39	4.9	37	314	13
1477.0	2.7	15	2.2	23	292	19	39	4.0	36	334	14
1477.7	2.3	16	2.3	27	267	15	33	4.3	41	305	11
1478.4	2.7	16	2.1	25	302	20	39	3.8	38	345	14
1479.1	2.0	15	1.8	25	266	16	28	3.3	38	304	12
1479.8	1.9	13	2.0	23	282	19	28	3.6	35	323	14
1480.5	2.5	15	2.3	27	279	17	36	4.2	41	319	12
1481.2	2.1	17	2.4	23	298	19	31	4.3	35	341	14
1481.9	2.4	14	1.9	23	271	20	35	3.5	35	310	14
1482.6	2.3	17	2.2	18	263	15	33	4.0	28	301	11
1483.3	2.6	15	1.8	20	287	19	38	3.4	31	328	14
1484.0	2.2	14	2.4	22	269	17	32	4.3	34	308	12
1484.6	2.5	16	1.9	20	264	18	36	3.5	31	302	13
1485.3	2.0	17	1.8	18	277	19	30	3.3	27	317	14
1486.0	2.1	16	1.4	22	274	16	30	2.6	34	313	12
1486.7	2.7	15	2.1	18	284	16	39	3.9	28	325	12
1487.4	2.6	16	1.9	16	247	17	37	3.4	25	282	12
1488.1	2.4	19	1.5	20	274	18	34	2.8	31	314	13
1488.8	2.3	14	2.1	16	285	15	33	3.9	25	326	11
1489.5	2.2	14	1.8	15	259	13	31	3.3	24	296	9.7
1490.2	2.9	17	1.8	18	258	16	42	3.3	27	296	11
1490.9	2.0	16	1.9	22	265	14	29	3.4	34	303	10
1491.6	2.1	15	2.1	16	300	13	30	3.9	25	343	9.8
1492.3	2.0	16	1.8	15	246	13	28	3.2	22	282	9.7
1493.0	1.6	16	1.6	15	251	12	23	2.9	23	287	8.5
1493.7	2.0	16	1.5	18	257	14	29	2.7	28	294	10
1494.4	2.6	17	1.5	16	270	13	38	2.8	25	308	9.4
1495.1	1.3	17	1.5	17	256	15	18	2.8	27	293	11
1495.8	2.5	17	1.6	16	275	11	37	2.8	24	315	8.2
1496.5	2.2	15	1.9	17	278	10	32	3.5	26	318	7.4
1497.2	1.8	15	1.9	15	277	11	27	3.4	23	317	8.2
1497.9	3.1	15	1.5	16	254	9.4	45	2.7	24	290	6.8
1498.6	2.3	14	1.5	18	279	12	34	2.8	27	320	8.8
1499.3	3.2	16	1.3	16	249	10	47	2.4	25	284	7.4
1500.0	2.5	14	1.4	12	265	8.0	36	2.6	19	304	5.8
1500.7	2.9	16	1.5	15	288	11	42	2.8	23	330	8.1
1501.4	2.9	13	1.6	15	257	7.8	42	2.8	23	294	5.7
1502.1	2.5	15	1.4	14	262	8.0	36	2.5	21	299	5.8
1502.8	2.5	16	1.7	15	297	10	36	3.1	22	339	7.6
1503.5	2.3	15	1.9	13	261	8.4	33	3.5	21	299	6.1
1504.2	2.0	15	1.8	11	285	9.4	29	3.3	17	325	6.9
1504.9	1.8	15	1.4	13	242	7.6	26	2.6	19	277	5.5
1505.6	3.1	13	1.8	14	300	7.9	45	3.2	21	343	5.8
1506.3	2.4	15	1.5	13	296	7.4	34	2.7	19	339	5.4
1507.0	2.1	14	1.2	12	244	6.5	30	2.2	19	279	4.7
1507.7	3.0	15	2.0	17	274	8.2	44	3.6	25	313	6.0
1508.4	2.6	14	1.4	13	265	5.0	37	2.5	20	303	3.7
1509.1	2.6	15	0.829	13	264	6.5	37	1.5	19	302	4.8
1509.8	2.4	13	1.5	16	283	7.3	34	2.7	24	324	5.4
1510.5	2.6	13	1.6	12	244	7.8	38	2.9	19	278	5.7
1511.2	2.1	14	1.3	13	234	4.7	30	2.3	19	267	3.4
1511.8	2.2	16	1.6	14	297	6.5	32	3.0	21	340	4.8
1512.5	2.3	15	1.4	11	286	6.1	33	2.6	17	327	4.5
1513.2	2.4	14	1.3	9.7	230	5.7	34	2.4	15	263	4.2
1513.9	2.3	12	1.8	13	257	4.9	34	3.3	20	293	3.6
1514.6	3.2	12	1.2	13	276	6.1	46	2.3	20	316	4.5
1515.3	2.6	14	1.7	9.9	254	5.1	38	3.1	15	291	3.7
1516.0	3.3	14	1.7	11	269	5.3	47	3.0	16	307	3.9
1516.7	3.2	15	1.7	12	259	5.4	47	3.0	19	296	4.0
1517.4	3.0	14	1.2	12	268	5.9	43	2.3	19	307	4.3
1518.1	3.1	16	1.4	11	268	6.2	44	2.5	17	306	4.5
1518.8	2.3	13	1.2	13	286	4.8	34	2.2	19	327	3.5
1519.5	2.8	14	1.4	11	263	3.3	40	2.6	17	301	2.4
1520.2	2.7	12	1.6	13	277	5.4	39	2.9	20	317	3.9
1520.9	2.1	15	1.3	12	273	3.8	30	2.3	19	312	2.8
1521.6	2.7	14	1.7	9.6	255	4.3	39	3.0	15	291	3.1
1522.3	2.2	12	0.995	10	256	4.6	31	1.8	16	292	3.3
1523.0	2.7	14	1.6	9.3	260	4.8	39	2.8	14	298	3.5
1523.7	2.3	12	1.2	12	263	5.4	33	2.1	18	301	3.9
1524.4	2.9	15	1.8	12	247	3.7	42	3.3	19	282	2.7
1525.1	3.1	12	1.4	9.1	262	2.8	45	2.6	14	300	2.0



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1525.8	2.7	14	1.3	9.3	273	3.6	39	2.4	14	312	2.7
1526.5	2.6	16	1.6	12	274	4.8	38	2.9	19	313	3.5
1527.2	2.9	15	1.9	12	312	5.5	42	3.4	18	357	4.0
1527.9	3.0	13	1.4	10	241	3.5	43	2.5	16	275	2.5
1528.6	2.6	14	1.8	9.8	257	3.9	38	3.3	15	294	2.9
1529.3	2.4	14	1.5	11	251	3.8	34	2.7	17	287	2.8
1530.0	3.4	15	1.7	11	280	3.3	49	3.0	16	320	2.4
1530.7	3.0	14	1.7	11	250	2.7	43	3.0	17	286	2.0
1531.4	2.2	15	2.0	11	247	3.7	31	3.7	17	282	2.7
1532.1	2.1	15	1.8	9.7	229	3.1	30	3.2	15	261	2.2
1532.8	2.2	12	2.2	9.0	265	4.4	32	4.0	14	303	3.2
1533.5	2.9	13	1.9	11	240	3.7	42	3.5	16	274	2.7
1534.2	1.7	13	1.6	12	247	4.0	24	3.0	18	283	2.9
1534.9	1.9	12	1.8	10	242	4.3	27	3.2	16	277	3.1
1535.6	2.3	13	1.9	9.4	238	3.8	33	3.5	14	272	2.8
1536.3	2.9	15	1.4	9.6	268	3.8	42	2.6	15	307	2.8
1537.0	2.4	16	1.7	12	228	3.3	35	3.0	18	261	2.4
1537.6	2.8	14	1.7	9.8	237	3.5	41	3.1	15	271	2.6
1538.3	2.0	14	1.6	13	226	3.1	29	2.8	19	259	2.2
1539.0	1.8	12	1.7	10.0	244	3.0	26	3.2	15	280	2.2
1539.7	3.3	14	2.0	11	233	3.0	48	3.6	16	266	2.2
1540.4	3.0	15	1.9	15	257	3.8	44	3.4	23	294	2.8
1541.1	2.0	14	1.4	12	236	2.2	29	2.6	18	270	1.6
1541.8	2.0	12	1.3	14	233	3.6	28	2.3	21	267	2.6
1542.5	1.8	13	1.9	12	233	2.7	25	3.4	18	266	2.0
1543.2	2.2	14	1.9	9.6	215	3.1	32	3.5	15	246	2.3
1543.9	2.6	14	1.7	9.4	233	3.1	37	3.1	14	267	2.2
1544.6	2.3	14	1.8	11	237	3.7	33	3.2	18	271	2.7
1545.3	1.3	13	1.4	14	217	2.4	18	2.6	21	248	1.8
1546.0	2.3	16	1.6	11	260	3.3	34	3.0	16	298	2.4
1546.7	2.2	13	1.5	12	238	3.1	32	2.6	19	272	2.3
1547.4	2.3	14	1.4	9.8	230	2.8	34	2.5	15	262	2.0
1548.1	2.5	13	1.4	9.1	224	2.8	35	2.5	14	256	2.0
1548.8	1.9	13	1.5	10	213	2.8	28	2.8	16	244	2.0
1549.5	2.2	14	1.8	10.0	240	1.4	32	3.3	15	274	1.0
1550.2	1.7	12	1.4	11	220	2.3	24	2.6	17	252	1.7
1550.9	2.1	13	1.3	9.7	228	1.4	30	2.3	15	261	1.0
1551.6	1.8	15	1.2	8.4	234	2.3	26	2.1	13	267	1.7
1552.3	2.2	14	1.5	9.5	245	1.8	32	2.7	15	280	1.3
1553.0	2.1	13	1.4	7.9	206	2.4	31	2.5	12	236	1.7
1553.7	1.4	15	1.5	12	234	2.5	20	2.8	18	267	1.8
1554.4	1.7	14	1.4	11	228	2.8	25	2.5	17	261	2.1
1555.1	1.9	14	1.2	8.4	236	2.7	27	2.3	13	270	2.0
1555.8	2.3	11	1.3	6.7	243	2.5	34	2.4	10	278	1.8
1556.5	1.7	11	1.1	7.1	233	2.2	25	1.9	11	267	1.6
1557.2	2.0	14	1.4	9.7	262	2.0	29	2.5	15	299	1.5
1557.9	1.8	13	0.981	9.2	219	3.0	26	1.8	14	251	2.2
1558.6	1.4	12	1.1	8.9	252	2.6	21	1.9	14	288	1.9
1559.3	1.6	11	1.1	8.2	258	2.9	23	2.1	13	295	2.1
1560.0	1.2	12	0.983	7.6	264	3.0	17	1.8	12	302	2.2
1560.7	1.3	11	0.868	4.9	250	2.6	19	1.6	7.5	285	1.9
1561.4	1.7	12	0.816	7.1	219	2.2	24	1.5	11	250	1.6
1562.1	1.6	12	0.598	6.9	242	2.1	23	1.1	11	277	1.5
1562.8	2.0	13	0.999	5.1	301	2.0	28	1.8	7.8	344	1.5
1563.5	1.5	14	0.905	5.6	245	2.2	22	1.7	8.6	280	1.6
1564.1	1.6	11	0.874	8.1	254	2.3	23	1.6	12	291	1.7
1564.8	1.4	10	0.474	7.0	238	2.2	20	0.865	11	272	1.6
1565.5	1.8	10	0.557	5.9	233	2.2	26	1.0	9.1	266	1.6
1566.2	1.1	12	0.824	7.0	270	2.7	16	1.5	11	308	1.9
1566.9	1.8	13	0.859	5.9	256	2.7	27	1.6	9.1	293	2.0
1567.6	1.7	13	0.414	6.5	254	2.5	24	0.754	9.9	290	1.8
1568.3	1.6	11	0.598	4.5	248	1.9	22	1.1	6.9	284	1.4
1569.0	1.5	10	0.372	5.9	222	3.3	21	0.678	9.0	254	2.4
1569.7	1.5	13	0.777	4.7	280	2.4	22	1.4	7.2	320	1.7
1570.4	1.7	12	0.616	8.1	281	2.6	25	1.1	12	322	1.9
1571.1	1.7	10	0.743	5.8	247	1.9	24	1.4	8.9	283	1.4
1571.8	1.9	9.6	0.496	3.4	246	1.8	27	0.904	5.2	281	1.3
1572.5	1.4	10.0	0.480	4.9	224	2.1	21	0.876	7.5	256	1.5
1573.2	1.4	11	0.548	4.6	254	2.8	20	0.999	7.1	291	2.0
1573.9	1.2	11	0.526	6.6	220	2.8	17	0.959	10	251	2.0
1574.6	0.835	10	0.518	4.4	216	2.0	12	0.944	6.7	247	1.5
1575.3	1.1	12	0.320	4.6	229	2.8	16	0.584	7.1	262	2.1
1576.0	1.7	12	0.919	5.8	234	1.5	24	1.7	8.9	268	1.1
1576.7	0.558	10	0.683	4.9	225	2.2	8.1	1.2	7.6	257	1.6
1577.4	0.949	11	0.636	4.5	251	1.9	14	1.2	7.0	288	1.4
1578.1	2.1	13	0.866	3.8	238	1.7	30	1.6	5.8	272	1.2
1578.8	1.0	12	0.664	3.6	235	1.7	15	1.2	5.6	268	1.2
1579.5	1.1	13	1.0	7.1	288	2.1	16	1.9	11	329	1.5
1580.2	1.3	13	0.984	5.2	211	2.4	19	1.8	8.0	242	1.8
1580.9	1.1	13	1.1	6.1	213	2.4	16	2.0	9.3	244	1.7
1581.6	0.871	10	0.745	4.1	182	1.6	13	1.4	6.3	208	1.2



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1582.3	1.6	12	0.805	5.0	216	2.1	23	1.5	7.6	247	1.5
1583.0	1.8	15	1.1	4.7	236	2.3	25	1.9	7.1	270	1.6
1583.7	1.4	14	0.858	4.9	190	1.5	20	1.6	7.5	217	1.1
1584.4	1.3	13	0.968	5.4	214	1.5	19	1.8	8.3	244	1.1
1585.1	1.4	12	0.876	4.4	198	1.4	20	1.6	6.7	226	0.997
1585.8	1.4	11	1.1	4.8	221	1.4	19	2.1	7.4	253	1.0
1586.5	2.1	12	0.863	3.8	224	1.4	30	1.6	5.8	257	1.1
1587.2	1.7	13	1.3	5.3	209	1.0	25	2.4	8.1	239	0.736
1587.9	1.8	14	1.3	6.2	209	1.8	26	2.4	9.4	238	1.3
1588.6	2.2	12	1.2	4.5	201	1.5	32	2.2	6.9	230	1.1
1589.3	1.6	12	1.4	4.3	225	1.9	23	2.5	6.5	257	1.4
1590.0	1.8	15	0.998	7.4	219	1.7	26	1.8	11	250	1.3
1590.6	1.6	14	1.3	6.8	206	1.4	23	2.3	10	236	1.0
1591.3	1.3	13	1.0	5.2	210	1.5	19	1.9	8.0	240	1.1
1592.0	1.3	13	1.4	5.9	204	0.823	19	2.5	9.1	233	0.601
1592.7	1.7	14	1.3	7.3	230	1.4	25	2.3	11	263	1.0
1593.4	2.1	15	1.5	7.3	259	2.0	31	2.7	11	296	1.5
1594.1	2.0	14	1.2	6.0	208	2.3	29	2.3	9.3	238	1.7
1594.8	1.9	15	1.6	8.5	200	1.2	28	2.9	13	229	0.904
1595.5	2.5	12	1.2	5.3	213	0.865	37	2.1	8.1	244	0.631
1596.2	2.3	15	1.4	5.5	253	1.5	33	2.6	8.5	290	1.1
1596.9	1.9	15	1.3	8.6	226	1.5	28	2.5	13	258	1.1
1597.6	2.4	14	1.7	6.3	216	1.3	35	3.1	9.6	247	0.916
1598.3	1.9	16	1.4	5.5	219	1.5	28	2.5	8.4	250	1.1
1599.0	2.1	14	1.5	4.8	214	2.0	31	2.8	7.3	244	1.5
1599.7	2.8	15	1.5	4.3	213	1.3	40	2.8	6.7	244	0.913
1600.4	2.4	17	1.5	7.0	209	1.3	34	2.8	11	239	0.933
1601.1	1.8	13	1.4	4.2	251	1.3	26	2.5	6.4	287	0.930
1601.8	1.9	15	1.4	7.5	234	1.4	27	2.6	11	267	1.0
1602.5	1.9	15	1.4	4.9	201	1.2	28	2.6	7.5	230	0.891
1603.2	2.0	14	1.6	9.4	231	1.9	29	3.0	14	264	1.4
1603.9	2.3	16	1.9	5.3	217	1.6	33	3.4	8.2	248	1.2
1604.6	2.1	16	1.4	9.0	228	1.3	31	2.5	14	261	0.981
1605.3	1.6	15	1.7	7.3	226	2.1	23	3.1	11	258	1.5
1606.0	2.3	14	2.1	4.9	244	1.8	33	3.9	7.4	279	1.3
1606.7	2.1	18	2.0	8.3	221	1.7	30	3.7	13	253	1.2
1607.4	2.4	17	1.6	7.6	221	1.000	34	2.9	12	253	0.730
1608.1	2.2	13	1.7	5.5	216	0.890	31	3.1	8.5	247	0.650
1608.8	2.5	13	1.9	7.8	216	2.2	35	3.5	12	247	1.6
1609.5	2.8	15	2.0	8.0	220	1.0	40	3.6	12	252	0.760
1610.2	2.2	15	2.1	6.8	242	1.6	32	3.8	10	277	1.2
1610.9	2.8	15	1.8	8.5	232	0.528	41	3.2	13	266	0.385
1611.6	2.2	16	1.9	6.0	215	1.0	32	3.5	9.1	246	0.749
1612.3	1.8	14	1.7	5.5	200	1.5	26	3.0	8.4	229	1.1
1613.0	2.8	18	1.9	8.3	230	1.2	40	3.4	13	263	0.842
1613.7	2.6	15	1.2	7.4	215	1.4	38	2.1	11	245	0.996
1614.4	2.0	18	2.1	9.6	226	1.9	29	3.9	15	258	1.4
1615.1	2.5	15	2.0	8.2	206	0.482	35	3.6	13	236	0.352
1615.8	2.3	17	1.7	7.2	233	1.2	33	3.0	11	266	0.874
1616.5	2.3	16	1.8	7.1	246	1.7	33	3.3	11	281	1.2
1617.1	2.6	20	2.2	7.4	224	1.6	38	4.0	11	257	1.2
1617.8	1.4	14	1.5	6.7	211	0.979	20	2.7	10	242	0.715
1618.5	1.5	17	1.7	7.2	214	0.468	22	3.1	11	245	0.342
1619.2	1.6	14	1.9	7.9	207	1.2	23	3.5	12	237	0.847
1619.9	2.2	16	1.7	10	242	1.3	32	3.1	16	277	0.916
1620.6	2.2	16	1.5	8.7	235	1.5	32	2.8	13	268	1.1
1621.3	1.6	17	1.2	6.3	239	1.3	23	2.2	9.6	273	0.957
1622.0	1.7	15	1.8	8.8	228	1.5	24	3.2	13	261	1.1
1622.7	2.2	16	1.6	7.4	223	1.3	32	2.9	11	255	0.918
1623.4	1.8	16	1.6	8.4	233	0.912	26	2.9	13	266	0.665
1624.1	2.2	16	1.4	6.1	209	1.0	32	2.5	9.4	239	0.760
1624.8	2.4	15	1.6	7.0	229	1.5	34	3.0	11	262	1.1
1625.5	1.6	12	1.4	5.3	208	0.771	23	2.5	8.1	238	0.563
1626.2	1.8	15	1.3	6.5	221	1.2	26	2.3	10	252	0.889
1626.9	1.9	16	1.1	7.4	234	1.6	28	2.0	11	267	1.2
1627.6	2.2	17	1.4	6.4	220	1.1	31	2.5	9.7	251	0.803
1628.3	2.3	18	1.1	8.2	228	1.1	33	2.1	13	261	0.772
1629.0	2.1	14	1.3	7.6	225	0.917	30	2.5	12	258	0.669
1629.7	2.0	15	1.0	5.7	222	1.6	28	1.9	8.7	254	1.2
1630.4	1.8	15	1.2	6.5	219	1.5	27	2.2	9.9	250	1.1
1631.1	1.2	16	0.843	5.5	230	0.699	18	1.5	8.5	263	0.510
1631.8	2.0	15	1.1	6.7	232	1.6	29	2.1	10	265	1.2
1632.5	1.9	15	1.2	6.6	234	0.908	27	2.2	10	268	0.662
1633.2	1.8	16	1.2	6.5	243	1.7	25	2.1	10	278	1.3
1633.9	2.2	20	1.1	7.0	237	1.2	31	2.1	11	271	0.904
1634.6	2.5	14	1.1	4.4	213	1.0	36	2.0	6.8	244	0.765
1635.3	1.8	15	0.999	4.7	236	1.3	26	1.8	7.1	270	0.983
1636.0	2.5	16	1.2	3.5	228	1.5	35	2.1	5.3	261	1.1
1636.7	2.3	15	0.972	5.3	220	1.0	33	1.8	8.1	252	0.753
1637.4	2.3	16	1.2	5.3	221	1.6	33	2.2	8.2	253	1.2
1638.1	1.8	15	1.2	5.5	237	1.2	26	2.2	8.4	271	0.869



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1638.8	2.2	16	1.1	4.4	230	0.765	31	2.0	6.8	263	0.558
1639.5	2.8	16	1.2	4.9	281	2.2	40	2.2	7.5	322	1.6
1640.2	1.7	15	0.888	6.3	225	0.980	24	1.6	9.7	258	0.715
1640.9	1.8	13	1.1	5.2	239	0.971	26	2.0	8.0	273	0.709
1641.6	1.8	13	1.3	6.5	242	0.850	26	2.4	10.0	276	0.620
1642.3	2.7	13	1.0	4.3	251	1.9	39	1.8	6.6	287	1.4
1642.9	2.3	13	1.1	3.7	230	1.3	34	1.9	5.7	263	0.913
1643.6	2.2	16	1.1	5.0	235	1.2	31	2.0	7.7	268	0.844
1644.3	2.2	15	0.937	4.0	230	1.6	32	1.7	6.1	263	1.2
1645.0	2.0	18	1.2	5.5	240	1.2	28	2.2	8.5	274	0.846
1645.7	2.3	14	0.855	4.2	198	1.2	33	1.6	6.5	227	0.846
1646.4	2.2	14	0.806	6.1	243	1.2	32	1.5	9.4	278	0.906
1647.1	1.4	12	1.2	3.2	237	1.3	20	2.2	4.9	271	0.966
1647.8	2.0	14	0.800	3.8	228	1.2	29	1.5	5.8	260	0.899
1648.5	2.0	13	1.0	4.2	218	1.1	28	1.9	6.4	250	0.836
1649.2	2.0	13	0.991	2.3	251	0.976	29	1.8	3.5	287	0.712
1649.9	0.986	13	1.3	2.6	225	1.0	14	2.3	4.0	257	0.741
1650.6	2.4	15	1.4	2.3	233	1.1	35	2.5	3.5	267	0.769
1651.3	2.0	14	1.2	2.7	228	1.1	30	2.2	4.1	260	0.796
1652.0	1.5	14	0.717	3.2	256	1.8	21	1.3	4.9	292	1.3
1652.7	1.4	15	1.1	3.7	238	0.609	21	2.0	5.7	273	0.444
1653.4	2.3	14	1.1	1.8	218	0.722	34	1.9	2.8	249	0.527
1654.1	1.8	12	1.2	3.2	224	0.950	26	2.2	4.9	256	0.693
1654.8	1.6	13	1.3	3.0	234	0.929	24	2.3	4.7	267	0.678
1655.5	1.6	16	1.2	3.5	264	0.953	23	2.1	5.3	301	0.695
1656.2	1.9	15	1.2	2.0	268	1.3	27	2.2	3.0	307	0.966
1656.9	2.2	14	1.1	3.5	213	0.734	32	2.1	5.3	243	0.536
1657.6	2.1	14	1.3	2.0	255	1.8	31	2.4	3.1	291	1.3
1658.3	2.2	12	1.4	2.9	244	0.640	32	2.5	4.4	279	0.467
1659.0	2.0	15	1.5	2.2	237	1.2	28	2.7	3.3	271	0.903
1659.7	2.2	15	1.1	2.2	239	1.2	32	2.1	3.3	274	0.882
1660.4	1.8	15	1.3	3.0	223	1.4	25	2.3	4.6	255	1.0
1661.1	1.6	15	1.4	1.1	253	1.2	23	2.6	1.7	289	0.845
1661.8	1.9	14	1.3	2.8	233	1.3	27	2.3	4.3	267	0.944
1662.5	2.0	15	1.6	1.7	273	0.992	29	2.9	2.7	313	0.723
1663.2	2.3	17	1.2	0.911	228	1.2	33	2.2	1.4	260	0.912
1663.9	2.1	14	1.4	3.2	242	1.9	30	2.6	4.9	277	1.4
1664.6	1.7	14	1.4	1.8	234	1.6	25	2.5	2.8	268	1.1
1665.3	2.2	13	1.2	2.1	233	1.1	31	2.2	3.3	266	0.766
1666.0	2.6	15	1.4	3.9	242	1.4	37	2.5	6.0	276	1.0
1666.7	2.2	15	1.4	2.8	254	2.2	31	2.6	4.3	291	1.6
1667.4	2.0	16	1.3	2.8	262	1.9	29	2.4	4.3	300	1.4
1668.1	2.0	12	1.3	3.8	215	1.2	29	2.3	5.9	246	0.882
1668.7	2.2	13	1.4	2.1	232	1.0	32	2.6	3.2	265	0.760
1669.4	1.7	14	1.6	2.5	230	0.852	24	3.0	3.8	263	0.622
1670.1	2.2	14	1.5	3.1	233	1.2	32	2.8	4.7	267	0.901
1670.8	1.5	13	1.4	1.9	228	0.814	22	2.6	3.0	260	0.594
1671.5	1.0	15	1.5	2.2	215	1.3	15	2.7	3.3	246	0.964
1672.2	2.3	17	1.6	2.6	242	0.794	33	2.9	4.0	276	0.579
1672.9	2.3	12	1.6	1.8	223	1.1	33	3.0	2.7	255	0.798
1673.6	1.6	13	1.4	2.3	206	0.941	23	2.6	3.5	236	0.687
1674.3	1.9	13	1.4	2.3	244	1.4	27	2.6	3.5	279	1.0
1675.0	1.9	12	1.4	2.0	193	1.2	27	2.6	3.1	221	0.898
1675.7	2.3	13	1.5	3.9	234	1.1	33	2.8	5.9	267	0.808
1676.4	1.9	13	1.2	1.4	218	1.9	27	2.2	2.2	249	1.4
1677.1	1.7	13	1.9	2.6	220	0.954	24	3.5	4.1	251	0.696
1677.8	1.8	12	1.6	1.4	245	1.2	27	3.0	2.1	280	0.896
1678.5	2.1	14	1.4	1.3	217	0.931	30	2.5	2.0	248	0.679
1679.2	1.9	13	1.8	1.5	232	1.1	28	3.3	2.4	266	0.796
1679.9	1.7	13	1.2	2.5	223	1.1	24	2.1	3.8	255	0.832
1680.6	1.5	15	1.5	1.6	224	1.3	22	2.7	2.5	256	0.972
1681.3	1.8	13	1.6	1.8	219	0.702	26	2.9	2.7	251	0.512
1682.0	1.1	12	1.2	1.7	258	1.1	15	2.2	2.6	295	0.776
1682.7	1.3	14	1.4	2.7	232	1.3	19	2.5	4.1	265	0.982
1683.4	1.4	13	1.2	1.7	240	1.1	20	2.2	2.6	274	0.833
1684.1	1.7	13	1.4	2.8	243	1.1	25	2.6	4.3	278	0.796
1684.8	1.7	13	1.3	2.1	234	1.4	24	2.3	3.2	267	0.989
1685.5	1.7	11	1.0	1.4	239	1.2	25	1.9	2.2	273	0.861
1686.2	2.0	13	1.0	2.4	226	0.743	28	1.9	3.7	259	0.542
1686.9	2.1	14	1.5	1.7	230	0.769	30	2.7	2.6	263	0.561
1687.6	1.6	14	1.4	3.2	227	0.995	23	2.5	4.8	259	0.726
1688.3	2.0	13	1.2	2.0	231	0.633	29	2.2	3.1	264	0.462
1689.0	1.8	13	1.4	2.6	233	1.1	26	2.5	4.1	266	0.837
1689.7	1.6	13	1.3	1.1	231	0.847	23	2.4	1.7	264	0.618
1690.4	1.6	11	1.1	1.7	228	0.653	24	2.0	2.6	260	0.476
1691.1	2.0	13	1.2	2.5	213	1.1	28	2.2	3.9	244	0.782
1691.8	1.7	14	1.5	2.0	245	1.9	25	2.7	3.1	280	1.4
1692.5	1.6	12	1.2	3.2	227	1.5	23	2.3	5.0	260	1.1
1693.2	1.3	13	1.0	2.5	267	1.3	19	1.8	3.8	305	0.927
1693.9	2.1	14	1.2	1.4	282	1.6	30	2.2	2.2	323	1.2
1694.6	1.4	12	0.908	0.625	238	0.655	20	1.7	0.958	272	0.478



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1695.2	1.8	11	0.827	2.1	237	1.1	27	1.5	3.2	271	0.813
1695.9	1.3	12	0.945	2.3	250	1.3	18	1.7	3.5	285	0.955
1696.6	1.7	11	0.864	2.3	257	0.780	25	1.6	3.5	294	0.569
1697.3	0.900	15	0.938	0.731	252	1.1	13	1.7	1.1	288	0.832
1698.0	1.2	14	1.0	3.0	249	1.0	17	1.9	4.5	284	0.753
1698.7	1.5	13	1.1	1.5	251	1.0	22	2.0	2.3	287	0.732
1699.4	1.2	11	0.877	2.1	250	1.1	17	1.6	3.2	285	0.783
1700.1	0.963	11	0.621	1.3	270	1.3	14	1.1	2.0	308	0.966
1700.8	1.7	11	0.612	1.9	242	1.1	24	1.1	3.0	277	0.772
1701.5	1.3	11	0.564	0.824	262	0.797	18	1.0	1.3	299	0.582
1702.2	0.971	11	0.719	1.7	245	2.4	14	1.3	2.6	280	1.7
1702.9	1.1	11	0.587	1.2	249	0.643	16	1.1	1.8	284	0.469
1703.6	0.817	12	0.809	2.4	269	0.830	12	1.5	3.7	307	0.606
1704.3	2.0	12	0.467	2.0	277	0.895	29	0.852	3.1	317	0.653
1705.0	1.3	9.7	0.602	1.3	279	0.825	18	1.1	2.0	319	0.602
1705.7	1.2	10.0	0.679	1.2	261	1.1	18	1.2	1.8	299	0.787
1706.4	1.7	11	0.341	1.6	254	0.861	24	0.622	2.4	291	0.628
1707.1	1.6	11	0.301	1.2	269	1.0	23	0.550	1.9	307	0.751
1707.8	1.6	10	0.506	2.7	288	1.4	23	0.922	4.1	330	1.0
1708.5	1.1	9.3	0.298	1.2	272	0.931	16	0.543	1.9	311	0.680
1709.2	0.727	10	0.465	1.2	285	0.927	10	0.848	1.9	326	0.676
1709.9	1.2	9.5	0.306	2.1	266	0.573	17	0.559	3.2	304	0.418
1710.6	1.7	9.0	0.612	1.8	280	1.1	25	1.1	2.7	321	0.783
1711.3	1.1	9.5	0.349	0.711	304	1.0	15	0.636	1.1	348	0.752
1712.0	1.5	11	0.388	1.6	275	1.1	22	0.707	2.5	314	0.836
1712.7	1.5	10	0.419	1.0	275	1.2	22	0.764	1.5	315	0.884
1713.4	1.0	8.4	0.393	2.3	246	0.849	15	0.716	3.5	281	0.619
1714.1	0.342	11	0.540	1.5	258	2.2	4.9	0.984	2.4	295	1.6
1714.8	0.975	11	0.443	1.2	262	1.4	14	0.808	1.8	299	1.0
1715.5	1.2	10	0.362	1.4	272	1.2	17	0.660	2.1	311	0.885
1716.2	1.6	8.8	0.346	2.9	255	1.7	23	0.630	4.5	291	1.3
1716.9	0.890	9.0	0.489	0.880	266	2.3	13	0.892	1.3	304	1.7
1717.6	0.715	9.3	0.494	0.968	257	0.995	10	0.901	1.5	294	0.726
1718.3	1.5	9.1	0.379	2.2	274	1.5	21	0.691	3.3	313	1.1
1719.0	1.3	12	0.512	0.509	279	1.3	18	0.934	0.780	319	0.942
1719.7	0.689	11	0.569	0.509	271	1.3	9.9	1.0	0.780	310	0.941
1720.4	0.465	8.5	0.477	1.8	256	0.915	6.7	0.871	2.7	293	0.668
1721.1	0.690	7.7	0.370	1.2	252	1.3	10.0	0.675	1.8	288	0.936
1721.8	0.748	8.4	0.429	0.618	250	1.5	11	0.782	0.946	286	1.1
1722.5	1.2	7.8	0.409	0.675	269	1.4	18	0.747	1.0	307	1.0
1723.1	0.989	8.9	0.374	0.924	249	1.5	14	0.682	1.4	285	1.1
1723.8	1.2	9.7	0.539	2.0	277	0.994	18	0.982	3.1	317	0.726
1724.5	0.979	9.5	0.687	0.509	267	1.1	14	1.3	0.780	305	0.797
1725.2	1.2	9.4	0.480	0.509	248	1.3	17	0.875	0.780	284	0.941
1725.9	0.913	9.0	0.639	0.509	239	0.909	13	1.2	0.780	273	0.663
1726.6	0.953	10	0.495	0.509	279	1.4	14	0.902	0.780	319	1.0
1727.3	1.2	9.5	0.720	1.0	253	0.856	17	1.3	1.5	290	0.625
1728.0	0.692	8.6	0.603	1.7	262	0.883	10.0	1.1	2.6	299	0.644
1728.7	0.802	8.0	0.576	1.2	244	0.979	12	1.1	1.8	280	0.714
1729.4	1.3	8.2	0.451	1.5	265	0.818	19	0.823	2.3	303	0.597
1730.1	0.997	9.7	0.605	1.1	253	1.0	14	1.1	1.7	290	0.749
1730.8	1.0	9.5	0.727	0.509	248	1.5	15	1.3	0.780	284	1.1
1731.5	1.3	8.9	0.640	1.1	254	1.7	18	1.2	1.7	290	1.3
1732.2	0.626	8.3	0.616	0.509	265	1.0	9.0	1.1	0.780	303	0.739
1732.9	0.906	7.3	0.555	1.0	245	1.6	13	1.0	1.6	280	1.1
1733.6	0.972	8.1	0.667	0.712	228	1.0	14	1.2	1.1	261	0.753
1734.3	1.1	8.6	0.853	0.509	256	0.436	16	1.6	0.780	292	0.318
1735.0	0.469	10	0.463	0.509	268	1.0	6.8	0.844	0.780	307	0.735
1735.7	0.896	9.2	0.550	2.4	256	1.1	13	1.0	3.7	293	0.815
1736.4	0.860	9.0	0.804	0.710	248	1.7	12	1.5	1.1	283	1.2
1737.1	0.900	8.6	0.728	1.9	250	1.2	13	1.3	3.0	285	0.869
1737.8	1.1	8.6	0.721	1.3	234	1.4	16	1.3	2.1	267	1.0
1738.5	0.891	8.7	0.793	1.1	235	1.6	13	1.4	1.7	269	1.2
1739.2	1.6	9.7	0.520	0.509	227	1.1	23	0.948	0.780	259	0.828
1739.9	1.1	10	0.737	0.860	237	1.3	16	1.3	1.3	271	0.913
1740.6	1.1	9.8	1.1	0.509	227	0.838	16	2.0	0.780	259	0.611
1741.3	0.752	9.7	0.779	0.893	260	0.842	11	1.4	1.4	298	0.614
1742.0	1.6	9.1	1.0	0.509	267	1.0	23	1.9	0.780	306	0.752
1742.7	1.0	10	0.887	0.509	227	0.924	15	1.6	0.780	260	0.674
1743.4	0.903	9.3	0.742	2.7	241	1.4	13	1.4	4.2	275	1.0
1744.1	1.0	11	0.882	0.857	237	1.1	15	1.6	1.3	271	0.788
1744.8	1.4	9.4	1.1	1.8	238	1.2	20	1.9	2.8	272	0.898
1745.5	1.4	9.5	0.877	0.604	223	1.3	20	1.6	0.925	255	0.926
1746.2	0.985	9.7	1.1	1.2	226	1.4	14	2.0	1.9	258	0.988
1746.9	1.4	11	1.0	0.757	225	1.2	21	1.9	1.2	258	0.863
1747.6	0.962	10	1.0	2.4	245	0.825	14	1.8	3.7	280	0.602
1748.3	0.847	10	1.1	2.4	247	1.5	12	2.0	3.6	282	1.1
1749.0	1.5	11	1.2	1.3	226	0.795	22	2.3	1.9	258	0.580
1749.6	0.481	12	1.1	0.656	237	1.3	6.9	2.0	1.0	271	0.943
1750.3	1.1	11	1.1	2.6	225	1.8	16	2.0	3.9	257	1.3
1751.0	1.5	10.0	1.3	0.786	237	1.4	22	2.4	1.2	271	1.0



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1751.7	1.0	11	1.6	1.3	219	1.2	15	3.0	2.1	250	0.859
1752.4	0.721	11	1.5	1.7	238	0.860	10	2.7	2.5	272	0.627
1753.1	1.5	11	1.2	2.8	209	1.7	22	2.3	4.3	239	1.3
1753.8	1.2	11	1.3	2.0	224	1.2	17	2.4	3.1	257	0.897
1754.5	1.4	12	1.2	2.3	250	1.7	20	2.2	3.6	286	1.2
1755.2	1.8	14	1.7	2.6	230	0.937	25	3.2	4.0	263	0.683
1755.9	0.849	12	1.2	4.8	233	1.000	12	2.2	7.4	266	0.729
1756.6	1.0	13	1.5	3.7	225	0.864	15	2.7	5.6	258	0.630
1757.3	1.1	12	1.5	4.3	223	1.8	16	2.8	6.6	255	1.3
1758.0	1.3	11	1.5	2.5	231	1.4	19	2.7	3.8	264	1.0
1758.7	1.3	12	1.4	3.4	244	1.5	19	2.6	5.3	279	1.1
1759.4	1.3	12	1.4	3.7	238	1.4	19	2.6	5.6	272	1.0
1760.1	1.7	13	2.0	4.1	251	2.1	25	3.6	6.3	287	1.6
1760.8	1.9	15	1.3	3.5	260	2.0	28	2.4	5.4	297	1.5
1761.5	1.8	12	1.2	5.1	256	1.5	25	2.2	7.8	293	1.1
1762.2	2.6	13	1.8	3.7	267	1.9	37	3.4	5.7	306	1.4
1762.9	1.1	14	1.6	4.9	238	1.3	15	3.0	7.6	272	0.916
1763.6	1.8	12	1.4	4.2	263	2.0	26	2.6	6.5	300	1.5
1764.3	2.5	13	1.9	4.7	260	2.6	36	3.5	7.2	297	1.9
1765.0	1.2	13	1.9	5.7	293	1.1	18	3.5	8.7	335	0.831
1765.7	2.0	12	1.9	4.6	241	2.1	29	3.4	7.0	276	1.5
1766.4	1.4	12	1.9	7.0	272	2.3	20	3.4	11	311	1.7
1767.1	1.5	14	1.4	5.8	261	2.0	22	2.6	8.9	298	1.4
1767.8	2.5	17	2.0	4.7	289	1.9	36	3.7	7.1	330	1.4
1768.5	1.7	14	1.8	6.8	264	1.8	25	3.4	10	302	1.3
1769.2	1.4	14	1.9	5.4	261	1.6	21	3.4	8.3	299	1.2
1769.9	1.6	11	1.7	5.9	252	1.2	22	3.0	9.0	288	0.902
1770.6	2.2	12	2.0	5.4	250	1.1	32	3.7	8.2	285	0.800
1771.3	1.3	12	2.0	4.7	255	0.977	19	3.6	7.2	292	0.713
1772.0	2.1	14	1.7	5.0	256	1.7	31	3.1	7.6	292	1.3
1772.7	1.9	13	2.2	6.5	273	1.3	27	4.0	10.0	312	0.951
1773.4	1.7	12	1.8	5.0	240	0.775	25	3.4	7.6	274	0.565
1774.1	1.7	10	1.8	6.8	245	1.4	24	3.2	10	280	1.0
1774.8	1.8	15	1.8	6.7	258	0.892	26	3.2	10	295	0.651
1775.5	1.0	13	1.7	4.7	249	0.711	15	3.1	7.1	284	0.519
1776.2	2.5	14	1.9	7.6	250	0.919	37	3.5	12	286	0.671
1776.8	1.9	12	1.9	5.1	266	0.929	28	3.4	7.8	305	0.678
1777.5	2.0	12	1.8	7.2	275	0.862	30	3.3	11	314	0.629
1778.2	1.9	13	1.3	4.7	247	1.4	28	2.3	7.2	282	0.987
1778.9	0.768	14	1.2	7.9	271	1.3	11	2.2	12	309	0.972
1779.6	2.0	13	1.5	6.2	257	1.4	29	2.8	9.5	294	0.998
1780.3	1.6	11	1.1	5.6	245	0.746	23	2.1	8.6	280	0.545
1781.0	2.1	13	1.5	5.4	252	1.4	31	2.7	8.3	288	1.0
1781.7	1.4	14	1.4	6.4	281	0.481	20	2.5	9.8	322	0.351
1782.4	1.5	12	1.2	4.6	244	0.381	22	2.2	7.1	279	0.278
1783.1	1.6	12	0.880	5.9	237	0.635	23	1.6	9.0	271	0.463
1783.8	1.4	13	0.797	5.1	245	0.782	21	1.5	7.9	281	0.571
1784.5	2.1	14	1.1	4.4	272	0.689	30	2.0	6.7	311	0.503
1785.2	1.8	11	0.894	4.4	240	0.914	26	1.6	6.7	274	0.667
1785.9	2.1	12	1.0	3.6	235	0.857	30	1.8	5.6	269	0.626
1786.6	1.1	12	0.962	4.2	236	0.804	16	1.8	6.4	270	0.587
1787.3	1.7	11	0.940	3.2	238	1.2	24	1.7	4.8	272	0.894
1788.0	1.4	11	0.672	4.1	244	1.2	20	1.2	6.2	279	0.900
1788.7	2.0	12	0.997	2.9	234	1.0	28	1.8	4.4	268	0.758
1789.4	2.0	11	0.728	3.7	219	0.468	29	1.3	5.6	250	0.342
1790.1	2.2	13	0.879	3.6	243	0.598	32	1.6	5.5	278	0.436
1790.8	2.4	9.6	0.650	3.1	257	0.793	34	1.2	4.7	294	0.579
1791.5	1.7	13	0.623	2.5	226	0.725	25	1.1	3.8	258	0.529
1792.2	2.3	12	0.667	2.2	255	1.2	33	1.2	3.4	291	0.856
1792.9	1.7	12	0.709	3.8	231	1.3	25	1.3	5.8	264	0.971
1793.6	1.9	11	0.717	4.3	227	0.747	27	1.3	6.6	260	0.545
1794.3	2.0	10.0	1.1	2.5	224	0.998	29	1.9	3.9	256	0.728
1795.0	2.1	16	0.708	2.8	261	1.6	30	1.3	4.2	298	1.1
1795.7	1.8	13	0.614	3.0	218	0.793	26	1.1	4.5	250	0.579
1796.4	1.9	10	0.644	3.9	224	0.971	28	1.2	6.0	256	0.709
1797.1	2.8	12	0.473	1.6	228	0.907	40	0.862	2.5	261	0.662
1797.8	1.9	10	0.801	3.0	214	0.313	28	1.5	4.7	245	0.228
1798.5	1.8	13	0.864	3.3	237	0.913	26	1.6	5.1	271	0.666
1799.2	1.6	13	0.543	1.4	229	0.902	23	0.991	2.1	261	0.658
1799.9	1.6	11	0.645	1.8	236	0.866	23	1.2	2.7	269	0.632
1800.6	1.5	12	0.696	2.1	254	0.944	22	1.3	3.2	291	0.689
1801.3	1.9	11	0.835	2.2	252	0.706	27	1.5	3.4	289	0.515
1802.0	1.5	11	0.673	0.509	234	0.936	22	1.2	0.780	267	0.683
1802.7	2.1	13	0.724	1.1	250	0.718	30	1.3	1.8	286	0.524
1803.3	1.9	10	0.683	2.2	236	1.1	27	1.2	3.4	270	0.793
1804.0	2.1	8.4	0.824	2.6	239	1.1	31	1.5	4.0	273	0.803
1804.7	2.4	13	0.645	1.7	252	1.1	35	1.2	2.6	288	0.828
1805.4	1.4	14	0.746	2.0	269	1.1	20	1.4	3.0	308	0.780
1806.1	1.4	11	0.735	2.2	237	1.3	20	1.3	3.4	271	0.924
1806.8	1.2	9.5	0.830	1.7	245	0.557	18	1.5	2.6	280	0.407
1807.5	1.1	8.5	0.699	1.5	250	1.3	16	1.3	2.3	285	0.946



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Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1808.2	1.1	8.8	0.673	1.9	247	0.937	17	1.2	2.8	283	0.683
1808.9	1.1	10	0.443	0.613	242	0.804	16	0.809	0.939	277	0.586
1809.6	1.2	10	0.666	0.901	247	1.0	17	1.2	1.4	282	0.733
1810.3	1.1	8.0	0.580	1.9	229	1.7	15	1.1	2.9	262	1.2
1811.0	1.2	10	0.592	1.9	265	1.5	17	1.1	3.0	303	1.1
1811.7	0.674	7.6	0.813	1.2	242	0.703	9.7	1.5	1.9	276	0.513
1812.4	1.3	9.9	0.551	2.1	255	1.1	18	1.0	3.3	292	0.822
1813.1	1.2	11	0.334	1.9	269	0.842	17	0.608	2.9	308	0.615
1813.8	1.0	9.2	0.468	1.6	227	1.4	15	0.854	2.5	260	1.0
1814.5	1.3	8.0	0.480	0.546	246	0.958	18	0.876	0.837	281	0.699
1815.2	1.2	8.3	0.456	0.509	230	0.555	18	0.831	0.780	263	0.405
1815.9	1.3	8.0	0.408	1.9	240	1.9	19	0.744	2.9	275	1.4
1816.6	1.3	9.9	0.373	0.874	238	1.4	19	0.680	1.3	272	0.990
1817.3	0.462	7.6	0.492	1.1	237	1.6	6.7	0.898	1.6	271	1.1
1818.0	1.1	8.4	0.379	1.4	215	1.2	15	0.692	2.2	246	0.890
1818.7	1.5	9.0	0.369	1.4	237	1.3	22	0.672	2.2	270	0.978
1819.4	1.1	7.2	0.424	0.936	241	0.882	16	0.774	1.4	276	0.644
1820.1	1.4	6.6	0.333	0.868	257	1.3	20	0.607	1.3	293	0.922
1820.8	0.835	9.5	0.468	2.5	253	1.5	12	0.853	3.8	290	1.1
1821.5	0.784	9.2	0.619	0.509	255	1.3	11	1.1	0.780	292	0.931
1822.2	0.583	11	0.574	2.1	245	1.5	8.4	1.0	3.2	280	1.1
1822.9	0.739	8.6	0.673	1.5	265	1.4	11	1.2	2.3	303	0.995
1823.6	1.0	8.2	0.387	1.7	224	0.993	15	0.706	2.6	256	0.724
1824.3	0.871	8.7	0.435	1.0	251	0.867	13	0.793	1.6	287	0.633
1825.0	0.437	9.0	0.623	2.2	258	1.5	6.3	1.1	3.3	295	1.1
1825.7	0.662	7.6	0.424	1.7	235	1.7	9.6	0.773	2.6	269	1.2
1826.4	0.562	9.1	0.401	0.987	223	1.3	8.1	0.732	1.5	255	0.941
1827.1	1.2	8.9	0.395	1.8	226	1.8	17	0.721	2.7	259	1.3
1827.8	1.1	8.5	0.484	0.809	234	1.3	16	0.883	1.2	267	0.973
1828.5	0.701	8.4	0.419	1.3	231	1.8	10	0.764	2.0	264	1.3
1829.2	1.1	8.4	0.718	1.1	238	1.9	16	1.3	1.7	273	1.4
1829.8	0.404	9.0	0.736	2.2	244	1.4	5.8	1.3	3.3	279	1.0
1830.5	1.3	8.8	0.506	0.509	252	0.970	19	0.923	0.780	288	0.708
1831.2	0.651	8.7	0.935	1.6	229	0.975	9.4	1.7	2.5	261	0.711
1831.9	1.3	10.0	0.554	2.0	253	1.5	19	1.0	3.1	289	1.1
1832.6	0.688	8.0	0.617	1.0	262	1.1	9.9	1.1	1.6	300	0.815
1833.3	0.845	10	0.374	1.9	237	0.809	12	0.683	3.0	271	0.590
1834.0	0.583	8.7	0.574	1.0	233	0.865	8.4	1.0	1.6	266	0.631
1834.7	0.973	9.5	0.572	0.509	227	1.4	14	1.0	0.780	259	1.0
1835.4	1.1	9.3	0.895	2.5	237	1.8	16	1.6	3.8	271	1.3
1836.1	0.952	8.9	0.594	0.920	215	1.2	14	1.1	1.4	246	0.878
1836.8	0.875	10	0.666	0.604	242	1.4	13	1.2	0.926	277	1.0
1837.5	1.2	8.8	0.521	1.1	241	1.5	17	0.950	1.7	276	1.1
1838.2	0.817	11	0.710	1.0	234	1.2	12	1.3	1.6	267	0.857
1838.9	0.727	12	0.653	0.643	245	1.9	10	1.2	0.985	280	1.4
1839.6	0.745	10	0.906	1.4	227	1.5	11	1.7	2.1	260	1.1
1840.3	1.6	8.3	0.925	2.2	249	2.4	22	1.7	3.3	285	1.7
1841.0	0.617	8.4	0.736	1.5	234	1.9	8.9	1.3	2.3	268	1.4
1841.7	0.869	9.6	1.1	1.6	229	1.3	13	2.0	2.5	262	0.973
1842.4	1.5	10	1.1	1.9	257	1.3	22	2.0	2.9	293	0.917
1843.1	1.5	9.7	0.996	2.0	224	1.6	22	1.8	3.1	256	1.2
1843.8	0.928	10	0.703	0.679	222	1.2	13	1.3	1.0	254	0.884
1844.5	1.4	11	1.1	0.636	215	1.1	21	1.9	0.975	245	0.792
1845.2	1.6	11	1.3	2.4	238	1.4	23	2.3	3.6	273	1.1
1845.9	1.0	9.9	0.986	0.517	230	1.2	15	1.8	0.793	263	0.843
1846.6	0.971	11	1.2	2.9	205	1.6	14	2.2	4.4	235	1.2
1847.3	1.2	10	1.4	2.5	200	0.705	18	2.5	3.8	229	0.515
1848.0	0.975	10	1.3	3.1	221	1.2	14	2.4	4.7	253	0.902
1848.7	1.4	12	0.913	2.3	237	1.1	20	1.7	3.5	271	0.816
1849.4	0.960	10.0	1.1	3.4	215	1.6	14	2.0	5.2	246	1.1
1850.1	1.0	11	1.3	2.9	207	1.1	15	2.5	4.5	237	0.838
1850.8	1.0	12	1.3	4.1	224	1.1	15	2.4	6.3	257	0.836
1851.5	0.926	11	1.7	4.6	224	1.1	13	3.0	7.1	256	0.777
1852.2	0.774	11	1.2	3.2	189	0.945	11	2.1	4.8	216	0.689
1852.9	0.797	11	1.4	3.7	203	0.566	12	2.6	5.6	232	0.413
1853.6	1.3	9.4	1.6	3.7	197	1.2	18	2.8	5.7	226	0.902
1854.3	0.466	9.9	1.4	2.2	199	1.1	6.7	2.5	3.4	227	0.824
1855.0	1.2	12	1.7	3.6	214	0.951	18	3.2	5.5	245	0.694
1855.7	1.3	11	1.2	3.9	200	1.2	19	2.2	5.9	229	0.883
1856.4	0.866	13	1.2	4.7	238	0.626	13	2.2	7.2	272	0.457
1857.1	1.2	8.7	1.4	4.3	190	1.0	18	2.6	6.6	217	0.744
1857.7	0.958	10	1.8	5.6	209	1.1	14	3.3	8.5	239	0.823
1858.4	0.927	8.9	1.3	4.1	187	1.3	13	2.3	6.4	214	0.939
1859.1	0.979	12	1.8	7.4	205	0.718	14	3.2	11	234	0.524
1859.8	1.3	11	1.5	5.4	197	0.730	19	2.7	8.3	225	0.532
1860.5	0.842	10.0	1.4	5.7	181	1.4	12	2.6	8.8	207	1.0
1861.2	1.2	11	1.4	5.5	197	1.3	17	2.6	8.5	225	0.982
1861.9	0.688	9.3	1.5	9.7	227	1.0	9.9	2.6	15	260	0.757
1862.6	0.985	10	1.5	7.5	211	0.765	14	2.7	12	242	0.558
1863.3	1.5	12	1.9	9.1	232	1.2	22	3.4	14	266	0.892
1864.0	1.2	11	1.4	8.5	242	0.507	18	2.6	13	276	0.370



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Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1864.7	0.920	9.3	1.8	8.4	207	0.977	13	3.3	13	237	0.712
1865.4	0.876	12	1.6	11	227	0.633	13	3.0	16	259	0.462
1866.1	1.7	11	1.9	10	226	1.1	24	3.4	16	258	0.814
1866.8	1.3	9.4	2.0	10	233	0.731	19	3.6	16	266	0.533
1867.5	1.2	11	2.1	9.6	223	0.729	18	3.7	15	255	0.532
1868.2	0.926	10	1.4	14	230	0.754	13	2.5	21	264	0.550
1868.9	1.7	12	1.9	12	226	1.1	24	3.4	18	258	0.791
1869.6	1.2	11	1.7	12	243	1.0	17	3.1	19	278	0.746
1870.3	0.845	12	1.6	11	216	0.434	12	2.8	16	246	0.316
1871.0	0.650	11	1.0	8.9	221	0.678	9.4	1.8	14	253	0.495
1871.7	1.5	12	1.6	10	255	0.730	21	2.9	16	291	0.533
1872.4	1.1	12	1.1	10	226	0.854	16	2.0	16	259	0.623
1873.1	0.983	12	1.2	14	246	0.640	14	2.2	21	281	0.467
1873.8	1.0	12	1.2	12	230	0.481	15	2.1	18	263	0.351
1874.5	1.6	13	1.1	7.1	269	0.644	23	2.0	11	308	0.470
1875.2	0.955	12	0.845	10	219	0.857	14	1.5	16	250	0.625
1875.9	1.8	12	0.921	8.1	232	0.860	26	1.7	12	265	0.627
1876.6	1.7	10	1.2	6.9	202	0.587	25	2.2	11	231	0.429
1877.3	1.5	11	0.578	7.4	227	0.818	22	1.1	11	260	0.597
1878.0	1.4	10	0.839	8.3	206	0.823	20	1.5	13	236	0.601
1878.7	1.0	12	0.942	5.4	209	0.735	14	1.7	8.2	239	0.536
1879.4	1.4	11	0.584	7.4	202	0.777	20	1.1	11	231	0.567
1880.1	1.0	10.0	0.931	7.4	239	1.6	14	1.7	11	274	1.1
1880.8	1.9	11	0.600	6.6	212	0.375	28	1.1	10	242	0.274
1881.5	1.2	11	0.758	6.1	238	1.2	17	1.4	9.3	272	0.876
1882.2	1.5	12	0.841	4.8	221	0.632	22	1.5	7.3	253	0.461
1882.9	1.5	11	0.606	4.5	227	0.532	21	1.1	6.9	259	0.388
1883.5	1.3	9.9	0.643	5.3	206	0.458	18	1.2	8.2	236	0.334
1884.2	2.2	11	0.337	6.6	221	0.726	32	0.615	10	253	0.529
1884.9	1.5	11	0.846	5.5	222	1.3	21	1.5	8.4	254	0.930
1885.6	1.9	12	0.708	5.1	213	0.903	27	1.3	7.8	243	0.659
1886.3	1.1	13	0.559	4.9	254	1.5	16	1.0	7.4	291	1.1
1887.0	1.2	12	0.467	6.4	216	1.3	18	0.852	9.9	247	0.951
1887.7	1.6	11	0.638	4.0	226	1.2	23	1.2	6.1	259	0.843
1888.4	0.930	11	0.440	3.2	217	0.477	13	0.803	4.9	249	0.348
1889.1	1.2	11	0.477	4.4	220	0.820	17	0.870	6.7	252	0.598
1889.8	1.1	10	0.517	4.0	199	0.850	16	0.942	6.1	228	0.620
1890.5	1.4	11	0.587	5.7	215	0.997	21	1.1	8.7	246	0.727
1891.2	1.8	10	0.616	4.4	220	1.1	25	1.1	6.7	252	0.778
1891.9	1.4	12	0.618	3.2	229	1.2	20	1.1	4.9	262	0.850
1892.6	1.3	12	0.487	4.2	205	0.708	18	0.887	6.5	234	0.516
1893.3	1.4	10	0.526	2.2	224	0.634	20	0.959	3.4	256	0.463
1894.0	1.5	11	0.471	2.4	222	1.2	22	0.859	3.6	254	0.873
1894.7	1.4	11	0.548	3.1	234	1.2	20	1.0	4.7	268	0.846
1895.4	0.717	11	0.569	3.1	224	0.914	10	1.0	4.8	256	0.667
1896.1	1.7	12	0.815	3.1	234	1.1	24	1.5	4.8	268	0.794
1896.8	1.1	9.4	0.552	2.9	210	1.3	16	1.0	4.4	240	0.942
1897.5	1.7	9.5	0.444	2.7	212	0.723	24	0.809	4.1	242	0.528
1898.2	1.5	10	0.502	2.1	228	0.699	22	0.915	3.2	261	0.510
1898.9	1.4	9.6	0.479	3.0	225	0.918	20	0.873	4.6	257	0.670
1899.6	1.6	8.3	0.385	2.4	226	1.7	23	0.702	3.7	258	1.2
1900.3	0.739	9.8	0.397	2.5	237	0.255	11	0.723	3.8	271	0.186
1901.0	1.5	8.5	0.415	5.3	241	1.0	21	0.757	8.1	276	0.750
1901.7	1.2	8.6	0.794	2.3	228	0.834	17	1.4	3.6	261	0.609
1902.4	1.4	9.2	0.412	2.7	241	0.821	20	0.751	4.1	276	0.599
1903.1	1.6	9.9	0.584	2.4	220	0.733	23	1.1	3.7	252	0.535
1903.8	1.9	10	0.767	3.2	222	1.0	27	1.4	4.8	254	0.748
1904.5	0.918	10	0.613	2.6	219	1.5	13	1.1	4.0	250	1.1
1905.2	1.1	8.3	0.653	1.5	206	1.1	15	1.2	2.3	236	0.774
1905.9	0.897	7.8	0.630	1.3	249	0.769	13	1.1	2.0	285	0.561
1906.6	1.4	8.8	0.587	1.9	208	1.0	21	1.1	2.9	238	0.764
1907.3	1.5	9.1	0.497	1.8	227	1.4	21	0.906	2.8	260	0.998
1908.0	1.3	9.0	0.435	1.3	234	0.986	18	0.792	2.0	268	0.719
1908.7	0.822	11	0.679	1.6	242	1.5	12	1.2	2.4	277	1.1
1909.4	1.2	8.5	0.621	2.5	225	1.6	17	1.1	3.8	257	1.2
1910.0	0.578	6.7	0.499	2.7	204	1.0	8.3	0.911	4.1	233	0.740
1910.7	1.2	10	0.511	2.0	226	0.993	18	0.933	3.0	258	0.725
1911.4	1.1	7.8	0.733	1.1	227	0.508	17	1.3	1.7	260	0.371
1912.1	1.3	8.0	0.465	0.509	209	0.504	19	0.848	0.780	239	0.368
1912.8	1.3	9.3	0.699	1.4	233	1.7	19	1.3	2.1	266	1.2
1913.5	1.1	9.0	0.576	1.5	220	1.0	16	1.1	2.4	252	0.737
1914.2	0.733	8.4	0.563	1.7	208	1.6	11	1.0	2.6	238	1.2
1914.9	1.1	10	0.437	0.509	227	0.539	16	0.797	0.780	260	0.393
1915.6	1.5	6.1	0.583	0.825	213	1.2	22	1.1	1.3	244	0.875
1916.3	1.0	8.7	0.609	2.7	218	1.2	15	1.1	4.1	249	0.887
1917.0	1.1	7.1	0.644	1.1	222	0.920	16	1.2	1.7	254	0.671
1917.7	0.969	8.6	0.752	1.0	214	1.1	14	1.4	1.6	245	0.808
1918.4	1.2	7.2	0.583	1.7	237	1.6	17	1.1	2.6	271	1.2
1919.1	0.763	7.8	0.652	0.800	222	0.775	11	1.2	1.2	254	0.565
1919.8	0.875	7.8	0.613	0.818	235	1.0	13	1.1	1.3	268	0.752
1920.5	0.802	7.3	0.680	0.509	212	1.5	12	1.2	0.780	243	1.1



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1921.2	1.2	8.4	0.427	0.509	242	0.589	17	0.780	0.780	277	0.430
1921.9	0.269	7.5	1.0	1.7	214	1.0	3.9	1.9	2.5	245	0.735
1922.6	0.947	8.3	0.930	1.1	236	1.0	14	1.7	1.7	270	0.751
1923.3	0.519	7.7	1.1	0.978	208	1.5	7.5	2.1	1.5	238	1.1
1924.0	1.0	6.9	1.0	1.9	228	1.1	15	1.9	2.9	261	0.807
1924.7	0.443	8.2	0.984	1.6	244	1.6	6.4	1.8	2.5	279	1.2
1925.4	0.957	6.9	1.1	0.958	222	0.821	14	2.0	1.5	254	0.599
1926.1	0.819	7.9	1.1	0.509	206	0.964	12	1.9	0.780	236	0.704
1926.8	0.915	7.9	1.1	0.509	206	1.4	13	2.1	0.780	236	1.0
1927.5	1.3	7.9	1.1	1.1	225	1.6	18	2.0	1.7	257	1.2
1928.2	1.3	7.6	1.4	0.771	206	2.3	19	2.5	1.2	236	1.7
1928.9	1.000	6.6	0.931	0.509	220	1.3	14	1.7	0.780	252	0.940
1929.6	0.842	8.5	0.997	1.4	200	1.6	12	1.8	2.2	229	1.2
1930.3	0.447	7.1	1.4	1.1	238	1.7	6.5	2.5	1.8	273	1.2
1931.0	0.567	8.4	1.4	1.1	209	1.1	8.2	2.5	1.7	239	0.790
1931.7	0.612	6.3	0.862	0.509	198	0.992	8.8	1.6	0.780	226	0.724
1932.4	1.1	8.5	1.4	1.2	230	0.892	16	2.5	1.8	263	0.651
1933.1	0.381	8.9	1.3	1.2	196	1.5	5.5	2.4	1.8	224	1.1
1933.8	0.684	7.9	1.3	0.509	211	1.2	9.9	2.4	0.780	241	0.869
1934.5	0.311	9.1	1.5	0.509	220	1.5	4.5	2.7	0.780	252	1.1
1935.2	1.2	7.1	1.5	1.5	207	1.3	18	2.7	2.2	236	0.931
1935.8	0.901	7.4	1.4	0.509	227	1.6	13	2.5	0.780	259	1.1
1936.5	0.455	7.5	1.4	0.511	210	1.4	6.6	2.6	0.783	241	1.0
1937.2	0.736	7.6	1.3	0.509	206	1.1	11	2.3	0.780	236	0.816
1937.9	0.442	7.8	1.9	0.924	183	1.1	6.4	3.5	1.4	210	0.809
1938.6	0.858	9.0	1.4	1.4	186	1.1	12	2.6	2.1	212	0.828
1939.3	0.540	8.7	1.6	0.509	208	1.1	7.8	2.9	0.780	238	0.828
1940.0	0.989	9.0	1.7	2.0	189	0.968	14	3.0	3.1	216	0.706
1940.7	0.437	8.4	1.3	1.3	200	1.0	6.3	2.4	2.0	228	0.742
1941.4	0.725	8.5	1.9	2.2	212	1.4	10	3.4	3.4	242	1.0
1942.1	0.364	8.4	1.3	1.2	222	2.0	5.3	2.4	1.8	253	1.5
1942.8	0.443	9.0	1.8	0.641	201	0.929	6.4	3.2	0.982	230	0.678
1943.5	0.661	8.7	1.3	1.6	196	1.1	9.5	2.4	2.5	224	0.784
1944.2	0.617	8.3	1.2	0.795	197	1.2	8.9	2.3	1.2	225	0.900
1944.9	1.2	9.1	1.4	1.2	200	1.3	18	2.6	1.9	229	0.975
1945.6	0.548	8.8	1.1	1.7	188	0.962	7.9	2.1	2.5	215	0.702
1946.3	0.410	9.8	1.5	2.5	197	1.8	5.9	2.8	3.9	226	1.3
1947.0	0.928	6.6	1.9	1.7	193	1.0	13	3.4	2.6	221	0.737
1947.7	1.0	9.0	1.8	2.5	201	1.6	14	3.3	3.8	230	1.1
1948.4	1.4	11	1.4	0.509	208	0.592	20	2.6	0.780	238	0.432
1949.1	0.865	7.4	1.5	1.4	178	1.2	12	2.8	2.1	204	0.868
1949.8	0.893	8.3	1.6	2.9	190	1.2	13	2.9	4.4	218	0.896
1950.5	0.627	11	1.6	2.8	202	0.861	9.1	3.0	4.3	231	0.628
1951.2	1.5	10	1.3	2.3	209	0.986	21	2.5	3.6	239	0.719
1951.9	0.341	9.8	1.3	3.3	187	0.936	4.9	2.4	5.1	213	0.683
1952.6	1.2	8.7	1.4	3.5	194	0.849	18	2.6	5.4	222	0.619
1953.3	1.1	8.1	1.1	3.9	182	0.870	16	2.1	5.9	208	0.634
1954.0	0.376	8.3	1.4	3.8	183	1.1	5.4	2.5	5.9	209	0.772
1954.7	1.0	6.9	1.5	3.8	181	0.952	15	2.7	5.8	207	0.695
1955.4	1.1	11	1.5	5.9	197	0.647	16	2.7	9.0	226	0.472
1956.1	0.865	9.3	1.4	4.4	194	0.940	12	2.5	6.7	222	0.686
1956.8	0.720	9.1	1.5	4.4	201	0.701	10	2.8	6.7	230	0.512
1957.5	0.694	11	1.6	4.3	187	0.676	10	2.8	6.6	213	0.494
1958.2	0.922	10	1.3	5.3	188	0.870	13	2.3	8.1	215	0.635
1958.9	0.600	11	1.3	8.2	200	0.728	8.7	2.4	12	229	0.531
1959.6	0.734	10	1.2	6.7	196	0.635	11	2.2	10	224	0.463
1960.3	1.4	9.7	1.6	8.5	187	0.853	20	3.0	13	214	0.622
1961.0	0.648	12	1.7	6.6	202	0.787	9.4	3.1	10	231	0.574
1961.6	0.768	13	1.3	5.8	188	0.915	11	2.5	8.9	215	0.668
1962.3	0.769	11	1.3	7.4	203	0.833	11	2.4	11	233	0.608
1963.0	1.1	11	1.3	6.9	195	0.626	16	2.3	11	223	0.457
1963.7	1.5	11	1.5	8.2	213	0.607	21	2.8	13	244	0.443
1964.4	1.1	9.8	1.5	6.5	181	0.605	16	2.8	10.0	207	0.442
1965.1	0.514	9.4	0.973	7.5	194	0.413	7.4	1.8	11	221	0.301
1965.8	1.3	11	0.912	7.1	201	0.483	19	1.7	11	230	0.352
1966.5	0.589	12	1.2	8.4	212	1.4	8.5	2.2	13	242	1.0
1967.2	0.975	11	0.916	7.6	199	0.874	14	1.7	12	228	0.638
1967.9	1.2	9.7	1.1	8.0	207	0.341	17	2.0	12	237	0.249
1968.6	0.548	12	0.964	8.8	191	0.482	7.9	1.8	13	219	0.352
1969.3	1.4	13	1.2	8.7	208	0.336	20	2.2	13	238	0.245
1970.0	0.992	11	0.854	6.3	183	0.693	14	1.6	9.7	209	0.506
1970.7	1.1	11	0.859	7.7	187	1.0	16	1.6	12	213	0.736
1971.4	1.0	11	0.852	9.4	208	0.640	15	1.6	14	237	0.467
1972.1	0.764	13	0.825	7.6	212	0.329	11	1.5	12	242	0.240
1972.8	0.818	10	0.699	7.4	197	0.631	12	1.3	11	225	0.460
1973.5	1.3	10	0.699	6.2	188	0.660	19	1.3	9.5	215	0.482
1974.2	0.815	11	0.830	6.3	191	0.780	12	1.5	9.6	219	0.569
1974.9	1.1	10	1.0	7.3	182	1.1	16	1.9	11	208	0.827
1975.6	1.1	11	0.697	5.1	200	0.483	16	1.3	7.8	229	0.353
1976.3	1.3	12	0.672	8.3	200	0.478	19	1.2	13	228	0.349
1977.0	0.269	10	0.525	5.9	214	0.490	3.9	0.958	9.1	245	0.358



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1977.7	0.807	11	0.502	6.3	206	0.523	12	0.915	9.7	236	0.382
1978.4	0.807	11	0.489	6.9	188	0.655	12	0.892	11	215	0.478
1979.1	1.8	11	0.622	6.1	215	0.438	26	1.1	9.4	246	0.320
1979.8	0.968	12	0.599	5.9	195	0.601	14	1.1	9.0	223	0.438
1980.5	0.803	11	0.577	8.0	201	0.898	12	1.1	12	230	0.655
1981.2	1.3	11	0.763	5.8	216	0.602	18	1.4	8.9	247	0.439
1981.9	0.985	10	0.598	6.9	204	0.336	14	1.1	11	233	0.245
1982.6	1.1	9.4	0.717	4.0	206	0.314	16	1.3	6.2	236	0.229
1983.3	0.926	12	0.633	8.0	229	0.794	13	1.2	12	262	0.580
1984.0	1.3	12	0.698	5.5	174	0.701	19	1.3	8.4	199	0.511
1984.7	1.4	11	0.486	5.1	192	1.3	21	0.886	7.8	219	0.942
1985.4	1.0	9.9	0.605	5.6	207	0.401	15	1.1	8.6	236	0.292
1986.1	1.6	11	0.699	6.4	190	0.461	22	1.3	9.8	217	0.336
1986.8	1.2	11	0.644	5.1	194	0.521	18	1.2	7.8	221	0.380
1987.5	0.957	11	0.829	4.0	191	1.1	14	1.5	6.1	219	0.798
1988.1	1.3	11	0.788	6.3	187	0.696	18	1.4	9.7	214	0.508
1988.8	1.4	10.0	0.684	5.3	196	0.872	20	1.2	8.1	224	0.636
1989.5	1.5	12	0.621	3.8	207	0.964	21	1.1	5.8	236	0.703
1990.2	1.7	11	0.671	3.7	203	0.718	24	1.2	5.7	232	0.524
1990.9	2.2	10	0.504	4.0	199	0.702	32	0.919	6.1	227	0.512
1991.6	1.0	11	0.772	3.2	183	0.322	15	1.4	5.0	210	0.235
1992.3	0.826	10	0.557	3.7	188	0.840	12	1.0	5.7	215	0.613
1993.0	1.6	10	0.857	4.5	201	1.1	23	1.6	6.9	230	0.799
1993.7	0.906	11	0.621	5.2	184	0.739	13	1.1	7.9	210	0.539
1994.4	0.744	11	0.641	6.1	204	0.805	11	1.2	9.3	233	0.588
1995.1	1.8	10	0.561	3.5	189	0.901	27	1.0	5.4	216	0.658
1995.8	2.1	11	0.763	3.0	192	0.656	30	1.4	4.5	220	0.479
1996.5	1.1	9.0	0.718	4.8	183	0.705	16	1.3	7.4	209	0.514
1997.2	1.2	9.0	0.659	6.7	201	0.520	17	1.2	10	230	0.380
1997.9	1.1	11	1.0	4.5	207	0.911	15	1.8	7.0	237	0.665
1998.6	1.2	9.8	0.712	4.7	203	0.884	17	1.3	7.3	233	0.645
1999.3	2.1	10	0.864	4.5	217	0.848	31	1.6	7.0	249	0.619
2000.0	1.4	9.5	0.706	4.3	196	0.477	20	1.3	6.5	224	0.348
2000.7	1.5	8.3	0.764	3.2	184	0.674	22	1.4	4.9	210	0.492
2001.4	1.5	9.9	0.752	4.1	222	0.679	21	1.4	6.3	254	0.495
2002.1	1.3	9.1	0.679	3.9	208	0.944	18	1.2	6.0	238	0.689
2002.8	1.1	8.3	1.0	2.6	192	0.645	16	1.9	3.9	219	0.470
2003.5	1.2	9.7	0.910	3.6	195	0.967	17	1.7	5.4	224	0.706
2004.2	1.6	9.3	0.771	1.8	201	0.912	23	1.4	2.7	229	0.666
2004.9	1.6	8.8	0.815	2.2	197	0.639	23	1.5	3.4	225	0.466
2005.6	1.2	9.2	0.902	2.9	196	0.940	18	1.6	4.5	224	0.686
2006.3	1.8	8.3	1.0	3.0	217	1.1	26	1.8	4.5	248	0.813
2007.0	0.881	9.3	1.2	3.3	234	0.878	13	2.1	5.1	268	0.640
2007.7	0.823	9.9	1.1	2.2	204	0.788	12	2.1	3.4	234	0.575
2008.4	1.1	10.0	0.830	3.8	203	0.545	15	1.5	5.8	232	0.398
2009.1	1.7	10	1.2	3.4	199	0.882	25	2.3	5.2	227	0.643
2009.8	0.948	10	1.2	3.8	201	1.1	14	2.2	5.9	229	0.790
2010.5	1.4	9.8	0.961	2.5	216	0.990	20	1.8	3.9	247	0.722
2011.2	1.5	11	1.2	3.5	213	1.2	22	2.2	5.3	244	0.897
2011.9	1.5	9.6	1.0	2.7	219	0.558	22	1.8	4.1	250	0.407
2012.6	0.911	7.8	0.935	1.7	200	0.546	13	1.7	2.5	229	0.398
2013.3	1.6	8.9	1.0	2.3	215	1.3	23	1.8	3.6	246	0.928
2014.0	0.925	8.5	1.1	3.7	192	0.754	13	2.0	5.7	219	0.550
2014.7	1.1	9.7	1.0	2.9	195	0.944	16	1.9	4.5	223	0.689
2015.4	0.834	9.7	0.813	2.0	212	1.1	12	1.5	3.1	242	0.816
2016.0	1.4	8.9	0.858	3.3	200	1.1	20	1.6	5.1	228	0.792
2016.7	1.0	9.7	1.0	3.2	219	1.2	15	1.9	4.9	251	0.878
2017.4	1.0	8.7	1.0	2.5	229	1.9	15	1.9	3.8	261	1.4
2018.1	1.3	10	1.3	4.4	226	1.6	18	2.5	6.8	258	1.1
2018.8	1.2	8.3	1.1	2.7	211	1.2	17	2.0	4.2	242	0.896
2019.5	1.1	8.8	1.1	3.2	251	0.889	16	2.1	5.0	287	0.649
2020.2	1.1	8.6	0.748	3.4	196	0.826	15	1.4	5.2	224	0.603
2020.9	1.7	9.4	0.767	2.6	210	1.0	24	1.4	3.9	240	0.764
2021.6	0.794	10	0.607	1.7	199	0.564	11	1.1	2.6	228	0.411
2022.3	1.3	7.9	0.766	1.8	224	1.2	19	1.4	2.7	256	0.907
2023.0	0.751	8.3	0.829	1.4	227	1.3	11	1.5	2.1	259	0.951
2023.7	1.0	11	0.670	2.0	213	0.757	15	1.2	3.1	244	0.552
2024.4	1.0	8.7	0.737	1.7	201	1.0	15	1.3	2.5	230	0.757
2025.1	0.961	8.5	0.877	1.5	198	0.672	14	1.6	2.3	226	0.490
2025.8	0.924	8.5	0.517	1.5	222	1.8	13	0.942	2.4	254	1.3
2026.5	1.1	7.0	0.639	1.3	202	0.963	16	1.2	1.9	230	0.702
2027.2	1.5	8.2	0.684	1.1	208	1.3	21	1.2	1.7	238	0.941
2027.9	1.3	10.0	0.628	0.509	206	0.774	19	1.1	0.780	235	0.565
2028.6	1.4	6.7	0.593	1.3	197	1.2	20	1.1	2.0	226	0.890
2029.3	1.5	7.8	0.537	0.779	220	1.0	21	0.979	1.2	252	0.761
2030.0	1.3	7.2	0.382	0.518	217	1.1	18	0.696	0.794	248	0.784
2030.7	1.5	8.3	0.427	1.2	212	0.673	22	0.779	1.9	242	0.491
2031.4	1.1	8.7	0.342	0.892	234	0.777	16	0.624	1.4	267	0.567
2032.1	1.5	7.4	0.491	1.5	209	1.1	22	0.896	2.3	239	0.782
2032.8	1.1	8.3	0.275	1.3	226	1.4	16	0.502	2.0	258	1.0
2033.5	0.775	8.3	0.277	1.9	219	0.709	11	0.505	2.9	251	0.517



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2034.2	1.3	9.6	0.517	1.1	215	1.2	19	0.944	1.6	246	0.885
2034.9	1.2	7.6	0.384	0.509	197	1.3	17	0.700	0.780	225	0.941
2035.6	1.3	7.2	0.390	0.940	217	1.3	18	0.712	1.4	248	0.941
2036.3	1.3	7.4	0.585	0.509	220	0.768	18	1.1	0.780	251	0.561
2037.0	0.892	9.1	0.558	2.2	214	1.5	13	1.0	3.4	245	1.1
2037.7	1.3	9.2	0.336	2.2	214	1.3	18	0.612	3.4	245	0.938
2038.4	0.788	7.8	0.210	1.2	214	1.2	11	0.383	1.8	245	0.878
2039.1	2.2	7.3	0.417	1.3	193	1.2	31	0.761	2.1	220	0.864
2039.8	1.0	7.5	0.454	1.6	223	0.987	15	0.827	2.5	255	0.720
2040.5	0.979	6.7	0.437	1.1	194	0.837	14	0.796	1.7	221	0.611
2041.2	1.1	7.6	0.398	0.737	189	0.656	16	0.726	1.1	216	0.479
2041.8	1.2	7.8	0.430	0.509	208	0.649	18	0.784	0.780	237	0.473
2042.5	1.1	8.2	0.747	2.0	209	1.1	16	1.4	3.1	239	0.822
2043.2	0.727	6.8	0.557	0.509	205	1.2	10	1.0	0.780	234	0.863
2043.9	1.0	7.1	0.825	1.5	202	1.4	14	1.5	2.3	231	1.0
2044.6	1.0	8.6	0.489	1.1	215	1.1	15	0.893	1.6	246	0.779
2045.3	0.700	7.3	0.559	0.665	221	1.0	10	1.0	1.0	253	0.764
2046.0	0.776	7.6	0.470	0.602	190	1.0	11	0.858	0.922	217	0.749
2046.7	1.1	8.0	0.483	1.5	213	1.0	15	0.880	2.4	244	0.741
2047.4	0.903	8.1	0.652	0.760	198	1.0	13	1.2	1.2	226	0.753
2048.1	0.930	7.0	0.790	0.886	184	1.3	13	1.4	1.4	211	0.942
2048.8	0.534	7.7	0.625	1.6	194	0.864	7.7	1.1	2.4	222	0.630
2049.5	0.428	7.0	0.912	0.509	200	1.0	6.2	1.7	0.780	229	0.752
2050.2	1.1	8.1	0.811	0.509	206	1.3	15	1.5	0.780	236	0.968
2050.9	0.760	7.5	0.660	1.7	189	0.947	11	1.2	2.7	216	0.691
2051.6	1.3	7.2	0.900	1.8	221	0.829	19	1.6	2.7	252	0.605
2052.3	1.0	10.0	1.0	0.509	208	1.2	15	1.9	0.780	237	0.890
2053.0	0.927	6.6	0.837	1.4	204	1.3	13	1.5	2.1	233	0.939
2053.7	0.776	8.6	1.1	0.767	198	0.295	11	2.1	1.2	226	0.215
2054.4	1.1	8.2	1.1	1.2	189	0.936	17	2.0	1.9	217	0.683
2055.1	1.0	8.5	1.2	2.3	204	1.2	15	2.3	3.6	233	0.879
2055.8	0.767	6.7	1.3	0.911	217	0.937	11	2.4	1.4	249	0.683
2056.5	0.764	8.0	1.8	2.8	205	2.1	11	3.3	4.2	234	1.5
2057.2	0.870	6.8	1.6	2.2	216	0.945	13	3.0	3.4	247	0.689
2057.9	0.864	9.0	1.8	1.8	211	2.1	12	3.2	2.7	241	1.5
2058.6	0.833	9.1	1.9	3.6	223	1.3	12	3.5	5.5	256	0.928
2059.3	1.3	8.4	1.9	1.4	199	1.0	19	3.5	2.1	228	0.763
2060.0	0.537	9.1	2.1	3.8	207	1.5	7.8	3.9	5.8	237	1.1
2060.7	0.774	8.9	2.4	0.509	231	1.1	11	4.3	0.780	264	0.796
2061.4	1.1	11	1.9	4.7	239	1.5	16	3.4	7.2	273	1.1
2062.1	0.740	9.1	2.1	1.5	217	0.882	11	3.8	2.3	248	0.644
2062.8	0.967	8.6	1.6	4.3	204	1.8	14	2.9	6.6	233	1.3
2063.5	0.732	9.4	1.8	5.4	240	1.3	11	3.3	8.3	275	0.926
2064.2	0.738	11	1.5	2.9	201	1.1	11	2.7	4.5	230	0.775
2064.9	1.7	10	1.7	5.5	210	1.0	24	3.0	8.5	240	0.738
2065.6	0.642	9.9	1.6	5.0	220	0.881	9.3	2.9	7.7	252	0.643
2066.3	1.3	9.7	1.5	4.5	217	1.2	18	2.7	6.9	248	0.844
2067.0	1.1	9.7	2.0	5.3	237	1.1	16	3.7	8.2	271	0.803
2067.7	1.2	10	1.3	5.7	210	0.645	17	2.3	8.8	240	0.471
2068.3	1.1	10	1.5	5.1	234	1.7	16	2.7	7.9	267	1.2
2069.0	0.567	12	1.8	5.2	218	1.8	8.2	3.3	8.0	250	1.3
2069.7	0.754	8.8	1.5	6.0	222	0.899	11	2.8	9.2	254	0.656
2070.4	0.755	8.4	0.969	5.7	198	0.998	11	1.8	8.7	227	0.728
2071.1	0.972	12	1.6	7.3	230	1.0	14	2.9	11	263	0.730
2071.8	0.919	10	1.5	7.1	220	0.748	13	2.7	11	251	0.546
2072.5	1.1	8.9	1.3	6.8	216	0.742	15	2.4	10	246	0.542
2073.2	1.0	9.6	1.3	6.5	221	0.931	15	2.3	9.9	253	0.680
2073.9	1.2	10.0	1.1	8.1	233	1.1	18	2.1	12	266	0.826
2074.6	0.988	11	1.4	8.3	223	0.805	14	2.5	13	255	0.587
2075.3	0.390	11	1.1	8.3	214	0.939	5.6	2.1	13	244	0.685
2076.0	1.1	9.7	1.3	8.7	198	0.610	16	2.3	13	226	0.445
2076.7	1.0	11	1.3	7.2	215	0.373	15	2.3	11	246	0.272
2077.4	0.513	12	1.2	9.1	221	0.451	7.4	2.2	14	253	0.329
2078.1	0.976	13	1.3	6.7	225	1.0	14	2.3	10	257	0.755
2078.8	0.929	11	1.1	5.9	224	0.797	13	2.1	9.0	256	0.581
2079.5	0.894	12	1.0	11	224	0.613	13	1.9	16	256	0.447
2080.2	0.740	9.8	1.1	8.4	230	0.752	11	2.1	13	263	0.549
2080.9	1.3	8.3	0.755	12	237	0.554	18	1.4	19	271	0.404
2081.6	0.758	9.7	0.991	11	222	1.0	11	1.8	16	254	0.731
2082.3	0.841	11	1.1	9.2	228	0.805	12	2.0	14	261	0.587
2083.0	1.7	9.4	0.967	13	262	0.856	24	1.8	19	300	0.624
2083.7	1.1	11	0.878	12	231	0.515	15	1.6	18	264	0.376
2084.4	1.9	9.9	0.891	13	238	0.754	27	1.6	20	272	0.550
2085.1	1.2	8.6	1.1	11	229	0.855	18	2.0	17	262	0.623
2085.8	0.601	11	0.916	12	227	0.403	8.7	1.7	18	260	0.294
2086.5	0.910	11	0.922	12	235	0.832	13	1.7	18	269	0.607
2087.2	0.771	11	1.1	10	235	0.445	11	2.0	15	269	0.325
2087.9	1.0	11	0.672	12	222	1.2	14	1.2	18	253	0.911
2088.6	0.918	9.9	0.812	13	208	0.824	13	1.5	20	238	0.601
2089.3	1.3	8.6	0.587	8.2	189	0.515	19	1.1	13	216	0.376
2090.0	0.720	9.9	0.725	13	204	0.545	10	1.3	20	233	0.398



Minnow Environmental  
Sample ID: 005

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
2090.7	1.4	11	0.812	12	231	1.1	21	1.5	19	264	0.797
2091.4	1.6	12	0.634	12	230	0.476	23	1.2	19	263	0.347
2092.1	1.2	11	0.767	13	240	0.930	17	1.4	20	275	0.679
2092.8	1.1	12	0.541	12	247	0.505	16	0.987	19	282	0.369
2093.5	1.3	13	0.765	12	236	0.674	19	1.4	18	270	0.492
2094.2	1.3	11	0.822	13	253	0.726	19	1.5	20	289	0.529
2094.9	1.1	10	0.340	14	242	0.773	16	0.621	21	276	0.564
2095.5	1.3	12	0.750	11	268	0.932	19	1.4	17	307	0.680
2096.2	1.4	11	0.576	14	229	0.472	20	1.1	22	261	0.345
2096.9	1.0	10.0	0.825	10	217	0.506	15	1.5	16	249	0.369
2097.6	0.905	11	0.514	11	215	0.542	13	0.938	17	246	0.396
2098.3	1.1	10	0.536	11	218	0.529	16	0.977	17	249	0.386
2099.0	1.3	11	0.576	12	214	0.324	19	1.1	19	244	0.236
2099.7	1.7	10	0.541	9.4	218	0.790	24	0.987	14	250	0.576
2100.4	0.876	9.9	0.668	11	227	0.839	13	1.2	17	259	0.612
2101.1	1.1	11	0.590	8.5	225	0.369	16	1.1	13	257	0.269
2101.8	1.2	11	0.693	11	222	0.410	17	1.3	17	254	0.299
2102.5	1.3	9.7	0.533	12	233	0.581	19	0.972	19	267	0.424
2103.2	1.5	12	0.694	13	213	1.0	22	1.3	19	243	0.743
2103.9	1.6	10.0	0.286	12	224	0.613	24	0.522	18	256	0.447
2104.6	1.2	10	0.545	11	206	0.987	17	0.994	17	236	0.720
2105.3	1.6	11	0.583	12	231	0.639	23	1.1	19	264	0.466
2106.0	1.4	11	0.469	11	229	0.764	20	0.855	17	262	0.558
2106.7	1.6	11	0.907	11	250	0.752	24	1.7	17	286	0.549
2107.4	1.5	12	0.479	11	212	0.447	21	0.873	16	243	0.326
2108.1	2.2	12	0.681	9.9	232	0.582	32	1.2	15	265	0.424
2108.8	1.5	9.4	0.458	9.5	226	0.614	21	0.835	15	259	0.448
2109.5	0.691	8.8	0.638	11	235	0.238	10.0	1.2	16	269	0.174
2110.2	2.2	10	0.553	9.5	243	0.690	32	1.0	15	278	0.503
2110.9	1.1	11	0.419	10	256	1.0	16	0.765	16	293	0.752
2111.6	2.1	10.0	0.592	11	214	0.519	31	1.1	17	245	0.379
2112.3	1.9	9.5	0.824	9.1	234	0.809	28	1.5	14	267	0.590
2113.0	2.0	11	0.334	11	229	0.673	29	0.608	17	262	0.491
2113.7	1.3	10	0.770	10	231	0.579	18	1.4	15	264	0.422
2114.4	2.1	11	0.736	8.6	220	0.463	31	1.3	13	252	0.338
2115.1	1.5	8.5	0.718	9.6	217	0.603	21	1.3	15	248	0.440
2115.8	1.3	9.2	0.585	8.8	237	0.802	19	1.1	14	271	0.585
2116.5	1.2	9.8	0.887	11	239	0.499	17	1.6	16	273	0.364
2117.2	1.3	11	0.741	8.0	218	0.532	19	1.4	12	249	0.388
2117.9	1.7	10	0.687	8.8	236	1.0	24	1.3	14	270	0.756
2118.6	1.7	9.7	0.723	10	221	0.507	25	1.3	16	253	0.370
2119.3	1.3	10.0	0.773	7.9	228	0.568	19	1.4	12	261	0.414
2120.0	1.4	8.9	0.760	8.8	243	0.981	21	1.4	13	278	0.716
2120.7	1.4	9.2	0.801	9.8	238	1.0	20	1.5	15	272	0.730
2121.4	1.7	9.6	1.2	7.9	233	1.4	25	2.1	12	266	1.1
2122.0	1.1	9.2	0.954	9.6	230	2.0	15	1.7	15	263	1.4
2122.7	2.2	10	0.842	10	242	1.8	32	1.5	16	277	1.3
2123.4	2.1	9.8	0.937	7.6	231	0.940	30	1.7	12	264	0.686
2124.1	1.3	9.1	1.0	7.5	242	1.1	19	1.8	12	276	0.787
2124.8	0.982	8.6	1.3	8.9	238	0.874	14	2.4	14	272	0.638
2125.5	1.8	8.1	1.3	9.4	257	1.0	25	2.4	14	293	0.760
2126.2	2.3	9.7	1.1	6.5	260	1.2	33	2.1	10.0	298	0.839
2126.9	1.9	9.8	1.5	7.0	256	1.4	27	2.8	11	292	1.0
2127.6	1.9	8.9	1.1	5.7	252	1.0	27	2.0	8.8	288	0.753
2128.3	1.7	10	1.3	9.0	265	1.7	25	2.3	14	304	1.2
2129.0	2.0	8.6	1.2	5.1	242	1.0	29	2.2	7.8	277	0.760
2129.7	2.0	7.7	1.3	5.6	254	1.5	29	2.3	8.6	290	1.1
2130.4	1.3	8.6	1.0	5.3	267	1.4	19	1.9	8.1	305	1.1
2131.1	1.7	9.5	1.3	5.9	279	1.6	24	2.4	9.1	319	1.2
2131.8	1.9	9.3	1.4	6.0	242	1.5	27	2.6	9.1	276	1.1
2132.5	1.8	9.4	1.5	4.6	264	1.1	26	2.8	7.1	302	0.783
2133.2	1.9	10	1.6	4.3	273	1.4	27	2.9	6.5	312	1.0
2133.9	1.6	9.2	1.4	6.0	264	1.5	24	2.5	9.1	302	1.1
2134.6	1.7	11	1.2	2.7	281	1.2	25	2.2	4.1	321	0.878
2135.3	1.6	9.9	1.1	3.0	275	1.7	23	2.0	4.6	314	1.2
2136.0	1.4	9.2	1.1	2.8	261	1.6	20	2.0	4.2	298	1.2
2136.7	1.2	9.5	1.0	4.0	258	1.2	18	1.8	6.2	294	0.891
2137.4	1.3	7.2	0.832	3.1	248	1.6	19	1.5	4.8	284	1.1
2138.1	1.6	8.3	0.771	4.1	275	1.5	24	1.4	6.3	315	1.1
2138.8	1.1	9.3	0.916	3.6	254	1.0	16	1.7	5.6	290	0.740
2139.5	0.820	10	0.433	3.5	268	0.706	12	0.790	5.3	307	0.515
2140.2	0.824	9.4	0.760	3.7	255	1.1	12	1.4	5.7	292	0.795
2140.9	1.1	11	0.662	2.2	257	1.4	16	1.2	3.4	294	1.0
2141.6	1.4	10	0.483	3.4	246	0.937	20	0.880	5.3	281	0.684
2142.3	0.951	9.7	0.766	2.9	297	1.6	14	1.4	4.5	339	1.2
2143.0	1.2	10	0.532	3.0	256	1.2	18	0.971	4.6	293	0.910
2143.7	0.907	9.4	0.416	2.6	279	2.0	13	0.759	4.0	320	1.4
2144.4	0.965	8.2	0.427	3.9	242	1.4	14	0.779	6.0	277	0.995
2145.1	1.2	10	0.529	3.6	254	0.850	18	0.966	5.5	291	0.621
2145.8	0.979	11	0.636	3.3	254	1.4	14	1.2	5.1	291	1.1
2146.5	1.4	8.4	0.522	3.5	249	1.8	20	0.952	5.3	285	1.3



Minnow Environmental  
Sample ID: 005

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
2147.2	0.998	9.0	0.507	3.0	235	2.0	14	0.926	4.5	268	1.5
2147.8	1.1	11	0.570	2.4	247	1.8	16	1.0	3.6	282	1.3
2148.5	1.9	9.1	0.595	2.6	284	2.9	27	1.1	4.0	325	2.1
2149.2	1.4	9.5	0.554	3.7	248	3.4	20	1.0	5.6	283	2.4
2149.9	1.1	9.5	0.417	4.2	271	2.8	16	0.760	6.4	310	2.0
2150.6	0.927	8.8	0.633	3.2	259	2.7	13	1.2	4.9	296	2.0
2151.3	0.965	8.6	0.659	2.8	297	3.1	14	1.2	4.2	340	2.2
2152.0	1.1	7.5	0.395	2.8	277	3.0	16	0.721	4.3	317	2.2
2152.7	1.7	8.6	0.604	3.3	270	2.5	24	1.1	5.1	309	1.8
2153.4	0.891	8.7	1.0	4.7	294	2.5	13	1.8	7.2	337	1.8
2154.1	0.583	9.0	0.748	4.3	266	2.8	8.4	1.4	6.6	304	2.0
2154.8	1.9	8.6	0.856	3.4	287	4.0	27	1.6	5.2	328	2.9
2155.5	1.2	10	0.794	3.1	280	3.0	17	1.4	4.8	320	2.2
2156.2	1.3	11	1.1	3.5	270	3.5	19	2.0	5.3	308	2.6
2156.9	1.3	7.8	1.1	3.1	274	2.6	19	2.1	4.8	313	1.9
2157.6	1.5	7.8	0.923	3.6	294	2.6	21	1.7	5.5	336	1.9
2158.3	1.2	10	0.729	2.5	280	3.8	17	1.3	3.9	320	2.8
2159.0	1.4	9.5	1.1	5.6	289	3.3	20	2.0	8.5	331	2.4
2159.7	1.1	11	1.3	5.9	253	4.0	17	2.3	9.1	289	2.9
2160.4	0.969	7.6	1.1	2.8	259	2.6	14	2.0	4.4	297	1.9
2161.1	1.2	9.2	1.4	4.4	259	2.7	17	2.5	6.8	296	2.0
2161.8	0.982	8.9	1.3	2.4	260	3.4	14	2.4	3.7	297	2.5
2162.5	1.4	7.1	1.3	3.7	267	2.1	20	2.4	5.6	306	1.5
2163.2	1.3	8.3	1.1	2.9	287	2.3	19	2.0	4.4	328	1.7
2163.9	1.1	8.1	1.6	3.6	257	3.0	15	2.9	5.5	294	2.2
2164.6	1.2	10	1.4	4.7	285	2.2	17	2.6	7.3	325	1.6
2165.3	1.1	8.8	1.5	3.9	307	3.2	16	2.7	6.0	351	2.4
2166.0	0.721	10	1.3	4.6	269	2.3	10	2.4	7.1	308	1.7
2166.7	1.5	10	1.8	4.8	274	2.0	21	3.3	7.4	313	1.5
2167.4	1.1	9.0	1.7	5.9	319	2.1	16	3.1	9.1	364	1.5
2168.1	1.4	11	1.4	7.6	297	2.0	20	2.5	12	340	1.5
2168.8	1.4	9.3	1.8	6.5	301	2.9	20	3.3	9.9	344	2.1
2169.5	1.3	11	1.7	7.4	265	1.2	19	3.1	11	303	0.909
2170.2	1.7	9.4	1.3	6.3	260	2.3	25	2.3	9.7	298	1.7
2170.9	1.1	9.8	1.5	6.1	272	2.2	16	2.7	9.4	311	1.6
2171.6	1.4	10	1.6	7.0	268	2.0	20	2.9	11	306	1.5
2172.3	1.1	9.8	1.4	5.5	257	1.2	16	2.6	8.4	294	0.870
2173.0	1.0	11	2.0	7.3	247	2.0	15	3.7	11	282	1.4
2173.7	1.5	8.6	1.0	5.6	244	2.4	21	1.9	8.5	279	1.7
2174.3	0.854	9.9	1.6	5.6	246	1.6	12	3.0	8.6	281	1.2
2175.0	1.1	10	1.4	6.2	255	1.5	16	2.6	9.5	292	1.1
2175.7	1.0	9.8	1.4	7.2	268	1.3	15	2.5	11	306	0.916
2176.4	0.939	9.8	1.2	6.6	266	1.8	14	2.3	10	304	1.3
2177.1	0.979	9.4	1.8	7.7	249	0.989	14	3.2	12	284	0.722
2177.8	0.978	9.0	1.6	8.0	283	1.4	14	2.9	12	323	1.0
2178.5	1.6	8.4	1.3	9.5	267	0.960	23	2.5	15	305	0.700
2179.2	1.4	10.0	1.3	9.4	289	1.6	20	2.4	14	330	1.1
2179.9	0.922	8.7	1.1	10	265	1.1	13	2.1	15	304	0.792
2180.6	1.9	9.9	1.9	9.3	254	1.5	28	3.5	14	290	1.1
2181.3	1.3	11	1.4	8.8	260	1.6	18	2.5	13	297	1.2
2182.0	1.8	12	1.7	10	274	0.989	26	3.1	16	313	0.722
2182.7	0.981	10	1.4	11	275	1.4	14	2.6	17	315	0.993
2183.4	1.9	10	1.7	9.6	277	1.0	27	3.1	15	316	0.745
2184.1	1.4	11	1.3	9.2	287	0.999	20	2.3	14	328	0.729
2184.8	1.3	12	2.0	14	273	1.6	19	3.6	21	313	1.2
2185.5	2.0	9.6	1.6	13	276	1.5	29	2.8	20	315	1.1
2186.2	1.2	10	1.4	11	256	1.6	17	2.6	17	292	1.1
2186.9	1.9	11	1.5	11	246	1.8	27	2.7	17	281	1.3
2187.6	1.8	11	1.9	10	293	1.4	26	3.4	16	336	1.1
2188.3	1.3	10	2.0	12	260	0.777	19	3.6	19	297	0.567
2189.0	1.1	12	1.7	13	273	1.5	16	3.1	20	312	1.1
2189.7	1.1	8.5	1.6	13	257	0.825	16	2.9	19	294	0.602
2190.4	1.4	11	1.4	18	264	1.3	21	2.6	28	302	0.913
2191.1	1.9	9.6	1.7	13	279	0.913	28	3.1	19	318	0.666
2191.8	1.2	12	1.9	14	263	0.676	18	3.4	22	301	0.493
2192.5	1.9	12	2.3	21	306	1.4	28	4.2	32	350	1.0
2193.2	1.0	11	1.8	18	284	1.5	15	3.4	28	325	1.1
2193.9	1.4	11	1.6	18	277	1.2	20	2.9	27	316	0.877
2194.6	1.8	11	2.1	18	257	0.402	26	3.8	27	294	0.293
2195.3	2.0	12	1.9	18	278	1.1	28	3.4	28	318	0.786
2196.0	1.1	12	1.5	20	275	0.557	15	2.8	31	314	0.406
2196.7	1.1	13	1.6	21	271	1.3	15	2.9	31	310	0.973
2197.4	1.8	11	1.5	20	299	0.657	26	2.7	30	342	0.479
2198.1	0.650	14	1.8	24	299	1.2	9.4	3.2	36	342	0.881
2198.8	1.8	12	1.5	23	271	0.931	25	2.8	35	309	0.679
2199.5	1.1	13	1.4	25	288	0.590	16	2.5	38	329	0.431
2200.2	1.2	11	1.6	17	262	1.2	18	2.8	26	300	0.884
2200.8	1.7	11	1.1	17	254	1.3	25	2.0	26	290	0.962
2201.5	1.1	9.7	0.839	23	246	1.0	16	1.5	35	282	0.734
2202.2	1.3	11	1.3	20	268	0.879	19	2.4	31	307	0.641
2202.9	1.6	11	0.787	20	260	0.970	24	1.4	31	297	0.708



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Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2203.6	1.8	12	0.952	22	248	0.921	26	1.7	34	284	0.672
2204.3	2.0	10	1.0	26	282	1.1	29	1.9	40	322	0.773
2205.0	1.7	9.9	0.802	20	238	0.981	25	1.5	31	272	0.716
2205.7	1.4	13	0.711	19	247	0.994	20	1.3	30	282	0.726
2206.4	1.6	12	0.736	24	257	0.567	23	1.3	37	294	0.413
2207.1	1.8	12	0.751	23	284	1.0	25	1.4	35	325	0.763
2207.8	2.0	11	0.898	22	243	0.544	29	1.6	33	278	0.397
2208.5	1.4	13	0.623	19	254	1.1	21	1.1	29	290	0.812
2209.2	1.9	11	0.687	20	246	1.4	28	1.3	31	281	0.989
2209.9	2.3	12	0.703	20	257	1.1	33	1.3	30	294	0.793
2210.6	2.1	13	0.545	22	258	0.575	30	0.994	34	295	0.419
2211.3	2.1	11	0.707	19	259	0.798	31	1.3	29	297	0.583
2212.0	2.0	13	0.450	18	249	0.509	28	0.821	28	284	0.371
2212.7	2.2	11	0.866	18	236	0.676	31	1.6	28	270	0.494
2213.4	2.5	12	0.670	22	253	0.854	36	1.2	33	290	0.623
2214.1	2.1	13	0.570	16	280	0.582	31	1.0	25	320	0.424
2214.8	2.8	12	0.600	17	264	0.981	41	1.1	26	302	0.715
2215.5	1.8	13	0.531	15	258	1.0	26	0.968	23	295	0.760
2216.2	1.7	10	0.525	16	239	1.2	24	0.958	25	273	0.840
2216.9	2.6	12	0.650	18	292	0.898	38	1.2	27	333	0.655
2217.6	2.0	11	0.365	15	260	0.413	28	0.666	23	298	0.301
2218.3	2.5	11	0.585	15	269	0.801	36	1.1	23	308	0.585
2219.0	2.3	12	0.522	15	274	1.4	33	0.952	23	313	1.0
2219.7	2.6	12	0.463	17	240	0.840	38	0.845	26	274	0.613
2220.4	1.9	11	0.778	14	252	0.879	27	1.4	21	288	0.641
2221.1	2.1	8.6	0.344	14	242	1.3	30	0.628	21	277	0.971
2221.8	2.1	12	0.449	14	273	1.1	30	0.819	21	312	0.832
2222.5	2.5	11	0.755	15	253	0.649	36	1.4	23	290	0.474
2223.2	2.2	9.8	0.444	14	285	0.754	32	0.810	22	326	0.550
2223.9	2.0	11	0.589	12	260	0.946	29	1.1	18	298	0.691
2224.6	2.1	11	0.610	11	301	1.8	31	1.1	17	344	1.3
2225.3	2.1	11	0.608	12	271	0.646	31	1.1	19	310	0.472
2226.0	2.4	10	0.700	11	281	1.3	35	1.3	17	322	0.925
2226.7	2.3	11	0.631	8.6	262	1.1	33	1.2	13	300	0.811
2227.3	2.5	11	0.545	8.1	277	1.7	36	0.995	12	317	1.2
2228.0	2.2	10	0.682	9.1	300	1.5	32	1.2	14	343	1.1
2228.7	2.6	9.6	0.798	8.4	260	0.940	37	1.5	13	298	0.686
2229.4	2.6	11	0.833	7.4	257	1.1	38	1.5	11	294	0.818
2230.1	1.6	9.2	0.814	7.4	272	1.4	23	1.5	11	311	1.1
2230.8	1.9	11	0.736	8.0	289	0.950	27	1.3	12	330	0.693
2231.5	1.7	11	0.818	7.0	278	1.4	25	1.5	11	318	1.1
2232.2	1.9	12	0.580	6.9	302	1.2	28	1.1	11	346	0.866
2232.9	2.2	12	1.1	4.2	319	2.3	32	2.0	6.4	365	1.7
2233.6	1.8	8.8	0.772	4.8	275	1.7	26	1.4	7.3	315	1.2
2234.3	1.4	8.9	1.0	5.0	249	1.4	21	1.9	7.7	284	1.0
2235.0	1.4	9.3	0.978	2.6	276	0.973	20	1.8	4.0	316	0.710
2235.7	1.7	10	0.875	6.3	259	0.895	25	1.6	9.7	296	0.653
2236.4	0.916	9.4	0.881	4.7	263	1.2	13	1.6	7.1	300	0.908
2237.1	2.0	9.7	0.561	6.4	294	1.7	28	1.0	9.7	337	1.2
2237.8	1.8	9.9	0.734	3.8	278	1.5	26	1.3	5.8	318	1.1
2238.5	1.8	10	0.729	4.9	319	1.4	25	1.3	7.5	365	0.988
2239.2	2.0	10	0.683	3.5	278	1.7	29	1.2	5.4	318	1.2
2239.9	1.2	9.6	0.674	3.4	287	1.8	17	1.2	5.2	329	1.3
2240.6	1.7	11	0.560	4.6	309	2.1	25	1.0	7.1	354	1.5
2241.3	1.3	9.5	0.791	3.4	301	2.2	18	1.4	5.2	344	1.6
2242.0	0.999	8.4	0.463	3.4	289	2.2	14	0.844	5.2	330	1.6
2242.7	1.5	10	0.770	3.7	270	2.4	22	1.4	5.6	309	1.8
2243.4	1.6	9.8	0.534	4.7	293	1.8	23	0.973	7.3	335	1.3
2244.1	1.2	8.7	0.422	6.4	305	2.2	17	0.770	9.8	348	1.6
2244.8	0.785	11	0.582	3.5	300	1.7	11	1.1	5.4	343	1.2
2245.5	1.5	9.6	0.488	2.9	257	2.0	22	0.891	4.5	294	1.4
2246.2	1.4	11	0.462	3.6	274	2.2	20	0.843	5.5	313	1.6
2246.9	1.5	12	0.562	2.6	266	2.6	22	1.0	4.0	304	1.9
2247.6	1.6	8.7	0.502	3.3	263	3.0	24	0.915	5.0	300	2.2
2248.3	1.3	9.7	0.384	3.1	249	3.0	18	0.701	4.8	285	2.2
2249.0	1.6	9.6	0.741	6.3	305	2.1	23	1.4	9.7	348	1.5
2249.7	0.571	9.3	0.562	3.6	286	2.3	8.2	1.0	5.5	327	1.7
2250.4	1.2	8.9	0.450	2.7	288	2.2	17	0.820	4.2	329	1.6
2251.1	0.923	7.1	0.549	6.3	282	2.4	13	1.0	9.6	322	1.8
2251.8	1.6	7.7	0.799	4.6	280	2.6	23	1.5	7.1	320	1.9
2252.5	0.978	9.7	0.622	4.8	273	3.7	14	1.1	7.3	313	2.7
2253.2	1.4	7.9	0.689	5.9	250	2.5	21	1.3	9.0	286	1.8
2253.9	1.0	9.5	0.688	5.6	274	2.8	15	1.3	8.5	314	2.0
2254.5	1.6	8.7	0.713	4.2	272	2.9	23	1.3	6.4	311	2.1
2255.2	1.4	9.4	1.0	5.6	284	2.8	20	1.9	8.6	325	2.1
2255.9	1.8	8.5	0.863	4.9	288	3.0	26	1.6	7.5	329	2.2
2256.6	1.1	9.9	1.1	5.6	303	3.0	15	2.1	8.6	346	2.2
2257.3	1.7	9.4	1.1	7.9	277	2.7	25	2.0	12	317	2.0
2258.0	1.6	8.0	1.1	6.3	279	3.4	23	1.9	9.7	319	2.5
2258.7	1.9	8.1	1.3	5.5	266	2.7	27	2.4	8.4	304	2.0
2259.4	1.3	8.8	1.1	7.6	291	2.7	19	2.0	12	333	1.9



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2260.1	1.3	8.3	1.3	5.9	255	2.9	18	2.4	9.0	292	2.1
2260.8	1.1	8.0	1.3	8.0	269	3.7	16	2.4	12	308	2.7
2261.5	1.2	9.0	1.5	8.6	262	2.2	18	2.8	13	299	1.6
2262.2	1.8	9.0	1.5	8.2	263	3.1	26	2.8	13	301	2.3
2262.9	1.3	8.7	1.5	7.3	238	2.4	19	2.8	11	272	1.8
2263.6	1.5	8.9	2.0	6.8	281	4.5	21	3.6	10	321	3.3
2264.3	0.904	9.7	1.9	7.1	241	2.7	13	3.5	11	275	2.0
2265.0	1.0	8.2	1.9	7.0	321	3.7	15	3.5	11	367	2.7
2265.7	0.651	8.4	2.0	11	243	2.6	9.4	3.7	17	278	1.9
2266.4	1.3	8.2	1.8	9.2	265	3.1	19	3.4	14	303	2.3
2267.1	1.1	8.8	2.1	8.1	265	3.6	15	3.9	12	303	2.6
2267.8	0.856	7.1	2.5	7.9	235	3.7	12	4.6	12	269	2.7
2268.5	1.1	9.0	2.8	10	249	3.5	16	5.1	16	284	2.6
2269.2	0.788	8.2	2.4	9.3	252	2.7	11	4.4	14	289	1.9
2269.9	0.787	8.8	2.7	10	250	2.9	11	5.0	16	286	2.1
2270.6	0.951	9.3	2.6	9.3	264	3.2	14	4.8	14	302	2.3
2271.3	1.1	8.9	2.7	10	286	3.6	16	4.8	16	327	2.6
2272.0	0.833	10	2.4	15	281	4.0	12	4.5	22	321	2.9
2272.7	1.6	10.0	3.6	13	296	3.4	23	6.5	20	338	2.5
2273.4	1.2	8.8	2.5	14	268	3.9	18	4.6	22	307	2.9
2274.1	1.3	8.1	2.7	14	278	4.1	19	4.8	21	318	3.0
2274.8	1.1	9.5	2.7	11	271	3.2	16	5.0	17	310	2.3
2275.5	0.423	10.0	2.8	16	313	3.3	6.1	5.2	24	358	2.4
2276.2	1.3	9.2	2.9	13	254	2.8	19	5.3	20	291	2.0
2276.9	1.0	10	2.6	15	277	2.8	15	4.8	23	316	2.0
2277.6	1.2	9.3	2.0	16	272	2.2	17	3.7	24	311	1.6
2278.3	0.542	12	2.7	12	284	2.8	7.8	4.9	18	325	2.0
2279.0	0.740	8.0	2.3	17	275	2.9	11	4.1	26	314	2.1
2279.7	1.4	9.4	2.5	13	253	2.1	20	4.6	20	289	1.5
2280.4	1.1	8.8	2.3	16	261	2.2	16	4.3	25	298	1.6
2281.0	0.914	9.8	2.0	16	258	1.7	13	3.7	25	295	1.3
2281.7	0.759	8.5	1.9	18	272	2.7	11	3.5	27	311	2.0
2282.4	1.0	7.9	1.6	18	275	2.6	14	2.9	27	315	1.9
2283.1	0.771	9.3	1.9	16	257	1.3	11	3.5	24	294	0.973
2283.8	0.761	11	1.6	19	303	3.1	11	2.9	30	346	2.2
2284.5	0.970	10	1.6	18	304	1.3	14	3.0	28	348	0.973
2285.2	1.1	11	1.3	16	276	2.7	17	2.4	25	315	2.0
2285.9	1.1	9.4	1.1	21	245	2.0	16	1.9	33	280	1.5
2286.6	0.530	8.6	1.5	20	248	1.8	7.6	2.6	30	284	1.3
2287.3	0.951	8.8	1.4	18	234	2.1	14	2.6	28	267	1.5
2288.0	0.593	9.3	1.6	19	263	1.8	8.6	2.9	29	300	1.3
2288.7	0.715	9.5	1.3	19	246	1.4	10	2.3	29	281	1.0
2289.4	1.3	9.6	1.2	21	257	1.2	18	2.2	32	294	0.895
2290.1	0.772	10	1.7	22	263	1.5	11	3.1	33	301	1.1
2290.8	0.764	10	1.2	21	241	1.9	11	2.1	31	275	1.4
2291.5	0.570	10	1.4	26	272	1.9	8.2	2.5	39	311	1.4
2292.2	0.828	10	1.1	23	254	2.1	12	2.0	35	291	1.5
2292.9	0.729	8.9	1.1	23	232	1.6	11	2.0	35	266	1.1
2293.6	0.913	11	1.2	20	270	1.5	13	2.2	30	309	1.1
2294.3	0.964	9.2	1.2	23	261	1.4	14	2.1	36	299	1.0
2295.0	1.1	9.6	1.2	25	246	1.7	17	2.2	38	282	1.3
2295.7	0.647	9.6	1.1	21	246	1.3	9.3	2.0	33	282	0.932
2296.4	1.4	9.8	1.3	19	242	1.5	21	2.3	29	277	1.1
2297.1	0.269	9.3	0.825	22	258	1.7	3.9	1.5	34	295	1.3
2297.8	1.8	10.0	0.854	24	267	2.5	26	1.6	37	305	1.8
2298.5	0.905	10	0.756	21	255	1.2	13	1.4	32	292	0.908
2299.2	0.848	9.4	1.1	22	254	1.6	12	2.1	33	291	1.2
2299.9	0.767	9.6	0.985	20	244	1.0	11	1.8	30	279	0.740
2300.6	1.3	9.2	0.752	21	242	1.2	19	1.4	32	277	0.908
2301.3	0.968	9.4	0.822	19	249	0.710	14	1.5	29	285	0.518
2302.0	1.1	9.0	0.626	22	247	1.2	16	1.1	34	282	0.851
2302.7	1.2	10	0.515	21	228	1.4	17	0.940	32	261	0.999
2303.4	1.3	11	0.512	16	271	1.5	18	0.934	24	310	1.1
2304.1	0.963	11	0.712	20	247	1.3	14	1.3	31	282	0.918
2304.8	1.1	11	0.829	17	229	1.2	15	1.5	27	262	0.911
2305.5	1.4	13	0.741	21	264	1.8	20	1.4	32	302	1.3
2306.2	1.1	10	0.708	18	223	1.1	17	1.3	28	255	0.813
2306.9	0.962	11	0.852	20	245	1.4	14	1.6	31	280	1.0
2307.5	1.7	8.8	0.641	17	236	0.915	24	1.2	25	270	0.668
2308.2	1.3	10	0.396	18	242	0.858	19	0.721	28	276	0.626
2308.9	1.5	9.8	113	17	217	1.4	21	206	26	248	1.0
2309.6	1.2	8.9	0.626	18	224	1.2	17	1.1	28	257	0.861
2310.3	0.979	10	0.600	18	246	1.4	14	1.1	27	282	1.1
2311.0	1.1	10	0.573	14	223	1.3	16	1.0	21	255	0.974
2311.7	1.2	8.6	0.544	12	206	0.723	17	0.992	19	236	0.528
2312.4	1.6	9.1	0.417	17	225	1.7	23	0.761	27	257	1.3
2313.1	1.2	10	0.569	16	222	0.937	18	1.0	24	254	0.684
2313.8	1.4	8.7	0.588	13	249	1.8	21	1.1	20	285	1.3
2314.5	2.2	11	0.767	14	291	1.2	32	1.4	21	332	0.904
2315.2	1.7	12	0.669	14	238	0.956	24	1.2	22	272	0.698
2315.9	1.4	9.6	0.640	11	277	1.6	21	1.2	17	316	1.1



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2316.6	1.6	9.2	0.651	11	236	1.0	23	1.2	18	270	0.752
2317.3	1.0	10	0.547	8.8	265	1.6	15	0.998	13	303	1.1
2318.0	1.8	10	0.629	9.3	261	2.4	26	1.1	14	299	1.7
2318.7	0.897	10	0.682	9.9	259	2.0	13	1.2	15	297	1.4
2319.4	1.1	10	0.748	9.7	233	1.9	16	1.4	15	266	1.4
2320.1	0.898	9.6	1.2	7.6	268	2.2	13	2.1	12	307	1.6
2320.8	1.5	10.0	0.935	9.5	268	1.7	21	1.7	15	306	1.2
2321.5	0.964	9.9	1.1	9.8	259	1.5	14	2.0	15	296	1.1
2322.2	1.3	9.3	0.970	7.0	234	2.2	19	1.8	11	268	1.6
2322.9	1.1	8.9	1.2	7.4	253	1.8	16	2.1	11	290	1.3
2323.6	1.2	8.8	1.7	8.8	269	2.6	17	3.1	14	308	1.9
2324.3	0.556	9.3	1.7	9.2	284	2.2	8.0	3.0	14	324	1.6
2325.0	1.3	9.5	1.7	10	284	2.1	19	3.1	16	325	1.5
2325.7	0.784	11	1.5	8.2	281	1.9	11	2.8	13	321	1.4
2326.4	1.1	9.2	1.7	8.5	275	2.1	17	3.1	13	314	1.5
2327.1	1.7	9.3	2.0	10	253	2.5	24	3.6	16	290	1.8
2327.8	1.3	8.9	1.7	9.0	263	2.6	19	3.2	14	301	1.9
2328.5	1.4	9.7	1.9	9.2	277	2.6	20	3.4	14	317	1.9
2329.2	0.902	9.1	1.7	7.9	252	2.5	13	3.1	12	288	1.8
2329.9	1.6	9.4	1.7	10	263	2.1	23	3.1	15	301	1.5
2330.6	1.2	9.8	1.7	9.8	273	2.4	17	3.0	15	312	1.8
2331.3	1.5	9.5	2.0	9.2	294	2.6	22	3.7	14	336	1.9
2332.0	0.981	8.9	1.5	12	282	2.4	14	2.8	19	323	1.8
2332.7	1.2	12	1.5	12	278	2.0	17	2.8	19	318	1.5
2333.4	0.791	11	1.6	12	288	1.5	11	2.9	19	329	1.1
2334.0	1.4	11	1.3	14	256	1.7	21	2.4	22	293	1.2
2334.7	1.1	10	1.4	14	287	2.0	15	2.6	21	328	1.4
2335.4	0.948	11	1.1	14	245	1.8	14	2.0	21	280	1.3
2336.1	1.4	9.5	1.4	15	241	1.0	20	2.5	22	275	0.752
2336.8	0.664	9.9	1.2	18	268	1.7	9.6	2.1	27	306	1.2
2337.5	1.4	9.7	1.4	20	287	2.0	20	2.5	30	328	1.4
2338.2	1.1	10	1.3	17	267	1.4	16	2.4	26	305	1.0
2338.9	0.895	11	0.970	18	247	1.6	13	1.8	28	283	1.2
2339.6	1.3	9.6	1.3	17	257	1.5	18	2.4	26	294	1.1
2340.3	1.8	9.6	1.1	17	261	1.3	26	2.0	26	298	0.975
2341.0	1.7	9.6	1.5	24	281	1.9	25	2.7	36	321	1.4
2341.7	1.4	11	1.2	22	275	1.6	21	2.2	34	315	1.2
2342.4	1.8	10	1.3	19	247	2.1	25	2.4	29	283	1.5
2343.1	1.4	11	1.4	25	270	1.4	21	2.6	38	308	1.0
2343.8	1.2	10	1.3	23	256	1.1	18	2.4	36	293	0.798
2344.5	1.6	10	1.4	25	246	1.4	23	2.5	38	281	1.1
2345.2	1.5	8.7	1.7	30	267	1.3	22	3.2	46	306	0.915
2345.9	1.0	11	1.3	22	228	1.7	14	2.3	33	261	1.3
2346.6	1.1	10	1.3	22	239	0.915	16	2.4	33	273	0.668
2347.3	1.5	9.7	1.5	31	264	1.1	22	2.7	47	302	0.781
2348.0	2.0	10	1.5	29	237	1.4	29	2.8	45	271	1.0
2348.7	1.2	10	1.3	28	244	1.7	18	2.5	43	279	1.2
2349.4	1.2	9.7	1.5	28	209	1.0	18	2.7	43	239	0.735
2350.1	1.1	9.1	1.1	33	231	1.2	16	2.0	50	264	0.845
2350.8	1.2	9.2	1.2	28	247	0.690	17	2.2	43	282	0.504
2351.5	1.1	8.7	1.2	35	249	0.667	16	2.3	53	285	0.487
2352.2	1.0	10	1.2	37	263	0.824	15	2.2	56	301	0.601
2352.9	1.4	9.6	1.1	32	247	0.875	20	2.1	50	282	0.638
2353.6	1.3	11	1.2	36	257	0.779	18	2.3	54	294	0.568
2354.3	1.6	12	0.878	32	247	1.4	24	1.6	49	283	1.0
2355.0	0.741	12	0.875	35	254	1.1	11	1.6	53	290	0.816
2355.7	1.1	8.6	0.717	30	229	1.4	16	1.3	46	262	0.991
2356.4	1.2	12	0.682	31	250	1.2	18	1.2	47	285	0.901
2357.1	1.3	9.2	0.995	30	249	0.696	18	1.8	46	285	0.508
2357.8	1.5	12	0.838	30	280	1.3	22	1.5	47	320	0.922
2358.5	1.3	10	0.901	32	276	1.1	18	1.6	48	315	0.822
2359.2	0.819	11	0.656	32	258	1.3	12	1.2	49	295	0.975
2359.9	0.735	12	0.994	34	247	0.972	11	1.8	52	282	0.709
2360.6	1.5	11	0.796	36	269	1.0	22	1.5	55	308	0.742
2361.2	0.988	10	0.543	28	251	0.536	14	0.990	43	287	0.391
2361.9	1.6	10	0.756	31	249	0.768	23	1.4	47	285	0.560
2362.6	1.0	7.7	0.581	30	253	1.4	15	1.1	46	289	0.989
2363.3	1.5	12	0.810	35	271	2.0	21	1.5	53	310	1.4
2364.0	1.8	10	0.834	27	232	1.0	26	1.5	41	265	0.744
2364.7	1.5	11	0.743	34	274	1.1	22	1.4	53	313	0.797
2365.4	1.2	10	0.714	29	247	0.910	17	1.3	45	283	0.664
2366.1	1.2	8.8	0.447	28	215	0.723	17	0.816	44	246	0.528
2366.8	1.2	9.9	0.848	32	247	1.3	18	1.5	50	283	0.912
2367.5	1.7	12	0.869	28	262	0.522	25	1.6	43	300	0.381
2368.2	1.2	9.8	1.1	23	265	1.2	17	2.0	36	303	0.899
2368.9	0.947	9.8	0.838	28	254	0.850	14	1.5	44	290	0.620
2369.6	1.6	11	1.2	25	244	1.7	23	2.3	38	279	1.2
2370.3	1.1	11	1.1	24	271	1.3	16	1.9	36	310	0.975
2371.0	1.8	11	1.3	26	288	1.5	26	2.4	40	330	1.1
2371.7	1.5	10	1.2	23	271	1.6	22	2.2	35	310	1.2
2372.4	2.1	8.5	1.2	23	307	2.5	31	2.2	36	351	1.9



Minnow Environmental  
Sample ID: 005

Parameter DL (ppm) Length (µm)	7Li 0.269	24Mg 0.196	55Mn 0.051	66Zn 0.509	88Sr 0.002	137Ba 0.006	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2373.1	1.6	10	1.9	24	308	2.3	23	3.4	37	352	1.6
2373.8	1.7	12	1.9	19	278	2.3	25	3.5	29	318	1.7
2374.5	2.0	11	2.2	22	296	3.2	29	4.1	34	339	2.3
2375.2	2.0	9.5	1.9	23	298	2.9	29	3.4	36	341	2.1
2375.9	1.9	10	2.3	22	291	2.5	27	4.2	34	332	1.8
2376.6	1.5	9.6	2.1	22	299	2.9	22	3.7	34	342	2.1
2377.3	2.3	8.6	2.6	24	291	4.2	34	4.7	37	332	3.0
2378.0	2.7	11	2.6	23	300	3.0	39	4.8	36	344	2.2
2378.7	2.0	12	2.8	25	290	3.7	29	5.2	39	332	2.7
2379.4	2.2	11	2.1	23	278	2.5	32	3.8	35	318	1.8
2380.1	1.5	10.0	2.6	27	277	1.7	21	4.8	42	317	1.2
2380.8	2.7	12	1.8	30	306	1.2	39	3.3	47	350	0.908
2381.5	2.2	10	1.7	32	286	2.1	31	3.1	49	328	1.6
2382.2	2.3	10	1.5	31	334	2.0	33	2.8	48	382	1.5
2382.9	2.0	10	1.4	30	317	2.5	29	2.6	46	362	1.8
2383.6	2.2	12	1.8	33	287	2.0	32	3.3	51	328	1.4
2384.3	2.1	12	1.8	33	273	2.2	30	3.3	50	312	1.6
2385.0	2.8	11	1.6	36	284	1.5	40	3.0	55	325	1.1
2385.7	2.8	10	1.4	34	258	1.3	41	2.5	52	295	0.947
2386.4	2.3	12	1.7	39	260	1.6	34	3.1	59	297	1.2
2387.1	3.7	11	1.8	38	274	1.5	53	3.3	58	313	1.1
2387.7	3.0	14	1.7	39	260	1.4	43	3.1	60	298	1.0
2388.4	2.6	12	1.6	42	296	1.6	37	2.9	64	338	1.2
2389.1	3.1	11	1.4	43	278	0.673	45	2.6	65	318	0.491
2389.8	2.9	13	1.8	44	275	1.2	41	3.2	67	314	0.886
2390.5	3.2	10	1.8	44	264	1.2	46	3.2	68	302	0.897
2391.2	3.8	13	1.6	43	298	0.966	54	2.9	66	341	0.705
2391.9	4.8	11	1.8	45	291	1.7	69	3.4	69	333	1.2
2392.6	3.2	11	1.7	52	289	1.3	47	3.1	79	331	0.961
2393.3	5.2	11	1.7	50	336	1.2	74	3.0	76	384	0.868
2394.0	4.8	13	1.9	58	392	1.7	70	3.5	88	449	1.2
2394.7	6.2	13	1.6	52	406	1.2	89	3.0	80	464	0.853
2395.4	5.5	14	1.5	51	401	1.3	79	2.8	77	459	0.954
2396.1	8.6	13	1.7	55	479	1.000	124	3.2	84	548	0.730
2396.8	9.2	12	2.0	61	529	2.2	133	3.6	93	605	1.6
2397.5	9.7	13	1.7	60	517	2.2	140	3.1	92	591	1.6
2398.2	11	13	1.9	61	605	1.9	156	3.5	94	692	1.4
2398.9	12	12	1.5	54	636	2.4	168	2.7	82	728	1.7
2399.6	11	11	2.2	62	649	2.0	154	4.1	95	743	1.5
2400.3	14	13	1.9	59	709	2.1	198	3.5	90	810	1.5
2401.0	11	12	1.6	53	702	1.9	161	3.0	81	803	1.4
2401.7	15	14	1.7	67	972	1.3	218	3.1	102	1111	0.966
2402.4	19	13	2.1	69	1013	2.1	277	3.8	106	1158	1.5
2403.1	20	13	2.9	72	1136	2.0	282	5.3	111	1299	1.5
2403.8	18	13	2.5	66	1073	2.2	255	4.5	102	1227	1.6
2404.5	18	13	2.3	65	1120	3.2	256	4.3	100	1280	2.3
2405.2	19	16	2.8	70	1229	3.4	277	5.2	108	1406	2.5
2405.9	19	12	2.4	64	1339	2.7	280	4.4	98	1531	2.0
2406.6	22	15	2.8	66	1358	2.3	322	5.0	101	1553	1.7
2407.3	19	16	2.9	67	1502	2.2	280	5.3	103	1717	1.6
2408.0	18	15	2.5	68	1457	2.5	261	4.6	104	1667	1.8
2408.7	18	14	2.7	79	1533	2.0	264	4.9	121	1754	1.5
2409.4	19	12	2.9	77	1769	2.4	275	5.2	118	2023	1.7
2410.1	17	14	2.4	72	1634	2.9	246	4.3	110	1868	2.1
2410.8	17	15	2.8	73	1761	2.7	242	5.1	111	2013	2.0
2411.5	15	15	2.6	86	1609	2.6	216	4.7	132	1840	1.9
2412.2	17	15	2.9	72	1753	2.3	245	5.2	110	2004	1.7
2412.9	14	14	2.7	86	2112	4.0	196	5.0	132	2415	2.9
2413.6	14	14	2.5	73	1713	2.2	200	4.6	113	1959	1.6
2414.2	13	17	2.9	79	2000	2.5	185	5.2	121	2286	1.8
2414.9	13	16	2.9	79	1817	1.9	186	5.3	120	2078	1.4
2415.6	13	14	2.8	70	1862	2.7	183	5.0	107	2129	2.0
2416.3	11	14	2.6	74	1874	1.8	155	4.8	113	2143	1.3
2417.0	10.0	16	2.5	70	2015	1.6	144	4.5	108	2304	1.2
2417.7	9.8	15	2.5	72	1868	1.6	141	4.6	110	2136	1.2
2418.4	9.5	17	2.2	75	1890	2.2	138	4.1	116	2161	1.6
2419.1	8.2	15	1.9	69	1958	1.3	119	3.5	105	2239	0.932
2419.8	9.4	16	2.4	68	2043	2.1	135	4.4	104	2336	1.5
2420.5	8.3	15	2.8	71	1917	2.4	120	5.1	108	2192	1.7
2421.2	8.9	13	2.4	65	2030	3.0	129	4.4	99	2321	2.2
2421.9	9.0	16	2.2	72	2032	2.3	129	4.1	110	2324	1.7
2422.6	7.9	14	2.5	58	1976	2.8	114	4.6	89	2259	2.0
2423.3	7.2	16	2.8	66	2068	3.0	103	5.2	101	2364	2.2
2424.0	6.8	16	2.7	62	2235	2.5	98	4.9	95	2556	1.8
2424.7	6.7	14	3.0	60	1791	1.6	97	5.4	92	2048	1.2
2425.4	8.5	16	2.6	64	1982	3.0	122	4.8	98	2266	2.2
2426.1	8.2	14	2.8	56	2172	2.1	118	5.1	87	2483	1.5
2426.8	7.9	16	3.0	59	1948	2.0	113	5.5	91	2228	1.4
2427.5	8.0	18	2.7	68	1959	1.8	116	4.9	104	2240	1.3
2428.2	7.4	16	2.6	59	1736	1.7	107	4.7	90	1985	1.2
2428.9	6.9	17	2.7	57	1891	2.2	99	5.0	87	2163	1.6



Minnow Environmental  
Sample ID: 005

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
2429.6	6.1	17	3.5	56	1995	1.1	89	6.5	86	2281	0.820
2430.3	5.7	15	3.3	53	1705	1.4	83	6.1	81	1950	1.1
2431.0	6.7	15	2.7	52	1841	1.5	97	5.0	80	2105	1.1
2431.7	5.7	16	3.4	49	1761	1.6	83	6.1	75	2014	1.2
2432.4	5.3	16	3.0	50	1822	1.4	76	5.5	77	2083	0.992
2433.1	4.2	16	3.3	48	1711	1.4	60	6.0	74	1956	1.0
2433.8	3.5	16	2.2	51	1756	1.6	51	4.1	79	2008	1.2
2434.5	3.6	17	2.8	52	1680	0.702	51	5.0	79	1921	0.512
2435.2	3.4	15	2.4	52	1529	1.3	49	4.4	79	1749	0.935
2435.9	3.2	15	2.4	52	1569	1.5	46	4.3	80	1794	1.1
2436.6	2.3	16	2.1	44	1423	2.2	34	3.7	67	1628	1.6
2437.3	3.3	13	2.0	37	1561	1.8	48	3.6	57	1785	1.3
2438.0	2.0	16	2.0	45	1269	1.8	30	3.6	69	1452	1.3
2438.7	2.3	13	1.5	35	1086	1.2	33	2.7	54	1241	0.852
2439.4	1.7	16	1.6	36	1213	1.9	24	3.0	55	1387	1.4
2440.0	1.7	21	1.5	33	1144	2.0	25	2.8	51	1309	1.5
2440.7	1.4	14	1.5	33	963	2.2	21	2.7	51	1101	1.6
2441.4	1.5	14	1.4	33	947	1.8	22	2.6	50	1083	1.3
2442.1	1.3	13	1.0	27	994	1.6	19	1.9	41	1137	1.2
2442.8	1.0	12	1.3	30	982	2.1	15	2.4	47	1123	1.5
2443.5	1.4	14	1.6	26	879	2.2	20	2.9	40	1005	1.6
2444.2	1.6	14	1.1	27	913	1.5	23	2.0	42	1044	1.1
2444.9	0.546	15	1.0	27	847	1.8	7.9	1.9	41	968	1.3
2445.6	0.841	12	1.1	22	775	2.3	12	1.9	34	886	1.7
2446.3	1.1	11	1.2	23	815	1.9	16	2.2	35	932	1.4
2447.0	1.1	12	1.1	20	738	1.4	16	2.0	31	843	1.1
2447.7	1.3	13	0.675	25	740	1.8	18	1.2	39	846	1.3
2448.4	0.707	11	0.798	17	701	2.3	10	1.5	26	801	1.7
2449.1	0.950	11	0.613	17	752	1.7	14	1.1	26	860	1.3
2449.8	0.502	14	0.843	19	709	3.0	7.2	1.5	29	811	2.2
2450.5	0.639	13	0.838	19	620	1.9	9.2	1.5	29	708	1.4
2451.2	1.1	12	0.757	17	735	2.2	16	1.4	26	840	1.6
2451.9	1.8	14	0.723	16	592	2.3	26	1.3	24	677	1.7
2452.6	1.1	9.7	0.623	19	627	1.9	16	1.1	29	717	1.4
2453.3	1.2	12	0.616	16	623	0.980	17	1.1	25	713	0.715
2454.0	2.0	11	0.808	17	571	1.9	29	1.5	25	653	1.4
2454.7	1.2	13	0.610	17	566	1.8	17	1.1	27	647	1.3
2455.4	0.838	11	0.840	15	563	1.7	12	1.5	23	643	1.2
2456.1	1.5	11	1.1	15	569	1.8	22	2.1	24	651	1.3
2456.8	1.9	13	0.952	13	578	1.4	27	1.7	20	661	1.0
2457.5	1.6	12	0.972	15	569	1.5	23	1.8	22	651	1.1
2458.2	1.9	12	0.735	15	589	1.8	28	1.3	23	673	1.3
2458.9	1.7	11	0.704	12	565	1.7	24	1.3	19	647	1.2
2459.6	1.3	10	0.882	14	587	0.612	19	1.6	22	671	0.446
2460.3	2.3	11	1.0	11	546	2.0	33	1.9	16	624	1.4
2461.0	2.4	12	1.7	15	550	1.9	35	3.0	23	629	1.4
2461.7	2.3	13	0.809	14	599	1.8	33	1.5	21	685	1.3
2462.4	2.6	12	1.4	11	567	2.1	37	2.5	17	648	1.6
2463.1	2.8	9.9	1.7	15	612	1.4	40	3.0	23	699	1.0
2463.8	3.3	15	1.6	13	632	2.0	48	2.9	21	722	1.5
2464.5	3.5	12	2.0	13	688	2.0	50	3.7	20	787	1.4
2465.2	3.4	12	2.0	14	710	1.4	49	3.7	22	812	0.996
2465.9	5.0	13	2.1	14	733	1.9	72	3.8	21	838	1.4
2466.6	3.5	15	2.5	14	826	2.4	50	4.6	22	944	1.7
2467.2	4.4	13	2.7	12	793	2.2	63	4.9	18	907	1.6
2467.9	4.5	12	2.6	11	717	1.8	65	4.7	17	819	1.3
2468.6	6.3	14	3.0	14	844	1.4	91	5.5	21	965	1.0
2469.3	6.3	12	3.4	14	823	2.6	91	6.2	21	941	1.9
2470.0	6.6	14	3.5	13	949	2.0	96	6.3	21	1085	1.5
2470.7	6.0	14	3.7	13	961	2.2	86	6.8	20	1099	1.6
2471.4	8.4	16	4.0	16	1052	2.3	121	7.3	24	1203	1.7
2472.1	8.7	14	4.5	15	1010	2.4	125	8.2	24	1154	1.7
2472.8	8.3	14	4.5	17	1060	2.3	120	8.2	25	1212	1.7
2473.5	8.5	14	6.1	19	1278	3.1	123	11	29	1461	2.3
2474.2	10	17	5.1	16	1227	4.1	145	9.3	24	1403	3.0
2474.9	8.8	15	5.3	21	1284	2.9	128	9.7	32	1469	2.1
2475.6	8.7	13	5.7	19	1292	2.5	125	10	29	1477	1.8
2476.3	9.6	15	5.7	18	1263	3.0	138	10	27	1444	2.2
2477.0	10	17	6.2	21	1246	2.8	150	11	32	1425	2.0
2477.7	9.2	15	6.0	23	1448	3.6	132	11	36	1656	2.6
2478.4	10	17	6.4	27	1525	3.0	147	12	42	1744	2.2
2479.1	11	15	7.2	25	1703	3.1	156	13	38	1947	2.2
2479.8	11	14	7.1	28	1666	4.7	152	13	43	1905	3.5
2480.5	11	14	6.1	25	1583	3.2	152	11	38	1810	2.3
2481.2	11	16	7.1	32	1724	3.3	164	13	49	1972	2.4
2481.9	11	15	7.5	29	1612	2.6	154	14	44	1844	1.9
2482.6	9.7	14	7.4	27	1663	2.6	139	14	42	1902	1.9
2483.3	10.0	15	6.8	32	1766	2.9	144	12	49	2019	2.1
2484.0	11	18	7.1	34	1681	2.1	160	13	51	1922	1.5
2484.7	9.3	15	7.4	38	1662	3.8	134	13	58	1900	2.7
2485.4	9.7	14	6.7	33	1665	2.2	140	12	50	1903	1.6



Minnow Environmental  
Sample ID: 005

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
2486.1	10	14	7.0	34	1878	2.2	150	13	52	2147	1.6
2486.8	10	17	6.6	37	1765	3.5	146	12	57	2018	2.6
2487.5	9.4	15	5.6	34	1790	2.5	136	10	53	2047	1.8
2488.2	9.3	14	6.1	44	1750	4.1	135	11	67	2002	3.0
2488.9	9.2	14	5.4	36	1707	3.2	133	9.9	55	1952	2.3
2489.6	6.5	11	4.3	25	1461	1.8	94	7.8	39	1671	1.3
2490.3	8.2	14	6.1	32	1735	3.1	119	11	49	1983	2.3
2491.0	8.9	16	5.4	37	1845	2.6	128	9.8	57	2110	1.9
2491.7	8.3	15	5.2	38	1729	2.2	120	9.5	58	1977	1.6
2492.4	7.9	15	5.3	40	1722	3.1	114	9.7	61	1969	2.2
2493.0	7.2	13	5.4	34	1650	2.1	103	9.8	51	1887	1.5
2493.7	7.7	15	4.7	36	1885	2.6	111	8.6	56	2155	1.9
2494.4	8.2	14	4.5	35	1698	2.4	118	8.3	54	1941	1.8
2495.1	7.1	12	4.6	31	1606	2.0	103	8.4	48	1837	1.4
2495.8	5.6	13	3.8	37	1558	2.6	81	6.9	56	1782	1.9
2496.5	8.0	13	3.7	33	1717	2.1	115	6.7	51	1964	1.5
2497.2	6.2	13	3.5	32	1691	2.0	90	6.4	49	1934	1.5
2497.9	6.5	11	4.3	29	1646	1.9	93	7.8	44	1882	1.4
2498.6	7.3	13	4.3	33	1719	2.2	106	7.8	50	1966	1.6
2499.3	5.6	12	4.6	29	1560	1.5	80	8.3	45	1784	1.1
2500.0	6.1	13	3.3	31	1618	2.7	87	6.0	47	1850	2.0
2500.7	5.9	13	4.0	29	1667	2.5	85	7.3	45	1907	1.8
2501.4	5.2	14	3.0	27	1589	2.4	75	5.6	41	1817	1.8
2502.1	5.9	12	3.0	25	1670	3.0	84	5.5	39	1909	2.2
2502.8	4.9	14	3.2	27	1623	1.9	71	5.8	42	1855	1.4
2503.5	5.4	15	3.3	32	1475	2.2	78	5.9	49	1687	1.6
2504.2	5.2	15	2.8	28	1453	2.8	75	5.1	42	1661	2.1
2504.9	4.8	13	2.7	21	1376	2.1	70	4.9	33	1573	1.6
2505.6	4.9	14	3.2	27	1561	2.1	71	5.9	42	1786	1.5
2506.3	3.5	12	2.4	24	1292	2.0	50	4.5	37	1477	1.5
2507.0	2.9	12	2.2	22	1246	2.0	42	4.1	34	1425	1.4
2507.7	3.1	15	2.5	22	1390	2.3	45	4.6	33	1589	1.7
2508.4	2.9	13	2.0	21	1199	1.6	42	3.6	32	1372	1.1
2509.1	2.1	13	1.9	26	1193	2.6	31	3.5	40	1364	1.9
2509.8	2.5	12	1.9	18	1114	1.9	36	3.4	28	1274	1.4
2510.5	2.1	12	2.0	22	1137	2.0	30	3.7	34	1300	1.5
2511.2	2.1	13	2.1	20	1071	1.9	30	3.8	31	1225	1.4
2511.9	1.2	11	1.9	18	1091	2.6	18	3.6	28	1247	1.9
2512.6	1.5	13	1.8	19	990	1.6	21	3.2	29	1132	1.1
2513.3	1.9	12	1.4	20	928	1.6	28	2.6	30	1062	1.1
2514.0	1.4	12	1.3	21	892	1.5	21	2.3	32	1020	1.1
2514.7	1.8	14	1.1	16	1041	1.5	25	2.1	25	1190	1.1
2515.4	0.790	12	0.855	17	841	1.4	11	1.6	27	962	0.996
2516.1	1.5	15	0.911	20	956	1.9	21	1.7	30	1094	1.4
2516.8	1.2	11	1.4	17	863	1.8	18	2.5	26	987	1.3
2517.5	1.5	16	0.924	18	855	1.9	22	1.7	27	977	1.4
2518.2	2.0	13	1.0	15	873	1.7	29	1.9	23	998	1.3
2518.9	1.1	11	0.900	15	784	1.2	16	1.6	22	896	0.864
2519.6	1.7	13	0.844	14	860	1.7	25	1.5	22	983	1.2
2520.2	1.2	13	0.957	18	833	1.8	17	1.7	28	953	1.3
2520.9	1.5	16	0.992	18	780	1.2	22	1.8	28	892	0.872
2521.6	1.4	14	1.2	16	785	1.9	20	2.2	24	898	1.4
2522.3	0.893	13	1.1	16	767	1.5	13	2.0	24	877	1.1
2523.0	0.980	13	0.760	14	779	1.7	14	1.4	22	891	1.2
2523.7	1.3	13	0.852	16	786	1.8	19	1.6	24	898	1.3
2524.4	1.8	12	0.667	18	797	1.1	27	1.2	27	911	0.773
2525.1	1.8	13	0.648	19	697	2.1	26	1.2	29	797	1.5
2525.8	2.6	15	0.630	16	762	0.838	38	1.1	25	872	0.611
2526.5	1.9	11	0.884	14	730	0.798	27	1.6	21	835	0.582
2527.2	1.5	12	0.712	18	731	1.3	22	1.3	28	836	0.940
2527.9	1.9	12	0.624	12	698	1.4	28	1.1	18	799	1.0
2528.6	1.3	11	0.531	13	728	1.3	18	0.969	20	832	0.937
2529.3	2.4	11	0.759	13	675	1.3	34	1.4	20	772	0.955
2530.0	1.6	13	0.851	15	762	1.7	24	1.6	22	871	1.2
2530.7	1.3	15	0.566	16	713	1.1	18	1.0	25	815	0.818
2531.4	1.5	12	0.583	11	707	1.6	22	1.1	17	809	1.2
2532.1	1.4	12	0.738	10	714	0.542	20	1.3	16	817	0.395
2532.8	2.1	11	0.711	13	719	1.2	30	1.3	19	822	0.894
2533.5	1.9	12	0.744	16	836	1.6	27	1.4	24	956	1.2
2534.2	1.6	13	0.598	13	670	1.0	24	1.1	21	766	0.747
2534.9	2.0	13	0.424	14	771	1.3	29	0.774	21	881	0.936
2535.6	2.3	13	0.768	12	738	1.9	34	1.4	18	844	1.4
2536.3	1.7	15	0.759	10	780	1.7	25	1.4	16	892	1.3
2537.0	2.0	12	0.474	11	721	1.5	29	0.865	16	824	1.1
2537.7	1.3	11	0.479	11	821	1.6	19	0.873	16	939	1.2
2538.4	2.1	12	0.426	11	906	2.0	30	0.777	17	1036	1.5
2539.1	2.2	11	0.635	9.3	871	0.986	32	1.2	14	996	0.719
2539.8	1.6	9.1	0.645	9.4	748	1.6	23	1.2	14	855	1.2
2540.5	1.7	12	0.820	11	823	2.0	25	1.5	17	941	1.5
2541.2	1.3	12	0.672	13	801	2.4	19	1.2	20	915	1.8
2541.9	1.3	13	0.456	11	890	2.5	18	0.831	17	1018	1.8



Minnow Environmental  
Sample ID: 005

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
2542.6	2.6	12	0.717	10	893	2.5	38	1.3	15	1021	1.9
2543.3	2.1	11	0.756	12	877	1.9	30	1.4	18	1003	1.4
2544.0	1.6	11	0.853	12	969	2.7	24	1.6	19	1108	2.0
2544.7	2.5	12	0.703	13	927	1.8	37	1.3	20	1060	1.3
2545.4	2.4	10	0.713	12	1028	2.2	34	1.3	18	1175	1.6
2546.1	1.7	14	0.687	10	994	1.6	25	1.3	16	1137	1.2
2546.8	2.6	14	0.877	11	991	1.8	38	1.6	17	1133	1.3
2547.4	2.2	11	0.564	13	1056	1.2	32	1.0	19	1208	0.907
2548.1	2.6	13	0.722	10	1122	2.3	37	1.3	15	1283	1.7
2548.8	2.2	15	0.591	14	1163	1.7	31	1.1	21	1330	1.2
2549.5	2.4	12	0.996	16	1159	1.6	35	1.8	24	1326	1.2
2550.2	2.2	12	1.0	16	1224	1.3	31	1.9	25	1399	0.924
2550.9	1.9	12	0.845	17	1245	2.6	27	1.5	26	1424	1.9
2551.6	2.4	11	0.649	17	1196	1.1	35	1.2	27	1368	0.784
2552.3	2.6	12	1.2	19	1158	1.3	38	2.1	28	1325	0.953
2553.0	2.5	13	0.752	19	1191	1.8	36	1.4	29	1362	1.3
2553.7	3.5	11	1.1	21	1101	2.3	51	1.9	32	1259	1.6
2554.4	4.4	11	1.3	20	1234	2.3	64	2.3	30	1411	1.7
2555.1	4.9	12	1.1	24	1357	3.0	70	2.0	37	1552	2.2
2555.8	6.8	15	1.4	19	1283	4.1	99	2.5	29	1467	3.0
2556.5	6.4	12	1.6	21	1252	3.8	92	2.9	33	1432	2.8
2557.2	7.2	14	1.7	23	1312	3.5	104	3.1	35	1500	2.6
2557.9	7.0	12	2.2	21	1326	3.4	101	4.0	31	1516	2.5
2558.6	8.9	12	2.7	28	1624	4.7	129	4.8	43	1857	3.5
2559.3	7.2	12	2.4	20	1344	4.8	104	4.3	31	1537	3.5
2560.0	7.1	13	2.9	22	1630	5.6	102	5.3	34	1864	4.1
2560.7	8.2	14	2.7	25	1723	6.3	119	4.9	38	1970	4.6
2561.4	5.9	13	2.5	23	1511	5.8	85	4.5	35	1727	4.2
2562.1	5.3	12	2.7	20	1484	5.3	77	5.0	30	1697	3.8
2562.8	5.4	16	2.9	22	1518	4.5	78	5.3	33	1735	3.3
2563.5	5.2	13	2.8	21	1630	4.9	74	5.1	31	1864	3.5
2564.2	4.9	14	2.4	24	1532	6.1	70	4.4	36	1751	4.4
2564.9	4.7	14	2.6	22	1398	5.0	68	4.8	33	1598	3.7
2565.6	4.7	13	2.4	22	1488	5.9	68	4.4	34	1701	4.3
2566.3	4.7	10	2.5	28	1442	6.2	68	4.5	42	1649	4.5
2567.0	3.7	11	2.8	22	1392	5.2	53	5.1	34	1592	3.8
2567.7	4.3	14	2.7	23	1456	6.0	62	5.0	35	1665	4.4
2568.4	3.1	13	2.3	22	1479	5.3	44	4.3	33	1691	3.8
2569.1	4.4	14	2.6	22	1541	6.8	63	4.8	34	1762	5.0
2569.8	3.3	13	2.6	21	1356	4.5	47	4.7	32	1551	3.3
2570.5	2.7	12	1.8	22	1319	4.4	38	3.3	34	1508	3.2
2571.2	3.9	12	2.4	22	1297	3.7	56	4.4	34	1483	2.7
2571.9	2.7	15	2.2	23	1371	3.4	39	4.0	35	1568	2.4
2572.6	2.3	13	2.0	26	1296	4.2	33	3.7	40	1482	3.1
2573.2	4.1	15	2.3	25	1488	4.4	59	4.2	38	1702	3.2
2573.9	2.1	12	1.9	22	1229	4.7	30	3.4	33	1405	3.4
2574.6	3.0	12	2.2	25	1314	5.9	43	4.0	38	1502	4.3
2575.3	2.9	15	2.4	24	1230	3.9	42	4.5	37	1407	2.8
2576.0	3.9	12	2.3	21	1199	3.9	56	4.2	33	1371	2.8
2576.7	3.3	12	1.8	22	1243	3.9	47	3.3	33	1421	2.8
2577.4	2.7	13	2.0	27	1297	3.2	40	3.7	41	1483	2.3
2578.1	2.7	13	1.9	27	1273	2.9	39	3.5	41	1456	2.1
2578.8	3.1	14	1.7	20	1202	3.1	45	3.2	31	1374	2.2
2579.5	2.8	14	1.7	23	1189	3.6	40	3.0	35	1360	2.6
2580.2	2.6	9.9	2.0	23	1140	2.9	37	3.7	35	1304	2.1
2580.9	3.1	12	2.2	22	1301	2.9	44	4.0	33	1488	2.1
2581.6	2.8	11	1.6	19	1212	2.1	41	2.9	29	1385	1.5
2582.3	2.4	10.0	1.9	21	1106	3.2	34	3.4	33	1265	2.3
2583.0	2.9	12	1.4	25	1148	2.3	42	2.5	38	1312	1.7
2583.7	2.1	12	1.4	19	1020	4.1	30	2.6	29	1167	3.0
2584.4	1.9	11	1.0	18	1103	2.8	27	1.8	28	1261	2.0
2585.1	2.1	14	1.6	21	980	2.2	30	2.9	32	1120	1.6
2585.8	2.2	12	1.6	20	924	2.6	32	2.9	31	1056	1.9
2586.5	1.4	13	1.3	20	1024	2.7	20	2.3	31	1171	1.9
2587.2	1.5	12	1.1	19	856	2.2	22	1.9	29	979	1.6
2587.9	1.2	11	1.2	20	912	3.2	17	2.3	31	1042	2.3
2588.6	1.6	13	0.784	19	949	3.7	22	1.4	29	1086	2.7
2589.3	0.859	13	0.654	18	864	2.7	12	1.2	28	989	1.9
2590.0	1.8	14	0.890	16	750	2.7	25	1.6	24	857	2.0
2590.7	1.1	14	0.869	15	785	3.4	16	1.6	22	898	2.5
2591.4	0.894	12	0.856	14	711	3.1	13	1.6	21	813	2.2
2592.1	0.908	14	0.800	14	811	4.0	13	1.5	22	928	2.9
2592.8	1.0	12	0.706	14	825	3.5	15	1.3	21	943	2.6
2593.5	1.3	14	0.819	15	796	3.7	19	1.5	23	911	2.7
2594.2	1.1	11	0.695	13	765	4.3	16	1.3	20	875	3.1
2594.9	1.1	13	0.634	14	744	5.4	16	1.2	22	850	3.9
2595.6	1.6	12	0.929	12	737	6.2	23	1.7	19	843	4.5
2596.3	0.937	12	0.523	12	661	3.4	14	0.954	18	756	2.5
2597.0	1.1	12	0.700	13	707	4.1	15	1.3	19	808	3.0
2597.7	1.2	11	0.403	11	709	4.9	17	0.735	17	811	3.6
2598.4	1.8	11	0.496	10	712	5.4	25	0.904	16	814	3.9



Minnow Environmental  
Sample ID: 005

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
2599.1	1.2	11	0.632	9.6	647	4.9	17	1.2	15	740	3.5
2599.8	2.1	10	0.335	8.8	623	3.7	31	0.611	13	713	2.7
2600.4	2.3	12	0.305	9.1	648	4.6	33	0.556	14	741	3.4
2601.1	2.4	14	0.281	12	687	3.9	35	0.513	18	785	2.9
2601.8	2.3	12	0.597	11	658	5.5	34	1.1	17	752	4.0
2602.5	2.9	12	0.369	12	695	5.8	41	0.673	19	795	4.2
2603.2	2.8	12	0.200	12	661	6.3	40	0.364	19	756	4.6
2603.9	2.3	9.9	0.363	13	629	4.6	34	0.662	20	720	3.4
2604.6	2.6	12	0.484	11	622	5.4	38	0.883	17	712	4.0
2605.3	2.7	12	0.227	13	637	5.4	39	0.414	20	728	4.0
2606.0	3.5	10.0	0.332	12	669	4.5	51	0.605	18	765	3.3
2606.7	4.0	10	0.486	12	612	5.9	57	0.886	19	699	4.3
2607.4	2.3	11	0.350	12	723	5.3	33	0.639	19	826	3.8
2608.1	3.8	9.3	0.527	15	650	5.6	55	0.960	22	744	4.1
2608.8	3.9	9.1	0.374	10	619	5.6	57	0.682	16	708	4.1
2609.5	5.0	8.8	0.401	12	626	5.3	72	0.731	18	716	3.9
2610.2	4.0	11	0.497	14	718	5.2	57	0.907	21	822	3.8
2610.9	3.4	9.9	0.521	15	603	5.8	49	0.950	23	690	4.2
2611.6	4.0	9.4	0.402	14	680	4.3	58	0.733	21	778	3.1
2612.3	5.3	11	0.775	16	679	5.5	77	1.4	25	777	4.0
2613.0	5.0	11	0.718	17	641	5.5	72	1.3	26	733	4.0
2613.7	5.5	10.0	0.690	14	659	4.2	80	1.3	22	753	3.1
2614.4	6.5	9.8	0.620	14	674	4.7	93	1.1	21	771	3.4
2615.1	5.9	9.8	0.709	17	722	4.9	85	1.3	26	826	3.5
2615.8	7.8	9.6	0.825	15	750	4.6	113	1.5	23	858	3.3
2616.5	6.4	12	0.771	15	735	4.8	93	1.4	23	841	3.5
2617.2	6.6	10	0.921	15	694	5.9	95	1.7	23	794	4.3
2617.9	7.7	9.0	1.1	19	704	4.9	112	2.0	28	805	3.6
2618.6	7.0	10.0	1.1	17	690	4.6	101	2.1	27	789	3.4
2619.3	6.9	13	1.2	18	747	4.4	100	2.1	28	855	3.2
2620.0	9.1	12	1.1	19	742	5.2	131	2.1	29	849	3.8
2620.7	8.1	9.3	1.2	17	757	4.6	118	2.2	26	865	3.3
2621.4	8.9	11	1.3	16	750	4.1	128	2.4	24	858	3.0
2622.1	9.0	11	1.6	19	722	4.4	130	2.9	29	826	3.2
2622.8	6.2	10	0.945	17	751	4.3	89	1.7	27	859	3.1
2623.5	8.2	12	1.4	19	765	3.8	118	2.5	30	875	2.8
2624.2	8.7	9.7	1.4	22	807	4.7	125	2.6	33	923	3.4
2624.9	7.3	11	2.0	20	842	3.4	106	3.6	31	963	2.5
2625.6	9.5	12	1.4	24	844	5.4	137	2.6	37	965	4.0
2626.3	7.9	11	2.0	22	797	4.9	114	3.6	34	911	3.6
2627.0	11	15	2.1	22	955	4.9	162	3.8	34	1092	3.6
2627.6	7.7	12	1.7	22	785	4.0	111	3.1	34	897	2.9
2628.3	8.9	11	2.2	25	868	4.1	128	4.1	39	993	3.0
2629.0	9.9	13	2.5	27	911	4.3	143	4.6	41	1042	3.1
2629.7	9.9	12	2.9	27	938	3.7	143	5.2	42	1072	2.7
2630.4	12	13	2.4	29	909	3.6	179	4.3	44	1039	2.6
2631.1	9.8	11	3.3	29	976	4.5	141	6.1	45	1116	3.3
2631.8	10	13	3.0	29	970	3.5	145	5.6	44	1109	2.5
2632.5	9.8	13	3.0	27	961	2.9	141	5.4	41	1099	2.1
2633.2	13	12	3.4	30	1099	4.4	184	6.2	46	1256	3.2
2633.9	10	14	4.1	33	1069	5.0	146	7.6	50	1222	3.7
2634.6	9.3	12	3.2	34	1053	3.8	135	5.8	52	1204	2.8
2635.3	10	14	4.8	36	1131	4.2	151	8.8	55	1294	3.0
2636.0	10.0	12	3.4	32	1196	5.2	144	6.2	49	1368	3.8
2636.7	11	15	3.9	36	1048	3.2	155	7.2	54	1199	2.4
2637.4	11	16	3.9	33	1081	2.9	153	7.1	51	1236	2.1
2638.1	8.9	13	4.0	35	1166	2.8	128	7.3	54	1333	2.1
2638.8	11	15	4.6	35	1249	4.1	156	8.4	53	1428	3.0
2639.5	9.5	14	4.2	33	1214	4.6	138	7.6	50	1388	3.4
2640.2	7.7	14	4.2	33	1219	3.7	111	7.6	51	1394	2.7
2640.9	6.7	13	3.9	31	1194	2.7	97	7.1	48	1366	2.0
2641.6	9.1	15	4.6	38	1293	3.4	132	8.3	58	1479	2.5
2642.3	9.2	17	4.9	38	1352	3.7	132	9.0	58	1547	2.7
2643.0	6.9	15	4.0	36	1345	3.5	99	7.3	56	1538	2.6
2643.7	7.3	13	4.4	38	1236	4.0	105	8.0	58	1413	2.9
2644.4	6.1	15	4.6	36	1403	3.5	89	8.4	56	1604	2.6
2645.1	6.4	15	4.1	41	1310	4.0	93	7.5	62	1498	2.9
2645.8	7.3	16	4.6	35	1304	3.5	105	8.3	53	1492	2.6
2646.5	7.1	14	5.1	42	1450	3.8	103	9.3	64	1659	2.8
2647.2	5.8	13	4.3	37	1216	3.3	84	7.8	56	1390	2.4
2647.9	5.6	15	4.5	36	1464	3.0	81	8.2	55	1675	2.2
2648.6	6.2	16	6.3	40	1623	2.8	89	12	62	1856	2.0
2649.3	6.4	15	5.0	42	1384	3.9	92	9.2	64	1583	2.8
2650.0	4.6	13	4.0	34	1231	3.9	67	7.3	52	1407	2.8
2650.7	6.1	14	4.4	45	1470	5.2	87	8.1	69	1681	3.8
2651.4	4.6	14	3.9	37	1397	4.3	66	7.1	57	1598	3.2
2652.1	4.9	15	4.9	40	1328	4.1	70	8.9	61	1519	3.0
2652.8	4.3	15	4.0	39	1228	4.5	63	7.3	60	1404	3.3
2653.5	4.3	15	4.1	41	1450	4.6	62	7.4	63	1658	3.4
2654.1	3.9	14	4.2	37	1476	5.4	57	7.6	57	1688	3.9
2654.8	4.7	15	3.3	35	1347	4.8	68	6.0	54	1540	3.5



Minnow Environmental  
Sample ID: 005

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
2655.5	3.5	14	3.3	36	1226	4.5	51	6.1	55	1402	3.3
2656.2	3.1	17	3.2	38	1377	5.6	45	5.9	58	1575	4.1
2656.9	2.8	15	3.6	41	1266	4.3	41	6.5	63	1447	3.1
2657.6	3.2	12	2.8	35	1312	4.7	46	5.1	53	1501	3.4
2658.3	2.9	15	2.9	34	1252	5.1	41	5.3	53	1432	3.7
2659.0	2.7	15	2.8	38	1316	5.3	39	5.1	59	1505	3.9
2659.7	2.5	15	3.0	41	1239	6.5	35	5.4	63	1417	4.7
2660.4	2.8	15	2.7	31	1228	6.0	41	4.9	48	1404	4.4
2661.1	1.9	15	3.0	37	1353	5.1	27	5.5	56	1547	3.7
2661.8	2.8	13	2.6	34	1175	7.0	40	4.8	52	1343	5.1
2662.5	2.1	12	2.9	37	1133	4.7	31	5.3	57	1296	3.4
2663.2	2.0	14	2.0	32	1006	5.4	28	3.7	49	1151	3.9
2663.9	1.6	12	2.0	29	948	5.6	24	3.6	44	1084	4.1
2664.6	2.3	14	1.8	35	1101	6.2	33	3.3	54	1259	4.6
2665.3	1.6	14	1.8	30	993	6.2	23	3.2	47	1135	4.5
2666.0	2.1	12	1.8	29	945	6.6	30	3.2	44	1081	4.8
2666.7	1.6	14	1.6	31	917	6.6	24	2.9	47	1048	4.8
2667.4	1.2	11	1.5	29	996	7.4	17	2.8	44	1139	5.4
2668.1	2.0	12	2.0	27	933	7.6	29	3.7	41	1067	5.5
2668.8	1.7	16	1.7	28	864	6.7	25	3.1	42	988	4.9
2669.5	0.990	16	1.5	28	886	8.6	14	2.6	43	1013	6.3
2670.2	1.3	13	1.2	25	792	7.1	19	2.1	39	906	5.2
2670.9	1.1	12	1.4	22	793	6.9	16	2.5	33	907	5.0
2671.6	1.2	14	1.2	30	845	10	17	2.3	45	966	7.4
2672.3	1.4	12	0.940	22	847	9.1	20	1.7	34	969	6.6
2673.0	1.3	13	1.5	27	867	7.4	19	2.8	41	992	5.4
2673.7	1.4	12	1.3	29	737	8.6	21	2.3	45	842	6.3
2674.4	1.7	13	1.2	21	759	9.3	24	2.2	33	868	6.8
2675.1	1.5	14	1.4	21	787	7.6	21	2.5	32	900	5.6
2675.8	2.3	13	0.819	23	742	7.4	33	1.5	35	848	5.4
2676.5	2.3	13	0.833	21	792	10	34	1.5	32	905	7.4
2677.2	1.1	12	0.844	22	644	8.0	16	1.5	34	736	5.9
2677.9	1.7	11	0.877	21	697	9.7	25	1.6	32	797	7.0
2678.6	1.7	11	0.951	19	662	9.6	24	1.7	29	757	7.0
2679.3	1.9	13	0.710	20	714	7.3	27	1.3	31	816	5.3
2680.0	1.8	12	0.723	17	661	6.9	26	1.3	27	756	5.1
2680.7	1.6	11	0.600	20	694	7.2	23	1.1	30	793	5.3
2681.3	1.9	12	0.918	19	809	8.9	28	1.7	29	926	6.5
2682.0	1.8	17	0.647	19	766	7.6	26	1.2	29	876	5.5
2682.7	2.1	13	0.871	18	767	6.8	30	1.6	27	877	5.0
2683.4	2.5	11	1.1	17	810	6.2	37	2.0	27	926	4.5
2684.1	1.5	11	0.602	14	751	6.4	22	1.1	22	858	4.7
2684.8	2.4	11	0.970	13	762	4.8	35	1.8	21	871	3.5
2685.5	2.2	14	0.946	20	903	9.1	32	1.7	30	1033	6.7
2686.2	2.7	14	0.914	19	1039	6.2	38	1.7	29	1188	4.5
2686.9	3.1	13	1.2	19	1001	6.4	44	2.2	28	1145	4.7
2687.6	2.1	13	1.1	17	1049	4.9	31	2.0	25	1200	3.6
2688.3	2.4	10	1.2	17	999	5.7	34	2.3	26	1143	4.2
2689.0	2.8	13	0.967	16	998	5.8	41	1.8	24	1141	4.2
2689.7	2.7	10	0.918	16	1020	5.7	39	1.7	24	1167	4.1
2690.4	2.6	11	0.829	13	1054	6.0	37	1.5	20	1206	4.3
2691.1	2.7	13	1.2	18	1166	5.7	39	2.1	27	1333	4.2
2691.8	2.9	12	1.0	15	1077	5.9	43	1.9	23	1231	4.3
2692.5	3.3	14	1.1	15	1042	5.0	48	1.9	23	1192	3.6
2693.2	2.2	13	1.5	17	1126	4.7	32	2.8	25	1288	3.4
2693.9	2.7	14	1.1	15	1139	5.4	39	2.1	22	1303	3.9
2694.6	2.8	9.3	1.3	16	1161	6.5	40	2.3	24	1328	4.7
2695.3	2.2	12	1.3	15	1181	5.0	31	2.4	23	1351	3.7
2696.0	3.9	14	1.5	15	1219	5.6	56	2.7	23	1394	4.1
2696.7	2.8	13	2.0	18	1157	6.4	40	3.7	27	1323	4.6
2697.4	3.0	13	1.6	16	1277	3.5	43	3.0	25	1460	2.6
2698.1	4.1	13	1.4	18	1163	4.5	59	2.6	28	1329	3.3
2698.8	3.1	13	1.4	16	1335	7.4	45	2.6	24	1526	5.4
2699.5	3.0	11	1.6	15	1214	3.2	43	2.8	24	1388	2.3
2700.2	3.4	12	1.6	14	1318	4.0	49	2.8	22	1507	3.0
2700.9	3.7	10	1.7	17	1201	5.3	54	3.2	26	1374	3.8
2701.6	2.8	12	2.1	16	1272	4.6	41	3.8	24	1454	3.3
2702.3	4.5	14	1.7	21	1420	5.1	65	3.1	33	1624	3.7
2703.0	3.0	13	2.0	21	1375	5.2	44	3.6	32	1572	3.8
2703.7	3.3	13	1.7	20	1402	5.0	47	3.1	30	1603	3.6
2704.4	3.3	11	2.0	20	1508	4.6	47	3.7	31	1725	3.4
2705.1	3.1	12	2.4	19	1601	5.7	45	4.5	30	1830	4.2
2705.8	3.6	14	1.8	16	1329	4.6	53	3.3	25	1519	3.3
2706.5	3.3	12	1.8	20	1549	5.2	47	3.3	31	1772	3.8
2707.2	2.7	14	2.0	21	1562	3.6	38	3.7	31	1787	2.6
2707.9	3.5	13	1.8	20	1566	3.3	50	3.3	31	1791	2.4
2708.5	3.2	11	2.5	20	1734	6.0	46	4.6	31	1982	4.4
2709.2	2.9	17	2.3	24	1640	5.3	41	4.2	36	1876	3.8
2709.9	3.5	15	2.1	22	1435	2.7	51	3.9	34	1641	1.9
2710.6	2.2	14	1.8	22	1543	4.6	31	3.3	34	1764	3.4
2711.3	3.0	12	2.3	23	1673	4.8	44	4.2	36	1913	3.5



Minnow Environmental  
Sample ID: 005

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.269	0.196	0.051	0.509	0.002	0.006					
Length (µm)											
2712.0	2.3	14	2.2	22	1585	3.9	33	3.9	33	1812	2.8
2712.7	2.6	14	2.4	21	1477	4.7	38	4.4	33	1689	3.4
2713.4	2.8	13	2.0	20	1513	3.7	40	3.7	30	1731	2.7
2714.1	2.5	14	2.3	23	1785	4.7	36	4.2	35	2041	3.4
2714.8	2.2	14	2.4	21	1540	6.0	31	4.3	33	1761	4.4
2715.5	2.7	14	2.0	25	1704	4.3	39	3.7	38	1949	3.1
2716.2	2.1	12	2.6	24	1658	4.6	30	4.7	37	1896	3.3
2716.9	1.8	15	2.4	27	1547	4.1	26	4.4	42	1769	3.0
2717.6	2.0	15	2.3	24	1667	4.4	29	4.1	37	1906	3.2
2718.3	1.9	13	2.0	23	1388	4.5	27	3.6	36	1587	3.3
2719.0	1.7	12	2.1	23	1493	4.4	25	3.8	36	1707	3.2
2719.7	1.7	14	2.2	22	1572	4.1	24	4.1	34	1798	3.0
2720.4	1.8	14	1.6	28	1626	5.0	27	3.0	43	1860	3.7
2721.1	1.1	13	2.1	26	1569	3.5	16	3.8	40	1794	2.6
2721.8	1.2	15	2.2	21	1501	5.1	17	3.9	31	1717	3.7
2722.5	1.6	16	2.1	25	1554	3.6	23	3.8	38	1777	2.6
2723.2	0.756	15	2.2	27	1371	5.3	11	3.9	42	1568	3.9
2723.9	1.3	13	2.1	26	1264	3.4	18	3.8	39	1445	2.5
2724.6	1.8	15	1.9	26	1349	3.7	26	3.5	40	1542	2.7
2725.3	1.0	16	1.9	28	1377	4.3	15	3.5	42	1575	3.1
2726.0	1.1	13	1.4	23	1186	3.7	16	2.6	35	1356	2.7
2726.7	0.929	13	1.9	24	1158	2.9	13	3.5	37	1324	2.1
2727.4	1.4	13	1.6	22	1267	4.3	20	2.9	34	1449	3.1
2728.1	0.700	14	1.5	25	1066	3.7	10	2.8	38	1219	2.7
2728.8	1.2	17	1.4	24	1154	3.7	18	2.6	36	1320	2.7
2729.5	0.804	12	1.3	20	1042	3.2	12	2.3	30	1192	2.3
2730.2	0.846	15	1.2	22	1024	2.2	12	2.2	33	1170	1.6
2730.9	0.865	13	1.3	19	1016	3.7	12	2.3	29	1162	2.7
2731.6	1.3	15	1.4	22	1153	3.6	19	2.5	34	1319	2.6
2732.3	0.836	17	1.3	20	1054	3.6	12	2.3	30	1206	2.6
2733.0	1.3	17	1.2	23	1109	3.4	18	2.2	35	1268	2.5
2733.7	0.766	17	0.949	19	888	2.4	11	1.7	29	1016	1.8
2734.3	1.1	22	1.2	20	880	2.5	16	2.1	31	1007	1.8
2735.0	1.1	17	1.0	17	947	2.9	15	1.9	26	1082	2.1
2735.7	0.909	20	1.1	18	924	3.7	13	2.0	27	1057	2.7
2736.4	1.3	22	1.4	19	856	3.3	18	2.5	29	979	2.4
2737.1	1.4	19	0.912	18	730	2.3	21	1.7	28	835	1.7
2737.8	1.4	18	0.830	16	764	2.0	21	1.5	24	874	1.4
2738.5	1.1	22	0.887	15	818	2.5	16	1.6	23	935	1.8
2739.2	1.2	28	0.885	17	697	2.4	18	1.6	26	797	1.7
2739.9	1.7	26	0.678	14	729	2.4	25	1.2	21	834	1.8
2740.6	0.954	21	1.2	14	666	2.6	14	2.1	22	762	1.9
2741.3	0.971	24	0.719	9.8	698	2.7	14	1.3	15	798	2.0
2742.0	0.807	31	0.781	8.4	728	2.8	12	1.4	13	833	2.0
2742.7	1.9	22	0.820	12	802	2.1	28	1.5	18	918	1.5
2743.4	0.869	26	0.664	11	739	2.1	13	1.2	17	845	1.6
2744.1	1.1	21	0.468	7.5	655	2.4	15	0.854	11	749	1.7
2744.8	1.6	32	0.683	4.4	674	1.8	23	1.2	6.7	771	1.3
2745.5	1.3	42	0.626	9.8	658	2.2	18	1.1	15	753	1.6
2746.2	1.6	24	0.644	6.2	633	2.0	23	1.2	9.6	724	1.5
2746.9	1.0	29	0.604	8.2	636	2.3	15	1.1	13	727	1.7
2747.6	0.902	26	0.670	7.0	593	2.2	13	1.2	11	678	1.6
2748.3	1.2	33	0.814	8.3	718	2.0	17	1.5	13	821	1.5
2749.0	1.2	34	0.759	7.5	603	1.7	17	1.4	11	690	1.3
2749.7	0.817	36	1.5	6.2	683	2.1	12	2.7	9.4	781	1.5
2750.4	0.731	37	0.954	3.3	602	1.3	11	1.7	5.0	688	0.954
2751.1	2.1	43	1.1	8.9	595	1.7	31	2.0	14	681	1.3
2751.8	0.915	29	0.782	5.5	529	1.8	13	1.4	8.4	605	1.3
2752.5	1.1	35	0.586	5.4	738	1.2	16	1.1	8.3	843	0.907
2753.2	1.8	39	0.811	8.7	586	1.8	26	1.5	13	670	1.3
2753.9	1.2	53	1.1	10	595	1.5	18	2.0	15	681	1.1
2754.6	2.1	50	0.897	6.4	483	0.770	31	1.6	9.9	552	0.562



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Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
0.1	0.537	183	30	41	444	4.1	7.8	54	64	508	3.0
0.8	0.445	96	33	42	451	1.7	6.4	61	64	515	1.3
1.5	0.787	72	18	35	430	3.1	11	32	53	492	2.2
2.2	0.601	61	14	31	397	2.1	8.7	26	47	454	1.5
2.9	0.830	68	13	25	425	2.8	12	24	38	486	2.0
3.6	0.563	61	11	24	456	2.2	8.1	19	37	521	1.6
4.3	0.776	63	9.3	46	472	2.8	11	17	71	539	2.0
5.0	0.337	57	7.0	26	434	2.4	4.9	13	39	496	1.7
5.7	0.657	45	6.1	26	416	2.9	9.5	11	40	476	2.1
6.4	0.337	52	5.2	21	421	2.1	4.9	9.5	33	482	1.5
7.1	0.473	42	15	23	457	2.1	6.8	27	36	522	1.6
7.8	0.516	46	4.6	24	472	2.3	7.5	8.4	37	540	1.7
8.5	0.802	51	4.9	23	426	2.5	12	9.0	36	487	1.8
9.2	1.1	54	5.6	28	498	2.6	16	10	44	569	1.9
9.9	0.622	48	4.7	27	460	1.9	9.0	8.6	42	526	1.4
10.6	0.592	43	5.5	21	417	2.7	8.5	10	32	477	2.0
11.3	0.337	42	3.8	22	379	2.7	4.9	6.9	33	433	1.9
12.0	0.686	59	8.1	21	423	2.9	9.9	15	33	484	2.1
12.7	0.337	52	10	26	406	2.9	4.9	19	40	464	2.1
13.4	0.337	51	5.8	21	434	2.8	4.9	11	33	496	2.1
14.1	0.337	48	5.8	25	443	2.1	4.9	11	39	507	1.6
14.8	0.652	47	5.1	22	489	3.1	9.4	9.2	34	559	2.3
15.5	0.343	51	4.2	26	452	3.2	4.9	7.6	39	517	2.3
16.2	0.337	46	5.1	26	484	3.2	4.9	9.3	40	554	2.3
16.9	0.337	47	6.8	27	428	2.7	4.9	12	42	490	2.0
17.6	0.676	61	9.1	31	449	3.2	9.8	17	47	514	2.3
18.2	0.497	48	7.1	28	410	2.5	7.2	13	43	469	1.8
18.9	0.595	45	5.6	28	404	1.7	8.6	10	43	462	1.2
19.6	0.497	41	4.2	25	442	2.3	7.2	7.7	38	505	1.7
20.3	0.510	43	3.4	23	460	3.5	7.4	6.2	35	526	2.5
21.0	0.368	35	2.5	25	397	2.2	5.3	4.5	38	454	1.6
21.7	0.389	35	3.1	23	479	2.5	5.6	5.6	35	548	1.9
22.4	0.675	37	2.7	23	471	2.4	9.7	4.9	35	539	1.7
23.1	0.844	36	6.2	36	431	2.4	12	11	55	493	1.8
23.8	0.337	66	43	24	434	3.0	4.9	78	36	497	2.2
24.5	0.492	31	2.6	23	413	2.8	7.1	4.7	35	472	2.1
25.2	1.6	177	2.8	23	419	1.9	23	5.0	35	479	1.4
25.9	0.945	39	9.5	25	463	2.8	14	17	38	530	2.0
26.6	0.889	46	3.6	25	421	2.2	13	6.6	39	482	1.6
27.3	0.620	33	8.1	26	466	2.6	8.9	15	40	533	1.9
28.0	0.497	32	3.0	25	462	3.0	7.2	5.5	39	529	2.2
28.7	15	30	2.0	25	466	3.1	222	3.6	39	532	2.3
29.4	0.746	27	2.0	24	430	2.7	11	3.7	37	492	2.0
30.1	1.5	41	3.5	27	457	2.6	22	6.3	42	523	1.9
30.8	1.0	25	1.9	122	428	2.4	15	3.4	187	489	1.7
31.5	0.410	31	6.0	26	421	2.5	5.9	11	41	482	1.8
32.2	0.522	29	2.5	25	498	1.9	7.5	4.6	38	570	1.4
32.9	0.657	30	1.8	23	446	2.6	9.5	3.2	35	510	1.9
33.6	0.825	25	2.3	26	472	1.9	12	4.2	39	540	1.4
34.3	0.746	26	1.9	24	472	1.8	11	3.4	36	539	1.3
35.0	0.503	24	1.8	23	464	3.1	7.3	3.2	36	531	2.3
35.7	0.506	27	2.0	20	438	2.7	7.3	3.7	30	501	1.9
36.4	0.781	26	1.8	25	412	3.4	11	3.2	39	471	2.5
37.1	0.494	26	1.6	20	487	2.7	7.1	2.9	31	557	2.0
37.8	0.337	24	1.8	25	418	2.3	4.9	3.4	39	478	1.7
38.5	0.438	23	1.8	24	489	2.9	6.3	3.3	36	559	2.1
39.2	0.424	21	1.8	25	392	2.4	6.1	3.4	39	449	1.7
39.9	0.454	22	1.6	21	404	2.3	6.6	2.9	32	462	1.7
40.6	0.403	22	1.7	24	393	2.9	5.8	3.0	37	449	2.1
41.3	0.341	22	1.7	24	370	1.9	4.9	3.0	37	423	1.4
42.0	0.698	20	1.8	22	393	2.6	10	3.3	34	450	1.9
42.7	0.460	19	1.7	22	401	3.0	6.6	3.1	34	458	2.2
43.4	0.357	18	1.5	23	408	1.9	5.2	2.7	36	467	1.4
44.1	1.0	21	1.5	22	402	1.9	15	2.8	33	460	1.4
44.7	0.337	23	1.4	21	399	2.5	4.9	2.5	32	456	1.9
45.4	0.337	20	1.7	23	393	2.2	4.9	3.1	35	450	1.6
46.1	0.938	21	1.6	20	379	1.8	14	3.0	31	434	1.3
46.8	0.337	18	1.8	24	396	1.9	4.9	3.2	37	453	1.4
47.5	0.407	22	1.5	24	374	2.3	5.9	2.7	36	428	1.7
48.2	0.618	17	1.2	28	417	3.4	8.9	2.2	42	476	2.5
48.9	0.360	19	1.4	27	395	2.3	5.2	2.5	41	451	1.7
49.6	0.337	20	1.3	24	388	2.3	4.9	2.3	37	444	1.7
50.3	0.755	20	1.7	26	389	2.2	11	3.1	40	444	1.6
51.0	0.429	18	1.2	20	376	1.9	6.2	2.2	31	430	1.4
51.7	0.508	19	1.1	22	424	1.9	7.3	2.1	34	485	1.4
52.4	0.337	18	1.5	21	389	2.8	4.9	2.8	33	444	2.0
53.1	0.728	18	1.5	22	383	2.6	11	2.7	33	438	1.9
53.8	0.780	20	1.3	25	403	3.0	11	2.3	38	461	2.2
54.5	0.502	20	1.5	27	403	2.8	7.2	2.6	42	461	2.0
55.2	0.337	17	1.2	20	365	2.4	4.9	2.2	31	418	1.8
55.9	0.659	19	1.3	29	421	2.4	9.5	2.5	45	481	1.7



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
56.6	0.670	16	1.3	24	365	1.3	9.7	2.4	36	417	0.935
57.3	0.618	17	0.945	27	389	3.9	8.9	1.7	41	445	2.8
58.0	0.797	18	0.995	20	387	3.4	12	1.8	30	442	2.5
58.7	0.834	18	1.3	22	386	2.8	12	2.3	34	441	2.1
59.4	0.623	17	1.1	25	418	4.3	9.0	2.1	39	478	3.1
60.1	0.744	18	1.3	24	412	2.7	11	2.4	37	471	2.0
60.8	0.591	19	0.998	23	449	3.2	8.5	1.8	35	513	2.4
61.5	0.337	17	1.2	22	412	2.3	4.9	2.2	34	471	1.7
62.2	0.477	21	0.807	22	381	1.9	6.9	1.5	34	435	1.4
62.9	0.795	18	0.894	24	365	3.0	11	1.6	36	417	2.2
63.6	0.457	18	1.5	25	389	3.7	6.6	2.8	38	445	2.7
64.3	0.705	16	0.925	28	403	4.2	10	1.7	42	461	3.0
65.0	0.337	19	1.1	22	405	2.5	4.9	2.0	33	463	1.8
65.7	0.337	17	0.897	29	395	3.5	4.9	1.6	44	451	2.5
66.4	0.774	16	0.652	25	383	2.8	11	1.2	38	438	2.0
67.1	0.991	17	0.965	26	426	3.7	14	1.8	40	487	2.7
67.8	0.408	17	1.1	25	341	2.2	5.9	2.0	38	389	1.6
68.5	0.337	16	0.655	26	345	3.0	4.9	1.2	40	395	2.2
69.2	0.826	18	1.2	29	371	3.0	12	2.3	44	424	2.2
69.9	0.399	16	1.0	24	371	2.6	5.8	1.9	36	424	1.9
70.6	0.884	18	0.931	29	438	3.0	13	1.7	44	501	2.2
71.2	0.350	16	0.809	28	369	2.5	5.1	1.5	43	422	1.9
71.9	0.339	16	0.911	27	371	3.6	4.9	1.7	41	424	2.6
72.6	0.697	17	0.728	27	384	3.5	10	1.3	41	439	2.6
73.3	1.3	15	1.1	24	363	3.0	18	2.1	37	415	2.2
74.0	0.408	19	0.834	30	360	3.5	5.9	1.5	45	412	2.5
74.7	0.433	15	0.955	33	381	3.1	6.2	1.7	50	435	2.3
75.4	0.337	16	0.813	26	421	3.7	4.9	1.5	40	482	2.7
76.1	0.337	14	0.956	24	384	3.3	4.9	1.7	37	439	2.4
76.8	1.2	15	1.1	27	344	3.8	18	2.0	42	394	2.8
77.5	0.686	16	0.809	30	366	2.5	9.9	1.5	47	418	1.8
78.2	0.337	17	0.725	31	357	4.3	4.9	1.3	48	408	3.1
78.9	0.923	16	0.793	27	365	2.8	13	1.4	42	417	2.1
79.6	0.923	15	0.709	26	358	2.5	13	1.3	40	409	1.9
80.3	0.526	14	1.3	29	358	3.6	7.6	2.3	44	409	2.6
81.0	0.589	16	1.0	28	346	2.4	8.5	1.8	43	396	1.8
81.7	0.731	15	0.567	32	335	3.1	11	1.0	49	383	2.2
82.4	0.648	15	0.811	27	352	2.7	9.4	1.5	41	402	2.0
83.1	0.564	16	0.905	30	339	4.1	8.1	1.7	45	387	3.0
83.8	0.477	15	1.1	32	390	3.5	6.9	2.0	49	445	2.6
84.5	0.551	14	0.827	25	342	2.7	8.0	1.5	39	391	2.0
85.2	0.412	15	1.1	28	372	3.7	5.9	2.0	44	425	2.7
85.9	0.337	15	0.831	29	346	3.6	4.9	1.5	44	395	2.6
86.6	0.337	16	0.695	26	328	2.9	4.9	1.3	39	375	2.1
87.3	0.693	14	0.910	30	385	5.2	10	1.7	46	440	3.8
88.0	0.455	17	0.963	34	454	3.7	6.6	1.8	52	519	2.7
88.7	1.1	15	1.0	27	360	3.2	15	1.9	42	412	2.4
89.4	0.663	15	0.869	27	326	2.4	9.6	1.6	41	372	1.7
90.1	0.337	17	0.817	31	368	3.8	4.9	1.5	47	421	2.7
90.8	0.337	16	1.0	32	359	3.9	4.9	1.8	48	410	2.9
91.5	0.587	16	1.2	28	339	3.4	8.5	2.1	42	388	2.5
92.2	0.532	15	0.872	30	359	3.8	7.7	1.6	46	410	2.7
92.9	0.789	17	0.795	34	373	4.0	11	1.4	52	427	2.9
93.6	0.606	17	0.751	28	356	4.2	8.7	1.4	43	407	3.1
94.3	0.751	16	0.932	32	331	3.2	11	1.7	49	379	2.4
95.0	0.800	14	0.843	27	328	3.6	12	1.5	41	375	2.6
95.7	0.337	16	1.1	32	358	4.0	4.9	2.0	49	409	3.0
96.4	0.827	15	0.711	30	381	3.5	12	1.3	47	435	2.6
97.1	0.708	14	1.1	30	367	3.4	10	1.9	47	419	2.5
97.7	0.602	16	0.709	32	356	3.8	8.7	1.3	49	407	2.8
98.4	0.660	15	0.989	34	376	4.2	9.5	1.8	52	430	3.1
99.1	0.423	16	1.0	33	327	3.7	6.1	1.9	51	374	2.7
99.8	0.888	17	0.776	34	364	3.9	13	1.4	51	416	2.9
100.5	0.597	15	1.1	31	343	4.3	8.6	1.9	47	392	3.1
101.2	0.737	15	0.958	32	360	2.8	11	1.7	49	412	2.1
101.9	0.738	13	0.976	33	418	2.8	11	1.8	50	478	2.0
102.6	0.468	16	0.767	33	352	2.9	6.8	1.4	51	403	2.1
103.3	0.523	14	0.815	38	354	3.4	7.5	1.5	58	405	2.5
104.0	0.398	15	0.947	29	349	3.6	5.7	1.7	44	399	2.6
104.7	0.956	14	0.886	34	380	3.5	14	1.6	52	435	2.5
105.4	0.337	12	0.713	35	319	3.4	4.9	1.3	53	365	2.5
106.1	0.337	16	0.935	34	354	2.8	4.9	1.7	52	404	2.0
106.8	0.337	12	0.768	39	408	3.9	4.9	1.4	59	466	2.8
107.5	0.380	14	0.786	32	349	2.9	5.5	1.4	48	399	2.1
108.2	1.1	14	0.916	31	312	3.4	15	1.7	48	357	2.5
108.9	0.487	13	0.814	30	318	3.5	7.0	1.5	47	364	2.6
109.6	0.337	13	0.598	36	313	3.5	4.9	1.1	55	358	2.5
110.3	0.337	14	0.974	33	310	3.1	4.9	1.8	51	355	2.2
111.0	0.337	13	0.533	36	335	3.8	4.9	0.972	55	383	2.8
111.7	0.337	13	0.876	33	331	3.6	4.9	1.6	50	379	2.6
112.4	0.337	16	0.971	38	347	3.4	4.9	1.8	58	397	2.5



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.1	0.572	14	1.1	39	313	3.0	8.3	2.0	59	357	2.2
113.8	0.519	12	0.746	40	355	3.4	7.5	1.4	62	406	2.5
114.5	0.651	13	0.977	29	288	2.7	9.4	1.8	45	329	2.0
115.2	0.619	14	0.912	36	358	2.5	8.9	1.7	55	410	1.9
115.9	1.000	13	0.623	38	310	2.8	14	1.1	58	354	2.0
116.6	0.879	13	0.658	39	328	2.4	13	1.2	60	375	1.8
117.3	0.337	13	0.623	35	329	3.1	4.9	1.1	54	376	2.3
118.0	0.766	13	0.646	35	311	3.6	11	1.2	54	356	2.7
118.7	0.337	13	0.661	36	321	2.7	4.9	1.2	56	367	1.9
119.4	0.761	14	0.950	36	319	3.4	11	1.7	56	364	2.4
120.1	0.559	14	0.853	38	324	2.0	8.1	1.6	58	371	1.4
120.8	0.496	15	1.0	34	304	3.5	7.2	1.9	52	348	2.6
121.5	0.769	15	0.847	30	278	2.8	11	1.5	47	317	2.1
122.2	0.511	14	0.863	38	325	2.2	7.4	1.6	57	372	1.6
122.9	0.337	15	0.709	37	290	2.6	4.9	1.3	56	332	1.9
123.6	0.337	14	0.677	37	318	2.6	4.9	1.2	56	364	1.9
124.2	0.495	14	0.608	39	339	3.3	7.1	1.1	60	388	2.4
124.9	0.337	12	0.936	38	295	3.3	4.9	1.7	58	337	2.4
125.6	0.402	14	0.704	33	292	2.9	5.8	1.3	51	333	2.1
126.3	0.553	12	0.622	38	312	2.4	8.0	1.1	59	357	1.7
127.0	0.620	15	0.880	35	310	2.8	8.9	1.6	53	355	2.0
127.7	0.565	14	0.983	37	295	3.0	8.2	1.8	57	338	2.2
128.4	0.355	12	0.489	41	313	3.1	5.1	0.892	63	358	2.3
129.1	0.350	13	0.541	38	317	3.6	5.1	0.987	58	363	2.6
129.8	0.473	16	0.429	43	311	2.3	6.8	0.782	65	356	1.7
130.5	0.337	12	0.850	36	282	2.6	4.9	1.6	56	322	1.9
131.2	0.483	13	0.786	43	318	2.5	7.0	1.4	67	363	1.9
131.9	0.337	12	1.0	47	340	3.4	4.9	1.9	72	388	2.5
132.6	0.592	12	0.741	43	328	3.3	8.6	1.4	66	376	2.4
133.3	0.361	12	0.559	40	299	1.9	5.2	1.0	62	342	1.4
134.0	0.337	12	0.545	38	286	2.5	4.9	0.993	59	327	1.8
134.7	0.446	9.9	0.720	38	272	2.3	6.4	1.3	59	311	1.7
135.4	0.720	13	0.450	43	339	3.4	10	0.820	66	388	2.5
136.1	0.419	14	0.819	45	316	2.7	6.1	1.5	70	362	2.0
136.8	0.750	13	0.509	42	291	2.2	11	0.928	64	332	1.6
137.5	0.337	10	0.651	42	348	2.4	4.9	1.2	64	398	1.8
138.2	0.656	11	0.665	36	285	2.7	9.5	1.2	55	326	1.9
138.9	0.658	12	0.793	48	357	2.9	9.5	1.4	74	409	2.1
139.6	0.337	12	0.755	38	331	2.7	4.9	1.4	59	379	2.0
140.3	0.687	13	0.579	42	294	2.7	9.9	1.1	65	336	2.0
141.0	0.337	11	0.780	38	352	3.2	4.9	1.4	59	402	2.4
141.7	0.337	13	0.734	34	328	2.5	4.9	1.3	52	375	1.8
142.4	0.603	14	0.807	47	324	2.8	8.7	1.5	71	371	2.1
143.1	0.337	12	0.677	42	308	2.0	4.9	1.2	64	352	1.4
143.8	0.700	12	0.806	44	348	3.0	10	1.5	68	398	2.2
144.5	0.337	14	0.842	42	303	1.8	4.9	1.5	64	346	1.3
145.2	0.755	13	0.599	41	362	2.5	11	1.1	63	414	1.8
145.9	0.366	13	0.790	45	330	1.9	5.3	1.4	70	377	1.4
146.6	0.337	13	0.544	43	314	3.3	4.9	0.992	66	359	2.4
147.3	0.337	12	1.0	49	326	2.0	4.9	1.9	75	372	1.5
148.0	0.764	13	0.859	40	307	2.5	11	1.6	61	351	1.8
148.7	0.598	13	0.823	50	352	3.2	8.6	1.5	77	403	2.3
149.4	0.337	13	0.655	44	286	2.8	4.9	1.2	68	327	2.0
150.1	0.337	12	0.642	46	298	2.9	4.9	1.2	71	341	2.1
150.7	0.337	11	0.708	45	298	2.3	4.9	1.3	68	340	1.6
151.4	0.816	11	0.543	45	318	3.2	12	0.991	69	364	2.3
152.1	0.337	11	0.605	43	322	2.4	4.9	1.1	66	368	1.7
152.8	0.428	13	0.500	50	339	2.3	6.2	0.911	77	388	1.7
153.5	0.398	12	0.764	44	304	3.6	5.7	1.4	67	347	2.6
154.2	0.337	11	0.640	38	314	2.1	4.9	1.2	58	360	1.6
154.9	0.337	12	0.595	556	356	2.4	4.9	1.1	852	408	1.7
155.6	0.763	12	0.625	47	331	3.1	11	1.1	72	379	2.3
156.3	0.867	12	0.632	50	307	2.8	13	1.2	76	351	2.1
157.0	0.337	12	0.494	42	296	2.0	4.9	0.901	64	339	1.5
157.7	0.681	12	0.675	45	319	1.8	9.8	1.2	69	365	1.3
158.4	0.337	11	0.426	39	270	2.2	4.9	0.777	60	308	1.6
159.1	0.569	13	0.796	44	290	3.8	8.2	1.5	68	332	2.7
159.8	0.613	12	0.601	49	290	3.4	8.8	1.1	75	332	2.5
160.5	0.337	11	0.492	43	327	3.0	4.9	0.898	67	374	2.2
161.2	0.428	12	0.530	43	294	2.4	6.2	0.967	65	336	1.7
161.9	0.337	13	0.829	45	335	1.8	4.9	1.5	70	383	1.3
162.6	0.505	10	0.620	46	300	2.4	7.3	1.1	70	343	1.8
163.3	0.478	11	0.619	46	308	2.6	6.9	1.1	71	352	1.9
164.0	0.337	11	0.460	46	301	2.1	4.9	0.840	71	344	1.6
164.7	0.475	11	0.535	42	279	2.0	6.9	0.975	65	319	1.4
165.4	0.584	9.5	0.748	48	296	2.4	8.4	1.4	73	338	1.7
166.1	0.433	12	0.742	44	278	3.1	6.3	1.4	67	318	2.3
166.8	0.337	13	0.903	44	297	2.5	4.9	1.6	68	339	1.8
167.5	0.601	11	0.644	42	293	2.2	8.7	1.2	65	335	1.6
168.2	0.400	11	0.750	38	266	2.0	5.8	1.4	58	305	1.4
168.9	0.675	13	0.556	44	313	2.3	9.7	1.0	67	358	1.7



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
169.6	0.337	13	0.688	51	338	2.4	4.9	1.3	78	386	1.7
170.3	0.337	12	0.637	44	278	2.6	4.9	1.2	67	318	1.9
171.0	0.337	10	0.745	39	253	1.9	4.9	1.4	60	290	1.4
171.7	0.736	12	0.680	50	303	2.7	11	1.2	77	347	1.9
172.4	0.557	13	0.417	49	290	3.0	8.0	0.761	74	331	2.2
173.1	0.337	13	0.515	43	271	2.6	4.9	0.940	66	310	1.9
173.8	0.337	8.7	0.668	39	263	1.7	4.9	1.2	60	301	1.3
174.5	0.518	10	0.809	39	263	2.4	7.5	1.5	60	300	1.8
175.2	0.366	10	0.809	39	287	2.6	5.3	1.5	60	328	1.9
175.9	0.520	13	0.683	60	303	3.3	7.5	1.2	92	346	2.4
176.6	0.535	10	0.702	41	252	2.6	7.7	1.3	63	288	1.9
177.2	0.573	11	0.716	47	276	2.5	8.3	1.3	72	316	1.8
177.9	0.469	11	1.1	51	287	3.4	6.8	1.9	78	328	2.5
178.6	0.423	13	1.1	50	263	3.9	6.1	2.0	76	301	2.8
179.3	0.337	15	0.910	50	242	3.3	4.9	1.7	77	277	2.4
180.0	0.337	12	1.0	42	235	2.4	4.9	1.8	65	268	1.7
180.7	0.337	11	0.971	47	243	3.0	4.9	1.8	73	278	2.2
181.4	0.337	13	1.2	49	267	3.2	4.9	2.2	76	305	2.3
182.1	0.501	15	0.977	53	263	2.7	7.2	1.8	82	301	2.0
182.8	0.337	12	1.3	59	243	2.7	4.9	2.3	90	278	2.0
183.5	0.337	11	1.2	49	235	3.1	4.9	2.2	75	269	2.2
184.2	0.496	13	1.4	48	216	2.8	7.2	2.6	74	247	2.0
184.9	0.337	14	1.6	62	243	3.3	4.9	2.9	95	278	2.4
185.6	0.495	12	1.2	60	214	3.3	7.2	2.3	92	244	2.4
186.3	0.337	13	1.2	60	241	2.4	4.9	2.2	92	276	1.8
187.0	0.337	11	1.4	52	216	3.2	4.9	2.6	79	247	2.3
187.7	0.427	11	1.5	51	205	3.5	6.2	2.7	79	234	2.5
188.4	0.337	12	1.6	63	217	4.0	4.9	2.9	97	249	2.9
189.1	0.337	13	1.6	59	216	3.7	4.9	2.9	90	248	2.7
189.8	0.337	12	1.8	51	204	3.9	4.9	3.4	79	234	2.9
190.5	0.569	13	1.7	58	232	3.2	8.2	3.2	88	265	2.4
191.2	0.337	15	1.9	57	262	4.1	4.9	3.5	88	300	3.0
191.9	0.337	14	1.9	63	234	4.6	4.9	3.4	96	267	3.3
192.6	0.492	16	1.7	63	238	4.0	7.1	3.1	96	272	2.9
193.3	0.642	15	1.9	64	234	5.4	9.3	3.4	98	268	4.0
194.0	0.604	14	1.8	66	244	5.2	8.7	3.3	101	278	3.8
194.7	0.337	14	1.8	56	251	5.5	4.9	3.4	86	287	4.0
195.4	0.504	15	2.0	72	246	5.3	7.3	3.7	110	282	3.9
196.1	0.635	15	1.9	70	237	4.5	9.2	3.4	108	271	3.3
196.8	0.530	15	2.3	68	301	5.4	7.7	4.2	104	344	4.0
197.5	0.410	13	1.8	60	262	6.5	5.9	3.3	91	300	4.8
198.2	0.483	13	2.1	62	233	7.6	7.0	3.8	95	267	5.6
198.9	0.526	13	1.7	70	259	8.4	7.6	3.1	108	297	6.2
199.6	0.337	14	1.5	69	261	6.1	4.9	2.8	105	299	4.4
200.3	0.932	14	1.8	67	298	7.6	13	3.3	102	340	5.5
201.0	0.452	15	1.7	63	254	6.8	6.5	3.2	97	291	5.0
201.7	0.537	15	2.2	73	307	11	7.7	4.1	111	352	7.7
202.4	0.725	15	1.9	64	283	7.2	10	3.4	98	324	5.2
203.1	0.337	14	1.8	70	265	6.7	4.9	3.3	108	303	4.9
203.7	0.337	16	1.8	68	312	9.0	4.9	3.3	104	357	6.6
204.4	0.925	15	2.0	60	332	7.4	13	3.6	91	380	5.4
205.1	0.736	19	2.3	70	313	13	11	4.2	107	357	9.2
205.8	0.542	19	2.0	82	295	11	7.8	3.6	126	337	7.8
206.5	0.337	17	1.7	74	321	12	4.9	3.2	113	367	9.1
207.2	0.337	16	2.0	69	327	15	4.9	3.7	105	374	11
207.9	0.608	18	2.0	68	333	14	8.8	3.7	105	380	11
208.6	0.510	16	2.6	72	359	15	7.4	4.7	110	411	11
209.3	0.504	16	1.8	63	279	15	7.3	3.2	96	319	11
210.0	0.626	14	2.1	70	333	16	9.0	3.8	108	380	11
210.7	0.570	15	2.1	77	333	17	8.2	3.7	118	381	12
211.4	0.337	17	2.5	64	298	17	4.9	4.5	98	341	13
212.1	0.462	17	1.9	77	347	18	6.7	3.4	118	397	13
212.8	1.1	17	2.1	77	295	14	16	3.9	118	338	11
213.5	0.337	17	2.6	70	364	17	4.9	4.7	107	416	13
214.2	0.613	15	2.1	59	342	16	8.8	3.9	91	391	12
214.9	0.698	20	1.9	83	406	20	10	3.4	127	464	15
215.6	0.811	16	2.2	70	343	14	12	3.9	108	392	10
216.3	1.0	19	2.2	75	393	15	15	4.1	115	449	11
217.0	0.939	16	2.2	68	356	13	14	4.0	104	407	9.4
217.7	0.399	16	1.5	62	350	11	5.8	2.8	96	400	8.3
218.4	0.832	18	2.1	78	381	16	12	3.9	120	436	11
219.1	0.337	17	1.9	59	349	12	4.9	3.4	90	399	9.1
219.8	0.812	19	2.1	71	383	12	12	3.9	109	438	8.9
220.5	0.856	19	1.9	60	366	11	12	3.4	91	419	8.3
221.2	0.602	18	2.3	68	369	12	8.7	4.2	105	422	8.6
221.9	0.871	17	1.8	72	336	11	13	3.4	110	384	7.9
222.6	0.337	18	2.1	66	393	11	4.9	3.9	101	450	8.0
223.3	0.806	17	1.7	67	361	10	12	3.1	102	413	7.4
224.0	0.454	15	1.9	64	422	9.6	6.6	3.5	98	482	7.0
224.7	0.753	17	1.5	60	378	10	11	2.7	92	432	7.6
225.4	0.972	15	1.4	57	350	9.7	14	2.6	88	400	7.1



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.1	0.592	17	2.1	68	377	12	8.5	3.8	105	432	8.5
226.8	0.429	17	1.9	55	307	9.1	6.2	3.4	84	351	6.7
227.5	0.684	19	1.6	60	404	14	9.9	2.9	92	462	11
228.2	0.635	18	1.8	58	400	13	9.2	3.2	88	458	9.7
228.9	0.866	19	1.9	61	355	14	13	3.5	94	406	10
229.5	0.617	18	1.7	57	320	11	8.9	3.0	88	366	8.0
230.2	0.497	15	1.5	57	300	12	7.2	2.8	87	343	8.7
230.9	0.802	14	1.7	50	336	12	12	3.1	77	384	8.5
231.6	0.489	17	2.1	65	349	14	7.1	3.8	100	399	10
232.3	0.566	17	1.6	63	323	12	8.2	2.9	96	370	8.5
233.0	0.812	18	1.2	62	305	9.9	12	2.3	96	349	7.2
233.7	0.377	13	1.6	50	325	9.9	5.4	2.9	77	371	7.2
234.4	0.337	14	1.5	60	324	9.0	4.9	2.8	93	370	6.5
235.1	0.337	15	1.9	53	299	10	4.9	3.4	81	342	7.6
235.8	0.337	17	2.1	63	310	14	4.9	3.8	97	355	9.9
236.5	0.337	19	2.5	68	355	9.6	4.9	4.5	104	406	7.0
237.2	0.337	19	1.7	61	335	11	4.9	3.2	94	384	8.0
237.9	0.337	18	1.6	62	301	13	4.9	2.9	96	344	9.2
238.6	0.383	19	1.9	66	361	17	5.5	3.4	101	412	12
239.3	0.518	18	1.6	60	323	22	7.5	2.9	91	369	16
240.0	0.649	22	2.1	62	325	27	9.4	3.8	95	372	20
240.7	0.485	21	1.5	60	316	32	7.0	2.8	92	361	23
241.4	0.432	19	2.2	61	324	33	6.2	4.0	93	371	24
242.1	0.337	17	1.8	58	306	33	4.9	3.2	89	350	24
242.8	0.395	22	2.0	62	310	34	5.7	3.7	96	355	25
243.5	0.337	17	1.8	50	293	25	4.9	3.4	77	335	18
244.2	0.337	18	1.8	55	323	25	4.9	3.3	84	369	18
244.9	0.337	15	1.8	56	340	24	4.9	3.3	85	389	18
245.6	0.368	19	1.9	61	335	25	5.3	3.5	93	383	18
246.3	0.337	17	1.9	60	312	23	4.9	3.4	92	357	16
247.0	0.437	20	1.8	58	303	22	6.3	3.3	88	346	16
247.7	0.518	16	1.4	67	307	18	7.5	2.6	103	352	13
248.4	0.337	15	1.9	51	298	17	4.9	3.5	79	341	12
249.1	0.337	18	1.3	60	346	18	4.9	2.3	92	396	13
249.8	0.337	14	1.9	55	329	18	4.9	3.4	85	376	13
250.5	0.337	15	1.8	61	342	14	4.9	3.3	94	391	10
251.2	0.372	16	1.8	59	310	17	5.4	3.2	90	355	12
251.9	0.393	14	2.4	61	358	14	5.7	4.3	93	410	10
252.6	0.415	14	1.5	58	323	13	6.0	2.8	89	369	9.6
253.3	0.853	13	1.3	50	326	14	12	2.4	77	372	9.9
254.0	0.337	14	1.9	53	299	13	4.9	3.5	81	342	9.7
254.7	0.386	14	2.2	51	307	14	5.6	4.0	78	351	9.9
255.4	0.337	13	2.1	51	313	15	4.9	3.8	78	357	11
256.0	0.375	15	1.8	57	306	12	5.4	3.3	88	350	8.5
256.7	0.491	13	1.8	56	342	13	7.1	3.2	86	391	9.3
257.4	0.337	15	1.7	50	305	13	4.9	3.1	76	349	9.5
258.1	0.337	15	1.7	54	316	11	4.9	3.0	83	361	8.4
258.8	0.518	15	1.7	55	347	12	7.5	3.2	84	397	8.7
259.5	0.337	15	1.7	55	323	11	4.9	3.2	84	369	8.0
260.2	0.337	15	1.8	54	304	12	4.9	3.3	83	347	8.5
260.9	0.653	13	1.7	53	325	12	9.4	3.0	80	372	8.4
261.6	0.337	14	1.6	53	332	11	4.9	3.0	81	379	8.3
262.3	0.337	12	1.3	55	305	10	4.9	2.3	85	343	7.5
263.0	0.495	14	1.5	56	305	11	7.1	2.7	86	349	7.9
263.7	0.363	14	1.7	58	338	12	5.2	3.2	89	387	8.9
264.4	0.390	16	1.9	51	365	12	5.6	3.4	78	417	8.9
265.1	0.337	15	1.7	66	343	12	4.9	3.2	102	392	9.0
265.8	0.522	14	1.6	59	292	11	7.5	2.8	90	334	7.7
266.5	0.337	11	1.7	52	310	11	4.9	3.1	80	355	8.3
267.2	0.430	14	2.0	64	361	11	6.2	3.6	98	413	8.1
267.9	0.337	13	2.4	58	293	8.9	4.9	4.3	89	335	6.5
268.6	0.337	14	1.7	68	346	15	4.9	3.1	104	395	11
269.3	0.337	13	1.8	63	342	11	4.9	3.2	97	391	8.1
270.0	0.337	11	1.6	57	295	9.8	4.9	2.9	88	337	7.1
270.7	0.337	12	1.6	50	285	8.0	4.9	3.0	76	326	5.8
271.4	0.337	14	2.3	65	341	12	4.9	4.3	100	390	8.4
272.1	0.337	12	1.8	51	301	8.2	4.9	3.3	78	344	6.0
272.8	0.337	13	1.8	56	308	9.6	4.9	3.4	85	352	7.0
273.5	0.337	14	2.1	60	341	11	4.9	3.8	92	390	8.1
274.2	0.403	14	1.7	57	317	11	5.8	3.1	88	363	7.7
274.9	0.337	13	2.0	61	318	7.9	4.9	3.6	93	364	5.8
275.6	0.492	14	2.0	65	320	10	7.1	3.6	100	366	7.6
276.3	0.337	12	1.6	61	300	6.7	4.9	2.9	94	343	4.9
277.0	0.337	14	1.5	53	297	7.9	4.9	2.7	82	340	5.8
277.7	0.337	12	2.1	59	359	8.2	4.9	3.7	91	410	6.0
278.4	0.337	12	2.0	59	308	7.3	4.9	3.7	90	352	5.3
279.1	0.337	14	1.4	66	327	8.7	4.9	2.6	101	374	6.4
279.8	0.337	14	1.6	57	293	7.5	4.9	2.9	88	335	5.5
280.5	0.337	13	1.7	46	301	6.7	4.9	3.2	70	344	4.9
281.2	0.536	14	1.6	62	356	7.9	7.7	3.0	95	407	5.8
281.9	0.458	13	1.5	57	293	7.4	6.6	2.8	87	336	5.4



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Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
282.6	0.373	15	1.8	62	326	6.6	5.4	3.3	95	373	4.8
283.2	0.337	13	1.7	56	282	6.5	4.9	3.1	86	322	4.7
283.9	0.337	12	1.7	59	317	7.2	4.9	3.0	90	362	5.2
284.6	1.0	15	1.6	60	302	6.9	15	2.9	92	345	5.0
285.3	0.337	14	1.8	59	283	6.5	4.9	3.3	90	324	4.7
286.0	0.358	14	2.1	53	299	7.0	5.2	3.9	81	342	5.1
286.7	0.337	12	1.7	62	269	6.8	4.9	3.0	95	307	4.9
287.4	0.351	14	1.7	60	307	6.7	5.1	3.2	93	351	4.9
288.1	0.337	12	2.0	59	328	7.0	4.9	3.6	90	375	5.1
288.8	0.337	14	1.7	52	252	6.4	4.9	3.1	80	288	4.7
289.5	0.337	12	1.7	56	284	5.5	4.9	3.1	86	325	4.0
290.2	0.337	16	1.9	55	317	4.6	4.9	3.4	84	362	3.4
290.9	0.337	12	1.5	61	275	7.1	4.9	2.8	93	314	5.2
291.6	0.498	16	1.8	65	336	6.4	7.2	3.2	99	384	4.7
292.3	0.610	16	1.6	58	279	5.0	8.8	2.9	89	319	3.6
293.0	0.337	13	1.8	53	269	4.8	4.9	3.3	81	307	3.5
293.7	0.649	11	1.4	51	306	6.7	9.4	2.5	78	349	4.9
294.4	0.541	13	1.6	53	341	6.2	7.8	3.0	81	390	4.5
295.1	0.494	14	1.2	60	319	5.9	7.1	2.2	92	365	4.3
295.8	0.404	14	1.4	54	307	4.9	5.8	2.6	83	351	3.6
296.5	0.337	12	1.6	49	347	6.2	4.9	2.9	75	396	4.5
297.2	0.337	13	1.0	48	310	6.2	4.9	1.9	74	355	4.5
297.9	0.337	12	1.6	48	308	5.8	4.9	2.8	74	352	4.2
298.6	0.415	14	1.1	46	285	6.6	6.0	2.1	71	325	4.8
299.3	0.337	13	1.5	49	299	4.3	4.9	2.7	74	341	3.2
300.0	0.571	11	1.1	45	317	6.6	8.2	2.0	69	362	4.8
300.7	0.337	11	1.2	34	284	5.2	4.9	2.2	52	325	3.8
301.4	0.337	13	1.2	43	320	5.7	4.9	2.1	65	366	4.2
302.1	0.337	14	1.3	33	260	5.1	4.9	2.3	50	297	3.7
302.8	0.337	10	1.1	37	310	5.5	4.9	2.0	57	354	4.0
303.5	0.636	10.0	1.0	31	258	4.7	9.2	1.8	47	295	3.4
304.2	0.337	11	0.887	36	321	6.3	4.9	1.6	55	367	4.6
304.9	0.337	14	1.0	37	306	5.5	4.9	1.9	56	349	4.0
305.6	0.489	13	1.1	30	258	4.1	7.1	2.0	46	296	3.0
306.3	0.337	9.9	0.898	30	274	4.0	4.9	1.6	46	313	2.9
307.0	0.337	12	1.1	27	349	4.9	4.9	2.0	42	399	3.6
307.7	0.337	14	0.798	31	315	4.2	4.9	1.5	47	360	3.0
308.4	0.504	12	1.0	33	329	6.4	7.3	1.9	50	376	4.7
309.1	0.337	12	1.0	29	269	4.5	4.9	1.8	44	308	3.3
309.8	0.337	9.9	0.746	28	313	4.7	4.9	1.4	43	358	3.4
310.4	0.337	12	0.952	24	297	4.9	4.9	1.7	37	339	3.6
311.1	0.337	11	0.845	28	288	5.5	4.9	1.5	42	329	4.0
311.8	0.342	12	0.698	32	316	5.6	4.9	1.3	49	361	4.1
312.5	0.337	12	0.795	25	250	3.8	4.9	1.5	39	286	2.8
313.2	0.337	9.4	0.610	21	254	3.9	4.9	1.1	33	291	2.9
313.9	0.337	12	0.885	22	262	3.8	4.9	1.6	34	299	2.8
314.6	0.337	13	1.0	30	300	5.6	4.9	1.9	46	344	4.1
315.3	0.337	9.8	0.888	21	314	4.4	4.9	1.6	33	359	3.2
316.0	0.337	10	0.779	23	285	4.8	4.9	1.4	35	325	3.5
316.7	0.337	9.8	0.663	23	340	5.5	4.9	1.2	36	389	4.0
317.4	0.337	11	0.399	23	291	4.6	4.9	0.728	35	332	3.4
318.1	0.810	12	0.553	18	261	3.9	12	1.0	27	298	2.9
318.8	0.371	9.2	0.663	23	278	4.6	5.4	1.2	35	318	3.3
319.5	0.337	10	0.659	19	279	3.6	4.9	1.2	30	319	2.6
320.2	0.337	9.5	0.486	19	256	3.9	4.9	0.887	29	293	2.8
320.9	0.337	11	0.494	18	262	4.3	4.9	0.901	28	299	3.1
321.6	0.597	12	0.620	18	281	3.4	8.6	1.1	28	321	2.5
322.3	0.398	8.9	0.768	19	299	4.6	5.8	1.4	30	341	3.3
323.0	0.337	9.6	0.514	20	284	3.4	4.9	0.937	30	325	2.5
323.7	0.337	10	0.489	15	300	4.4	4.9	0.891	23	343	3.2
324.4	0.337	10	0.383	18	293	4.6	4.9	0.698	28	336	3.3
325.1	0.337	11	0.657	18	266	2.3	4.9	1.2	28	305	1.7
325.8	0.337	7.5	0.557	16	250	2.8	4.9	1.0	25	285	2.1
326.5	0.337	9.5	0.511	16	261	3.9	4.9	0.931	25	298	2.9
327.2	0.337	9.5	0.560	14	309	4.6	4.9	1.0	22	354	3.3
327.9	0.337	11	0.326	18	275	3.8	4.9	0.594	28	314	2.7
328.6	0.337	11	0.467	19	303	4.1	4.9	0.851	29	346	3.0
329.3	0.337	8.1	0.494	14	241	3.5	4.9	0.902	22	276	2.6
330.0	0.337	8.2	0.671	21	295	3.2	4.9	1.2	33	338	2.3
330.7	0.663	9.8	0.401	16	324	4.0	9.6	0.731	25	371	2.9
331.4	0.688	11	0.687	19	270	4.3	9.9	1.3	29	308	3.2
332.1	0.337	8.7	0.659	20	251	3.6	4.9	1.2	30	287	2.6
332.8	0.337	9.8	0.451	22	291	3.9	4.9	0.822	34	333	2.8
333.5	0.365	9.1	0.429	20	301	2.9	5.3	0.782	31	344	2.1
334.2	0.337	12	0.292	21	263	3.3	4.9	0.532	31	301	2.4
334.9	0.337	8.4	0.451	18	221	3.1	4.9	0.823	27	253	2.3
335.6	0.368	10	0.380	20	290	2.8	5.3	0.693	30	331	2.0
336.3	0.337	11	0.424	21	316	2.8	4.9	0.773	31	362	2.1
336.9	0.516	8.7	0.739	23	243	2.9	7.4	1.3	35	278	2.1
337.6	0.337	10	0.694	24	264	3.6	4.9	1.3	36	302	2.6
338.3	0.337	9.6	0.771	24	245	3.6	4.9	1.4	36	281	2.6



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.0	0.337	9.8	0.457	23	230	1.6	4.9	0.833	35	263	1.2
339.7	0.337	9.5	0.608	20	281	3.2	4.9	1.1	30	321	2.4
340.4	0.337	11	0.729	25	286	3.0	4.9	1.3	38	327	2.2
341.1	0.337	13	0.782	24	256	2.0	4.9	1.4	37	292	1.5
341.8	0.337	10	0.526	27	235	2.7	4.9	0.959	42	268	2.0
342.5	0.564	12	0.899	28	253	2.9	8.1	1.6	43	290	2.1
343.2	0.337	11	0.641	27	228	2.8	4.9	1.2	42	260	2.0
343.9	0.337	9.3	0.669	27	235	2.9	4.9	1.2	41	269	2.1
344.6	0.337	12	0.716	30	252	4.0	4.9	1.3	45	288	2.9
345.3	0.337	12	0.755	29	271	2.8	4.9	1.4	45	310	2.1
346.0	0.337	12	0.525	27	253	2.7	4.9	0.957	41	290	2.0
346.7	0.654	13	0.735	30	258	2.5	9.4	1.3	47	295	1.9
347.4	0.337	13	0.906	28	226	3.7	4.9	1.7	43	258	2.7
348.1	0.399	12	0.717	27	213	2.3	5.8	1.3	41	244	1.7
348.8	0.337	12	0.693	34	259	2.5	4.9	1.3	52	297	1.8
349.5	0.337	12	0.593	31	253	2.4	4.9	1.1	48	289	1.7
350.2	0.337	12	0.847	34	262	3.7	4.9	1.5	53	299	2.7
350.9	0.337	14	1.3	37	320	2.9	4.9	2.4	56	366	2.1
351.6	0.338	14	0.984	43	253	2.3	4.9	1.8	66	289	1.7
352.3	0.337	12	0.952	37	300	3.4	4.9	1.7	57	343	2.5
353.0	0.337	11	0.795	33	213	1.7	4.9	1.5	50	243	1.2
353.7	0.337	11	0.906	38	284	2.7	4.9	1.7	58	324	2.0
354.4	0.337	13	1.1	43	260	2.8	4.9	2.0	67	297	2.1
355.1	0.337	11	0.812	38	240	2.9	4.9	1.5	58	274	2.1
355.8	0.836	13	0.922	49	263	2.7	12	1.7	75	301	2.0
356.5	0.337	12	1.2	42	246	1.6	4.9	2.1	65	282	1.2
357.2	0.418	10	1.1	45	300	3.2	6.0	2.1	68	343	2.3
357.9	0.764	14	1.3	52	288	2.7	11	2.4	80	329	1.9
358.6	0.521	13	1.2	54	261	2.8	7.5	2.1	82	298	2.0
359.3	0.337	12	0.841	45	312	3.0	4.9	1.5	69	357	2.2
360.0	0.337	11	1.2	40	237	2.3	4.9	2.2	61	270	1.7
360.7	0.337	13	1.4	52	317	3.8	4.9	2.6	79	362	2.8
361.4	0.337	13	1.5	50	275	2.4	4.9	2.7	76	315	1.8
362.1	0.337	13	1.5	43	270	2.9	4.9	2.7	67	309	2.1
362.8	0.337	14	1.1	48	303	2.9	4.9	2.0	73	346	2.1
363.4	0.532	13	1.1	56	323	2.2	7.7	2.1	86	370	1.6
364.1	0.496	13	1.1	53	304	3.8	7.2	1.9	80	347	2.8
364.8	0.822	11	0.907	45	254	3.1	12	1.7	70	290	2.2
365.5	0.337	9.8	0.936	43	244	2.5	4.9	1.7	66	279	1.8
366.2	0.381	9.8	1.2	36	270	2.7	5.5	2.3	56	309	1.9
366.9	0.845	15	1.000	45	321	2.9	12	1.8	69	367	2.1
367.6	0.337	13	0.888	47	287	3.2	4.9	1.6	72	328	2.3
368.3	0.337	13	0.945	44	262	3.0	4.9	1.7	68	300	2.2
369.0	0.607	9.7	1.1	41	251	2.5	8.8	1.9	63	287	1.8
369.7	0.727	11	1.0	44	287	2.7	10	1.8	67	328	1.9
370.4	0.471	12	1.1	38	293	2.9	6.8	2.0	58	336	2.1
371.1	0.337	13	1.1	41	274	2.1	4.9	2.1	63	314	1.6
371.8	0.337	13	0.750	45	291	2.1	4.9	1.4	70	332	1.5
372.5	0.337	12	0.880	42	296	2.8	4.9	1.6	65	339	2.1
373.2	0.422	11	1.1	39	297	3.2	6.1	2.0	60	340	2.3
373.9	0.337	13	0.788	38	286	3.3	4.9	1.4	57	327	2.4
374.6	0.471	13	1.2	48	321	3.5	6.8	2.1	74	367	2.6
375.3	0.388	14	1.3	45	276	3.0	5.6	2.3	69	315	2.2
376.0	0.396	10	1.2	41	323	2.9	5.7	2.2	63	369	2.1
376.7	0.337	12	1.1	41	280	2.5	4.9	1.9	63	321	1.8
377.4	0.421	13	1.2	48	291	3.2	6.1	2.2	73	332	2.4
378.1	0.684	16	1.1	54	289	3.2	9.9	2.1	83	330	2.3
378.8	0.337	15	1.6	53	349	3.5	4.9	2.8	81	399	2.5
379.5	0.337	13	1.3	38	307	4.2	4.9	2.4	59	351	3.1
380.2	0.337	12	1.4	46	347	3.8	4.9	2.6	71	397	2.8
380.9	0.502	13	1.5	40	305	4.5	7.2	2.7	61	348	3.3
381.6	0.337	14	1.5	49	324	5.2	4.9	2.7	75	371	3.8
382.3	0.515	13	1.3	43	272	6.2	7.4	2.4	66	312	4.5
383.0	0.337	13	1.3	44	309	10	4.9	2.4	67	354	7.5
383.7	0.337	13	1.5	49	284	14	4.9	2.7	75	325	10
384.4	0.383	14	1.8	53	331	21	5.5	3.2	82	378	15
385.1	0.337	13	1.4	51	238	20	4.9	2.6	79	272	14
385.8	0.591	15	1.7	64	331	26	8.5	3.1	98	379	19
386.5	0.429	14	2.0	44	273	22	6.2	3.6	68	313	16
387.2	0.669	14	2.1	55	307	24	9.7	3.8	85	351	18
387.9	0.337	13	2.2	56	313	26	4.9	4.0	85	358	19
388.6	0.337	13	2.3	49	261	23	4.9	4.2	75	299	17
389.3	0.337	12	1.9	58	272	20	4.9	3.4	89	311	14
390.0	0.369	10	2.2	48	280	23	5.3	3.9	74	320	17
390.6	0.337	12	1.9	57	271	22	4.9	3.5	87	310	16
391.3	0.598	13	2.0	60	290	20	8.6	3.7	92	331	15
392.0	0.337	15	2.1	62	300	17	4.9	3.7	94	343	13
392.7	0.458	13	2.4	56	282	17	6.6	4.5	86	323	12
393.4	0.337	15	2.4	54	316	15	4.9	4.3	83	361	11
394.1	0.337	16	2.6	73	357	16	4.9	4.8	112	409	11
394.8	0.387	14	1.8	61	309	17	5.6	3.3	93	353	12



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Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
395.5	0.337	15	1.9	58	296	11	4.9	3.4	90	338	7.9
396.2	0.337	14	1.6	68	318	11	4.9	3.0	104	364	8.0
396.9	0.337	13	2.1	58	323	9.9	4.9	3.8	89	370	7.2
397.6	0.337	16	1.6	62	349	11	4.9	2.8	95	400	8.1
398.3	0.601	13	1.6	55	292	8.3	8.7	3.0	84	333	6.1
399.0	0.579	14	1.6	51	306	7.2	8.4	3.0	78	349	5.3
399.7	0.337	15	2.0	54	306	6.0	4.9	3.6	83	349	4.4
400.4	0.506	15	1.5	54	340	7.8	7.3	2.7	83	388	5.7
401.1	0.337	15	1.6	68	327	6.5	4.9	2.9	105	374	4.8
401.8	0.611	12	1.3	55	310	7.1	8.8	2.3	85	355	5.2
402.5	0.337	14	1.5	54	330	6.0	4.9	2.7	83	378	4.4
403.2	0.337	14	1.7	49	286	5.4	4.9	3.1	75	327	3.9
403.9	0.337	15	1.3	57	351	5.6	4.9	2.3	88	402	4.1
404.6	0.337	16	1.2	57	290	4.5	4.9	2.2	88	332	3.3
405.3	0.560	14	1.3	54	282	5.2	8.1	2.3	83	322	3.8
406.0	0.340	12	1.3	48	260	6.7	4.9	2.4	74	297	4.9
406.7	0.337	13	1.3	45	323	5.3	4.9	2.4	69	370	3.9
407.4	0.337	18	1.4	49	330	5.5	4.9	2.6	76	378	4.0
408.1	0.337	14	1.1	52	286	3.5	4.9	2.0	79	327	2.6
408.8	0.337	15	0.875	59	295	3.4	4.9	1.6	91	337	2.5
409.5	0.337	14	1.2	50	297	3.4	4.9	2.1	77	340	2.4
410.2	0.349	15	1.1	52	362	5.5	5.0	2.0	80	414	4.0
410.9	0.337	16	1.2	55	367	7.4	4.9	2.3	84	419	5.4
411.6	0.472	16	0.993	45	313	4.2	6.8	1.8	69	358	3.1
412.3	0.337	13	1.3	41	309	3.4	4.9	2.4	63	353	2.5
413.0	0.346	13	1.1	46	279	2.0	5.0	2.0	71	319	1.5
413.7	0.361	18	1.4	49	317	3.1	5.2	2.5	75	363	2.2
414.4	0.616	15	1.0	54	293	4.8	8.9	1.8	83	335	3.5
415.1	0.393	16	1.1	39	298	2.7	5.7	2.0	60	341	1.9
415.8	0.739	16	1.1	42	314	3.7	11	2.0	65	359	2.7
416.5	0.337	16	0.972	39	307	3.2	4.9	1.8	59	351	2.4
417.1	0.573	15	0.877	45	327	3.2	8.3	1.6	69	374	2.4
417.8	0.432	15	1.0	41	289	3.1	6.2	1.9	63	331	2.3
418.5	0.412	12	1.3	39	299	2.7	6.0	2.4	60	342	2.0
419.2	0.337	12	0.923	33	260	2.0	4.9	1.7	51	297	1.5
419.9	0.337	11	0.901	41	284	4.1	4.9	1.6	63	325	3.0
420.6	0.481	15	1.4	44	328	3.3	7.0	2.5	67	376	2.4
421.3	0.337	15	1.0	45	299	3.9	4.9	1.9	69	342	2.9
422.0	0.337	13	0.724	42	290	2.4	4.9	1.3	64	332	1.8
422.7	0.337	10	1.1	35	308	3.2	4.9	2.0	54	353	2.3
423.4	0.337	14	1.0	33	308	3.1	4.9	1.8	51	352	2.3
424.1	0.690	14	1.1	40	295	3.4	10.0	2.0	62	337	2.5
424.8	0.513	15	1.5	42	304	3.5	7.4	2.7	64	348	2.5
425.5	0.451	12	1.1	39	342	2.7	6.5	2.1	59	391	1.9
426.2	0.947	11	0.967	55	299	2.2	14	1.8	84	341	1.6
426.9	0.405	12	1.1	42	318	2.8	5.8	2.0	64	364	2.1
427.6	0.440	14	1.1	37	293	4.0	6.4	1.9	56	335	2.9
428.3	0.690	14	1.2	37	309	2.4	10.0	2.2	56	353	1.8
429.0	0.619	11	0.928	35	306	2.5	8.9	1.7	54	350	1.9
429.7	0.337	14	0.895	37	311	3.4	4.9	1.6	56	356	2.5
430.4	0.337	11	1.1	35	300	3.3	4.9	1.9	54	343	2.4
431.1	0.337	13	0.723	38	296	2.8	4.9	1.3	58	339	2.0
431.8	0.537	12	0.924	36	271	1.9	7.8	1.7	55	310	1.4
432.5	0.337	13	1.0	30	328	2.7	4.9	1.9	46	375	2.0
433.2	0.337	12	1.0	26	292	2.7	4.9	1.8	40	334	2.0
433.9	0.706	13	0.829	32	260	2.9	10	1.5	49	298	2.1
434.6	0.337	13	0.945	35	292	2.6	4.9	1.7	54	334	1.9
435.3	0.387	13	1.1	29	260	1.7	5.6	2.0	45	298	1.3
436.0	0.337	12	1.2	28	267	2.4	4.9	2.1	44	305	1.7
436.7	0.337	12	1.1	34	311	2.0	4.9	2.1	52	355	1.4
437.4	0.337	12	0.913	32	321	2.1	4.9	1.7	50	367	1.5
438.1	0.337	13	0.789	27	285	2.1	4.9	1.4	42	325	1.6
438.8	0.337	11	0.958	30	304	2.1	4.9	1.7	46	348	1.5
439.5	0.337	12	0.760	29	262	1.8	4.9	1.4	45	299	1.3
440.2	0.337	13	0.619	25	294	2.4	4.9	1.1	39	337	1.8
440.9	0.377	13	0.903	26	283	3.1	5.4	1.6	39	324	2.3
441.6	0.389	13	0.780	18	237	1.9	5.6	1.4	28	271	1.4
442.3	0.548	12	0.890	19	312	1.5	7.9	1.6	29	357	1.1
443.0	0.470	15	0.706	21	348	2.6	6.8	1.3	32	398	1.9
443.6	0.337	14	0.775	19	334	2.1	4.9	1.4	30	382	1.6
444.3	0.337	12	0.942	18	271	3.5	4.9	1.7	28	310	2.5
445.0	0.458	9.3	0.687	17	297	2.6	6.6	1.3	26	339	1.9
445.7	0.337	10	1.2	15	281	2.1	4.9	2.2	23	321	1.5
446.4	0.427	13	0.642	15	326	2.0	6.2	1.2	23	373	1.5
447.1	0.337	11	1.0	14	318	2.9	4.9	1.8	21	364	2.1
447.8	0.337	11	0.758	15	289	1.7	4.9	1.4	22	330	1.3
448.5	0.337	9.5	0.505	12	298	2.3	4.9	0.921	18	340	1.7
449.2	0.337	9.9	0.569	13	283	1.6	4.9	1.0	20	324	1.2
449.9	0.650	10	0.400	12	323	2.1	9.4	0.729	19	369	1.5
450.6	0.432	10	0.469	13	321	2.2	6.2	0.855	19	367	1.6
451.3	0.337	10	0.432	13	295	2.2	4.9	0.788	20	337	1.6



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Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
452.0	0.337	9.7	0.421	8.8	303	2.0	4.9	0.768	14	346	1.4
452.7	0.353	11	0.511	12	364	2.4	5.1	0.933	19	416	1.7
453.4	0.337	9.4	0.399	15	306	2.1	4.9	0.728	23	349	1.5
454.1	0.404	9.7	0.522	9.6	281	1.5	5.8	0.953	15	322	1.1
454.8	0.337	8.2	0.557	10	286	1.9	4.9	1.0	16	328	1.4
455.5	0.337	10	0.476	14	333	1.6	4.9	0.868	22	380	1.2
456.2	0.337	9.7	0.427	13	297	1.8	4.9	0.778	19	339	1.3
456.9	0.337	9.2	0.439	12	257	1.4	4.9	0.800	18	294	1.0
457.6	0.337	11	0.673	11	304	2.2	4.9	1.2	17	348	1.6
458.3	0.337	9.7	0.380	12	264	2.1	4.9	0.693	18	302	1.5
459.0	0.469	8.2	0.528	11	247	2.2	6.8	0.963	18	283	1.6
459.7	0.337	9.8	0.364	11	299	1.7	4.9	0.664	17	342	1.3
460.4	0.337	9.2	0.406	13	285	2.0	4.9	0.741	20	326	1.5
461.1	0.337	9.4	0.394	15	280	2.5	4.9	0.718	23	320	1.8
461.8	0.337	8.2	0.365	14	279	0.862	4.9	0.666	21	319	0.629
462.5	0.337	7.9	0.372	12	259	1.1	4.9	0.679	19	296	0.779
463.2	0.337	9.2	0.589	11	266	2.4	4.9	1.1	17	305	1.8
463.9	0.453	9.2	0.221	14	286	2.2	6.5	0.402	21	327	1.6
464.6	0.463	8.9	0.556	13	287	2.0	6.7	1.0	21	328	1.5
465.3	0.337	7.2	0.422	12	304	1.8	4.9	0.770	19	348	1.3
466.0	0.337	9.4	0.438	12	263	1.7	4.9	0.799	19	301	1.2
466.7	0.337	9.8	0.311	14	317	2.3	4.9	0.568	21	362	1.7
467.4	0.337	8.2	0.320	13	279	2.0	4.9	0.583	19	319	1.5
468.1	0.337	8.5	0.461	16	273	1.1	4.9	0.840	24	312	0.821
468.8	0.337	10	0.466	16	314	2.8	4.9	0.850	24	359	2.0
469.4	0.337	9.0	0.384	12	243	1.5	4.9	0.701	18	278	1.1
470.1	0.337	9.6	0.610	16	284	1.4	4.9	1.1	24	325	1.0
470.8	0.337	9.7	0.426	17	272	1.2	4.9	0.777	26	312	0.897
471.5	0.337	7.5	0.443	19	294	1.1	4.9	0.808	30	337	0.816
472.2	0.337	7.5	0.511	14	227	1.5	4.9	0.932	22	259	1.1
472.9	0.337	8.1	0.643	14	240	1.3	4.9	1.2	21	274	0.921
473.6	0.337	9.3	0.762	14	244	1.6	4.9	1.4	21	279	1.2
474.3	0.659	9.2	0.395	16	267	1.4	9.5	0.720	25	305	1.0
475.0	0.337	7.8	0.486	13	260	1.7	4.9	0.887	20	297	1.2
475.7	0.337	8.6	0.933	19	259	1.6	4.9	1.7	29	296	1.1
476.4	0.337	8.7	0.722	21	299	1.3	4.9	1.3	32	342	0.937
477.1	0.337	10.0	0.693	20	283	2.0	4.9	1.3	31	323	1.4
477.8	0.351	9.1	0.679	22	294	1.4	5.1	1.2	34	336	1.1
478.5	0.337	12	0.639	18	308	1.6	4.9	1.2	28	352	1.2
479.2	0.337	11	0.463	17	251	1.8	4.9	0.844	27	287	1.3
479.9	0.337	11	0.760	23	254	0.989	4.9	1.4	35	291	0.722
480.6	0.539	9.3	0.809	18	258	1.7	7.8	1.5	28	295	1.2
481.3	0.337	9.1	0.700	19	225	1.4	4.9	1.3	29	258	0.993
482.0	0.337	8.7	0.907	20	277	1.6	4.9	1.7	31	317	1.1
482.7	0.337	9.9	0.675	24	265	1.2	4.9	1.2	36	303	0.853
483.4	0.337	10	0.762	26	269	1.4	4.9	1.4	40	308	1.0
484.1	0.337	9.1	0.967	25	268	0.939	4.9	1.8	38	307	0.685
484.8	0.337	9.4	1.1	25	256	1.7	4.9	2.0	39	293	1.2
485.5	0.398	10	1.2	26	300	1.3	5.7	2.3	40	343	0.921
486.2	0.618	12	0.927	26	267	1.4	8.9	1.7	39	306	1.0
486.9	0.337	11	0.945	31	274	1.7	4.9	1.7	47	313	1.2
487.6	0.337	14	1.2	31	264	1.2	4.9	2.1	48	301	0.848
488.3	0.337	9.6	1.1	32	291	2.6	4.9	2.0	49	332	1.9
489.0	0.337	10	1.3	33	323	1.3	4.9	2.4	50	369	0.951
489.7	0.337	12	1.2	34	254	1.5	4.9	2.2	52	291	1.1
490.4	0.337	10	1.3	34	285	2.1	4.9	2.3	51	326	1.6
491.1	0.343	14	1.3	33	277	1.3	5.0	2.3	51	317	0.971
491.8	0.337	8.8	1.2	30	226	1.2	4.9	2.3	46	259	0.904
492.5	0.337	11	0.918	31	253	1.2	4.9	1.7	48	290	0.861
493.2	0.337	12	1.4	38	294	1.3	4.9	2.5	59	336	0.961
493.9	0.337	13	1.4	46	287	1.9	4.9	2.6	71	328	1.4
494.6	0.337	12	1.1	42	254	2.2	4.9	2.1	64	291	1.6
495.3	0.337	11	1.3	36	245	1.3	4.9	2.4	55	281	0.970
496.0	0.337	11	1.4	45	289	1.6	4.9	2.6	69	330	1.2
496.7	0.347	14	1.7	44	295	2.1	5.0	3.2	68	337	1.5
497.3	0.337	11	1.2	42	253	1.4	4.9	2.3	64	289	1.000
498.0	0.337	9.5	1.3	40	254	1.8	4.9	2.4	61	290	1.3
498.7	0.374	11	1.1	39	275	1.7	5.4	2.0	60	314	1.2
499.4	0.413	9.9	1.5	37	260	1.2	6.0	2.8	57	297	0.906
500.1	0.489	11	1.4	47	249	1.4	7.1	2.5	72	285	1.0
500.8	0.604	14	1.6	40	254	1.4	8.7	2.9	61	290	1.1
501.5	0.472	11	1.6	46	249	1.9	6.8	2.8	70	285	1.4
502.2	0.337	11	1.9	40	248	1.2	4.9	3.4	61	283	0.875
502.9	0.337	13	1.5	47	290	1.2	4.9	2.6	72	332	0.894
503.6	0.337	10	1.9	45	259	1.4	4.9	3.5	69	297	1.0
504.3	0.400	9.8	1.8	44	242	1.5	5.8	3.2	68	277	1.1
505.0	0.337	12	1.9	54	279	1.1	4.9	3.5	83	319	0.795
505.7	0.337	11	2.2	42	281	1.1	4.9	4.0	65	321	0.810
506.4	0.413	14	2.4	54	308	1.5	6.0	4.4	83	352	1.1
507.1	0.337	15	1.8	45	265	2.1	4.9	3.3	70	303	1.6
507.8	0.337	13	2.0	55	294	0.871	4.9	3.7	84	336	0.635



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.5	0.473	12	1.9	51	247	0.960	6.8	3.4	78	283	0.701
509.2	0.537	11	2.0	52	259	0.832	7.8	3.6	80	297	0.607
509.9	0.706	13	1.7	52	294	1.4	10	3.1	79	336	0.994
510.6	0.432	14	1.8	59	300	1.5	6.2	3.3	91	343	1.1
511.3	0.337	13	1.7	43	271	1.2	4.9	3.0	66	309	0.874
512.0	0.337	12	2.2	48	289	1.6	4.9	4.0	74	331	1.2
512.7	0.498	15	1.7	54	291	1.3	7.2	3.1	83	333	0.971
513.4	0.337	16	2.2	50	285	1.3	4.9	3.9	77	326	0.961
514.1	0.337	12	1.9	62	275	1.1	4.9	3.6	96	315	0.806
514.8	0.878	11	2.1	49	269	1.2	13	3.9	75	308	0.909
515.5	0.636	10	2.1	53	314	1.1	9.2	3.8	81	360	0.839
516.2	0.337	13	2.5	58	328	1.5	4.9	4.5	88	375	1.1
516.9	0.372	14	1.9	66	344	2.2	5.4	3.5	101	394	1.6
517.6	0.337	13	1.9	65	244	1.3	4.9	3.4	99	279	0.952
518.3	0.337	13	1.3	61	252	1.0	4.9	2.3	94	288	0.744
519.0	0.753	11	1.9	52	287	1.1	11	3.5	80	328	0.818
519.7	0.357	11	2.2	52	305	0.983	5.2	4.0	80	349	0.718
520.4	0.337	13	2.4	62	292	1.8	4.9	4.3	95	334	1.3
521.1	0.337	12	2.0	58	298	1.5	4.9	3.6	89	340	1.1
521.8	0.488	9.9	1.6	54	277	0.963	7.1	2.9	83	316	0.702
522.5	0.495	11	1.7	58	276	1.2	7.1	3.1	89	316	0.887
523.2	0.655	14	1.8	58	305	1.4	9.5	3.3	90	349	0.993
523.8	0.337	12	1.8	61	276	0.415	4.9	3.3	93	315	0.303
524.5	0.337	13	1.3	55	274	0.654	4.9	2.4	85	313	0.477
525.2	0.337	10	1.5	55	315	0.496	4.9	2.7	84	360	0.362
525.9	0.337	11	1.6	57	296	1.2	4.9	2.9	88	338	0.862
526.6	0.337	12	1.5	63	312	0.806	4.9	2.8	97	357	0.588
527.3	0.337	14	1.6	67	314	0.255	4.9	3.0	102	359	0.186
528.0	0.337	11	1.3	51	296	0.444	4.9	2.3	78	339	0.324
528.7	0.337	12	1.3	54	305	1.0	4.9	2.4	82	349	0.747
529.4	0.791	12	0.981	56	356	0.917	11	1.8	86	407	0.669
530.1	0.337	11	0.969	55	287	0.935	4.9	1.8	84	328	0.682
530.8	0.337	11	1.0	58	264	0.886	4.9	1.8	90	302	0.647
531.5	0.337	9.3	1.2	48	272	0.864	4.9	2.2	73	312	0.630
532.2	0.337	12	1.2	46	264	0.718	4.9	2.1	71	302	0.524
532.9	0.448	10	1.1	47	276	1.3	6.5	2.0	73	316	0.940
533.6	0.337	15	1.1	54	278	0.882	4.9	1.9	83	318	0.643
534.3	0.337	13	1.1	55	325	0.987	4.9	2.0	84	372	0.720
535.0	0.337	12	0.958	50	275	1.5	4.9	1.7	77	314	1.1
535.7	0.534	9.6	0.935	46	272	0.827	7.7	1.7	71	311	0.603
536.4	0.337	12	1.0	55	302	1.1	4.9	1.8	84	345	0.795
537.1	0.337	13	0.950	56	307	1.0	4.9	1.7	86	351	0.734
537.8	0.337	11	0.683	45	248	0.923	4.9	1.2	69	283	0.673
538.5	0.337	9.1	0.738	40	238	1.1	4.9	1.3	62	272	0.824
539.2	0.337	12	0.815	44	305	1.2	4.9	1.5	68	349	0.857
539.9	0.337	14	0.961	47	274	0.522	4.9	1.8	72	314	0.381
540.6	0.337	12	0.850	54	257	0.736	4.9	1.5	82	293	0.537
541.3	0.357	12	0.755	55	253	0.831	5.2	1.4	84	289	0.607
542.0	0.337	12	0.861	46	292	0.646	4.9	1.6	70	334	0.471
542.7	0.458	11	1.1	43	261	0.633	6.6	2.0	65	299	0.462
543.4	0.448	14	0.807	53	274	1.1	6.5	1.5	81	314	0.773
544.1	0.337	13	1.0	46	268	0.767	4.9	1.9	71	307	0.560
544.8	0.337	13	1.1	40	260	0.706	4.9	1.9	62	297	0.515
545.5	0.337	14	0.885	40	285	1.4	4.9	1.6	61	326	0.986
546.2	0.337	16	0.946	48	310	1.4	4.9	1.7	74	355	1.0
546.9	0.337	12	1.0	41	240	0.911	4.9	1.9	62	275	0.665
547.6	0.356	13	0.937	42	297	0.861	5.1	1.7	64	339	0.628
548.3	0.337	13	1.1	43	313	1.2	4.9	1.9	66	358	0.850
549.0	0.499	13	0.716	35	274	0.690	7.2	1.3	54	313	0.504
549.7	0.337	15	1.2	38	294	0.915	4.9	2.2	59	336	0.668
550.4	0.337	13	0.913	34	258	1.4	4.9	1.7	52	295	1.0
551.0	0.809	12	0.535	33	279	1.0	12	0.975	51	319	0.761
551.7	0.337	11	0.812	33	306	1.2	4.9	1.5	51	350	0.910
552.4	0.657	10	0.985	29	270	1.2	9.5	1.8	45	308	0.863
553.1	0.496	12	0.895	27	270	0.671	7.2	1.6	42	309	0.490
553.8	0.337	13	0.853	26	242	1.7	4.9	1.6	40	276	1.2
554.5	0.359	12	0.827	27	247	1.1	5.2	1.5	41	283	0.777
555.2	0.337	12	1.0	20	270	1.3	4.9	1.8	31	309	0.923
555.9	0.337	14	0.773	28	296	0.851	4.9	1.4	42	339	0.621
556.6	0.424	14	1.0	25	264	1.4	6.1	1.8	38	301	1.0
557.3	0.337	12	0.970	23	274	1.5	4.9	1.8	35	314	1.1
558.0	0.337	12	0.940	24	275	1.2	4.9	1.7	36	314	0.898
558.7	0.337	12	0.690	22	267	0.455	4.9	1.3	33	305	0.332
559.4	0.391	9.9	0.864	18	278	0.954	5.6	1.6	27	318	0.696
560.1	0.337	14	0.933	23	305	1.5	4.9	1.7	35	349	1.1
560.8	0.337	14	0.496	23	271	0.240	4.9	0.905	35	310	0.175
561.5	0.595	10	0.749	20	261	0.717	8.6	1.4	31	298	0.523
562.2	0.337	9.9	0.680	19	300	1.4	4.9	1.2	29	343	1.0
562.9	0.417	12	1.0	19	314	0.971	6.0	1.8	28	360	0.709
563.6	0.337	16	0.825	19	295	1.4	4.9	1.5	30	337	1.0
564.3	0.337	9.8	0.461	15	256	0.924	4.9	0.841	23	293	0.674



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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
565.0	0.337	11	0.535	15	273	1.2	4.9	0.976	22	313	0.879
565.7	0.524	10	0.835	10	264	1.0	7.6	1.5	15	302	0.753
566.4	0.337	12	0.532	15	292	1.6	4.9	0.971	24	334	1.2
567.1	0.337	11	0.588	14	264	1.4	4.9	1.1	21	301	1.1
567.8	0.702	10	0.575	11	231	1.3	10	1.0	17	265	0.918
568.5	0.337	10.0	0.516	14	293	0.581	4.9	0.941	22	335	0.424
569.2	0.337	14	0.691	15	284	1.3	4.9	1.3	23	325	0.956
569.9	0.337	11	0.586	17	273	2.1	4.9	1.1	26	312	1.6
570.6	0.337	8.1	0.533	9.4	262	0.975	4.9	0.972	14	300	0.711
571.3	0.337	12	0.469	14	281	0.975	4.9	0.855	21	321	0.711
572.0	0.410	9.7	0.582	11	291	1.2	5.9	1.1	18	332	0.844
572.7	0.431	9.0	0.738	13	283	1.1	6.2	1.3	20	323	0.769
573.4	0.337	11	0.473	11	279	1.7	4.9	0.862	16	319	1.3
574.1	0.337	11	0.656	14	278	1.3	4.9	1.2	22	318	0.965
574.8	0.412	9.3	0.585	16	254	0.542	6.0	1.1	24	290	0.396
575.5	0.337	10	0.495	11	271	0.827	4.9	0.904	17	310	0.603
576.2	0.337	12	0.383	13	262	1.0	4.9	0.698	20	299	0.744
576.9	0.337	12	0.577	12	259	1.4	4.9	1.1	19	296	1.0
577.5	0.482	9.3	0.563	12	298	1.7	7.0	1.0	18	340	1.3
578.2	0.340	8.5	0.384	11	238	0.936	4.9	0.700	16	272	0.683
578.9	0.337	11	0.544	12	289	2.4	4.9	0.993	19	330	1.7
579.6	0.337	12	0.751	14	278	0.780	4.9	1.4	21	318	0.569
580.3	0.546	9.7	0.529	15	271	0.461	7.9	0.964	23	310	0.336
581.0	0.337	8.6	0.480	12	243	1.0	4.9	0.875	18	278	0.761
581.7	0.337	10	0.500	13	279	1.4	4.9	0.913	19	319	1.1
582.4	0.528	13	0.357	15	274	1.2	7.6	0.650	24	314	0.847
583.1	0.337	8.9	0.403	11	263	1.2	4.9	0.736	16	301	0.865
583.8	0.337	8.4	0.628	11	278	0.323	4.9	1.1	18	318	0.236
584.5	0.337	9.7	0.574	10	270	1.3	4.9	1.0	16	308	0.944
585.2	0.337	9.6	0.766	11	271	1.3	4.9	1.4	16	310	0.944
585.9	0.337	11	0.614	15	304	1.1	4.9	1.1	22	348	0.781
586.6	0.337	9.8	0.332	12	251	1.0	4.9	0.605	18	287	0.747
587.3	0.337	8.1	0.396	9.9	277	1.1	4.9	0.723	15	317	0.814
588.0	0.337	9.0	0.354	11	262	1.3	4.9	0.646	17	300	0.932
588.7	0.337	8.9	0.400	11	269	1.2	4.9	0.730	18	308	0.858
589.4	0.438	12	0.439	11	281	2.1	6.3	0.800	17	321	1.5
590.1	0.337	8.9	0.481	12	252	1.1	4.9	0.878	19	288	0.791
590.8	0.337	8.5	0.461	9.6	247	0.924	4.9	0.841	15	283	0.674
591.5	0.337	8.1	0.745	10	284	1.8	4.9	1.4	16	325	1.3
592.2	0.337	8.9	0.805	14	264	1.2	4.9	1.5	21	302	0.861
592.9	0.337	8.9	0.416	12	238	1.2	4.9	0.759	18	272	0.892
593.6	0.528	8.2	0.630	9.2	286	1.1	7.6	1.1	14	327	0.769
594.3	0.337	8.6	0.544	9.9	265	1.4	4.9	0.992	15	303	1.0
595.0	0.509	9.0	0.765	11	293	1.0	7.4	1.4	16	335	0.754
595.7	0.337	8.0	0.445	11	263	1.3	4.9	0.812	16	301	0.937
596.4	0.337	10	0.577	15	279	2.2	4.9	1.1	23	319	1.6
597.1	0.337	8.7	0.439	9.9	231	0.685	4.9	0.800	15	264	0.500
597.8	0.337	9.2	0.865	12	279	1.2	4.9	1.6	19	319	0.907
598.5	0.337	8.5	0.683	14	292	1.4	4.9	1.2	21	334	1.0
599.2	0.337	9.2	0.586	14	289	1.4	4.9	1.1	21	330	0.994
599.9	0.345	9.9	0.482	13	280	2.0	5.0	0.879	20	320	1.5
600.6	0.337	7.8	0.617	14	284	1.0	4.9	1.1	21	324	0.737
601.3	0.337	7.6	0.592	14	291	1.4	4.9	1.1	22	333	1.0
602.0	0.337	9.0	0.403	16	319	1.6	4.9	0.734	24	365	1.2
602.7	0.416	9.1	0.450	13	252	1.1	6.0	0.820	20	288	0.836
603.3	0.337	8.3	0.528	14	231	1.1	4.9	0.962	22	264	0.837
604.0	0.641	9.4	0.481	11	299	1.1	9.3	0.877	17	342	0.790
604.7	0.337	8.4	0.582	15	278	1.4	4.9	1.1	23	318	0.990
605.4	0.337	6.5	0.626	13	267	2.1	4.9	1.1	20	306	1.5
606.1	0.337	7.8	0.758	15	261	1.4	4.9	1.4	23	298	1.0
606.8	0.354	9.3	0.666	16	254	1.5	5.1	1.2	25	290	1.1
607.5	0.337	7.7	0.583	15	262	1.0	4.9	1.1	24	299	0.733
608.2	0.337	10	1.0	19	277	1.3	4.9	1.9	30	317	0.921
608.9	0.337	8.5	0.903	15	255	1.2	4.9	1.6	23	291	0.901
609.6	0.337	10	0.717	20	299	1.3	4.9	1.3	31	342	0.943
610.3	0.337	11	1.1	17	292	1.6	4.9	2.0	26	334	1.2
611.0	0.337	10.0	0.800	17	293	1.4	4.9	1.5	27	335	0.993
611.7	0.337	9.5	1.3	23	286	1.4	4.9	2.3	35	327	1.0
612.4	0.337	9.7	1.4	19	281	1.7	4.9	2.5	30	321	1.2
613.1	0.337	9.7	0.917	23	313	2.4	4.9	1.7	35	358	1.8
613.8	0.337	9.5	0.967	20	232	0.812	4.9	1.8	31	266	0.592
614.5	0.337	9.2	0.971	19	205	1.2	4.9	1.8	30	235	0.850
615.2	0.510	12	0.939	22	262	1.5	7.4	1.7	34	300	1.1
615.9	0.337	12	1.0	23	243	1.7	4.9	1.9	35	277	1.2
616.6	0.556	11	0.799	23	253	0.860	8.0	1.5	35	290	0.628
617.3	0.417	10	0.853	22	239	1.1	6.0	1.6	34	273	0.801
618.0	0.339	9.9	1.2	25	248	1.6	4.9	2.2	38	283	1.1
618.7	0.353	12	0.987	27	223	1.0	5.1	1.8	42	255	0.748
619.4	0.569	16	1.1	28	246	0.673	8.2	2.0	42	281	0.491
620.1	0.337	14	0.994	27	255	1.9	4.9	1.8	41	292	1.4
620.8	0.337	10	0.898	27	197	0.413	4.9	1.6	41	225	0.301



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.5	0.409	11	0.845	20	240	1.3	5.9	1.5	31	275	0.947
622.2	0.337	12	0.767	27	222	0.708	4.9	1.4	42	254	0.517
622.9	0.337	13	1.0	23	209	0.580	4.9	1.9	36	239	0.423
623.6	0.337	13	0.840	26	264	0.946	4.9	1.5	40	302	0.690
624.3	0.411	11	0.636	22	252	0.956	5.9	1.2	34	288	0.697
625.0	0.337	12	0.774	21	228	0.510	4.9	1.4	32	261	0.372
625.7	0.346	13	0.820	23	231	0.923	5.0	1.5	35	264	0.673
626.4	0.455	14	0.702	26	202	0.941	6.6	1.3	40	231	0.686
627.1	0.337	10	0.405	19	208	0.608	4.9	0.739	28	238	0.444
627.8	0.337	11	0.700	21	191	0.600	4.9	1.3	32	218	0.438
628.5	0.337	9.8	0.511	25	286	0.885	4.9	0.932	38	327	0.646
629.2	0.515	11	0.638	24	291	1.5	7.4	1.2	37	333	1.1
629.8	0.393	13	0.572	20	225	0.914	5.7	1.0	31	257	0.667
630.5	0.582	13	0.582	21	217	0.983	8.4	1.1	32	248	0.717
631.2	0.415	12	0.588	23	254	0.546	6.0	1.1	35	291	0.398
631.9	0.337	11	0.677	19	279	1.8	4.9	1.2	29	319	1.3
632.6	0.630	13	0.654	23	252	1.2	9.1	1.2	36	288	0.896
633.3	0.337	13	0.479	22	267	1.7	4.9	0.873	34	305	1.2
634.0	0.337	11	0.492	20	284	1.4	4.9	0.898	30	324	0.996
634.7	0.337	12	1.0	21	318	0.586	4.9	1.8	32	363	0.428
635.4	0.337	14	0.607	21	261	0.793	4.9	1.1	32	299	0.579
636.1	0.337	11	0.218	16	252	0.907	4.9	0.397	25	288	0.662
636.8	0.337	12	0.637	18	295	1.4	4.9	1.2	27	337	1.0
637.5	0.400	12	0.639	15	259	1.9	5.8	1.2	23	296	1.4
638.2	0.337	13	0.605	15	291	1.4	4.9	1.1	22	333	0.994
638.9	0.337	9.3	0.543	19	246	1.3	4.9	0.990	29	281	0.921
639.6	0.337	10	0.694	18	329	1.8	4.9	1.3	28	376	1.3
640.3	0.337	9.2	0.580	13	250	0.792	4.9	1.1	20	286	0.578
641.0	0.337	8.9	0.487	13	247	1.3	4.9	0.887	20	283	0.914
641.7	0.489	9.9	0.403	15	286	1.8	7.1	0.736	23	327	1.3
642.4	0.337	10	0.462	15	320	1.8	4.9	0.842	23	366	1.3
643.1	0.337	12	0.339	15	267	1.5	4.9	0.618	22	306	1.1
643.8	0.337	8.3	0.349	10	256	1.4	4.9	0.636	16	292	1.0
644.5	0.337	11	0.338	10	284	1.2	4.9	0.617	15	324	0.851
645.2	0.337	11	0.322	12	265	1.5	4.9	0.587	18	303	1.1
645.9	0.337	9.4	0.337	13	237	0.844	4.9	0.614	19	271	0.616
646.6	0.337	9.2	0.249	9.9	242	0.724	4.9	0.455	15	277	0.528
647.3	0.337	8.1	0.265	11	260	1.4	4.9	0.484	17	297	0.989
648.0	0.337	9.3	0.504	10	276	0.841	4.9	0.919	16	316	0.614
648.7	0.337	10	0.401	16	296	1.4	4.9	0.732	24	338	1.0
649.4	0.337	8.4	0.265	11	239	0.798	4.9	0.484	18	273	0.582
650.1	0.337	8.5	0.422	9.2	272	1.0	4.9	0.769	14	311	0.751
650.8	0.337	7.3	0.319	8.9	256	1.1	4.9	0.582	14	292	0.817
651.5	0.337	7.3	0.336	12	277	0.759	4.9	0.614	18	316	0.553
652.2	0.337	7.9	0.366	15	286	1.3	4.9	0.667	23	327	0.936
652.9	0.337	8.3	0.259	13	317	1.8	4.9	0.472	20	363	1.3
653.6	0.337	6.8	0.360	13	243	1.2	4.9	0.657	20	278	0.889
654.3	0.337	7.5	0.334	10	249	0.501	4.9	0.608	15	285	0.366
655.0	0.532	7.0	0.579	16	284	0.990	7.7	1.1	24	325	0.722
655.6	0.337	7.4	0.245	9.8	236	1.1	4.9	0.446	15	270	0.806
656.3	0.337	8.9	0.325	13	264	1.6	4.9	0.593	20	302	1.1
657.0	0.337	8.2	0.316	11	298	1.4	4.9	0.577	17	341	1.0
657.7	0.337	8.3	0.498	13	282	1.6	4.9	0.908	20	323	1.2
658.4	0.337	6.8	0.530	12	252	1.5	4.9	0.967	19	288	1.1
659.1	0.337	7.3	0.412	18	283	2.2	4.9	0.751	28	323	1.6
659.8	0.337	8.1	0.414	15	220	0.822	4.9	0.756	23	251	0.600
660.5	0.337	9.0	0.581	13	230	0.982	4.9	1.1	21	263	0.716
661.2	0.337	7.6	0.511	15	237	1.2	4.9	0.932	22	272	0.868
661.9	0.337	9.0	0.345	16	274	1.7	4.9	0.630	24	313	1.3
662.6	0.337	8.2	0.638	14	206	1.6	4.9	1.2	21	236	1.2
663.3	0.337	6.6	0.407	16	268	1.2	4.9	0.742	25	306	0.872
664.0	0.337	7.9	0.695	20	274	1.9	4.9	1.3	30	314	1.4
664.7	0.337	7.4	0.613	16	252	1.5	4.9	1.1	24	288	1.1
665.4	0.337	8.1	0.685	17	258	1.6	4.9	1.3	26	295	1.2
666.1	0.337	6.8	0.779	20	259	1.6	4.9	1.4	31	296	1.2
666.8	0.337	7.6	0.793	16	231	1.5	4.9	1.4	25	264	1.1
667.5	0.337	7.7	0.725	16	199	1.1	4.9	1.3	24	228	0.813
668.2	0.337	7.6	0.652	16	232	1.0	4.9	1.2	25	266	0.753
668.9	0.337	8.5	0.644	22	240	0.791	4.9	1.2	33	274	0.577
669.6	0.337	6.1	0.735	20	218	2.0	4.9	1.3	31	250	1.5
670.3	0.337	8.2	0.640	15	221	1.8	4.9	1.2	22	253	1.3
671.0	0.465	8.9	0.972	18	240	1.7	6.7	1.8	28	275	1.2
671.7	0.337	9.0	1.1	23	267	2.4	4.9	2.0	35	305	1.8
672.4	0.337	9.6	1.2	22	286	1.3	4.9	2.1	33	327	0.915
673.1	0.337	9.9	0.553	24	278	2.0	4.9	1.0	36	318	1.5
673.8	0.337	7.2	0.840	22	228	1.2	4.9	1.5	34	260	0.900
674.5	0.575	8.2	0.826	21	243	1.9	8.3	1.5	32	278	1.4
675.2	0.337	9.3	1.1	24	273	1.8	4.9	2.0	36	312	1.3
675.9	0.337	8.3	1.2	19	282	1.8	4.9	2.3	30	323	1.3
676.6	0.337	7.6	1.4	28	274	1.4	4.9	2.5	43	313	1.0
677.3	0.337	7.0	1.1	22	311	1.8	4.9	2.0	34	356	1.3



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
678.0	0.337	8.6	0.864	24	291	2.0	4.9	1.6	36	333	1.5
678.7	0.337	8.2	0.635	21	246	1.7	4.9	1.2	32	281	1.3
679.4	0.337	8.7	1.1	21	268	1.4	4.9	2.0	33	307	1.1
680.1	0.337	7.6	0.665	22	240	0.974	4.9	1.2	34	275	0.710
680.8	0.599	9.4	0.917	19	274	1.8	8.7	1.7	30	313	1.3
681.5	0.337	9.1	0.806	25	265	2.3	4.9	1.5	38	303	1.7
682.1	0.337	10	0.834	24	261	2.2	4.9	1.5	37	298	1.6
682.8	0.337	10	1.1	25	245	1.6	4.9	2.0	39	280	1.2
683.5	0.337	9.0	0.666	24	296	1.9	4.9	1.2	36	339	1.4
684.2	0.337	9.3	0.886	25	279	1.6	4.9	1.6	38	320	1.2
684.9	0.337	8.7	1.1	25	242	0.886	4.9	2.0	39	277	0.646
685.6	0.337	10	0.816	27	279	1.8	4.9	1.5	41	319	1.3
686.3	0.337	10	1.0	29	268	0.919	4.9	1.8	44	307	0.671
687.0	0.337	9.1	0.830	30	277	1.2	4.9	1.5	46	317	0.888
687.7	0.337	10.0	0.656	22	259	0.622	4.9	1.2	34	296	0.454
688.4	0.337	11	0.770	29	275	2.1	4.9	1.4	44	315	1.6
689.1	0.337	10	0.842	27	249	1.4	4.9	1.5	42	284	1.0
689.8	0.337	8.3	0.712	29	259	1.1	4.9	1.3	44	297	0.819
690.5	0.337	7.6	0.985	28	254	1.1	4.9	1.8	43	291	0.794
691.2	0.337	9.8	1.0	32	255	1.5	4.9	1.8	49	292	1.1
691.9	0.337	7.9	0.666	30	283	1.4	4.9	1.2	46	323	1.0
692.6	0.337	10	0.777	34	241	0.622	4.9	1.4	53	275	0.454
693.3	0.337	7.6	0.818	32	236	1.2	4.9	1.5	49	270	0.896
694.0	0.337	10	0.702	30	233	1.3	4.9	1.3	46	267	0.923
694.7	0.337	9.6	0.882	34	292	1.4	4.9	1.6	52	334	0.985
695.4	0.337	10	0.721	36	280	1.4	4.9	1.3	55	321	1.0
696.1	0.337	9.3	0.777	38	233	1.4	4.9	1.4	59	266	0.999
696.8	0.367	9.0	0.535	41	244	1.2	5.3	0.975	62	279	0.850
697.5	0.337	9.0	0.776	38	257	0.873	4.9	1.4	58	293	0.637
698.2	0.337	8.2	1.0	38	278	1.0	4.9	1.9	58	318	0.735
698.9	0.337	10	0.723	39	265	0.752	4.9	1.3	59	303	0.548
699.6	0.337	12	0.840	42	278	1.6	4.9	1.5	64	318	1.2
700.3	0.532	8.9	0.665	37	232	0.824	7.7	1.2	57	265	0.601
701.0	0.337	9.3	0.947	39	246	1.2	4.9	1.7	59	281	0.881
701.7	0.337	11	1.1	43	244	1.0	4.9	1.9	65	279	0.736
702.4	0.337	10	0.924	45	248	1.4	4.9	1.7	70	283	1.0
703.1	0.337	11	0.973	45	253	1.2	4.9	1.8	69	289	0.856
703.8	0.337	13	1.1	43	243	0.687	4.9	1.9	66	278	0.501
704.5	0.337	11	0.881	45	257	1.3	4.9	1.6	68	294	0.944
705.2	0.337	10	0.907	46	268	1.6	4.9	1.7	70	306	1.1
705.9	0.337	10	0.685	48	264	1.1	4.9	1.2	74	302	0.788
706.6	0.507	8.7	0.685	53	306	1.0	7.3	1.2	82	349	0.750
707.3	0.372	8.5	0.900	43	256	1.0	5.4	1.6	65	293	0.765
707.9	0.337	9.1	0.835	48	269	0.799	4.9	1.5	74	308	0.583
708.6	0.337	12	0.831	49	253	0.488	4.9	1.5	75	290	0.356
709.3	0.337	11	0.879	49	305	0.674	4.9	1.6	76	349	0.492
710.0	0.337	9.8	0.634	48	280	0.695	4.9	1.2	74	321	0.507
710.7	0.337	9.2	0.741	44	274	0.890	4.9	1.4	68	314	0.649
711.4	0.337	9.9	0.677	43	251	0.521	4.9	1.2	66	287	0.380
712.1	0.337	9.4	0.676	47	232	0.371	4.9	1.2	72	266	0.271
712.8	0.421	12	0.579	46	240	0.395	6.1	1.1	71	274	0.288
713.5	0.337	9.7	0.636	41	235	0.829	4.9	1.2	62	269	0.605
714.2	0.337	8.2	0.514	46	248	0.463	4.9	0.937	70	283	0.338
714.9	0.337	9.6	0.695	41	231	0.470	4.9	1.3	62	265	0.343
715.6	0.337	11	0.766	55	278	0.530	4.9	1.4	84	318	0.387
716.3	0.337	11	0.427	46	248	0.308	4.9	0.779	70	284	0.225
717.0	0.337	11	0.451	41	231	0.451	4.9	0.822	63	264	0.329
717.7	0.337	8.8	0.454	42	223	0.438	4.9	0.828	65	256	0.320
718.4	0.337	13	0.690	45	286	1.1	4.9	1.3	68	328	0.819
719.1	0.337	11	0.414	45	241	0.298	4.9	0.754	68	276	0.218
719.8	0.337	11	0.380	40	222	0.928	4.9	0.693	61	254	0.677
720.5	0.337	11	0.297	50	290	0.630	4.9	0.541	76	331	0.460
721.2	0.337	11	0.465	51	269	0.620	4.9	0.848	78	307	0.453
721.9	0.337	12	0.490	43	249	0.552	4.9	0.893	66	284	0.403
722.6	0.470	12	0.423	48	229	0.636	6.8	0.772	74	262	0.464
723.3	0.422	11	0.221	43	243	0.713	6.1	0.404	66	278	0.520
724.0	0.337	9.6	0.388	43	264	0.380	4.9	0.708	67	302	0.278
724.7	0.337	9.2	0.519	49	300	1.1	4.9	0.946	75	343	0.821
725.4	0.408	11	0.345	57	246	0.691	5.9	0.629	87	282	0.504
726.1	0.337	11	0.641	42	221	0.546	4.9	1.2	64	252	0.399
726.8	0.337	9.0	0.414	40	226	1.0	4.9	0.754	61	259	0.762
727.5	0.337	9.2	0.389	43	293	0.501	4.9	0.709	66	335	0.365
728.2	0.337	11	0.462	42	262	0.724	4.9	0.843	65	299	0.529
728.9	0.550	11	0.640	46	268	1.0	7.9	1.2	71	306	0.747
729.6	0.611	10	0.437	39	269	0.657	8.8	0.797	60	308	0.479
730.3	0.433	8.7	0.343	43	240	0.651	6.3	0.625	66	274	0.475
731.0	0.337	11	0.570	29	272	1.0	4.9	1.0	44	311	0.749
731.7	0.337	12	0.681	31	349	1.1	4.9	1.2	48	400	0.768
732.4	0.337	11	0.575	33	326	1.0	4.9	1.0	51	372	0.732
733.1	0.337	10	0.483	36	303	0.968	4.9	0.882	55	347	0.706
733.8	0.337	12	0.837	29	291	0.943	4.9	1.5	44	333	0.688



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
734.4	0.337	11	0.712	25	274	1.2	4.9	1.3	39	313	0.855
735.1	0.456	10	0.599	28	290	0.848	6.6	1.1	43	331	0.619
735.8	0.337	9.9	0.659	21	273	0.913	4.9	1.2	32	312	0.666
736.5	0.337	14	0.563	24	269	1.6	4.9	1.0	36	307	1.2
737.2	0.421	9.7	0.703	21	263	0.950	6.1	1.3	32	301	0.693
737.9	0.712	11	0.419	20	315	1.6	10	0.764	30	360	1.2
738.6	0.337	13	0.683	16	286	0.940	4.9	1.2	24	327	0.686
739.3	0.337	15	0.606	18	277	1.8	4.9	1.1	28	317	1.3
740.0	0.341	9.9	0.697	17	268	1.2	4.9	1.3	27	307	0.844
740.7	0.337	8.7	0.678	14	235	1.1	4.9	1.2	22	268	0.779
741.4	0.337	11	0.821	17	292	1.6	4.9	1.5	27	334	1.1
742.1	0.337	11	0.996	20	309	2.0	4.9	1.8	31	354	1.5
742.8	0.427	9.4	0.802	20	304	1.6	6.2	1.5	30	348	1.2
743.5	0.337	12	0.528	17	276	1.3	4.9	0.963	26	315	0.930
744.2	0.337	12	0.625	13	266	1.0	4.9	1.1	20	304	0.742
744.9	0.337	9.3	0.674	14	246	1.7	4.9	1.2	21	282	1.2
745.6	0.337	9.3	0.659	18	262	1.2	4.9	1.2	28	300	0.842
746.3	0.648	9.8	0.411	17	301	1.9	9.4	0.749	25	345	1.4
747.0	0.337	7.8	0.559	14	245	1.5	4.9	1.0	21	280	1.1
747.7	0.337	8.3	0.869	14	256	1.1	4.9	1.6	21	293	0.784
748.4	0.630	9.5	0.709	16	246	0.982	9.1	1.3	25	282	0.717
749.1	0.589	10	0.425	12	274	1.7	8.5	0.775	19	313	1.2
749.8	0.364	7.6	0.410	14	270	0.924	5.3	0.748	21	308	0.674
750.5	0.337	8.7	0.553	12	227	0.996	4.9	1.0	18	260	0.727
751.2	0.337	11	0.299	12	266	1.8	4.9	0.545	18	304	1.3
751.9	0.537	9.0	0.604	13	295	1.2	7.8	1.1	20	338	0.903
752.6	0.550	9.6	0.544	14	263	1.5	7.9	0.992	22	301	1.1
753.3	0.337	8.2	0.376	14	245	1.6	4.9	0.685	21	280	1.2
754.0	0.337	10	0.522	14	268	1.1	4.9	0.951	22	306	0.800
754.7	0.337	11	0.370	11	239	1.1	4.9	0.675	16	274	0.793
755.4	0.337	8.9	0.635	15	277	1.3	4.9	1.2	22	317	0.927
756.1	0.422	9.7	0.674	16	263	1.8	6.1	1.2	25	301	1.3
756.8	0.337	7.8	0.517	14	258	1.0	4.9	0.943	21	295	0.762
757.5	0.337	9.5	0.281	14	263	1.1	4.9	0.513	21	301	0.803
758.2	0.337	10	0.542	16	272	1.5	4.9	0.989	25	311	1.1
758.9	0.337	10	0.587	19	269	1.9	4.9	1.1	29	307	1.4
759.6	0.337	8.5	0.491	16	262	1.0	4.9	0.896	24	300	0.749
760.3	0.337	8.7	0.722	14	274	2.4	4.9	1.3	22	314	1.8
760.9	0.337	8.6	0.803	15	252	1.6	4.9	1.5	23	288	1.2
761.6	0.337	9.1	0.629	16	230	1.7	4.9	1.1	25	262	1.2
762.3	0.337	9.2	0.782	17	292	1.1	4.9	1.4	26	334	0.837
763.0	0.337	7.5	0.911	16	263	1.1	4.9	1.7	25	300	0.805
763.7	0.337	8.7	0.735	19	268	1.0	4.9	1.3	29	306	0.748
764.4	0.337	9.1	0.902	17	279	1.6	4.9	1.6	25	319	1.2
765.1	0.413	10	0.777	18	255	1.3	6.0	1.4	28	291	0.957
765.8	0.337	8.1	0.878	19	270	0.757	4.9	1.6	28	308	0.552
766.5	0.337	6.8	0.825	16	244	1.3	4.9	1.5	25	279	0.956
767.2	0.491	8.3	0.954	16	272	0.980	7.1	1.7	25	311	0.715
767.9	0.337	8.9	0.990	21	230	0.991	4.9	1.8	32	263	0.723
768.6	0.337	8.4	0.919	21	251	1.7	4.9	1.7	32	287	1.2
769.3	0.337	9.6	0.812	19	255	1.6	4.9	1.5	29	292	1.1
770.0	0.337	8.1	1.3	20	264	2.7	4.9	2.4	31	302	1.9
770.7	0.337	9.0	1.1	20	246	1.9	4.9	1.9	30	281	1.4
771.4	0.337	10	1.0	23	258	2.2	4.9	1.9	35	295	1.6
772.1	0.337	7.5	1.2	26	319	1.7	4.9	2.1	40	364	1.3
772.8	0.337	9.3	1.3	24	252	1.6	4.9	2.3	37	288	1.1
773.5	0.337	8.3	1.2	22	288	2.0	4.9	2.2	33	329	1.4
774.2	0.337	9.2	1.1	26	292	2.5	4.9	2.0	40	333	1.8
774.9	0.337	10	1.1	21	219	1.8	4.9	1.9	32	251	1.3
775.6	0.337	8.8	1.2	26	258	2.0	4.9	2.2	40	295	1.5
776.3	0.337	7.2	1.0	23	231	1.6	4.9	1.9	35	264	1.1
777.0	0.337	8.0	2.0	23	271	1.9	4.9	3.7	36	310	1.4
777.7	0.337	8.3	1.6	29	285	2.4	4.9	3.0	44	326	1.8
778.4	0.337	9.1	1.5	28	296	2.7	4.9	2.7	43	339	2.0
779.1	0.337	7.9	1.3	30	268	1.9	4.9	2.4	46	307	1.4
779.8	0.337	8.7	1.5	25	289	2.3	4.9	2.7	38	330	1.7
780.5	0.337	11	1.8	36	344	3.8	4.9	3.3	56	393	2.8
781.2	0.337	9.5	1.7	31	305	3.2	4.9	3.1	48	349	2.4
781.9	0.526	8.7	1.3	35	299	3.6	7.6	2.4	54	342	2.6
782.6	0.337	9.5	1.4	30	224	1.2	4.9	2.5	46	256	0.891
783.3	0.337	7.0	1.3	26	267	2.0	4.9	2.4	40	305	1.4
784.0	0.337	8.3	1.3	35	330	2.6	4.9	2.4	54	377	1.9
784.7	0.337	11	1.5	29	290	1.8	4.9	2.7	45	332	1.3
785.4	0.337	11	1.2	35	299	3.1	4.9	2.2	54	342	2.3
786.1	0.337	12	1.4	34	284	1.8	4.9	2.6	52	325	1.3
786.8	0.434	10	0.743	34	320	1.8	6.3	1.4	53	366	1.3
787.5	0.337	8.2	1.1	29	276	1.6	4.9	2.0	45	316	1.1
788.1	0.814	8.9	1.1	35	266	1.8	12	2.1	53	304	1.3
788.8	0.366	12	1.1	36	271	2.3	5.3	2.1	55	310	1.7
789.5	0.337	10	0.923	35	289	1.3	4.9	1.7	54	331	0.941
790.2	0.337	9.3	1.1	36	305	2.3	4.9	2.0	55	349	1.6



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
790.9	0.379	9.9	0.767	40	273	1.4	5.5	1.4	61	312	0.996
791.6	0.337	12	0.957	42	315	1.3	4.9	1.7	64	360	0.972
792.3	0.337	11	1.1	41	337	1.4	4.9	2.0	63	386	1.0
793.0	0.337	11	1.5	40	332	1.7	4.9	2.7	61	380	1.2
793.7	0.656	11	1.1	41	305	1.2	9.5	2.0	63	349	0.865
794.4	0.337	12	0.733	36	249	1.6	4.9	1.3	55	285	1.1
795.1	0.337	13	1.1	46	315	1.4	4.9	2.0	71	360	1.0
795.8	0.337	9.9	0.847	44	273	0.874	4.9	1.5	68	312	0.637
796.5	0.337	9.1	0.847	38	240	1.0	4.9	1.5	58	275	0.732
797.2	0.337	11	1.2	52	338	1.4	4.9	2.3	80	386	0.986
797.9	0.479	12	1.1	46	274	0.972	6.9	2.1	71	313	0.709
798.6	0.392	11	1.3	48	287	0.663	5.7	2.5	73	328	0.484
799.3	0.337	11	0.934	45	257	0.885	4.9	1.7	68	293	0.646
800.0	0.337	9.2	0.932	39	257	1.4	4.9	1.7	60	294	0.986
800.7	0.337	13	1.1	44	290	1.4	4.9	1.9	67	332	1.0
801.4	0.337	11	1.3	57	323	1.5	4.9	2.3	88	370	1.1
802.1	0.337	12	1.0	48	262	0.940	4.9	1.9	74	300	0.686
802.8	0.516	11	0.774	50	252	0.363	7.4	1.4	77	288	0.265
803.5	0.337	11	0.830	49	296	0.748	4.9	1.5	74	339	0.545
804.2	0.560	9.2	0.945	54	299	1.1	8.1	1.7	83	342	0.805
804.9	0.337	11	0.740	51	248	0.741	4.9	1.4	78	284	0.540
805.6	0.337	11	0.969	49	274	0.363	4.9	1.8	75	314	0.265
806.3	0.337	11	0.703	48	254	0.980	4.9	1.3	74	290	0.715
807.0	0.337	12	0.824	49	277	0.682	4.9	1.5	75	317	0.497
807.7	0.337	12	0.696	64	297	1.2	4.9	1.3	98	340	0.843
808.4	0.337	12	0.808	51	240	0.873	4.9	1.5	79	275	0.637
809.1	0.337	12	0.494	57	253	1.2	4.9	0.901	88	290	0.840
809.8	0.337	11	0.845	60	298	1.1	4.9	1.5	92	340	0.768
810.5	0.337	11	0.512	53	259	0.693	4.9	0.934	81	296	0.505
811.2	0.467	12	0.543	55	248	1.1	6.7	0.991	85	284	0.806
811.9	0.337	14	0.652	67	316	1.2	4.9	1.2	102	362	0.844
812.6	0.337	12	0.551	56	269	0.961	4.9	1.0	86	308	0.701
813.3	0.337	13	0.564	56	301	1.7	4.9	1.0	87	345	1.3
814.0	0.337	12	0.568	59	250	0.452	4.9	1.0	90	286	0.330
814.6	0.523	12	0.321	59	274	0.643	7.5	0.585	90	313	0.469
815.3	0.640	12	0.617	53	251	0.772	9.2	1.1	81	287	0.563
816.0	0.337	12	0.398	61	261	0.898	4.9	0.727	93	298	0.655
816.7	0.337	12	0.708	54	263	0.455	4.9	1.3	82	301	0.332
817.4	0.337	14	0.601	57	263	0.423	4.9	1.1	87	301	0.309
818.1	0.337	15	0.591	63	250	0.945	4.9	1.1	96	286	0.690
818.8	0.384	12	0.541	58	274	0.893	5.5	0.986	89	313	0.651
819.5	0.337	14	0.541	51	256	0.893	4.9	0.986	78	293	0.651
820.2	0.337	12	0.160	50	296	1.1	4.9	0.292	77	338	0.821
820.9	0.337	14	0.554	57	342	0.802	4.9	1.0	88	391	0.585
821.6	0.337	12	0.496	56	267	0.773	4.9	0.904	86	305	0.564
822.3	0.337	13	0.511	50	265	1.1	4.9	0.931	77	303	0.783
823.0	0.411	12	0.343	50	262	1.3	5.9	0.625	77	300	0.959
823.7	0.337	13	0.436	50	291	0.946	4.9	0.795	77	333	0.690
824.4	0.383	14	0.630	59	296	1.1	5.5	1.1	91	338	0.769
825.1	0.337	13	0.362	48	274	0.964	4.9	0.660	74	313	0.703
825.8	0.337	13	0.624	54	276	1.1	4.9	1.1	82	316	0.831
826.5	0.404	13	0.398	52	301	0.770	5.8	0.726	79	344	0.561
827.2	0.382	15	0.513	59	319	0.554	5.5	0.935	90	365	0.404
827.9	0.337	13	0.745	47	284	0.838	4.9	1.4	73	325	0.612
828.6	0.337	12	0.543	52	275	0.570	4.9	0.990	79	315	0.416
829.3	0.337	11	0.300	49	245	0.675	4.9	0.546	74	281	0.493
830.0	0.640	11	0.651	43	279	1.3	9.2	1.2	65	319	0.958
830.7	0.337	13	0.613	45	317	0.518	4.9	1.1	68	362	0.378
831.4	0.337	12	0.364	39	227	1.4	4.9	0.664	60	260	0.989
832.1	0.337	11	0.560	48	301	1.2	4.9	1.0	74	344	0.891
832.8	0.337	12	0.697	42	311	1.4	4.9	1.3	64	356	1.0
833.5	0.337	11	0.546	47	331	1.6	4.9	0.996	72	379	1.2
834.2	0.440	12	0.698	44	316	0.992	6.3	1.3	68	362	0.724
834.9	0.337	15	0.743	47	321	1.9	4.9	1.4	72	367	1.4
835.6	0.337	11	0.678	36	278	0.744	4.9	1.2	55	318	0.543
836.3	0.337	10	0.636	36	259	0.829	4.9	1.2	56	296	0.605
837.0	0.337	10	1.1	36	312	0.874	4.9	2.1	56	357	0.637
837.7	0.337	10	0.909	37	307	1.5	4.9	1.7	56	351	1.1
838.4	0.337	13	1.0	38	306	1.5	4.9	1.9	58	350	1.1
839.1	0.337	11	0.775	40	307	1.1	4.9	1.4	61	351	0.775
839.8	0.681	11	0.701	33	363	0.861	9.8	1.3	51	415	0.628
840.4	0.337	9.6	0.916	36	377	1.6	4.9	1.7	56	431	1.2
841.1	0.337	12	1.1	30	317	1.4	4.9	2.1	47	363	1.0
841.8	0.337	10	0.778	31	288	1.7	4.9	1.4	47	329	1.3
842.5	0.337	11	1.0	27	277	1.2	4.9	1.9	42	317	0.892
843.2	0.337	9.4	0.884	26	246	1.7	4.9	1.6	40	281	1.2
843.9	0.337	13	1.2	31	341	1.1	4.9	2.2	47	390	0.838
844.6	0.337	11	0.734	28	295	1.3	4.9	1.3	44	337	0.976
845.3	0.337	11	1.0	23	303	1.2	4.9	1.8	36	346	0.848
846.0	0.337	9.5	1.0	25	342	1.6	4.9	1.8	38	391	1.2
846.7	0.337	9.2	0.758	23	316	2.6	4.9	1.4	35	362	1.9



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
847.4	0.419	11	1.2	28	394	3.0	6.1	2.2	44	451	2.2
848.1	0.337	11	1.0	22	273	1.8	4.9	1.9	34	312	1.3
848.8	0.337	10	0.715	22	281	1.3	4.9	1.3	34	321	0.960
849.5	0.745	9.6	0.785	20	289	1.3	11	1.4	30	331	0.974
850.2	0.337	10	1.0	21	338	1.5	4.9	1.9	32	387	1.1
850.9	0.337	13	0.767	23	374	2.4	4.9	1.4	35	428	1.7
851.6	0.337	10	0.805	17	252	1.1	4.9	1.5	26	288	0.827
852.3	0.337	11	0.792	19	361	2.1	4.9	1.4	29	412	1.5
853.0	0.429	9.9	0.665	20	348	1.4	6.2	1.2	30	398	0.993
853.7	0.377	11	0.405	16	354	1.5	5.4	0.739	25	405	1.1
854.4	0.337	10	0.576	18	237	1.5	4.9	1.0	27	271	1.1
855.1	0.337	11	0.528	17	287	1.7	4.9	0.963	26	329	1.3
855.8	0.337	8.9	0.572	17	258	1.6	4.9	1.0	26	295	1.2
856.5	0.337	9.9	0.632	15	329	2.2	4.9	1.2	23	377	1.6
857.2	0.337	11	0.736	16	357	2.2	4.9	1.3	24	408	1.6
857.9	0.337	12	0.771	19	323	2.3	4.9	1.4	29	370	1.7
858.6	0.337	11	0.571	16	282	1.4	4.9	1.0	24	323	1.0
859.3	0.337	8.9	0.320	14	282	1.5	4.9	0.583	21	323	1.1
860.0	0.337	11	0.735	16	256	2.0	4.9	1.3	24	293	1.4
860.7	0.337	10	0.681	19	336	2.7	4.9	1.2	29	385	2.0
861.4	0.448	11	0.632	19	339	2.7	6.5	1.2	28	388	1.9
862.1	0.371	10	0.719	17	307	2.3	5.4	1.3	26	351	1.7
862.8	0.337	9.4	0.687	16	275	1.1	4.9	1.3	24	315	0.811
863.5	0.337	8.7	0.569	16	300	2.1	4.9	1.0	25	343	1.5
864.2	0.660	10	0.707	15	286	2.8	9.5	1.3	22	327	2.0
864.9	0.337	9.8	0.614	17	308	2.8	4.9	1.1	26	352	2.1
865.6	0.406	8.8	0.491	13	279	1.8	5.9	0.895	21	319	1.3
866.3	0.337	8.8	0.618	15	292	2.3	4.9	1.1	23	334	1.7
867.0	0.646	10	0.746	17	324	2.9	9.3	1.4	25	371	2.1
867.6	0.337	11	0.863	18	310	2.5	4.9	1.6	27	355	1.8
868.3	0.337	11	0.630	18	302	2.1	4.9	1.1	28	346	1.5
869.0	0.386	8.1	0.725	16	332	3.0	5.6	1.3	24	380	2.2
869.7	0.515	11	0.831	24	289	2.9	7.4	1.5	36	330	2.1
870.4	0.337	11	0.932	21	310	2.9	4.9	1.7	32	354	2.1
871.1	0.337	9.4	0.698	21	282	2.1	4.9	1.3	32	322	1.5
871.8	0.337	10	0.833	21	284	2.3	4.9	1.5	32	325	1.7
872.5	0.337	11	1.2	23	296	3.3	4.9	2.2	35	338	2.4
873.2	0.337	12	1.2	23	350	2.4	4.9	2.1	35	401	1.7
873.9	0.337	10	1.0	24	329	2.0	4.9	1.9	37	376	1.4
874.6	0.337	10	1.3	30	323	3.1	4.9	2.4	46	369	2.3
875.3	0.337	11	1.1	21	314	2.0	4.9	2.0	33	359	1.5
876.0	0.337	9.1	0.872	22	279	2.1	4.9	1.6	34	319	1.5
876.7	0.337	10	0.871	23	312	2.0	4.9	1.6	35	357	1.4
877.4	0.337	13	1.2	24	282	2.6	4.9	2.2	37	322	1.9
878.1	0.337	9.7	1.0	29	316	2.6	4.9	1.9	44	361	1.9
878.8	0.337	11	0.945	22	254	2.4	4.9	1.7	34	290	1.8
879.5	0.337	9.2	1.1	31	285	1.9	4.9	2.0	48	326	1.4
880.2	0.337	9.8	1.0	28	272	2.7	4.9	1.9	43	312	2.0
880.9	0.337	9.4	0.935	27	317	1.8	4.9	1.7	41	363	1.3
881.6	0.337	11	0.693	29	262	1.7	4.9	1.3	44	300	1.2
882.3	0.337	12	0.842	33	306	1.5	4.9	1.5	51	350	1.1
883.0	0.337	9.9	0.845	35	338	2.5	4.9	1.5	53	387	1.8
883.7	0.530	10	0.778	32	332	1.6	7.7	1.4	50	380	1.2
884.4	0.337	14	0.864	37	313	2.1	4.9	1.6	57	358	1.5
885.1	0.337	11	0.932	41	308	0.923	4.9	1.7	62	352	0.674
885.8	0.337	9.4	1.1	32	277	1.3	4.9	2.1	50	317	0.957
886.5	0.648	11	1.1	36	315	1.9	9.3	2.0	55	360	1.4
887.2	0.469	13	0.880	34	283	2.3	6.8	1.6	53	324	1.7
887.9	0.337	15	1.2	52	335	1.3	4.9	2.1	80	383	0.914
888.6	0.337	12	1.0	37	249	1.1	4.9	1.9	56	285	0.772
889.3	0.337	11	0.995	45	308	1.0	4.9	1.8	69	352	0.740
890.0	0.337	11	1.3	47	313	1.7	4.9	2.3	72	358	1.3
890.7	0.337	12	1.7	47	339	1.5	4.9	3.1	72	388	1.1
891.4	0.337	12	0.960	46	265	1.4	4.9	1.8	71	303	1.1
892.1	0.390	10	1.4	40	260	1.2	5.6	2.6	61	298	0.842
892.8	0.337	11	1.2	44	326	1.2	4.9	2.3	68	373	0.894
893.5	0.337	12	1.6	55	352	1.6	4.9	2.9	84	402	1.2
894.1	0.337	12	1.5	47	323	1.5	4.9	2.7	71	369	1.1
894.8	0.656	12	0.913	46	284	1.4	9.5	1.7	71	325	1.0
895.5	0.337	10	0.961	47	242	0.953	4.9	1.8	71	277	0.695
896.2	0.353	12	1.2	54	279	0.768	5.1	2.1	83	319	0.561
896.9	0.337	13	1.2	61	311	1.1	4.9	2.2	93	356	0.838
897.6	0.337	12	1.1	50	255	0.811	4.9	1.9	77	291	0.591
898.3	0.337	10	1.2	53	250	0.714	4.9	2.2	81	286	0.521
899.0	0.468	12	1.3	51	331	0.967	6.8	2.3	78	379	0.706
899.7	0.337	11	1.2	66	320	1.4	4.9	2.2	101	366	0.987
900.4	0.337	10	1.2	53	303	1.1	4.9	2.2	81	347	0.822
901.1	0.337	12	1.1	68	299	1.3	4.9	1.9	104	342	0.956
901.8	0.337	10	0.882	62	279	1.4	4.9	1.6	96	319	0.985
902.5	0.337	10	0.900	60	332	0.901	4.9	1.6	92	380	0.657
903.2	0.337	11	1.3	62	295	0.944	4.9	2.3	94	337	0.688



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
903.9	0.337	14	0.793	67	318	1.6	4.9	1.4	103	364	1.2
904.6	0.337	13	1.1	66	323	1.8	4.9	2.0	102	369	1.3
905.3	0.337	10	1.2	65	335	1.0	4.9	2.1	100	383	0.758
906.0	0.337	8.3	0.881	59	266	0.915	4.9	1.6	91	305	0.667
906.7	0.337	13	0.746	68	357	1.3	4.9	1.4	104	409	0.927
907.4	0.337	12	1.3	70	305	1.5	4.9	2.4	107	349	1.1
908.1	0.337	12	1.2	67	309	0.972	4.9	2.2	103	354	0.709
908.8	0.337	11	0.896	63	314	0.887	4.9	1.6	97	359	0.648
909.5	0.337	13	1.3	67	377	2.1	4.9	2.3	103	431	1.5
910.2	0.536	12	0.767	66	272	0.987	7.7	1.4	101	312	0.720
910.9	0.490	15	0.938	65	276	1.2	7.1	1.7	99	315	0.906
911.6	0.425	12	0.905	59	286	0.559	6.1	1.7	91	327	0.408
912.3	0.337	10	1.1	60	289	1.6	4.9	1.9	92	330	1.2
913.0	0.337	12	0.795	58	298	1.4	4.9	1.4	88	341	1.0
913.7	0.337	13	1.2	84	341	1.4	4.9	2.1	129	390	1.0
914.4	0.565	15	1.3	93	398	1.6	8.2	2.3	143	455	1.2
915.1	0.441	13	0.884	71	385	1.4	6.4	1.6	109	440	1.0
915.8	0.337	11	0.898	56	327	1.3	4.9	1.6	86	373	0.964
916.5	0.337	13	0.918	59	342	2.0	4.9	1.7	91	391	1.5
917.2	0.337	12	1.0	62	333	1.9	4.9	1.8	95	381	1.4
917.9	0.337	12	0.685	60	319	1.3	4.9	1.2	92	364	0.965
918.6	0.337	12	1.3	53	279	0.852	4.9	2.4	81	319	0.622
919.3	0.337	12	0.925	56	314	1.3	4.9	1.7	86	360	0.934
919.9	0.337	10.0	1.3	61	335	1.7	4.9	2.3	94	383	1.3
920.6	0.337	13	0.786	56	309	1.4	4.9	1.4	86	353	1.0
921.3	0.337	13	1.3	56	316	1.2	4.9	2.4	86	362	0.874
922.0	0.337	12	1.5	49	344	1.6	4.9	2.7	75	393	1.2
922.7	0.337	13	1.6	43	321	1.5	4.9	2.8	66	368	1.1
923.4	0.570	13	1.1	52	293	1.8	8.2	2.1	80	335	1.3
924.1	0.578	14	1.7	42	317	1.8	8.3	3.1	64	362	1.3
924.8	0.337	12	1.1	41	260	1.6	4.9	2.1	63	298	1.2
925.5	0.337	9.5	1.4	41	327	2.1	4.9	2.5	63	374	1.5
926.2	0.378	9.6	1.3	37	324	1.1	5.5	2.3	57	371	0.802
926.9	0.337	9.8	1.3	38	307	1.0	4.9	2.4	58	351	0.758
927.6	0.392	9.7	1.3	30	280	2.0	5.7	2.3	46	321	1.5
928.3	0.337	9.6	1.1	33	280	1.1	4.9	2.1	51	321	0.822
929.0	0.337	9.4	0.728	31	350	2.1	4.9	1.3	48	400	1.5
929.7	0.337	12	0.951	29	325	0.892	4.9	1.7	44	371	0.651
930.4	0.337	12	1.4	34	340	1.9	4.9	2.5	53	389	1.4
931.1	0.337	13	1.0	37	306	1.5	4.9	1.9	56	349	1.1
931.8	0.337	11	1.2	35	311	1.6	4.9	2.2	54	356	1.2
932.5	0.337	9.5	0.804	28	312	1.6	4.9	1.5	42	357	1.2
933.2	0.337	13	1.8	28	327	1.6	4.9	3.2	43	374	1.2
933.9	0.355	11	0.915	29	328	2.4	5.1	1.7	44	375	1.8
934.6	0.337	10	0.970	31	334	2.0	4.9	1.8	47	382	1.4
935.3	0.337	10	1.3	27	321	1.7	4.9	2.4	42	367	1.3
936.0	0.337	10	1.1	28	277	1.9	4.9	2.0	43	317	1.4
936.7	0.337	11	1.2	28	276	2.4	4.9	2.3	42	316	1.7
937.4	0.337	11	1.1	33	326	1.8	4.9	2.1	51	373	1.3
938.1	0.337	10.0	1.1	27	276	1.2	4.9	2.0	42	316	0.841
938.8	0.337	11	1.1	25	327	1.5	4.9	1.9	38	374	1.1
939.5	0.337	11	0.945	27	317	2.5	4.9	1.7	41	363	1.8
940.2	0.337	8.8	1.0	27	296	2.3	4.9	1.8	42	339	1.7
940.9	0.395	8.3	0.946	27	284	1.3	5.7	1.7	42	324	0.975
941.6	0.337	9.7	0.925	26	318	1.7	4.9	1.7	40	364	1.3
942.3	0.337	9.2	0.689	22	249	1.6	4.9	1.3	34	284	1.2
943.0	0.380	10	1.2	22	329	2.1	5.5	2.2	33	376	1.5
943.7	0.337	12	0.995	27	301	2.0	4.9	1.8	41	344	1.5
944.4	0.337	12	0.980	24	281	1.9	4.9	1.8	37	321	1.4
945.1	0.339	7.7	0.783	25	337	1.2	4.9	1.4	39	385	0.898
945.8	0.337	8.5	0.615	17	358	1.6	4.9	1.1	27	409	1.2
946.4	0.407	10	0.669	26	349	1.6	5.9	1.2	40	399	1.2
947.1	0.337	11	0.854	23	326	1.9	4.9	1.6	35	372	1.4
947.8	0.337	9.3	0.707	22	269	1.2	4.9	1.3	33	308	0.906
948.5	0.337	9.4	0.629	16	243	0.996	4.9	1.1	25	278	0.727
949.2	0.511	9.1	0.715	18	284	1.6	7.4	1.3	27	325	1.2
949.9	0.337	10	0.910	20	269	1.8	4.9	1.7	31	308	1.3
950.6	0.337	9.7	0.986	26	331	2.9	4.9	1.8	40	379	2.1
951.3	0.337	9.9	0.633	23	316	1.6	4.9	1.2	35	361	1.1
952.0	0.337	10.0	0.525	21	345	1.8	4.9	0.958	32	394	1.3
952.7	0.337	9.4	0.609	19	319	2.4	4.9	1.1	30	365	1.7
953.4	0.388	9.6	0.730	25	318	3.5	5.6	1.3	38	363	2.5
954.1	0.337	9.9	0.603	21	279	1.9	4.9	1.1	32	319	1.4
954.8	0.337	8.7	0.675	21	308	1.5	4.9	1.2	32	352	1.1
955.5	0.337	8.6	0.890	23	300	2.3	4.9	1.6	35	343	1.7
956.2	0.337	7.5	0.854	23	275	1.5	4.9	1.6	35	314	1.1
956.9	0.337	10	0.718	25	302	2.5	4.9	1.3	38	345	1.8
957.6	0.337	8.4	0.889	21	287	1.7	4.9	1.6	33	328	1.2
958.3	0.337	7.9	0.855	23	272	1.9	4.9	1.6	35	311	1.4
959.0	0.678	10	0.996	26	355	3.0	9.8	1.8	39	406	2.2
959.7	0.337	9.0	1.1	20	296	2.6	4.9	2.0	31	338	1.9



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Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.4	0.337	9.5	0.966	22	281	2.3	4.9	1.8	34	321	1.7
961.1	0.337	9.7	0.894	18	234	1.9	4.9	1.6	28	267	1.4
961.8	0.337	8.6	0.973	18	256	2.4	4.9	1.8	28	293	1.7
962.5	0.337	9.0	1.1	25	284	2.5	4.9	2.1	39	324	1.8
963.2	0.468	9.1	1.4	24	287	3.9	6.8	2.5	37	328	2.8
963.9	0.337	10.0	1.3	27	320	2.9	4.9	2.4	41	366	2.1
964.6	0.337	9.3	1.2	24	277	3.0	4.9	2.2	37	317	2.2
965.3	0.337	9.3	1.3	24	304	2.6	4.9	2.4	37	347	1.9
966.0	0.337	8.3	1.6	27	333	2.9	4.9	2.8	42	380	2.1
966.7	0.377	10	1.8	28	286	3.3	5.4	3.2	42	327	2.4
967.4	0.337	9.3	1.4	26	270	2.1	4.9	2.5	40	308	1.5
968.1	0.337	8.3	1.4	26	291	2.2	4.9	2.6	39	333	1.6
968.8	0.337	9.0	1.6	26	273	2.1	4.9	3.0	40	312	1.6
969.5	0.337	10	1.6	27	298	3.9	4.9	2.9	42	341	2.8
970.2	0.337	8.7	1.8	33	344	3.6	4.9	3.3	51	393	2.6
970.9	0.337	8.9	1.5	34	312	2.6	4.9	2.7	52	357	1.9
971.6	0.337	8.5	1.6	35	281	2.4	4.9	2.9	54	321	1.8
972.3	0.337	9.7	1.9	29	295	2.3	4.9	3.5	44	337	1.7
972.9	0.409	9.5	1.9	36	303	1.1	5.9	3.5	56	347	0.821
973.6	0.337	12	1.6	38	280	2.9	4.9	2.9	58	320	2.1
974.3	0.337	9.4	1.6	38	270	2.1	4.9	2.9	58	309	1.5
975.0	0.337	9.8	1.5	35	257	1.9	4.9	2.7	53	294	1.4
975.7	0.337	10	1.7	38	271	1.6	4.9	3.1	58	310	1.2
976.4	0.337	13	1.7	49	356	2.6	4.9	3.2	75	407	1.9
977.1	0.337	12	1.3	45	288	1.2	4.9	2.4	69	329	0.862
977.8	0.337	12	1.4	43	334	1.9	4.9	2.5	66	382	1.4
978.5	0.614	10	1.4	38	334	2.0	8.9	2.5	59	382	1.4
979.2	0.584	12	0.996	44	307	1.9	8.4	1.8	67	351	1.4
979.9	0.337	11	1.3	38	291	1.1	4.9	2.4	58	333	0.783
980.6	0.337	11	1.4	42	241	0.873	4.9	2.5	65	275	0.637
981.3	0.337	9.0	1.1	40	243	1.2	4.9	2.1	62	277	0.857
982.0	0.337	10	0.928	42	263	1.2	4.9	1.7	65	300	0.846
982.7	0.353	13	1.0	48	318	1.7	5.1	1.9	74	364	1.2
983.4	0.428	15	1.1	51	283	1.4	6.2	2.1	78	324	1.1
984.1	0.337	12	0.810	49	274	1.9	4.9	1.5	75	313	1.4
984.8	0.337	10	0.969	48	344	0.770	4.9	1.8	73	393	0.562
985.5	0.375	12	0.882	48	272	1.6	5.4	1.6	74	311	1.2
986.2	0.337	13	0.826	43	267	0.987	4.9	1.5	66	305	0.720
986.9	0.337	12	1.2	51	260	1.7	4.9	2.2	78	297	1.2
987.6	0.370	12	1.1	58	319	1.6	5.3	2.0	88	365	1.2
988.3	0.337	12	1.0	41	270	1.6	4.9	1.9	63	309	1.2
989.0	0.591	13	0.721	38	347	1.2	8.5	1.3	58	397	0.911
989.7	0.337	12	0.715	47	309	1.7	4.9	1.3	73	353	1.3
990.4	0.337	14	0.783	46	318	1.2	4.9	1.4	70	363	0.858
991.1	0.337	13	0.639	36	279	1.5	4.9	1.2	55	320	1.1
991.8	0.337	12	0.967	45	292	2.0	4.9	1.8	69	334	1.5
992.5	0.337	9.8	1.0	32	248	1.0	4.9	1.8	49	283	0.759
993.2	0.591	12	0.775	34	286	0.998	8.5	1.4	52	327	0.728
993.9	0.337	10	0.825	33	329	1.1	4.9	1.5	50	376	0.819
994.6	0.337	11	1.0	31	276	2.2	4.9	1.8	47	316	1.6
995.3	0.375	11	0.968	30	359	2.1	5.4	1.8	46	411	1.5
996.0	0.337	13	0.926	38	357	2.4	4.9	1.7	58	408	1.8
996.7	0.423	13	1.3	37	309	1.7	6.1	2.3	56	353	1.3
997.4	0.510	11	0.765	29	321	1.6	7.4	1.4	45	368	1.2
998.1	0.337	9.5	0.705	33	295	1.6	4.9	1.3	50	337	1.2
998.8	0.337	13	0.614	34	356	1.8	4.9	1.1	52	407	1.3
999.4	0.337	11	0.667	31	324	1.4	4.9	1.2	47	370	1.0
1000.1	0.337	14	1.1	32	372	2.1	4.9	2.0	49	426	1.5
1000.8	0.337	13	0.855	35	352	1.8	4.9	1.6	54	403	1.3
1001.5	0.337	12	1.4	33	332	1.9	4.9	2.5	50	380	1.4
1002.2	0.361	11	1.0	30	299	1.4	5.2	1.9	46	342	1.0
1002.9	0.348	11	0.786	31	302	1.7	5.0	1.4	47	345	1.2
1003.6	0.337	11	0.682	29	271	1.7	4.9	1.2	44	309	1.2
1004.3	0.337	9.9	1.2	34	329	2.0	4.9	2.2	53	376	1.4
1005.0	0.444	10	0.877	36	421	2.2	6.4	1.6	55	481	1.6
1005.7	0.337	12	1.2	32	363	2.8	4.9	2.3	48	415	2.1
1006.4	0.645	13	0.949	38	313	2.2	9.3	1.7	59	357	1.6
1007.1	0.337	12	0.771	45	367	1.3	4.9	1.4	69	420	0.934
1007.8	0.555	11	1.0	36	315	1.7	8.0	1.9	55	360	1.3
1008.5	0.337	10	0.878	32	257	1.2	4.9	1.6	49	294	0.861
1009.2	0.419	11	0.998	34	323	1.9	6.1	1.8	53	369	1.4
1009.9	0.337	11	1.2	37	331	1.3	4.9	2.2	56	379	0.930
1010.6	0.532	13	0.835	42	334	1.6	7.7	1.5	64	382	1.1
1011.3	0.337	9.6	0.868	34	337	1.5	4.9	1.6	52	385	1.1
1012.0	0.652	14	1.1	34	456	2.8	9.4	2.1	52	522	2.0
1012.7	0.480	13	1.3	46	514	3.4	6.9	2.3	70	587	2.5
1013.4	0.337	14	1.4	47	469	3.2	4.9	2.6	72	536	2.3
1014.1	0.337	10	0.914	48	411	1.2	4.9	1.7	73	471	0.858
1014.8	0.822	11	1.2	45	418	1.5	12	2.1	68	478	1.1
1015.5	0.856	12	1.4	46	586	3.2	12	2.5	70	670	2.4
1016.2	0.540	14	1.5	48	555	3.3	7.8	2.7	73	634	2.4



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1016.9	0.472	15	1.2	53	547	2.4	6.8	2.1	81	625	1.7
1017.6	0.724	12	1.3	43	557	2.0	10	2.3	66	636	1.4
1018.3	1.1	11	1.4	46	570	1.5	16	2.6	71	652	1.1
1019.0	1.2	16	1.5	50	583	2.7	17	2.8	76	667	2.0
1019.7	1.0	13	1.5	58	798	2.5	15	2.8	88	913	1.8
1020.4	0.566	15	1.6	60	678	2.1	8.2	2.9	92	775	1.5
1021.1	0.850	12	1.4	53	552	2.0	12	2.5	82	631	1.5
1021.8	0.657	12	1.5	40	693	2.4	9.5	2.7	61	793	1.7
1022.5	0.950	15	1.6	67	890	1.8	14	3.0	103	1017	1.3
1023.2	0.780	14	1.5	75	868	2.3	11	2.7	115	993	1.7
1023.9	0.723	13	1.1	62	812	1.8	10	2.1	95	928	1.3
1024.6	0.757	12	1.3	51	589	2.7	11	2.4	78	673	2.0
1025.3	0.969	14	1.3	47	704	2.0	14	2.4	72	805	1.4
1025.9	1.0	13	1.9	64	796	1.9	15	3.4	98	911	1.4
1026.6	1.2	15	1.4	58	843	1.3	18	2.5	89	963	0.939
1027.3	1.2	15	1.4	68	817	2.6	17	2.5	104	935	1.9
1028.0	0.938	14	1.6	65	812	1.7	14	2.9	100	928	1.3
1028.7	0.753	10	1.5	47	680	1.6	11	2.8	72	777	1.1
1029.4	1.6	11	1.4	56	681	2.2	22	2.6	86	779	1.6
1030.1	0.901	14	1.4	49	632	1.3	13	2.6	76	722	0.934
1030.8	1.5	14	1.4	46	644	1.4	22	2.5	71	737	1.0
1031.5	1.5	14	1.5	81	854	2.5	21	2.7	124	977	1.8
1032.2	0.966	14	1.4	64	909	1.6	14	2.5	98	1040	1.2
1032.9	0.897	16	1.8	60	907	2.2	13	3.2	92	1037	1.6
1033.6	1.2	17	1.6	80	942	3.5	17	2.8	122	1077	2.5
1034.3	1.7	13	1.5	66	832	1.8	24	2.7	101	951	1.3
1035.0	1.3	11	1.8	66	1025	1.9	19	3.3	100	1172	1.4
1035.7	1.3	15	1.9	64	1033	1.6	18	3.4	97	1181	1.2
1036.4	1.3	16	1.5	76	1009	2.6	19	2.8	116	1154	1.9
1037.1	1.0	16	2.1	88	1202	1.9	15	3.8	135	1374	1.4
1037.8	2.3	16	1.7	73	1211	2.1	33	3.1	111	1385	1.5
1038.5	1.9	17	2.3	69	1240	1.5	27	4.2	106	1418	1.1
1039.2	2.8	16	2.1	83	1192	3.7	41	3.9	127	1363	2.7
1039.9	2.5	17	2.1	80	1239	2.0	37	3.9	123	1417	1.5
1040.6	2.3	15	2.1	73	1168	1.9	34	3.8	112	1336	1.4
1041.3	1.7	13	1.5	70	945	2.2	24	2.8	107	1081	1.6
1042.0	1.5	14	1.7	57	1062	2.0	22	3.0	87	1214	1.5
1042.7	1.4	16	1.9	70	1178	2.0	21	3.4	108	1348	1.5
1043.4	1.9	19	1.9	78	1134	2.7	27	3.4	119	1296	2.0
1044.1	1.4	15	2.0	70	1118	2.2	20	3.6	107	1278	1.6
1044.8	2.0	15	2.0	70	1142	2.2	29	3.6	107	1306	1.6
1045.5	1.7	16	2.2	79	1319	2.4	25	3.9	122	1508	1.8
1046.2	2.1	18	2.1	73	1273	2.1	31	3.9	112	1455	1.5
1046.9	1.7	17	2.3	68	1096	1.9	25	4.2	105	1253	1.4
1047.6	2.3	18	2.2	81	1577	2.5	34	4.0	124	1804	1.8
1048.3	1.5	16	2.3	73	1485	2.8	21	4.2	112	1698	2.1
1049.0	2.0	15	2.6	68	1463	2.9	30	4.7	105	1673	2.1
1049.7	2.5	20	2.8	85	1541	2.6	36	5.0	130	1762	1.9
1050.4	2.1	17	2.5	84	1528	1.9	31	4.5	129	1748	1.4
1051.1	1.8	15	2.4	78	1402	1.9	27	4.4	119	1604	1.4
1051.8	1.3	13	2.1	75	1338	3.0	18	3.8	115	1530	2.2
1052.4	2.9	18	2.0	80	1654	2.1	42	3.6	122	1891	1.6
1053.1	2.0	16	2.4	92	1562	3.2	29	4.5	141	1786	2.3
1053.8	1.9	18	2.7	78	1545	2.8	28	4.9	119	1767	2.0
1054.5	2.2	16	3.0	72	1425	1.9	31	5.5	110	1630	1.4
1055.2	2.3	17	2.5	74	1264	2.1	34	4.5	113	1446	1.5
1055.9	3.0	17	3.2	91	1795	2.9	43	5.8	140	2052	2.1
1056.6	3.1	15	3.0	82	1451	2.3	45	5.4	125	1659	1.7
1057.3	2.4	15	2.2	75	1408	2.1	35	3.9	115	1610	1.6
1058.0	2.6	15	3.2	93	1781	2.6	38	5.8	142	2036	1.9
1058.7	3.4	17	2.7	96	1747	1.7	50	4.9	147	1998	1.2
1059.4	1.9	15	3.4	90	1917	3.1	28	6.2	138	2192	2.2
1060.1	2.1	18	2.6	95	1537	2.5	31	4.7	146	1758	1.8
1060.8	2.9	16	2.7	81	1609	2.4	42	4.9	123	1840	1.8
1061.5	3.1	17	3.5	95	2113	3.1	45	6.4	146	2416	2.3
1062.2	1.9	15	3.0	85	1604	2.4	27	5.4	130	1835	1.8
1062.9	3.3	18	3.2	100	2082	4.0	48	5.8	154	2380	2.9
1063.6	2.9	16	1.8	95	1552	2.5	41	3.3	145	1775	1.8
1064.3	1.5	14	3.0	104	1859	2.5	22	5.5	160	2126	1.8
1065.0	3.2	18	2.9	92	1802	2.7	46	5.3	141	2061	2.0
1065.7	2.4	19	3.2	89	2087	1.7	35	5.9	136	2387	1.2
1066.4	2.2	21	2.9	94	1674	2.4	32	5.2	144	1914	1.8
1067.1	2.0	15	2.7	94	1957	2.7	29	4.9	144	2238	2.0
1067.8	2.8	13	2.5	88	1532	1.5	40	4.6	135	1752	1.1
1068.5	2.5	17	2.7	95	1910	1.8	37	4.9	146	2184	1.3
1069.2	2.4	16	2.8	112	1975	3.2	34	5.1	172	2259	2.3
1069.9	2.5	21	2.8	110	1711	2.8	37	5.2	169	1956	2.0
1070.6	2.9	20	3.4	119	2266	3.7	42	6.2	182	2591	2.7
1071.3	2.6	17	2.5	93	1848	2.6	38	4.6	143	2114	1.9
1072.0	3.7	18	2.9	106	2216	2.9	54	5.3	162	2534	2.1
1072.7	3.0	17	3.3	116	2404	2.9	43	6.1	177	2749	2.1



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.4	3.0	19	2.9	130	2010	3.7	44	5.3	199	2299	2.7
1074.1	3.1	14	3.7	103	2078	2.5	44	6.8	159	2376	1.8
1074.8	3.0	17	3.0	94	1940	1.6	44	5.4	144	2218	1.2
1075.5	2.8	18	4.3	112	2489	3.1	41	7.8	172	2847	2.3
1076.2	3.2	20	3.4	109	2039	3.6	47	6.3	167	2331	2.6
1076.9	1.9	18	2.7	101	1824	2.5	28	4.9	155	2085	1.8
1077.6	2.6	14	3.3	110	2204	3.2	37	6.0	168	2521	2.3
1078.3	2.8	19	3.5	96	2468	3.6	40	6.3	147	2822	2.6
1078.9	3.4	19	2.9	113	2577	3.6	49	5.3	173	2946	2.6
1079.6	2.4	19	2.9	107	2072	3.1	35	5.3	164	2369	2.3
1080.3	2.0	19	3.8	110	2038	3.9	29	7.0	169	2331	2.8
1081.0	3.0	17	3.7	120	2154	2.9	43	6.7	184	2463	2.1
1081.7	2.8	18	3.4	125	2722	3.4	40	6.2	191	3112	2.5
1082.4	2.8	22	4.0	127	2524	2.6	41	7.2	194	2886	1.9
1083.1	3.3	20	3.9	113	2038	2.9	48	7.2	174	2330	2.1
1083.8	2.1	17	3.6	119	2141	2.9	30	6.6	182	2448	2.1
1084.5	1.7	14	3.5	105	2255	2.1	25	6.4	161	2579	1.5
1085.2	2.4	16	4.0	109	2576	2.6	34	7.4	168	2946	1.9
1085.9	2.6	23	3.8	108	2492	2.4	37	6.9	166	2849	1.7
1086.6	2.6	20	4.1	135	2768	4.9	37	7.4	206	3166	3.6
1087.3	2.8	17	4.5	124	2313	2.2	40	8.1	190	2645	1.6
1088.0	3.5	18	5.8	125	2495	2.1	50	11	192	2854	1.5
1088.7	2.7	17	3.8	109	2792	4.5	39	6.9	166	3193	3.3
1089.4	2.8	21	3.8	117	2634	2.5	41	7.0	179	3012	1.8
1090.1	2.5	17	3.7	118	2437	2.2	36	6.7	181	2787	1.6
1090.8	2.6	17	4.0	119	2423	3.6	37	7.4	182	2771	2.6
1091.5	2.4	19	4.3	101	2103	1.8	35	7.9	155	2405	1.3
1092.2	2.6	20	4.7	116	2354	3.1	37	8.6	178	2691	2.2
1092.9	2.2	19	4.7	120	2396	2.7	31	8.6	184	2740	1.9
1093.6	1.5	20	3.7	125	2303	2.3	22	6.7	191	2634	1.7
1094.3	1.4	16	3.6	109	2129	3.3	20	6.5	167	2435	2.4
1095.0	2.0	13	4.5	120	2318	1.6	29	8.1	184	2650	1.1
1095.7	2.3	18	4.5	127	2442	2.3	33	8.2	194	2792	1.6
1096.4	1.9	18	4.2	162	2275	2.3	27	7.6	249	2601	1.7
1097.1	1.5	19	4.7	117	2155	2.6	22	8.6	179	2464	1.9
1097.8	2.3	16	4.0	116	2393	2.4	33	7.3	178	2736	1.7
1098.5	1.8	17	4.4	121	2267	2.8	26	8.1	186	2593	2.0
1099.2	2.2	19	4.6	127	2650	2.4	31	8.3	195	3030	1.7
1099.9	2.5	19	3.5	125	2400	1.6	37	6.4	191	2744	1.1
1100.6	1.4	16	4.3	133	2669	1.7	20	7.8	205	3052	1.3
1101.3	1.9	16	5.0	109	2540	2.6	27	9.1	167	2905	1.9
1102.0	2.1	20	4.8	132	2756	2.6	30	8.7	203	3151	1.9
1102.7	2.3	19	4.5	142	2739	2.4	33	8.3	217	3132	1.8
1103.4	1.4	18	4.2	141	2858	3.1	20	7.8	216	3268	2.2
1104.1	1.8	17	5.4	125	2281	2.2	26	9.8	192	2608	1.6
1104.8	2.0	18	5.0	116	2465	2.0	29	9.1	178	2819	1.5
1105.4	1.8	17	4.4	113	2275	2.6	25	8.0	173	2601	1.9
1106.1	3.2	20	4.6	136	2367	2.3	46	8.4	208	2706	1.7
1106.8	1.2	15	4.1	123	2420	2.6	17	7.5	188	2767	1.9
1107.5	1.2	16	3.8	125	2510	2.0	17	7.0	191	2870	1.5
1108.2	1.3	20	4.6	116	2581	2.6	19	8.4	178	2951	1.9
1108.9	1.4	19	5.9	122	2766	3.1	20	11	187	3163	2.3
1109.6	1.9	19	4.2	114	2565	2.7	27	7.6	175	2933	2.0
1110.3	1.8	19	3.7	113	2161	1.6	26	6.8	173	2472	1.2
1111.0	2.3	16	3.8	118	2550	2.1	33	6.9	181	2916	1.5
1111.7	1.4	17	4.2	95	2383	2.0	20	7.7	145	2725	1.4
1112.4	2.4	24	4.5	120	3016	3.4	34	8.3	184	3449	2.5
1113.1	2.0	22	3.7	102	2227	2.2	29	6.8	156	2547	1.6
1113.8	1.9	18	4.4	107	2233	2.1	27	8.1	163	2553	1.5
1114.5	1.7	17	3.9	98	2166	2.0	25	7.2	150	2477	1.5
1115.2	1.9	17	4.3	96	2513	1.8	27	7.8	147	2874	1.3
1115.9	1.6	19	4.6	114	2602	2.3	23	8.4	175	2975	1.7
1116.6	1.6	18	4.4	120	2337	2.1	24	8.1	184	2673	1.6
1117.3	2.9	21	3.3	109	2490	2.6	42	5.9	167	2847	1.9
1118.0	2.1	19	4.7	100	2250	1.7	30	8.5	154	2573	1.2
1118.7	2.6	20	3.7	97	2210	2.2	37	6.8	149	2527	1.6
1119.4	1.7	21	4.3	114	2555	2.5	24	7.9	175	2922	1.8
1120.1	1.8	18	3.1	91	1983	2.2	26	5.7	140	2268	1.6
1120.8	1.5	16	3.5	95	2524	2.4	22	6.5	146	2886	1.8
1121.5	1.4	17	3.7	83	2291	1.8	20	6.7	128	2619	1.3
1122.2	2.4	21	3.6	89	2754	2.9	35	6.7	137	3149	2.1
1122.9	1.6	21	3.3	81	2188	2.9	23	6.0	124	2502	2.1
1123.6	1.7	21	3.2	93	2295	2.6	24	5.8	143	2624	1.9
1124.3	1.5	18	3.4	82	1882	2.5	21	6.3	126	2152	1.8
1125.0	0.833	19	3.1	72	2099	3.2	12	5.6	110	2400	2.4
1125.7	1.7	17	3.2	90	2366	2.4	24	5.8	138	2706	1.7
1126.4	2.4	20	2.9	81	2013	2.3	35	5.2	124	2302	1.6
1127.1	1.2	17	2.5	72	1636	2.1	18	4.6	110	1871	1.6
1127.8	1.1	17	2.4	78	2078	2.2	16	4.3	120	2376	1.6
1128.5	1.5	18	2.5	77	2137	3.1	21	4.5	118	2444	2.3
1129.2	2.6	20	2.7	82	1916	3.5	37	4.8	126	2191	2.5



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1129.9	1.9	23	2.3	78	1891	2.9	27	4.2	120	2162	2.1
1130.6	1.5	17	2.3	72	1648	3.0	22	4.2	110	1885	2.2
1131.3	1.3	15	2.4	72	1720	2.9	18	4.4	111	1967	2.1
1131.9	1.9	16	2.5	64	1816	2.0	28	4.5	98	2076	1.5
1132.6	2.2	19	2.8	73	1928	3.4	32	5.2	111	2205	2.5
1133.3	1.2	16	2.3	67	1629	1.9	17	4.2	102	1863	1.4
1134.0	2.5	18	2.6	71	1723	3.8	36	4.8	109	1970	2.8
1134.7	1.4	20	2.0	66	1528	2.8	20	3.6	100	1747	2.0
1135.4	2.0	20	2.1	65	1780	2.6	29	3.8	100	2036	1.9
1136.1	2.3	20	2.0	76	1744	1.7	33	3.7	117	1994	1.3
1136.8	1.6	16	1.7	56	1548	1.9	22	3.1	86	1770	1.4
1137.5	1.9	12	1.4	55	1441	2.6	27	2.6	84	1647	1.9
1138.2	2.3	15	1.7	50	1773	2.4	34	3.1	77	2027	1.8
1138.9	2.1	18	2.0	66	1764	3.8	30	3.7	101	2017	2.7
1139.6	2.5	14	1.5	53	1377	3.2	36	2.8	81	1574	2.3
1140.3	1.7	15	1.4	49	1423	2.2	24	2.6	76	1627	1.6
1141.0	2.6	15	1.3	48	1364	3.6	38	2.3	73	1560	2.6
1141.7	2.3	14	1.7	52	1346	2.4	34	3.0	79	1539	1.8
1142.4	3.1	15	1.4	54	1547	3.0	45	2.6	83	1769	2.2
1143.1	3.5	17	1.6	53	1392	2.5	50	2.9	82	1592	1.8
1143.8	2.2	13	1.7	67	1424	2.5	32	3.1	102	1628	1.8
1144.5	2.3	14	1.8	50	1185	2.6	33	3.4	76	1355	1.9
1145.2	3.4	15	1.2	50	1460	3.3	49	2.2	76	1670	2.4
1145.9	2.8	18	1.2	53	1626	3.3	40	2.2	82	1859	2.4
1146.6	2.0	17	1.6	60	1399	2.9	29	2.9	93	1600	2.1
1147.3	2.1	15	1.4	47	1388	2.6	31	2.6	72	1587	1.9
1148.0	4.4	15	1.2	50	1269	2.6	64	2.2	77	1451	1.9
1148.7	3.2	15	1.3	48	1321	1.6	46	2.4	74	1511	1.2
1149.4	1.6	15	0.941	56	1379	1.9	23	1.7	85	1577	1.4
1150.1	1.8	15	1.4	48	1311	2.9	26	2.6	74	1500	2.1
1150.8	2.6	14	1.1	38	1323	2.8	37	2.0	58	1512	2.0
1151.5	1.9	15	1.1	41	1163	2.4	27	2.0	63	1330	1.7
1152.2	2.7	14	1.1	40	1178	3.1	39	1.9	62	1347	2.3
1152.9	3.1	15	1.2	56	1219	3.0	45	2.2	86	1394	2.2
1153.6	2.5	14	1.1	55	1367	3.1	36	2.0	85	1563	2.2
1154.3	2.3	12	0.742	39	1242	2.5	34	1.4	60	1420	1.8
1155.0	1.8	13	0.655	45	1066	3.0	26	1.2	69	1219	2.2
1155.7	4.6	15	0.736	39	1128	2.0	66	1.3	59	1290	1.4
1156.4	1.6	12	0.898	49	1032	1.6	24	1.6	75	1180	1.2
1157.1	1.6	15	0.949	46	1179	3.5	23	1.7	70	1348	2.5
1157.7	1.1	13	0.733	33	1298	3.1	16	1.3	50	1484	2.3
1158.4	2.2	15	1.0	41	1026	2.9	32	1.9	62	1174	2.1
1159.1	1.5	12	0.868	45	1262	3.2	22	1.6	69	1443	2.3
1159.8	2.0	12	0.764	37	980	2.5	29	1.4	57	1121	1.9
1160.5	2.9	10	0.818	40	1193	2.4	42	1.5	61	1364	1.8
1161.2	1.8	14	1.1	34	1038	1.7	26	2.0	53	1187	1.3
1161.9	2.6	14	0.712	36	1134	1.2	37	1.3	56	1297	0.845
1162.6	2.9	13	1.1	33	1104	1.9	42	2.0	51	1262	1.4
1163.3	2.2	12	1.0	32	1034	1.6	32	1.9	49	1182	1.1
1164.0	2.0	8.7	0.798	32	869	1.8	30	1.5	49	994	1.3
1164.7	1.9	12	1.1	36	1296	3.6	28	1.9	56	1482	2.7
1165.4	2.1	13	0.718	43	1075	2.2	30	1.3	66	1230	1.6
1166.1	3.3	9.2	0.956	28	957	2.1	48	1.7	43	1094	1.5
1166.8	3.1	10	1.1	30	986	2.5	45	1.9	46	1127	1.8
1167.5	1.8	11	1.4	30	1273	2.1	26	2.6	46	1456	1.6
1168.2	1.9	11	0.845	29	945	2.1	27	1.5	45	1080	1.5
1168.9	3.2	10	1.0	30	1048	1.8	47	1.9	46	1198	1.3
1169.6	2.4	9.7	1.0	31	875	1.9	34	1.9	48	1000	1.4
1170.3	2.5	8.8	0.892	30	1184	2.6	37	1.6	46	1354	1.9
1171.0	2.5	11	0.723	31	1025	2.2	36	1.3	47	1172	1.6
1171.7	2.7	9.8	0.985	36	1189	3.5	40	1.8	55	1359	2.5
1172.4	3.4	11	0.822	26	866	2.3	49	1.5	40	991	1.7
1173.1	2.8	10	0.992	32	1138	2.0	41	1.8	49	1302	1.4
1173.8	2.8	9.3	0.922	26	1092	1.8	41	1.7	40	1249	1.3
1174.5	3.6	10	0.994	28	957	1.4	52	1.8	43	1095	1.0
1175.2	4.3	11	1.2	25	1032	2.0	62	2.3	39	1180	1.5
1175.9	3.3	13	1.3	32	1150	2.3	47	2.4	49	1315	1.7
1176.6	2.5	10	1.1	23	948	1.2	36	2.1	35	1084	0.894
1177.3	2.9	11	1.1	25	1001	1.3	42	2.0	38	1145	0.983
1178.0	4.0	8.3	0.960	28	943	2.1	58	1.8	43	1079	1.5
1178.7	3.3	8.5	1.2	24	898	2.4	47	2.1	37	1027	1.8
1179.4	4.6	12	1.2	30	1193	2.8	67	2.2	47	1364	2.0
1180.1	3.9	8.8	1.2	31	1131	2.8	56	2.2	48	1293	2.1
1180.8	4.5	8.2	1.4	30	1110	2.3	64	2.6	47	1269	1.7
1181.5	5.0	11	0.978	26	1250	2.9	72	1.8	40	1430	2.1
1182.2	5.9	12	1.7	32	1165	2.8	84	3.1	50	1333	2.1
1182.9	3.8	7.7	1.6	29	1015	2.3	54	2.9	44	1161	1.7
1183.6	5.9	9.1	2.1	30	1365	2.9	85	3.9	46	1561	2.1
1184.2	7.0	10	2.2	30	1179	3.8	102	4.0	47	1349	2.8
1184.9	7.3	12	1.8	37	1145	3.7	105	3.3	57	1309	2.7
1185.6	5.3	12	2.6	36	1366	2.4	77	4.8	56	1562	1.8



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1186.3	4.9	9.8	2.1	32	1154	4.2	70	3.9	49	1319	3.1
1187.0	6.8	10	2.0	26	1215	3.6	98	3.7	39	1390	2.6
1187.7	6.3	10	2.5	31	1242	2.8	91	4.5	48	1420	2.0
1188.4	8.2	11	3.5	40	1450	3.9	119	6.3	61	1658	2.9
1189.1	7.2	11	3.1	37	1334	3.6	104	5.6	56	1525	2.6
1189.8	8.4	9.0	2.6	36	1194	3.4	121	4.8	55	1365	2.5
1190.5	6.1	9.9	3.4	35	1283	4.2	87	6.3	54	1467	3.1
1191.2	7.8	11	3.6	34	1272	4.9	112	6.6	52	1455	3.6
1191.9	8.7	11	3.8	39	1268	4.0	125	7.0	60	1450	2.9
1192.6	7.1	10	3.6	36	1316	2.6	103	6.5	56	1505	1.9
1193.3	7.4	9.0	3.6	35	1258	3.3	107	6.6	54	1439	2.4
1194.0	6.3	9.9	3.4	35	1240	4.3	91	6.3	54	1418	3.2
1194.7	9.6	13	4.1	42	1456	4.1	139	7.5	65	1665	3.0
1195.4	10	11	4.4	43	1322	5.8	146	8.1	66	1512	4.2
1196.1	8.6	11	4.4	51	1463	4.1	124	8.0	78	1674	3.0
1196.8	7.0	11	4.7	42	1540	4.5	101	8.5	64	1761	3.3
1197.5	8.8	12	4.7	43	1570	5.4	127	8.6	66	1795	3.9
1198.2	11	13	3.8	50	1626	7.1	165	7.0	76	1860	5.2
1198.9	8.1	14	4.8	54	1607	3.8	117	8.8	82	1837	2.8
1199.6	9.6	12	5.6	56	1694	4.3	139	10	86	1937	3.1
1200.3	9.7	15	5.8	54	1646	4.4	139	11	82	1882	3.2
1201.0	10	13	7.1	57	2058	6.7	149	13	88	2353	4.9
1201.7	7.8	13	6.4	52	1738	5.9	112	12	79	1988	4.3
1202.4	9.7	15	5.9	73	1914	6.3	141	11	112	2189	4.6
1203.1	8.9	11	6.1	54	1870	5.9	128	11	83	2139	4.3
1203.8	9.3	15	6.7	59	1956	6.5	134	12	91	2237	4.7
1204.5	8.4	15	7.3	62	2265	7.0	121	13	95	2590	5.1
1205.2	9.7	17	6.6	70	2103	7.6	140	12	108	2404	5.6
1205.9	8.3	16	6.9	63	1877	7.0	120	13	96	2147	5.1
1206.6	8.4	14	7.1	75	2114	5.4	121	13	114	2418	3.9
1207.3	9.0	16	6.8	57	2272	7.0	131	12	87	2598	5.1
1208.0	8.0	14	7.5	72	2245	10.0	116	14	110	2567	7.3
1208.7	9.6	19	8.4	67	2199	6.8	139	15	102	2515	5.0
1209.4	7.1	14	5.9	66	1866	4.2	103	11	102	2134	3.1
1210.1	7.2	15	7.3	76	2243	7.3	104	13	117	2565	5.3
1210.7	5.9	16	8.1	66	2342	8.6	86	15	101	2679	6.3
1211.4	7.6	18	8.5	88	2579	7.8	110	16	135	2949	5.7
1212.1	5.7	18	7.9	82	2444	6.9	82	14	125	2795	5.0
1212.8	6.2	17	8.2	81	2368	5.6	89	15	124	2708	4.1
1213.5	6.4	15	7.0	76	2323	6.6	92	13	116	2657	4.8
1214.2	6.2	17	8.4	88	2788	8.9	90	15	136	3188	6.5
1214.9	6.2	18	8.0	97	2953	6.2	89	15	148	3376	4.5
1215.6	6.1	20	7.4	76	2311	6.1	88	14	117	2643	4.4
1216.3	4.6	15	6.4	77	2339	5.0	66	12	118	2675	3.7
1217.0	4.3	16	7.7	72	2698	7.1	62	14	110	3086	5.2
1217.7	3.5	18	7.4	84	2617	8.2	51	14	129	2993	6.0
1218.4	4.8	20	6.9	86	2467	6.9	69	13	132	2821	5.1
1219.1	5.3	18	8.1	90	2841	7.3	76	15	138	3249	5.4
1219.8	4.8	16	6.7	81	2739	5.4	69	12	124	3132	3.9
1220.5	2.8	17	6.8	80	2818	5.3	40	12	123	3223	3.9
1221.2	3.5	19	6.8	80	2886	6.7	51	12	122	3300	4.9
1221.9	4.5	21	6.2	94	2908	5.6	64	11	144	3326	4.1
1222.6	3.1	16	5.3	93	2796	5.8	44	9.7	143	3198	4.2
1223.3	3.0	15	5.8	66	2673	5.1	44	11	101	3056	3.7
1224.0	2.6	16	6.5	80	3090	7.1	38	12	123	3534	5.2
1224.7	2.9	18	5.5	79	2874	6.1	42	10	121	3287	4.5
1225.4	3.0	16	5.7	75	2271	4.4	43	10	115	2597	3.2
1226.1	2.0	18	5.2	79	2943	6.4	29	9.5	122	3365	4.7
1226.8	1.6	12	3.9	64	2196	5.0	22	7.2	98	2512	3.7
1227.5	1.4	15	4.0	62	2738	3.5	20	7.3	95	3131	2.6
1228.2	1.7	15	4.2	64	2526	5.4	24	7.7	98	2888	4.0
1228.9	2.2	19	4.6	77	2515	5.5	32	8.4	119	2876	4.0
1229.6	1.9	18	3.8	72	2678	4.9	27	7.0	111	3062	3.5
1230.3	1.7	14	4.3	64	2422	4.9	24	7.9	98	2769	3.6
1231.0	1.8	15	3.6	76	2635	5.2	27	6.5	116	3013	3.8
1231.7	1.7	17	3.2	64	2757	5.2	24	5.8	98	3153	3.8
1232.4	1.5	16	3.4	73	2468	5.6	21	6.2	112	2823	4.1
1233.1	0.835	16	3.5	63	2505	4.7	12	6.4	96	2865	3.4
1233.8	0.940	14	2.6	59	2098	3.5	14	4.8	90	2399	2.6
1234.5	1.2	14	2.7	56	2544	4.3	17	5.0	86	2909	3.1
1235.2	0.731	17	3.0	69	2416	4.1	11	5.5	105	2763	3.0
1235.9	0.746	14	2.2	52	2175	3.6	11	4.1	79	2487	2.6
1236.6	0.651	13	2.3	53	2146	2.7	9.4	4.2	81	2454	2.0
1237.2	0.746	13	2.3	51	1893	3.0	11	4.2	78	2165	2.2
1237.9	0.357	15	2.1	51	2339	4.2	5.2	3.9	78	2675	3.1
1238.6	0.536	14	2.2	51	2068	3.1	7.7	4.0	79	2365	2.3
1239.3	0.657	19	1.7	57	2274	4.1	9.5	3.1	88	2601	3.0
1240.0	0.356	14	1.6	50	2172	3.8	5.1	2.9	77	2484	2.8
1240.7	0.678	13	1.6	45	1971	3.6	9.8	2.8	69	2254	2.6
1241.4	0.337	17	1.9	45	2233	3.3	4.9	3.5	69	2553	2.4
1242.1	0.337	16	1.6	46	1778	2.8	4.9	2.8	70	2033	2.0



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1242.8	0.337	17	1.7	50	1906	2.2	4.9	3.1	77	2180	1.6
1243.5	0.789	16	1.5	53	2067	2.8	11	2.7	81	2364	2.0
1244.2	0.337	14	1.3	40	1715	3.5	4.9	2.3	62	1961	2.6
1244.9	0.337	18	1.2	43	1789	3.3	4.9	2.3	65	2046	2.4
1245.6	0.438	16	1.1	40	1435	3.2	6.3	2.0	62	1642	2.3
1246.3	0.337	16	0.939	31	1361	1.6	4.9	1.7	48	1556	1.2
1247.0	0.432	14	1.0	42	1564	3.8	6.2	1.9	64	1789	2.8
1247.7	0.444	18	1.0	38	1813	4.2	6.4	1.8	58	2073	3.1
1248.4	0.684	17	1.1	41	1513	3.8	9.9	2.1	62	1730	2.7
1249.1	0.337	15	1.0	37	1650	3.2	4.9	1.9	57	1887	2.3
1249.8	0.337	16	1.3	41	1399	2.5	4.9	2.4	63	1600	1.8
1250.5	0.398	14	0.822	36	1425	3.1	5.7	1.5	55	1630	2.3
1251.2	0.438	14	0.845	39	1633	2.3	6.3	1.5	60	1867	1.7
1251.9	0.708	14	1.1	37	1378	4.0	10	1.9	57	1576	3.0
1252.6	0.528	17	1.2	32	1388	3.4	7.6	2.2	49	1587	2.5
1253.3	0.370	11	0.660	28	1244	3.5	5.3	1.2	43	1423	2.6
1254.0	0.688	16	0.550	23	1348	2.6	9.9	1.0	36	1542	1.9
1254.7	0.613	17	0.939	33	1374	3.6	8.9	1.7	50	1571	2.6
1255.4	0.603	12	0.904	31	1410	3.6	8.7	1.6	47	1612	2.7
1256.1	0.440	15	0.551	29	1215	1.8	6.4	1.0	45	1390	1.3
1256.8	0.619	19	0.657	26	1296	2.3	8.9	1.2	40	1483	1.7
1257.5	0.630	14	0.895	21	1169	2.7	9.1	1.6	32	1337	2.0
1258.2	1.2	15	0.873	28	1435	3.0	17	1.6	44	1641	2.2
1258.9	1.0	12	0.747	25	1241	3.0	15	1.4	38	1420	2.2
1259.6	0.778	12	0.819	26	1183	2.5	11	1.5	40	1353	1.9
1260.3	0.823	13	0.732	31	1446	2.2	12	1.3	48	1654	1.6
1261.0	1.0	11	0.662	24	1232	2.3	14	1.2	37	1409	1.7
1261.7	0.606	13	0.661	27	1456	2.9	8.7	1.2	41	1665	2.1
1262.4	0.950	15	0.655	25	1467	3.1	14	1.2	38	1678	2.3
1263.1	1.3	8.9	0.726	22	1242	2.3	19	1.3	33	1421	1.7
1263.8	0.826	13	0.855	21	1227	3.4	12	1.6	32	1403	2.5
1264.4	0.931	14	0.627	21	1250	2.9	13	1.1	33	1429	2.1
1265.1	0.657	10	0.706	23	1158	1.6	9.5	1.3	35	1324	1.2
1265.8	0.666	11	0.481	25	1166	2.8	9.6	0.877	38	1333	2.0
1266.5	0.693	10	0.658	19	1187	2.7	10	1.2	29	1357	1.9
1267.2	0.593	12	0.445	25	1508	3.9	8.6	0.811	38	1724	2.9
1267.9	0.821	12	0.752	18	1220	3.2	12	1.4	28	1395	2.3
1268.6	1.1	11	0.384	17	1237	2.8	16	0.700	26	1415	2.1
1269.3	0.777	12	0.454	18	1161	2.9	11	0.829	28	1328	2.1
1270.0	0.337	12	0.494	16	1390	2.1	4.9	0.901	25	1589	1.6
1270.7	0.393	8.1	0.311	14	1102	1.7	5.7	0.568	21	1260	1.2
1271.4	1.1	12	0.394	14	1248	2.3	15	0.718	22	1428	1.7
1272.1	0.923	9.1	0.403	18	1269	3.0	13	0.735	27	1451	2.2
1272.8	0.830	9.4	0.582	17	1208	3.3	12	1.1	27	1381	2.4
1273.5	0.817	8.6	0.646	14	1049	1.6	12	1.2	22	1199	1.2
1274.2	0.820	11	0.505	14	1288	3.2	12	0.922	21	1473	2.3
1274.9	1.2	10	0.455	18	1384	2.3	17	0.829	28	1583	1.7
1275.6	0.671	12	0.395	15	1003	2.6	9.7	0.720	22	1147	1.9
1276.3	0.509	10.0	0.382	16	1116	2.7	7.3	0.696	25	1276	2.0
1277.0	0.760	9.1	0.322	18	1292	2.5	11	0.587	27	1477	1.8
1277.7	0.600	7.9	0.467	15	1145	2.2	8.7	0.852	22	1309	1.6
1278.4	1.6	10	0.347	19	1282	2.9	23	0.633	28	1466	2.1
1279.1	0.567	11	0.425	17	1127	2.8	8.2	0.775	26	1288	2.0
1279.8	0.841	11	0.333	15	1403	2.5	12	0.608	22	1604	1.8
1280.5	0.949	8.4	0.533	16	1137	2.4	14	0.971	24	1300	1.8
1281.2	1.0	12	0.335	18	1236	2.6	15	0.610	27	1413	1.9
1281.9	0.665	12	0.498	16	1216	2.5	9.6	0.908	25	1391	1.8
1282.6	0.520	10.0	0.293	16	1264	3.0	7.5	0.533	24	1445	2.2
1283.3	0.731	8.1	0.237	14	1202	2.7	11	0.432	22	1374	2.0
1284.0	1.1	9.2	0.362	16	1352	3.8	16	0.660	24	1546	2.8
1284.7	1.1	12	0.292	16	1218	2.6	16	0.532	24	1393	1.9
1285.4	0.679	10	0.254	17	1187	3.0	9.8	0.463	26	1358	2.2
1286.1	0.537	8.7	0.384	16	1162	2.8	7.8	0.701	25	1329	2.0
1286.8	0.728	7.4	0.208	14	1136	2.4	11	0.379	21	1299	1.7
1287.5	0.999	8.2	0.220	12	1136	2.3	14	0.402	19	1299	1.7
1288.2	0.629	10	0.314	17	1192	2.5	9.1	0.573	27	1363	1.8
1288.9	0.770	9.5	0.356	16	1104	2.0	11	0.649	24	1263	1.5
1289.6	1.0	7.5	0.409	17	1221	2.2	14	0.745	26	1397	1.6
1290.2	0.898	8.7	0.352	13	1147	3.2	13	0.642	19	1312	2.4
1290.9	0.757	10	0.415	20	1281	2.8	11	0.758	31	1465	2.0
1291.6	0.750	11	0.403	17	1173	4.0	11	0.736	26	1341	2.9
1292.3	1.2	9.0	0.197	17	1190	2.8	17	0.360	26	1361	2.0
1293.0	0.793	8.7	0.262	16	1146	1.9	11	0.477	24	1311	1.4
1293.7	0.651	7.7	0.296	17	1291	3.5	9.4	0.540	26	1476	2.5
1294.4	0.791	10	0.444	16	1230	2.9	11	0.810	24	1407	2.1
1295.1	0.755	9.1	0.318	19	1109	3.4	11	0.580	29	1268	2.5
1295.8	0.701	10	0.367	17	1263	2.9	10	0.670	26	1444	2.1
1296.5	0.373	8.6	0.438	19	1049	2.2	5.4	0.799	30	1199	1.6
1297.2	0.389	8.3	0.310	16	1258	2.5	5.6	0.566	24	1439	1.8
1297.9	0.812	10	0.405	17	1125	2.0	12	0.739	27	1286	1.4
1298.6	0.440	9.1	0.429	18	1186	2.9	6.4	0.783	28	1357	2.1



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1299.3	0.762	9.2	0.150	19	1148	2.5	11	0.274	30	1312	1.8
1300.0	0.712	10	0.190	20	1242	2.7	10	0.347	30	1421	2.0
1300.7	0.783	10	0.219	16	1156	3.5	11	0.400	25	1322	2.5
1301.4	0.619	9.7	0.059	22	1207	2.2	8.9	0.108	34	1380	1.6
1302.1	0.667	8.7	0.312	23	1446	3.4	9.6	0.569	35	1654	2.5
1302.8	0.796	11	0.617	16	1206	3.8	11	1.1	25	1379	2.7
1303.5	0.428	8.5	0.257	15	1055	1.9	6.2	0.468	23	1207	1.4
1304.2	1.0	8.1	0.358	24	1271	3.3	15	0.653	36	1453	2.4
1304.9	0.807	12	0.100	24	1171	3.3	12	0.182	37	1340	2.4
1305.6	1.1	8.1	0.469	21	915	1.6	16	0.855	32	1046	1.2
1306.3	0.708	9.9	0.284	22	1121	3.0	10	0.518	34	1281	2.2
1307.0	0.929	6.9	0.399	20	1074	2.3	13	0.729	30	1228	1.7
1307.7	0.927	11	0.673	30	1198	3.2	13	1.2	47	1370	2.3
1308.4	1.8	8.9	0.605	26	1205	2.7	27	1.1	41	1378	2.0
1309.1	1.3	9.3	0.489	25	1057	2.2	18	0.891	38	1209	1.6
1309.8	0.647	8.1	0.485	20	1123	2.8	9.3	0.884	31	1284	2.0
1310.5	1.5	11	0.676	27	1482	3.6	22	1.2	41	1695	2.6
1311.2	1.9	11	0.794	30	1386	5.8	27	1.4	47	1584	4.2
1311.9	1.9	12	0.569	32	1387	5.6	28	1.0	50	1586	4.1
1312.6	1.7	8.8	0.709	32	1181	5.2	24	1.3	49	1350	3.8
1313.3	2.1	10	0.578	23	1291	4.4	30	1.1	36	1476	3.2
1314.0	2.9	13	0.507	34	1427	6.9	42	0.925	52	1632	5.1
1314.7	2.0	11	0.632	32	1170	5.7	29	1.2	48	1337	4.2
1315.4	1.4	11	0.885	36	1469	4.6	21	1.6	55	1680	3.4
1316.1	2.3	11	0.715	37	1593	4.5	33	1.3	56	1821	3.3
1316.7	2.6	11	0.750	37	1460	5.5	38	1.4	56	1669	4.0
1317.4	2.1	12	0.698	38	1468	4.8	31	1.3	58	1679	3.5
1318.1	2.2	9.4	0.800	45	1878	6.2	32	1.5	69	2148	4.5
1318.8	1.8	13	0.626	38	1756	4.8	26	1.1	58	2008	3.5
1319.5	2.1	11	0.704	40	2033	6.1	30	1.3	62	2325	4.4
1320.2	1.8	13	0.962	39	1785	5.2	26	1.8	61	2042	3.8
1320.9	2.3	14	0.820	40	1655	7.4	33	1.5	62	1893	5.4
1321.6	1.7	12	0.641	38	1650	5.0	25	1.2	59	1886	3.6
1322.3	1.1	12	0.813	34	1832	7.2	15	1.5	52	2095	5.3
1323.0	0.955	12	0.874	30	1765	5.5	14	1.6	46	2019	4.0
1323.7	0.508	13	1.1	36	1818	8.2	7.3	2.0	56	2078	6.0
1324.4	0.751	13	0.939	39	1925	8.2	11	1.7	59	2201	6.0
1325.1	0.886	13	0.830	39	1830	6.4	13	1.5	60	2092	4.7
1325.8	0.892	13	0.940	35	1954	8.7	13	1.7	53	2235	6.4
1326.5	0.561	12	1.1	34	1920	7.3	8.1	2.0	53	2195	5.3
1327.2	0.633	14	0.690	37	2159	9.9	9.1	1.3	56	2469	7.2
1327.9	0.555	16	1.000	35	1856	8.2	8.0	1.8	54	2122	6.0
1328.6	0.357	16	0.941	33	1716	6.1	5.2	1.7	51	1962	4.4
1329.3	0.668	13	0.925	35	1675	7.6	9.6	1.7	53	1915	5.6
1330.0	0.572	11	0.590	29	1477	6.2	8.3	1.1	44	1689	4.5
1330.7	0.625	15	0.852	38	1767	5.6	9.0	1.6	58	2021	4.1
1331.4	0.618	13	0.623	32	1419	4.7	8.9	1.1	49	1623	3.4
1332.1	0.468	15	0.879	33	1481	2.2	6.8	1.6	50	1694	1.6
1332.8	0.337	14	1.0	33	1546	3.6	4.9	1.9	51	1768	2.6
1333.5	0.489	15	0.863	33	1500	3.1	7.1	1.6	51	1715	2.2
1334.2	0.337	15	0.866	38	1680	4.3	4.9	1.6	58	1921	3.1
1334.9	0.337	14	0.636	31	1311	2.9	4.9	1.2	48	1500	2.1
1335.6	0.540	17	1.1	41	1390	3.9	7.8	1.9	62	1589	2.9
1336.3	0.337	13	0.859	33	1405	4.9	4.9	1.6	51	1606	3.6
1337.0	0.472	12	0.814	31	1482	3.7	6.8	1.5	47	1694	2.7
1337.7	0.337	13	1.2	46	1523	5.7	4.9	2.2	70	1742	4.1
1338.4	0.391	18	0.903	39	1306	4.6	5.6	1.6	60	1494	3.4
1339.1	0.337	15	1.0	37	1276	2.6	4.9	1.9	56	1459	1.9
1339.8	0.483	14	0.871	36	1126	2.9	7.0	1.6	55	1288	2.1
1340.5	0.337	17	1.3	41	1448	3.1	4.9	2.3	62	1656	2.3
1341.2	0.612	16	0.938	38	1114	4.0	8.8	1.7	58	1274	2.9
1341.8	0.387	14	0.946	33	945	3.7	5.6	1.7	51	1080	2.7
1342.5	0.337	15	0.804	45	1216	2.7	4.9	1.5	69	1390	2.0
1343.2	0.337	13	0.874	34	1006	2.9	4.9	1.6	52	1151	2.1
1343.9	0.337	16	1.4	40	1165	4.2	4.9	2.6	61	1332	3.1
1344.6	0.337	15	0.973	37	1044	3.8	4.9	1.8	57	1194	2.8
1345.3	1.0	15	0.819	38	1103	2.5	15	1.5	58	1262	1.8
1346.0	0.993	12	0.725	35	975	3.7	14	1.3	53	1115	2.7
1346.7	0.584	15	1.2	34	1104	2.5	8.4	2.1	51	1263	1.9
1347.4	0.440	12	0.794	31	881	2.6	6.4	1.4	47	1008	1.9
1348.1	0.637	15	0.717	35	928	2.8	9.2	1.3	54	1061	2.1
1348.8	0.681	16	0.688	37	1021	3.2	9.8	1.3	56	1167	2.3
1349.5	0.337	11	0.754	27	870	2.8	4.9	1.4	41	995	2.0
1350.2	0.526	16	0.879	28	1059	3.3	7.6	1.6	43	1211	2.4
1350.9	0.720	15	0.598	31	1115	3.0	10	1.1	47	1275	2.2
1351.6	0.657	17	0.574	25	903	3.5	9.5	1.0	38	1033	2.5
1352.3	0.927	16	0.675	27	963	2.9	13	1.2	42	1101	2.1
1353.0	0.337	14	0.476	24	816	2.5	4.9	0.867	37	933	1.8
1353.7	0.930	14	0.365	23	876	2.7	13	0.666	36	1001	2.0
1354.4	0.624	15	0.390	20	807	2.2	9.0	0.711	30	923	1.6
1355.1	0.366	14	0.531	20	818	2.7	5.3	0.969	31	936	1.9



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1355.8	0.828	11	0.482	17	835	2.9	12	0.879	27	954	2.1
1356.5	1.2	12	0.495	18	889	3.1	18	0.902	28	1016	2.2
1357.2	1.4	13	0.318	17	1036	3.1	21	0.581	26	1185	2.3
1357.9	1.5	12	0.495	16	794	2.9	21	0.903	25	908	2.1
1358.6	0.676	10	0.325	18	855	2.1	9.8	0.593	28	978	1.5
1359.3	1.9	10	0.305	18	966	2.4	28	0.557	28	1105	1.8
1360.0	1.1	11	0.453	14	1036	1.7	16	0.826	22	1185	1.2
1360.7	1.2	12	0.426	17	1046	2.4	17	0.778	26	1196	1.7
1361.4	1.4	12	0.114	14	836	1.8	21	0.208	21	956	1.3
1362.1	1.7	7.8	0.239	13	808	1.8	25	0.435	19	924	1.3
1362.8	2.0	8.8	0.289	15	1013	1.8	29	0.527	22	1159	1.3
1363.5	1.6	9.2	0.211	12	884	2.5	22	0.385	19	1011	1.9
1364.2	2.5	9.2	0.390	17	919	2.5	36	0.712	26	1051	1.8
1364.9	1.7	9.1	0.371	14	1002	1.9	25	0.677	21	1145	1.4
1365.6	1.7	7.8	0.243	14	881	1.3	25	0.443	21	1007	0.985
1366.3	2.1	10	0.322	12	923	1.9	30	0.587	18	1055	1.4
1367.0	2.3	11	0.292	20	976	2.8	33	0.533	30	1116	2.1
1367.7	1.4	11	0.405	16	948	3.3	21	0.739	24	1084	2.4
1368.4	2.6	10	0.202	13	993	3.1	37	0.369	20	1136	2.3
1369.0	2.1	9.1	0.293	17	1008	3.3	31	0.534	25	1152	2.4
1369.7	2.0	9.4	0.317	13	782	1.5	29	0.579	20	895	1.1
1370.4	2.6	10	0.547	14	886	1.8	37	0.997	21	1013	1.3
1371.1	2.4	9.9	0.655	13	883	2.5	34	1.2	20	1010	1.8
1371.8	1.9	9.5	0.815	13	843	1.6	28	1.5	21	964	1.2
1372.5	2.9	8.8	0.626	16	896	2.3	42	1.1	25	1025	1.6
1373.2	3.1	11	0.605	11	884	2.3	44	1.1	17	1011	1.7
1373.9	3.8	9.7	0.917	12	914	1.8	54	1.7	19	1045	1.3
1374.6	2.9	9.6	0.517	16	848	2.2	41	0.943	25	970	1.6
1375.3	4.3	9.4	0.726	18	893	1.5	63	1.3	27	1021	1.1
1376.0	3.5	8.7	0.649	16	969	2.9	50	1.2	25	1108	2.1
1376.7	3.7	8.3	0.961	17	985	2.8	53	1.8	26	1127	2.1
1377.4	4.3	11	0.585	20	1042	2.5	62	1.1	30	1192	1.9
1378.1	3.6	8.4	0.780	20	818	1.9	52	1.4	30	935	1.4
1378.8	3.9	9.0	0.924	15	885	2.4	57	1.7	22	1011	1.8
1379.5	3.9	11	1.1	16	902	2.7	57	2.0	25	1031	2.0
1380.2	4.1	9.8	1.3	17	840	3.1	59	2.3	26	960	2.3
1380.9	4.5	11	0.962	20	994	2.6	65	1.8	30	1136	1.9
1381.6	4.6	10	1.4	20	1082	2.2	66	2.6	30	1237	1.6
1382.3	5.8	11	1.6	22	1134	3.1	84	2.9	34	1297	2.3
1383.0	6.2	11	1.3	20	1120	2.9	90	2.4	30	1281	2.1
1383.7	6.7	13	1.8	23	1076	2.8	96	3.2	35	1231	2.1
1384.4	8.8	12	2.0	24	1074	3.6	127	3.7	37	1228	2.6
1385.1	8.7	10	2.2	25	1238	2.7	125	4.0	38	1415	1.9
1385.8	12	11	2.5	28	1475	3.3	171	4.5	43	1687	2.4
1386.5	9.9	13	2.8	30	1388	4.2	143	5.2	45	1588	3.0
1387.2	12	11	2.8	23	1215	2.5	177	5.2	36	1389	1.8
1387.9	10	14	3.1	29	1230	3.7	145	5.6	44	1407	2.7
1388.6	11	13	3.3	26	1619	4.3	152	6.0	40	1852	3.1
1389.3	9.6	12	3.5	26	1355	3.0	138	6.4	40	1549	2.2
1390.0	12	15	4.2	27	1701	3.3	177	7.7	42	1945	2.4
1390.7	8.5	12	3.7	31	1437	3.9	122	6.8	47	1644	2.8
1391.4	9.5	14	3.9	29	1537	3.2	137	7.2	44	1758	2.4
1392.1	9.2	12	4.1	35	1732	3.5	134	7.5	54	1981	2.5
1392.8	11	15	4.5	24	1565	4.6	163	8.1	37	1789	3.4
1393.5	8.5	15	5.5	31	1535	4.2	122	9.9	47	1755	3.0
1394.2	6.9	14	4.9	36	1451	4.5	100	9.0	55	1659	3.3
1394.8	7.3	14	5.0	36	1666	3.7	105	9.1	55	1906	2.7
1395.5	5.5	11	4.0	37	1683	4.5	80	7.4	56	1925	3.3
1396.2	5.4	14	5.1	40	1800	4.0	78	9.4	62	2058	2.9
1396.9	5.3	15	5.3	39	1924	5.4	76	9.7	59	2200	4.0
1397.6	5.5	16	5.0	41	1898	4.9	79	9.1	62	2170	3.6
1398.3	3.4	14	4.2	36	1791	5.0	49	7.7	55	2048	3.6
1399.0	5.3	14	4.3	36	1972	5.3	76	7.8	55	2255	3.9
1399.7	3.8	15	4.7	42	2029	4.6	54	8.6	65	2320	3.3
1400.4	4.2	15	4.4	37	2125	6.0	61	8.0	57	2430	4.4
1401.1	3.3	16	4.1	44	2272	6.2	48	7.5	67	2598	4.5
1401.8	2.8	15	4.6	45	2080	5.4	41	8.5	69	2379	3.9
1402.5	3.7	16	4.3	38	2000	4.9	54	7.8	59	2287	3.5
1403.2	3.3	15	4.5	44	2731	5.4	47	8.2	68	3123	3.9
1403.9	2.9	18	4.1	46	2419	5.0	42	7.4	71	2766	3.7
1404.6	3.2	21	4.2	53	2260	4.3	46	7.7	81	2584	3.1
1405.3	2.6	13	3.7	44	1974	3.6	38	6.7	68	2257	2.7
1406.0	2.3	14	4.2	43	2138	5.5	34	7.6	66	2444	4.0
1406.7	2.2	16	4.4	45	2889	4.0	32	8.1	68	3303	2.9
1407.4	2.7	16	4.1	44	2388	6.0	39	7.5	68	2730	4.4
1408.1	1.4	20	4.2	40	2130	5.1	20	7.6	61	2435	3.7
1408.8	1.9	20	4.1	43	2124	3.4	27	7.5	66	2428	2.5
1409.5	1.7	17	4.4	44	2496	5.3	25	8.1	68	2855	3.9
1410.2	2.2	17	4.4	41	2290	5.3	31	8.0	64	2619	3.9
1410.9	1.4	17	4.0	48	1975	3.4	20	7.3	74	2259	2.4
1411.6	1.3	12	3.3	31	1825	3.3	18	6.0	48	2087	2.4



Minnow Environmental  
Sample ID: 006

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1412.3	1.3	14	3.0	35	2109	3.9	18	5.5	54	2412	2.8
1413.0	0.755	14	3.0	38	1988	3.5	11	5.4	58	2273	2.5
1413.7	0.582	17	3.1	31	1811	6.3	8.4	5.6	48	2071	4.6
1414.4	0.806	21	2.8	38	1840	4.6	12	5.2	59	2104	3.3
1415.1	0.584	14	2.5	33	1578	3.5	8.4	4.5	50	1805	2.6
1415.8	0.337	16	2.4	28	1535	3.7	4.9	4.3	43	1755	2.7
1416.5	0.517	16	2.2	30	1474	4.2	7.5	4.0	45	1686	3.1
1417.2	0.337	16	1.9	34	1490	4.4	4.9	3.5	52	1704	3.2
1417.9	0.387	17	2.1	33	1571	5.2	5.6	3.8	50	1796	3.8
1418.6	0.613	16	2.1	36	1566	4.9	8.9	3.8	56	1790	3.6
1419.3	0.339	13	2.1	29	1452	4.1	4.9	3.8	44	1660	3.0
1420.0	0.337	17	2.2	27	1200	3.4	4.9	4.0	41	1372	2.5
1420.7	0.337	17	1.6	29	1201	4.5	4.9	2.8	45	1373	3.2
1421.4	0.480	17	1.7	29	1242	5.0	6.9	3.1	45	1420	3.7
1422.0	0.366	15	1.5	26	1015	3.6	5.3	2.7	40	1160	2.7
1422.7	0.337	15	1.2	25	1179	3.1	4.9	2.1	39	1348	2.3
1423.4	0.337	16	1.1	27	1053	4.4	4.9	2.0	42	1204	3.2
1424.1	0.337	17	1.3	25	1033	3.8	4.9	2.3	38	1182	2.8
1424.8	0.337	13	1.1	26	995	4.2	4.9	2.0	41	1138	3.0
1425.5	0.337	12	1.3	25	890	2.8	4.9	2.4	39	1017	2.1
1426.2	0.337	17	1.1	29	1165	3.4	4.9	2.1	45	1332	2.5
1426.9	0.526	13	1.2	25	1238	4.0	7.6	2.2	39	1416	2.9
1427.6	0.641	16	0.882	23	957	4.2	9.3	1.6	35	1094	3.0
1428.3	0.337	12	0.919	25	1012	3.6	4.9	1.7	38	1157	2.6
1429.0	0.337	14	1.2	23	1056	3.7	4.9	2.2	36	1207	2.7
1429.7	0.337	18	0.961	24	982	4.7	4.9	1.8	37	1123	3.4
1430.4	0.648	16	0.710	20	1016	4.0	9.3	1.3	31	1162	2.9
1431.1	0.337	16	0.749	19	799	3.8	4.9	1.4	29	914	2.7
1431.8	0.337	12	0.873	18	856	2.9	4.9	1.6	27	979	2.1
1432.5	0.337	14	0.795	20	961	3.9	4.9	1.4	31	1099	2.9
1433.2	0.337	15	0.970	17	1098	4.0	4.9	1.8	25	1255	2.9
1433.9	0.337	15	0.673	22	944	3.2	4.9	1.2	34	1079	2.3
1434.6	0.337	13	0.693	14	669	3.3	4.9	1.3	22	765	2.4
1435.3	0.337	14	0.708	18	1086	3.2	4.9	1.3	27	1242	2.3
1436.0	0.337	14	0.711	18	1047	2.4	4.9	1.3	27	1197	1.8
1436.7	0.337	13	0.753	18	957	2.9	4.9	1.4	27	1095	2.1
1437.4	0.337	15	0.255	15	953	3.4	4.9	0.466	23	1090	2.5
1438.1	0.337	10	0.685	17	844	2.7	4.9	1.2	26	965	2.0
1438.8	0.511	12	0.901	13	964	2.3	7.4	1.6	20	1103	1.7
1439.5	0.780	15	0.389	15	933	2.4	11	0.710	23	1066	1.7
1440.2	0.337	12	0.401	15	1061	3.4	4.9	0.731	23	1213	2.5
1440.9	0.481	13	0.451	12	828	2.0	6.9	0.823	19	947	1.4
1441.6	0.609	11	0.353	14	1035	1.9	8.8	0.643	21	1183	1.4
1442.3	0.448	12	0.205	9.3	936	3.0	6.5	0.374	14	1071	2.2
1443.0	0.451	11	0.319	12	980	2.2	6.5	0.582	19	1121	1.6
1443.7	0.840	11	0.373	11	1044	3.3	12	0.681	18	1194	2.4
1444.4	0.592	11	0.399	14	1158	2.7	8.5	0.728	22	1324	2.0
1445.1	0.723	10	0.600	13	1110	2.8	10	1.1	20	1270	2.0
1445.8	0.724	7.8	0.560	9.4	989	2.3	10	1.0	14	1130	1.7
1446.5	0.767	8.9	0.557	8.9	939	1.6	11	1.0	14	1074	1.2
1447.2	0.660	9.6	0.512	14	917	1.6	9.5	0.934	22	1049	1.2
1447.9	0.969	11	0.311	10	902	1.9	14	0.566	15	1032	1.4
1448.5	0.668	12	0.404	12	1148	2.5	9.6	0.737	19	1312	1.8
1449.2	0.969	9.5	0.496	11	1108	1.8	14	0.905	17	1267	1.3
1449.9	1.1	8.9	0.655	13	962	1.8	16	1.2	20	1101	1.3
1450.6	0.752	9.8	0.450	12	1051	1.9	11	0.821	18	1202	1.4
1451.3	0.649	10	0.355	11	1161	2.2	9.4	0.648	17	1327	1.6
1452.0	0.640	11	0.480	9.5	1164	2.6	9.2	0.875	15	1331	1.9
1452.7	0.972	7.8	0.569	9.5	939	2.1	14	1.0	15	1073	1.5
1453.4	0.878	8.1	0.476	11	1064	2.1	13	0.868	17	1217	1.5
1454.1	1.2	10	0.368	13	1078	2.6	18	0.671	20	1233	1.9
1454.8	0.754	7.8	0.476	12	1147	1.7	11	0.869	19	1312	1.2
1455.5	1.4	8.2	0.398	15	1227	2.4	20	0.727	23	1404	1.8
1456.2	1.4	9.5	0.348	14	1197	2.4	20	0.634	21	1369	1.7
1456.9	0.914	9.1	0.378	12	1086	2.4	13	0.689	18	1242	1.7
1457.6	0.868	12	0.344	15	1119	2.7	13	0.627	23	1280	1.9
1458.3	0.657	11	0.475	12	1073	2.5	9.5	0.865	18	1227	1.8
1459.0	1.1	9.7	0.469	12	1392	2.0	16	0.856	19	1592	1.5
1459.7	0.928	9.5	0.695	13	1209	2.8	13	1.3	20	1383	2.1
1460.4	1.6	11	0.764	15	1372	3.1	23	1.4	24	1569	2.3
1461.1	0.892	11	0.612	16	1184	1.6	13	1.1	25	1354	1.2
1461.8	1.5	13	0.777	17	1393	2.8	22	1.4	26	1593	2.0
1462.5	1.4	11	0.592	14	1504	3.0	20	1.1	21	1720	2.2
1463.2	1.7	10	0.937	16	1595	2.2	25	1.7	24	1823	1.6
1463.9	1.6	13	0.735	16	1385	3.5	23	1.3	25	1584	2.5
1464.6	1.6	13	0.805	21	1500	2.0	23	1.5	33	1715	1.5
1465.3	1.4	11	1.0	16	1532	2.5	20	1.8	25	1752	1.9
1466.0	1.5	11	0.823	16	1872	3.1	22	1.5	25	2141	2.3
1466.7	2.8	10	1.3	26	1857	3.8	40	2.3	39	2124	2.8
1467.4	2.0	11	1.1	20	1807	3.0	30	2.0	30	2066	2.2
1468.1	1.7	13	0.953	17	1803	3.3	24	1.7	27	2062	2.4



Minnow Environmental  
Sample ID: 006

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.337	0.298	0.059	0.458	0.003	0.003					
Length (µm)											
1468.8	2.5	12	1.0	19	1801	2.0	37	1.9	30	2060	1.5
1469.5	2.2	11	1.2	17	1910	2.7	32	2.3	26	2184	2.0
1470.2	1.8	13	1.3	21	2045	4.2	26	2.3	31	2339	3.1
1470.9	1.2	11	1.5	20	1852	3.5	18	2.7	31	2118	2.5
1471.6	1.2	11	1.4	21	2207	3.4	18	2.6	32	2524	2.5
1472.3	1.3	12	1.2	15	2198	2.8	19	2.2	22	2513	2.0
1473.0	1.6	13	1.1	26	2320	3.8	23	2.0	39	2653	2.8
1473.7	1.4	13	1.4	24	2353	2.7	20	2.6	36	2691	2.0
1474.4	1.2	15	1.1	25	2447	4.9	18	2.0	39	2798	3.6
1475.1	1.4	12	1.0	17	1777	3.2	20	1.8	26	2032	2.3
1475.7	1.3	13	1.2	25	2351	3.4	18	2.3	38	2688	2.5
1476.4	0.585	12	1.6	25	2217	3.5	8.4	3.0	38	2535	2.6
1477.1	0.804	14	1.5	21	2055	4.1	12	2.7	32	2350	3.0
1477.8	0.542	15	1.1	23	1841	3.4	7.8	2.0	35	2105	2.5
1478.5	0.705	13	1.4	21	2145	3.3	10	2.5	33	2453	2.4
1479.2	0.550	11	1.3	21	1910	3.2	7.9	2.3	31	2184	2.3
1479.9	0.337	11	1.4	25	2440	4.1	4.9	2.5	39	2791	3.0
1480.6	0.839	16	1.3	25	2163	4.8	12	2.4	39	2474	3.5
1481.3	0.337	16	1.3	20	1853	3.5	4.9	2.3	31	2119	2.5
1482.0	0.337	11	1.3	20	1971	3.0	4.9	2.5	31	2254	2.2
1482.7	0.337	14	1.6	28	2386	3.5	4.9	2.9	43	2729	2.5
1483.4	0.412	14	1.0	24	1992	3.0	5.9	1.8	37	2278	2.2
1484.1	0.337	13	1.1	28	1735	3.7	4.9	1.9	43	1984	2.7
1484.8	0.337	13	1.3	25	2273	3.8	4.9	2.4	39	2599	2.8
1485.5	0.337	14	1.7	26	2057	5.2	4.9	3.1	41	2352	3.8
1486.2	0.337	13	1.4	25	2057	3.7	4.9	2.6	38	2353	2.7
1486.9	0.407	17	1.1	30	2115	4.2	5.9	2.1	46	2418	3.1
1487.6	0.337	15	1.2	21	1836	4.4	4.9	2.1	33	2100	3.2
1488.3	0.337	14	0.889	27	1818	3.0	4.9	1.6	41	2078	2.2
1489.0	0.337	16	1.2	27	2023	3.2	4.9	2.1	42	2314	2.3
1489.7	0.350	15	1.3	30	1915	3.6	5.1	2.4	46	2190	2.7
1490.4	0.337	16	1.2	27	1914	5.0	4.9	2.2	42	2189	3.7
1491.1	0.337	15	1.4	21	1433	3.1	4.9	2.6	33	1638	2.2
1491.8	0.337	14	1.1	26	1833	3.1	4.9	2.1	39	2096	2.2
1492.5	0.337	15	1.1	21	1639	4.8	4.9	2.0	33	1875	3.5
1493.2	0.337	14	1.2	24	1691	4.3	4.9	2.2	37	1934	3.1
1493.9	0.425	16	1.1	22	1486	3.7	6.1	2.1	34	1699	2.7
1494.6	0.337	13	0.697	27	1583	3.3	4.9	1.3	41	1810	2.4
1495.3	0.337	13	0.972	17	1251	3.3	4.9	1.8	26	1430	2.4
1496.0	0.337	15	0.939	27	1477	2.9	4.9	1.7	42	1689	2.1
1496.7	0.337	17	0.902	25	1732	5.1	4.9	1.6	38	1980	3.7
1497.4	0.337	14	0.824	23	1371	3.5	4.9	1.5	36	1567	2.6
1498.1	0.337	13	0.719	24	1393	3.8	4.9	1.3	36	1593	2.7
1498.8	0.337	13	0.792	19	1158	2.3	4.9	1.4	29	1325	1.7
1499.5	0.337	17	0.599	22	1301	3.0	4.9	1.1	34	1487	2.2
1500.2	0.337	18	0.643	22	1168	3.2	4.9	1.2	34	1336	2.3
1500.9	0.337	24	0.603	24	1273	2.4	4.9	1.1	36	1456	1.8
1501.5	0.337	14	0.664	22	1305	2.2	4.9	1.2	33	1493	1.6
1502.2	0.337	12	0.610	17	1230	3.1	4.9	1.1	27	1406	2.2
1502.9	0.337	15	0.780	18	1095	2.2	4.9	1.4	28	1253	1.6
1503.6	0.337	14	0.535	19	1049	3.3	4.9	0.975	28	1199	2.4
1504.3	0.337	14	0.630	16	1044	2.2	4.9	1.1	25	1194	1.6
1505.0	0.337	17	0.426	17	1110	2.3	4.9	0.777	26	1269	1.7
1505.7	0.337	15	0.304	15	988	2.5	4.9	0.554	24	1130	1.8
1506.4	0.337	13	0.767	17	952	2.0	4.9	1.4	27	1088	1.5
1507.1	0.337	15	0.186	14	904	2.1	4.9	0.340	22	1034	1.5
1507.8	0.337	18	0.176	16	1068	2.4	4.9	0.322	24	1222	1.7
1508.5	0.337	13	0.501	12	892	1.5	4.9	0.915	18	1020	1.1
1509.2	0.337	12	0.257	14	1084	2.3	4.9	0.468	22	1240	1.7
1509.9	0.337	17	0.483	15	1008	2.2	4.9	0.881	23	1152	1.6
1510.6	0.337	22	0.272	12	781	2.0	4.9	0.495	19	893	1.5
1511.3	0.337	19	0.339	11	895	2.9	4.9	0.618	16	1024	2.1
1512.0	0.337	15	0.274	10	746	1.4	4.9	0.500	15	853	1.0
1512.7	0.337	15	0.240	8.1	821	1.4	4.9	0.438	12	939	1.1
1513.4	0.337	21	0.445	11	982	1.5	4.9	0.811	17	1123	1.1
1514.1	0.337	25	0.463	11	847	1.5	4.9	0.844	17	968	1.1
1514.8	0.337	26	0.243	12	907	1.9	4.9	0.443	18	1037	1.4
1515.5	0.337	38	0.311	9.3	905	1.6	4.9	0.567	14	1034	1.1
1516.2	0.337	35	0.299	11	885	2.2	4.9	0.545	16	1012	1.6
1516.9	0.337	39	0.299	6.7	799	1.3	4.9	0.545	10	913	0.983
1517.6	0.337	67	0.304	6.8	674	1.9	4.9	0.554	10	771	1.4
1518.3	0.337	65	0.379	5.0	724	0.892	4.9	0.692	7.7	828	0.651
1519.0	0.337	85	0.448	6.0	722	1.3	4.9	0.817	9.2	825	0.927
1519.7	0.337	85	0.346	6.6	788	1.3	4.9	0.631	10	901	0.925
1520.4	0.337	91	0.595	9.0	739	1.3	4.9	1.1	14	845	0.978
1521.1	0.410	111	0.838	11	759	2.7	5.9	1.5	17	868	2.0
1521.8	0.337	102	0.503	8.4	624	0.907	4.9	0.918	13	713	0.662
1522.5	0.337	120	0.750	13	704	1.1	4.9	1.4	19	805	0.821
1523.2	0.337	138	1.3	15	897	1.5	4.9	2.3	24	1025	1.1
1523.9	0.337	165	0.974	13	618	2.0	4.9	1.8	20	707	1.4
1524.6	0.337	149	1.3	14	653	1.2	4.9	2.4	22	746	0.911



Minnow Environmental  
Sample ID: 006

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.337	0.298	0.059	0.458	0.003	0.003					
Length (µm)											
1525.3	0.590	177	2.5	26	690	2.2	8.5	4.5	40	789	1.6
1526.0	0.337	202	2.1	22	686	1.2	4.9	3.7	33	784	0.899
1526.7	0.337	179	2.5	25	675	2.5	4.9	4.6	38	772	1.8
1527.3	0.337	151	1.8	16	606	1.6	4.9	3.2	24	693	1.1
1528.0	0.337	160	1.8	27	639	1.3	4.9	3.3	41	730	0.967
1528.7	0.700	159	3.2	22	553	1.4	10	5.8	33	632	1.0
1529.4	0.842	164	2.9	20	657	1.0	12	5.2	31	751	0.744
1530.1	1.4	168	1.4	20	523	1.3	21	2.5	31	598	0.972
1530.8	0.337	208	2.5	30	674	2.5	4.9	4.6	46	771	1.8
1531.5	0.337	157	1.8	18	460	1.4	4.9	3.2	27	525	1.0
1532.2	0.339	183	3.0	27	542	0.294	4.9	5.5	42	619	0.214
1532.9	0.757	202	3.4	33	963	2.3	11	6.1	50	1101	1.6
1533.6	0.337	249	3.1	28	561	1.1	4.9	5.7	43	641	0.787
1534.3	0.337	262	5.2	37	641	1.7	4.9	9.5	56	733	1.2
1535.0	0.337	385	4.0	27	636	3.6	4.9	7.3	42	727	2.6
1535.7	0.337	249	4.2	32	923	5.5	4.9	7.6	49	1055	4.0
1536.4	0.337	249	3.4	78	586	1.4	4.9	6.3	120	670	1.0
1537.1	0.880	311	6.5	57	698	4.0	13	12	87	798	2.9
1537.8	0.337	319	4.2	30	525	1.6	4.9	7.6	45	601	1.2
1538.5	0.570	359	5.9	41	532	2.5	8.2	11	62	608	1.8
1539.2	0.337	295	6.0	50	360	3.5	4.9	11	77	412	2.6
1539.9	0.337	476	6.9	69	478	2.2	4.9	13	105	547	1.6



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
0.5	3.2	722	103	230	845	0.003	46	189	353	967	0.002
1.2	6.6	334	22	0.458	611	0.003	95	40	0.702	699	0.002
1.9	0.337	417	14	57	938	5.3	4.9	26	87	1073	3.8
2.6	12	455	7.6	30	664	4.5	175	14	46	760	3.3
3.3	5.4	202	3.0	26	546	4.4	77	5.6	39	624	3.2
4.0	0.457	179	1.5	16	589	1.3	6.6	2.8	25	674	0.972
4.7	0.360	219	1.9	7.1	575	3.7	5.2	3.5	11	657	2.7
5.4	0.337	211	2.8	8.0	690	2.0	4.9	5.1	12	789	1.4
6.1	0.467	175	1.6	3.4	553	1.8	6.7	2.9	5.2	632	1.3
6.8	0.510	152	1.5	2.2	538	1.1	7.4	2.7	3.3	616	0.794
7.5	0.809	126	1.3	4.5	491	0.885	12	2.5	6.9	562	0.645
8.2	0.337	116	1.6	5.5	550	0.448	4.9	2.8	8.4	629	0.327
8.9	0.381	144	3.2	1.6	601	1.8	5.5	5.8	2.5	688	1.3
9.5	1.1	133	2.6	4.3	604	2.0	16	4.8	6.7	690	1.5
10.2	0.432	94	2.3	1.9	511	1.6	6.2	4.3	2.9	584	1.1
10.9	0.386	109	2.4	3.0	466	1.1	5.6	4.3	4.6	532	0.798
11.6	0.469	95	1.9	3.5	599	1.1	6.8	3.5	5.4	685	0.782
12.3	0.704	95	1.9	1.8	652	1.2	10	3.4	2.7	745	0.845
13.0	0.337	83	2.3	3.9	483	1.5	4.9	4.2	5.9	552	1.1
13.7	0.337	77	1.7	4.0	738	2.2	4.9	3.1	6.1	844	1.6
14.4	0.337	88	4.4	3.0	572	1.9	4.9	8.0	4.7	654	1.4
15.1	0.337	72	0.963	3.0	497	0.811	4.9	1.8	4.6	568	0.592
15.8	0.337	71	0.759	3.3	393	0.675	4.9	1.4	5.1	450	0.493
16.5	0.337	62	0.952	1.5	497	1.5	4.9	1.7	2.3	568	1.1
17.2	0.612	60	0.685	3.4	456	1.0	8.8	1.2	5.2	521	0.739
17.9	0.337	59	0.780	2.4	411	0.714	4.9	1.4	3.6	470	0.521
18.6	0.337	57	0.607	1.3	596	0.967	4.9	1.1	2.0	681	0.706
19.3	0.337	56	0.608	2.3	561	1.2	4.9	1.1	3.5	642	0.907
20.0	0.337	51	0.617	2.1	511	1.2	4.9	1.1	3.2	584	0.896
20.7	0.364	39	0.577	0.683	462	0.940	5.2	1.1	1.0	528	0.686
21.4	0.337	39	0.376	0.458	505	0.487	4.9	0.686	0.702	577	0.355
22.1	0.337	39	0.263	2.4	650	0.937	4.9	0.481	3.7	743	0.684
22.8	0.337	40	0.396	0.458	538	0.821	4.9	0.723	0.702	615	0.599
23.5	0.670	36	0.368	1.9	512	0.404	9.7	0.671	2.9	585	0.295
24.2	0.436	29	0.287	1.5	514	0.629	6.3	0.524	2.2	588	0.459
24.9	0.337	38	0.361	1.1	592	0.892	4.9	0.659	1.6	677	0.651
25.6	0.337	34	0.235	0.613	546	0.464	4.9	0.428	0.940	625	0.338
26.3	0.337	27	0.219	1.9	567	0.691	4.9	0.399	2.9	648	0.504
27.0	0.337	21	0.155	0.896	528	0.333	4.9	0.283	1.4	604	0.243
27.7	0.337	23	0.208	0.845	595	0.902	4.9	0.380	1.3	680	0.658
28.4	0.337	23	0.107	1.3	584	0.713	4.9	0.194	2.0	668	0.520
29.1	0.337	25	0.264	0.465	631	0.533	4.9	0.482	0.713	722	0.389
29.8	0.536	20	0.363	1.6	614	0.710	7.7	0.661	2.4	702	0.518
30.5	0.337	25	0.227	1.8	584	0.990	4.9	0.414	2.8	668	0.722
31.2	0.337	22	0.274	1.3	657	1.5	4.9	0.499	2.0	751	1.1
31.9	0.337	25	0.149	2.4	686	0.958	4.9	0.271	3.7	785	0.699
32.6	0.337	26	0.237	0.964	730	1.4	4.9	0.431	1.5	835	1.0
33.3	0.337	22	0.284	1.5	720	1.0	4.9	0.519	2.3	824	0.752
34.0	0.337	21	0.238	0.528	640	0.798	4.9	0.433	0.809	732	0.582
34.7	0.648	20	0.126	0.828	715	1.0	9.4	0.231	1.3	818	0.730
35.4	0.337	19	0.110	0.728	734	1.1	4.9	0.201	1.1	840	0.794
36.0	0.457	18	0.067	0.458	653	1.3	6.6	0.122	0.702	747	0.955
36.7	0.337	20	0.059	0.620	736	1.0	4.9	0.108	0.950	842	0.735
37.4	0.337	18	0.134	0.973	733	0.864	4.9	0.245	1.5	838	0.631
38.1	0.337	15	0.103	0.678	741	1.1	4.9	0.187	1.0	847	0.792
38.8	0.337	16	0.192	1.5	700	1.2	4.9	0.350	2.3	800	0.865
39.5	0.337	14	0.059	0.458	661	1.2	4.9	0.108	0.702	756	0.866
40.2	0.337	15	0.164	0.843	817	1.1	4.9	0.298	1.3	934	0.801
40.9	0.337	14	0.088	0.458	768	0.883	4.9	0.161	0.702	879	0.644
41.6	0.337	17	0.101	1.1	838	1.1	4.9	0.183	1.6	958	0.827
42.3	0.337	16	0.221	0.931	784	0.483	4.9	0.402	1.4	896	0.352
43.0	0.337	14	0.107	0.793	796	0.915	4.9	0.196	1.2	910	0.668
43.7	0.337	14	0.059	1.1	807	0.924	4.9	0.108	1.6	922	0.674
44.4	0.359	15	0.123	1.3	779	1.2	5.2	0.224	1.9	891	0.865
45.1	0.337	15	0.150	0.636	721	1.0	4.9	0.273	0.975	825	0.734
45.8	0.337	15	0.094	0.458	792	1.6	4.9	0.172	0.702	905	1.2
46.5	0.337	16	0.106	1.4	770	1.4	4.9	0.194	2.2	881	0.994
47.2	0.453	16	0.059	0.458	856	1.6	6.5	0.108	0.702	979	1.2
47.9	0.337	15	0.095	1.5	793	0.867	4.9	0.173	2.4	907	0.633
48.6	0.337	16	0.059	0.957	796	1.6	4.9	0.108	1.5	910	1.2
49.3	0.337	14	0.166	2.3	825	1.3	4.9	0.302	3.6	943	0.956
50.0	0.337	17	0.059	1.8	825	1.0	4.9	0.108	2.8	944	0.732
50.7	0.337	16	0.191	3.3	790	1.2	4.9	0.348	5.1	903	0.861
51.4	0.337	13	0.134	2.1	711	1.4	4.9	0.244	3.2	813	1.0
52.1	0.337	16	0.184	1.8	781	1.3	4.9	0.336	2.8	893	0.927
52.8	0.337	18	0.130	2.2	844	1.6	4.9	0.237	3.4	965	1.2
53.5	0.337	17	0.305	2.5	829	1.4	4.9	0.556	3.9	948	1.0
54.2	0.337	20	0.118	2.3	910	1.8	4.9	0.216	3.6	1040	1.3
54.9	0.337	15	0.186	3.1	845	1.1	4.9	0.340	4.7	967	0.839
55.6	0.337	17	0.113	2.0	767	0.970	4.9	0.206	3.0	877	0.707
56.3	0.337	16	0.212	2.8	822	0.993	4.9	0.386	4.3	940	0.725



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
57.0	0.337	17	0.198	1.2	929	1.1	4.9	0.361	1.8	1063	0.825
57.7	0.351	18	0.206	2.6	834	1.9	5.1	0.376	3.9	954	1.4
58.4	0.337	17	0.255	3.4	863	1.8	4.9	0.466	5.2	987	1.3
59.1	0.342	16	0.271	2.4	917	1.4	4.9	0.494	3.7	1048	1.0
59.8	0.661	17	0.388	3.6	940	1.6	9.5	0.708	5.5	1075	1.2
60.5	0.352	20	0.297	2.5	1007	2.1	5.1	0.541	3.8	1152	1.5
61.2	0.337	17	0.288	3.1	956	1.3	4.9	0.525	4.7	1094	0.978
61.9	0.337	15	0.232	3.0	1050	2.2	4.9	0.423	4.6	1201	1.6
62.6	0.337	18	0.297	3.8	1112	1.9	4.9	0.542	5.8	1272	1.4
63.2	0.454	16	0.257	4.6	1012	1.7	6.6	0.469	7.1	1157	1.3
63.9	0.337	16	0.339	5.2	1065	2.4	4.9	0.618	8.0	1218	1.7
64.6	0.351	17	0.392	4.6	1166	2.5	5.1	0.715	7.1	1333	1.8
65.3	0.337	16	0.481	4.8	1365	2.0	4.9	0.877	7.3	1560	1.4
66.0	0.337	20	0.507	4.3	1265	2.7	4.9	0.925	6.6	1447	2.0
66.7	0.337	19	0.715	5.8	1369	2.6	4.9	1.3	8.8	1565	1.9
67.4	0.337	18	0.595	5.6	1315	3.2	4.9	1.1	8.6	1504	2.3
68.1	0.337	18	0.534	6.0	1544	2.1	4.9	0.974	9.2	1766	1.5
68.8	0.337	17	0.557	6.0	1318	3.0	4.9	1.0	9.2	1507	2.2
69.5	0.337	18	0.768	5.3	1414	2.4	4.9	1.4	8.1	1617	1.8
70.2	0.337	18	0.454	4.4	1519	2.3	4.9	0.828	6.7	1737	1.7
70.9	0.337	15	0.669	5.1	1657	2.5	4.9	1.2	7.8	1895	1.8
71.6	0.337	19	0.571	5.2	1610	2.5	4.9	1.0	8.0	1841	1.8
72.3	0.337	18	0.513	5.8	1574	1.8	4.9	0.936	8.9	1800	1.3
73.0	0.337	16	0.498	4.6	1550	1.9	4.9	0.909	7.1	1772	1.4
73.7	0.426	16	0.859	5.9	1620	2.7	6.2	1.6	9.1	1852	2.0
74.4	0.578	15	0.827	3.7	1513	2.1	8.3	1.5	5.7	1730	1.5
75.1	0.938	16	0.653	4.2	1565	2.6	14	1.2	6.4	1789	1.9
75.8	0.938	15	0.563	5.8	1575	2.3	14	1.0	8.9	1802	1.7
76.5	0.747	14	0.836	5.4	1548	1.9	11	1.5	8.3	1770	1.4
77.2	1.6	14	0.425	4.7	1514	2.6	23	0.776	7.1	1731	1.9
77.9	1.5	17	0.905	7.0	1429	2.4	22	1.7	11	1634	1.7
78.6	1.7	15	0.727	5.1	1435	2.5	24	1.3	7.8	1641	1.9
79.3	1.6	13	0.698	4.5	1309	2.3	22	1.3	6.9	1497	1.7
80.0	1.8	12	0.678	4.2	1260	2.4	25	1.2	6.5	1441	1.8
80.7	1.2	13	0.593	4.5	1270	2.0	17	1.1	6.9	1453	1.5
81.4	1.4	13	0.535	5.0	1363	2.2	20	0.975	7.7	1559	1.6
82.1	1.1	13	0.544	5.2	1264	2.0	16	0.993	8.0	1445	1.4
82.8	1.2	12	0.566	5.0	1340	1.7	17	1.0	7.7	1532	1.2
83.5	0.807	12	0.573	4.8	1122	2.0	12	1.0	7.3	1283	1.4
84.2	1.2	11	0.411	3.1	1037	2.0	17	0.749	4.8	1186	1.4
84.9	1.2	12	0.413	3.2	1248	1.8	17	0.753	4.9	1427	1.3
85.6	0.943	12	0.277	3.2	1092	1.4	14	0.505	5.0	1248	0.993
86.3	0.817	13	0.225	2.8	957	1.7	12	0.411	4.3	1094	1.2
87.0	0.932	11	0.207	2.3	1020	2.3	13	0.378	3.6	1167	1.7
87.7	0.460	14	0.278	3.1	947	2.9	6.6	0.506	4.8	1083	2.1
88.4	0.337	11	0.264	3.5	1016	1.2	4.9	0.482	5.4	1161	0.846
89.0	0.908	12	0.225	3.3	992	1.6	13	0.411	5.1	1134	1.2
89.7	0.896	12	0.272	3.1	1000	2.5	13	0.497	4.7	1144	1.8
90.4	0.337	13	0.241	2.0	937	1.7	4.9	0.440	3.0	1072	1.2
91.1	0.598	9.5	0.091	1.5	891	1.1	8.6	0.167	2.2	1019	0.837
91.8	0.579	9.8	0.171	2.8	943	0.962	8.4	0.311	4.3	1078	0.702
92.5	0.681	12	0.195	1.3	851	1.5	9.8	0.356	2.1	973	1.1
93.2	0.603	9.5	0.197	2.3	839	1.9	8.7	0.360	3.4	959	1.4
93.9	0.679	11	0.090	3.2	905	1.4	9.8	0.164	4.9	1035	0.989
94.6	0.337	10	0.077	1.2	828	1.3	4.9	0.140	1.8	947	0.920
95.3	0.337	10.0	0.168	3.0	828	1.9	4.9	0.307	4.6	946	1.4
96.0	0.406	12	0.139	1.8	860	1.6	5.9	0.254	2.8	984	1.1
96.7	0.337	12	0.237	2.6	978	1.8	4.9	0.432	4.0	1118	1.3
97.4	0.562	11	0.227	1.4	842	1.8	8.1	0.414	2.2	962	1.3
98.1	0.337	11	0.136	1.8	866	1.5	4.9	0.247	2.8	991	1.1
98.8	0.364	11	0.153	3.6	877	1.6	5.3	0.278	5.6	1002	1.1
99.5	0.392	13	0.197	1.5	833	0.704	5.7	0.360	2.3	952	0.514
100.2	0.337	13	0.135	2.0	809	1.3	4.9	0.245	3.1	925	0.941
100.9	0.519	12	0.256	1.8	900	1.8	7.5	0.468	2.8	1029	1.3
101.6	0.404	15	0.155	2.1	889	1.3	5.8	0.282	3.2	1017	0.977
102.3	0.337	14	0.207	2.9	792	1.5	4.9	0.378	4.5	905	1.1
103.0	0.337	12	0.144	1.5	804	1.1	4.9	0.263	2.3	920	0.774
103.7	0.337	14	0.145	3.7	928	1.8	4.9	0.265	5.7	1061	1.3
104.4	0.337	12	0.163	1.8	912	1.5	4.9	0.298	2.8	1043	1.1
105.1	0.510	12	0.136	2.7	942	1.6	7.4	0.248	4.1	1077	1.2
105.8	0.369	14	0.155	3.7	842	1.2	5.3	0.282	5.7	963	0.848
106.5	0.337	14	0.351	1.4	869	1.3	4.9	0.640	2.2	993	0.954
107.2	0.397	18	0.269	3.5	886	1.5	5.7	0.490	5.4	1014	1.1
107.9	0.337	15	0.132	2.3	803	1.3	4.9	0.241	3.6	918	0.924
108.6	0.552	15	0.180	2.9	837	1.4	8.0	0.329	4.4	957	1.1
109.3	0.337	13	0.177	2.5	801	1.8	4.9	0.323	3.8	916	1.3
110.0	0.337	13	0.244	3.8	886	1.5	4.9	0.445	5.8	1013	1.1
110.7	0.381	12	0.118	2.9	811	1.8	5.5	0.215	4.5	927	1.3
111.4	0.337	16	0.286	3.4	857	1.0	4.9	0.521	5.2	979	0.746
112.1	0.515	17	0.168	2.7	763	0.673	7.4	0.307	4.1	872	0.491
112.8	0.337	14	0.255	4.6	744	1.4	4.9	0.464	7.1	851	1.0



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.5	0.337	16	0.272	2.3	905	1.3	4.9	0.496	3.5	1035	0.971
114.2	0.377	14	0.144	3.1	817	1.2	5.4	0.263	4.7	934	0.866
114.9	0.337	15	0.161	3.6	811	1.2	4.9	0.293	5.5	927	0.881
115.5	0.337	15	0.215	4.8	887	1.3	4.9	0.393	7.4	1015	0.983
116.2	0.357	14	0.268	2.8	851	1.8	5.1	0.488	4.3	973	1.3
116.9	0.337	11	0.236	3.3	702	0.976	4.9	0.430	5.0	803	0.712
117.6	0.337	18	0.274	2.9	916	1.6	4.9	0.500	4.5	1048	1.2
118.3	0.337	15	0.340	3.5	873	1.5	4.9	0.620	5.4	998	1.1
119.0	0.337	15	0.362	5.3	858	1.9	4.9	0.660	8.2	981	1.4
119.7	0.337	14	0.248	4.5	993	1.6	4.9	0.452	6.8	1135	1.2
120.4	0.488	16	0.456	4.3	976	3.2	7.0	0.831	6.6	1116	2.4
121.1	0.337	17	0.518	5.0	990	1.7	4.9	0.945	7.7	1132	1.3
121.8	0.337	16	0.444	4.7	910	2.0	4.9	0.810	7.2	1040	1.4
122.5	0.337	17	0.395	4.0	1001	1.9	4.9	0.720	6.1	1145	1.4
123.2	0.337	15	0.536	5.9	1057	1.9	4.9	0.977	9.0	1209	1.4
123.9	0.418	17	0.467	7.1	1103	1.9	6.0	0.852	11	1261	1.4
124.6	0.609	18	0.404	4.7	1149	1.1	8.8	0.737	7.2	1314	0.795
125.3	0.337	15	0.891	6.5	1157	2.2	4.9	1.6	10.0	1323	1.6
126.0	0.337	16	0.797	8.6	1181	1.7	4.9	1.5	13	1350	1.2
126.7	0.590	16	0.945	6.0	1272	3.4	8.5	1.7	9.2	1455	2.5
127.4	0.936	15	0.850	7.1	1207	1.8	14	1.6	11	1381	1.3
128.1	0.514	17	1.1	10	1264	2.0	7.4	2.1	16	1446	1.5
128.8	0.811	17	0.739	7.3	1276	3.0	12	1.3	11	1460	2.2
129.5	0.620	16	1.1	12	1455	2.3	8.9	2.0	19	1663	1.7
130.2	0.755	17	1.4	8.9	1403	2.7	11	2.6	14	1604	2.0
130.9	1.0	17	1.3	11	1501	2.5	14	2.4	17	1717	1.8
131.6	0.964	18	1.5	11	1513	3.0	14	2.8	17	1731	2.2
132.3	0.958	19	1.7	11	1566	3.0	14	3.1	17	1791	2.2
133.0	1.2	17	1.9	10	1337	2.3	18	3.5	16	1529	1.7
133.7	1.3	16	1.6	10	1457	2.9	18	3.0	16	1666	2.1
134.4	0.844	15	2.2	8.8	1565	3.6	12	3.9	14	1789	2.6
135.1	1.6	18	2.1	11	1444	2.5	24	3.8	16	1651	1.8
135.8	1.8	18	2.3	11	1395	2.4	27	4.3	17	1596	1.7
136.5	1.2	15	2.0	13	1484	2.0	18	3.7	20	1697	1.4
137.2	2.7	15	2.2	14	1655	3.5	39	4.1	22	1893	2.5
137.9	2.5	15	2.3	14	1607	2.5	36	4.2	21	1837	1.9
138.6	3.5	14	2.4	13	1494	2.5	50	4.4	20	1708	1.8
139.3	4.1	14	2.7	12	1585	2.4	60	5.0	18	1812	1.7
140.0	4.3	15	2.3	13	1408	2.1	62	4.2	20	1610	1.6
140.7	4.2	11	2.4	11	1418	2.0	60	4.4	17	1621	1.4
141.4	5.8	14	2.6	14	1506	2.6	83	4.8	22	1722	1.9
142.1	6.0	12	1.8	10	1370	2.9	87	3.4	16	1567	2.1
142.7	4.9	13	2.0	10	1235	2.1	71	3.7	16	1412	1.5
143.4	5.1	13	2.4	8.9	1162	2.3	73	4.3	14	1329	1.7
144.1	5.3	13	1.7	8.6	1227	2.1	77	3.1	13	1403	1.5
144.8	5.6	14	2.0	8.1	1329	2.4	81	3.6	12	1520	1.7
145.5	6.1	13	1.9	8.3	1152	2.5	88	3.5	13	1317	1.8
146.2	6.2	12	1.5	9.6	1203	2.2	89	2.7	15	1376	1.6
146.9	6.7	12	1.6	5.6	1130	1.1	97	2.8	8.5	1293	0.820
147.6	5.7	12	1.3	6.3	1051	1.7	83	2.4	9.6	1202	1.3
148.3	4.8	11	1.0	6.8	1057	2.1	69	1.9	10	1208	1.5
149.0	4.1	10	1.1	6.6	1080	1.4	60	2.0	10	1235	1.0
149.7	4.6	11	1.1	5.5	936	1.5	67	2.0	8.5	1070	1.1
150.4	5.8	10	1.2	4.8	1077	2.0	83	2.2	7.4	1232	1.5
151.1	4.3	8.8	0.484	4.3	944	2.2	62	0.883	6.5	1080	1.6
151.8	3.6	8.7	0.680	4.6	1083	2.0	52	1.2	7.0	1239	1.5
152.5	3.9	9.8	0.694	5.4	1035	2.6	56	1.3	8.3	1183	1.9
153.2	3.0	12	0.598	4.7	1065	2.5	44	1.1	7.2	1218	1.8
153.9	2.8	11	0.432	3.3	1066	1.7	40	0.787	5.0	1219	1.2
154.6	3.0	10	0.535	2.5	997	1.4	44	0.977	3.9	1140	1.1
155.3	3.1	10	0.455	3.9	894	1.6	44	0.830	6.0	1022	1.1
156.0	2.8	10	0.425	3.2	830	1.5	40	0.776	4.9	950	1.1
156.7	2.7	9.4	0.398	2.8	956	1.1	38	0.727	4.3	1094	0.839
157.4	2.3	10	0.421	2.6	816	1.4	33	0.767	4.1	933	1.0
158.1	2.1	12	0.533	4.5	818	2.1	30	0.971	6.9	936	1.6
158.8	2.1	10	0.399	4.0	955	2.2	30	0.727	6.1	1092	1.6
159.5	1.0	11	0.136	3.5	881	1.1	14	0.247	5.3	1008	0.797
160.2	1.6	11	0.363	4.3	957	1.7	23	0.661	6.6	1094	1.3
160.9	1.3	11	0.277	3.6	971	1.7	18	0.506	5.4	1110	1.2
161.6	1.2	12	0.179	3.7	958	1.2	17	0.326	5.7	1095	0.905
162.3	0.626	12	0.238	4.5	983	0.967	9.0	0.434	6.9	1124	0.705
163.0	0.477	16	0.306	4.4	994	1.3	6.9	0.557	6.8	1137	0.923
163.7	1.2	13	0.253	5.3	950	2.1	17	0.462	8.1	1086	1.6
164.4	0.803	11	0.249	4.9	844	2.8	12	0.453	7.6	965	2.0
165.1	0.526	12	0.289	5.7	980	2.0	7.6	0.527	8.7	1120	1.4
165.8	0.900	14	0.341	6.8	987	2.2	13	0.621	10	1128	1.6
166.5	1.0	12	0.583	4.6	1122	1.8	15	1.1	7.1	1283	1.3
167.2	0.695	13	0.392	5.9	1021	1.1	10	0.715	9.0	1167	0.791
167.9	0.337	11	0.248	4.8	924	1.8	4.9	0.452	7.4	1057	1.3
168.5	0.337	11	0.341	5.1	950	2.0	4.9	0.621	7.9	1087	1.5
169.2	0.964	12	0.461	6.1	1168	2.2	14	0.842	9.4	1336	1.6



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
169.9	0.656	11	0.592	5.7	928	2.3	9.5	1.1	8.7	1061	1.6
170.6	0.612	15	0.595	5.4	1151	3.1	8.8	1.1	8.3	1316	2.2
171.3	0.729	14	0.530	6.2	1200	1.9	11	0.967	9.5	1372	1.4
172.0	0.799	15	0.579	8.6	1338	3.0	12	1.1	13	1530	2.2
172.7	0.579	14	0.398	9.0	1241	3.6	8.4	0.727	14	1419	2.6
173.4	0.456	16	0.544	7.1	1374	1.9	6.6	0.992	11	1571	1.4
174.1	0.401	13	0.412	7.8	1363	2.4	5.8	0.751	12	1558	1.8
174.8	0.390	11	0.596	7.2	1264	3.4	5.6	1.1	11	1445	2.5
175.5	0.854	14	0.387	6.4	1613	3.6	12	0.707	9.8	1845	2.6
176.2	1.1	14	0.715	9.6	1421	2.9	16	1.3	15	1625	2.1
176.9	1.2	13	0.570	5.9	1261	2.9	18	1.0	9.0	1442	2.1
177.6	2.0	15	0.522	6.0	1482	3.1	28	0.952	9.2	1694	2.3
178.3	1.7	10	0.331	7.8	1349	3.2	25	0.604	12	1542	2.3
179.0	1.6	12	0.415	7.3	1273	3.2	24	0.756	11	1456	2.3
179.7	1.8	11	0.522	8.9	1272	2.6	26	0.953	14	1454	1.9
180.4	1.6	12	0.520	6.7	1288	3.3	23	0.949	10	1472	2.4
181.1	1.8	12	0.516	7.3	1248	2.9	26	0.940	11	1428	2.1
181.8	1.1	9.7	0.249	6.5	1238	2.6	16	0.454	10.0	1416	1.9
182.5	1.2	9.2	0.411	5.6	1093	2.4	17	0.750	8.6	1250	1.8
183.2	2.1	12	0.216	6.2	1078	3.6	30	0.393	9.5	1233	2.6
183.9	1.7	10	0.520	7.7	1090	1.5	25	0.949	12	1247	1.1
184.6	1.8	12	0.541	7.6	1246	2.5	25	0.987	12	1425	1.8
185.3	1.3	11	0.352	6.0	1182	2.4	18	0.643	9.2	1351	1.8
186.0	1.6	10	0.463	5.1	1099	1.6	23	0.844	7.8	1256	1.1
186.7	1.4	9.9	0.193	6.8	1102	1.5	20	0.353	10	1260	1.1
187.4	2.1	9.9	0.369	6.0	1064	1.9	30	0.672	9.1	1216	1.4
188.1	1.7	8.8	0.242	4.0	1185	2.0	25	0.441	6.1	1355	1.4
188.8	1.7	10	0.316	5.9	1161	1.8	24	0.576	9.1	1327	1.3
189.5	1.5	9.2	0.308	3.6	913	1.1	21	0.561	5.6	1044	0.793
190.2	1.5	9.8	0.109	3.8	1095	2.2	21	0.200	5.8	1252	1.6
190.9	1.8	10	0.240	4.3	906	1.1	26	0.438	6.6	1036	0.767
191.6	1.4	8.1	0.245	5.2	1023	2.2	20	0.447	7.9	1170	1.6
192.3	0.897	8.7	0.165	2.8	945	1.8	13	0.300	4.3	1081	1.3
193.0	0.983	12	0.111	4.2	994	1.6	14	0.202	6.4	1137	1.1
193.7	1.2	8.9	0.156	5.0	913	1.7	17	0.285	7.7	1044	1.3
194.4	1.3	9.7	0.206	3.0	915	1.3	19	0.376	4.6	1047	0.984
195.0	1.1	7.0	0.111	2.7	984	1.3	16	0.203	4.1	1125	0.972
195.7	1.1	7.8	0.260	4.6	981	2.0	16	0.475	7.1	1122	1.4
196.4	0.866	10	0.243	3.4	1029	2.5	13	0.443	5.3	1176	1.8
197.1	0.889	8.7	0.232	4.8	1016	1.0	13	0.424	7.4	1162	0.740
197.8	0.337	9.6	0.142	3.3	834	1.3	4.9	0.259	5.1	954	0.943
198.5	0.817	8.1	0.256	2.6	913	1.4	12	0.467	4.0	1044	1.1
199.2	0.769	7.9	0.185	2.1	959	1.3	11	0.337	3.2	1097	0.934
199.9	0.636	9.2	0.059	4.5	858	1.3	9.2	0.108	6.8	981	0.949
200.6	0.886	9.6	0.121	4.9	906	1.4	13	0.221	7.5	1036	1.0
201.3	0.584	9.3	0.098	2.9	758	0.902	8.4	0.180	4.5	867	0.658
202.0	0.387	9.9	0.362	3.7	866	1.3	5.6	0.660	5.7	990	0.932
202.7	0.409	11	0.157	5.5	944	1.3	5.9	0.286	8.5	1079	0.984
203.4	0.498	9.2	0.223	4.2	881	1.4	7.2	0.407	6.5	1008	0.986
204.1	0.337	9.8	0.259	3.7	942	1.1	4.9	0.472	5.7	1078	0.829
204.8	0.424	10	0.287	4.0	930	1.5	6.1	0.524	6.1	1063	1.1
205.5	0.416	11	0.159	6.8	840	1.5	6.0	0.291	10	961	1.1
206.2	0.518	11	0.250	6.2	920	2.2	7.5	0.456	9.5	1052	1.6
206.9	0.459	12	0.298	6.1	863	1.3	6.6	0.543	9.3	987	0.959
207.6	0.337	11	0.148	5.8	897	1.3	4.9	0.270	9.0	1025	0.932
208.3	0.337	11	0.404	5.9	775	1.5	4.9	0.736	9.0	887	1.1
209.0	0.337	11	0.211	7.7	854	1.6	4.9	0.385	12	977	1.1
209.7	0.337	14	0.510	10	839	1.8	4.9	0.931	16	959	1.3
210.4	0.337	12	0.309	8.0	803	1.6	4.9	0.563	12	918	1.2
211.1	0.499	12	0.558	8.1	834	2.7	7.2	1.0	12	954	2.0
211.8	0.337	13	0.414	10	922	2.1	4.9	0.755	16	1055	1.5
212.5	0.337	12	0.556	11	875	3.0	4.9	1.0	16	1001	2.2
213.2	0.337	16	0.697	12	942	1.9	4.9	1.3	18	1077	1.4
213.9	0.337	13	0.871	11	844	1.6	4.9	1.6	17	965	1.2
214.6	0.516	12	1.0	11	1018	2.3	7.5	1.9	17	1165	1.7
215.3	0.357	15	0.753	11	1211	3.0	5.2	1.4	17	1384	2.2
216.0	0.337	14	1.1	12	1061	2.3	4.9	2.0	19	1213	1.7
216.7	0.337	13	1.2	14	993	1.9	4.9	2.2	22	1135	1.4
217.4	0.675	13	0.826	12	1118	1.9	9.7	1.5	19	1279	1.4
218.1	0.337	15	1.2	15	1185	2.0	4.9	2.2	24	1355	1.4
218.8	0.637	15	1.2	15	1171	1.6	9.2	2.1	24	1340	1.2
219.5	0.665	13	1.2	13	1170	1.7	9.6	2.2	20	1338	1.2
220.2	0.337	13	1.3	16	1278	1.7	4.9	2.3	24	1461	1.2
220.9	0.365	14	1.2	18	1425	2.6	5.3	2.3	27	1629	1.9
221.6	0.561	15	1.4	20	1369	2.4	8.1	2.6	30	1566	1.8
222.2	0.776	14	1.7	21	1482	2.2	11	3.2	32	1694	1.6
222.9	0.628	12	1.3	18	1414	1.6	9.1	2.3	28	1617	1.1
223.6	0.337	14	1.8	21	1578	2.3	4.9	3.3	33	1804	1.7
224.3	0.812	14	2.0	17	1359	2.4	12	3.6	27	1554	1.8
225.0	0.556	12	2.0	17	1464	1.8	8.0	3.6	27	1674	1.3
225.7	1.9	13	2.7	20	1613	2.2	27	4.9	30	1845	1.6



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.4	0.889	12	2.5	21	1676	2.6	13	4.5	32	1917	1.9
227.1	2.3	12	2.5	21	1587	2.1	33	4.5	32	1815	1.5
227.8	1.8	15	2.7	29	1858	3.8	26	4.9	44	2125	2.7
228.5	1.8	11	2.8	27	1742	3.2	25	5.2	41	1992	2.3
229.2	2.1	15	2.9	23	1724	2.9	30	5.3	36	1972	2.1
229.9	2.0	14	2.8	21	1559	2.4	28	5.2	33	1783	1.7
230.6	1.7	13	3.0	24	2009	2.4	25	5.5	37	2297	1.7
231.3	2.0	14	2.9	21	1528	3.1	29	5.3	32	1748	2.2
232.0	3.3	18	3.3	30	1758	2.3	48	6.1	46	2010	1.7
232.7	3.3	14	3.8	27	1718	2.9	47	7.0	42	1965	2.1
233.4	2.7	13	3.6	32	1789	2.5	39	6.6	48	2046	1.8
234.1	2.8	13	3.9	27	1705	2.8	41	7.0	41	1950	2.0
234.8	3.6	11	3.7	30	1641	3.2	52	6.7	46	1876	2.4
235.5	3.1	12	4.1	28	1634	2.3	45	7.4	43	1868	1.7
236.2	3.9	14	3.6	32	1488	2.6	56	6.5	50	1701	1.9
236.9	4.6	12	4.0	25	1793	4.1	66	7.3	38	2050	3.0
237.6	4.8	11	4.0	26	1427	2.4	69	7.3	39	1632	1.8
238.3	5.3	13	3.9	25	1484	3.1	76	7.2	38	1697	2.2
239.0	6.1	12	4.0	24	1479	3.6	88	7.4	37	1692	2.6
239.7	5.8	14	4.6	24	1389	3.1	84	8.4	37	1588	2.2
240.4	8.1	12	4.9	26	1639	3.2	117	8.9	40	1874	2.4
241.1	8.1	14	4.3	21	1407	3.5	118	7.9	32	1609	2.5
241.8	7.7	13	4.0	23	1443	3.7	112	7.2	35	1650	2.7
242.5	7.4	13	4.4	21	1410	3.5	106	8.1	33	1613	2.6
243.2	7.5	11	3.9	22	1422	3.7	108	7.2	34	1627	2.7
243.9	8.6	11	3.4	21	1303	3.1	125	6.3	32	1491	2.3
244.6	9.9	11	3.0	18	1141	1.9	143	5.5	27	1305	1.4
245.3	8.5	11	3.1	19	1417	3.0	122	5.7	29	1620	2.2
246.0	8.1	11	2.9	20	1422	4.0	117	5.3	30	1626	2.9
246.7	9.4	9.7	2.8	13	1099	4.0	135	5.0	20	1257	2.9
247.4	8.2	11	2.4	16	1167	2.3	119	4.3	24	1334	1.7
248.0	8.8	12	2.4	15	1142	3.6	127	4.4	23	1306	2.6
248.7	8.5	9.9	2.7	13	1097	3.6	123	4.9	20	1255	2.6
249.4	7.5	8.5	2.6	12	1104	3.2	108	4.7	19	1262	2.3
250.1	9.2	11	2.4	11	1063	2.6	133	4.3	16	1216	1.9
250.8	6.6	8.1	1.4	11	1087	2.9	95	2.6	17	1243	2.1
251.5	7.0	8.8	1.7	8.5	1071	2.0	101	3.1	13	1225	1.4
252.2	7.4	10	1.5	10	1074	2.8	107	2.7	16	1228	2.1
252.9	6.1	9.7	1.4	8.8	1047	1.8	88	2.6	14	1198	1.3
253.6	6.7	9.5	1.2	6.5	1131	3.2	97	2.1	10.0	1294	2.3
254.3	4.3	9.0	0.973	7.3	1000	3.1	62	1.8	11	1144	2.2
255.0	4.9	8.4	0.841	5.9	869	1.9	71	1.5	9.0	993	1.4
255.7	3.6	7.8	1.0	4.9	1015	2.3	53	1.8	7.4	1161	1.7
256.4	3.5	8.6	0.401	5.8	1169	2.4	50	0.730	8.9	1337	1.8
257.1	3.6	6.6	0.474	5.0	972	2.8	53	0.864	7.6	1111	2.1
257.8	4.0	7.8	0.533	4.1	1008	2.1	58	0.972	6.3	1153	1.6
258.5	2.7	7.4	0.525	6.0	1180	2.0	39	0.957	9.2	1349	1.4
259.2	2.9	9.6	0.426	5.4	1044	1.6	42	0.776	8.2	1194	1.2
259.9	2.1	10	0.209	5.9	973	2.0	31	0.381	9.1	1113	1.5
260.6	2.0	8.2	0.201	5.3	918	1.8	30	0.366	8.1	1050	1.3
261.3	1.9	7.2	0.175	5.7	977	1.5	27	0.319	8.7	1117	1.1
262.0	1.2	9.8	0.468	5.2	894	1.8	17	0.853	8.0	1023	1.3
262.7	2.2	12	0.315	6.8	1001	2.0	31	0.574	10	1144	1.5
263.4	1.5	11	0.277	6.5	873	1.4	22	0.506	10.0	998	0.995
264.1	0.988	8.4	0.373	5.3	908	1.4	14	0.681	8.0	1038	0.985
264.8	0.907	12	0.399	8.5	974	1.2	13	0.728	13	1114	0.858
265.5	0.462	9.0	0.309	8.9	1072	2.3	6.7	0.563	14	1226	1.7
266.2	0.692	11	0.416	7.4	974	2.0	10.0	0.759	11	1113	1.5
266.9	0.576	9.4	0.350	8.9	1014	1.8	8.3	0.639	14	1160	1.3
267.6	0.408	9.4	0.457	9.5	854	1.7	5.9	0.833	15	977	1.2
268.3	0.774	12	0.414	10	918	2.2	11	0.755	16	1049	1.6
269.0	0.421	13	0.557	10	921	1.7	6.1	1.0	15	1054	1.2
269.7	0.453	11	0.423	10	905	2.0	6.5	0.771	15	1035	1.5
270.4	0.749	14	0.577	13	964	2.7	11	1.1	19	1103	2.0
271.1	0.553	12	0.385	9.1	928	2.3	8.0	0.703	14	1062	1.7
271.8	0.731	15	0.514	12	1085	1.9	11	0.937	19	1241	1.4
272.5	0.384	14	0.341	12	1056	2.1	5.5	0.622	18	1208	1.5
273.2	0.337	13	0.708	14	998	1.9	4.9	1.3	22	1141	1.4
273.9	0.337	10	0.532	17	1027	2.3	4.9	0.970	26	1174	1.7
274.5	0.711	15	0.796	14	925	2.3	10	1.5	22	1058	1.7
275.2	0.609	17	0.665	16	1080	2.2	8.8	1.2	24	1235	1.6
275.9	0.399	17	0.804	17	954	1.9	5.8	1.5	26	1091	1.4
276.6	0.575	14	0.803	21	1134	2.1	8.3	1.5	32	1297	1.5
277.3	0.832	14	0.769	18	1065	1.4	12	1.4	27	1218	1.0
278.0	0.337	16	0.949	19	1108	2.3	4.9	1.7	29	1267	1.7
278.7	0.819	15	1.0	24	1174	2.3	12	1.9	37	1343	1.7
279.4	0.491	15	1.1	24	1213	2.1	7.1	2.1	37	1387	1.5
280.1	0.337	15	1.2	22	1342	2.4	4.9	2.1	34	1534	1.8
280.8	0.337	13	1.0	19	1251	2.1	4.9	1.9	29	1430	1.5
281.5	0.602	14	1.1	20	1257	1.6	8.7	2.0	30	1438	1.1
282.2	0.337	15	1.5	24	1558	2.5	4.9	2.8	36	1781	1.8



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
282.9	0.337	16	1.2	25	1450	1.8	4.9	2.1	39	1658	1.3
283.6	0.337	14	1.3	26	1500	2.0	4.9	2.3	40	1715	1.5
284.3	0.498	12	1.4	24	1420	1.2	7.2	2.6	36	1624	0.854
285.0	0.481	13	1.5	26	1381	1.8	6.9	2.7	40	1579	1.3
285.7	0.473	15	1.4	29	1529	2.3	6.8	2.5	44	1748	1.6
286.4	1.2	14	1.3	27	1723	1.8	17	2.4	42	1971	1.3
287.1	0.611	14	1.4	23	1636	1.9	8.8	2.5	36	1870	1.4
287.8	0.337	13	1.3	25	1637	1.8	4.9	2.4	39	1872	1.3
288.5	0.687	15	1.5	26	1733	1.6	9.9	2.7	39	1981	1.2
289.2	0.345	12	1.6	26	1716	1.7	5.0	2.9	40	1962	1.2
289.9	0.526	13	1.9	30	1846	1.7	7.6	3.5	45	2111	1.2
290.6	0.878	14	1.5	27	1738	1.6	13	2.8	41	1988	1.2
291.3	0.563	17	2.3	31	1733	1.9	8.1	4.2	47	1981	1.4
292.0	0.490	14	1.8	34	1907	1.1	7.1	3.2	52	2180	0.828
292.7	0.903	13	1.8	27	1721	0.918	13	3.3	42	1968	0.670
293.4	0.428	13	1.9	36	1681	1.7	6.2	3.5	55	1922	1.2
294.1	1.2	14	1.8	31	2080	2.2	18	3.2	47	2378	1.6
294.8	1.1	15	2.2	32	1866	1.7	16	4.1	50	2134	1.3
295.5	1.2	16	2.2	35	1976	1.0	17	3.9	54	2259	0.757
296.2	1.5	12	2.4	37	2038	1.6	22	4.4	57	2330	1.1
296.9	0.874	13	2.3	36	1943	2.1	13	4.2	56	2222	1.5
297.6	1.3	11	2.5	31	2092	2.2	19	4.6	47	2392	1.6
298.3	1.5	15	2.5	39	1805	1.4	21	4.5	59	2064	0.999
299.0	1.9	12	2.5	37	1624	1.4	27	4.5	56	1857	1.0
299.7	1.4	13	2.7	37	1592	1.3	20	4.9	57	1820	0.937
300.4	1.2	11	3.2	34	1601	1.2	18	5.9	53	1831	0.856
301.1	1.7	13	2.8	34	1657	1.9	25	5.2	53	1894	1.4
301.8	1.2	12	3.1	36	1995	1.8	17	5.6	55	2281	1.3
302.4	1.5	14	3.3	38	1791	1.8	21	6.0	58	2048	1.3
303.1	2.9	14	3.3	42	1803	2.4	41	6.0	65	2061	1.7
303.8	1.4	13	3.9	41	1715	2.1	21	7.2	63	1961	1.5
304.5	1.6	13	3.4	38	1641	1.4	24	6.2	58	1876	1.0
305.2	2.3	14	3.6	44	1811	2.6	33	6.5	68	2071	1.9
305.9	1.8	14	3.2	47	1866	3.3	26	5.9	72	2133	2.4
306.6	1.6	10	4.1	44	1810	2.2	22	7.4	68	2070	1.6
307.3	1.8	14	4.0	42	1759	2.2	25	7.3	64	2012	1.6
308.0	2.5	12	4.1	45	1881	2.1	37	7.5	70	2151	1.6
308.7	2.2	11	3.7	47	1797	2.7	31	6.8	72	2055	1.9
309.4	1.9	11	3.6	44	1623	1.8	27	6.5	67	1856	1.3
310.1	2.3	13	3.6	39	1641	2.0	33	6.6	60	1876	1.4
310.8	3.1	12	3.7	40	1721	1.9	44	6.8	62	1968	1.4
311.5	3.6	13	3.7	40	1454	2.1	51	6.8	62	1663	1.5
312.2	3.8	11	3.2	40	1648	2.0	55	5.9	62	1885	1.5
312.9	2.9	11	3.4	43	1648	2.0	42	6.2	67	1884	1.5
313.6	2.9	11	3.1	35	1375	2.3	42	5.7	54	1572	1.7
314.3	4.0	11	2.9	37	1299	2.5	58	5.4	56	1486	1.8
315.0	3.5	12	3.2	37	1388	2.3	51	5.8	57	1587	1.6
315.7	3.2	11	2.3	30	1134	1.9	47	4.2	46	1297	1.4
316.4	3.7	12	3.7	36	1261	1.7	54	6.7	56	1442	1.2
317.1	2.5	10	2.6	29	1343	1.8	36	4.8	45	1536	1.3
317.8	2.2	10	2.6	32	1159	2.4	32	4.7	48	1325	1.8
318.5	2.9	11	3.0	33	1221	2.1	41	5.5	50	1396	1.5
319.2	2.8	11	2.3	30	1226	1.4	40	4.3	47	1402	1.1
319.9	2.2	9.3	2.2	29	1208	2.2	32	4.0	45	1382	1.6
320.6	2.4	9.7	2.3	24	1067	1.6	35	4.2	37	1220	1.2
321.3	2.8	11	2.0	26	1194	2.8	40	3.6	41	1365	2.1
322.0	2.1	9.1	1.4	23	846	1.7	30	2.6	35	967	1.2
322.7	1.7	9.5	1.6	19	884	1.4	25	2.9	30	1011	1.1
323.4	2.4	9.2	1.4	18	741	1.7	34	2.5	28	847	1.3
324.1	2.1	8.2	1.1	14	753	1.3	31	2.0	21	861	0.957
324.8	3.4	9.2	0.854	16	663	1.4	49	1.6	25	758	1.0
325.5	2.3	11	0.706	12	701	2.0	33	1.3	19	802	1.4
326.2	1.5	6.9	0.881	11	459	1.7	21	1.6	17	525	1.2
326.9	1.6	9.1	1.1	11	510	1.7	23	1.9	17	584	1.2
327.6	1.3	7.7	0.904	10	400	0.972	18	1.6	15	458	0.709
328.3	1.3	8.5	1.0	9.6	430	2.0	18	1.9	15	492	1.5
328.9	0.507	6.6	0.448	6.5	413	1.5	7.3	0.817	10.0	472	1.1
329.6	1.0	7.7	0.425	6.1	398	1.6	15	0.775	9.3	455	1.1
330.3	1.2	7.3	0.725	4.0	395	2.0	17	1.3	6.1	452	1.5
331.0	1.1	8.1	0.336	4.0	337	1.4	16	0.613	6.1	385	1.0
331.7	0.838	6.9	0.710	5.3	389	1.0	12	1.3	8.1	445	0.752
332.4	0.676	8.7	0.506	5.3	312	1.4	9.8	0.923	8.1	356	1.1
333.1	0.337	5.8	0.562	5.5	335	1.5	4.9	1.0	8.5	383	1.1
333.8	0.657	8.4	0.386	4.5	346	1.6	9.5	0.704	6.9	396	1.1
334.5	0.337	8.3	0.763	4.4	323	0.888	4.9	1.4	6.7	369	0.648
335.2	0.777	8.5	0.886	4.3	272	1.4	11	1.6	6.7	311	1.0
335.9	0.337	9.8	0.968	6.8	315	1.2	4.9	1.8	10	361	0.860
336.6	0.493	8.1	0.881	8.5	344	1.0	7.1	1.6	13	393	0.758
337.3	0.337	6.6	0.680	6.6	311	0.917	4.9	1.2	10	355	0.669
338.0	0.337	8.0	0.578	8.7	314	1.1	4.9	1.1	13	359	0.773
338.7	0.778	8.0	0.804	6.5	306	0.839	11	1.5	10.0	349	0.612



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.4	0.337	8.1	0.709	5.6	264	0.913	4.9	1.3	8.6	302	0.666
340.1	0.407	8.0	0.904	6.6	282	1.1	5.9	1.6	10	323	0.786
340.8	0.764	7.7	0.988	6.2	264	1.3	11	1.8	9.5	302	0.928
341.5	0.337	8.8	0.936	7.5	291	1.4	4.9	1.7	12	333	1.1
342.2	0.476	9.6	1.0	9.9	258	1.1	6.9	1.9	15	295	0.785
342.9	0.337	9.1	0.851	8.7	274	1.1	4.9	1.6	13	314	0.791
343.6	0.337	8.3	0.966	10.0	259	0.935	4.9	1.8	15	297	0.683
344.3	0.375	8.5	1.3	9.0	280	0.688	5.4	2.3	14	320	0.502
345.0	0.337	8.2	1.2	10	252	1.2	4.9	2.3	16	288	0.853
345.7	0.398	9.9	0.965	9.1	226	0.658	5.7	1.8	14	258	0.480
346.4	0.412	8.4	1.0	13	242	0.750	5.9	1.8	20	277	0.547
347.1	0.337	9.4	1.3	13	298	1.0	4.9	2.3	20	341	0.730
347.8	0.467	10	1.2	14	307	1.0	6.7	2.2	22	351	0.751
348.5	0.553	8.3	1.1	13	306	1.6	8.0	2.1	20	350	1.2
349.2	0.337	9.3	0.857	12	334	1.5	4.9	1.6	19	382	1.1
349.9	0.565	7.9	0.884	9.4	230	0.690	8.2	1.6	14	263	0.504
350.6	0.337	7.1	0.905	9.4	212	0.810	4.9	1.7	14	242	0.591
351.3	0.337	9.9	1.5	14	281	1.4	4.9	2.7	22	322	1.1
352.0	0.337	8.7	1.2	15	234	0.714	4.9	2.2	23	268	0.521
352.7	0.414	7.9	1.1	12	235	0.683	6.0	2.0	18	268	0.498
353.4	0.337	7.0	1.2	14	249	2.3	4.9	2.2	22	284	1.6
354.1	0.434	7.5	0.980	15	258	0.862	6.3	1.8	23	295	0.629
354.8	0.489	9.7	0.956	13	260	1.3	7.1	1.7	19	298	0.914
355.4	0.337	7.8	0.993	13	291	1.1	4.9	1.8	19	332	0.810
356.1	0.705	8.4	1.1	13	284	1.3	10	2.0	20	324	0.970
356.8	0.428	7.6	1.1	10	306	1.3	6.2	2.0	16	350	0.982
357.5	0.337	7.2	1.1	8.2	269	1.3	4.9	2.0	13	308	0.974
358.2	0.520	11	1.2	11	265	0.940	7.5	2.2	17	303	0.686
358.9	0.389	7.7	0.737	9.4	264	1.9	5.6	1.3	14	302	1.4
359.6	0.337	6.2	0.858	11	294	2.0	4.9	1.6	17	336	1.5
360.3	0.337	8.3	0.821	9.6	283	1.4	4.9	1.5	15	323	1.0
361.0	0.378	8.7	0.994	9.1	313	1.6	5.5	1.8	14	358	1.1
361.7	0.586	9.7	0.691	11	283	1.7	8.5	1.3	16	323	1.2
362.4	0.337	8.0	0.637	8.3	298	1.1	4.9	1.2	13	341	0.796
363.1	0.337	7.3	0.721	5.9	256	1.2	4.9	1.3	9.0	293	0.875
363.8	0.337	8.1	0.728	8.3	321	1.7	4.9	1.3	13	367	1.2
364.5	0.337	8.3	0.803	7.1	330	1.6	4.9	1.5	11	377	1.2
365.2	0.755	8.9	0.775	6.6	338	1.9	11	1.4	10	387	1.4
365.9	0.337	8.9	0.697	6.8	311	1.5	4.9	1.3	10	355	1.1
366.6	0.337	7.0	0.515	4.0	331	0.916	4.9	0.940	6.1	379	0.668
367.3	0.337	6.6	0.619	4.4	295	2.2	4.9	1.1	6.8	337	1.6
368.0	0.724	7.7	0.543	6.7	335	1.9	10	0.990	10	383	1.4
368.7	0.496	8.0	0.554	5.2	328	1.7	7.2	1.0	8.0	375	1.3
369.4	0.337	7.3	0.492	5.6	288	1.6	4.9	0.898	8.6	330	1.2
370.1	0.337	7.5	0.662	4.2	336	1.1	4.9	1.2	6.4	384	0.781
370.8	0.337	6.7	0.352	5.2	381	1.4	4.9	0.641	7.9	436	1.0
371.5	0.337	7.1	0.469	4.5	332	1.2	4.9	0.855	6.9	380	0.867
372.2	0.337	7.7	0.312	2.7	306	1.7	4.9	0.568	4.2	350	1.3
372.9	0.422	4.9	0.492	3.8	373	1.7	6.1	0.896	5.8	426	1.2
373.6	0.337	5.4	0.191	3.0	314	1.5	4.9	0.348	4.6	360	1.1
374.3	0.368	8.4	0.293	4.3	327	2.1	5.3	0.535	6.5	374	1.6
375.0	0.407	8.2	0.206	5.2	284	0.374	5.9	0.375	8.0	325	0.273
375.7	0.337	6.9	0.391	4.0	273	1.1	4.9	0.712	6.1	312	0.788
376.4	0.337	5.8	0.360	4.5	297	1.7	4.9	0.657	6.8	340	1.3
377.1	0.337	6.6	0.455	4.2	307	1.8	4.9	0.829	6.5	351	1.3
377.8	0.337	8.3	0.487	5.7	325	1.4	4.9	0.887	8.8	372	1.0
378.5	0.337	7.6	0.545	3.7	281	1.4	4.9	0.995	5.7	321	1.0
379.2	0.337	9.1	0.433	6.5	322	1.7	4.9	0.789	10	368	1.2
379.9	0.377	6.5	0.438	3.0	292	1.2	5.4	0.799	4.6	334	0.850
380.6	0.337	9.9	0.430	5.5	361	1.5	4.9	0.785	8.5	413	1.1
381.3	0.337	8.3	0.601	5.2	283	1.6	4.9	1.1	8.0	324	1.2
381.9	0.337	9.4	0.803	5.0	287	2.2	4.9	1.5	7.7	328	1.6
382.6	0.337	9.0	0.685	7.7	262	0.727	4.9	1.2	12	299	0.530
383.3	0.337	6.8	0.429	6.8	283	1.1	4.9	0.782	10	323	0.767
384.0	0.337	8.2	0.916	8.6	294	1.1	4.9	1.7	13	336	0.838
384.7	0.337	10.0	0.847	7.1	312	1.5	4.9	1.5	11	357	1.1
385.4	0.337	8.5	0.532	7.5	251	0.836	4.9	0.971	11	287	0.610
386.1	0.337	7.7	0.815	11	306	1.9	4.9	1.5	16	350	1.4
386.8	0.337	9.5	0.700	9.1	286	0.818	4.9	1.3	14	327	0.597
387.5	0.337	10	0.597	7.9	284	0.911	4.9	1.1	12	325	0.664
388.2	0.337	9.0	0.749	9.8	276	1.5	4.9	1.4	15	315	1.1
388.9	0.337	9.8	0.914	11	260	0.907	4.9	1.7	17	297	0.662
389.6	0.337	8.3	0.673	13	252	0.818	4.9	1.2	20	288	0.597
390.3	0.337	8.3	0.787	11	255	1.1	4.9	1.4	16	291	0.838
391.0	0.337	9.6	1.0	16	288	1.2	4.9	1.9	25	330	0.859
391.7	0.337	10	0.674	16	235	1.0	4.9	1.2	24	269	0.731
392.4	0.337	10	0.652	16	230	0.473	4.9	1.2	24	263	0.345
393.1	0.372	9.1	0.568	15	235	0.684	5.4	1.0	23	268	0.499
393.8	0.523	10	0.941	13	220	0.534	7.5	1.7	19	252	0.390
394.5	0.337	11	0.915	17	286	0.721	4.9	1.7	27	327	0.526
395.2	0.431	10	0.878	15	195	0.571	6.2	1.6	22	223	0.416



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
395.9	0.337	9.6	0.688	16	212	0.545	4.9	1.3	24	242	0.398
396.6	0.337	8.7	0.832	16	259	0.771	4.9	1.5	24	297	0.563
397.3	0.337	11	0.969	16	258	0.684	4.9	1.8	24	295	0.499
398.0	0.464	9.3	0.913	17	211	0.769	6.7	1.7	27	241	0.561
398.7	0.337	11	0.788	20	236	0.459	4.9	1.4	31	269	0.335
399.4	0.337	11	0.835	17	240	1.1	4.9	1.5	26	275	0.784
400.1	0.337	8.7	0.718	18	246	1.1	4.9	1.3	27	282	0.834
400.8	0.337	7.9	0.941	17	261	1.0	4.9	1.7	25	298	0.741
401.5	0.337	8.4	0.645	19	238	0.885	4.9	1.2	29	273	0.645
402.2	0.337	9.6	0.778	19	242	0.694	4.9	1.4	30	276	0.507
402.9	0.337	8.0	0.629	19	258	0.719	4.9	1.1	28	295	0.524
403.6	0.337	8.6	0.769	18	243	0.730	4.9	1.4	28	278	0.533
404.3	0.337	12	0.917	18	310	0.464	4.9	1.7	27	354	0.338
405.0	0.337	9.7	0.915	18	224	0.714	4.9	1.7	27	256	0.521
405.7	0.337	9.9	1.0	16	228	1.4	4.9	1.8	25	261	1.0
406.4	0.337	8.2	1.0	15	258	0.544	4.9	1.8	24	296	0.397
407.1	0.337	7.2	1.1	14	266	1.1	4.9	2.0	21	304	0.777
407.8	0.337	9.2	1.3	15	304	1.7	4.9	2.3	23	348	1.2
408.4	0.352	8.4	1.4	18	268	1.9	5.1	2.5	27	306	1.4
409.1	0.337	7.9	1.0	12	259	1.6	4.9	1.8	18	296	1.2
409.8	0.383	9.4	1.2	13	297	2.0	5.5	2.2	20	340	1.4
410.5	0.456	8.4	1.3	17	283	1.4	6.6	2.4	25	323	1.0
411.2	0.337	9.6	1.3	13	305	2.2	4.9	2.3	19	349	1.6
411.9	0.337	8.0	1.1	13	250	1.5	4.9	2.1	19	285	1.1
412.6	0.337	6.5	1.1	12	247	1.7	4.9	2.1	19	283	1.3
413.3	0.337	7.4	1.2	11	313	1.9	4.9	2.1	17	358	1.4
414.0	0.337	8.1	1.1	12	287	2.1	4.9	2.0	18	329	1.5
414.7	0.337	8.2	0.985	10	270	1.5	4.9	1.8	15	309	1.1
415.4	0.337	9.2	0.878	11	266	1.2	4.9	1.6	17	304	0.868
416.1	0.337	5.9	0.674	7.9	249	1.4	4.9	1.2	12	285	1.0
416.8	0.337	7.4	0.907	8.1	285	1.0	4.9	1.7	12	326	0.739
417.5	0.337	8.3	1.4	9.2	311	0.895	4.9	2.6	14	356	0.653
418.2	0.337	8.9	1.1	10.0	355	1.6	4.9	2.0	15	406	1.1
418.9	0.337	7.2	1.0	11	287	1.1	4.9	1.8	17	328	0.775
419.6	0.337	5.6	0.681	6.3	256	1.7	4.9	1.2	9.6	293	1.2
420.3	0.337	6.9	0.852	6.8	327	1.4	4.9	1.6	10	374	0.989
421.0	0.337	6.3	0.541	6.0	272	2.2	4.9	0.987	9.2	311	1.6
421.7	0.337	7.7	0.569	8.6	291	1.4	4.9	1.0	13	333	1.0
422.4	0.337	7.7	0.650	6.9	293	1.5	4.9	1.2	11	335	1.1
423.1	0.337	7.6	0.554	6.2	298	1.3	4.9	1.0	9.4	341	0.981
423.8	0.337	7.6	0.367	6.0	302	1.5	4.9	0.669	9.2	345	1.1
424.5	0.337	7.4	0.464	6.1	351	2.0	4.9	0.847	9.4	401	1.4
425.2	0.337	6.8	0.283	5.3	295	1.0	4.9	0.516	8.2	337	0.758
425.9	0.337	7.0	0.419	4.7	278	0.619	4.9	0.763	7.2	318	0.452
426.6	0.337	6.6	0.200	5.0	289	0.741	4.9	0.366	7.7	330	0.541
427.3	0.566	8.7	0.215	5.8	307	1.1	8.2	0.393	8.9	351	0.799
428.0	0.337	6.8	0.326	7.6	299	0.791	4.9	0.594	12	342	0.577
428.7	0.622	7.6	0.183	6.4	281	0.715	9.0	0.335	9.9	322	0.522
429.4	0.337	8.2	0.336	5.1	263	0.877	4.9	0.612	7.8	301	0.640
430.1	0.337	7.2	0.270	4.6	258	0.978	4.9	0.492	7.1	295	0.714
430.8	0.337	8.3	0.383	5.3	284	1.2	4.9	0.698	8.1	325	0.842
431.5	0.337	9.8	0.347	6.6	306	1.4	4.9	0.633	10	349	0.991
432.2	0.337	6.9	0.356	5.8	272	1.5	4.9	0.649	8.9	311	1.1
432.9	0.337	6.9	0.475	4.3	304	1.2	4.9	0.866	6.6	348	0.902
433.6	0.427	9.0	0.399	6.0	280	0.495	6.2	0.728	9.2	320	0.361
434.3	0.394	9.7	0.368	5.3	299	1.1	5.7	0.671	8.2	341	0.770
434.9	0.337	8.0	0.468	7.1	281	0.815	4.9	0.853	11	322	0.595
435.6	0.337	8.8	0.465	5.3	265	0.733	4.9	0.848	8.1	304	0.535
436.3	0.543	6.7	0.515	3.5	261	0.971	7.8	0.939	5.4	299	0.709
437.0	0.337	8.6	0.537	6.5	283	1.2	4.9	0.980	9.9	324	0.899
437.7	0.613	9.4	0.390	6.9	280	1.2	8.9	0.711	11	321	0.858
438.4	0.337	7.8	0.664	6.2	258	0.539	4.9	1.2	9.5	295	0.393
439.1	0.538	8.2	0.536	8.4	262	0.894	7.8	0.978	13	300	0.652
439.8	0.337	7.8	0.493	7.7	242	1.1	4.9	0.898	12	277	0.768
440.5	0.337	8.9	0.767	10	271	1.2	4.9	1.4	16	310	0.907
441.2	0.337	9.5	0.715	12	269	0.838	4.9	1.3	18	307	0.612
441.9	0.337	8.0	0.555	11	294	0.945	4.9	1.0	17	336	0.689
442.6	0.337	8.2	0.587	11	269	1.2	4.9	1.1	17	307	0.892
443.3	0.337	6.7	0.742	14	306	1.0	4.9	1.4	21	350	0.747
444.0	0.337	8.2	0.661	15	255	1.1	4.9	1.2	23	291	0.768
444.7	0.337	11	1.1	13	256	0.875	4.9	1.9	20	293	0.638
445.4	0.337	9.2	0.746	17	272	0.983	4.9	1.4	26	311	0.717
446.1	0.489	9.7	0.872	16	228	0.730	7.1	1.6	24	261	0.532
446.8	0.337	8.5	0.613	20	290	0.615	4.9	1.1	31	332	0.449
447.5	0.337	9.4	1.0	21	299	1.5	4.9	1.8	32	342	1.1
448.2	0.337	11	1.0	20	285	1.0	4.9	1.9	31	326	0.730
448.9	0.429	11	0.907	21	293	1.7	6.2	1.7	32	335	1.2
449.6	0.337	9.7	0.877	21	246	1.1	4.9	1.6	32	281	0.789
450.3	0.337	9.4	0.869	21	253	0.698	4.9	1.6	32	289	0.510
451.0	0.337	13	0.957	20	232	1.3	4.9	1.7	31	266	0.921
451.7	0.397	11	0.785	25	278	0.876	5.7	1.4	38	318	0.639



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
452.4	0.337	10	1.0	26	257	1.2	4.9	1.8	40	294	0.861
453.1	0.390	9.3	0.834	24	280	1.1	5.6	1.5	37	321	0.836
453.8	0.337	10	0.937	27	260	1.2	4.9	1.7	41	298	0.881
454.5	0.337	11	0.836	26	248	0.746	4.9	1.5	40	284	0.545
455.2	0.492	8.8	0.762	27	235	0.884	7.1	1.4	41	269	0.645
455.9	0.337	11	0.659	21	244	0.410	4.9	1.2	33	279	0.299
456.6	0.337	9.8	0.922	27	308	1.1	4.9	1.7	42	352	0.809
457.3	0.337	10	0.942	32	281	0.886	4.9	1.7	48	322	0.646
458.0	0.337	9.6	0.879	30	229	0.785	4.9	1.6	45	262	0.573
458.7	0.337	9.5	0.981	27	250	0.708	4.9	1.8	42	286	0.516
459.4	0.401	9.4	0.614	29	304	1.1	5.8	1.1	44	348	0.785
460.1	0.337	9.0	0.898	33	256	0.544	4.9	1.6	50	293	0.397
460.8	0.481	12	1.2	29	236	1.0	6.9	2.3	45	270	0.756
461.4	0.337	10	0.989	36	265	0.674	4.9	1.8	55	303	0.492
462.1	0.337	8.3	1.1	34	267	0.620	4.9	1.9	51	305	0.453
462.8	0.337	11	1.2	38	354	0.956	4.9	2.1	59	404	0.698
463.5	0.337	11	1.3	39	291	0.554	4.9	2.4	60	333	0.404
464.2	0.563	9.9	1.1	32	270	0.623	8.1	2.1	49	308	0.454
464.9	0.337	11	0.984	39	318	0.966	4.9	1.8	60	363	0.705
465.6	0.337	9.7	1.4	32	278	0.541	4.9	2.5	49	318	0.395
466.3	0.389	9.5	1.1	27	254	0.572	5.6	2.0	42	290	0.418
467.0	0.337	9.5	1.3	35	292	1.2	4.9	2.4	53	334	0.869
467.7	0.337	9.0	1.2	26	247	1.0	4.9	2.2	41	283	0.753
468.4	0.337	9.2	1.1	27	254	1.3	4.9	2.1	42	290	0.936
469.1	0.337	12	1.1	23	246	0.969	4.9	2.0	36	281	0.707
469.8	0.385	9.2	1.3	24	238	1.1	5.6	2.3	37	272	0.791
470.5	0.351	8.9	1.2	25	236	1.1	5.1	2.2	38	270	0.791
471.2	0.337	8.2	1.4	28	243	1.1	4.9	2.5	43	277	0.822
471.9	0.337	8.2	1.5	28	273	0.917	4.9	2.7	43	312	0.669
472.6	0.352	8.5	1.5	24	231	0.969	5.1	2.7	37	264	0.707
473.3	0.337	9.5	1.9	26	303	1.0	4.9	3.5	40	346	0.742
474.0	0.494	8.0	1.5	30	245	0.967	7.1	2.7	46	280	0.706
474.7	0.337	10	1.5	24	243	1.1	4.9	2.7	36	278	0.826
475.4	0.337	8.6	1.7	21	245	0.966	4.9	3.1	32	280	0.705
476.1	0.337	8.3	1.5	22	248	0.975	4.9	2.8	34	284	0.712
476.8	0.337	10	1.9	22	238	1.6	4.9	3.5	33	272	1.1
477.5	0.337	9.3	1.6	21	319	1.4	4.9	2.8	32	365	1.0
478.2	0.337	7.4	1.6	21	278	1.5	4.9	2.9	32	318	1.1
478.9	0.495	7.8	1.4	16	271	1.2	7.1	2.6	24	310	0.849
479.6	0.480	8.5	1.7	16	271	1.1	6.9	3.0	25	310	0.824
480.3	0.480	8.6	1.9	15	288	1.9	6.9	3.4	23	330	1.4
481.0	0.337	9.0	1.6	14	276	2.4	4.9	3.0	22	316	1.7
481.7	0.337	8.5	1.3	12	234	1.4	4.9	2.4	19	267	1.1
482.4	0.337	6.3	1.7	15	240	1.2	4.9	3.0	23	274	0.839
483.1	0.337	7.3	1.3	11	301	1.8	4.9	2.4	17	345	1.3
483.8	0.337	8.7	1.4	12	284	0.930	4.9	2.5	18	325	0.679
484.5	0.337	7.9	1.2	13	260	1.5	4.9	2.2	20	298	1.1
485.2	0.337	9.4	1.3	9.7	289	1.2	4.9	2.4	15	330	0.896
485.9	0.387	6.5	1.2	12	283	1.3	5.6	2.2	18	323	0.933
486.6	0.427	7.7	0.986	10	275	2.3	6.2	1.8	16	315	1.7
487.3	0.337	8.1	1.1	11	305	1.6	4.9	2.0	17	349	1.2
487.9	0.337	5.8	0.949	7.4	244	1.7	4.9	1.7	11	279	1.3
488.6	0.337	5.5	0.766	9.2	335	1.6	4.9	1.4	14	383	1.2
489.3	0.337	6.9	0.759	6.7	334	1.7	4.9	1.4	10	382	1.3
490.0	0.337	7.7	0.799	5.7	302	2.3	4.9	1.5	8.8	346	1.7
490.7	0.337	6.6	0.614	5.0	301	2.4	4.9	1.1	7.6	344	1.7
491.4	0.371	7.6	0.925	5.7	386	1.8	5.4	1.7	8.7	442	1.3
492.1	0.337	6.8	0.605	3.4	292	1.1	4.9	1.1	5.3	334	0.824
492.8	0.502	6.5	0.670	4.9	340	1.3	7.2	1.2	7.4	389	0.962
493.5	0.337	7.0	0.500	3.0	309	1.9	4.9	0.911	4.5	354	1.4
494.2	0.337	8.6	0.499	6.6	320	1.6	4.9	0.911	10	366	1.2
494.9	0.337	7.0	0.535	4.9	288	1.7	4.9	0.975	7.6	329	1.2
495.6	0.430	6.6	0.467	4.8	308	1.4	6.2	0.852	7.4	352	0.994
496.3	0.337	7.3	0.364	6.0	266	1.9	4.9	0.663	9.1	304	1.4
497.0	0.337	7.5	0.513	5.4	308	1.2	4.9	0.935	8.3	352	0.886
497.7	0.337	8.3	0.438	5.6	258	2.3	4.9	0.798	8.6	295	1.7
498.4	0.739	7.4	0.248	5.6	295	1.9	11	0.452	8.5	338	1.4
499.1	0.337	8.0	0.348	5.4	323	1.9	4.9	0.634	8.3	370	1.4
499.8	0.337	8.5	0.528	5.1	345	1.6	4.9	0.963	7.9	394	1.2
500.5	0.337	7.5	0.246	5.8	276	2.2	4.9	0.448	8.9	315	1.6
501.2	0.337	8.4	0.603	7.6	268	1.9	4.9	1.1	12	307	1.4
501.9	0.337	8.0	0.644	8.0	300	2.4	4.9	1.2	12	343	1.8
502.6	0.337	8.6	0.504	6.1	259	2.0	4.9	0.918	9.3	296	1.4
503.3	0.337	9.3	0.958	6.7	368	2.8	4.9	1.7	10	421	2.0
504.0	0.337	9.8	0.764	12	355	2.7	4.9	1.4	19	406	2.0
504.7	0.337	8.4	0.595	8.2	212	0.931	4.9	1.1	13	242	0.679
505.4	0.337	7.4	0.594	11	259	1.3	4.9	1.1	17	296	0.964
506.1	0.337	7.2	0.913	9.2	283	0.985	4.9	1.7	14	323	0.719
506.8	0.337	9.2	1.1	11	295	2.6	4.9	2.1	16	337	1.9
507.5	0.337	8.7	0.906	11	249	1.4	4.9	1.7	17	285	1.0
508.2	0.842	10	1.0	12	282	2.0	12	1.9	18	322	1.4



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.9	0.337	8.3	1.2	14	266	1.8	4.9	2.3	21	304	1.3
509.6	0.337	10	1.0	14	291	2.3	4.9	1.8	21	333	1.7
510.3	0.337	9.4	1.5	15	273	1.8	4.9	2.6	23	312	1.3
511.0	0.337	9.9	1.4	16	324	1.5	4.9	2.5	25	370	1.1
511.7	0.337	8.2	1.2	14	252	1.2	4.9	2.2	21	288	0.851
512.4	0.337	11	1.2	14	246	1.9	4.9	2.3	22	282	1.4
513.1	0.337	8.1	1.6	18	288	1.9	4.9	2.9	28	329	1.4
513.8	0.337	10	1.3	20	276	1.6	4.9	2.4	31	315	1.2
514.5	0.382	10	1.1	19	247	1.3	5.5	1.9	30	282	0.974
515.1	0.351	9.3	1.4	21	260	1.1	5.1	2.6	32	297	0.793
515.8	0.483	8.2	1.1	22	252	1.3	7.0	2.1	33	289	0.957
516.5	0.337	10	1.3	19	320	1.8	4.9	2.4	29	365	1.3
517.2	0.337	11	1.6	24	276	1.5	4.9	2.9	37	316	1.1
517.9	0.337	9.7	1.1	24	248	0.739	4.9	2.0	37	284	0.539
518.6	0.337	9.1	1.3	20	241	0.989	4.9	2.4	30	276	0.722
519.3	0.337	8.8	1.0	23	247	1.1	4.9	1.9	35	283	0.769
520.0	0.337	9.8	1.3	23	265	0.953	4.9	2.4	36	303	0.695
520.7	0.337	9.6	1.0	27	315	1.6	4.9	1.8	41	360	1.2
521.4	0.337	8.1	0.950	22	269	0.850	4.9	1.7	33	308	0.620
522.1	0.753	9.2	1.1	24	289	0.977	11	1.9	37	330	0.713
522.8	0.337	8.4	1.3	20	291	1.1	4.9	2.3	31	333	0.786
523.5	0.337	8.5	1.0	24	274	0.889	4.9	1.9	37	313	0.648
524.2	0.337	7.6	0.833	25	285	1.1	4.9	1.5	39	326	0.775
524.9	0.369	8.6	0.734	23	273	1.3	5.3	1.3	36	313	0.944
525.6	0.599	8.1	0.965	17	280	0.930	8.6	1.8	26	320	0.678
526.3	0.337	11	0.728	19	279	1.2	4.9	1.3	29	319	0.902
527.0	0.337	10	1.0	21	293	1.8	4.9	1.9	32	335	1.3
527.7	0.337	9.5	0.850	18	273	0.987	4.9	1.6	28	312	0.720
528.4	0.337	6.6	0.693	19	233	1.0	4.9	1.3	28	266	0.752
529.1	0.338	6.4	0.998	17	252	0.698	4.9	1.8	26	288	0.509
529.8	0.337	6.6	0.811	19	279	2.1	4.9	1.5	28	319	1.6
530.5	0.337	9.7	0.840	18	261	1.5	4.9	1.5	27	298	1.1
531.2	0.337	7.6	0.746	18	242	1.1	4.9	1.4	27	277	0.827
531.9	0.337	8.5	0.815	18	312	1.4	4.9	1.5	27	356	1.0
532.6	0.337	8.5	0.867	17	278	1.2	4.9	1.6	26	318	0.841
533.3	0.517	11	1.0	19	308	1.7	7.5	1.9	29	352	1.2
534.0	0.410	9.7	1.0	19	263	1.7	5.9	1.9	29	300	1.2
534.7	0.337	8.1	1.2	13	262	1.1	4.9	2.2	20	300	0.795
535.4	0.386	8.4	1.1	16	289	1.8	5.6	2.0	24	331	1.3
536.1	0.410	11	1.2	14	310	1.5	5.9	2.3	21	355	1.1
536.8	0.337	8.6	0.850	15	263	1.9	4.9	1.6	23	301	1.4
537.5	0.337	8.2	1.0	13	240	0.749	4.9	1.9	19	274	0.546
538.2	0.337	7.6	1.1	12	278	1.7	4.9	2.0	18	318	1.3
538.9	0.377	8.1	1.4	11	291	1.3	5.4	2.5	17	333	0.959
539.6	0.337	9.4	1.3	15	303	1.7	4.9	2.4	23	347	1.3
540.3	0.337	8.4	1.3	11	246	2.2	4.9	2.3	17	281	1.6
540.9	0.432	7.0	0.837	10	235	1.9	6.2	1.5	16	269	1.4
541.6	0.337	6.9	0.846	11	300	1.6	4.9	1.5	17	343	1.2
542.3	0.337	9.0	1.1	11	277	1.7	4.9	2.1	17	317	1.2
543.0	0.648	8.8	1.1	13	373	3.0	9.4	2.0	20	427	2.2
543.7	0.337	7.7	0.719	9.5	285	2.1	4.9	1.3	14	326	1.5
544.4	0.337	7.9	0.849	8.8	300	1.9	4.9	1.5	13	343	1.4
545.1	0.337	7.7	0.844	7.7	305	1.9	4.9	1.5	12	349	1.4
545.8	0.337	7.0	0.820	5.8	281	1.8	4.9	1.5	9.0	322	1.3
546.5	0.337	8.2	0.986	8.5	273	1.6	4.9	1.8	13	312	1.2
547.2	0.337	8.9	0.599	8.6	289	2.0	4.9	1.1	13	330	1.5
547.9	0.337	7.4	0.509	11	282	2.2	4.9	0.929	17	323	1.6
548.6	0.337	6.4	0.506	7.6	286	1.4	4.9	0.922	12	328	1.0
549.3	0.337	7.6	0.823	8.1	306	2.1	4.9	1.5	12	350	1.5
550.0	0.337	7.5	0.526	7.0	310	2.0	4.9	0.959	11	355	1.4
550.7	0.337	8.4	0.559	5.9	302	1.3	4.9	1.0	9.1	346	0.961
551.4	0.337	6.2	0.562	6.3	284	1.1	4.9	1.0	9.6	325	0.811
552.1	0.337	7.5	0.202	5.1	294	1.6	4.9	0.369	7.9	337	1.1
552.8	0.362	7.9	0.438	6.7	278	1.8	5.2	0.798	10	317	1.3
553.5	0.337	8.7	0.451	7.0	281	2.4	4.9	0.823	11	321	1.8
554.2	0.337	7.0	0.454	6.7	309	0.921	4.9	0.828	10	354	0.672
554.9	0.337	7.5	0.506	6.2	306	1.3	4.9	0.922	9.5	349	0.944
555.6	0.337	8.5	0.370	7.6	294	1.4	4.9	0.675	12	336	0.996
556.3	0.337	9.9	0.496	7.8	312	1.9	4.9	0.905	12	356	1.4
557.0	0.432	8.8	0.360	8.6	293	2.2	6.2	0.656	13	335	1.6
557.7	0.337	6.5	0.417	8.8	250	1.4	4.9	0.761	13	286	0.992
558.4	0.337	7.6	0.393	6.3	295	1.5	4.9	0.717	9.6	338	1.1
559.1	0.337	7.4	0.493	6.2	288	1.5	4.9	0.899	9.5	330	1.1
559.8	0.337	8.8	0.526	7.7	308	1.5	4.9	0.959	12	352	1.1
560.5	0.337	9.7	0.612	9.8	262	2.0	4.9	1.1	15	300	1.5
561.2	0.337	8.0	0.537	10	264	2.0	4.9	0.980	16	302	1.5
561.9	0.337	9.1	0.706	8.9	288	2.0	4.9	1.3	14	329	1.5
562.6	0.337	9.1	0.871	10	327	2.3	4.9	1.6	16	374	1.7
563.3	0.337	8.4	0.731	10.0	276	2.1	4.9	1.3	15	315	1.5
564.0	0.337	9.3	0.665	12	254	1.6	4.9	1.2	18	291	1.1
564.7	0.616	8.5	0.706	11	236	1.5	8.9	1.3	17	270	1.1



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
565.4	0.337	7.6	0.947	12	245	1.7	4.9	1.7	18	280	1.2
566.1	0.337	7.6	0.771	13	240	2.3	4.9	1.4	20	275	1.7
566.8	0.337	11	0.970	16	277	1.7	4.9	1.8	24	317	1.3
567.4	0.337	12	0.694	16	265	1.6	4.9	1.3	25	303	1.2
568.1	0.337	8.1	0.728	14	226	1.2	4.9	1.3	21	258	0.888
568.8	0.337	8.6	0.657	17	263	2.1	4.9	1.2	26	301	1.5
569.5	0.337	8.0	0.756	17	278	1.6	4.9	1.4	26	318	1.1
570.2	0.337	12	0.821	21	268	1.1	4.9	1.5	31	307	0.772
570.9	0.337	8.8	0.768	23	252	1.3	4.9	1.4	35	289	0.970
571.6	0.342	7.6	0.691	17	208	1.3	4.9	1.3	26	238	0.964
572.3	0.445	8.9	0.875	18	297	2.0	6.4	1.6	28	339	1.5
573.0	0.337	11	0.798	22	251	1.3	4.9	1.5	33	287	0.920
573.7	0.337	9.3	0.770	21	213	1.2	4.9	1.4	33	243	0.888
574.4	0.337	9.8	0.794	27	235	0.651	4.9	1.4	42	269	0.475
575.1	0.337	9.3	0.708	20	216	1.9	4.9	1.3	30	247	1.4
575.8	0.337	8.2	0.728	23	216	1.2	4.9	1.3	35	247	0.876
576.5	0.337	8.9	0.675	25	246	0.902	4.9	1.2	39	281	0.658
577.2	0.337	12	0.869	23	197	0.776	4.9	1.6	35	225	0.566
577.9	1.1	7.9	1.0	28	232	0.850	16	1.8	43	266	0.620
578.6	0.337	7.1	0.700	25	215	0.930	4.9	1.3	38	246	0.678
579.3	0.337	9.7	1.1	25	255	1.1	4.9	2.0	38	292	0.829
580.0	0.337	10	0.881	27	252	0.551	4.9	1.6	42	289	0.402
580.7	0.337	9.1	0.538	31	283	0.972	4.9	0.981	47	324	0.709
581.4	0.337	9.2	0.907	30	229	0.602	4.9	1.7	46	262	0.440
582.1	0.337	5.9	0.705	22	221	0.721	4.9	1.3	34	253	0.526
582.8	0.337	9.7	0.899	23	213	0.830	4.9	1.6	36	243	0.605
583.5	0.398	11	0.591	27	212	1.5	5.7	1.1	42	243	1.1
584.2	0.337	10	0.752	19	224	1.2	4.9	1.4	30	256	0.851
584.9	0.337	8.0	0.869	21	208	0.689	4.9	1.6	33	238	0.503
585.6	0.399	9.0	1.2	26	231	0.880	5.8	2.2	40	264	0.642
586.3	0.337	10	0.735	23	241	1.1	4.9	1.3	36	276	0.835
587.0	0.337	8.5	0.818	24	224	1.7	4.9	1.5	36	256	1.3
587.7	0.337	8.7	0.647	26	219	1.3	4.9	1.2	39	250	0.941
588.4	0.625	7.1	0.515	23	226	0.971	9.0	0.939	35	258	0.708
589.1	0.337	9.0	0.718	24	253	1.2	4.9	1.3	36	290	0.846
589.8	0.337	11	0.641	25	231	1.0	4.9	1.2	38	264	0.752
590.5	0.379	8.9	0.650	26	225	1.3	5.5	1.2	40	258	0.971
591.2	0.337	8.9	0.752	22	239	1.3	4.9	1.4	34	273	0.918
591.9	0.337	8.5	0.688	21	257	1.1	4.9	1.3	32	294	0.783
592.6	0.337	8.0	0.658	22	257	1.0	4.9	1.2	33	293	0.731
593.3	0.337	11	0.716	26	266	1.3	4.9	1.3	39	304	0.943
594.0	0.337	7.9	0.592	16	205	1.9	4.9	1.1	24	234	1.4
594.6	0.337	8.5	0.762	18	271	1.8	4.9	1.4	28	310	1.3
595.3	0.337	11	0.340	19	306	1.5	4.9	0.620	29	350	1.1
596.0	0.337	8.1	0.642	22	316	1.8	4.9	1.2	33	361	1.3
596.7	0.380	9.1	0.581	17	261	2.6	5.5	1.1	26	298	1.9
597.4	0.337	7.6	0.504	16	224	0.560	4.9	0.918	25	256	0.408
598.1	0.337	7.4	0.641	15	248	1.6	4.9	1.2	23	284	1.2
598.8	0.337	7.9	0.697	12	280	1.7	4.9	1.3	18	320	1.2
599.5	0.337	8.1	0.647	16	327	2.3	4.9	1.2	24	374	1.7
600.2	0.337	7.4	0.740	15	283	2.1	4.9	1.3	23	323	1.6
600.9	0.337	7.5	0.606	11	248	2.8	4.9	1.1	17	283	2.0
601.6	0.337	7.8	0.683	11	284	2.1	4.9	1.2	17	325	1.5
602.3	0.337	9.2	0.719	15	295	3.1	4.9	1.3	22	337	2.3
603.0	0.337	8.9	0.589	12	278	2.1	4.9	1.1	19	318	1.5
603.7	0.337	8.0	0.525	11	289	1.5	4.9	0.958	17	330	1.1
604.4	0.639	7.0	0.494	8.9	223	1.9	9.2	0.902	14	255	1.4
605.1	0.520	8.1	0.912	7.4	318	2.5	7.5	1.7	11	364	1.8
605.8	0.337	8.0	0.651	8.1	303	2.9	4.9	1.2	12	346	2.1
606.5	0.337	9.2	0.577	6.7	279	2.1	4.9	1.1	10	319	1.5
607.2	0.447	7.4	0.541	9.4	346	1.7	6.5	0.986	14	395	1.2
607.9	0.337	6.7	0.515	6.8	275	2.0	4.9	0.939	10	314	1.5
608.6	0.337	7.4	0.481	4.1	241	1.7	4.9	0.877	6.3	276	1.3
609.3	0.337	9.4	0.333	7.3	280	2.0	4.9	0.608	11	321	1.4
610.0	0.337	8.4	0.385	6.6	245	2.3	4.9	0.702	10	280	1.7
610.7	0.337	7.2	0.156	8.1	296	1.3	4.9	0.285	12	339	0.980
611.4	0.337	7.1	0.211	4.4	228	2.5	4.9	0.385	6.8	260	1.8
612.1	0.337	7.0	0.347	7.4	269	1.1	4.9	0.634	11	307	0.783
612.8	0.582	8.1	0.598	5.9	292	2.6	8.4	1.1	9.0	334	1.9
613.5	0.341	6.3	0.475	7.3	251	1.7	4.9	0.866	11	287	1.2
614.2	0.337	7.7	0.297	5.7	233	1.7	4.9	0.541	8.7	266	1.2
614.9	0.337	7.1	0.496	4.9	316	2.0	4.9	0.905	7.5	361	1.4
615.6	0.337	6.8	0.281	6.7	303	1.9	4.9	0.513	10	347	1.4
616.3	0.337	7.7	0.287	5.3	291	2.1	4.9	0.524	8.1	333	1.5
617.0	0.337	8.2	0.469	6.0	242	1.7	4.9	0.855	9.2	277	1.2
617.7	0.337	7.2	0.309	4.8	245	1.6	4.9	0.563	7.4	280	1.2
618.4	0.337	7.6	0.360	6.0	288	2.0	4.9	0.657	9.2	329	1.4
619.1	0.337	8.6	0.472	6.5	282	1.9	4.9	0.861	10.0	323	1.4
619.8	0.337	9.1	0.374	5.5	278	2.0	4.9	0.683	8.4	318	1.5
620.5	0.337	6.7	0.483	6.1	252	1.5	4.9	0.880	9.3	289	1.1
621.1	0.337	6.4	0.515	5.4	258	1.7	4.9	0.940	8.3	295	1.3



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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.8	0.337	9.1	0.547	6.0	299	2.3	4.9	0.997	9.2	342	1.7
622.5	0.337	8.8	0.576	7.8	284	2.4	4.9	1.1	12	325	1.7
623.2	0.337	10	0.459	7.6	289	2.2	4.9	0.837	12	331	1.6
623.9	0.337	8.1	0.506	9.3	294	2.8	4.9	0.923	14	336	2.0
624.6	0.337	7.9	0.569	7.1	257	1.8	4.9	1.0	11	293	1.3
625.3	0.337	7.9	0.620	10.0	313	2.4	4.9	1.1	15	358	1.7
626.0	0.341	11	0.827	7.8	253	1.8	4.9	1.5	12	289	1.3
626.7	0.337	9.4	0.558	7.7	257	2.7	4.9	1.0	12	294	2.0
627.4	0.337	7.3	0.739	8.9	256	1.8	4.9	1.3	14	293	1.3
628.1	0.337	8.5	0.682	7.3	293	2.5	4.9	1.2	11	335	1.8
628.8	0.337	10	1.1	8.8	274	2.4	4.9	2.0	13	314	1.8
629.5	0.337	11	0.901	13	267	2.6	4.9	1.6	20	305	1.9
630.2	0.337	9.5	0.893	9.2	254	2.0	4.9	1.6	14	291	1.5
630.9	0.337	9.9	0.692	10	246	1.8	4.9	1.3	15	282	1.3
631.6	0.337	9.1	0.664	11	260	2.1	4.9	1.2	17	297	1.5
632.3	0.337	12	0.838	12	307	2.5	4.9	1.5	18	351	1.8
633.0	0.337	11	0.635	11	215	1.6	4.9	1.2	17	246	1.2
633.7	0.337	9.4	0.686	12	223	2.2	4.9	1.3	18	255	1.6
634.4	0.337	8.6	0.819	11	245	1.0	4.9	1.5	17	281	0.762
635.1	0.337	11	0.960	13	257	2.1	4.9	1.8	20	294	1.5
635.8	0.455	11	0.844	12	267	1.8	6.6	1.5	18	305	1.3
636.5	0.337	11	0.833	15	225	1.9	4.9	1.5	23	258	1.4
637.2	0.709	10	0.717	15	199	1.6	10	1.3	23	227	1.2
637.9	0.337	9.1	0.707	15	228	1.1	4.9	1.3	24	261	0.818
638.6	0.337	13	0.789	17	266	1.5	4.9	1.4	26	304	1.1
639.3	0.389	14	0.720	18	248	1.6	5.6	1.3	28	283	1.2
640.0	0.602	12	0.822	23	262	1.8	8.7	1.5	36	300	1.3
640.7	0.337	12	0.706	24	239	1.2	4.9	1.3	36	273	0.846
641.4	0.539	12	0.837	21	276	2.5	7.8	1.5	32	315	1.8
642.1	0.337	10	0.932	20	280	1.2	4.9	1.7	31	320	0.906
642.8	0.381	11	0.954	14	203	1.2	5.5	1.7	22	232	0.867
643.5	0.337	13	0.689	24	233	1.8	4.9	1.3	36	267	1.3
644.2	0.337	10	0.727	19	212	1.2	4.9	1.3	29	242	0.842
644.9	0.429	9.4	1.1	18	205	1.3	6.2	2.0	27	235	0.943
645.6	0.337	11	0.954	21	227	0.924	4.9	1.7	32	259	0.674
646.3	0.337	12	1.3	29	222	0.772	4.9	2.3	44	254	0.563
646.9	0.589	12	1.3	27	235	1.4	8.5	2.3	42	269	0.990
647.6	0.564	10	1.1	25	241	1.3	8.1	2.0	38	276	0.947
648.3	0.337	8.8	1.1	25	201	1.3	4.9	2.0	38	230	0.940
649.0	0.337	12	1.4	27	260	1.4	4.9	2.6	42	297	1.1
649.7	0.337	12	1.3	26	254	1.4	4.9	2.4	40	291	1.0
650.4	0.337	12	0.959	27	261	1.3	4.9	1.7	41	299	0.926
651.1	0.337	11	1.2	29	292	1.5	4.9	2.2	44	334	1.1
651.8	0.449	7.7	0.999	22	217	1.4	6.5	1.8	33	248	0.988
652.5	0.337	12	1.1	26	243	1.9	4.9	1.9	40	278	1.4
653.2	0.337	12	1.4	26	238	1.4	4.9	2.5	39	272	1.0
653.9	0.337	12	1.0	29	238	0.867	4.9	1.9	44	272	0.632
654.6	0.337	13	1.1	23	284	0.973	4.9	2.0	35	325	0.710
655.3	0.337	12	0.916	22	212	1.8	4.9	1.7	33	243	1.3
656.0	0.382	11	1.0	24	210	1.8	5.5	1.9	37	241	1.3
656.7	0.337	11	0.641	26	198	1.3	4.9	1.2	40	226	0.938
657.4	0.337	10	0.915	24	240	0.848	4.9	1.7	37	274	0.619
658.1	0.337	8.8	0.729	22	237	1.5	4.9	1.3	34	271	1.1
658.8	0.456	11	0.610	24	230	0.906	6.6	1.1	36	263	0.661
659.5	0.337	11	0.744	25	216	1.3	4.9	1.4	38	247	0.944
660.2	0.468	11	0.575	25	241	1.7	6.8	1.0	39	276	1.2
660.9	0.367	11	0.814	21	222	0.832	5.3	1.5	32	254	0.607
661.6	0.337	11	0.754	18	259	1.4	4.9	1.4	28	296	1.0
662.3	0.337	12	0.716	22	231	1.3	4.9	1.3	33	264	0.943
663.0	0.337	12	0.814	26	239	2.3	4.9	1.5	41	273	1.7
663.7	0.358	12	0.630	19	246	1.3	5.2	1.1	29	281	0.916
664.4	0.337	9.4	0.818	21	226	1.8	4.9	1.5	33	259	1.3
665.1	0.337	12	0.835	20	250	1.3	4.9	1.5	31	286	0.960
665.8	0.337	14	0.588	18	263	2.2	4.9	1.1	28	301	1.6
666.5	0.337	12	0.757	24	233	2.3	4.9	1.4	37	266	1.7
667.2	0.337	12	0.630	18	223	1.1	4.9	1.1	28	255	0.787
667.9	0.337	9.6	0.896	13	193	1.2	4.9	1.6	20	220	0.882
668.6	0.364	11	0.707	20	209	1.7	5.3	1.3	31	239	1.3
669.3	0.464	14	0.690	23	242	2.7	6.7	1.3	35	277	2.0
670.0	0.337	14	0.599	21	250	2.5	4.9	1.1	33	285	1.8
670.7	0.407	8.8	0.455	15	198	1.9	5.9	0.830	23	226	1.4
671.4	0.337	10	0.565	17	222	2.1	4.9	1.0	27	253	1.5
672.1	0.337	13	0.586	17	240	1.5	4.9	1.1	26	274	1.1
672.8	0.337	14	0.415	20	229	4.3	4.9	0.756	31	262	3.1
673.5	0.337	13	0.561	19	236	1.5	4.9	1.0	29	269	1.1
674.1	0.337	10	0.488	15	220	1.7	4.9	0.889	23	251	1.3
674.8	0.529	9.1	0.316	19	209	2.6	7.6	0.576	29	239	1.9
675.5	0.337	13	0.503	19	221	2.2	4.9	0.917	29	253	1.6
676.2	0.564	12	0.319	18	200	2.5	8.1	0.581	28	229	1.8
676.9	0.337	13	0.472	20	272	2.6	4.9	0.861	30	311	1.9
677.6	0.337	7.9	0.291	15	172	2.3	4.9	0.530	23	197	1.7



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
678.3	0.337	10	0.384	15	211	1.8	4.9	0.700	24	241	1.3
679.0	0.337	13	0.496	20	263	2.5	4.9	0.905	30	301	1.8
679.7	0.337	13	0.338	13	188	2.1	4.9	0.616	19	215	1.6
680.4	0.337	12	0.340	17	225	2.6	4.9	0.620	25	257	1.9
681.1	0.337	8.9	0.229	15	243	2.4	4.9	0.417	23	278	1.7
681.8	0.377	9.5	0.266	15	235	1.9	5.4	0.485	23	269	1.4
682.5	0.337	13	0.496	13	232	3.1	4.9	0.905	20	266	2.3
683.2	0.337	11	0.748	15	225	1.6	4.9	1.4	23	257	1.1
683.9	0.337	11	0.388	14	242	2.5	4.9	0.708	22	276	1.8
684.6	0.379	10	0.389	13	226	2.3	5.5	0.709	20	258	1.7
685.3	0.337	13	0.255	15	252	2.7	4.9	0.465	23	288	1.9
686.0	0.337	13	0.361	16	225	2.1	4.9	0.659	24	258	1.6
686.7	0.340	12	0.433	14	209	1.9	4.9	0.790	22	239	1.4
687.4	0.337	11	0.175	13	205	1.7	4.9	0.320	20	234	1.3
688.1	0.337	9.8	0.267	10	220	1.8	4.9	0.487	16	252	1.3
688.8	0.337	8.9	0.239	17	216	2.2	4.9	0.435	26	247	1.6
689.5	0.337	12	0.214	15	212	2.5	4.9	0.390	22	242	1.8
690.2	0.337	11	0.138	13	180	1.6	4.9	0.252	21	206	1.1
690.9	0.337	11	0.218	14	238	2.5	4.9	0.398	21	272	1.9
691.6	0.337	11	0.319	11	218	2.3	4.9	0.582	16	250	1.7
692.3	0.673	11	0.256	13	260	2.1	9.7	0.467	19	297	1.5
693.0	0.337	12	0.241	12	216	3.4	4.9	0.439	18	247	2.5
693.7	0.337	10	0.190	16	238	1.9	4.9	0.347	24	272	1.4
694.4	0.352	9.6	0.200	12	190	1.7	5.1	0.364	18	217	1.3
695.1	0.337	11	0.318	12	242	2.0	4.9	0.581	18	277	1.5
695.8	0.337	11	0.171	15	206	2.2	4.9	0.313	23	236	1.6
696.5	0.337	11	0.152	12	212	3.6	4.9	0.277	19	242	2.6
697.2	0.337	8.3	0.421	9.5	189	1.4	4.9	0.767	15	216	1.0
697.9	0.337	11	0.271	11	204	2.3	4.9	0.495	16	233	1.7
698.6	0.625	10	0.373	12	248	2.0	9.0	0.680	18	284	1.5
699.3	0.337	11	0.429	12	195	1.7	4.9	0.783	19	223	1.3
699.9	0.337	9.8	0.152	12	212	2.3	4.9	0.277	19	242	1.6
700.6	0.337	9.0	0.364	10	205	2.0	4.9	0.663	16	234	1.4
701.3	0.337	9.8	0.452	12	216	2.5	4.9	0.825	18	247	1.8
702.0	0.337	13	0.327	13	241	2.7	4.9	0.597	20	276	2.0
702.7	0.364	12	0.387	12	220	3.2	5.2	0.706	18	252	2.3
703.4	0.337	8.9	0.397	14	209	2.2	4.9	0.725	21	239	1.6
704.1	0.337	13	0.403	14	242	2.5	4.9	0.735	21	276	1.8
704.8	0.337	11	0.457	12	232	3.0	4.9	0.834	18	265	2.2
705.5	0.337	10	0.679	13	213	2.0	4.9	1.2	20	244	1.5
706.2	0.630	10	0.317	14	220	1.9	9.1	0.579	22	252	1.4
706.9	0.337	9.5	0.320	13	226	2.5	4.9	0.583	20	258	1.8
707.6	0.337	11	0.458	14	239	3.1	4.9	0.835	21	273	2.3
708.3	0.337	11	0.536	13	230	2.2	4.9	0.978	21	263	1.6
709.0	0.337	12	0.535	14	274	3.2	4.9	0.976	22	313	2.3
709.7	0.337	11	0.621	15	238	2.6	4.9	1.1	23	272	1.9
710.4	0.337	9.9	0.469	14	201	2.7	4.9	0.855	22	230	1.9
711.1	0.337	9.4	0.452	12	201	1.4	4.9	0.825	18	229	1.0
711.8	0.585	10	0.688	16	200	2.5	8.4	1.3	25	229	1.8
712.5	0.337	12	0.658	16	199	3.2	4.9	1.2	24	227	2.3
713.2	0.337	8.8	0.405	13	193	2.1	4.9	0.740	20	221	1.6
713.9	0.337	11	0.448	13	265	3.3	4.9	0.817	21	303	2.4
714.6	0.360	9.7	0.799	15	199	2.8	5.2	1.5	23	228	2.1
715.3	0.586	13	0.538	14	257	4.9	8.5	0.981	22	294	3.5
716.0	0.444	12	0.644	16	177	2.8	6.4	1.2	24	203	2.0
716.7	0.337	10	0.698	13	184	3.3	4.9	1.3	20	210	2.4
717.4	0.337	9.6	0.793	16	229	3.7	4.9	1.4	25	262	2.7
718.1	0.337	12	0.703	14	238	4.2	4.9	1.3	22	272	3.1
718.8	0.337	13	1.1	16	235	3.9	4.9	2.1	24	268	2.8
719.5	0.337	15	0.646	23	226	2.5	4.9	1.2	36	258	1.9
720.2	0.337	8.9	0.774	26	171	2.9	4.9	1.4	40	195	2.1
720.9	0.411	11	0.527	18	181	2.0	5.9	0.961	28	206	1.5
721.6	0.337	12	0.789	17	206	3.2	4.9	1.4	26	235	2.3
722.3	0.337	12	0.817	22	220	2.7	4.9	1.5	34	251	2.0
723.0	0.337	14	0.742	22	200	2.5	4.9	1.4	33	229	1.8
723.7	0.337	13	0.677	23	245	3.0	4.9	1.2	36	280	2.2
724.4	0.473	15	0.529	19	236	1.9	6.8	0.965	29	270	1.4
725.1	0.510	16	0.702	23	228	3.5	7.4	1.3	36	260	2.6
725.8	0.575	15	0.727	30	250	4.7	8.3	1.3	45	286	3.4
726.5	0.337	15	0.700	25	191	2.7	4.9	1.3	38	218	2.0
727.1	0.337	18	0.878	24	242	3.0	4.9	1.6	36	276	2.2
727.8	0.337	14	0.675	25	249	3.3	4.9	1.2	38	284	2.4
728.5	0.494	15	0.552	22	230	3.4	7.1	1.0	34	263	2.5
729.2	0.337	16	0.580	28	227	4.5	4.9	1.1	44	260	3.3
729.9	0.395	15	0.659	34	231	2.9	5.7	1.2	52	264	2.1
730.6	0.337	15	0.741	25	194	2.4	4.9	1.4	39	222	1.7
731.3	0.337	14	0.780	25	260	3.9	4.9	1.4	38	298	2.8
732.0	0.337	17	0.922	36	239	4.5	4.9	1.7	56	273	3.3
732.7	0.337	16	0.750	33	210	4.1	4.9	1.4	50	240	3.0
733.4	0.337	15	0.878	35	216	3.4	4.9	1.6	54	247	2.5
734.1	0.337	11	0.931	29	187	2.8	4.9	1.7	44	214	2.0



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
734.8	0.337	13	0.760	30	166	3.2	4.9	1.4	46	190	2.4
735.5	0.337	18	0.938	34	193	4.3	4.9	1.7	53	221	3.1
736.2	0.350	17	0.866	38	206	4.7	5.0	1.6	59	236	3.4
736.9	0.337	16	0.921	38	216	7.4	4.9	1.7	57	247	5.4
737.6	0.636	10	1.1	28	175	4.6	9.2	2.0	43	200	3.3
738.3	0.337	16	0.928	28	164	5.9	4.9	1.7	44	188	4.3
739.0	0.337	17	1.4	33	169	6.9	4.9	2.5	50	193	5.0
739.7	0.337	18	1.2	38	149	5.0	4.9	2.2	59	171	3.6
740.4	0.337	13	1.1	33	146	5.1	4.9	2.0	51	167	3.7
741.1	0.375	16	1.2	30	145	8.0	5.4	2.1	46	166	5.8
741.8	0.481	16	1.5	36	146	10	6.9	2.7	55	167	7.4
742.5	0.337	17	1.7	40	123	5.9	4.9	3.1	61	141	4.3
743.2	0.337	16	1.4	38	132	7.2	4.9	2.6	58	151	5.3
743.9	0.337	11	1.4	34	117	5.0	4.9	2.5	52	134	3.6
744.6	0.337	13	1.5	35	123	7.5	4.9	2.8	54	140	5.5
745.3	0.337	16	2.1	36	130	7.9	4.9	3.8	55	149	5.7
746.0	0.337	16	1.0	35	113	7.1	4.9	1.9	53	130	5.1
746.7	0.337	15	1.2	39	122	6.6	4.9	2.2	60	140	4.8
747.4	0.337	14	1.1	27	114	5.8	4.9	2.1	42	130	4.2
748.1	0.561	16	1.5	34	118	8.5	8.1	2.7	52	134	6.2
748.8	0.337	16	1.8	43	136	8.6	4.9	3.3	66	156	6.3
749.5	0.337	18	1.1	38	108	7.1	4.9	2.0	59	124	5.2
750.2	0.337	16	1.3	39	103	5.9	4.9	2.3	60	118	4.3
750.9	0.337	14	1.5	35	107	6.8	4.9	2.7	53	122	5.0
751.6	0.337	17	1.6	38	126	8.7	4.9	2.9	58	144	6.3
752.3	0.391	15	1.5	42	104	7.4	5.6	2.7	64	119	5.4
753.0	0.337	15	1.2	39	107	8.2	4.9	2.2	60	123	6.0
753.6	0.479	12	1.4	38	123	7.9	6.9	2.6	58	141	5.8
754.3	0.337	13	1.3	36	110	7.8	4.9	2.4	54	125	5.7
755.0	0.337	19	1.2	38	124	9.8	4.9	2.2	58	142	7.1
755.7	0.342	16	1.4	48	146	10	4.9	2.6	74	167	7.6
756.4	0.337	17	1.4	42	112	8.9	4.9	2.5	65	128	6.5
757.1	0.394	14	1.6	44	113	9.8	5.7	2.9	68	129	7.1
757.8	0.595	14	1.7	45	117	7.3	8.6	3.2	68	134	5.3
758.5	0.337	17	1.9	51	124	12	4.9	3.4	78	141	8.7
759.2	0.337	16	1.9	48	111	7.7	4.9	3.4	74	127	5.6
759.9	0.436	15	1.6	43	114	7.9	6.3	2.9	66	130	5.7
760.6	0.337	18	1.8	44	132	7.7	4.9	3.3	68	150	5.6
761.3	0.337	17	1.9	47	119	7.5	4.9	3.5	72	136	5.4
762.0	0.337	20	2.0	53	111	9.5	4.9	3.7	82	127	6.9
762.7	0.337	19	1.7	54	105	9.8	4.9	3.1	82	120	7.2
763.4	0.430	16	1.8	48	102	7.4	6.2	3.3	73	116	5.4
764.1	0.394	17	2.1	50	123	8.9	5.7	3.9	77	140	6.5
764.8	0.337	18	2.0	44	119	8.6	4.9	3.6	67	136	6.2
765.5	0.337	15	1.8	56	113	8.4	4.9	3.3	86	130	6.2
766.2	0.337	16	1.6	56	104	6.7	4.9	3.0	85	119	4.9
766.9	0.337	13	1.6	42	109	6.8	4.9	2.9	64	125	4.9
767.6	0.337	13	1.8	47	126	6.1	4.9	3.4	72	144	4.5
768.3	0.337	18	1.9	49	113	7.5	4.9	3.5	75	129	5.4
769.0	0.596	18	1.2	51	97	7.3	8.6	2.2	78	110	5.3
769.7	0.380	17	1.6	50	112	6.7	5.5	3.0	76	128	4.9
770.4	0.337	14	1.8	41	105	5.0	4.9	3.2	63	120	3.7
771.1	0.337	17	2.1	50	130	5.3	4.9	3.8	77	149	3.9
771.8	0.337	20	2.1	54	116	7.6	4.9	3.9	83	133	5.5
772.5	0.337	19	1.7	50	97	5.8	4.9	3.1	77	111	4.2
773.2	0.337	17	1.4	47	117	4.6	4.9	2.5	72	134	3.4
773.9	0.337	14	1.8	41	111	4.7	4.9	3.3	63	127	3.4
774.6	0.391	15	2.1	59	126	6.0	5.6	3.7	90	145	4.4
775.3	0.509	19	2.6	64	141	6.7	7.3	4.8	99	162	4.9
776.0	0.337	15	2.4	57	114	4.5	4.9	4.4	88	130	3.3
776.7	0.337	14	2.0	52	113	4.9	4.9	3.6	80	129	3.5
777.4	0.337	16	2.2	52	127	5.5	4.9	4.0	79	145	4.0
778.1	0.337	15	1.6	53	128	4.6	4.9	2.9	81	147	3.4
778.8	0.337	19	2.4	59	107	5.4	4.9	4.3	91	122	4.0
779.5	0.337	16	2.2	62	115	5.4	4.9	4.0	94	132	4.0
780.1	0.337	12	2.5	53	118	4.5	4.9	4.6	81	135	3.3
780.8	0.337	13	2.6	53	139	5.6	4.9	4.7	81	159	4.1
781.5	0.337	19	2.9	58	159	8.2	4.9	5.3	88	182	6.0
782.2	0.337	19	2.7	62	137	8.0	4.9	5.0	94	157	5.8
782.9	0.337	16	2.5	55	137	6.6	4.9	4.6	84	157	4.8
783.6	0.337	14	2.5	49	145	6.3	4.9	4.6	75	166	4.6
784.3	0.337	14	3.3	43	135	4.9	4.9	6.1	66	154	3.6
785.0	0.337	17	2.9	53	146	6.4	4.9	5.3	81	167	4.7
785.7	0.337	15	2.6	53	141	6.3	4.9	4.7	82	162	4.6
786.4	0.337	16	2.5	46	172	4.7	4.9	4.5	71	196	3.4
787.1	0.489	11	2.0	41	178	4.4	7.1	3.6	62	204	3.2
787.8	0.337	16	2.3	38	146	3.6	4.9	4.3	58	167	2.6
788.5	0.337	16	2.4	53	170	6.2	4.9	4.3	81	195	4.5
789.2	0.337	15	2.2	49	200	5.7	4.9	4.0	76	228	4.2
789.9	0.337	12	1.5	37	172	3.2	4.9	2.8	57	197	2.4
790.6	0.337	12	2.1	34	191	2.9	4.9	3.9	52	218	2.1



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
791.3	0.433	14	1.9	39	222	2.8	6.2	3.4	59	254	2.0
792.0	0.337	13	1.4	37	185	2.6	4.9	2.6	56	212	1.9
792.7	0.337	11	1.7	33	213	2.0	4.9	3.1	50	244	1.5
793.4	0.337	11	1.2	32	242	2.3	4.9	2.3	48	276	1.7
794.1	0.337	11	1.3	32	229	2.9	4.9	2.3	48	262	2.1
794.8	0.395	17	1.5	41	257	2.9	5.7	2.8	63	294	2.1
795.5	0.383	14	1.7	34	247	2.8	5.5	3.0	52	283	2.0
796.2	0.337	11	1.0	31	229	1.8	4.9	1.9	48	262	1.3
796.9	0.337	11	0.973	25	211	1.9	4.9	1.8	38	241	1.4
797.6	0.337	12	1.3	30	293	2.6	4.9	2.4	47	335	1.9
798.3	0.337	13	1.1	33	296	3.4	4.9	2.0	51	338	2.5
799.0	0.337	12	1.2	25	226	2.8	4.9	2.1	38	259	2.1
799.7	0.337	10	1.1	25	268	2.4	4.9	2.1	38	306	1.7
800.4	0.337	12	1.3	19	274	2.8	4.9	2.3	30	313	2.1
801.1	0.337	14	1.2	24	281	3.3	4.9	2.2	37	322	2.4
801.8	0.337	14	0.837	26	241	3.7	4.9	1.5	39	275	2.7
802.5	0.337	11	1.1	23	230	2.3	4.9	2.1	35	263	1.7
803.2	0.337	9.4	0.851	21	252	2.7	4.9	1.6	32	288	2.0
803.9	0.337	9.6	0.773	18	216	1.2	4.9	1.4	27	247	0.889
804.6	0.337	13	1.4	20	286	2.2	4.9	2.5	30	326	1.6
805.3	0.337	14	0.985	19	231	2.2	4.9	1.8	29	264	1.6
806.0	0.337	13	0.765	21	215	1.9	4.9	1.4	32	246	1.4
806.6	0.337	12	0.689	14	261	1.3	4.9	1.3	22	299	0.918
807.3	0.337	11	0.713	18	267	1.3	4.9	1.3	27	305	0.970
808.0	0.337	15	0.820	19	297	1.4	4.9	1.5	29	340	1.1
808.7	0.337	14	0.512	22	296	1.5	4.9	0.934	34	338	1.1
809.4	0.337	12	0.511	17	280	1.7	4.9	0.932	26	320	1.2
810.1	0.597	13	0.447	18	306	1.5	8.6	0.816	27	350	1.1
810.8	0.415	12	0.464	17	313	1.6	6.0	0.847	26	358	1.2
811.5	0.379	13	0.503	19	267	1.4	5.5	0.917	29	305	1.0
812.2	0.337	14	0.522	18	297	1.4	4.9	0.952	27	339	1.0
812.9	0.337	11	0.678	16	276	1.8	4.9	1.2	25	315	1.3
813.6	0.337	11	0.399	15	357	2.0	4.9	0.728	24	408	1.5
814.3	0.337	12	0.501	18	301	1.6	4.9	0.914	27	345	1.2
815.0	0.601	13	0.468	15	263	1.1	8.7	0.853	23	301	0.785
815.7	0.337	11	0.230	14	271	1.5	4.9	0.420	22	310	1.1
816.4	0.337	12	0.302	15	365	1.2	4.9	0.551	23	417	0.896
817.1	0.337	11	0.407	15	345	1.5	4.9	0.742	23	394	1.1
817.8	0.405	13	0.230	17	263	1.4	5.8	0.419	26	301	1.0
818.5	0.337	14	0.561	20	315	1.3	4.9	1.0	30	360	0.942
819.2	0.456	12	0.324	17	288	1.3	6.6	0.590	26	330	0.978
819.9	0.337	9.9	0.455	19	326	1.1	4.9	0.830	29	373	0.797
820.6	0.337	10	0.294	13	316	1.4	4.9	0.535	20	361	1.000
821.3	0.337	11	0.431	16	283	1.5	4.9	0.786	24	324	1.1
822.0	0.337	13	0.321	15	271	2.2	4.9	0.585	23	310	1.6
822.7	0.582	10	0.716	16	300	1.2	8.4	1.3	25	343	0.844
823.4	0.337	9.9	0.380	13	316	1.9	4.9	0.693	19	362	1.4
824.1	0.337	12	0.324	17	312	1.0	4.9	0.591	26	357	0.760
824.8	0.337	14	0.593	15	272	1.7	4.9	1.1	23	312	1.2
825.5	0.361	13	0.460	16	266	1.4	5.2	0.839	25	304	1.1
826.2	0.337	11	0.547	16	319	1.6	4.9	0.997	25	365	1.2
826.9	0.566	9.0	0.425	14	340	1.9	8.2	0.775	21	389	1.4
827.6	0.337	13	0.558	15	307	1.5	4.9	1.0	23	351	1.1
828.3	0.402	13	0.365	20	304	1.0	5.8	0.666	31	348	0.759
829.0	0.337	13	0.478	17	255	1.4	4.9	0.872	25	292	1.0
829.7	0.337	12	0.374	16	288	1.0	4.9	0.682	24	330	0.760
830.4	0.337	12	0.606	18	342	1.3	4.9	1.1	28	391	0.916
831.1	0.337	16	0.645	20	314	1.7	4.9	1.2	31	359	1.2
831.8	0.337	14	0.431	20	302	1.3	4.9	0.786	30	345	0.926
832.5	0.337	14	0.771	16	275	1.5	4.9	1.4	25	315	1.1
833.2	0.337	13	0.591	16	285	1.4	4.9	1.1	25	325	0.989
833.8	0.509	13	0.700	17	325	1.4	7.3	1.3	27	372	1.0
834.5	0.616	18	0.855	23	271	1.4	8.9	1.6	36	310	1.0
835.2	0.337	15	0.640	20	240	1.6	4.9	1.2	30	275	1.1
835.9	0.337	16	0.634	19	222	1.4	4.9	1.2	30	254	1.0
836.6	0.337	12	0.660	16	253	1.8	4.9	1.2	25	289	1.3
837.3	0.337	15	0.678	21	286	2.2	4.9	1.2	33	327	1.6
838.0	0.337	19	0.666	29	335	1.6	4.9	1.2	45	383	1.2
838.7	0.506	20	0.641	22	258	2.0	7.3	1.2	34	295	1.5
839.4	0.678	14	0.608	23	227	0.602	9.8	1.1	35	260	0.439
840.1	0.337	20	0.712	23	258	1.7	4.9	1.3	35	295	1.3
840.8	0.337	16	0.853	24	253	1.9	4.9	1.6	37	290	1.4
841.5	0.337	20	0.694	28	296	1.2	4.9	1.3	42	339	0.901
842.2	0.337	18	0.922	30	304	0.860	4.9	1.7	46	348	0.628
842.9	0.337	16	0.666	24	242	1.3	4.9	1.2	37	276	0.921
843.6	0.337	15	0.981	24	285	1.5	4.9	1.8	37	326	1.1
844.3	0.337	22	0.941	29	295	1.5	4.9	1.7	45	337	1.1
845.0	0.415	25	0.897	39	276	2.1	6.0	1.6	60	315	1.6
845.7	0.337	20	0.412	33	285	1.5	4.9	0.751	51	326	1.1
846.4	0.337	16	0.757	27	248	0.643	4.9	1.4	42	284	0.469
847.1	0.337	24	0.589	31	268	1.4	4.9	1.1	47	306	1.1



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
847.8	0.337	20	0.847	37	291	1.9	4.9	1.5	56	333	1.4
848.5	0.337	22	0.541	28	210	1.2	4.9	0.986	44	240	0.846
849.2	0.337	18	0.689	36	287	0.746	4.9	1.3	55	328	0.544
849.9	0.363	16	0.589	31	210	1.1	5.2	1.1	47	240	0.820
850.6	0.337	16	1.0	33	234	1.8	4.9	1.9	50	267	1.3
851.3	0.337	20	0.539	35	242	0.886	4.9	0.983	54	277	0.646
852.0	0.337	23	0.592	37	256	1.1	4.9	1.1	56	293	0.822
852.7	0.337	19	0.611	34	263	1.4	4.9	1.1	52	301	1.0
853.4	0.337	19	0.784	29	262	1.1	4.9	1.4	44	300	0.789
854.1	0.337	19	0.788	33	304	1.6	4.9	1.4	51	348	1.2
854.8	0.337	19	0.606	35	306	1.2	4.9	1.1	54	350	0.893
855.5	0.337	22	0.671	45	279	1.1	4.9	1.2	69	319	0.825
856.2	0.337	18	0.509	36	316	1.9	4.9	0.929	56	362	1.4
856.9	0.337	19	0.692	37	290	0.814	4.9	1.3	56	332	0.594
857.6	0.337	19	0.980	42	260	1.7	4.9	1.8	65	297	1.3
858.3	0.337	22	0.689	47	228	1.3	4.9	1.3	72	261	0.921
859.0	0.358	17	0.643	40	271	0.841	5.2	1.2	61	310	0.613
859.7	0.337	19	0.666	43	301	1.3	4.9	1.2	66	345	0.927
860.3	0.356	22	0.527	39	286	0.681	5.1	0.961	59	327	0.497
861.0	0.898	23	0.815	62	300	1.7	13	1.5	96	343	1.2
861.7	0.337	20	0.585	49	258	0.985	4.9	1.1	75	295	0.718
862.4	0.337	16	0.466	41	265	1.5	4.9	0.849	62	303	1.1
863.1	0.342	14	0.847	40	232	0.643	4.9	1.5	61	266	0.469
863.8	0.337	18	0.806	38	269	1.6	4.9	1.5	58	308	1.1
864.5	0.409	25	0.821	46	277	1.8	5.9	1.5	71	317	1.3
865.2	0.437	21	0.671	58	333	1.3	6.3	1.2	89	381	0.975
865.9	0.505	21	0.955	52	278	1.8	7.3	1.7	80	317	1.3
866.6	0.414	18	0.565	48	292	1.4	6.0	1.0	73	333	0.999
867.3	0.435	19	0.566	41	230	1.0	6.3	1.0	63	263	0.736
868.0	0.782	23	0.550	49	220	1.2	11	1.0	76	251	0.891
868.7	0.456	24	0.739	63	320	1.1	6.6	1.3	96	366	0.822
869.4	0.337	22	0.802	53	292	1.6	4.9	1.5	81	334	1.1
870.1	0.337	17	0.697	50	254	1.5	4.9	1.3	77	291	1.1
870.8	0.337	23	1.0	52	253	0.899	4.9	1.8	80	290	0.656
871.5	0.540	25	0.731	55	273	1.4	7.8	1.3	84	313	1.0
872.2	0.516	19	0.593	51	240	0.500	7.5	1.1	78	274	0.365
872.9	0.337	20	0.740	47	257	1.2	4.9	1.4	73	294	0.840
873.6	0.416	20	0.839	50	301	1.5	6.0	1.5	76	344	1.1
874.3	0.337	22	0.956	48	307	1.3	4.9	1.7	74	351	0.984
875.0	0.541	23	0.913	52	225	1.5	7.8	1.7	79	257	1.1
875.7	0.723	22	0.905	56	276	1.8	10	1.7	86	316	1.3
876.4	0.337	21	0.762	50	323	1.0	4.9	1.4	77	369	0.749
877.1	0.337	23	0.911	59	332	1.7	4.9	1.7	90	380	1.2
877.8	0.337	25	1.0	66	273	1.2	4.9	1.9	102	312	0.866
878.5	0.337	21	1.1	57	273	1.5	4.9	2.1	88	312	1.1
879.2	0.337	21	0.528	50	213	0.940	4.9	0.963	77	244	0.686
879.9	0.337	17	0.791	48	272	1.6	4.9	1.4	74	311	1.2
880.6	0.337	23	0.885	61	260	2.4	4.9	1.6	93	297	1.7
881.3	0.337	25	1.2	67	275	2.0	4.9	2.1	103	314	1.4
882.0	0.337	23	0.813	62	259	1.7	4.9	1.5	95	296	1.2
882.7	0.359	23	1.2	58	315	1.3	5.2	2.2	89	360	0.972
883.4	0.681	22	1.2	62	351	2.2	9.8	2.2	96	401	1.6
884.1	0.337	26	1.2	64	344	2.6	4.9	2.2	98	394	1.9
884.8	0.337	25	1.3	73	337	1.1	4.9	2.3	111	385	0.799
885.5	0.383	26	1.1	60	217	1.2	5.5	2.1	92	248	0.874
886.1	0.337	22	1.1	52	242	1.4	4.9	1.9	79	277	1.0
886.8	0.337	21	1.1	53	288	1.3	4.9	2.0	82	329	0.930
887.5	0.883	25	1.6	72	320	2.5	13	2.9	111	366	1.8
888.2	0.337	23	0.887	60	233	0.904	4.9	1.6	92	266	0.659
888.9	0.337	24	0.902	65	263	2.0	4.9	1.6	99	300	1.5
889.6	0.337	25	1.5	69	275	1.3	4.9	2.8	105	314	0.975
890.3	0.337	23	0.861	66	246	1.6	4.9	1.6	101	281	1.1
891.0	0.337	30	1.4	78	282	1.3	4.9	2.5	119	323	0.961
891.7	0.337	26	1.3	71	233	1.5	4.9	2.3	109	266	1.1
892.4	0.337	25	1.4	73	253	1.2	4.9	2.5	111	289	0.856
893.1	0.337	27	1.4	69	353	1.9	4.9	2.5	105	404	1.4
893.8	0.337	24	1.7	80	343	2.3	4.9	3.1	122	392	1.7
894.5	0.428	23	1.1	65	259	1.6	6.2	2.0	99	296	1.1
895.2	0.337	30	1.2	71	237	2.1	4.9	2.2	108	271	1.6
895.9	0.337	22	1.1	72	253	0.876	4.9	2.0	110	290	0.639
896.6	0.337	22	1.3	64	240	0.835	4.9	2.4	97	275	0.609
897.3	0.407	30	1.7	71	302	1.6	5.9	3.2	108	345	1.2
898.0	0.547	31	1.2	75	263	1.5	7.9	2.2	116	300	1.1
898.7	0.337	29	1.2	103	284	1.6	4.9	2.2	157	325	1.2
899.4	0.337	27	1.4	72	254	1.2	4.9	2.5	110	290	0.867
900.1	0.659	24	1.2	64	234	1.2	9.5	2.1	98	268	0.853
900.8	0.337	27	1.3	62	255	1.8	4.9	2.4	95	291	1.3
901.5	0.398	34	1.2	84	232	1.9	5.7	2.1	128	266	1.4
902.2	0.337	31	1.2	92	284	1.7	4.9	2.2	142	325	1.2
902.9	0.337	26	1.7	81	285	1.4	4.9	3.0	125	326	1.0
903.6	0.337	27	1.6	86	294	0.779	4.9	2.9	132	337	0.568



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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
904.3	0.337	31	1.8	71	243	1.8	4.9	3.3	109	277	1.3
905.0	0.337	32	1.7	81	227	1.1	4.9	3.2	125	259	0.839
905.7	0.337	28	1.3	81	285	1.9	4.9	2.4	124	326	1.4
906.4	0.492	25	1.8	72	237	0.978	7.1	3.2	111	271	0.713
907.1	0.617	28	1.6	71	282	1.9	8.9	3.0	109	322	1.4
907.8	0.337	33	2.2	78	266	1.0	4.9	3.9	119	304	0.754
908.5	0.337	35	1.6	80	258	1.7	4.9	2.9	122	295	1.2
909.2	0.337	26	1.9	69	216	1.2	4.9	3.6	106	246	0.902
909.9	0.337	26	1.4	67	257	0.790	4.9	2.6	102	294	0.576
910.6	0.356	30	1.8	68	268	1.9	5.1	3.2	105	306	1.4
911.3	0.443	34	1.9	79	238	1.5	6.4	3.4	121	272	1.1
911.9	0.337	30	1.7	84	226	1.7	4.9	3.1	129	258	1.2
912.6	0.337	29	1.6	73	226	1.5	4.9	2.9	112	259	1.1
913.3	0.389	29	1.6	73	235	1.3	5.6	2.9	112	269	0.938
914.0	0.337	26	1.9	72	241	1.9	4.9	3.5	110	276	1.4
914.7	0.337	39	1.7	91	248	1.7	4.9	3.0	139	283	1.2
915.4	0.337	33	1.7	63	176	1.0	4.9	3.0	96	202	0.732
916.1	0.337	29	1.6	65	205	1.3	4.9	2.9	100	235	0.930
916.8	0.337	31	1.6	69	220	1.4	4.9	2.8	105	252	1.0
917.5	0.611	35	1.8	79	242	2.0	8.8	3.2	121	277	1.5
918.2	0.536	41	2.2	73	212	1.5	7.7	3.9	112	242	1.1
918.9	0.337	33	1.5	78	216	1.4	4.9	2.7	120	246	0.993
919.6	0.337	34	1.7	75	241	0.829	4.9	3.1	115	275	0.605
920.3	0.337	34	1.8	71	245	1.2	4.9	3.2	109	280	0.856
921.0	0.515	33	2.2	73	256	1.3	7.4	4.0	112	293	0.963
921.7	0.337	42	2.1	94	279	2.0	4.9	3.9	144	319	1.4
922.4	0.337	35	1.5	82	241	1.1	4.9	2.8	126	275	0.795
923.1	0.337	31	2.1	71	214	1.1	4.9	3.8	109	245	0.777
923.8	0.544	31	2.0	71	222	1.3	7.9	3.6	108	254	0.965
924.5	0.445	33	1.9	86	269	1.3	6.4	3.5	132	307	0.954
925.2	0.349	36	1.8	80	208	0.504	5.0	3.3	122	238	0.367
925.9	0.395	32	1.3	73	213	1.2	5.7	2.4	112	244	0.900
926.6	0.337	34	2.5	76	264	1.6	4.9	4.6	117	302	1.2
927.3	0.337	40	2.1	81	257	2.4	4.9	3.8	124	294	1.8
928.0	0.337	44	1.8	83	227	1.3	4.9	3.4	127	260	0.932
928.7	0.337	33	1.6	94	230	1.5	4.9	3.0	144	263	1.1
929.4	0.337	33	1.8	68	195	1.0	4.9	3.2	104	223	0.737
930.1	0.337	33	1.5	64	234	1.7	4.9	2.8	98	268	1.2
930.8	0.337	38	2.0	72	224	1.8	4.9	3.7	110	256	1.3
931.5	0.552	40	1.6	67	206	1.2	8.0	2.9	103	236	0.891
932.2	0.337	36	1.7	83	221	1.4	4.9	3.0	128	253	1.0
932.9	0.337	31	1.8	70	207	1.2	4.9	3.3	107	236	0.850
933.6	0.337	31	1.6	61	208	1.5	4.9	2.9	94	238	1.1
934.3	0.354	43	1.8	80	246	1.5	5.1	3.3	122	281	1.1
935.0	0.484	39	1.3	71	195	1.4	7.0	2.4	109	224	1.0
935.7	0.337	28	2.0	66	195	1.4	4.9	3.6	100	222	1.1
936.4	0.337	30	1.8	66	234	1.4	4.9	3.4	101	268	1.0
937.1	0.337	37	1.2	65	243	1.5	4.9	2.2	99	278	1.1
937.8	0.530	37	1.7	64	228	1.4	7.7	3.1	97	261	0.991
938.5	0.386	31	1.4	70	221	2.2	5.6	2.5	108	253	1.6
939.1	0.337	31	1.5	69	219	0.662	4.9	2.7	106	250	0.483
939.8	0.337	28	1.6	57	211	1.6	4.9	2.8	88	242	1.2
940.5	0.337	34	2.0	68	234	1.7	4.9	3.6	105	268	1.2
941.2	0.558	36	1.5	67	246	1.5	8.0	2.7	103	282	1.1
941.9	0.337	36	1.7	78	267	1.1	4.9	3.0	119	305	0.826
942.6	0.337	26	1.2	54	212	0.641	4.9	2.3	83	242	0.468
943.3	0.337	32	2.0	55	220	1.6	4.9	3.7	84	251	1.1
944.0	0.337	36	1.5	72	259	1.8	4.9	2.8	111	297	1.3
944.7	0.337	35	1.5	62	251	1.1	4.9	2.7	94	286	0.826
945.4	0.337	35	1.4	56	260	1.8	4.9	2.5	86	298	1.3
946.1	0.337	29	0.925	54	264	1.7	4.9	1.7	82	302	1.3
946.8	0.337	33	1.3	58	246	1.1	4.9	2.4	89	282	0.800
947.5	0.337	30	0.971	56	278	1.6	4.9	1.8	86	318	1.2
948.2	0.337	30	1.1	61	259	1.7	4.9	1.9	94	297	1.2
948.9	0.337	25	0.832	45	233	1.2	4.9	1.5	70	267	0.857
949.6	0.351	22	1.4	48	261	1.5	5.1	2.5	73	299	1.1
950.3	0.337	28	1.3	49	284	1.8	4.9	2.4	76	324	1.3
951.0	0.337	23	0.913	50	277	1.9	4.9	1.7	77	317	1.4
951.7	0.406	21	0.950	45	235	1.3	5.9	1.7	69	269	0.924
952.4	0.337	19	0.677	44	274	1.8	4.9	1.2	67	313	1.3
953.1	0.651	23	0.858	41	339	0.916	9.4	1.6	63	388	0.668
953.8	0.621	21	0.889	43	264	1.0	9.0	1.6	66	302	0.753
954.5	0.337	18	0.648	34	236	2.0	4.9	1.2	52	269	1.5
955.2	0.337	17	0.748	40	287	1.3	4.9	1.4	61	328	0.952
955.9	0.337	14	0.689	37	286	1.6	4.9	1.3	57	327	1.1
956.6	0.337	16	0.675	35	275	1.5	4.9	1.2	54	314	1.1
957.3	0.421	17	0.548	42	303	1.7	6.1	0.999	65	346	1.3
958.0	0.337	17	0.437	37	304	2.2	4.9	0.797	57	348	1.6
958.7	0.337	15	0.587	40	323	1.4	4.9	1.1	62	369	1.0
959.4	0.337	14	0.305	32	268	1.5	4.9	0.556	49	306	1.1
960.1	0.337	15	0.495	40	348	2.4	4.9	0.902	61	398	1.7



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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.8	0.381	17	0.617	39	275	1.6	5.5	1.1	59	315	1.1
961.5	0.456	15	0.510	35	294	1.2	6.6	0.930	54	336	0.856
962.2	0.337	11	0.310	29	317	1.3	4.9	0.566	45	363	0.937
962.9	0.337	13	0.368	34	312	1.5	4.9	0.672	53	357	1.1
963.6	0.337	14	0.526	30	338	2.1	4.9	0.960	46	386	1.5
964.3	0.337	14	0.359	32	281	1.6	4.9	0.654	48	321	1.2
965.0	0.337	12	0.328	31	328	1.4	4.9	0.599	47	375	0.997
965.6	0.337	14	0.253	25	300	1.4	4.9	0.461	39	343	1.0
966.3	0.337	12	0.608	29	291	1.6	4.9	1.1	44	333	1.2
967.0	0.337	16	0.504	33	284	1.4	4.9	0.920	51	325	1.0
967.7	0.337	15	0.604	39	301	1.9	4.9	1.1	60	344	1.4
968.4	0.337	12	0.620	27	259	1.8	4.9	1.1	41	296	1.3
969.1	0.337	13	0.372	28	312	1.3	4.9	0.678	44	357	0.958
969.8	0.337	15	0.500	29	312	1.9	4.9	0.912	45	357	1.4
970.5	0.492	12	0.570	33	287	1.1	7.1	1.0	50	328	0.791
971.2	0.337	12	0.786	27	242	0.956	4.9	1.4	41	277	0.698
971.9	0.337	13	0.466	30	285	2.1	4.9	0.849	47	326	1.5
972.6	0.337	14	0.393	27	313	1.9	4.9	0.717	41	358	1.4
973.3	0.337	15	0.678	31	323	1.7	4.9	1.2	47	370	1.2
974.0	0.337	14	0.340	26	272	1.7	4.9	0.621	39	311	1.2
974.7	0.359	12	0.663	30	264	1.5	5.2	1.2	46	302	1.1
975.4	0.337	12	0.580	32	293	2.3	4.9	1.1	49	335	1.7
976.1	0.429	14	0.435	30	280	2.2	6.2	0.793	46	321	1.6
976.8	0.337	17	0.562	28	273	1.6	4.9	1.0	43	312	1.2
977.5	0.337	17	0.500	33	300	1.5	4.9	0.912	50	343	1.1
978.2	0.337	12	0.364	36	336	1.2	4.9	0.663	55	384	0.844
978.9	0.337	15	0.585	29	386	1.4	4.9	1.1	44	442	1.0
979.6	0.337	15	0.565	27	259	0.549	4.9	1.0	42	296	0.401
980.3	0.337	16	0.473	32	273	1.5	4.9	0.863	49	312	1.1
981.0	0.337	15	0.606	27	307	1.4	4.9	1.1	41	352	1.0
981.7	0.337	14	0.536	28	270	1.6	4.9	0.978	42	308	1.1
982.4	0.337	13	0.544	27	308	0.833	4.9	0.993	41	353	0.608
983.1	0.365	15	0.713	31	364	1.9	5.3	1.3	47	417	1.4
983.8	0.337	18	0.795	31	323	2.4	4.9	1.4	48	369	1.7
984.5	0.337	15	0.627	36	314	2.2	4.9	1.1	54	359	1.6
985.2	0.337	14	0.570	31	317	1.3	4.9	1.0	47	363	0.923
985.9	0.337	12	0.930	29	291	1.1	4.9	1.7	44	332	0.793
986.6	0.337	17	0.360	36	358	1.8	4.9	0.657	55	410	1.3
987.3	0.337	20	0.473	36	313	2.1	4.9	0.863	56	358	1.5
988.0	0.337	17	0.706	29	305	1.4	4.9	1.3	45	349	1.0
988.7	0.337	13	0.563	31	295	1.9	4.9	1.0	47	337	1.4
989.4	0.337	18	0.679	31	299	1.6	4.9	1.2	47	342	1.1
990.1	0.337	17	0.741	28	316	1.7	4.9	1.4	43	362	1.2
990.8	0.337	15	0.568	29	284	1.5	4.9	1.0	44	325	1.1
991.5	0.337	15	0.673	34	293	0.793	4.9	1.2	52	335	0.578
992.1	0.337	15	0.789	30	353	2.6	4.9	1.4	45	404	1.9
992.8	0.337	19	1.1	29	342	1.5	4.9	1.9	45	392	1.1
993.5	0.337	20	1.1	34	360	1.8	4.9	2.0	53	412	1.3
994.2	0.337	21	0.605	29	297	2.1	4.9	1.1	44	340	1.5
994.9	0.337	16	0.716	33	304	1.9	4.9	1.3	51	347	1.4
995.6	0.452	16	0.622	27	276	1.8	6.5	1.1	42	315	1.3
996.3	0.337	15	0.957	31	271	1.3	4.9	1.7	47	309	0.978
997.0	0.337	19	0.727	37	295	2.3	4.9	1.3	56	337	1.7
997.7	0.337	19	0.920	38	351	0.932	4.9	1.7	58	402	0.680
998.4	0.337	16	0.607	30	264	0.989	4.9	1.1	46	302	0.722
999.1	0.631	16	0.728	29	263	2.5	9.1	1.3	44	300	1.8
999.8	0.498	19	0.694	39	289	1.3	7.2	1.3	60	330	0.975
1000.5	0.496	19	0.760	42	254	1.8	7.2	1.4	64	290	1.3
1001.2	0.393	16	0.830	42	300	0.924	5.7	1.5	65	344	0.674
1001.9	0.337	17	0.915	35	262	1.4	4.9	1.7	53	300	1.0
1002.6	0.337	15	0.875	40	287	1.8	4.9	1.6	61	328	1.3
1003.3	0.476	19	0.805	36	248	1.6	6.9	1.5	55	284	1.1
1004.0	0.337	20	0.756	40	293	1.2	4.9	1.4	62	336	0.866
1004.7	0.337	16	0.609	42	273	1.6	4.9	1.1	64	313	1.2
1005.4	0.337	17	0.855	46	303	0.558	4.9	1.6	70	347	0.407
1006.1	0.376	18	0.853	43	302	0.924	5.4	1.6	67	346	0.674
1006.8	0.337	16	0.721	49	312	1.8	4.9	1.3	75	356	1.3
1007.5	0.393	22	0.665	51	273	1.6	5.7	1.2	79	312	1.1
1008.2	0.337	17	0.669	44	268	0.992	4.9	1.2	68	306	0.724
1008.9	0.337	17	0.519	44	275	1.4	4.9	0.946	67	315	1.0
1009.6	0.337	21	1.4	52	372	1.2	4.9	2.5	80	426	0.903
1010.3	0.337	20	0.828	43	300	1.0	4.9	1.5	66	343	0.759
1011.0	0.567	19	1.1	48	263	1.0	8.2	2.0	73	300	0.753
1011.7	0.337	21	0.762	51	268	1.4	4.9	1.4	78	306	1.0
1012.4	0.468	17	0.910	50	295	1.4	6.8	1.7	77	337	0.987
1013.1	0.422	18	0.723	48	265	1.0	6.1	1.3	73	303	0.762
1013.8	0.337	22	0.815	58	282	1.6	4.9	1.5	89	322	1.2
1014.5	0.337	19	0.931	52	283	1.0	4.9	1.7	80	323	0.757
1015.2	0.387	20	0.809	59	327	1.3	5.6	1.5	90	374	0.927
1015.9	0.536	21	1.2	59	310	1.4	7.7	2.3	91	355	1.0
1016.6	0.752	25	0.864	61	328	1.1	11	1.6	93	375	0.835



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1017.3	0.337	23	0.910	62	301	1.4	4.9	1.7	95	344	0.987
1018.0	0.337	18	0.610	61	279	1.8	4.9	1.1	93	319	1.3
1018.6	0.337	18	0.851	53	320	1.6	4.9	1.6	82	366	1.2
1019.3	0.337	22	0.840	56	297	2.1	4.9	1.5	86	340	1.5
1020.0	0.360	26	1.1	67	414	2.3	5.2	2.0	102	473	1.7
1020.7	0.779	25	0.789	73	287	1.9	11	1.4	112	328	1.4
1021.4	0.337	18	0.783	56	270	1.3	4.9	1.4	86	309	0.931
1022.1	0.337	20	0.735	64	327	1.4	4.9	1.3	98	374	1.0
1022.8	0.337	24	0.747	64	367	1.8	4.9	1.4	97	420	1.3
1023.5	0.636	27	1.0	72	348	2.3	9.2	1.9	110	398	1.7
1024.2	0.337	23	1.1	78	300	1.5	4.9	2.1	120	343	1.1
1024.9	0.337	24	1.0	90	368	2.3	4.9	1.8	138	421	1.7
1025.6	0.337	23	0.816	62	323	1.5	4.9	1.5	94	369	1.1
1026.3	0.337	27	0.962	59	359	2.0	4.9	1.8	91	410	1.5
1027.0	0.725	25	1.0	75	314	1.5	10	1.8	115	359	1.1
1027.7	0.337	30	0.939	85	328	1.9	4.9	1.7	130	375	1.4
1028.4	0.351	24	0.960	66	324	1.4	5.1	1.8	101	371	1.0
1029.1	0.412	19	1.1	71	289	1.4	5.9	2.1	109	330	1.0
1029.8	0.337	25	1.4	70	363	1.7	4.9	2.6	107	415	1.2
1030.5	0.337	30	1.3	77	342	1.2	4.9	2.5	119	391	0.841
1031.2	0.636	27	1.3	76	329	2.3	9.2	2.4	116	376	1.7
1031.9	0.590	23	1.4	78	320	1.6	8.5	2.6	120	366	1.2
1032.6	0.337	27	1.3	64	316	1.2	4.9	2.3	98	361	0.852
1033.3	0.337	26	1.6	78	396	2.0	4.9	3.0	120	453	1.5
1034.0	0.337	25	1.4	71	332	1.9	4.9	2.6	109	380	1.4
1034.7	0.337	26	1.3	97	360	2.1	4.9	2.3	148	412	1.5
1035.4	0.494	25	1.1	77	357	1.2	7.1	2.1	118	408	0.896
1036.1	0.337	25	1.2	83	393	1.0	4.9	2.2	128	450	0.735
1036.8	0.388	27	1.3	77	376	1.8	5.6	2.4	118	430	1.3
1037.5	0.337	27	1.6	87	330	1.6	4.9	2.9	133	378	1.1
1038.2	0.337	26	1.1	83	369	1.3	4.9	2.0	127	422	0.978
1038.9	0.337	25	1.4	78	394	2.6	4.9	2.6	120	451	1.9
1039.6	0.337	27	1.2	76	378	1.6	4.9	2.1	117	432	1.2
1040.3	0.337	34	1.5	86	338	2.1	4.9	2.8	132	386	1.6
1041.0	0.337	33	1.7	89	349	1.8	4.9	3.2	136	399	1.3
1041.7	0.337	27	1.4	74	343	1.9	4.9	2.5	114	392	1.3
1042.4	0.431	26	1.2	92	320	1.8	6.2	2.1	141	366	1.3
1043.1	0.337	24	1.3	81	332	1.4	4.9	2.4	124	380	1.0
1043.8	0.337	29	1.7	84	310	1.9	4.9	3.1	128	354	1.4
1044.4	0.512	33	1.4	97	353	1.4	7.4	2.6	149	403	1.0
1045.1	0.337	30	1.5	83	323	1.3	4.9	2.7	127	370	0.984
1045.8	0.337	22	1.5	77	281	0.761	4.9	2.8	118	321	0.555
1046.5	0.337	28	1.6	80	307	1.3	4.9	2.9	123	351	0.956
1047.2	0.337	35	1.1	85	293	2.5	4.9	2.1	130	336	1.8
1047.9	0.337	29	1.4	82	299	1.8	4.9	2.6	125	342	1.3
1048.6	0.337	25	1.6	80	271	0.673	4.9	3.0	122	310	0.491
1049.3	0.343	23	1.5	71	276	1.1	4.9	2.8	109	316	0.823
1050.0	0.337	32	1.8	100	406	1.6	4.9	3.3	153	464	1.2
1050.7	0.337	28	1.5	92	299	1.7	4.9	2.6	141	342	1.2
1051.4	0.337	31	1.2	92	269	0.809	4.9	2.1	141	308	0.590
1052.1	0.597	29	1.2	76	281	1.1	8.6	2.2	117	322	0.835
1052.8	0.337	28	1.8	80	281	0.774	4.9	3.3	123	321	0.565
1053.5	0.337	31	1.5	92	291	1.4	4.9	2.7	141	333	1.0
1054.2	0.361	36	1.2	86	270	1.3	5.2	2.2	131	309	0.928
1054.9	0.692	34	1.3	96	294	0.796	10.0	2.3	147	336	0.581
1055.6	0.394	28	1.6	77	254	0.894	5.7	3.0	119	290	0.653
1056.3	0.388	25	1.5	73	246	0.641	5.6	2.7	111	281	0.468
1057.0	0.440	30	1.3	70	212	1.2	6.4	2.3	107	243	0.904
1057.7	0.393	33	1.6	95	244	1.1	5.7	2.9	146	279	0.769
1058.4	0.351	33	1.6	88	249	1.4	5.1	3.0	135	285	1.1
1059.1	0.337	26	1.4	81	242	0.884	4.9	2.5	124	277	0.645
1059.8	0.337	25	1.6	77	252	1.7	4.9	2.9	118	288	1.2
1060.5	0.526	32	1.7	99	264	0.873	7.6	3.0	151	302	0.637
1061.2	0.532	31	1.6	89	240	1.1	7.7	2.9	136	274	0.819
1061.9	0.337	26	2.1	92	232	1.1	4.9	3.9	141	265	0.794
1062.6	0.337	29	1.7	85	270	1.3	4.9	3.2	131	309	0.918
1063.3	0.416	24	2.0	93	251	1.1	6.0	3.7	143	287	0.781
1064.0	0.337	29	1.7	81	249	1.9	4.9	3.0	125	285	1.4
1064.7	0.337	30	1.2	90	263	1.7	4.9	2.2	137	300	1.2
1065.4	0.337	26	1.4	85	242	1.5	4.9	2.6	130	276	1.1
1066.1	0.424	26	1.2	80	281	1.6	6.1	2.2	123	321	1.1
1066.8	0.693	29	2.3	95	307	1.5	10	4.2	145	351	1.1
1067.5	0.337	28	2.0	81	233	1.4	4.9	3.6	124	266	1.0
1068.2	0.427	29	2.3	102	282	1.6	6.2	4.2	157	322	1.2
1068.9	0.337	24	1.4	83	269	1.0	4.9	2.5	128	307	0.751
1069.6	0.337	28	2.1	87	276	1.1	4.9	3.9	134	315	0.796
1070.3	0.337	27	2.0	96	313	1.5	4.9	3.7	147	358	1.1
1071.0	0.462	29	2.0	103	265	1.5	6.7	3.7	157	303	1.1
1071.6	0.370	28	1.7	117	266	1.4	5.3	3.0	179	304	1.1
1072.3	0.337	27	1.8	100	257	1.3	4.9	3.3	153	294	0.952
1073.0	0.337	25	2.0	99	284	0.919	4.9	3.6	152	325	0.671



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Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.7	0.370	22	1.6	95	251	1.3	5.3	3.0	145	287	0.943
1074.4	0.337	27	1.8	104	253	1.2	4.9	3.3	160	289	0.873
1075.1	0.337	25	2.0	98	235	0.890	4.9	3.6	150	269	0.649
1075.8	0.337	20	1.9	82	254	0.921	4.9	3.4	126	291	0.672
1076.5	0.337	22	2.0	99	243	0.856	4.9	3.6	151	278	0.624
1077.2	0.337	24	2.3	107	253	1.3	4.9	4.1	163	289	0.944
1077.9	0.355	23	1.8	88	209	0.806	5.1	3.3	135	238	0.588
1078.6	0.466	21	1.6	94	232	1.1	6.7	2.9	145	266	0.820
1079.3	0.359	25	2.2	94	220	1.8	5.2	4.0	144	252	1.3
1080.0	0.337	26	2.2	98	222	1.4	4.9	4.1	151	253	1.0
1080.7	0.401	25	1.7	115	244	1.7	5.8	3.1	176	280	1.3
1081.4	0.337	23	1.5	99	211	1.4	4.9	2.8	152	241	1.0
1082.1	0.337	22	2.1	103	283	1.8	4.9	3.7	158	324	1.3
1082.8	0.384	22	1.9	97	272	0.871	5.5	3.4	149	312	0.635
1083.5	0.368	24	2.2	129	235	0.606	5.3	3.9	197	268	0.442
1084.2	0.374	26	1.5	86	233	1.6	5.4	2.8	131	267	1.2
1084.9	0.337	23	1.5	101	210	0.820	4.9	2.8	155	240	0.598
1085.6	0.337	17	1.6	73	194	1.3	4.9	2.9	112	222	0.927
1086.3	0.337	20	1.8	88	216	1.2	4.9	3.3	134	247	0.859
1087.0	0.511	24	1.9	94	214	1.1	7.4	3.5	144	244	0.787
1087.7	0.337	23	1.6	96	225	1.2	4.9	2.9	147	258	0.841
1088.4	0.337	21	2.1	81	196	0.839	4.9	3.8	124	224	0.612
1089.1	0.337	21	1.8	90	189	1.3	4.9	3.3	138	217	0.978
1089.8	0.337	22	2.4	91	246	1.7	4.9	4.5	139	281	1.2
1090.5	0.337	24	1.6	91	225	1.7	4.9	3.0	140	257	1.2
1091.2	0.337	22	1.8	93	217	0.821	4.9	3.4	142	248	0.599
1091.9	0.337	21	1.8	85	202	1.0	4.9	3.2	131	231	0.730
1092.6	0.348	21	1.9	79	201	1.7	5.0	3.5	120	230	1.2
1093.3	0.514	24	1.9	80	223	1.8	7.4	3.5	123	255	1.3
1094.0	0.402	30	1.8	105	231	1.9	5.8	3.3	161	265	1.4
1094.7	0.337	21	1.6	85	207	1.3	4.9	3.0	130	237	0.935
1095.4	0.337	22	2.0	75	201	1.4	4.9	3.7	115	229	1.0
1096.1	0.337	22	1.3	82	229	1.6	4.9	2.4	125	262	1.2
1096.8	0.337	20	1.9	83	194	1.3	4.9	3.4	128	222	0.943
1097.5	0.398	23	1.5	92	191	1.2	5.7	2.7	140	218	0.853
1098.1	0.337	20	1.7	88	204	1.1	4.9	3.1	134	233	0.801
1098.8	0.337	17	1.7	79	221	1.2	4.9	3.1	120	253	0.905
1099.5	0.337	24	1.9	88	249	1.4	4.9	3.4	135	285	1.0
1100.2	0.337	22	1.8	80	195	1.4	4.9	3.4	122	223	1.0
1100.9	0.337	22	1.7	91	202	1.5	4.9	3.0	140	230	1.1
1101.6	0.337	22	1.6	96	208	1.7	4.9	3.0	147	238	1.2
1102.3	0.337	23	2.0	81	268	2.0	4.9	3.6	123	307	1.4
1103.0	0.337	23	2.2	99	241	2.4	4.9	4.1	152	276	1.8
1103.7	0.337	22	1.6	90	206	1.4	4.9	2.9	137	235	1.1
1104.4	0.337	19	1.3	87	199	1.3	4.9	2.3	133	227	0.929
1105.1	0.337	19	1.4	72	183	1.2	4.9	2.5	110	209	0.857
1105.8	0.337	17	1.5	74	193	1.7	4.9	2.7	113	221	1.3
1106.5	0.337	20	1.8	84	197	1.8	4.9	3.3	128	225	1.3
1107.2	0.337	23	2.0	103	226	2.7	4.9	3.7	158	259	1.9
1107.9	0.337	22	1.9	85	199	1.8	4.9	3.5	130	228	1.3
1108.6	0.337	20	1.7	80	241	2.2	4.9	3.1	123	276	1.6
1109.3	0.534	23	2.2	86	232	1.9	7.7	4.0	131	265	1.4
1110.0	0.337	24	1.9	85	208	2.1	4.9	3.4	130	238	1.5
1110.7	0.337	23	1.9	107	215	2.2	4.9	3.6	164	246	1.6
1111.4	0.420	21	2.2	102	205	1.5	6.1	3.9	156	234	1.1
1112.1	0.337	18	1.8	69	223	1.6	4.9	3.2	105	255	1.1
1112.8	0.428	21	1.8	103	261	2.0	6.2	3.3	157	299	1.5
1113.5	0.337	20	2.4	76	192	2.7	4.9	4.4	116	220	2.0
1114.2	0.405	23	2.2	104	230	2.9	5.8	4.0	160	263	2.1
1114.9	0.337	21	2.1	84	247	1.5	4.9	3.9	129	283	1.1
1115.6	0.337	21	1.4	76	243	2.6	4.9	2.5	117	278	1.9
1116.3	0.337	28	2.4	76	212	2.8	4.9	4.4	117	242	2.0
1117.0	0.337	20	1.8	79	218	1.8	4.9	3.3	121	249	1.3
1117.7	0.337	21	1.8	88	217	1.3	4.9	3.3	135	248	0.967
1118.4	0.337	17	1.4	71	212	2.2	4.9	2.6	108	243	1.6
1119.1	0.337	16	1.9	81	228	2.3	4.9	3.4	124	261	1.7
1119.8	0.337	21	1.6	80	225	1.9	4.9	2.8	123	258	1.4
1120.5	0.337	23	1.9	98	230	2.0	4.9	3.4	150	262	1.5
1121.2	0.337	17	1.6	95	197	2.0	4.9	2.9	146	225	1.4
1121.9	0.423	16	1.6	86	216	2.7	6.1	2.9	132	247	2.0
1122.6	0.337	17	1.6	79	221	2.1	4.9	3.0	121	253	1.5
1123.3	0.337	20	1.7	85	226	2.5	4.9	3.1	131	258	1.8
1124.0	0.337	21	1.9	97	211	2.0	4.9	3.5	149	242	1.4
1124.6	0.571	21	1.6	92	211	2.5	8.2	3.0	140	242	1.8
1125.3	0.337	15	2.3	77	242	2.3	4.9	4.3	118	277	1.7
1126.0	0.337	21	1.7	90	235	2.1	4.9	3.2	139	268	1.6
1126.7	0.706	19	1.6	70	195	2.2	10	3.0	107	224	1.6
1127.4	0.337	18	1.9	85	185	2.2	4.9	3.4	130	212	1.6
1128.1	0.337	17	1.4	76	210	1.9	4.9	2.6	116	240	1.4
1128.8	0.337	13	1.8	72	197	2.9	4.9	3.3	111	226	2.1
1129.5	0.381	16	2.4	85	237	3.4	5.5	4.3	130	271	2.5



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1130.2	0.337	18	1.5	84	256	2.8	4.9	2.8	129	292	2.1
1130.9	0.537	16	2.1	81	202	2.4	7.8	3.8	123	231	1.7
1131.6	0.489	17	1.5	82	222	1.8	7.1	2.7	125	254	1.3
1132.3	0.337	15	1.9	86	239	2.9	4.9	3.5	132	273	2.1
1133.0	0.337	21	2.2	70	262	3.1	4.9	4.1	107	300	2.3
1133.7	0.492	19	2.0	88	244	3.2	7.1	3.6	136	279	2.4
1134.4	0.337	19	1.5	79	269	2.9	4.9	2.7	121	307	2.1
1135.1	0.337	14	1.7	65	217	2.7	4.9	3.1	100	248	2.0
1135.8	0.650	17	2.2	74	268	2.7	9.4	4.0	114	306	2.0
1136.5	0.337	21	1.7	81	272	2.5	4.9	3.0	124	311	1.8
1137.2	0.337	14	1.6	71	226	1.2	4.9	2.8	108	259	0.892
1137.9	0.337	14	1.6	59	234	2.3	4.9	3.0	90	268	1.7
1138.6	0.347	17	1.6	68	263	2.2	5.0	2.9	104	301	1.6
1139.3	0.606	15	1.8	79	326	3.2	8.7	3.4	121	373	2.3
1140.0	0.660	17	1.6	71	290	2.4	9.5	2.9	108	332	1.7
1140.7	0.719	20	1.5	64	274	2.2	10	2.7	98	314	1.6
1141.4	0.337	18	0.954	52	270	1.4	4.9	1.7	80	308	1.0
1142.1	0.337	14	1.7	57	258	2.1	4.9	3.0	87	295	1.5
1142.8	0.337	14	1.6	57	289	1.5	4.9	2.9	87	331	1.1
1143.5	0.337	17	1.7	70	260	2.4	4.9	3.1	108	297	1.8
1144.2	0.337	18	1.3	63	302	1.5	4.9	2.3	97	345	1.1
1144.9	0.466	14	1.4	51	263	3.0	6.7	2.6	78	300	2.2
1145.6	0.470	17	1.3	56	299	1.6	6.8	2.4	86	341	1.1
1146.3	0.337	18	1.4	65	328	2.2	4.9	2.6	100	375	1.6
1147.0	0.457	18	0.898	52	266	2.0	6.6	1.6	80	304	1.5
1147.7	0.900	18	1.4	60	291	1.7	13	2.5	92	333	1.2
1148.4	0.337	17	1.2	50	291	1.6	4.9	2.2	76	332	1.2
1149.1	0.337	15	1.2	52	283	1.3	4.9	2.2	79	323	0.917
1149.8	0.719	16	1.2	50	275	1.7	10	2.2	77	314	1.2
1150.5	0.337	18	1.1	55	277	1.2	4.9	1.9	84	316	0.869
1151.2	0.481	16	0.942	52	281	1.4	6.9	1.7	79	321	1.0
1151.8	0.704	16	0.788	43	242	1.1	10	1.4	65	277	0.809
1152.5	0.444	16	1.3	55	300	1.1	6.4	2.3	85	343	0.774
1153.2	0.337	22	1.0	53	278	1.0	4.9	1.9	81	318	0.758
1153.9	0.550	19	0.939	61	339	1.6	7.9	1.7	94	387	1.2
1154.6	0.337	14	1.1	52	296	0.939	4.9	2.0	80	339	0.685
1155.3	0.337	17	0.854	44	275	1.9	4.9	1.6	68	315	1.4
1156.0	0.760	19	1.0	51	316	0.451	11	1.8	78	362	0.329
1156.7	0.663	19	1.3	52	336	1.8	9.6	2.3	79	384	1.3
1157.4	0.337	22	1.5	50	336	1.1	4.9	2.7	77	384	0.819
1158.1	0.365	21	0.944	57	315	1.6	5.3	1.7	88	360	1.2
1158.8	0.587	21	1.4	46	330	1.7	8.5	2.5	71	377	1.3
1159.5	0.337	18	1.1	50	318	1.8	4.9	1.9	77	364	1.3
1160.2	0.474	20	0.785	46	325	0.643	6.8	1.4	70	372	0.469
1160.9	0.337	23	1.000	49	332	1.2	4.9	1.8	76	380	0.841
1161.6	0.337	22	0.954	44	308	1.5	4.9	1.7	67	352	1.1
1162.3	0.500	20	0.864	43	285	1.6	7.2	1.6	66	326	1.2
1163.0	0.537	24	0.942	47	324	1.1	7.8	1.7	73	371	0.838
1163.7	0.350	24	1.4	51	329	1.7	5.0	2.5	78	376	1.2
1164.4	0.337	20	1.0	47	284	1.1	4.9	1.8	72	325	0.809
1165.1	0.650	22	0.727	43	281	1.1	9.4	1.3	66	322	0.839
1165.8	0.428	23	1.1	49	330	1.9	6.2	2.0	75	378	1.4
1166.5	0.337	23	1.2	51	362	2.3	4.9	2.3	78	413	1.7
1167.2	0.376	24	1.1	46	258	1.1	5.4	2.1	71	295	0.791
1167.9	0.676	20	0.910	48	296	1.2	9.8	1.7	74	339	0.882
1168.6	0.720	23	0.970	49	362	1.2	10	1.8	74	414	0.873
1169.3	0.337	24	1.4	48	335	1.7	4.9	2.5	74	383	1.2
1170.0	0.535	24	0.867	52	347	0.806	7.7	1.6	79	397	0.588
1170.7	0.623	21	0.911	44	313	0.962	9.0	1.7	67	357	0.702
1171.4	0.337	23	1.3	51	301	0.784	4.9	2.3	78	344	0.572
1172.1	0.614	22	1.1	44	350	1.0	8.9	2.1	67	401	0.745
1172.8	0.477	27	1.2	41	338	1.7	6.9	2.1	63	386	1.2
1173.5	0.337	20	1.1	43	300	1.1	4.9	2.1	66	344	0.800
1174.2	0.998	20	1.1	45	336	1.4	14	2.0	69	384	1.0
1174.9	0.522	17	1.2	43	353	0.867	7.5	2.1	66	403	0.633
1175.6	0.502	22	1.3	48	365	0.985	7.3	2.3	73	418	0.718
1176.3	0.337	21	1.2	53	342	2.1	4.9	2.1	81	391	1.5
1176.9	0.541	19	0.922	44	300	1.1	7.8	1.7	67	343	0.819
1177.6	0.487	23	1.1	46	357	0.807	7.0	2.1	71	408	0.589
1178.3	0.521	19	1.1	37	327	1.7	7.5	2.0	57	374	1.3
1179.0	0.337	21	1.4	45	339	1.9	4.9	2.6	69	387	1.4
1179.7	0.337	23	1.3	48	318	1.3	4.9	2.3	74	364	0.928
1180.4	0.381	19	1.2	45	283	1.2	5.5	2.2	70	323	0.874
1181.1	0.666	20	1.3	51	334	1.0	9.6	2.3	78	382	0.759
1181.8	0.423	19	1.8	42	315	0.777	6.1	3.3	64	360	0.567
1182.5	0.469	20	1.3	44	368	1.3	6.8	2.4	67	421	0.943
1183.2	0.440	17	1.4	44	387	0.566	6.4	2.5	67	443	0.413
1183.9	0.522	18	1.1	47	415	0.866	7.5	2.0	72	474	0.632
1184.6	0.354	18	0.990	42	371	1.2	5.1	1.8	65	424	0.855
1185.3	0.824	18	1.2	36	400	1.3	12	2.3	55	458	0.958
1186.0	0.628	20	1.4	46	384	1.5	9.1	2.6	70	439	1.1



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1186.7	0.979	19	1.5	43	356	1.5	14	2.7	65	407	1.1
1187.4	0.739	18	1.0	47	384	1.4	11	1.9	72	439	1.0
1188.1	0.681	15	1.3	41	311	0.734	9.8	2.4	63	356	0.535
1188.8	0.797	18	1.4	42	383	1.7	12	2.5	64	438	1.2
1189.5	0.411	18	1.5	42	432	1.1	5.9	2.7	65	494	0.827
1190.2	0.493	21	1.5	48	411	1.9	7.1	2.7	74	470	1.4
1190.9	0.509	19	1.2	46	384	0.845	7.3	2.2	71	439	0.617
1191.6	0.575	17	1.5	35	363	0.752	8.3	2.7	54	415	0.548
1192.3	0.337	15	1.1	39	346	1.7	4.9	2.0	60	395	1.2
1193.0	0.507	20	1.3	45	375	1.9	7.3	2.4	68	429	1.4
1193.7	0.594	16	0.986	40	362	1.4	8.6	1.8	61	414	0.997
1194.4	0.446	15	1.1	28	305	1.2	6.4	2.1	43	349	0.900
1195.1	0.374	18	1.5	33	316	1.2	5.4	2.7	50	361	0.853
1195.8	0.642	21	1.3	39	388	1.3	9.3	2.4	59	444	0.958
1196.5	0.337	19	1.2	50	491	1.5	4.9	2.2	76	562	1.1
1197.2	0.615	22	1.4	38	323	1.2	8.9	2.5	58	370	0.853
1197.9	0.454	23	1.7	40	366	1.1	6.6	3.2	61	419	0.768
1198.6	0.857	22	1.1	35	353	0.858	12	2.0	53	404	0.626
1199.3	0.582	21	1.7	40	394	1.6	8.4	3.0	61	451	1.2
1200.0	0.337	23	1.4	33	327	1.3	4.9	2.6	50	374	0.956
1200.7	0.337	23	1.5	36	309	1.4	4.9	2.7	54	354	1.0
1201.4	0.337	19	1.5	37	345	1.7	4.9	2.8	56	395	1.2
1202.1	0.863	19	1.3	38	387	2.1	12	2.4	58	442	1.5
1202.8	0.462	22	1.4	36	342	1.4	6.7	2.5	56	391	1.0
1203.5	0.337	21	1.6	38	394	1.0	4.9	2.9	59	451	0.765
1204.1	0.542	21	1.2	42	392	1.1	7.8	2.2	64	448	0.776
1204.8	0.634	19	1.4	34	393	1.1	9.2	2.6	53	450	0.828
1205.5	0.372	20	1.4	34	432	1.6	5.4	2.5	52	494	1.2
1206.2	0.631	22	1.4	36	395	1.5	9.1	2.5	56	451	1.1
1206.9	0.930	23	1.5	32	380	1.8	13	2.7	50	435	1.3
1207.6	0.494	20	1.3	32	332	1.2	7.1	2.4	49	379	0.869
1208.3	0.722	19	1.5	30	373	1.1	10	2.8	46	426	0.780
1209.0	0.762	24	1.5	33	428	1.2	11	2.7	51	489	0.868
1209.7	0.770	25	1.7	36	448	1.4	11	3.1	55	513	0.995
1210.4	0.523	23	1.4	34	382	1.7	7.5	2.5	53	437	1.3
1211.1	0.438	21	1.3	44	409	1.6	6.3	2.4	67	468	1.2
1211.8	0.337	21	1.6	25	369	0.848	4.9	2.8	38	422	0.619
1212.5	0.712	21	1.5	33	472	1.5	10	2.7	50	540	1.1
1213.2	0.533	25	1.6	31	397	2.7	7.7	3.0	47	454	1.9
1213.9	0.550	22	1.3	32	403	1.3	7.9	2.4	49	461	0.945
1214.6	0.337	24	2.0	37	444	1.2	4.9	3.7	56	507	0.876
1215.3	0.443	22	1.8	31	412	1.8	6.4	3.2	47	472	1.3
1216.0	0.642	23	1.7	31	367	1.4	9.3	3.0	47	419	0.988
1216.7	1.2	22	1.3	35	399	1.3	17	2.3	53	457	0.972
1217.4	0.397	19	1.5	28	361	1.7	5.7	2.7	42	413	1.2
1218.1	0.337	20	1.5	34	417	1.6	4.9	2.7	53	477	1.1
1218.8	0.661	24	1.7	27	419	2.0	9.5	3.1	41	480	1.4
1219.5	0.494	24	2.1	33	453	2.2	7.1	3.8	50	518	1.6
1220.2	0.451	25	2.1	32	411	1.9	6.5	3.7	49	470	1.4
1220.9	0.505	17	1.3	31	467	2.3	7.3	2.4	47	534	1.7
1221.6	0.337	18	1.7	32	412	1.4	4.9	3.0	49	471	1.0
1222.3	0.830	26	2.0	32	453	1.9	12	3.6	49	517	1.4
1223.0	0.501	26	1.9	32	425	1.2	7.2	3.4	49	486	0.907
1223.7	0.627	24	1.8	34	416	1.7	9.1	3.3	53	476	1.2
1224.4	0.674	21	1.4	24	430	0.881	9.7	2.6	36	492	0.643
1225.1	0.674	21	2.0	28	489	1.4	9.7	3.6	43	559	1.1
1225.8	0.664	22	2.2	31	454	2.1	9.6	4.1	47	520	1.5
1226.5	0.337	26	1.8	32	464	1.4	4.9	3.3	49	531	1.000
1227.2	0.542	26	2.2	32	524	2.5	7.8	4.0	49	599	1.8
1227.9	0.337	18	1.9	24	398	1.4	4.9	3.4	37	455	1.0
1228.6	0.741	28	2.0	25	546	2.3	11	3.7	38	624	1.7
1229.2	0.854	28	2.7	34	529	2.2	12	4.9	52	605	1.6
1229.9	0.341	29	2.0	34	474	1.6	4.9	3.6	52	542	1.2
1230.6	0.337	23	2.0	26	437	0.852	4.9	3.6	40	500	0.622
1231.3	0.707	23	2.6	23	498	2.1	10	4.8	36	570	1.5
1232.0	0.828	31	2.2	27	462	1.9	12	4.0	42	529	1.4
1232.7	0.499	27	2.4	32	485	1.5	7.2	4.4	49	555	1.1
1233.4	0.586	27	2.1	25	422	1.8	8.5	3.9	38	483	1.3
1234.1	0.660	25	2.6	23	400	0.962	9.5	4.7	35	457	0.702
1234.8	0.567	24	2.4	25	392	1.5	8.2	4.4	38	448	1.1
1235.5	0.622	24	2.8	24	423	1.4	9.0	5.1	37	483	1.0
1236.2	0.692	27	2.8	26	422	1.3	10.0	5.2	39	482	0.960
1236.9	0.489	25	3.0	29	433	1.3	7.1	5.5	45	495	0.918
1237.6	0.758	24	3.0	31	524	1.3	11	5.4	47	599	0.981
1238.3	0.396	24	3.0	27	507	1.6	5.7	5.5	41	580	1.2
1239.0	0.487	29	3.5	26	442	1.2	7.0	6.4	39	506	0.910
1239.7	0.337	27	3.6	28	497	1.3	4.9	6.6	43	569	0.913
1240.4	0.743	24	4.2	24	464	0.946	11	7.7	37	531	0.690
1241.1	0.430	24	4.0	27	415	0.925	6.2	7.3	41	475	0.675
1241.8	0.337	24	4.1	21	436	0.534	4.9	7.6	32	498	0.389
1242.5	0.337	26	4.7	27	481	1.8	4.9	8.5	41	550	1.3



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1243.2	0.936	28	4.5	27	441	1.6	14	8.3	41	505	1.2
1243.9	0.337	29	3.9	24	414	1.5	4.9	7.2	37	473	1.1
1244.6	0.824	26	4.0	22	431	1.0	12	7.4	34	493	0.739
1245.3	0.425	25	4.1	26	428	1.2	6.1	7.5	40	490	0.841
1246.0	0.679	27	5.0	26	444	1.8	9.8	9.1	40	508	1.3
1246.7	0.628	31	4.6	28	503	1.1	9.1	8.4	42	575	0.817
1247.4	0.659	30	11	21	440	1.5	9.5	19	33	503	1.1
1248.1	0.592	25	4.6	28	465	1.2	8.5	8.3	43	532	0.910
1248.8	0.687	28	4.7	27	467	0.875	9.9	8.6	41	534	0.639
1249.5	0.790	28	4.5	23	427	0.840	11	8.3	35	488	0.613
1250.2	0.762	30	5.5	27	495	1.5	11	10.0	41	566	1.1
1250.9	0.340	31	4.8	25	458	1.3	4.9	8.7	38	524	0.956
1251.6	0.996	27	4.5	28	410	1.1	14	8.3	42	469	0.810
1252.3	0.369	26	4.8	24	450	1.3	5.3	8.8	38	515	0.980
1253.0	0.375	29	5.2	25	473	1.1	5.4	9.4	39	541	0.804
1253.7	0.982	31	4.9	24	471	1.2	14	9.0	36	539	0.862
1254.4	0.760	28	5.1	31	476	1.3	11	9.3	47	544	0.924
1255.1	0.984	27	5.0	29	455	1.0	14	9.1	45	521	0.738
1255.7	0.487	25	4.1	23	420	1.1	7.0	7.5	35	480	0.773
1256.4	0.817	30	5.5	25	499	0.974	12	10	38	570	0.711
1257.1	0.478	30	5.2	27	476	1.3	6.9	9.5	42	545	0.917
1257.8	0.608	27	5.0	25	442	1.3	8.8	9.2	39	506	0.969
1258.5	0.337	28	5.3	25	477	1.4	4.9	9.7	39	546	0.991
1259.2	0.337	33	5.1	27	458	1.4	4.9	9.4	41	524	1.0
1259.9	0.409	32	5.6	30	448	0.863	5.9	10	45	513	0.630
1260.6	0.672	32	5.2	22	472	1.5	9.7	9.4	34	540	1.1
1261.3	0.644	42	5.7	30	489	0.947	9.3	10	47	559	0.691
1262.0	0.539	36	6.0	29	513	1.5	7.8	11	45	586	1.1
1262.7	0.696	39	5.6	27	514	1.9	10	10	42	587	1.4
1263.4	0.471	44	6.2	29	549	1.6	6.8	11	44	627	1.2
1264.1	0.502	36	5.1	28	487	1.1	7.2	9.3	43	557	0.826
1264.8	1.2	35	4.8	29	495	1.2	18	8.7	44	566	0.871
1265.5	0.729	31	4.7	23	449	1.2	11	8.6	36	514	0.888
1266.2	0.539	35	11	22	499	1.4	7.8	20	34	570	1.0
1266.9	0.427	40	5.3	29	509	1.4	6.2	9.7	44	582	1.0
1267.6	0.578	38	5.2	25	471	1.8	8.3	9.4	39	539	1.3
1268.3	0.907	41	6.3	27	489	0.884	13	12	41	559	0.645
1269.0	0.556	40	6.4	26	519	1.5	8.0	12	40	594	1.1
1269.7	0.426	45	6.1	26	564	1.6	6.2	11	39	645	1.2
1270.4	0.741	44	6.5	28	542	1.2	11	12	43	620	0.902
1271.1	0.652	38	6.2	24	495	1.4	9.4	11	37	566	1.0
1271.8	0.611	35	6.1	27	543	1.2	8.8	11	41	621	0.900
1272.5	0.399	33	6.5	26	580	1.3	5.8	12	41	663	0.926
1273.2	0.582	31	5.3	25	536	1.1	8.4	9.7	39	612	0.820
1273.9	0.479	30	5.8	28	534	1.3	6.9	10	43	611	0.982
1274.6	0.448	29	5.6	24	517	1.4	6.5	10	37	591	1.0
1275.3	0.406	31	6.2	23	614	0.882	5.9	11	36	702	0.644
1276.0	0.472	36	6.4	30	594	1.6	6.8	12	45	679	1.2
1276.7	0.337	31	4.8	22	450	1.2	4.9	8.7	34	514	0.895
1277.4	0.660	30	4.3	23	482	0.892	9.5	7.8	35	551	0.651
1278.1	0.686	33	5.0	27	509	1.1	9.9	9.1	41	582	0.834
1278.8	0.520	32	5.2	21	523	1.2	7.5	9.4	32	598	0.842
1279.5	0.641	36	4.6	21	574	1.5	9.3	8.4	32	657	1.1
1280.2	0.683	31	3.7	23	457	0.830	9.9	6.8	36	522	0.605
1280.9	0.761	40	4.2	21	478	1.6	11	7.6	32	547	1.2
1281.6	0.943	37	4.0	23	475	1.3	14	7.3	35	543	0.966
1282.3	1.0	30	4.1	23	515	1.4	14	7.4	36	589	0.995
1282.9	0.609	35	3.9	24	477	1.5	8.8	7.1	36	546	1.1
1283.6	0.410	32	3.0	20	408	1.5	5.9	5.5	30	466	1.1
1284.3	0.510	33	3.8	32	500	1.5	7.4	6.9	49	571	1.1
1285.0	0.705	33	3.5	26	457	1.7	10	6.4	40	522	1.3
1285.7	0.337	36	3.2	26	465	1.2	4.9	5.8	40	531	0.859
1286.4	0.643	31	3.2	24	478	1.6	9.3	5.8	38	547	1.1
1287.1	0.401	32	3.4	27	441	2.1	5.8	6.2	41	504	1.6
1287.8	0.897	29	3.4	25	431	0.713	13	6.3	39	493	0.520
1288.5	0.856	31	3.5	29	452	1.7	12	6.4	45	517	1.3
1289.2	0.759	32	3.3	28	472	1.6	11	6.1	43	540	1.2
1289.9	0.648	31	2.7	28	445	1.6	9.4	4.9	43	509	1.2
1290.6	0.525	26	2.5	29	416	1.3	7.6	4.6	44	475	0.930
1291.3	0.875	47	2.9	35	500	1.9	13	5.3	53	571	1.4
1292.0	0.658	31	2.9	30	475	2.0	9.5	5.2	46	543	1.4
1292.7	0.465	24	2.8	31	421	1.4	6.7	5.2	48	481	1.0
1293.4	0.741	28	2.1	28	384	1.3	11	3.8	42	439	0.951
1294.1	0.337	27	2.7	29	453	1.4	4.9	5.0	44	518	1.1
1294.8	0.910	23	2.9	26	419	1.7	13	5.2	40	479	1.2
1295.5	0.654	26	2.6	30	451	1.2	9.4	4.7	46	516	0.844
1296.2	0.546	27	2.6	32	394	1.7	7.9	4.8	49	451	1.3
1296.9	0.376	29	2.7	23	404	1.7	5.4	4.9	36	462	1.2
1297.6	0.767	32	2.8	30	453	1.6	11	5.0	46	518	1.2
1298.3	0.425	25	2.6	26	396	1.3	6.1	4.7	40	453	0.981
1299.0	1.1	27	2.8	31	428	1.7	15	5.2	48	489	1.2



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1299.7	0.735	26	2.1	29	384	1.8	11	3.8	44	440	1.3
1300.4	0.456	29	2.7	30	419	2.1	6.6	5.0	46	479	1.5
1301.1	0.942	24	2.9	31	401	1.3	14	5.2	47	458	0.939
1301.8	0.712	26	2.7	27	470	1.1	10	5.0	41	423	0.770
1302.5	0.598	28	3.0	31	437	1.8	8.6	5.5	48	500	1.3
1303.2	0.838	27	2.9	33	470	1.3	12	5.3	50	537	0.913
1303.9	0.882	26	2.7	28	413	1.8	13	4.8	43	473	1.3
1304.6	0.803	27	2.7	32	465	1.6	12	4.9	49	532	1.1
1305.3	0.779	29	2.7	34	408	1.5	11	4.9	52	467	1.1
1306.0	0.688	29	2.3	33	417	1.9	9.9	4.1	50	477	1.4
1306.7	0.684	28	2.4	34	451	0.875	9.9	4.4	52	515	0.638
1307.4	0.436	25	2.9	31	473	2.1	6.3	5.3	47	541	1.5
1308.1	0.870	29	2.3	29	434	1.5	13	4.2	44	497	1.1
1308.8	0.763	28	2.3	26	387	1.1	11	4.2	41	443	0.773
1309.4	0.645	30	2.6	31	434	2.5	9.3	4.8	47	496	1.8
1310.1	0.916	27	2.2	30	414	1.4	13	4.1	46	474	0.990
1310.8	0.361	25	2.4	28	453	1.9	5.2	4.4	44	518	1.4
1311.5	0.857	26	2.7	30	445	1.9	12	4.9	46	508	1.4
1312.2	0.580	26	2.2	37	380	1.2	8.4	4.1	57	435	0.905
1312.9	0.471	29	2.7	30	382	1.2	6.8	4.9	46	437	0.881
1313.6	0.820	28	2.4	31	353	1.4	12	4.3	48	403	0.998
1314.3	0.465	25	2.2	29	386	2.0	6.7	4.0	44	442	1.5
1315.0	0.783	27	2.4	35	428	1.7	11	4.3	54	489	1.2
1315.7	1.1	28	2.2	32	399	1.7	16	3.9	49	456	1.2
1316.4	0.446	25	1.9	30	349	1.5	6.4	3.5	46	400	1.1
1317.1	0.859	27	2.4	32	414	1.7	12	4.4	49	474	1.2
1317.8	1.1	26	2.1	34	388	1.3	15	3.8	51	443	0.979
1318.5	0.720	25	2.3	33	411	1.5	10	4.2	51	470	1.1
1319.2	0.657	26	2.5	35	390	0.923	9.5	4.6	54	446	0.674
1319.9	0.752	26	2.3	32	422	1.3	11	4.2	49	483	0.914
1320.6	0.752	24	1.9	28	351	1.1	11	3.4	43	401	0.819
1321.3	0.337	27	2.0	32	355	1.2	4.9	3.6	49	406	0.894
1322.0	0.338	25	1.9	37	460	1.9	4.9	3.5	57	526	1.4
1322.7	0.455	31	2.3	35	445	1.7	6.6	4.1	54	509	1.2
1323.4	0.853	28	2.5	34	381	1.8	12	4.6	53	436	1.3
1324.1	0.453	28	1.8	30	368	2.0	6.5	3.3	46	421	1.5
1324.8	2.0	27	1.8	32	377	1.0	29	3.3	49	431	0.763
1325.5	0.607	24	2.2	30	353	1.5	8.8	4.0	45	404	1.1
1326.2	0.528	25	2.2	35	363	1.5	7.6	4.0	54	416	1.1
1326.9	0.615	24	2.0	51	370	1.9	8.9	3.6	78	423	1.4
1327.6	0.764	21	1.7	31	371	1.5	11	3.1	47	424	1.1
1328.3	0.794	26	2.1	32	379	1.2	11	3.8	49	434	0.865
1329.0	0.337	28	2.0	34	374	1.6	4.9	3.6	53	428	1.2
1329.7	0.337	23	1.8	42	393	1.3	4.9	3.2	64	449	0.923
1330.4	0.755	24	1.8	40	328	1.3	11	3.3	62	375	0.918
1331.1	1.0	20	1.3	33	346	1.1	15	2.5	51	396	0.784
1331.8	0.460	25	1.9	37	386	1.9	6.6	3.5	56	442	1.4
1332.5	0.337	27	1.8	44	416	1.4	4.9	3.2	67	476	1.0
1333.2	0.442	25	1.4	33	323	1.3	6.4	2.5	51	369	0.924
1333.9	0.813	23	1.4	39	360	1.1	12	2.6	60	412	0.792
1334.6	0.686	23	1.8	36	387	1.7	9.9	3.3	56	443	1.2
1335.2	0.766	27	1.4	38	448	1.4	11	2.6	58	512	1.0
1335.9	0.539	25	1.7	36	361	2.0	7.8	3.1	55	412	1.5
1336.6	0.677	22	1.5	35	348	0.987	9.8	2.8	53	398	0.720
1337.3	0.337	23	1.7	33	368	1.8	4.9	3.2	51	421	1.3
1338.0	0.693	24	1.6	35	409	2.3	10	2.9	54	467	1.7
1338.7	0.550	24	1.3	37	376	0.913	7.9	2.4	56	430	0.666
1339.4	0.736	27	1.8	40	381	1.7	11	3.3	62	435	1.3
1340.1	1.0	23	1.5	36	365	1.6	15	2.6	55	418	1.2
1340.8	0.788	26	1.4	40	374	0.803	11	2.6	61	427	0.586
1341.5	0.364	22	1.6	33	345	1.1	5.3	2.9	50	394	0.829
1342.2	0.933	22	1.3	37	376	1.7	13	2.5	56	430	1.2
1342.9	0.337	26	1.6	40	329	1.2	4.9	2.9	61	376	0.886
1343.6	1.1	23	1.8	38	353	1.5	15	3.3	58	404	1.1
1344.3	0.672	25	1.6	35	377	1.9	9.7	3.0	54	431	1.4
1345.0	0.819	23	1.6	41	382	2.9	12	3.0	62	437	2.1
1345.7	0.829	23	1.4	39	367	1.6	12	2.6	59	420	1.2
1346.4	0.337	23	1.3	40	360	0.940	4.9	2.4	61	411	0.686
1347.1	0.337	21	1.3	36	346	1.5	4.9	2.3	55	396	1.1
1347.8	0.632	22	1.1	32	328	1.8	9.1	2.0	50	375	1.3
1348.5	0.889	26	1.5	39	390	1.4	13	2.7	60	446	1.0
1349.2	0.625	27	1.4	43	363	1.3	9.0	2.5	66	416	0.933
1349.9	0.929	26	1.4	43	337	1.8	13	2.5	65	385	1.3
1350.6	0.482	22	1.1	38	372	1.5	7.0	2.1	58	426	1.1
1351.3	0.337	22	1.4	38	359	1.3	4.9	2.5	59	411	0.957
1352.0	0.705	25	1.2	43	358	2.0	10	2.1	66	409	1.4
1352.7	0.457	22	1.4	44	353	1.7	6.6	2.6	68	404	1.2
1353.4	0.740	21	1.3	39	369	1.4	11	2.3	60	422	1.000
1354.1	0.711	20	1.3	35	307	0.562	10	2.3	54	351	0.410
1354.8	0.492	23	1.1	35	337	1.3	7.1	1.9	53	385	0.963
1355.5	0.464	25	1.1	37	330	1.8	6.7	2.0	57	377	1.3



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1356.2	0.846	26	1.5	47	370	1.6	12	2.8	73	423	1.1
1356.9	0.627	20	1.1	45	377	1.5	9.0	2.0	69	431	1.1
1357.6	0.709	20	1.3	35	332	1.6	10	2.4	54	380	1.1
1358.3	0.337	24	1.3	41	359	0.933	4.9	2.4	63	410	0.681
1359.0	1.1	21	1.5	43	331	0.572	15	2.7	66	378	0.417
1359.7	0.356	21	1.2	44	340	1.5	5.1	2.2	67	389	1.1
1360.4	0.527	21	1.0	43	334	0.874	7.6	1.8	66	382	0.638
1361.1	0.509	18	0.860	38	355	0.538	7.4	1.6	59	406	0.392
1361.7	0.720	19	1.2	44	406	1.3	10	2.3	68	464	0.984
1362.4	0.595	22	0.964	42	314	1.3	8.6	1.8	65	360	0.928
1363.1	0.519	20	1.0	39	336	0.934	7.5	1.8	60	384	0.682
1363.8	0.657	19	1.1	41	318	1.1	9.5	2.0	63	364	0.798
1364.5	0.495	19	1.1	35	344	1.5	7.1	2.0	53	393	1.1
1365.2	0.783	19	1.1	36	323	1.4	11	2.1	55	369	1.0
1365.9	0.760	22	0.992	43	328	1.4	11	1.8	65	375	1.0
1366.6	0.504	20	0.936	42	328	0.837	7.3	1.7	65	375	0.610
1367.3	0.592	20	1.0	40	314	0.844	8.5	1.9	61	359	0.616
1368.0	0.492	19	1.1	42	325	1.3	7.1	2.1	64	372	0.920
1368.7	0.660	22	1.5	48	325	1.6	9.5	2.7	74	372	1.2
1369.4	0.417	21	1.3	44	319	1.4	6.0	2.3	68	365	1.0
1370.1	0.337	24	1.1	41	295	0.846	4.9	2.0	63	338	0.617
1370.8	0.368	19	0.863	37	338	0.947	5.3	1.6	56	387	0.691
1371.5	0.522	23	1.2	52	375	1.5	7.5	2.2	79	428	1.1
1372.2	0.364	19	0.942	40	275	1.5	5.3	1.7	61	315	1.1
1372.9	0.337	18	0.990	43	303	1.6	4.9	1.8	65	347	1.2
1373.6	0.352	16	1.2	45	296	1.3	5.1	2.2	70	339	0.954
1374.3	0.337	19	1.0	49	397	1.0	4.9	1.9	75	453	0.736
1375.0	0.496	21	0.723	42	298	0.755	7.2	1.3	64	340	0.551
1375.7	0.835	24	0.971	48	291	1.6	12	1.8	73	333	1.1
1376.4	0.416	20	1.1	45	336	1.4	6.0	2.1	70	384	1.0
1377.1	0.337	20	0.946	44	369	1.4	4.9	1.7	68	421	0.991
1377.8	0.725	17	0.939	40	286	1.1	10	1.7	61	327	0.830
1378.5	0.421	19	0.798	49	306	1.7	6.1	1.5	75	350	1.2
1379.2	0.750	17	0.545	50	310	1.5	11	0.994	77	355	1.1
1379.9	0.987	18	0.792	44	281	1.0	14	1.4	67	321	0.744
1380.6	0.337	20	0.911	40	277	1.4	4.9	1.7	61	316	1.0
1381.3	0.481	20	1.0	36	266	1.2	6.9	1.8	55	305	0.846
1382.0	0.611	19	0.893	49	291	1.2	8.8	1.6	76	333	0.900
1382.7	0.501	17	0.761	45	305	1.4	7.2	1.4	68	348	1.0
1383.4	0.426	19	0.790	49	342	1.6	6.2	1.4	75	391	1.1
1384.1	0.337	19	1.0	45	331	1.3	4.9	1.8	68	378	0.942
1384.8	0.337	21	0.700	44	367	1.6	4.9	1.3	68	420	1.1
1385.5	0.337	17	0.600	46	275	1.4	4.9	1.1	70	315	1.0
1386.2	0.392	17	0.711	45	325	1.5	5.7	1.3	69	371	1.1
1386.9	0.337	19	0.984	45	314	1.4	4.9	1.8	69	359	1.000
1387.6	0.798	18	0.769	39	316	1.2	12	1.4	60	361	0.869
1388.3	0.376	22	0.438	47	275	1.6	5.4	0.798	71	314	1.2
1388.9	0.398	18	0.803	42	278	1.1	5.8	1.5	65	318	0.801
1389.6	0.337	18	0.633	43	286	0.894	4.9	1.2	65	328	0.653
1390.3	0.498	16	0.791	47	271	1.4	7.2	1.4	71	310	0.986
1391.0	0.757	17	0.668	45	268	1.2	11	1.2	69	306	0.853
1391.7	0.438	15	0.787	49	368	2.5	6.3	1.4	75	421	1.8
1392.4	0.465	15	0.795	40	313	0.771	6.7	1.4	62	358	0.562
1393.1	0.766	16	0.798	37	285	1.7	11	1.5	57	326	1.3
1393.8	0.458	20	1.1	46	328	1.1	6.6	2.1	71	375	0.831
1394.5	0.337	18	1.1	41	286	1.5	4.9	1.9	63	327	1.1
1395.2	0.537	23	1.0	51	308	1.9	7.8	1.9	77	353	1.4
1395.9	0.337	15	0.784	42	256	1.1	4.9	1.4	64	292	0.834
1396.6	0.829	16	0.758	48	322	1.8	12	1.4	74	368	1.3
1397.3	0.337	18	0.939	55	268	0.785	4.9	1.7	84	306	0.573
1398.0	0.337	19	0.708	50	261	1.9	4.9	1.3	77	299	1.4
1398.7	0.337	18	0.877	52	277	1.7	4.9	1.6	79	317	1.2
1399.4	0.337	15	1.1	50	293	1.5	4.9	1.9	76	335	1.1
1400.1	0.437	14	0.972	47	250	1.8	6.3	1.8	71	286	1.3
1400.8	0.767	19	1.1	50	253	2.0	11	2.1	77	289	1.5
1401.5	0.337	17	1.3	62	255	2.1	4.9	2.3	94	291	1.6
1402.2	0.627	18	1.3	59	257	1.6	9.1	2.3	91	294	1.2
1402.9	0.621	15	1.1	51	265	1.1	9.0	2.0	78	303	0.810
1403.6	0.337	15	1.3	52	237	2.3	4.9	2.5	80	271	1.7
1404.3	0.337	18	1.2	61	269	2.3	4.9	2.3	93	308	1.7
1405.0	0.337	17	1.1	58	211	1.8	4.9	2.0	89	241	1.3
1405.7	0.447	16	1.4	54	275	1.6	6.5	2.5	83	315	1.1
1406.4	0.337	14	0.979	49	252	1.3	4.9	1.8	75	288	0.913
1407.1	0.337	19	1.1	61	294	2.4	4.9	2.0	94	336	1.8
1407.8	0.448	18	0.863	55	228	2.3	6.5	1.6	84	261	1.7
1408.5	0.745	15	1.1	65	219	1.8	11	1.9	100	250	1.3
1409.2	0.517	14	1.1	55	225	1.1	7.5	2.0	85	258	0.772
1409.9	0.516	19	1.4	57	267	2.6	7.4	2.5	87	305	1.9
1410.6	0.337	18	1.4	64	239	2.2	4.9	2.5	97	273	1.6
1411.3	0.337	17	0.894	57	206	2.4	4.9	1.6	87	236	1.7
1412.0	0.511	17	1.5	67	236	1.9	7.4	2.6	103	270	1.4



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1412.7	0.337	14	1.2	56	187	1.3	4.9	2.2	85	214	0.927
1413.4	0.337	19	1.1	57	247	2.0	4.9	1.9	87	283	1.5
1414.1	0.540	20	1.5	72	257	1.9	7.8	2.8	110	294	1.4
1414.7	0.337	17	1.4	61	198	2.0	4.9	2.5	94	227	1.5
1415.4	0.465	17	1.3	61	194	1.5	6.7	2.3	93	222	1.1
1416.1	0.364	16	1.5	61	226	1.7	5.3	2.8	93	258	1.2
1416.8	0.337	17	1.6	67	205	2.2	4.9	2.8	103	235	1.6
1417.5	0.367	20	1.4	64	216	2.6	5.3	2.5	99	247	1.9
1418.2	0.337	19	1.5	78	204	1.0	4.9	2.7	120	234	0.765
1418.9	0.368	15	1.4	69	199	1.7	5.3	2.5	106	228	1.3
1419.6	0.421	18	1.6	65	232	2.2	6.1	3.0	100	265	1.6
1420.3	0.337	19	1.7	68	206	1.9	4.9	3.2	104	236	1.4
1421.0	0.337	19	1.6	81	206	2.4	4.9	2.9	124	236	1.8
1421.7	0.337	18	1.4	69	220	1.5	4.9	2.6	105	251	1.1
1422.4	0.337	15	1.7	61	220	1.2	4.9	3.2	93	251	0.895
1423.1	0.731	18	1.6	68	238	2.8	11	3.0	104	272	2.0
1423.8	0.407	21	1.8	70	222	1.9	5.9	3.2	107	254	1.4
1424.5	0.517	22	1.7	71	199	1.2	7.5	3.2	108	228	0.909
1425.2	0.337	18	1.5	71	179	1.9	4.9	2.8	108	205	1.4
1425.9	0.337	19	1.8	67	189	1.1	4.9	3.2	103	217	0.824
1426.6	0.407	17	2.2	64	245	2.4	5.9	4.0	98	281	1.8
1427.3	0.337	20	1.9	72	234	2.4	4.9	3.5	110	268	1.8
1428.0	0.418	21	1.4	77	222	1.9	6.0	2.5	119	254	1.4
1428.7	0.337	20	1.6	68	191	1.5	4.9	2.9	104	218	1.1
1429.4	0.337	19	1.7	64	231	2.2	4.9	3.0	99	264	1.6
1430.1	0.477	19	1.9	73	204	2.1	6.9	3.5	112	233	1.5
1430.8	0.337	26	1.9	72	208	2.1	4.9	3.5	110	237	1.5
1431.5	0.405	21	2.1	78	215	2.5	5.9	3.7	120	246	1.8
1432.2	0.337	18	1.8	72	213	2.2	4.9	3.2	110	244	1.6
1432.9	0.337	20	1.9	62	216	1.3	4.9	3.5	95	246	0.955
1433.6	0.337	21	1.8	75	258	1.5	4.9	3.3	114	295	1.1
1434.3	0.337	22	2.1	71	202	1.3	4.9	3.8	109	231	0.974
1435.0	0.448	17	1.3	68	193	0.816	6.5	2.3	105	221	0.595
1435.7	0.337	18	1.6	66	208	2.1	4.9	2.8	102	237	1.5
1436.4	0.555	17	1.7	66	193	1.3	8.0	3.1	102	221	0.932
1437.1	0.337	22	2.0	66	192	1.9	4.9	3.7	101	220	1.4
1437.8	0.337	20	1.9	64	192	1.4	4.9	3.4	98	219	1.0
1438.5	0.337	21	1.9	74	202	1.8	4.9	3.4	113	230	1.3
1439.2	0.337	18	1.6	64	219	1.4	4.9	3.0	98	251	1.0
1439.9	0.337	23	2.1	71	215	1.2	4.9	3.8	108	246	0.882
1440.6	0.337	26	1.6	77	200	2.0	4.9	3.0	118	228	1.4
1441.2	0.337	21	1.6	59	180	1.9	4.9	2.9	91	206	1.4
1441.9	0.337	22	1.6	63	202	1.6	4.9	3.0	97	231	1.2
1442.6	0.337	17	2.0	62	195	1.3	4.9	3.6	96	223	0.952
1443.3	0.471	19	2.1	70	209	1.9	6.8	3.8	107	239	1.4
1444.0	0.337	21	2.0	66	210	2.1	4.9	3.6	101	241	1.5
1444.7	0.640	25	1.6	59	164	1.3	9.2	2.9	90	188	0.984
1445.4	0.438	26	1.8	84	226	2.1	6.3	3.3	128	259	1.5
1446.1	0.337	22	1.6	65	243	1.4	4.9	2.9	100	278	1.0
1446.8	0.337	24	2.4	72	248	2.1	4.9	4.3	110	284	1.5
1447.5	0.493	27	1.9	59	219	1.2	7.1	3.5	91	250	0.874
1448.2	0.505	26	2.0	55	218	1.2	7.3	3.7	84	249	0.867
1448.9	0.337	28	1.8	65	228	1.4	4.9	3.3	100	261	0.991
1449.6	0.337	27	2.3	66	209	1.1	4.9	4.1	101	238	0.809
1450.3	0.391	160	1.9	55	205	1.1	5.6	3.4	85	234	0.818
1451.0	0.717	31	2.4	69	234	2.1	10	4.5	105	267	1.5
1451.7	0.337	29	1.8	75	211	1.7	4.9	3.2	115	242	1.3
1452.4	0.372	26	1.9	64	192	1.3	5.4	3.4	99	220	0.951
1453.1	0.337	26	1.7	59	236	1.6	4.9	3.0	90	270	1.2
1453.8	0.337	28	2.1	63	249	1.1	4.9	3.9	96	285	0.832
1454.5	0.380	31	2.3	63	225	2.1	5.5	4.2	97	257	1.5
1455.2	0.693	24	1.6	59	211	1.2	10	2.9	91	241	0.898
1455.9	0.378	24	1.7	59	200	1.2	5.5	3.0	91	229	0.911
1456.6	1.1	29	2.1	75	322	1.8	16	3.8	116	368	1.3
1457.3	0.337	27	2.3	73	247	2.1	4.9	4.3	112	283	1.5
1458.0	0.337	28	2.2	59	187	1.0	4.9	4.0	91	214	0.758
1458.7	0.676	20	2.1	59	207	0.914	9.8	3.8	90	237	0.667
1459.4	0.565	25	1.8	58	213	1.6	8.2	3.2	89	243	1.1
1460.1	0.337	32	2.3	66	269	1.5	4.9	4.2	101	308	1.1
1460.8	0.337	29	1.9	73	255	1.9	4.9	3.5	112	292	1.4
1461.5	0.337	29	1.8	69	224	1.1	4.9	3.4	105	257	0.769
1462.2	0.458	25	1.7	64	183	1.3	6.6	3.1	98	209	0.925
1462.9	0.361	20	2.0	54	232	0.955	5.2	3.7	83	266	0.697
1463.6	0.461	26	1.9	60	240	1.3	6.7	3.5	92	274	0.964
1464.3	0.337	28	1.9	68	228	2.2	4.9	3.5	105	260	1.6
1465.0	0.337	29	2.1	68	204	1.5	4.9	3.9	104	233	1.1
1465.7	0.337	27	2.1	63	215	1.7	4.9	3.9	97	246	1.2
1466.4	0.580	26	1.7	57	239	1.3	8.4	3.1	88	274	0.973
1467.1	0.358	30	2.3	70	263	1.6	5.2	4.2	107	301	1.2
1467.8	0.337	30	1.9	64	198	1.7	4.9	3.4	98	227	1.3
1468.4	0.449	25	1.5	71	247	1.3	6.5	2.8	108	283	0.976



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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1469.1	0.371	19	1.6	63	213	1.3	5.4	2.8	96	244	0.944
1469.8	0.337	27	2.4	65	255	2.4	4.9	4.4	100	291	1.7
1470.5	0.661	28	2.0	71	252	1.5	9.5	3.6	109	288	1.1
1471.2	0.337	27	1.7	73	214	1.2	4.9	3.1	113	245	0.902
1471.9	0.337	23	2.0	64	202	0.880	4.9	3.6	98	231	0.642
1472.6	0.888	28	1.8	57	222	1.4	13	3.3	87	254	1.0
1473.3	0.506	26	2.3	79	270	1.6	7.3	4.2	122	309	1.2
1474.0	0.367	33	1.8	76	228	1.7	5.3	3.4	117	261	1.3
1474.7	0.533	35	2.1	80	231	1.3	7.7	3.8	122	265	0.939
1475.4	0.461	23	2.2	71	217	1.3	6.7	4.0	108	248	0.912
1476.1	0.337	24	2.0	66	244	2.2	4.9	3.6	100	279	1.6
1476.8	0.766	33	2.8	67	265	1.7	11	5.0	102	303	1.2
1477.5	0.558	30	2.6	94	285	2.0	8.1	4.7	143	326	1.5
1478.2	0.337	24	1.9	66	223	0.868	4.9	3.5	101	254	0.633
1478.9	0.337	22	2.2	61	242	1.2	4.9	4.0	93	277	0.911
1479.6	0.730	25	2.2	63	231	1.2	11	4.0	97	265	0.888
1480.3	0.337	26	2.4	71	229	1.7	4.9	4.4	109	262	1.2
1481.0	0.438	30	2.1	75	242	1.4	6.3	3.8	115	277	0.998
1481.7	0.337	30	2.2	74	230	1.5	4.9	4.0	114	263	1.1
1482.4	0.371	25	1.6	66	228	1.7	5.4	2.9	102	260	1.2
1483.1	0.562	26	2.0	77	266	1.8	8.1	3.7	118	304	1.3
1483.8	0.337	31	2.3	82	227	2.1	4.9	4.2	126	259	1.5
1484.5	0.489	31	2.4	76	246	1.5	7.1	4.4	116	281	1.1
1485.2	0.402	20	1.5	71	227	1.3	5.8	2.8	109	260	0.972
1485.9	0.382	23	2.2	65	224	1.1	5.5	4.0	99	256	0.769
1486.6	0.512	27	2.3	70	288	1.4	7.4	4.2	108	330	1.0
1487.3	0.421	32	2.0	75	235	1.7	6.1	3.7	115	269	1.2
1488.0	0.616	28	1.8	83	250	2.2	8.9	3.2	127	285	1.6
1488.7	0.337	26	1.6	79	246	1.3	4.9	2.9	121	281	0.960
1489.4	0.423	24	2.0	76	260	1.7	6.1	3.7	116	298	1.2
1490.1	0.531	24	2.2	64	253	1.8	7.7	3.9	98	289	1.3
1490.8	0.383	27	1.8	84	268	1.6	5.5	3.2	128	307	1.2
1491.5	0.353	26	2.0	77	238	1.7	5.1	3.6	119	272	1.3
1492.2	0.337	23	1.4	61	201	1.8	4.9	2.6	94	230	1.3
1492.9	0.684	24	2.2	82	253	1.7	9.9	4.0	125	290	1.3
1493.6	0.540	22	2.2	87	262	1.4	7.8	3.9	133	300	1.0
1494.2	0.353	39	1.8	90	225	1.2	5.1	3.3	138	257	0.847
1494.9	0.337	17	1.3	62	216	1.2	4.9	2.4	96	247	0.845
1495.6	0.337	24	1.8	61	261	1.7	4.9	3.4	93	299	1.2
1496.3	0.337	23	2.1	69	291	1.5	4.9	3.8	105	332	1.1
1497.0	0.337	28	2.1	85	233	1.4	4.9	3.8	130	266	1.0
1497.7	0.559	24	2.1	93	264	1.4	8.1	3.8	143	302	1.0
1498.4	0.337	24	1.8	72	240	0.969	4.9	3.2	111	275	0.707
1499.1	0.337	22	1.8	65	244	2.1	4.9	3.2	99	279	1.5
1499.8	0.337	28	1.7	70	267	2.1	4.9	3.1	108	306	1.6
1500.5	0.601	31	2.1	82	311	2.2	8.7	3.9	126	356	1.6
1501.2	0.337	25	2.1	80	225	1.5	4.9	3.9	122	257	1.1
1501.9	0.337	20	1.5	72	216	0.975	4.9	2.8	110	247	0.712
1502.6	0.337	17	2.2	70	236	0.930	4.9	4.0	107	270	0.678
1503.3	0.568	27	2.4	89	304	1.4	8.2	4.4	136	347	1.0
1504.0	0.337	28	1.6	84	252	2.1	4.9	2.9	129	289	1.6
1504.7	0.337	25	1.8	87	267	0.969	4.9	3.3	134	306	0.707
1505.4	0.337	25	1.8	67	282	0.640	4.9	3.4	103	322	0.467
1506.1	0.337	26	1.7	78	278	1.1	4.9	3.1	120	317	0.782
1506.8	0.676	26	1.5	80	264	1.6	9.8	2.8	122	301	1.2
1507.5	0.337	26	1.5	87	277	1.8	4.9	2.7	133	317	1.3
1508.2	0.337	24	1.3	72	241	0.551	4.9	2.4	110	275	0.402
1508.9	0.337	23	1.4	72	239	1.5	4.9	2.6	110	274	1.1
1509.6	0.730	30	2.1	77	253	1.4	11	3.8	118	289	1.0
1510.3	0.420	28	1.6	74	247	1.1	6.1	2.9	113	282	0.821
1511.0	0.337	23	1.4	70	219	0.557	4.9	2.6	107	250	0.406
1511.7	0.907	24	1.4	63	216	1.4	13	2.6	97	247	0.993
1512.4	0.337	22	1.6	64	255	0.972	4.9	2.9	98	292	0.709
1513.1	0.551	26	2.0	71	242	1.2	7.9	3.6	109	277	0.908
1513.8	0.533	25	1.5	74	213	0.723	7.7	2.8	113	243	0.527
1514.5	0.388	22	1.4	79	257	0.720	5.6	2.5	122	293	0.525
1515.2	0.337	21	1.6	70	220	1.5	4.9	2.8	107	251	1.1
1515.9	0.562	25	1.8	62	282	0.931	8.1	3.2	95	323	0.679
1516.6	0.337	28	1.6	68	247	1.6	4.9	2.9	104	282	1.2
1517.3	0.337	24	1.3	74	247	0.800	4.9	2.4	114	282	0.583
1518.0	0.337	22	1.6	71	249	1.3	4.9	3.0	108	285	0.945
1518.7	0.337	21	1.2	60	248	1.3	4.9	2.2	91	284	0.942
1519.4	0.337	23	1.5	66	270	1.2	4.9	2.7	102	309	0.839
1520.1	0.337	23	1.4	66	258	1.3	4.9	2.6	101	295	0.966
1520.7	0.337	25	1.7	81	241	1.2	4.9	3.1	124	275	0.906
1521.4	0.483	22	1.6	63	242	0.559	7.0	2.9	97	277	0.408
1522.1	3.6	254	7.0	71	251	1.7	52	13	108	287	1.2
1522.8	0.504	31	1.6	65	269	1.3	7.3	3.0	100	307	0.913
1523.5	0.337	24	1.4	78	272	1.2	4.9	2.6	120	311	0.896
1524.2	0.417	20	1.3	68	265	1.1	6.0	2.4	105	303	0.838
1524.9	0.337	22	1.4	72	300	1.4	4.9	2.5	110	343	0.996



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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1525.6	0.911	21	1.8	60	280	2.3	13	3.4	92	320	1.7
1526.3	0.337	21	1.5	63	299	2.0	4.9	2.8	97	342	1.5
1527.0	0.337	22	1.8	69	271	1.4	4.9	3.3	106	310	1.0
1527.7	0.337	20	1.4	69	341	1.8	4.9	2.6	105	390	1.3
1528.4	0.337	18	1.6	63	307	1.7	4.9	2.9	96	351	1.3
1529.1	0.337	21	1.3	71	322	1.1	4.9	2.5	109	368	0.819
1529.8	0.337	20	1.3	63	297	2.1	4.9	2.3	96	339	1.5
1530.5	0.337	22	1.1	66	297	1.6	4.9	2.0	102	340	1.2
1531.2	0.454	24	1.3	66	311	1.8	6.6	2.4	101	356	1.3
1531.9	0.421	24	1.5	67	346	1.5	6.1	2.8	102	396	1.1
1532.6	0.337	22	1.4	70	328	1.5	4.9	2.6	108	375	1.1
1533.3	0.337	21	1.3	57	335	1.9	4.9	2.4	88	384	1.4
1534.0	0.337	23	1.1	66	307	2.6	4.9	2.0	102	351	1.9
1534.7	0.464	21	1.2	76	336	1.4	6.7	2.2	116	384	1.1
1535.4	0.667	19	1.2	61	332	2.0	9.6	2.2	93	380	1.4
1536.1	0.337	20	1.5	63	327	2.4	4.9	2.7	97	373	1.7
1536.8	0.337	24	1.4	81	351	1.6	4.9	2.6	125	402	1.2
1537.5	0.337	20	1.4	63	307	1.7	4.9	2.6	96	351	1.3
1538.2	0.445	18	1.7	63	352	1.6	6.4	3.2	96	402	1.2
1538.9	0.337	21	1.5	64	338	2.3	4.9	2.7	98	386	1.7
1539.6	0.337	21	1.6	80	345	1.8	4.9	2.9	122	395	1.3
1540.3	0.337	20	1.4	60	268	0.632	4.9	2.6	91	306	0.461
1541.0	0.337	19	1.4	64	330	1.7	4.9	2.5	97	377	1.2
1541.7	0.337	20	1.3	59	342	1.8	4.9	2.4	91	391	1.3
1542.4	0.337	22	1.6	63	372	2.1	4.9	2.9	97	425	1.5
1543.1	0.337	19	1.3	69	335	1.5	4.9	2.3	106	383	1.1
1543.8	0.391	21	1.7	69	326	1.6	5.6	3.2	106	373	1.1
1544.5	0.405	19	1.3	63	327	1.3	5.9	2.4	97	374	0.915
1545.2	0.494	20	1.3	57	328	1.4	7.1	2.4	87	375	1.0
1545.9	0.812	19	1.5	71	323	2.0	12	2.8	108	369	1.5
1546.6	0.527	23	1.9	67	357	1.7	7.6	3.4	103	409	1.2
1547.2	0.359	18	1.3	62	280	1.5	5.2	2.3	95	320	1.1
1547.9	0.568	21	0.998	61	357	2.1	8.2	1.8	93	408	1.6
1548.6	0.337	21	1.4	59	362	2.1	4.9	2.6	90	414	1.5
1549.3	0.337	22	1.3	61	311	1.8	4.9	2.4	94	356	1.3
1550.0	0.384	25	1.4	72	328	2.7	5.5	2.6	110	375	2.0
1550.7	0.337	23	0.996	64	306	1.8	4.9	1.8	98	350	1.3
1551.4	0.337	23	1.2	65	329	1.6	4.9	2.1	100	376	1.2
1552.1	0.362	20	1.2	60	333	2.0	5.2	2.1	93	381	1.4
1552.8	0.384	22	0.991	58	292	2.1	5.5	1.8	89	334	1.5
1553.5	0.337	22	1.4	70	332	2.2	4.9	2.6	107	380	1.6
1554.2	0.349	21	0.936	63	301	2.3	5.0	1.7	97	344	1.7
1554.9	0.337	19	1.3	62	351	2.0	4.9	2.3	95	401	1.4
1555.6	0.353	20	1.5	58	294	1.4	5.1	2.7	89	336	1.0
1556.3	0.458	20	0.923	58	280	1.5	6.6	1.7	90	320	1.1
1557.0	0.576	22	1.3	60	311	1.6	8.3	2.4	92	356	1.1
1557.7	0.407	21	1.1	59	292	1.7	5.9	1.9	90	334	1.2
1558.4	0.337	16	1.2	50	262	1.4	4.9	2.1	77	300	0.999
1559.1	0.337	20	0.991	61	356	2.4	4.9	1.8	94	408	1.7
1559.8	0.337	21	1.3	57	318	1.3	4.9	2.4	87	364	0.982
1560.5	0.520	19	1.2	60	369	1.3	7.5	2.1	92	421	0.942
1561.2	0.337	20	1.1	63	361	1.5	4.9	2.0	96	412	1.1
1561.9	0.448	18	1.2	51	347	0.831	6.5	2.1	78	396	0.606
1562.6	0.337	18	1.0	62	365	1.8	4.9	1.9	96	417	1.3
1563.3	0.518	20	1.1	66	285	1.9	7.5	2.0	101	326	1.4
1564.0	0.337	21	1.1	54	275	1.8	4.9	2.0	83	314	1.3
1564.7	0.337	20	0.986	52	331	2.2	4.9	1.8	80	379	1.6
1565.4	0.454	18	1.1	52	304	2.2	6.5	2.1	80	347	1.6
1566.1	0.533	18	0.851	58	350	1.2	7.7	1.6	88	400	0.902
1566.8	0.337	19	0.952	50	297	2.3	4.9	1.7	77	340	1.7
1567.5	0.337	15	0.995	50	275	1.2	4.9	1.8	76	314	0.873
1568.2	0.524	17	0.779	47	303	1.0	7.6	1.4	72	347	0.749
1568.9	0.348	20	1.0	48	285	1.1	5.0	1.9	73	326	0.776
1569.6	0.337	21	1.0	56	324	1.1	4.9	1.9	87	371	0.838
1570.3	0.337	20	0.730	51	310	1.1	4.9	1.3	78	355	0.791
1571.0	0.337	20	0.981	48	289	1.4	4.9	1.8	73	330	1.0
1571.7	0.337	18	0.949	42	307	0.848	4.9	1.7	64	351	0.619
1572.4	0.337	21	1.0	45	306	0.929	4.9	1.8	70	349	0.678
1573.0	0.337	18	0.974	53	292	1.5	4.9	1.8	81	333	1.1
1573.7	0.475	16	0.811	39	254	1.6	6.9	1.5	60	291	1.1
1574.4	0.337	18	0.834	41	265	0.579	4.9	1.5	63	303	0.422
1575.1	0.476	20	0.863	47	316	1.8	6.9	1.6	72	361	1.3
1575.8	0.337	20	0.977	39	257	0.698	4.9	1.8	59	294	0.509
1576.5	0.374	18	0.926	44	268	0.967	5.4	1.7	68	307	0.705
1577.2	0.337	17	0.761	38	263	1.4	4.9	1.4	59	301	1.0
1577.9	0.337	16	0.665	41	296	1.3	4.9	1.2	62	339	0.952
1578.6	0.440	16	1.1	41	317	1.3	6.3	2.1	63	363	0.926
1579.3	0.385	18	0.793	42	285	1.4	5.6	1.4	64	326	0.991
1580.0	0.421	17	0.587	46	304	1.1	6.1	1.1	71	348	0.824
1580.7	0.337	18	0.856	39	248	0.993	4.9	1.6	60	284	0.725
1581.4	0.349	16	0.846	41	280	1.1	5.0	1.5	63	320	0.838



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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1582.1	0.362	17	0.801	35	264	1.6	5.2	1.5	54	302	1.2
1582.8	0.378	17	0.836	33	268	1.6	5.5	1.5	50	306	1.2
1583.5	0.777	17	0.927	40	267	1.1	11	1.7	62	306	0.817
1584.2	0.337	15	0.949	39	261	0.581	4.9	1.7	59	298	0.424
1584.9	0.337	15	1.2	36	301	0.715	4.9	2.2	56	345	0.521
1585.6	0.513	17	0.706	38	265	1.3	7.4	1.3	58	303	0.930
1586.3	0.337	15	1.0	39	268	1.1	4.9	1.9	59	307	0.782
1587.0	0.378	16	0.936	35	264	1.2	5.5	1.7	53	302	0.908
1587.7	0.337	15	0.622	28	288	1.6	4.9	1.1	42	329	1.2
1588.4	0.509	14	0.926	31	278	1.0	7.3	1.7	48	318	0.738
1589.1	0.353	14	0.856	29	254	1.5	5.1	1.6	44	291	1.1
1589.8	0.337	16	0.834	30	266	0.713	4.9	1.5	46	304	0.520
1590.5	0.473	15	1.1	31	273	1.2	6.8	2.0	48	312	0.888
1591.2	0.498	14	1.3	30	319	1.4	7.2	2.4	46	365	1.0
1591.9	0.337	18	0.885	27	302	0.877	4.9	1.6	41	346	0.640
1592.6	0.337	15	0.654	27	276	0.881	4.9	1.2	41	316	0.643
1593.3	0.337	17	0.844	24	300	1.3	4.9	1.5	37	343	0.961
1594.0	0.337	12	0.889	27	255	1.4	4.9	1.6	41	292	1.0
1594.7	0.378	15	0.698	26	295	1.7	5.4	1.3	40	337	1.2
1595.4	0.420	14	0.720	24	280	1.6	6.1	1.3	37	320	1.2
1596.1	0.337	15	0.640	23	296	1.8	4.9	1.2	36	339	1.3
1596.8	0.516	16	0.748	24	267	1.3	7.4	1.4	38	305	0.935
1597.5	0.337	14	0.714	23	265	1.5	4.9	1.3	36	303	1.1
1598.2	0.337	13	0.985	21	282	1.4	4.9	1.8	32	323	1.0
1598.8	0.337	14	0.994	24	286	1.2	4.9	1.8	37	327	0.859
1599.5	0.337	14	0.796	24	289	2.5	4.9	1.5	36	330	1.8
1600.2	0.337	12	0.650	21	246	1.5	4.9	1.2	32	281	1.1
1600.9	0.337	11	0.827	26	276	1.2	4.9	1.5	40	315	0.878
1601.6	0.337	16	0.979	26	309	1.7	4.9	1.8	39	353	1.3
1602.3	0.413	14	0.670	17	269	1.2	6.0	1.2	27	308	0.870
1603.0	0.337	12	0.526	18	255	1.3	4.9	0.960	27	292	0.974
1603.7	0.337	12	0.787	20	256	1.7	4.9	1.4	30	292	1.3
1604.4	0.337	11	0.540	17	300	1.9	4.9	0.984	27	343	1.4
1605.1	0.337	13	0.713	21	278	1.4	4.9	1.3	32	318	1.0
1605.8	0.337	13	0.611	18	267	2.1	4.9	1.1	27	305	1.5
1606.5	0.337	14	0.709	22	288	1.9	4.9	1.3	34	330	1.4
1607.2	0.337	11	0.428	16	280	2.4	4.9	0.780	24	320	1.8
1607.9	0.337	9.9	0.752	16	252	1.5	4.9	1.4	24	288	1.1
1608.6	0.337	13	0.663	14	291	1.3	4.9	1.2	22	332	0.931
1609.3	0.337	14	1.0	17	290	1.5	4.9	1.8	27	331	1.1
1610.0	0.337	13	0.727	13	285	1.8	4.9	1.3	20	326	1.3
1610.7	0.337	13	0.675	14	291	1.5	4.9	1.2	22	333	1.1
1611.4	0.337	12	0.472	16	304	2.9	4.9	0.860	25	348	2.1
1612.1	0.337	12	0.880	16	260	1.3	4.9	1.6	24	297	0.937
1612.8	0.337	12	0.683	14	246	1.3	4.9	1.2	21	281	0.944
1613.5	0.375	13	0.810	14	303	2.6	5.4	1.5	21	346	1.9
1614.2	0.337	11	1.0	17	262	1.3	4.9	1.8	27	299	0.928
1614.9	0.493	13	0.611	12	319	1.5	7.1	1.1	18	365	1.1
1615.6	0.337	11	0.451	16	256	1.6	4.9	0.823	25	292	1.2
1616.3	0.337	12	0.743	14	258	2.1	4.9	1.4	22	295	1.5
1617.0	0.337	10	0.607	16	270	1.8	4.9	1.1	24	308	1.3
1617.7	0.337	12	0.475	12	306	1.6	4.9	0.866	18	349	1.2
1618.4	0.337	13	0.516	14	279	1.9	4.9	0.941	21	319	1.4
1619.1	0.337	11	0.581	16	289	2.0	4.9	1.1	25	331	1.5
1619.8	0.363	11	0.425	13	267	1.9	5.2	0.774	19	305	1.4
1620.5	0.337	11	0.505	11	263	1.2	4.9	0.920	17	300	0.879
1621.2	0.337	11	0.716	13	279	0.797	4.9	1.3	20	320	0.582
1621.9	0.763	10	0.471	16	318	2.0	11	0.859	25	363	1.5
1622.6	0.337	11	0.480	15	279	1.7	4.9	0.875	24	319	1.2
1623.3	0.337	14	0.505	14	275	1.5	4.9	0.921	21	314	1.1
1624.0	0.337	10	0.448	14	276	1.8	4.9	0.817	22	316	1.3
1624.7	0.337	11	0.662	15	304	1.4	4.9	1.2	22	348	1.0
1625.3	0.337	9.8	0.376	15	309	1.4	4.9	0.685	23	354	1.0
1626.0	0.337	9.7	0.734	13	270	1.6	4.9	1.3	19	308	1.1
1626.7	0.378	10	0.561	17	332	2.3	5.5	1.0	27	380	1.7
1627.4	0.337	11	0.502	12	305	1.0	4.9	0.915	19	349	0.749
1628.1	0.337	13	0.475	13	337	1.7	4.9	0.867	20	385	1.2
1628.8	0.337	12	0.436	15	303	1.6	4.9	0.796	23	347	1.2
1629.5	0.337	12	0.798	14	273	1.2	4.9	1.5	22	312	0.887
1630.2	0.337	11	0.458	17	254	2.2	4.9	0.836	25	291	1.6
1630.9	0.337	10	0.615	16	291	1.6	4.9	1.1	24	333	1.2
1631.6	0.337	11	0.643	16	304	1.3	4.9	1.2	25	347	0.978
1632.3	0.440	13	0.552	15	326	0.817	6.4	1.0	24	373	0.596
1633.0	0.337	12	0.538	12	279	1.0	4.9	0.981	18	319	0.747
1633.7	0.337	10	0.676	11	293	1.4	4.9	1.2	17	336	1.0
1634.4	0.591	10	0.741	16	311	2.1	8.5	1.4	25	356	1.6
1635.1	0.337	9.9	0.558	11	290	1.3	4.9	1.0	17	332	0.968
1635.8	0.337	11	0.503	14	301	1.2	4.9	0.917	21	345	0.846
1636.5	0.337	12	0.510	15	269	1.3	4.9	0.929	24	307	0.951
1637.2	0.337	9.9	0.360	14	314	1.5	4.9	0.656	22	359	1.1
1637.9	0.337	9.3	0.527	15	281	2.0	4.9	0.961	23	322	1.5



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Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1638.6	0.337	9.9	0.440	14	285	1.1	4.9	0.802	21	326	0.803
1639.3	0.337	10	0.618	14	273	1.1	4.9	1.1	22	312	0.814
1640.0	0.337	8.6	0.693	15	281	1.2	4.9	1.3	23	322	0.875
1640.7	0.337	9.7	0.431	14	284	2.1	4.9	0.786	22	325	1.5
1641.4	0.467	8.8	0.446	15	304	1.0	6.7	0.813	22	347	0.751
1642.1	0.337	11	0.598	18	323	1.6	4.9	1.1	28	369	1.2
1642.8	0.337	10	0.400	12	272	2.1	4.9	0.730	19	311	1.5
1643.5	0.585	9.9	0.635	15	284	2.2	8.4	1.2	22	325	1.6
1644.2	0.337	10	0.280	13	320	1.3	4.9	0.510	20	366	0.953
1644.9	0.337	13	0.369	12	280	1.3	4.9	0.674	19	321	0.923
1645.6	0.508	10.0	0.589	16	305	1.6	7.3	1.1	24	348	1.2
1646.3	0.337	12	0.615	16	259	1.1	4.9	1.1	25	296	0.772
1647.0	0.337	10	0.568	15	269	1.2	4.9	1.0	23	307	0.855
1647.7	0.337	9.7	0.522	16	270	1.5	4.9	0.951	25	308	1.1
1648.4	0.337	11	0.705	15	271	2.0	4.9	1.3	22	309	1.4
1649.1	0.337	9.9	0.633	16	283	0.995	4.9	1.2	25	324	0.726
1649.8	0.337	9.4	0.664	13	275	1.1	4.9	1.2	21	314	0.779
1650.5	0.337	11	0.660	16	282	0.924	4.9	1.2	25	322	0.674
1651.2	0.337	11	0.279	21	297	1.7	4.9	0.508	33	340	1.2
1651.9	0.337	10	0.309	19	270	1.4	4.9	0.563	29	309	0.990
1652.5	0.337	9.0	0.391	17	308	2.3	4.9	0.712	26	353	1.7
1653.2	0.337	10	0.477	20	267	2.4	4.9	0.871	31	306	1.7
1653.9	0.337	11	0.601	17	283	1.9	4.9	1.1	27	323	1.4
1654.6	0.368	12	0.623	20	270	1.5	5.3	1.1	31	309	1.1
1655.3	0.337	13	0.629	23	293	1.5	4.9	1.1	35	335	1.1
1656.0	0.337	13	0.753	25	282	1.6	4.9	1.4	38	322	1.2
1656.7	0.337	9.6	0.670	23	275	1.2	4.9	1.2	35	314	0.895
1657.4	0.337	8.9	0.765	23	258	0.930	4.9	1.4	35	295	0.678
1658.1	0.337	11	0.584	25	287	1.8	4.9	1.1	39	328	1.3
1658.8	0.337	14	0.763	25	296	1.4	4.9	1.4	38	338	1.0
1659.5	0.337	13	0.705	32	314	1.3	4.9	1.3	49	359	0.929
1660.2	0.337	12	0.862	27	293	1.9	4.9	1.6	41	335	1.4
1660.9	0.419	11	0.795	29	273	1.0	6.1	1.5	45	313	0.757
1661.6	0.337	11	0.839	26	269	1.4	4.9	1.5	40	308	0.993
1662.3	0.337	13	0.951	33	286	1.1	4.9	1.7	51	327	0.822
1663.0	0.337	12	0.415	26	267	1.5	4.9	0.757	41	306	1.1
1663.7	0.337	9.7	0.669	30	260	1.5	4.9	1.2	45	297	1.1
1664.4	0.337	11	0.720	30	272	1.6	4.9	1.3	46	311	1.2
1665.1	0.337	12	0.701	27	247	1.4	4.9	1.3	42	282	1.0
1665.8	0.344	13	0.600	27	265	0.970	5.0	1.1	42	303	0.708
1666.5	0.337	13	0.871	36	279	1.4	4.9	1.6	55	319	1.0
1667.2	0.337	11	0.677	31	252	1.7	4.9	1.2	47	288	1.2
1667.9	0.337	12	0.712	29	246	1.2	4.9	1.3	44	281	0.882
1668.6	0.337	12	0.666	36	277	1.5	4.9	1.2	56	317	1.1
1669.3	0.337	13	0.931	33	265	1.1	4.9	1.7	51	303	0.832
1670.0	0.337	13	0.861	33	262	2.0	4.9	1.6	51	300	1.5
1670.7	0.337	13	0.813	34	284	2.4	4.9	1.5	52	325	1.7
1671.4	0.707	15	0.996	34	259	1.5	10	1.8	52	297	1.1
1672.1	0.337	13	1.1	41	257	1.2	4.9	1.9	63	293	0.870
1672.8	0.337	15	0.979	36	256	1.7	4.9	1.8	55	293	1.3
1673.5	0.337	13	0.904	32	226	1.3	4.9	1.6	49	258	0.982
1674.2	0.337	12	1.1	32	287	1.1	4.9	1.9	50	328	0.773
1674.9	0.337	15	0.767	38	292	1.5	4.9	1.4	58	334	1.1
1675.6	0.337	15	1.2	41	262	2.3	4.9	2.1	62	299	1.7
1676.3	0.337	14	0.531	44	253	1.6	4.9	0.969	67	290	1.2
1677.0	0.337	12	0.924	35	269	1.5	4.9	1.7	54	308	1.1
1677.7	0.390	13	0.829	41	269	1.3	5.6	1.5	63	307	0.939
1678.4	0.559	13	1.1	37	244	1.0	8.1	2.1	56	279	0.738
1679.0	0.337	14	0.961	41	266	1.6	4.9	1.8	63	304	1.2
1679.7	0.337	16	1.5	43	261	1.1	4.9	2.8	66	299	0.771
1680.4	0.337	15	1.3	40	272	1.7	4.9	2.4	62	311	1.3
1681.1	0.337	13	0.884	36	255	1.2	4.9	1.6	55	292	0.903
1681.8	0.337	16	1.1	35	254	0.923	4.9	2.0	54	290	0.673
1682.5	0.337	16	1.4	41	255	0.741	4.9	2.6	63	292	0.541
1683.2	0.337	16	1.1	45	278	1.9	4.9	2.0	69	317	1.4
1683.9	0.337	13	0.975	45	253	0.812	4.9	1.8	69	289	0.593
1684.6	0.337	17	1.1	46	259	1.6	4.9	2.1	70	296	1.2
1685.3	0.337	16	0.923	44	269	1.5	4.9	1.7	67	307	1.1
1686.0	0.354	18	1.1	43	232	1.2	5.1	2.0	65	265	0.849
1686.7	0.426	17	1.2	46	261	1.5	6.2	2.1	70	298	1.1
1687.4	0.337	16	1.1	46	234	1.1	4.9	1.9	70	267	0.801
1688.1	0.337	17	1.2	54	236	1.5	4.9	2.3	82	270	1.1
1688.8	0.337	17	1.4	50	253	1.4	4.9	2.5	76	289	1.0
1689.5	0.337	19	1.5	43	253	1.6	4.9	2.7	66	289	1.2
1690.2	0.585	20	1.3	54	241	1.9	8.4	2.3	82	276	1.4
1690.9	0.337	16	1.7	50	206	1.4	4.9	3.1	77	236	1.0
1691.6	0.337	18	1.6	52	236	2.1	4.9	2.9	80	270	1.5
1692.3	0.337	22	1.5	49	221	1.8	4.9	2.7	75	252	1.3
1693.0	0.337	24	1.7	57	268	1.4	4.9	3.1	88	307	1.0
1693.7	0.337	20	1.6	56	198	1.5	4.9	3.0	86	226	1.1
1694.4	0.337	21	1.6	63	217	1.6	4.9	2.9	97	248	1.2



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Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1695.1	0.337	21	1.7	66	254	0.944	4.9	3.1	101	291	0.689
1695.8	0.820	22	1.9	64	234	2.0	12	3.5	99	268	1.5
1696.5	0.409	24	2.2	66	231	1.6	5.9	4.1	101	264	1.2
1697.2	0.337	20	1.5	57	221	1.6	4.9	2.7	88	253	1.2
1697.9	0.448	20	1.9	62	209	0.965	6.5	3.5	96	239	0.704
1698.6	0.337	22	2.0	61	227	1.3	4.9	3.6	93	260	0.955
1699.3	0.337	25	1.7	57	214	1.8	4.9	3.2	88	245	1.3
1700.0	0.337	23	1.7	62	198	1.2	4.9	3.1	95	226	0.848
1700.7	0.337	17	1.6	58	194	1.2	4.9	2.9	89	222	0.842
1701.4	0.347	18	1.4	51	214	1.4	5.0	2.6	78	245	0.992
1702.1	0.337	27	1.6	62	228	1.3	4.9	2.9	95	261	0.922
1702.8	0.337	21	1.6	65	220	1.5	4.9	3.0	99	251	1.1
1703.5	0.337	26	1.9	65	219	1.0	4.9	3.5	100	251	0.750
1704.2	0.408	21	1.9	69	205	1.4	5.9	3.4	105	234	1.0
1704.9	0.686	20	1.9	58	225	2.4	9.9	3.5	89	258	1.8
1705.5	0.587	25	2.0	70	242	1.5	8.5	3.7	107	277	1.1
1706.2	0.500	24	2.3	61	215	0.905	7.2	4.2	93	246	0.660
1706.9	0.526	24	1.4	64	202	2.2	7.6	2.6	99	231	1.6
1707.6	0.337	23	1.7	60	198	1.7	4.9	3.1	91	226	1.2
1708.3	0.886	23	2.0	59	221	1.3	13	3.6	91	253	0.965
1709.0	0.412	27	2.1	63	228	1.1	5.9	3.8	97	260	0.773
1709.7	0.337	24	2.1	69	215	2.1	4.9	3.9	106	245	1.5
1710.4	0.420	25	1.9	68	211	1.4	6.1	3.5	104	242	1.0
1711.1	0.337	24	2.1	67	225	1.2	4.9	3.9	103	257	0.849
1711.8	0.610	24	1.9	57	233	1.5	8.8	3.4	87	266	1.1
1712.5	0.445	26	2.0	76	224	1.6	6.4	3.7	116	256	1.1
1713.2	0.374	28	2.2	68	219	1.5	5.4	4.0	105	250	1.1
1713.9	0.421	26	2.1	64	212	1.8	6.1	3.8	98	242	1.3
1714.6	0.337	24	1.7	55	243	1.7	4.9	3.1	84	278	1.2
1715.3	0.337	22	1.9	61	214	1.4	4.9	3.5	94	244	1.000
1716.0	0.337	29	2.2	65	217	1.4	4.9	4.1	100	248	1.1
1716.7	0.337	25	1.6	67	207	1.5	4.9	2.9	102	237	1.1
1717.4	0.337	24	1.9	69	219	1.2	4.9	3.6	105	250	0.864
1718.1	0.337	23	1.7	60	214	1.2	4.9	3.2	92	245	0.846
1718.8	0.337	26	1.9	67	237	1.8	4.9	3.5	103	271	1.3
1719.5	0.337	25	1.8	76	212	1.5	4.9	3.3	116	242	1.1
1720.2	0.388	26	2.1	69	232	1.5	5.6	3.8	106	265	1.1
1720.9	0.365	24	2.3	63	215	1.1	5.3	4.2	96	246	0.823
1721.6	0.337	25	1.8	67	268	2.1	4.9	3.2	102	307	1.5
1722.3	0.337	23	2.0	68	243	1.7	4.9	3.6	104	278	1.2
1723.0	0.733	27	2.1	70	227	1.8	11	3.7	107	260	1.3
1723.7	0.337	23	1.6	69	213	1.1	4.9	2.8	106	244	0.837
1724.4	0.337	25	1.7	64	236	1.9	4.9	3.1	99	270	1.4
1725.1	0.337	26	1.5	67	232	0.909	4.9	2.8	103	266	0.663
1725.8	0.337	28	2.1	73	218	1.4	4.9	3.8	111	250	1.0
1726.5	0.386	28	1.8	71	232	1.7	5.6	3.3	108	265	1.2
1727.2	0.337	23	2.0	69	237	1.4	4.9	3.6	105	271	0.996
1727.9	0.602	30	2.0	63	284	1.3	8.7	3.6	96	325	0.954
1728.6	0.337	26	2.2	61	214	2.4	4.9	4.0	93	245	1.7
1729.3	0.337	27	1.5	67	246	1.5	4.9	2.7	102	282	1.1
1730.0	0.337	30	2.1	67	226	2.1	4.9	3.8	103	258	1.5
1730.7	0.337	25	1.9	59	227	1.7	4.9	3.4	91	259	1.3
1731.3	0.337	24	1.5	64	223	0.933	4.9	2.7	97	255	0.681
1732.0	0.379	25	2.0	61	238	2.0	5.5	3.7	94	272	1.5
1732.7	0.337	27	1.5	71	236	1.2	4.9	2.7	109	269	0.884
1733.4	0.337	27	1.9	63	206	1.3	4.9	3.4	97	236	0.955
1734.1	0.652	27	2.0	66	237	1.2	9.4	3.7	101	271	0.851
1734.8	0.338	27	1.8	57	237	1.7	4.9	3.2	88	271	1.3
1735.5	0.337	28	1.9	65	214	1.7	4.9	3.5	99	244	1.2
1736.2	0.347	26	1.9	80	219	1.5	5.0	3.5	123	250	1.1
1736.9	0.337	27	1.7	66	214	1.9	4.9	3.1	101	245	1.4
1737.6	0.337	28	2.0	59	240	1.5	4.9	3.6	90	275	1.1
1738.3	0.383	28	2.2	71	245	1.9	5.5	4.0	108	280	1.4
1739.0	0.563	31	2.0	67	240	2.3	8.1	3.6	102	274	1.7
1739.7	0.337	23	1.5	61	237	2.0	4.9	2.7	93	271	1.5
1740.4	0.370	27	1.5	75	245	1.8	5.3	2.7	114	281	1.3
1741.1	0.337	26	1.5	57	257	1.7	4.9	2.7	87	294	1.2
1741.8	0.527	30	1.5	68	263	2.3	7.6	2.8	104	300	1.7
1742.5	0.383	32	1.7	65	266	2.8	5.5	3.2	99	305	2.1
1743.2	0.446	26	1.7	59	249	1.9	6.4	3.1	90	285	1.4
1743.9	0.337	24	1.6	62	203	1.5	4.9	2.9	95	232	1.1
1744.6	0.337	28	1.6	60	255	1.4	4.9	2.9	91	292	1.0
1745.3	0.438	30	1.6	64	245	1.8	6.3	3.0	99	280	1.3
1746.0	0.525	32	1.7	66	273	2.1	7.6	3.2	101	312	1.5
1746.7	0.337	33	1.5	67	258	2.1	4.9	2.7	103	295	1.6
1747.4	0.427	24	1.3	56	225	1.6	6.2	2.3	86	257	1.2
1748.1	0.337	30	1.5	57	248	1.9	4.9	2.7	87	284	1.4
1748.8	0.337	30	1.7	68	269	1.7	4.9	3.0	105	308	1.3
1749.5	0.406	30	1.2	56	226	1.5	5.9	2.3	86	259	1.1
1750.2	0.337	29	1.5	62	268	2.6	4.9	2.8	95	306	1.9
1750.9	0.677	26	1.9	63	243	2.3	9.8	3.5	97	277	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1751.6	0.337	27	1.6	66	284	2.8	4.9	2.9	100	325	2.1
1752.3	0.497	38	1.8	71	287	3.4	7.2	3.3	109	329	2.5
1753.0	0.337	27	1.5	57	234	2.9	4.9	2.7	87	268	2.1
1753.7	0.337	28	1.9	68	245	2.5	4.9	3.5	105	281	1.8
1754.4	0.337	24	1.8	57	237	2.3	4.9	3.4	88	270	1.7
1755.1	0.446	29	1.6	56	266	2.9	6.4	2.9	86	304	2.1
1755.8	0.391	28	1.7	61	241	2.3	5.6	3.0	94	276	1.6
1756.5	0.337	30	1.6	60	261	2.1	4.9	2.9	91	298	1.6
1757.2	0.420	25	1.5	57	250	2.3	6.1	2.8	87	285	1.7
1757.8	0.496	28	1.5	61	259	3.1	7.2	2.8	93	297	2.3
1758.5	0.337	28	1.7	60	266	2.8	4.9	3.1	93	304	2.0
1759.2	0.376	31	1.3	63	275	2.1	5.4	2.5	96	314	1.5
1759.9	0.337	29	1.5	62	269	2.5	4.9	2.7	95	307	1.8
1760.6	0.337	32	1.3	57	249	2.3	4.9	2.4	87	285	1.7
1761.3	0.337	36	1.2	66	271	2.5	4.9	2.3	101	310	1.8
1762.0	0.452	32	1.1	60	289	2.6	6.5	2.0	92	330	1.9
1762.7	0.337	29	1.1	60	260	2.7	4.9	1.9	92	297	2.0
1763.4	0.337	26	1.4	56	254	3.3	4.9	2.5	85	290	2.4
1764.1	0.613	25	1.6	59	281	2.6	8.9	3.0	90	321	1.9
1764.8	0.337	27	1.6	54	294	2.7	4.9	2.9	83	336	1.9
1765.5	0.400	28	1.2	56	243	1.7	5.8	2.3	86	278	1.3
1766.2	0.337	23	1.2	68	301	2.6	4.9	2.2	104	344	1.9
1766.9	0.360	24	1.4	53	291	1.7	5.2	2.6	82	333	1.2
1767.6	0.366	28	1.2	46	294	2.2	5.3	2.2	71	336	1.6
1768.3	0.337	31	1.3	61	291	2.9	4.9	2.4	94	333	2.1
1769.0	0.432	26	1.1	60	292	2.1	6.2	2.1	92	334	1.6
1769.7	0.337	23	1.4	61	256	1.5	4.9	2.5	93	293	1.1
1770.4	0.337	21	1.3	55	269	1.4	4.9	2.4	84	308	1.1
1771.1	0.664	24	1.4	56	279	2.0	9.6	2.6	85	319	1.4
1771.8	0.337	26	1.4	61	284	2.9	4.9	2.6	94	325	2.1
1772.5	0.520	25	1.3	61	281	3.2	7.5	2.4	93	321	2.3
1773.2	0.691	26	0.901	52	265	2.4	10.0	1.6	80	303	1.7
1773.9	0.337	24	1.2	54	278	2.0	4.9	2.1	83	318	1.5
1774.6	0.337	26	1.5	52	267	2.7	4.9	2.7	79	305	2.0
1775.3	0.484	23	1.4	61	275	2.1	7.0	2.6	94	315	1.6
1776.0	0.337	26	1.1	57	286	2.7	4.9	2.0	88	327	1.9
1776.7	0.375	26	0.870	56	323	1.9	5.4	1.6	86	369	1.4
1777.4	0.681	24	1.1	51	284	3.0	9.8	2.1	78	325	2.2
1778.1	0.337	20	1.5	61	277	2.2	4.9	2.7	93	317	1.6
1778.8	0.521	25	0.932	55	271	1.7	7.5	1.7	84	310	1.3
1779.5	0.400	23	1.1	54	282	1.7	5.8	1.9	83	323	1.3
1780.2	0.452	23	0.929	50	286	1.2	6.5	1.7	77	327	0.848
1780.9	0.650	21	1.2	51	297	1.4	9.4	2.1	78	340	1.0
1781.6	0.337	18	1.1	49	272	1.9	4.9	2.0	76	311	1.4
1782.3	0.337	22	0.714	49	259	0.814	4.9	1.3	75	296	0.594
1783.0	0.337	21	1.2	58	285	1.2	4.9	2.2	90	325	0.843
1783.6	0.337	23	0.952	54	270	1.3	4.9	1.7	83	309	0.977
1784.3	0.436	21	1.3	55	304	1.2	6.3	2.4	85	348	0.877
1785.0	0.337	21	1.0	55	294	1.5	4.9	1.9	84	336	1.1
1785.7	0.337	22	0.764	58	290	1.5	4.9	1.4	90	332	1.1
1786.4	0.337	21	1.2	51	270	0.988	4.9	2.2	78	309	0.721
1787.1	0.355	20	0.820	51	260	1.8	5.1	1.5	78	298	1.3
1787.8	0.337	19	0.984	50	287	1.4	4.9	1.8	77	328	1.0
1788.5	0.604	20	1.1	57	277	1.9	8.7	2.0	87	317	1.4
1789.2	0.398	21	0.737	49	237	1.4	5.7	1.3	75	272	1.0
1789.9	0.388	18	0.894	50	258	1.7	5.6	1.6	77	295	1.2
1790.6	0.427	21	0.913	48	272	1.7	6.2	1.7	74	311	1.3
1791.3	0.337	22	0.828	44	258	1.4	4.9	1.5	68	295	1.0
1792.0	0.337	23	1.0	51	273	1.8	4.9	1.8	79	312	1.3
1792.7	0.337	19	0.827	47	245	1.2	4.9	1.5	72	280	0.880
1793.4	0.337	18	0.841	49	283	2.1	4.9	1.5	74	324	1.5
1794.1	0.430	18	0.638	47	283	0.868	6.2	1.2	72	324	0.633
1794.8	0.337	20	1.2	47	266	1.3	4.9	2.2	72	304	0.931
1795.5	0.391	19	0.965	47	245	1.1	5.6	1.8	73	280	0.787
1796.2	0.337	16	0.960	49	255	0.945	4.9	1.8	75	291	0.690
1796.9	0.337	17	0.885	49	259	1.2	4.9	1.6	75	296	0.870
1797.6	0.366	18	1.0	42	253	1.2	5.3	1.8	64	289	0.884
1798.3	0.761	21	0.820	46	252	1.9	11	1.5	70	289	1.4
1799.0	0.337	16	0.640	45	267	1.3	4.9	1.2	68	306	0.914
1799.7	0.337	19	0.830	47	254	1.1	4.9	1.5	71	290	0.801
1800.4	0.377	18	0.714	43	252	1.0	5.4	1.3	66	288	0.758
1801.1	0.498	18	0.787	43	292	1.4	7.2	1.4	66	334	1.1
1801.8	0.337	19	0.756	48	284	1.7	4.9	1.4	74	325	1.2
1802.5	0.356	19	0.594	41	235	1.4	5.1	1.1	62	269	1.0
1803.2	0.337	17	0.539	44	256	1.1	4.9	0.983	68	293	0.820
1803.9	0.650	18	0.872	45	269	1.2	9.4	1.6	69	308	0.842
1804.6	0.373	17	0.707	45	267	1.5	5.4	1.3	68	305	1.1
1805.3	0.337	16	0.906	42	247	1.3	4.9	1.7	64	283	0.930
1806.0	0.337	18	0.785	45	251	1.6	4.9	1.4	69	287	1.1
1806.7	0.337	16	0.797	45	246	1.1	4.9	1.5	69	281	0.778
1807.4	0.337	17	0.870	38	250	1.3	4.9	1.6	58	285	0.980



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Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1808.1	0.337	18	0.809	41	249	1.5	4.9	1.5	62	285	1.1
1808.8	0.404	17	0.683	42	249	1.9	5.8	1.2	65	285	1.4
1809.4	0.337	18	0.697	40	276	1.1	4.9	1.3	62	316	0.813
1810.1	0.337	17	0.469	41	280	1.8	4.9	0.855	62	320	1.3
1810.8	0.376	17	0.712	39	254	1.5	5.4	1.3	60	290	1.1
1811.5	0.337	17	0.702	39	258	0.817	4.9	1.3	60	295	0.596
1812.2	0.337	17	0.681	41	240	1.2	4.9	1.2	62	274	0.867
1812.9	0.337	16	0.702	37	250	0.782	4.9	1.3	57	286	0.571
1813.6	0.392	16	0.855	36	263	0.792	5.7	1.6	55	301	0.578
1814.3	0.419	16	0.776	37	251	1.2	6.0	1.4	56	287	0.910
1815.0	0.337	15	0.700	40	252	1.4	4.9	1.3	61	288	1.0
1815.7	0.337	16	0.730	36	239	1.1	4.9	1.3	55	273	0.826
1816.4	0.512	13	0.762	32	266	1.1	7.4	1.4	49	304	0.827
1817.1	0.337	14	0.768	34	249	1.3	4.9	1.4	53	284	0.963
1817.8	0.337	14	0.711	27	248	1.5	4.9	1.3	41	284	1.1
1818.5	0.573	17	0.817	32	272	1.3	8.3	1.5	49	312	0.925
1819.2	0.337	15	0.703	35	279	1.6	4.9	1.3	54	319	1.2
1819.9	0.337	13	0.609	30	219	0.758	4.9	1.1	46	251	0.553
1820.6	0.337	16	0.733	30	250	0.684	4.9	1.3	46	286	0.499
1821.3	0.338	17	0.713	29	319	1.7	4.9	1.3	45	364	1.3
1822.0	0.337	13	0.651	28	241	0.742	4.9	1.2	43	275	0.541
1822.7	0.487	14	0.754	29	258	1.4	7.0	1.4	45	295	1.0
1823.4	0.337	14	1.0	28	230	1.1	4.9	1.8	42	263	0.809
1824.1	0.377	16	0.884	27	263	2.0	5.4	1.6	41	301	1.5
1824.8	0.337	16	0.873	28	278	1.4	4.9	1.6	42	318	1.0
1825.5	0.337	15	0.786	30	256	1.6	4.9	1.4	46	293	1.2
1826.2	0.607	13	1.1	23	274	1.9	8.8	2.0	36	313	1.4
1826.9	0.337	12	0.679	25	269	2.1	4.9	1.2	38	307	1.6
1827.6	0.491	15	0.944	20	298	2.1	7.1	1.7	31	340	1.6
1828.3	0.337	14	0.827	22	256	1.8	4.9	1.5	33	293	1.3
1829.0	0.337	12	0.912	21	271	1.3	4.9	1.7	32	309	0.953
1829.7	0.337	13	1.0	20	259	1.0	4.9	1.9	31	296	0.741
1830.4	0.501	12	0.796	19	277	1.4	7.2	1.5	30	317	0.993
1831.1	0.337	13	0.750	21	274	1.5	4.9	1.4	33	314	1.1
1831.8	0.358	11	0.793	19	264	2.2	5.2	1.4	29	302	1.6
1832.5	0.457	11	0.649	17	239	1.5	6.6	1.2	27	273	1.1
1833.2	0.337	14	0.651	22	324	2.0	4.9	1.2	33	371	1.5
1833.9	0.337	12	0.966	17	266	1.8	4.9	1.8	26	304	1.3
1834.6	0.352	12	0.941	18	265	1.6	5.1	1.7	27	303	1.2
1835.3	0.337	13	0.935	19	258	1.8	4.9	1.7	29	295	1.3
1835.9	0.372	11	0.978	15	272	1.5	5.4	1.8	23	311	1.1
1836.6	0.587	10	0.507	17	279	1.3	8.5	0.924	27	319	0.931
1837.3	0.337	12	0.475	16	275	1.7	4.9	0.866	24	314	1.3
1838.0	0.337	13	0.571	16	263	1.9	4.9	1.0	25	301	1.4
1838.7	0.337	11	0.661	15	280	1.0	4.9	1.2	23	320	0.752
1839.4	0.337	9.8	0.794	13	271	1.4	4.9	1.4	20	309	1.0
1840.1	0.522	9.4	0.777	13	284	1.9	7.5	1.4	19	324	1.4
1840.8	0.337	9.6	0.469	12	273	1.5	4.9	0.856	18	312	1.1
1841.5	0.337	11	0.672	15	237	1.1	4.9	1.2	24	271	0.833
1842.2	0.337	11	0.587	14	299	1.2	4.9	1.1	21	342	0.865
1842.9	0.337	12	0.509	13	245	1.2	4.9	0.929	20	280	0.878
1843.6	0.337	11	0.612	14	268	1.6	4.9	1.1	21	306	1.2
1844.3	0.337	10	0.570	12	247	1.2	4.9	1.0	18	282	0.851
1845.0	0.337	9.9	0.364	11	250	1.3	4.9	0.664	17	286	0.920
1845.7	0.337	8.7	0.378	13	269	1.6	4.9	0.689	20	307	1.2
1846.4	0.337	9.5	0.573	12	261	0.992	4.9	1.0	18	298	0.724
1847.1	0.337	9.3	0.559	13	286	1.4	4.9	1.0	21	327	0.990
1847.8	0.337	10	0.431	10	241	1.3	4.9	0.787	16	276	0.948
1848.5	0.337	9.9	0.361	14	264	1.6	4.9	0.658	21	302	1.2
1849.2	0.337	9.3	0.497	12	259	1.2	4.9	0.906	18	297	0.883
1849.9	0.337	8.5	0.510	10	239	0.962	4.9	0.930	16	273	0.702
1850.6	0.672	9.2	0.379	11	267	1.2	9.7	0.692	17	306	0.873
1851.3	0.356	7.3	0.431	12	284	0.808	5.1	0.786	18	325	0.589
1852.0	0.337	7.5	0.521	9.3	262	1.4	4.9	0.951	14	299	1.0
1852.7	0.605	7.3	0.522	12	270	1.1	8.7	0.952	19	309	0.790
1853.4	0.337	9.0	0.458	13	268	1.8	4.9	0.835	20	307	1.3
1854.1	0.337	8.5	0.411	9.9	247	1.4	4.9	0.750	15	282	1.0
1854.8	0.337	8.0	0.521	13	304	1.5	4.9	0.949	20	348	1.1
1855.5	0.337	9.6	0.483	8.0	251	1.3	4.9	0.880	12	287	0.938
1856.2	0.368	8.3	0.336	10	244	0.810	5.3	0.613	16	279	0.591
1856.9	0.337	10.0	0.371	11	260	1.1	4.9	0.677	17	297	0.817
1857.6	0.337	10	0.253	11	247	1.2	4.9	0.462	17	282	0.864
1858.3	0.337	7.6	0.484	11	279	1.3	4.9	0.883	16	319	0.942
1859.0	0.337	9.3	0.382	13	269	2.0	4.9	0.697	20	308	1.4
1859.7	0.337	9.2	0.290	8.8	254	2.0	4.9	0.529	13	291	1.4
1860.4	0.337	9.4	0.347	14	266	1.7	4.9	0.633	21	304	1.2
1861.1	0.337	9.8	0.679	11	241	1.0	4.9	1.2	16	275	0.753
1861.8	0.522	9.7	0.472	13	278	1.4	7.5	0.860	20	318	1.1
1862.4	0.393	9.7	0.552	11	268	1.4	5.7	1.0	17	307	1.0
1863.1	0.337	9.9	0.700	11	269	2.3	4.9	1.3	17	308	1.7
1863.8	0.337	10	0.577	12	265	0.972	4.9	1.1	19	303	0.709



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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1864.5	0.337	10	0.371	9.7	289	2.2	4.9	0.677	15	330	1.6
1865.2	0.337	9.5	0.500	14	277	1.2	4.9	0.911	22	316	0.861
1865.9	0.337	9.3	0.255	13	257	1.3	4.9	0.465	20	293	0.979
1866.6	0.337	9.5	0.372	12	251	1.2	4.9	0.679	18	286	0.889
1867.3	0.337	8.4	0.435	12	244	1.6	4.9	0.793	19	279	1.1
1868.0	0.337	8.7	0.339	13	241	1.4	4.9	0.619	21	276	1.0
1868.7	0.337	8.8	0.721	14	268	1.0	4.9	1.3	21	306	0.765
1869.4	0.337	10	0.336	9.8	233	1.6	4.9	0.613	15	267	1.1
1870.1	0.337	9.9	0.744	12	299	1.3	4.9	1.4	18	342	0.922
1870.8	0.337	8.4	0.472	8.6	256	1.6	4.9	0.860	13	292	1.1
1871.5	0.337	9.8	0.480	13	255	1.7	4.9	0.875	21	292	1.2
1872.2	0.337	8.2	0.601	10.0	272	1.2	4.9	1.1	15	310	0.845
1872.9	0.337	10	0.698	9.7	261	0.899	4.9	1.3	15	298	0.656
1873.6	0.337	11	0.672	13	262	2.0	4.9	1.2	19	300	1.4
1874.3	0.337	9.2	0.527	12	252	1.7	4.9	0.961	18	289	1.3
1875.0	0.337	11	0.760	12	236	1.8	4.9	1.4	19	270	1.3
1875.7	0.337	8.5	0.658	12	260	1.3	4.9	1.2	19	297	0.963
1876.4	0.337	8.3	0.715	14	249	1.7	4.9	1.3	22	284	1.3
1877.1	0.337	10	0.575	15	258	1.6	4.9	1.0	23	295	1.2
1877.8	0.337	9.2	0.577	15	228	1.6	4.9	1.1	24	261	1.1
1878.5	0.337	8.3	1.0	11	249	1.9	4.9	1.8	17	285	1.4
1879.2	0.337	9.8	0.613	13	278	1.7	4.9	1.1	20	318	1.2
1879.9	0.337	10	0.581	15	242	1.8	4.9	1.1	22	277	1.3
1880.6	0.337	8.3	0.779	14	238	1.7	4.9	1.4	22	273	1.2
1881.3	0.337	11	0.829	14	253	2.8	4.9	1.5	22	290	2.0
1882.0	0.337	11	0.922	15	250	1.8	4.9	1.7	23	286	1.3
1882.7	0.337	9.7	0.619	12	241	1.4	4.9	1.1	19	276	1.0
1883.4	0.337	9.6	0.652	17	256	1.9	4.9	1.2	25	293	1.4
1884.1	0.337	12	0.740	17	251	2.0	4.9	1.3	26	287	1.5
1884.8	0.337	9.8	0.654	13	266	1.8	4.9	1.2	20	304	1.3
1885.5	0.337	11	0.807	15	236	2.0	4.9	1.5	23	269	1.5
1886.2	0.337	10	1.1	15	261	1.5	4.9	2.1	23	298	1.1
1886.9	0.337	10	0.824	13	258	2.0	4.9	1.5	20	295	1.5
1887.6	0.337	12	0.929	15	282	2.4	4.9	1.7	23	322	1.7
1888.3	0.343	9.7	0.902	15	237	1.7	5.0	1.6	24	271	1.2
1889.0	0.337	10	1.1	18	246	2.2	4.9	2.0	28	281	1.6
1889.6	0.337	11	0.935	17	263	2.0	4.9	1.7	26	301	1.4
1890.3	0.337	12	1.0	17	248	2.8	4.9	1.9	26	284	2.1
1891.0	0.535	11	1.2	16	242	1.5	7.7	2.2	25	277	1.1
1891.7	0.337	11	0.924	20	236	2.3	4.9	1.7	30	270	1.7
1892.4	0.644	12	0.880	16	249	2.1	9.3	1.6	25	285	1.6
1893.1	0.337	9.6	0.924	16	236	2.9	4.9	1.7	25	269	2.1
1893.8	0.337	9.3	1.2	15	204	1.9	4.9	2.2	23	234	1.4
1894.5	0.337	10	1.1	18	239	2.5	4.9	1.9	28	274	1.8
1895.2	0.337	11	1.2	18	226	2.3	4.9	2.2	28	258	1.7
1895.9	0.337	13	1.3	16	246	3.3	4.9	2.4	24	281	2.4
1896.6	0.337	9.9	1.1	17	219	1.5	4.9	2.0	27	250	1.1
1897.3	0.337	12	1.0	16	253	2.7	4.9	1.9	24	290	2.0
1898.0	0.337	15	1.1	22	247	2.3	4.9	2.1	33	282	1.7
1898.7	0.337	11	1.0	21	213	2.8	4.9	1.9	32	243	2.0
1899.4	0.337	11	1.2	19	219	1.6	4.9	2.2	29	251	1.2
1900.1	0.337	12	1.2	20	221	1.9	4.9	2.1	31	253	1.4
1900.8	0.337	13	1.6	22	240	2.1	4.9	2.9	34	275	1.5
1901.5	0.337	16	1.6	23	244	3.0	4.9	3.0	35	279	2.2
1902.2	0.509	14	1.8	27	203	3.3	7.3	3.3	41	232	2.4
1902.9	0.337	13	1.8	26	211	3.5	4.9	3.4	40	242	2.5
1903.6	0.337	13	2.2	28	211	3.8	4.9	4.0	43	241	2.8
1904.3	0.484	13	2.6	30	201	5.0	7.0	4.7	47	230	3.6
1905.0	0.337	14	2.4	28	182	4.0	4.9	4.5	42	209	2.9
1905.7	0.337	15	2.2	30	204	4.9	4.9	4.0	46	233	3.5
1906.4	0.402	15	2.8	29	183	4.2	5.8	5.1	44	209	3.1
1907.1	0.337	15	2.8	32	186	5.1	4.9	5.1	49	213	3.7
1907.8	0.337	17	2.6	39	184	4.4	4.9	4.7	60	211	3.2
1908.5	0.614	18	2.4	35	179	5.1	8.9	4.4	54	204	3.7
1909.2	0.337	14	2.6	33	166	4.3	4.9	4.8	50	190	3.2
1909.9	0.337	14	3.1	35	167	5.4	4.9	5.7	54	191	3.9
1910.6	0.337	15	2.9	31	165	4.9	4.9	5.3	48	189	3.5
1911.3	0.337	16	3.2	39	162	5.8	4.9	5.8	60	186	4.2
1912.0	0.337	15	3.3	42	172	6.0	4.9	6.0	65	197	4.4
1912.7	0.337	16	3.1	34	144	6.7	4.9	5.6	52	165	4.9
1913.4	0.337	14	3.5	41	160	6.5	4.9	6.3	63	183	4.8
1914.1	0.337	16	3.2	38	143	5.2	4.9	5.9	58	164	3.8
1914.8	0.337	17	3.1	49	158	5.9	4.9	5.7	74	181	4.3
1915.5	0.337	16	3.1	41	141	6.0	4.9	5.7	64	161	4.4
1916.1	0.487	18	3.2	46	160	7.1	7.0	5.8	70	183	5.2
1916.8	0.337	13	2.8	48	147	6.0	4.9	5.0	73	168	4.4
1917.5	0.348	17	3.1	45	158	6.6	5.0	5.7	69	180	4.8
1918.2	0.337	18	2.8	51	153	5.4	4.9	5.0	78	175	4.0
1918.9	0.337	16	3.0	41	140	5.6	4.9	5.5	63	160	4.1
1919.6	0.337	15	3.1	48	156	5.8	4.9	5.7	74	179	4.3
1920.3	0.337	17	3.1	45	142	4.5	4.9	5.7	69	163	3.3



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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1921.0	0.337	18	3.2	47	158	5.4	4.9	5.9	73	180	3.9
1921.7	0.337	15	3.2	57	139	5.8	4.9	5.9	88	159	4.2
1922.4	0.544	18	3.0	50	149	5.4	7.9	5.5	76	170	3.9
1923.1	0.337	19	3.1	46	138	4.5	4.9	5.7	71	157	3.3
1923.8	0.337	17	3.5	45	141	5.7	4.9	6.4	69	162	4.2
1924.5	0.360	18	3.1	45	131	5.3	5.2	5.7	69	150	3.8
1925.2	0.337	17	3.0	52	131	5.3	4.9	5.5	80	150	3.9
1925.9	0.337	17	2.8	51	134	5.7	4.9	5.2	79	154	4.2
1926.6	0.337	19	3.0	46	147	5.3	4.9	5.5	71	168	3.9
1927.3	0.337	18	2.7	46	132	5.3	4.9	4.8	70	151	3.9
1928.0	0.337	20	3.0	52	135	6.4	4.9	5.5	80	154	4.7
1928.7	0.337	16	3.8	53	130	5.1	4.9	6.9	81	148	3.7
1929.4	0.337	19	2.6	47	119	5.5	4.9	4.8	72	136	4.0
1930.1	0.337	18	2.9	48	125	4.9	4.9	5.3	74	143	3.6
1930.8	0.337	17	2.6	50	127	5.4	4.9	4.7	76	145	4.0
1931.5	0.545	18	3.1	57	127	5.0	7.9	5.6	88	145	3.6
1932.2	0.337	19	3.3	53	121	5.1	4.9	6.0	81	138	3.7
1932.9	0.337	18	2.6	55	116	5.3	4.9	4.8	84	132	3.8
1933.6	0.337	22	2.7	55	125	6.0	4.9	5.0	84	143	4.4
1934.3	0.464	17	2.6	52	117	4.1	6.7	4.7	79	134	3.0
1935.0	0.337	20	2.8	52	113	5.9	4.9	5.0	80	129	4.3
1935.7	0.368	17	2.5	54	111	6.0	5.3	4.6	82	127	4.4
1936.4	0.337	16	2.1	53	124	5.4	4.9	3.7	81	142	3.9
1937.1	0.337	17	2.3	48	115	5.5	4.9	4.2	74	132	4.0
1937.8	0.337	16	2.2	60	116	5.8	4.9	4.0	93	133	4.3
1938.5	0.337	18	2.4	48	103	4.1	4.9	4.4	74	118	3.0
1939.2	0.337	18	2.4	48	120	4.9	4.9	4.4	74	138	3.6
1939.9	0.337	19	2.2	51	124	4.6	4.9	3.9	79	142	3.4
1940.6	0.337	18	2.7	55	130	5.2	4.9	4.9	84	149	3.8
1941.3	0.337	20	3.0	58	122	5.3	4.9	5.5	88	139	3.9
1942.0	0.337	18	2.6	56	119	5.2	4.9	4.7	85	136	3.8
1942.6	0.337	17	2.2	48	114	4.9	4.9	4.1	73	130	3.6
1943.3	0.337	15	2.2	45	95	3.8	4.9	4.0	69	108	2.8
1944.0	0.337	19	2.7	48	115	5.5	4.9	5.0	74	132	4.0
1944.7	0.509	19	2.4	60	117	5.5	7.3	4.4	93	133	4.0
1945.4	0.337	19	2.7	55	113	7.0	4.9	4.9	84	129	5.1
1946.1	0.337	16	2.0	49	105	4.9	4.9	3.7	75	120	3.6
1946.8	0.337	15	2.0	48	109	3.7	4.9	3.7	73	125	2.7
1947.5	0.337	17	2.3	47	113	5.3	4.9	4.2	72	129	3.8
1948.2	0.337	16	2.4	54	113	6.2	4.9	4.4	83	129	4.5
1948.9	0.337	16	2.0	56	108	5.4	4.9	3.7	86	124	4.0
1949.6	0.337	18	2.4	50	131	7.0	4.9	4.4	77	150	5.1
1950.3	0.337	17	2.5	52	104	6.1	4.9	4.6	80	119	4.4
1951.0	0.337	16	2.3	50	115	6.6	4.9	4.3	76	131	4.8
1951.7	0.337	18	2.6	50	112	6.1	4.9	4.7	77	128	4.4
1952.4	0.425	15	2.3	46	112	5.6	6.1	4.3	70	128	4.1
1953.1	0.337	17	2.7	57	122	5.3	4.9	4.8	87	139	3.9
1953.8	0.337	18	2.9	49	106	5.1	4.9	5.2	76	122	3.7
1954.5	0.337	18	2.8	49	104	5.6	4.9	5.1	75	119	4.1
1955.2	0.337	15	2.2	53	107	7.3	4.9	4.1	81	122	5.3
1955.9	0.337	16	2.3	43	97	5.7	4.9	4.3	66	111	4.1
1956.6	0.337	16	2.7	54	111	5.8	4.9	5.0	82	127	4.2
1957.3	0.337	19	2.5	51	111	7.5	4.9	4.6	79	127	5.5
1958.0	0.337	18	2.4	54	116	7.1	4.9	4.3	83	132	5.2
1958.7	0.337	23	2.5	53	108	4.5	4.9	4.6	81	123	3.3
1959.4	0.413	15	2.4	48	107	7.0	6.0	4.3	74	122	5.1
1960.1	0.337	15	2.8	45	108	7.3	4.9	5.1	68	123	5.3
1960.8	0.337	17	2.5	49	104	7.4	4.9	4.5	75	119	5.4
1961.5	0.337	18	2.1	48	98	6.0	4.9	3.8	73	112	4.4
1962.2	0.337	16	2.7	53	97	6.0	4.9	5.0	82	111	4.3
1962.9	0.337	15	2.4	51	105	6.8	4.9	4.4	78	120	4.9
1963.6	0.337	16	2.4	47	98	5.6	4.9	4.4	72	112	4.1
1964.3	0.337	19	2.9	61	114	7.5	4.9	5.4	94	131	5.5
1965.0	0.337	20	2.3	52	105	7.5	4.9	4.2	79	120	5.5
1965.7	0.337	19	2.8	48	107	6.2	4.9	5.1	73	122	4.5
1966.4	0.337	17	2.5	47	107	7.3	4.9	4.5	72	122	5.3
1967.1	0.392	18	2.3	51	113	9.2	5.7	4.2	78	129	6.7
1967.8	0.337	17	2.4	56	112	10	4.9	4.3	85	128	7.4
1968.5	0.337	21	2.9	54	101	8.0	4.9	5.2	82	116	5.8
1969.1	0.337	16	3.0	57	111	7.1	4.9	5.5	88	127	5.2
1969.8	0.337	16	2.3	49	101	7.4	4.9	4.2	75	115	5.4
1970.5	0.337	19	2.7	54	114	8.5	4.9	4.9	83	131	6.2
1971.2	0.337	20	2.4	54	104	8.3	4.9	4.4	83	119	6.0
1971.9	0.337	19	2.6	51	108	9.4	4.9	4.7	78	123	6.9
1972.6	0.337	17	2.4	54	103	9.0	4.9	4.4	83	118	6.6
1973.3	0.337	17	2.5	50	101	9.2	4.9	4.5	76	116	6.7
1974.0	0.337	17	2.2	47	102	7.3	4.9	4.1	72	116	5.4
1974.7	0.597	19	2.6	65	118	8.2	8.6	4.8	100	135	6.0
1975.4	0.337	19	2.4	55	100	7.1	4.9	4.3	84	115	5.2
1976.1	0.337	18	2.4	54	110	7.4	4.9	4.4	83	126	5.4
1976.8	0.337	18	2.8	50	110	7.3	4.9	5.0	76	125	5.3



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1977.5	0.337	19	2.6	53	103	8.8	4.9	4.8	81	118	6.4
1978.2	0.337	19	2.8	50	104	8.2	4.9	5.2	77	119	6.0
1978.9	0.337	18	2.3	53	99	7.4	4.9	4.2	81	113	5.4
1979.6	0.337	18	2.4	56	105	8.7	4.9	4.4	86	120	6.3
1980.3	0.337	21	2.9	52	102	9.0	4.9	5.3	79	117	6.6
1981.0	0.337	21	2.8	54	110	9.5	4.9	5.1	84	125	6.9
1981.7	0.337	19	2.1	49	95	8.2	4.9	3.8	75	109	6.0
1982.4	0.337	20	2.3	50	98	7.7	4.9	4.1	77	112	5.6
1983.1	0.337	18	2.3	54	104	8.6	4.9	4.2	83	119	6.3
1983.8	0.337	17	2.2	51	104	9.4	4.9	4.0	78	119	6.9
1984.5	0.337	20	2.5	57	129	9.7	4.9	4.5	87	148	7.1
1985.2	0.337	18	2.3	54	100	9.1	4.9	4.1	83	115	6.6
1985.9	0.337	18	1.7	47	94	6.2	4.9	3.2	73	108	4.5
1986.6	0.337	20	2.1	43	113	7.5	4.9	3.8	66	130	5.4
1987.3	0.337	18	1.8	49	105	8.0	4.9	3.4	75	120	5.8
1988.0	0.337	20	2.7	48	127	9.7	4.9	4.8	74	146	7.1
1988.7	0.337	21	1.8	53	115	8.2	4.9	3.3	81	132	6.0
1989.4	0.337	19	2.2	50	111	8.6	4.9	4.0	76	127	6.3
1990.1	0.337	18	2.1	48	109	10.0	4.9	3.8	73	125	7.3
1990.8	0.337	17	2.3	43	101	9.0	4.9	4.1	66	116	6.6
1991.5	0.337	21	2.1	54	108	8.5	4.9	3.8	83	123	6.2
1992.2	0.337	22	2.5	52	100	8.7	4.9	4.5	80	115	6.4
1992.9	0.337	17	2.4	48	108	7.4	4.9	4.3	73	124	5.4
1993.6	0.337	19	2.2	47	119	8.2	4.9	4.1	73	136	6.0
1994.3	0.412	19	2.1	49	110	8.4	6.0	3.9	75	126	6.1
1995.0	0.446	18	2.2	56	105	10	6.4	4.0	86	120	7.5
1995.7	0.395	20	2.3	45	96	6.9	5.7	4.2	68	110	5.0
1996.3	0.337	20	2.0	47	112	9.4	4.9	3.7	72	128	6.9
1997.0	0.337	17	2.7	41	94	6.7	4.9	4.9	63	108	4.9
1997.7	0.366	22	1.9	52	114	8.5	5.3	3.5	79	130	6.2
1998.4	0.337	22	2.4	54	109	7.4	4.9	4.4	83	125	5.4
1999.1	0.337	16	2.0	44	94	8.0	4.9	3.7	67	107	5.9
1999.8	0.337	20	2.2	42	96	7.4	4.9	4.0	65	110	5.4
2000.5	0.337	20	1.9	48	126	9.7	4.9	3.6	73	144	7.1
2001.2	0.337	20	2.0	49	97	7.8	4.9	3.7	75	111	5.7
2001.9	0.337	21	1.6	45	99	5.8	4.9	2.9	70	113	4.2
2002.6	0.367	19	1.7	44	107	8.8	5.3	3.1	68	122	6.4
2003.3	0.337	18	2.0	43	114	8.0	4.9	3.6	66	130	5.8
2004.0	0.337	21	2.1	47	108	10	4.9	3.9	72	124	7.6
2004.7	0.337	24	2.4	47	103	8.6	4.9	4.4	73	118	6.3
2005.4	0.337	20	2.1	42	103	6.6	4.9	3.9	65	118	4.8
2006.1	0.337	20	2.2	44	111	6.9	4.9	4.1	68	127	5.0
2006.8	0.337	17	2.2	42	100	9.6	4.9	3.9	65	115	7.0
2007.5	0.337	21	1.9	42	108	8.1	4.9	3.4	65	123	5.9
2008.2	0.337	21	2.0	42	103	7.2	4.9	3.6	64	118	5.2
2008.9	0.337	17	1.7	40	89	8.1	4.9	3.2	62	101	5.9
2009.6	0.337	20	1.9	47	114	11	4.9	3.5	72	130	8.0
2010.3	0.337	20	2.3	40	104	6.6	4.9	4.1	61	119	4.8
2011.0	0.337	20	1.9	43	108	8.1	4.9	3.4	67	124	5.9
2011.7	0.378	18	2.0	46	100	7.8	5.5	3.7	70	114	5.7
2012.4	0.337	16	2.0	44	113	7.2	4.9	3.6	68	129	5.2
2013.1	0.337	19	2.4	40	105	7.3	4.9	4.4	62	120	5.3
2013.8	0.512	21	1.8	40	99	8.0	7.4	3.3	61	113	5.8
2014.5	0.783	22	2.4	42	113	7.7	11	4.4	64	129	5.6
2015.2	0.337	18	1.9	45	115	8.2	4.9	3.5	69	132	6.0
2015.9	0.337	19	2.6	46	109	8.1	4.9	4.7	71	125	5.9
2016.6	0.337	20	2.3	45	115	6.7	4.9	4.1	69	132	4.9
2017.3	0.337	17	1.8	43	123	7.2	4.9	3.3	65	141	5.2
2018.0	0.337	21	1.8	44	127	7.1	4.9	3.3	67	145	5.2
2018.7	0.443	21	1.8	44	144	8.5	6.4	3.3	68	165	6.2
2019.4	0.337	23	2.0	43	123	6.9	4.9	3.6	66	140	5.0
2020.1	0.337	19	1.7	40	127	7.4	4.9	3.1	62	145	5.4
2020.8	0.520	20	1.8	44	133	7.4	7.5	3.3	67	152	5.4
2021.5	0.337	19	1.6	40	124	6.7	4.9	2.9	61	142	4.9
2022.2	0.427	21	1.8	35	126	7.9	6.2	3.2	54	144	5.7
2022.8	0.337	19	1.4	41	142	5.2	4.9	2.6	62	162	3.8
2023.5	0.365	18	1.6	36	141	6.2	5.3	3.0	55	161	4.5
2024.2	0.476	23	1.4	38	142	7.7	6.9	2.5	58	163	5.6
2024.9	0.337	20	1.5	38	143	7.3	4.9	2.8	58	163	5.4
2025.6	0.337	24	1.8	42	142	7.1	4.9	3.3	65	163	5.2
2026.3	0.337	21	1.6	38	135	4.9	4.9	3.0	58	154	3.5
2027.0	0.337	23	1.9	39	149	7.3	4.9	3.5	60	171	5.3
2027.7	0.337	22	1.7	39	156	7.2	4.9	3.1	60	178	5.3
2028.4	0.337	23	1.6	39	137	6.2	4.9	3.0	60	156	4.5
2029.1	0.597	23	1.6	39	139	6.0	8.6	2.9	60	159	4.4
2029.8	0.337	21	1.5	40	152	6.0	4.9	2.7	61	174	4.4
2030.5	0.337	26	2.1	43	186	9.8	4.9	3.8	66	212	7.1
2031.2	0.337	21	2.1	45	144	7.7	4.9	3.9	68	164	5.6
2031.9	0.337	21	1.6	41	148	5.7	4.9	3.0	63	170	4.1
2032.6	0.354	22	1.5	41	157	6.4	5.1	2.8	62	180	4.7
2033.3	0.337	21	1.5	41	160	5.4	4.9	2.8	62	183	3.9



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Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2034.0	0.337	19	1.8	39	171	6.3	4.9	3.2	60	195	4.6
2034.7	0.337	21	1.5	36	168	5.3	4.9	2.7	55	192	3.8
2035.4	0.337	22	1.4	44	165	6.1	4.9	2.5	67	188	4.4
2036.1	0.337	21	1.5	40	162	6.2	4.9	2.7	61	185	4.5
2036.8	0.337	19	1.6	36	159	5.9	4.9	2.9	55	182	4.3
2037.5	0.337	27	1.7	42	169	9.2	4.9	3.1	65	193	6.7
2038.2	0.337	23	1.6	40	175	6.5	4.9	3.0	61	201	4.8
2038.9	0.337	20	1.7	43	164	6.1	4.9	3.1	67	188	4.5
2039.6	0.450	20	1.5	33	166	5.9	6.5	2.7	51	189	4.3
2040.3	0.337	26	1.5	38	164	6.8	4.9	2.8	58	188	4.9
2041.0	0.362	23	1.7	48	171	7.2	5.2	3.1	73	196	5.2
2041.7	0.376	27	1.5	43	153	7.5	5.4	2.7	66	175	5.4
2042.4	0.337	21	1.4	48	142	5.5	4.9	2.6	74	163	4.0
2043.1	0.337	18	1.4	44	145	6.7	4.9	2.6	67	166	4.9
2043.8	0.337	19	1.4	42	166	5.6	4.9	2.6	65	190	4.1
2044.5	0.337	17	1.4	39	150	5.4	4.9	2.5	60	172	3.9
2045.2	0.337	21	1.7	53	156	7.4	4.9	3.0	81	178	5.4
2045.9	0.557	21	1.8	40	164	6.8	8.0	3.4	61	188	5.0
2046.6	0.337	18	1.5	37	158	7.0	4.9	2.7	56	181	5.1
2047.3	0.337	20	1.5	43	175	8.2	4.9	2.7	65	200	6.0
2048.0	0.427	19	1.4	41	154	6.4	6.2	2.5	62	176	4.7
2048.6	0.337	18	1.4	36	157	6.5	4.9	2.6	55	179	4.8
2049.3	0.337	20	1.7	39	142	5.8	4.9	3.0	60	162	4.2
2050.0	0.337	22	1.6	36	172	9.3	4.9	2.9	55	196	6.8
2050.7	0.337	20	1.4	47	166	7.6	4.9	2.5	72	190	5.6
2051.4	0.337	23	1.4	44	149	5.9	4.9	2.6	67	171	4.3
2052.1	0.337	20	1.4	32	145	6.2	4.9	2.5	49	166	4.6
2052.8	0.337	20	1.4	42	158	6.2	4.9	2.6	64	180	4.6
2053.5	0.596	19	1.9	41	157	7.5	8.6	3.4	63	179	5.4
2054.2	0.337	19	1.4	46	154	6.8	4.9	2.6	70	176	4.9
2054.9	0.348	17	1.2	41	138	6.5	5.0	2.2	63	158	4.8
2055.6	0.337	17	1.3	43	146	6.9	4.9	2.4	66	166	5.0
2056.3	0.337	16	1.3	40	136	6.4	4.9	2.4	62	155	4.7
2057.0	0.337	18	1.2	41	150	8.8	4.9	2.2	62	171	6.5
2057.7	0.337	19	1.4	49	145	7.8	4.9	2.6	75	166	5.7
2058.4	0.440	16	1.4	42	147	5.4	6.4	2.6	64	168	3.9
2059.1	0.337	18	1.3	41	155	7.0	4.9	2.3	62	177	5.1
2059.8	0.337	16	1.4	42	145	7.2	4.9	2.5	65	166	5.3
2060.5	0.337	18	1.4	44	151	6.3	4.9	2.6	68	173	4.6
2061.2	0.518	18	1.3	48	139	5.7	7.5	2.4	73	159	4.1
2061.9	0.337	20	0.998	39	128	5.8	4.9	1.8	60	146	4.2
2062.6	0.337	16	1.3	42	152	5.8	4.9	2.3	64	174	4.2
2063.3	0.337	17	1.6	47	150	7.3	4.9	2.9	72	172	5.4
2064.0	0.337	18	1.6	44	128	7.3	4.9	3.0	67	146	5.3
2064.7	0.337	17	1.4	47	138	6.3	4.9	2.6	72	158	4.6
2065.4	0.337	16	1.2	42	134	6.2	4.9	2.2	64	153	4.6
2066.1	0.337	18	1.5	42	138	7.0	4.9	2.7	65	158	5.1
2066.8	0.337	16	1.6	43	137	6.0	4.9	2.9	66	157	4.4
2067.5	0.337	17	1.7	51	133	5.9	4.9	3.1	78	152	4.3
2068.2	0.337	15	1.5	45	132	6.4	4.9	2.8	69	150	4.7
2068.9	0.337	15	1.6	46	137	6.6	4.9	3.0	70	157	4.8
2069.6	0.337	15	1.6	43	129	7.3	4.9	3.0	65	148	5.3
2070.3	0.337	15	1.4	49	146	8.1	4.9	2.5	74	167	5.9
2071.0	0.337	15	1.3	41	119	6.4	4.9	2.4	64	136	4.7
2071.7	0.337	15	1.5	50	132	6.5	4.9	2.8	77	151	4.7
2072.4	0.337	14	1.6	43	119	5.7	4.9	3.0	65	136	4.2
2073.1	0.337	18	2.0	54	140	8.3	4.9	3.6	82	160	6.1
2073.8	0.337	15	1.7	51	127	6.9	4.9	3.1	79	145	5.0
2074.5	0.337	15	1.8	55	136	6.5	4.9	3.2	84	156	4.7
2075.1	0.337	17	1.7	49	153	7.1	4.9	3.1	75	175	5.2
2075.8	0.337	17	1.7	48	126	6.6	4.9	3.0	74	144	4.8
2076.5	0.337	17	2.1	51	139	8.1	4.9	3.8	78	159	5.9
2077.2	0.337	17	2.1	52	126	7.8	4.9	3.8	80	144	5.7
2077.9	0.337	15	2.0	48	125	7.8	4.9	3.6	73	143	5.7
2078.6	0.423	17	2.2	51	121	6.9	6.1	4.0	79	139	5.1
2079.3	0.337	15	2.1	57	131	8.0	4.9	3.8	88	150	5.8
2080.0	0.338	16	1.9	56	145	10	4.9	3.5	86	166	7.3
2080.7	0.337	14	2.2	53	129	8.5	4.9	4.1	81	148	6.2
2081.4	0.337	14	1.9	48	111	5.1	4.9	3.5	74	127	3.7
2082.1	0.337	13	1.7	51	142	8.8	4.9	3.1	79	162	6.4
2082.8	0.376	15	1.6	53	127	7.4	5.4	2.9	81	146	5.4
2083.5	0.337	16	2.0	54	123	7.8	4.9	3.6	83	141	5.7
2084.2	0.337	16	1.9	48	124	6.7	4.9	3.5	73	142	4.9
2084.9	0.337	14	2.1	54	142	8.7	4.9	3.8	83	162	6.4
2085.6	0.337	14	1.9	56	142	8.6	4.9	3.6	86	163	6.3
2086.3	0.470	15	1.9	54	138	7.9	6.8	3.5	82	158	5.7
2087.0	0.337	15	1.7	45	118	7.2	4.9	3.0	69	135	5.3
2087.7	0.390	13	1.9	48	126	5.8	5.6	3.5	74	144	4.2
2088.4	0.337	15	1.6	56	131	7.9	4.9	2.9	86	150	5.8
2089.1	0.337	17	1.7	46	120	7.3	4.9	3.2	70	138	5.3
2089.8	0.337	15	1.5	55	154	7.4	4.9	2.7	84	176	5.4



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Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2090.5	0.337	13	1.6	53	147	7.9	4.9	2.9	81	168	5.8
2091.2	0.337	14	1.2	48	131	7.8	4.9	2.2	73	149	5.7
2091.9	0.337	12	1.4	45	127	6.2	4.9	2.5	70	145	4.5
2092.6	0.337	14	1.1	56	144	6.0	4.9	2.1	85	165	4.4
2093.3	0.337	14	1.5	60	161	8.8	4.9	2.7	92	184	6.4
2094.0	0.337	13	1.2	51	153	5.4	4.9	2.1	78	175	3.9
2094.7	0.337	16	1.7	50	148	5.3	4.9	3.0	76	170	3.8
2095.4	0.408	13	1.5	55	158	5.3	5.9	2.7	85	181	3.8
2096.1	0.337	14	1.2	42	169	7.2	4.9	2.3	65	193	5.2
2096.8	0.337	14	1.2	48	169	5.6	4.9	2.2	73	194	4.1
2097.5	0.337	16	1.3	48	189	5.2	4.9	2.3	73	216	3.8
2098.2	0.337	14	1.1	37	181	4.8	4.9	2.1	56	207	3.5
2098.9	0.337	11	1.4	43	190	5.2	4.9	2.6	66	217	3.8
2099.6	0.337	13	1.7	44	187	4.8	4.9	3.1	68	214	3.5
2100.3	0.337	12	1.0	42	191	4.7	4.9	1.9	64	218	3.5
2101.0	0.685	16	1.1	38	175	4.6	9.9	2.1	59	201	3.4
2101.6	0.337	12	1.3	41	202	5.2	4.9	2.3	63	231	3.8
2102.3	0.395	12	1.0	46	190	6.6	5.7	1.8	71	218	4.8
2103.0	0.337	11	1.3	37	215	4.6	4.9	2.4	57	245	3.3
2103.7	0.337	11	1.1	43	191	4.4	4.9	1.9	66	219	3.2
2104.4	0.337	10.0	1.1	34	182	4.1	4.9	2.0	53	209	3.0
2105.1	0.337	11	0.874	39	194	4.8	4.9	1.6	60	222	3.5
2105.8	0.337	12	0.977	42	193	4.2	4.9	1.8	65	221	3.1
2106.5	0.337	12	1.4	38	227	3.5	4.9	2.5	59	260	2.5
2107.2	0.412	14	1.1	37	219	3.9	5.9	2.1	56	250	2.9
2107.9	0.337	9.1	1.2	40	209	3.6	4.9	2.2	62	239	2.6
2108.6	0.337	13	0.772	36	192	2.9	4.9	1.4	55	219	2.1
2109.3	0.337	11	0.704	33	203	4.6	4.9	1.3	51	232	3.4
2110.0	0.337	11	1.2	30	203	3.7	4.9	2.2	46	233	2.7
2110.7	0.337	14	0.704	36	236	3.2	4.9	1.3	55	270	2.3
2111.4	0.337	11	0.776	30	187	3.3	4.9	1.4	46	214	2.4
2112.1	0.337	14	0.838	31	213	3.9	4.9	1.5	48	243	2.8
2112.8	0.337	11	0.803	32	215	3.5	4.9	1.5	49	246	2.6
2113.5	0.486	11	0.777	37	253	4.1	7.0	1.4	56	289	3.0
2114.2	0.473	11	0.669	29	201	4.1	6.8	1.2	45	230	3.0
2114.9	0.337	11	0.951	28	196	2.9	4.9	1.7	43	224	2.1
2115.6	0.337	12	0.936	30	204	3.5	4.9	1.7	46	233	2.5
2116.3	0.337	11	0.689	29	226	3.2	4.9	1.3	44	258	2.3
2117.0	0.337	12	0.903	26	210	3.6	4.9	1.6	41	240	2.6
2117.7	0.551	10	0.875	31	210	4.2	8.0	1.6	47	240	3.1
2118.4	0.337	10	0.881	25	224	3.3	4.9	1.6	38	256	2.4
2119.1	0.337	8.7	0.976	27	199	3.2	4.9	1.8	41	227	2.3
2119.8	0.348	11	0.789	25	216	3.9	5.0	1.4	39	247	2.9
2120.5	0.337	11	0.754	26	211	3.2	4.9	1.4	40	242	2.3
2121.2	0.337	11	0.655	21	186	3.1	4.9	1.2	32	213	2.2
2121.9	0.337	9.7	0.926	25	237	4.0	4.9	1.7	38	271	2.9
2122.6	0.337	11	0.715	27	199	3.6	4.9	1.3	41	228	2.6
2123.3	0.337	10	0.997	28	245	4.5	4.9	1.8	43	280	3.3
2124.0	0.337	10	0.603	24	211	2.8	4.9	1.1	36	242	2.1
2124.7	0.337	8.8	0.826	18	204	3.9	4.9	1.5	28	233	2.9
2125.4	0.337	10	1.1	24	230	3.8	4.9	2.0	36	262	2.8
2126.1	0.337	10	0.899	23	217	4.5	4.9	1.6	35	248	3.3
2126.8	0.374	12	0.932	23	198	4.7	5.4	1.7	35	226	3.4
2127.5	0.346	9.6	0.838	19	225	3.7	5.0	1.5	30	257	2.7
2128.2	0.337	9.3	0.933	22	203	3.6	4.9	1.7	33	232	2.6
2128.8	0.389	9.5	1.0	24	236	4.5	5.6	1.9	37	270	3.3
2129.5	0.386	9.3	1.1	20	205	4.0	5.6	2.0	30	235	2.9
2130.2	0.396	8.2	0.569	23	248	3.6	5.7	1.0	35	283	2.6
2130.9	0.337	8.2	1.1	19	214	4.1	4.9	1.9	29	245	3.0
2131.6	0.337	8.8	1.1	20	238	4.2	4.9	1.9	31	272	3.1
2132.3	0.337	8.2	0.729	21	221	4.4	4.9	1.3	32	253	3.2
2133.0	0.337	9.3	0.854	19	191	2.9	4.9	1.6	29	219	2.1
2133.7	0.385	7.6	1.0	22	253	4.0	5.6	1.8	33	290	2.9
2134.4	0.337	9.2	0.800	18	209	3.6	4.9	1.5	27	239	2.7
2135.1	0.337	8.3	0.709	13	202	2.8	4.9	1.3	20	231	2.1
2135.8	0.337	9.2	0.727	20	219	3.5	4.9	1.3	31	251	2.5
2136.5	0.337	7.5	0.690	17	213	3.5	4.9	1.3	26	244	2.5
2137.2	0.337	9.3	0.742	20	232	3.3	4.9	1.4	31	265	2.4
2137.9	0.337	8.7	0.945	18	217	4.4	4.9	1.7	27	248	3.2
2138.6	0.337	9.7	0.789	19	240	3.5	4.9	1.4	29	275	2.6
2139.3	0.337	9.0	0.745	19	221	3.4	4.9	1.4	30	253	2.5
2140.0	0.337	6.6	0.681	16	213	2.8	4.9	1.2	25	244	2.0
2140.7	0.337	8.5	0.613	18	213	3.3	4.9	1.1	28	244	2.4
2141.4	0.337	8.4	0.517	14	219	3.1	4.9	0.944	21	250	2.2
2142.1	0.341	8.6	0.559	19	230	3.3	4.9	1.0	30	263	2.4
2142.8	0.337	9.5	0.613	17	232	3.6	4.9	1.1	25	266	2.6
2143.5	0.337	7.8	0.563	14	207	2.2	4.9	1.0	21	237	1.6
2144.2	0.337	8.7	0.489	17	206	3.4	4.9	0.891	26	235	2.5
2144.9	0.337	8.1	0.707	17	217	3.1	4.9	1.3	26	249	2.2
2145.6	0.337	9.8	0.656	15	234	3.3	4.9	1.2	23	267	2.4
2146.3	0.337	7.4	0.717	15	211	3.9	4.9	1.3	23	242	2.8



Minnow Environmental  
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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2147.0	0.337	7.9	0.622	15	245	3.3	4.9	1.1	23	281	2.4
2147.7	0.337	10	0.587	14	246	3.4	4.9	1.1	22	281	2.5
2148.4	0.458	9.8	0.558	16	198	2.8	6.6	1.0	25	227	2.1
2149.1	0.337	10	0.486	16	217	2.2	4.9	0.887	24	249	1.6
2149.8	0.337	9.4	0.484	15	222	2.5	4.9	0.884	22	254	1.8
2150.5	0.431	6.6	0.625	15	209	3.4	6.2	1.1	23	238	2.5
2151.2	0.337	7.9	0.434	16	216	3.1	4.9	0.792	25	247	2.3
2151.9	0.337	8.5	0.686	16	212	2.7	4.9	1.3	24	243	2.0
2152.6	0.337	8.2	0.475	14	219	3.0	4.9	0.866	22	250	2.2
2153.3	0.337	8.3	0.485	15	209	2.6	4.9	0.885	24	239	1.9
2154.0	0.337	9.8	0.489	14	232	2.5	4.9	0.893	22	265	1.8
2154.7	0.337	8.6	0.485	16	220	3.1	4.9	0.885	25	252	2.2
2155.4	0.453	7.2	0.524	12	207	2.0	6.5	0.955	19	237	1.5
2156.0	0.337	8.2	0.446	16	217	3.3	4.9	0.814	25	248	2.4
2156.7	0.337	8.0	0.563	17	218	3.0	4.9	1.0	26	249	2.2
2157.4	0.431	5.7	0.387	15	201	2.6	6.2	0.705	24	230	1.9
2158.1	0.337	7.5	0.355	16	202	3.3	4.9	0.647	24	231	2.4
2158.8	0.337	9.7	0.407	14	215	2.0	4.9	0.743	21	246	1.5
2159.5	0.337	9.6	0.611	15	192	3.3	4.9	1.1	23	220	2.4
2160.2	0.337	9.1	0.325	16	229	2.7	4.9	0.593	24	262	2.0
2160.9	0.337	10	0.383	18	202	2.6	4.9	0.699	28	231	1.9
2161.6	0.337	8.3	0.493	14	205	3.2	4.9	0.899	22	234	2.3
2162.3	0.337	8.0	0.290	17	196	2.8	4.9	0.529	26	224	2.0
2163.0	0.337	11	0.300	16	193	2.6	4.9	0.546	25	220	1.9
2163.7	0.337	8.5	0.426	18	208	1.6	4.9	0.778	28	238	1.2
2164.4	0.337	8.5	0.428	16	205	2.6	4.9	0.781	25	235	1.9
2165.1	0.349	9.6	0.502	16	209	3.4	5.0	0.916	25	238	2.5
2165.8	0.337	8.3	0.426	20	188	2.4	4.9	0.777	30	215	1.8
2166.5	0.337	7.9	0.414	19	202	3.0	4.9	0.755	29	231	2.2
2167.2	0.337	8.6	0.269	18	189	2.7	4.9	0.490	28	216	2.0
2167.9	0.337	7.1	0.266	20	187	2.0	4.9	0.485	31	214	1.4
2168.6	0.337	7.9	0.318	14	196	2.4	4.9	0.580	22	224	1.7
2169.3	0.337	8.8	0.263	18	211	2.8	4.9	0.479	28	241	2.1
2170.0	0.337	9.5	0.289	20	179	2.1	4.9	0.526	31	205	1.5
2170.7	0.337	10	0.311	20	207	2.9	4.9	0.566	31	236	2.1
2171.4	0.337	7.9	0.310	21	194	2.5	4.9	0.566	32	222	1.9
2172.1	0.386	7.6	0.132	19	216	2.4	5.6	0.241	29	247	1.8
2172.8	0.444	11	0.392	21	191	2.1	6.4	0.716	32	219	1.5
2173.5	0.337	9.7	0.215	25	213	1.4	4.9	0.392	39	244	1.0
2174.2	0.337	7.6	0.277	20	216	1.9	4.9	0.506	31	247	1.4
2174.9	0.337	8.1	0.226	19	187	1.6	4.9	0.411	29	214	1.2
2175.6	0.337	7.4	0.162	18	253	2.6	4.9	0.295	28	289	1.9
2176.3	0.337	9.1	0.344	19	208	2.1	4.9	0.628	29	238	1.5
2177.0	0.444	9.2	0.303	22	203	2.7	6.4	0.553	34	232	2.0
2177.7	0.337	7.7	0.266	20	198	2.0	4.9	0.486	31	227	1.5
2178.4	0.337	7.9	0.149	21	217	2.1	4.9	0.272	32	248	1.5
2179.1	0.337	10	0.438	23	206	2.2	4.9	0.799	35	235	1.6
2179.8	0.337	7.3	0.417	24	231	3.0	4.9	0.761	38	264	2.2
2180.5	0.452	8.1	0.241	19	173	3.2	6.5	0.440	29	198	2.4
2181.2	0.337	6.9	0.390	26	231	3.7	4.9	0.711	39	264	2.7
2181.8	0.337	8.9	0.330	22	218	2.2	4.9	0.602	33	250	1.6
2182.5	0.337	8.1	0.327	23	198	2.7	4.9	0.596	35	226	2.0
2183.2	0.337	9.8	0.474	29	222	2.9	4.9	0.865	44	254	2.2
2183.9	0.337	8.5	0.317	23	223	3.2	4.9	0.579	35	255	2.3
2184.6	0.337	8.5	0.247	23	196	2.8	4.9	0.451	35	224	2.0
2185.3	0.337	9.9	0.339	27	208	2.4	4.9	0.618	41	237	1.8
2186.0	0.337	8.6	0.196	24	218	3.6	4.9	0.358	37	249	2.6
2186.7	0.337	9.9	0.687	24	204	2.2	4.9	1.3	37	233	1.6
2187.4	0.337	8.8	0.562	25	217	2.8	4.9	1.0	38	248	2.0
2188.1	0.337	8.7	0.339	27	226	3.2	4.9	0.618	42	258	2.3
2188.8	0.337	8.8	0.464	26	204	2.6	4.9	0.846	40	233	1.9
2189.5	0.337	10	0.523	27	221	2.5	4.9	0.953	41	253	1.8
2190.2	0.337	9.0	0.380	27	240	3.5	4.9	0.693	41	275	2.6
2190.9	0.337	8.4	0.421	32	212	2.9	4.9	0.768	49	242	2.1
2191.6	0.337	12	0.378	22	189	1.8	4.9	0.690	34	216	1.3
2192.3	0.337	9.1	0.556	31	214	2.3	4.9	1.0	47	245	1.7
2193.0	0.337	9.7	0.318	31	202	2.7	4.9	0.580	48	231	1.9
2193.7	0.337	10	0.595	30	222	2.8	4.9	1.1	46	254	2.1
2194.4	0.337	8.6	0.357	28	211	2.5	4.9	0.651	42	241	1.8
2195.1	0.337	9.2	0.682	31	252	2.9	4.9	1.2	48	289	2.1
2195.8	0.337	9.0	0.537	29	222	2.9	4.9	0.979	44	254	2.1
2196.5	0.359	9.6	0.402	37	217	3.3	5.2	0.733	56	248	2.4
2197.2	0.337	11	0.537	31	240	2.6	4.9	0.979	47	274	1.9
2197.9	0.337	8.0	0.662	33	230	3.2	4.9	1.2	50	263	2.3
2198.6	0.337	9.2	0.807	30	200	2.0	4.9	1.5	47	229	1.5
2199.3	0.337	9.9	0.820	30	233	2.4	4.9	1.5	46	266	1.8
2200.0	0.337	10	0.659	38	250	2.9	4.9	1.2	58	286	2.1
2200.7	0.337	8.9	0.360	36	211	2.0	4.9	0.657	54	242	1.5
2201.4	0.337	8.5	0.707	28	213	2.4	4.9	1.3	43	244	1.8
2202.1	0.337	9.3	0.790	37	235	2.8	4.9	1.4	56	269	2.1
2202.8	0.337	11	0.669	40	233	2.6	4.9	1.2	62	267	1.9



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2203.5	0.337	9.5	0.650	40	235	2.3	4.9	1.2	62	269	1.6
2204.2	0.425	21	0.616	38	252	2.5	6.1	1.1	58	288	1.8
2204.9	0.337	11	0.748	37	251	1.5	4.9	1.4	57	287	1.1
2205.6	0.351	8.5	0.621	33	239	1.7	5.1	1.1	51	273	1.3
2206.3	0.337	10	1.0	44	246	2.6	4.9	1.9	68	281	1.9
2206.9	0.337	8.9	0.643	35	211	2.5	4.9	1.2	54	241	1.8
2207.6	0.337	9.5	0.953	35	238	2.2	4.9	1.7	53	272	1.6
2208.3	0.337	10	0.755	35	231	2.0	4.9	1.4	54	264	1.4
2209.0	0.337	9.7	0.851	38	232	3.0	4.9	1.6	59	266	2.2
2209.7	0.337	9.7	0.861	34	258	2.5	4.9	1.6	52	295	1.9
2210.4	0.337	11	0.821	45	252	2.1	4.9	1.5	69	288	1.5
2211.1	0.337	8.4	0.702	41	232	1.6	4.9	1.3	62	265	1.2
2211.8	0.337	7.5	0.897	44	268	2.3	4.9	1.6	67	306	1.7
2212.5	0.337	8.4	0.829	36	243	2.7	4.9	1.5	55	278	1.9
2213.2	0.517	9.8	1.0	44	257	2.9	7.5	1.9	68	293	2.1
2213.9	0.362	9.0	0.952	39	257	2.0	5.2	1.7	60	294	1.5
2214.6	0.337	9.8	0.819	39	242	1.7	4.9	1.5	60	277	1.2
2215.3	0.353	8.6	1.1	38	257	1.6	5.1	2.0	57	294	1.2
2216.0	0.337	8.3	0.947	39	258	1.9	4.9	1.7	60	295	1.4
2216.7	0.337	10	1.1	42	251	2.6	4.9	2.0	64	288	1.9
2217.4	0.337	10	0.652	41	229	1.3	4.9	1.2	63	261	0.959
2218.1	0.337	9.1	0.846	41	260	1.5	4.9	1.5	63	298	1.1
2218.8	0.337	7.8	0.900	38	218	1.9	4.9	1.6	58	250	1.4
2219.5	0.337	8.1	1.0	42	255	1.8	4.9	1.8	64	292	1.3
2220.2	0.337	10	0.941	43	242	1.7	4.9	1.7	67	277	1.2
2220.9	0.337	8.7	0.713	43	247	0.948	4.9	1.3	66	282	0.692
2221.6	0.337	9.8	0.866	39	221	1.8	4.9	1.6	60	252	1.3
2222.3	0.337	9.0	0.881	42	243	1.3	4.9	1.6	64	278	0.925
2223.0	0.337	10	0.935	38	253	1.9	4.9	1.7	58	289	1.4
2223.7	0.337	9.6	1.2	48	241	1.7	4.9	2.2	73	276	1.2
2224.4	0.337	9.2	0.883	50	236	1.7	4.9	1.6	77	269	1.3
2225.1	0.337	8.4	1.2	44	232	1.7	4.9	2.2	68	265	1.2
2225.8	0.337	8.7	1.0	45	242	1.6	4.9	1.9	69	277	1.2
2226.5	0.337	9.2	0.815	44	231	1.7	4.9	1.5	67	264	1.2
2227.2	0.337	9.0	0.910	45	228	1.3	4.9	1.7	70	261	0.942
2227.9	0.337	9.7	0.959	41	237	1.4	4.9	1.7	63	270	0.993
2228.6	0.337	10	0.906	44	246	1.3	4.9	1.7	68	281	0.969
2229.3	0.437	9.6	1.0	43	244	1.1	6.3	1.9	66	279	0.768
2230.0	0.337	11	1.3	48	265	1.8	4.9	2.5	74	303	1.3
2230.7	0.337	11	1.1	48	228	0.900	4.9	2.0	74	261	0.656
2231.4	0.337	15	1.1	51	233	0.977	4.9	2.1	78	266	0.713
2232.1	0.337	9.4	1.2	43	240	1.2	4.9	2.1	66	275	0.868
2232.8	0.337	10	1.0	47	241	2.0	4.9	1.9	72	275	1.5
2233.5	0.337	10	1.1	56	225	1.5	4.9	2.0	86	258	1.1
2234.1	0.337	9.1	1.3	53	221	1.3	4.9	2.3	81	253	0.953
2234.8	0.337	9.9	1.1	51	226	1.5	4.9	2.0	78	258	1.1
2235.5	0.337	10	1.0	50	253	1.4	4.9	1.9	76	290	1.1
2236.2	0.337	12	1.4	55	246	1.5	4.9	2.6	84	281	1.1
2236.9	0.337	11	1.3	50	222	1.3	4.9	2.3	77	254	0.937
2237.6	0.337	9.8	1.1	59	274	1.4	4.9	1.9	91	313	1.0
2238.3	0.337	10	1.1	50	251	1.1	4.9	1.9	76	287	0.788
2239.0	0.434	10	1.3	48	237	1.9	6.3	2.3	73	271	1.4
2239.7	0.337	11	1.1	53	226	1.8	4.9	2.1	81	258	1.3
2240.4	0.337	9.5	1.0	60	240	1.3	4.9	1.8	92	275	0.973
2241.1	0.458	11	1.2	50	244	2.2	6.6	2.1	77	279	1.6
2241.8	0.337	8.3	1.2	51	232	1.7	4.9	2.2	79	265	1.3
2242.5	0.340	11	1.4	55	249	0.982	4.9	2.6	84	284	0.717
2243.2	0.337	11	1.3	58	277	1.8	4.9	2.4	88	316	1.3
2243.9	0.337	10	1.3	54	242	1.6	4.9	2.4	83	277	1.2
2244.6	0.337	9.8	1.2	51	249	1.3	4.9	2.2	78	284	0.939
2245.3	0.382	10	1.2	54	266	1.5	5.5	2.2	83	305	1.1
2246.0	0.337	11	1.2	57	277	1.3	4.9	2.3	87	317	0.912
2246.7	0.337	10.0	1.3	55	239	2.2	4.9	2.3	84	273	1.6
2247.4	0.337	11	0.989	54	259	1.5	4.9	1.8	82	296	1.1
2248.1	0.337	10	1.1	48	251	2.0	4.9	1.9	74	287	1.5
2248.8	0.337	9.3	1.2	49	235	1.1	4.9	2.2	74	268	0.838
2249.5	0.337	11	1.3	52	249	2.2	4.9	2.3	79	285	1.6
2250.2	0.337	10	0.944	53	240	1.9	4.9	1.7	82	275	1.4
2250.9	0.337	13	1.0	49	254	1.1	4.9	1.8	76	290	0.795
2251.6	0.337	13	1.3	50	260	1.7	4.9	2.3	76	297	1.2
2252.3	0.337	11	1.3	53	260	1.6	4.9	2.4	81	297	1.2
2253.0	0.337	11	1.4	48	240	2.5	4.9	2.5	74	275	1.8
2253.7	0.337	10	1.2	47	263	1.3	4.9	2.3	72	301	0.971
2254.4	0.337	8.7	1.2	46	265	1.9	4.9	2.3	70	303	1.4
2255.1	0.337	12	1.0	49	232	1.6	4.9	1.8	76	266	1.2
2255.8	0.337	13	1.1	49	278	2.0	4.9	2.0	75	318	1.4
2256.5	0.337	11	1.2	49	278	2.7	4.9	2.1	76	318	2.0
2257.2	0.337	9.5	0.913	43	223	2.2	4.9	1.7	66	254	1.6
2257.9	0.337	9.0	1.2	40	225	1.4	4.9	2.2	61	257	0.994
2258.6	0.337	11	1.0	43	251	1.8	4.9	1.9	66	287	1.3
2259.3	0.337	9.7	1.1	46	250	1.7	4.9	2.1	71	285	1.3



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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2260.0	0.337	9.4	0.879	39	225	2.2	4.9	1.6	60	258	1.6
2260.6	0.337	9.9	1.3	39	254	0.995	4.9	2.3	60	291	0.726
2261.3	0.337	8.7	1.0	34	249	1.6	4.9	1.8	52	285	1.2
2262.0	0.436	9.9	0.857	40	280	1.9	6.3	1.6	61	321	1.4
2262.7	0.337	8.8	0.777	39	251	1.9	4.9	1.4	60	287	1.4
2263.4	0.337	9.3	0.777	41	273	2.4	4.9	1.4	62	313	1.7
2264.1	0.337	9.5	1.1	38	235	1.9	4.9	2.0	59	269	1.4
2264.8	0.337	9.0	1.0	37	276	2.3	4.9	1.9	56	316	1.7
2265.5	0.337	11	1.3	36	283	2.5	4.9	2.4	56	324	1.8
2266.2	0.337	10	0.880	37	273	2.6	4.9	1.6	57	312	1.9
2266.9	0.337	8.4	1.0	33	239	1.2	4.9	1.8	51	273	0.879
2267.6	0.337	8.4	1.0	27	246	1.9	4.9	1.9	41	282	1.4
2268.3	0.337	8.4	0.956	31	253	1.9	4.9	1.7	47	289	1.4
2269.0	0.372	9.9	0.962	31	283	2.4	5.4	1.8	48	324	1.7
2269.7	0.337	10	0.867	32	264	2.4	4.9	1.6	49	302	1.7
2270.4	0.337	6.9	0.737	28	237	1.5	4.9	1.3	43	271	1.1
2271.1	0.337	9.1	1.0	25	263	2.3	4.9	1.9	38	301	1.7
2271.8	0.458	11	1.0	28	263	2.7	6.6	1.8	43	301	2.0
2272.5	0.337	10	1.2	29	259	2.6	4.9	2.3	45	296	1.9
2273.2	0.337	7.8	0.767	26	265	2.2	4.9	1.4	40	302	1.6
2273.9	0.337	8.2	0.879	25	276	2.3	4.9	1.6	39	316	1.7
2274.6	0.337	7.9	1.0	20	262	2.4	4.9	1.9	31	300	1.8
2275.3	0.337	9.1	0.809	26	282	1.5	4.9	1.5	39	322	1.1
2276.0	0.337	7.6	0.678	25	275	2.4	4.9	1.2	39	314	1.7
2276.7	0.337	10	0.966	21	261	2.1	4.9	1.8	32	298	1.5
2277.4	0.337	8.1	0.844	23	259	2.6	4.9	1.5	36	296	1.9
2278.1	0.337	8.6	0.747	18	282	2.4	4.9	1.4	28	323	1.7
2278.8	0.337	9.9	0.717	18	282	2.5	4.9	1.3	28	323	1.8
2279.5	0.337	9.8	0.631	22	278	3.2	4.9	1.2	33	318	2.4
2280.2	0.337	7.7	0.752	19	264	2.9	4.9	1.4	30	302	2.1
2280.9	0.337	8.5	0.910	16	260	2.4	4.9	1.7	25	297	1.8
2281.6	0.337	10	0.602	16	285	2.8	4.9	1.1	25	326	2.0
2282.3	0.337	8.6	0.855	19	274	2.1	4.9	1.6	30	314	1.6
2283.0	0.337	8.1	0.725	13	284	2.8	4.9	1.3	21	324	2.1
2283.7	0.337	7.7	0.566	16	281	2.8	4.9	1.0	24	322	2.0
2284.4	0.337	8.7	0.691	17	274	2.3	4.9	1.3	26	313	1.6
2285.1	0.337	8.2	0.672	14	267	2.1	4.9	1.2	22	305	1.6
2285.8	0.337	8.7	0.663	16	290	3.3	4.9	1.2	25	332	2.4
2286.4	0.337	7.7	0.740	15	288	2.1	4.9	1.3	23	329	1.5
2287.1	0.337	8.8	0.763	17	285	2.3	4.9	1.4	26	325	1.7
2287.8	0.340	9.3	0.520	15	275	2.4	4.9	0.948	23	315	1.7
2288.5	0.337	9.7	0.745	15	264	3.2	4.9	1.4	23	302	2.3
2289.2	0.337	8.8	0.664	14	253	2.4	4.9	1.2	21	289	1.8
2289.9	0.337	8.1	0.482	12	257	2.8	4.9	0.880	19	294	2.1
2290.6	0.337	10	0.415	14	319	2.5	4.9	0.757	22	365	1.8
2291.3	0.337	7.8	0.668	16	265	2.3	4.9	1.2	25	303	1.7
2292.0	0.337	8.4	0.440	17	288	2.4	4.9	0.802	25	329	1.8
2292.7	0.337	9.5	0.395	15	260	2.3	4.9	0.721	24	297	1.7
2293.4	0.337	9.2	0.665	16	274	3.3	4.9	1.2	25	313	2.4
2294.1	0.337	9.4	0.522	14	264	3.0	4.9	0.952	21	302	2.2
2294.8	0.337	8.4	0.457	15	248	1.6	4.9	0.833	23	283	1.1
2295.5	0.337	9.0	0.656	16	274	3.1	4.9	1.2	25	314	2.2
2296.2	0.337	8.3	0.570	20	292	2.2	4.9	1.0	31	334	1.6
2296.9	0.337	7.9	0.757	17	286	2.5	4.9	1.4	26	327	1.8
2297.6	0.337	7.3	0.582	18	254	3.1	4.9	1.1	27	290	2.3
2298.3	0.337	10	0.828	20	317	2.1	4.9	1.5	31	363	1.6
2299.0	0.337	9.2	0.640	22	267	1.9	4.9	1.2	34	305	1.4
2299.7	0.337	8.9	0.416	20	256	2.3	4.9	0.759	31	292	1.7
2300.4	0.675	8.3	0.787	26	254	2.7	9.8	1.4	39	291	2.0
2301.1	0.337	8.7	0.766	23	264	3.2	4.9	1.4	35	301	2.3
2301.8	0.337	8.4	0.488	22	297	2.2	4.9	0.891	33	339	1.6
2302.5	0.420	9.6	0.747	25	245	1.5	6.1	1.4	38	281	1.1
2303.2	0.337	8.9	0.661	21	266	2.3	4.9	1.2	32	304	1.7
2303.9	0.494	9.3	0.690	24	310	2.3	7.1	1.3	36	355	1.6
2304.6	0.337	8.7	0.633	24	235	1.9	4.9	1.2	37	268	1.4
2305.3	0.337	9.0	0.590	26	258	2.4	4.9	1.1	40	295	1.8
2306.0	0.337	9.0	0.644	29	276	1.7	4.9	1.2	45	315	1.2
2306.7	0.609	7.5	0.738	26	252	2.2	8.8	1.3	39	288	1.6
2307.4	0.417	7.7	0.589	29	262	1.9	6.0	1.1	45	299	1.4
2308.1	0.337	8.6	1.0	24	257	1.9	4.9	1.8	37	294	1.4
2308.8	0.337	9.0	0.714	28	259	1.0	4.9	1.3	42	296	0.759
2309.5	0.337	12	0.998	24	257	1.6	4.9	1.8	37	293	1.1
2310.2	0.337	9.0	0.653	30	264	2.0	4.9	1.2	47	302	1.4
2310.9	0.337	9.4	0.684	33	265	1.2	4.9	1.2	50	303	0.852
2311.6	0.337	7.4	0.751	29	271	1.5	4.9	1.4	44	310	1.1
2312.3	0.434	7.7	0.821	35	240	1.2	6.3	1.5	53	275	0.908
2313.0	0.337	7.8	0.521	38	298	1.2	4.9	0.950	58	341	0.845
2313.6	0.337	9.7	0.583	34	247	1.4	4.9	1.1	53	282	1.0
2314.3	0.337	12	0.822	30	246	1.7	4.9	1.5	47	281	1.3
2315.0	0.337	9.0	0.742	37	280	1.5	4.9	1.4	57	320	1.1
2315.7	0.350	10	0.706	39	271	1.9	5.1	1.3	60	310	1.4



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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2316.4	0.399	9.5	0.696	45	254	1.5	5.8	1.3	70	290	1.1
2317.1	0.337	11	0.579	37	250	1.8	4.9	1.1	57	286	1.3
2317.8	0.337	10	0.858	37	244	1.3	4.9	1.6	57	279	0.981
2318.5	0.337	9.7	0.456	45	280	2.0	4.9	0.831	69	320	1.5
2319.2	0.337	9.3	0.933	41	236	1.4	4.9	1.7	62	270	0.987
2319.9	0.337	7.0	1.0	41	219	1.2	4.9	1.9	62	250	0.864
2320.6	0.337	11	0.803	50	253	1.4	4.9	1.5	76	289	1.0
2321.3	0.337	9.7	0.627	40	242	1.4	4.9	1.1	61	276	1.0
2322.0	0.337	9.3	0.803	42	257	1.5	4.9	1.5	64	294	1.1
2322.7	0.337	9.9	0.917	43	246	1.6	4.9	1.7	67	281	1.2
2323.4	0.337	8.4	0.961	46	214	1.5	4.9	1.8	71	245	1.1
2324.1	0.337	8.1	0.831	43	229	1.3	4.9	1.5	66	262	0.948
2324.8	0.337	9.6	0.760	41	263	1.3	4.9	1.4	63	301	0.940
2325.5	0.337	10	0.745	43	233	1.6	4.9	1.4	66	266	1.2
2326.2	0.337	11	0.814	47	248	1.7	4.9	1.5	73	283	1.2
2326.9	0.337	9.9	0.767	51	248	0.790	4.9	1.4	79	283	0.577
2327.6	0.337	8.9	0.666	46	233	1.8	4.9	1.2	70	266	1.3
2328.3	0.337	10	0.792	45	255	1.2	4.9	1.4	69	292	0.904
2329.0	0.375	10	1.0	49	267	1.9	5.4	1.9	75	305	1.4
2329.7	0.337	9.7	0.894	48	234	1.2	4.9	1.6	73	268	0.860
2330.4	0.337	10	0.742	51	227	0.994	4.9	1.4	79	259	0.726
2331.1	0.337	9.3	0.721	48	255	0.804	4.9	1.3	73	292	0.587
2331.8	0.337	9.6	0.896	50	243	1.4	4.9	1.6	76	278	0.990
2332.5	0.337	10	1.1	48	247	0.711	4.9	2.0	73	283	0.519
2333.2	0.337	9.6	1.1	53	261	1.2	4.9	2.0	81	298	0.876
2333.9	0.495	8.8	0.820	48	238	1.1	7.1	1.5	73	273	0.784
2334.6	0.381	8.5	1.0	52	237	1.2	5.5	1.9	79	271	0.875
2335.3	0.337	11	0.540	49	245	1.3	4.9	0.985	75	281	0.949
2336.0	0.337	9.8	0.902	54	260	1.5	4.9	1.6	82	298	1.1
2336.7	0.337	10	0.932	58	250	1.2	4.9	1.7	90	286	0.869
2337.4	0.337	11	0.722	51	255	1.2	4.9	1.3	78	292	0.847
2338.1	0.337	10	0.951	48	237	1.2	4.9	1.7	74	271	0.880
2338.8	0.337	11	0.848	52	239	1.2	4.9	1.5	79	273	0.906
2339.5	0.337	11	0.973	54	243	1.4	4.9	1.8	83	278	0.995
2340.1	0.374	11	0.739	59	276	2.3	5.4	1.3	91	316	1.7
2340.8	0.337	9.2	0.851	48	237	0.981	4.9	1.6	74	271	0.715
2341.5	0.389	12	1.1	52	284	1.7	5.6	2.0	80	325	1.3
2342.2	0.337	11	0.848	53	255	1.4	4.9	1.5	81	292	0.990
2342.9	0.337	8.9	0.774	57	240	1.7	4.9	1.4	87	274	1.3
2343.6	0.337	8.8	0.928	47	271	1.5	4.9	1.7	72	310	1.1
2344.3	0.337	8.8	1.1	50	244	0.822	4.9	2.0	77	279	0.600
2345.0	0.337	10	1.0	58	247	0.904	4.9	1.8	89	283	0.659
2345.7	0.337	9.5	0.893	53	244	1.5	4.9	1.6	81	279	1.1
2346.4	0.454	10	0.875	57	229	1.1	6.6	1.6	87	262	0.823
2347.1	0.337	7.9	0.975	49	222	0.633	4.9	1.8	75	254	0.462
2347.8	0.337	10	1.1	53	262	1.7	4.9	2.0	82	299	1.2
2348.5	0.337	11	1.4	50	257	1.5	4.9	2.5	77	294	1.1
2349.2	0.337	9.0	0.696	46	267	1.3	4.9	1.3	70	306	0.971
2349.9	0.337	9.2	0.964	52	243	1.4	4.9	1.8	79	277	1.0
2350.6	0.337	8.1	0.677	46	235	1.8	4.9	1.2	71	269	1.3
2351.3	0.337	10	1.0	44	261	1.4	4.9	1.9	68	299	1.0
2352.0	0.337	9.3	0.672	55	253	1.6	4.9	1.2	85	289	1.2
2352.7	0.337	11	1.1	44	254	2.3	4.9	1.9	68	290	1.7
2353.4	0.337	11	0.958	49	258	1.8	4.9	1.7	75	295	1.3
2354.1	0.337	8.1	0.933	45	264	1.5	4.9	1.7	69	302	1.1
2354.8	0.337	9.1	1.1	39	239	1.8	4.9	2.1	60	273	1.3
2355.5	0.337	9.0	0.927	42	253	1.7	4.9	1.7	65	290	1.2
2356.2	0.337	12	0.607	39	244	1.8	4.9	1.1	60	279	1.3
2356.9	0.337	9.1	0.968	41	250	1.7	4.9	1.8	63	286	1.2
2357.6	0.337	7.9	1.0	35	271	2.8	4.9	1.9	53	310	2.1
2358.3	0.337	9.7	1.1	35	254	2.0	4.9	1.9	53	290	1.4
2359.0	0.337	10	0.625	45	276	1.6	4.9	1.1	69	316	1.2
2359.7	0.337	8.9	0.971	43	264	2.3	4.9	1.8	66	302	1.7
2360.4	0.337	7.6	0.700	35	261	1.5	4.9	1.3	53	299	1.1
2361.1	0.337	6.6	0.879	29	258	1.4	4.9	1.6	45	295	1.0
2361.8	0.337	9.5	0.925	38	281	1.9	4.9	1.7	58	321	1.4
2362.5	0.337	9.7	0.708	32	252	1.9	4.9	1.3	50	288	1.4
2363.2	0.337	7.8	0.817	29	270	1.6	4.9	1.5	44	308	1.2
2363.9	0.337	7.9	0.694	28	274	2.1	4.9	1.3	43	313	1.5
2364.6	0.455	10	1.0	27	272	2.3	6.6	1.9	42	311	1.6
2365.3	0.337	10	0.771	30	325	1.5	4.9	1.4	46	372	1.1
2366.0	0.337	8.8	0.568	32	264	1.9	4.9	1.0	49	301	1.4
2366.6	0.369	8.7	0.649	24	306	2.1	5.3	1.2	37	349	1.5
2367.3	0.337	7.8	0.917	24	277	3.1	4.9	1.7	37	316	2.3
2368.0	0.349	13	0.736	25	339	2.5	5.0	1.3	38	388	1.9
2368.7	0.385	12	0.801	29	301	2.2	5.6	1.5	44	344	1.6
2369.4	0.337	10	0.701	26	274	2.1	4.9	1.3	39	314	1.5
2370.1	0.337	9.0	0.655	23	288	1.9	4.9	1.2	35	330	1.4
2370.8	0.337	9.3	0.936	21	278	2.6	4.9	1.7	32	317	1.9
2371.5	0.358	9.4	0.729	25	262	1.8	5.2	1.3	38	299	1.3
2372.2	0.337	10	0.714	25	291	2.2	4.9	1.3	38	332	1.6



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2372.9	0.337	8.6	0.785	20	265	1.8	4.9	1.4	31	303	1.3
2373.6	0.337	11	0.777	20	257	2.9	4.9	1.4	30	294	2.1
2374.3	0.337	9.8	0.874	24	316	2.0	4.9	1.6	37	361	1.5
2375.0	0.337	10	0.876	25	269	1.7	4.9	1.6	38	308	1.3
2375.7	0.337	10	0.902	21	233	1.4	4.9	1.6	33	267	1.0
2376.4	0.337	8.2	1.1	23	287	2.5	4.9	1.9	35	328	1.8
2377.1	0.466	10.0	0.837	19	274	2.5	6.7	1.5	28	314	1.8
2377.8	0.337	11	0.876	25	278	2.1	4.9	1.6	38	318	1.6
2378.5	0.460	10	0.700	20	300	2.8	6.6	1.3	31	343	2.1
2379.2	0.411	9.1	0.812	23	298	2.3	5.9	1.5	35	340	1.7
2379.9	0.337	10	0.997	23	312	2.9	4.9	1.8	35	357	2.1
2380.6	0.468	10	1.1	23	283	1.6	6.8	2.0	35	323	1.1
2381.3	0.337	9.7	0.870	21	260	1.5	4.9	1.6	32	297	1.1
2382.0	0.407	9.8	1.2	24	306	1.9	5.9	2.2	37	350	1.4
2382.7	0.337	11	1.1	21	292	2.0	4.9	1.9	33	334	1.5
2383.4	0.337	7.5	0.844	19	256	2.4	4.9	1.5	30	293	1.7
2384.1	0.337	10	0.975	22	299	2.4	4.9	1.8	34	342	1.8
2384.8	0.337	9.7	0.948	27	294	2.3	4.9	1.7	42	337	1.7
2385.5	0.393	9.8	1.0	20	273	1.5	5.7	1.9	31	312	1.1
2386.2	0.380	8.8	0.826	20	292	2.7	5.5	1.5	31	334	2.0
2386.9	0.337	8.4	0.955	24	284	2.0	4.9	1.7	36	325	1.5
2387.6	0.337	10	1.1	21	282	1.8	4.9	2.0	33	322	1.3
2388.3	0.337	13	1.2	28	285	1.7	4.9	2.2	43	326	1.3
2389.0	0.337	11	0.885	27	306	1.4	4.9	1.6	42	349	1.0
2389.7	0.337	10	1.0	26	293	1.7	4.9	1.8	41	336	1.2
2390.4	0.337	9.8	1.2	27	278	1.5	4.9	2.2	41	318	1.1
2391.1	0.337	9.2	1.3	30	285	1.7	4.9	2.4	46	326	1.3
2391.8	0.337	10	1.1	29	277	2.0	4.9	2.0	45	316	1.5
2392.5	0.337	8.9	0.850	33	263	0.933	4.9	1.6	50	301	0.681
2393.1	0.337	8.6	1.2	32	286	1.6	4.9	2.2	49	327	1.2
2393.8	0.337	8.2	1.1	28	282	1.4	4.9	2.1	43	323	0.996
2394.5	0.417	10	1.1	33	291	2.1	6.0	2.0	50	333	1.5
2395.2	0.337	8.9	0.853	33	255	1.9	4.9	1.6	51	292	1.4
2395.9	0.337	8.6	1.3	33	262	1.2	4.9	2.4	51	300	0.864
2396.6	0.337	8.6	1.2	37	295	1.8	4.9	2.2	57	338	1.3
2397.3	0.337	10.0	1.1	32	231	1.5	4.9	2.0	49	264	1.1
2398.0	0.337	9.2	0.965	40	288	1.8	4.9	1.8	61	329	1.3
2398.7	0.337	11	0.871	36	243	1.6	4.9	1.6	55	278	1.1
2399.4	0.417	11	0.943	38	273	1.7	6.0	1.7	58	312	1.2
2400.1	0.337	7.7	1.1	34	243	1.3	4.9	2.1	51	278	0.972
2400.8	0.337	9.5	1.0	35	285	1.4	4.9	1.9	54	326	0.994
2401.5	0.337	11	0.996	37	260	2.1	4.9	1.8	57	297	1.5
2402.2	0.337	9.8	0.883	39	271	1.6	4.9	1.6	60	310	1.1
2402.9	0.337	9.9	1.1	39	267	1.7	4.9	1.9	60	306	1.2
2403.6	0.428	9.6	1.2	37	282	1.7	6.2	2.2	57	323	1.2
2404.3	0.337	9.2	1.2	38	254	1.5	4.9	2.3	58	290	1.1
2405.0	0.579	9.6	0.945	49	284	1.3	8.4	1.7	75	324	0.973
2405.7	0.337	12	1.4	44	282	1.7	4.9	2.5	68	322	1.2
2406.4	0.337	11	1.5	43	257	1.2	4.9	2.8	66	294	0.868
2407.1	0.394	11	1.0	48	289	1.2	5.7	1.9	73	330	0.844
2407.8	0.337	9.7	1.2	51	272	1.4	4.9	2.3	78	311	1.0
2408.5	0.337	10	1.3	48	319	1.6	4.9	2.3	73	365	1.2
2409.2	0.337	12	1.2	47	286	1.8	4.9	2.1	72	327	1.3
2409.9	0.337	12	1.1	45	282	1.1	4.9	2.0	69	323	0.792
2410.6	0.337	10	1.4	42	253	1.5	4.9	2.6	64	290	1.1
2411.3	0.391	11	1.4	47	271	2.0	5.6	2.5	72	309	1.5
2412.0	0.385	11	0.995	52	273	1.3	5.6	1.8	80	312	0.928
2412.7	0.337	11	1.4	50	280	2.2	4.9	2.5	77	320	1.6
2413.4	0.434	11	0.936	46	241	1.7	6.3	1.7	71	275	1.2
2414.1	0.475	9.2	1.3	48	309	2.0	6.9	2.4	74	354	1.4
2414.8	0.337	10	1.1	44	236	1.0	4.9	2.0	68	270	0.747
2415.5	0.337	13	1.3	47	259	1.5	4.9	2.3	73	296	1.1
2416.2	0.337	9.1	1.3	46	277	1.7	4.9	2.3	70	317	1.2
2416.9	0.476	10	1.1	51	270	1.3	6.9	1.9	78	309	0.914
2417.6	0.360	11	1.3	47	284	1.7	5.2	2.3	72	325	1.2
2418.3	0.595	12	1.3	51	284	1.4	8.6	2.4	78	325	1.0
2418.9	0.337	11	1.2	56	309	2.1	4.9	2.2	86	353	1.6
2419.6	0.337	11	1.1	45	260	1.1	4.9	2.1	70	297	0.776
2420.3	0.337	12	1.1	45	280	1.9	4.9	2.0	68	321	1.4
2421.0	0.567	12	1.3	50	292	0.870	8.2	2.3	76	333	0.635
2421.7	0.337	14	1.2	50	312	2.0	4.9	2.1	76	357	1.5
2422.4	0.337	11	1.4	42	264	1.4	4.9	2.5	64	302	0.986
2423.1	0.337	9.8	1.3	45	275	1.8	4.9	2.4	69	314	1.3
2423.8	0.337	12	1.1	44	328	2.3	4.9	1.9	68	375	1.7
2424.5	0.337	11	1.3	43	269	1.5	4.9	2.3	66	307	1.1
2425.2	0.468	12	1.2	43	282	2.1	6.8	2.2	66	323	1.5
2425.9	0.337	10	1.1	43	261	1.1	4.9	2.0	65	298	0.795
2426.6	0.337	11	1.1	44	331	1.4	4.9	2.1	67	378	1.1
2427.3	0.500	13	0.975	45	286	1.8	7.2	1.8	69	328	1.3
2428.0	0.337	12	0.991	48	329	1.3	4.9	1.8	74	376	0.931
2428.7	0.337	11	1.2	40	277	1.6	4.9	2.2	61	317	1.2



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Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2429.4	0.440	13	1.1	45	311	2.3	6.4	2.0	70	356	1.7
2430.1	0.337	9.7	0.742	41	287	1.3	4.9	1.4	62	329	0.956
2430.8	0.337	13	1.2	45	316	1.3	4.9	2.2	68	361	0.958
2431.5	0.549	10	1.3	41	267	1.6	7.9	2.4	62	306	1.2
2432.2	0.555	12	1.4	51	263	1.6	8.0	2.6	78	300	1.2
2432.9	0.337	12	1.1	41	286	1.6	4.9	2.0	63	327	1.2
2433.6	0.337	11	1.4	41	284	1.6	4.9	2.6	62	325	1.2
2434.3	0.337	11	1.6	42	289	1.3	4.9	2.9	64	330	0.974
2435.0	0.337	12	1.4	42	302	1.7	4.9	2.5	65	346	1.2
2435.7	0.337	11	1.1	44	311	1.9	4.9	2.1	67	356	1.4
2436.4	0.337	11	1.4	43	249	1.7	4.9	2.5	66	285	1.2
2437.1	0.337	11	1.2	35	269	1.6	4.9	2.3	54	308	1.2
2437.8	0.485	11	1.6	40	307	2.4	7.0	2.9	62	352	1.7
2438.5	0.337	11	1.5	41	282	1.9	4.9	2.7	63	323	1.4
2439.2	0.337	11	1.6	43	285	1.4	4.9	2.9	65	326	1.0
2439.9	0.337	10	1.6	42	284	2.1	4.9	2.8	64	325	1.5
2440.6	0.337	11	1.3	40	295	1.8	4.9	2.4	61	337	1.3
2441.3	0.337	12	1.3	43	273	1.3	4.9	2.4	65	312	0.962
2442.0	0.489	13	1.5	50	283	2.0	7.1	2.7	77	324	1.5
2442.7	0.337	11	1.4	42	254	2.1	4.9	2.5	65	291	1.5
2443.4	0.922	11	1.5	47	293	1.9	13	2.7	72	335	1.4
2444.1	0.337	10	1.6	38	262	1.3	4.9	2.9	59	300	0.985
2444.7	0.337	13	1.4	42	298	1.9	4.9	2.5	64	341	1.4
2445.4	0.337	13	1.6	45	278	1.9	4.9	3.0	69	318	1.4
2446.1	0.395	10	1.3	41	251	1.7	5.7	2.4	63	287	1.3
2446.8	0.337	10	1.4	43	279	2.0	4.9	2.6	65	319	1.4
2447.5	0.337	12	1.5	41	289	0.830	4.9	2.8	63	331	0.606
2448.2	0.337	12	1.5	43	313	1.7	4.9	2.8	66	358	1.3
2448.9	0.337	12	1.4	43	276	1.6	4.9	2.5	66	316	1.2
2449.6	0.438	15	1.3	43	314	1.0	6.3	2.4	66	359	0.741
2450.3	0.337	10	1.4	49	273	2.2	4.9	2.6	75	312	1.6
2451.0	0.337	13	1.5	54	269	1.5	4.9	2.7	83	307	1.1
2451.7	0.337	11	1.3	49	269	1.0	4.9	2.3	76	307	0.754
2452.4	0.603	10	1.5	47	261	0.870	8.7	2.8	72	298	0.635
2453.1	0.438	11	1.4	45	279	4.5	6.3	2.6	68	319	3.3
2453.8	0.337	11	1.5	49	286	1.5	4.9	2.8	75	327	1.1
2454.5	0.374	12	1.3	59	291	1.4	5.4	2.5	90	332	1.1
2455.2	0.641	13	1.4	53	310	1.8	9.3	2.5	82	354	1.3
2455.9	0.413	14	1.2	54	270	1.4	6.0	2.1	83	309	0.998
2456.6	0.337	9.7	1.2	49	292	1.2	4.9	2.2	76	334	0.894
2457.3	0.337	13	1.7	54	302	2.0	4.9	3.1	83	345	1.4
2458.0	0.337	12	1.3	52	260	1.2	4.9	2.3	80	297	0.847
2458.7	0.337	12	0.952	56	272	1.8	4.9	1.7	86	311	1.3
2459.4	0.337	13	1.4	54	269	2.1	4.9	2.6	82	308	1.5
2460.1	0.452	11	1.5	51	272	1.2	6.5	2.8	78	312	0.866
2460.8	0.337	12	1.2	51	296	1.5	4.9	2.2	77	339	1.1
2461.5	0.337	12	1.4	56	274	1.5	4.9	2.6	86	313	1.1
2462.2	0.384	12	1.4	52	266	0.988	5.5	2.6	80	304	0.721
2462.9	0.577	14	1.4	54	274	1.6	8.3	2.5	83	313	1.1
2463.6	0.337	13	1.4	51	269	1.6	4.9	2.5	78	307	1.2
2464.3	0.337	13	1.2	50	281	1.3	4.9	2.2	77	322	0.962
2465.0	0.411	13	1.1	49	270	1.5	5.9	2.0	76	308	1.1
2465.7	0.337	12	1.5	57	309	2.2	4.9	2.6	87	354	1.6
2466.4	0.337	12	1.2	56	269	1.5	4.9	2.3	86	307	1.1
2467.1	0.476	13	1.3	51	341	1.7	6.9	2.4	78	390	1.3
2467.8	0.337	13	1.3	55	285	1.7	4.9	2.4	84	325	1.3
2468.5	0.451	13	1.4	56	287	1.1	6.5	2.6	85	328	0.793
2469.2	0.337	14	1.2	56	283	1.3	4.9	2.1	86	323	0.931
2469.9	0.337	13	1.3	51	298	0.723	4.9	2.4	79	341	0.527
2470.6	0.337	12	1.3	53	274	1.4	4.9	2.3	80	313	1.0
2471.2	0.337	15	1.4	53	271	1.3	4.9	2.6	81	309	0.981
2471.9	0.337	13	1.3	56	298	1.6	4.9	2.3	85	340	1.2
2472.6	0.337	11	0.968	43	246	0.921	4.9	1.8	65	281	0.672
2473.3	0.337	14	1.0	54	262	1.2	4.9	1.9	83	300	0.844
2474.0	0.337	12	1.0	53	260	1.2	4.9	1.9	81	297	0.856
2474.7	0.337	12	1.4	54	279	1.3	4.9	2.5	82	319	0.929
2475.4	0.337	13	0.906	54	261	1.9	4.9	1.7	83	298	1.4
2476.1	0.337	13	1.3	55	279	1.0	4.9	2.5	84	319	0.750
2476.8	0.337	11	1.4	56	316	0.964	4.9	2.6	85	362	0.703
2477.5	0.337	12	1.2	53	287	1.4	4.9	2.2	81	328	1.0
2478.2	0.337	13	1.3	55	310	2.0	4.9	2.4	84	354	1.5
2478.9	0.337	11	0.973	51	227	0.715	4.9	1.8	78	259	0.522
2479.6	0.418	9.9	1.2	52	267	1.4	6.0	2.2	80	306	1.0
2480.3	0.337	12	1.2	53	273	1.5	4.9	2.2	81	312	1.1
2481.0	0.337	12	0.970	53	272	0.943	4.9	1.8	81	311	0.688
2481.7	0.337	12	1.5	48	273	1.4	4.9	2.7	73	312	0.989
2482.4	0.337	13	1.4	63	309	1.3	4.9	2.6	97	353	0.915
2483.1	0.411	13	1.3	60	290	1.4	5.9	2.3	92	332	1.0
2483.8	0.337	12	1.2	54	258	1.2	4.9	2.2	82	295	0.860
2484.5	0.337	12	1.3	56	290	1.9	4.9	2.4	86	332	1.4
2485.2	0.337	13	1.4	54	292	1.2	4.9	2.6	83	334	0.864



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2485.9	0.337	13	1.5	69	289	1.1	4.9	2.6	106	331	0.825
2486.6	0.429	12	1.4	48	267	1.9	6.2	2.6	74	305	1.4
2487.3	0.337	13	1.2	54	294	1.5	4.9	2.1	83	337	1.1
2488.0	0.337	13	1.0	53	267	1.6	4.9	1.8	82	305	1.1
2488.7	0.337	11	1.2	48	275	1.5	4.9	2.2	74	315	1.1
2489.4	0.551	12	1.1	53	268	1.2	8.0	2.0	81	306	0.908
2490.1	0.437	14	1.5	49	271	1.4	6.3	2.7	75	310	1.0
2490.8	0.575	11	1.3	50	296	1.5	8.3	2.4	77	339	1.1
2491.5	0.629	12	1.2	52	303	1.8	9.1	2.1	79	347	1.3
2492.2	0.337	13	1.1	47	259	1.3	4.9	2.0	72	296	0.944
2492.9	0.337	10	1.0	49	270	2.1	4.9	1.9	75	309	1.6
2493.6	0.337	10	1.3	50	285	1.8	4.9	2.4	76	326	1.3
2494.3	0.337	12	1.3	42	263	1.2	4.9	2.3	64	301	0.895
2495.0	0.337	12	1.3	52	280	1.3	4.9	2.3	80	321	0.917
2495.7	0.337	12	1.2	44	282	0.845	4.9	2.1	68	323	0.617
2496.4	0.645	11	1.1	51	306	1.7	9.3	1.9	79	350	1.2
2497.1	0.337	13	1.2	47	338	1.7	4.9	2.1	72	387	1.3
2497.7	0.364	11	1.2	49	260	1.3	5.3	2.2	76	297	0.926
2498.4	0.337	12	1.2	50	278	1.5	4.9	2.2	76	318	1.1
2499.1	0.337	11	0.879	50	301	1.5	4.9	1.6	77	344	1.1
2499.8	0.337	11	1.2	55	295	1.9	4.9	2.1	84	338	1.4
2500.5	0.418	10	1.1	47	265	1.7	6.0	2.0	71	303	1.2
2501.2	0.337	11	1.2	48	273	1.4	4.9	2.1	74	313	0.997
2501.9	0.355	14	1.1	55	317	1.8	5.1	2.0	84	362	1.3
2502.6	0.337	10.0	0.891	49	268	0.979	4.9	1.6	75	307	0.714
2503.3	0.337	12	0.931	48	257	1.2	4.9	1.7	73	294	0.854
2504.0	0.337	11	1.2	55	287	0.878	4.9	2.1	84	328	0.641
2504.7	0.337	12	1.2	61	321	1.0	4.9	2.1	93	367	0.762
2505.4	0.337	13	0.762	57	310	1.5	4.9	1.4	88	355	1.1
2506.1	0.337	12	1.1	54	265	0.550	4.9	2.0	83	302	0.401
2506.8	0.337	12	1.2	44	260	1.1	4.9	2.2	67	297	0.766
2507.5	0.337	12	0.957	49	318	1.3	4.9	1.7	75	364	0.924
2508.2	0.337	12	1.1	45	283	1.4	4.9	1.9	69	323	1.0
2508.9	0.337	11	1.0	52	277	1.6	4.9	1.8	80	316	1.1
2509.6	0.337	10.0	0.740	44	261	0.649	4.9	1.3	67	299	0.474
2510.3	0.337	11	0.968	52	279	0.893	4.9	1.8	80	319	0.652
2511.0	0.337	11	0.904	49	299	1.4	4.9	1.6	75	342	1.0
2511.7	0.445	12	0.858	54	276	1.2	6.4	1.6	83	316	0.860
2512.4	0.337	12	0.814	54	279	0.839	4.9	1.5	83	319	0.612
2513.1	0.337	10	1.0	45	273	1.0	4.9	1.8	69	312	0.759
2513.8	0.629	12	1.1	55	295	0.598	9.1	2.0	85	337	0.436
2514.5	0.442	11	1.1	49	298	1.6	6.4	2.0	75	341	1.2
2515.2	0.337	13	0.974	50	250	0.920	4.9	1.8	77	286	0.672
2515.9	0.507	11	0.849	53	286	0.843	7.3	1.5	81	328	0.615
2516.6	0.337	13	0.714	57	334	1.2	4.9	1.3	87	382	0.898
2517.3	0.408	12	1.0	42	265	1.3	5.9	1.9	65	303	0.936
2518.0	0.337	12	1.1	58	272	1.6	4.9	2.1	89	311	1.2
2518.7	0.397	12	1.3	49	286	1.3	5.7	2.3	75	327	0.958
2519.4	0.366	9.9	0.872	47	255	1.3	5.3	1.6	71	291	0.931
2520.1	0.337	11	1.000	52	334	1.1	4.9	1.8	80	382	0.828
2520.8	0.421	10	0.909	47	280	1.4	6.1	1.7	72	321	1.0
2521.5	0.337	12	1.0	48	303	1.6	4.9	1.9	74	346	1.2
2522.2	0.337	10	1.0	49	280	1.4	4.9	1.9	75	321	1.0
2522.9	0.337	12	0.840	48	292	1.4	4.9	1.5	74	334	1.0
2523.6	0.337	12	0.987	43	295	1.1	4.9	1.8	65	338	0.805
2524.2	0.489	10	0.874	45	296	1.7	7.1	1.6	69	339	1.2
2524.9	0.340	9.8	0.786	44	283	1.4	4.9	1.4	67	323	1.0
2525.6	0.632	11	0.910	43	302	1.6	9.1	1.7	65	345	1.2
2526.3	0.337	9.4	0.920	47	268	1.5	4.9	1.7	72	306	1.1
2527.0	0.337	11	0.918	45	262	0.974	4.9	1.7	68	300	0.711
2527.7	0.337	9.8	1.1	40	268	1.4	4.9	2.0	61	307	0.989
2528.4	0.337	8.8	0.877	37	268	1.4	4.9	1.6	56	306	1.0
2529.1	0.444	12	0.856	46	290	2.1	6.4	1.6	71	331	1.6
2529.8	0.337	11	1.0	46	293	1.8	4.9	1.8	70	336	1.3
2530.5	0.337	11	0.748	52	273	2.3	4.9	1.4	79	312	1.7
2531.2	0.379	11	0.951	43	285	1.4	5.5	1.7	66	326	1.0
2531.9	0.337	11	0.968	41	294	1.3	4.9	1.8	62	336	0.923
2532.6	0.337	9.4	1.0	37	331	1.6	4.9	1.8	56	378	1.2
2533.3	0.337	12	1.3	46	325	1.8	4.9	2.3	70	371	1.3
2534.0	0.337	11	0.974	42	286	1.5	4.9	1.8	64	327	1.1
2534.7	0.337	7.9	0.931	38	265	1.3	4.9	1.7	59	303	0.964
2535.4	0.337	9.5	0.779	40	307	1.1	4.9	1.4	61	351	0.776
2536.1	0.337	9.0	0.704	35	338	1.5	4.9	1.3	53	386	1.1
2536.8	0.337	8.9	0.829	34	276	1.7	4.9	1.5	52	316	1.3
2537.5	0.337	10.0	0.857	36	244	1.4	4.9	1.6	55	279	0.998
2538.2	0.337	12	1.1	37	276	1.4	4.9	2.0	57	316	1.0
2538.9	0.337	8.9	0.859	34	292	2.1	4.9	1.6	53	334	1.5
2539.6	0.337	9.0	0.762	31	272	1.7	4.9	1.4	48	311	1.2
2540.3	0.428	8.7	0.897	36	291	1.7	6.2	1.6	56	333	1.3
2541.0	0.337	9.3	0.981	38	281	1.4	4.9	1.8	58	322	1.0
2541.7	0.337	11	0.894	38	297	1.8	4.9	1.6	59	339	1.3



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2542.4	0.337	9.7	0.894	30	261	0.895	4.9	1.6	46	298	0.653
2543.1	0.561	8.5	0.962	32	289	1.4	8.1	1.8	50	331	1.0
2543.8	0.589	11	1.3	32	300	2.2	8.5	2.4	49	343	1.6
2544.5	0.337	8.7	0.728	37	307	1.5	4.9	1.3	57	351	1.1
2545.2	0.337	10	1.2	38	321	1.8	4.9	2.1	58	367	1.3
2545.9	0.432	9.5	1.1	35	260	1.5	6.2	2.0	53	297	1.1
2546.6	0.337	9.7	1.0	43	294	1.6	4.9	1.9	66	337	1.2
2547.3	0.337	11	0.740	37	274	1.8	4.9	1.3	57	314	1.3
2548.0	0.433	10.0	0.963	29	257	1.4	6.2	1.8	45	294	0.999
2548.7	0.337	9.8	1.3	36	271	2.5	4.9	2.4	56	310	1.8
2549.4	0.337	9.1	1.1	30	317	2.2	4.9	2.0	46	362	1.6
2550.0	0.337	9.2	1.1	33	278	1.3	4.9	2.0	51	318	0.965
2550.7	0.425	10	0.882	32	279	2.0	6.1	1.6	50	319	1.4
2551.4	0.337	10	1.3	36	292	1.2	4.9	2.3	56	334	0.891
2552.1	0.513	11	1.2	35	329	1.3	7.4	2.2	53	376	0.958
2552.8	0.337	10	1.0	35	275	1.1	4.9	1.9	53	315	0.778
2553.5	0.337	9.2	0.872	31	277	1.3	4.9	1.6	48	317	0.933
2554.2	0.337	9.8	0.924	28	293	1.5	4.9	1.7	43	335	1.1
2554.9	0.337	9.8	0.743	35	275	1.5	4.9	1.4	53	314	1.1
2555.6	0.337	10	0.929	34	254	1.1	4.9	1.7	52	290	0.830
2556.3	0.377	12	1.0	39	332	1.4	5.4	1.8	60	379	1.0
2557.0	0.757	12	1.1	36	315	0.982	11	2.1	55	360	0.717
2557.7	0.337	11	0.738	39	307	0.784	4.9	1.3	60	351	0.572
2558.4	0.337	11	0.659	41	278	0.753	4.9	1.2	62	318	0.549
2559.1	0.337	8.5	0.651	31	254	0.890	4.9	1.2	47	290	0.649
2559.8	0.367	9.8	0.730	32	312	1.1	5.3	1.3	50	357	0.773
2560.5	0.337	10	0.812	35	248	0.740	4.9	1.5	53	284	0.540
2561.2	0.611	11	0.892	39	309	1.2	8.8	1.6	60	354	0.855
2561.9	0.337	9.8	1.1	35	273	0.924	4.9	1.9	54	312	0.674
2562.6	0.337	9.2	0.793	41	265	1.2	4.9	1.4	63	303	0.895
2563.3	0.337	11	1.3	36	304	2.1	4.9	2.4	55	348	1.5
2564.0	0.645	10.0	0.754	38	292	1.1	9.3	1.4	58	334	0.836
2564.7	0.442	11	0.754	36	291	1.3	6.4	1.4	56	333	0.961
2565.4	0.349	9.2	0.741	37	299	1.6	5.0	1.4	57	342	1.2
2566.1	0.337	11	1.1	40	313	1.5	4.9	1.9	61	358	1.1
2566.8	0.337	8.8	0.952	31	280	0.953	4.9	1.7	48	320	0.695
2567.5	0.337	10	0.760	39	273	1.4	4.9	1.4	59	313	1.0
2568.2	0.337	9.8	0.751	35	227	1.2	4.9	1.4	54	259	0.886
2568.9	0.381	12	1.2	41	299	2.0	5.5	2.1	63	342	1.5
2569.6	0.337	11	0.660	41	246	0.754	4.9	1.2	63	281	0.550
2570.3	0.359	11	1.1	45	301	1.4	5.2	2.0	68	345	1.0
2571.0	0.819	11	0.739	46	302	1.8	12	1.3	70	345	1.3
2571.7	0.337	11	1.2	39	270	1.9	4.9	2.3	59	308	1.4
2572.4	0.337	11	1.2	40	295	1.5	4.9	2.1	61	338	1.1
2573.1	0.488	12	0.887	40	287	1.1	7.0	1.6	61	328	0.767
2573.8	0.432	11	0.881	38	296	1.4	6.2	1.6	58	338	1.0
2574.5	0.337	11	1.2	36	296	1.4	4.9	2.2	55	338	0.997
2575.2	0.337	11	1.1	32	271	1.3	4.9	2.0	50	309	0.921
2575.9	0.337	12	1.2	33	272	1.1	4.9	2.3	50	311	0.797
2576.5	0.337	8.3	1.1	39	328	1.8	4.9	2.0	60	375	1.3
2577.2	0.337	12	0.782	37	280	1.5	4.9	1.4	56	320	1.1
2577.9	0.337	11	0.884	35	286	1.8	4.9	1.6	54	327	1.3
2578.6	0.337	12	0.746	30	232	0.951	4.9	1.4	46	265	0.694
2579.3	0.337	12	1.1	33	286	1.8	4.9	1.9	51	327	1.3
2580.0	0.337	10	0.993	30	310	1.3	4.9	1.8	45	354	0.959
2580.7	0.337	13	0.954	37	277	0.995	4.9	1.7	57	317	0.726
2581.4	0.442	12	0.820	44	284	1.4	6.4	1.5	68	324	1.0
2582.1	0.539	12	1.0	33	251	1.3	7.8	1.8	51	287	0.980
2582.8	0.337	10	1.0	41	278	1.8	4.9	1.9	62	317	1.3
2583.5	0.489	9.5	0.848	34	294	1.1	7.1	1.5	52	336	0.790
2584.2	0.337	12	1.2	37	286	1.3	4.9	2.2	57	326	0.979
2584.9	0.493	13	1.1	43	337	1.2	7.1	2.0	66	385	0.867
2585.6	0.337	9.3	0.886	31	287	1.2	4.9	1.6	48	328	0.861
2586.3	0.337	9.2	1.1	41	300	1.9	4.9	1.9	62	343	1.4
2587.0	0.338	9.9	0.812	38	272	1.7	4.9	1.5	59	311	1.3
2587.7	0.384	9.6	0.941	42	331	1.5	5.5	1.7	64	379	1.1
2588.4	0.337	12	0.899	45	319	1.7	4.9	1.6	69	365	1.3
2589.1	0.337	13	0.896	37	309	1.4	4.9	1.6	56	353	1.0
2589.8	0.572	13	0.979	40	272	1.1	8.3	1.8	61	311	0.834
2590.5	0.449	11	0.870	39	324	1.5	6.5	1.6	60	370	1.1
2591.2	0.337	12	1.1	38	260	0.808	4.9	2.0	58	297	0.590
2591.9	0.337	10.0	1.1	39	309	1.8	4.9	2.0	60	354	1.3
2592.6	0.337	9.9	0.885	43	265	1.0	4.9	1.6	67	303	0.755
2593.3	0.434	9.4	0.853	36	320	1.4	6.3	1.6	56	365	0.997
2594.0	0.337	11	1.2	39	255	1.4	4.9	2.1	60	291	1.0
2594.7	0.501	12	0.930	45	290	0.907	7.2	1.7	69	332	0.662
2595.4	0.337	9.7	1.1	45	295	1.7	4.9	2.0	70	337	1.3
2596.1	0.337	8.6	1.2	40	289	1.0	4.9	2.2	61	331	0.737
2596.8	0.419	10	1.1	41	284	1.1	6.0	1.9	62	325	0.786
2597.5	0.349	10	1.4	49	280	1.1	5.0	2.6	75	320	0.777
2598.2	0.561	10	0.974	44	284	1.6	8.1	1.8	67	325	1.1



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Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2598.9	0.337	9.3	0.736	43	301	1.2	4.9	1.3	66	344	0.899
2599.6	0.981	9.7	1.1	44	297	0.956	14	1.9	67	339	0.698
2600.3	0.337	11	0.940	45	302	1.7	4.9	1.7	70	345	1.2
2601.0	0.446	11	0.942	41	308	1.3	6.4	1.7	64	352	0.970
2601.7	0.492	10	1.0	33	226	0.760	7.1	1.9	50	258	0.555
2602.4	0.450	11	1.0	42	294	0.522	6.5	1.8	64	336	0.381
2603.0	0.337	11	0.893	42	262	1.5	4.9	1.6	65	300	1.1
2603.7	0.376	12	1.0	32	298	1.7	5.4	1.9	50	341	1.2
2604.4	0.412	14	1.4	37	273	1.5	5.9	2.5	56	312	1.1
2605.1	0.503	11	1.1	34	271	1.3	7.3	2.1	53	310	0.965
2605.8	0.610	11	1.1	36	273	1.2	8.8	1.9	56	312	0.899
2606.5	0.719	9.9	1.1	38	312	1.6	10	2.0	58	356	1.2
2607.2	0.953	10	0.934	36	307	1.5	14	1.7	55	352	1.1
2607.9	0.337	10	0.740	31	287	1.2	4.9	1.3	48	328	0.851
2608.6	0.822	11	0.936	37	291	0.549	12	1.7	57	333	0.400
2609.3	0.663	9.4	0.850	32	341	2.1	9.6	1.5	49	389	1.6
2610.0	0.615	11	0.987	30	305	2.2	8.9	1.8	46	348	1.6
2610.7	1.2	12	0.867	33	359	1.5	17	1.6	50	411	1.1
2611.4	0.594	9.3	1.0	31	373	2.0	8.6	1.9	48	426	1.5
2612.1	0.820	11	1.1	38	405	2.1	12	1.9	58	463	1.5
2612.8	1.5	14	1.3	37	419	1.7	21	2.3	57	480	1.3
2613.5	1.5	13	1.2	42	521	2.6	21	2.1	65	596	1.9
2614.2	0.871	13	1.1	36	457	2.6	13	1.9	55	523	1.9
2614.9	1.1	12	1.3	45	541	1.9	16	2.4	69	618	1.4
2615.6	1.1	11	1.1	41	522	1.5	16	2.0	63	597	1.1
2616.3	1.2	11	1.0	38	571	2.2	17	1.9	58	653	1.6
2617.0	1.5	13	1.3	46	654	1.8	21	2.4	70	748	1.3
2617.7	2.0	14	1.1	50	656	1.4	29	2.0	76	750	1.0
2618.4	1.2	13	1.4	51	568	1.7	18	2.6	78	650	1.2
2619.1	1.5	13	1.7	47	544	2.8	21	3.1	72	622	2.0
2619.8	1.9	11	1.5	55	703	2.4	28	2.7	84	804	1.7
2620.5	1.5	13	1.4	52	607	1.5	22	2.6	80	694	1.1
2621.2	1.9	14	1.8	50	586	2.3	27	3.3	77	670	1.7
2621.9	1.9	14	1.6	60	725	2.2	28	2.8	92	829	1.6
2622.6	2.1	13	1.5	55	668	1.7	31	2.8	84	764	1.3
2623.3	1.5	14	1.9	64	790	2.2	22	3.4	98	904	1.6
2624.0	2.3	14	1.8	58	765	1.2	33	3.2	89	874	0.877
2624.7	2.1	11	1.7	60	622	1.5	31	3.1	93	712	1.1
2625.4	1.5	13	1.6	62	874	1.6	22	2.9	95	1000	1.2
2626.1	1.8	12	1.8	50	645	2.1	26	3.3	76	738	1.6
2626.8	2.7	16	2.0	58	851	1.9	39	3.6	89	973	1.4
2627.5	1.0	13	1.8	73	922	2.0	15	3.3	112	1054	1.4
2628.2	1.8	16	2.1	70	921	1.9	26	3.9	107	1053	1.4
2628.9	1.5	16	2.0	71	1024	2.3	22	3.7	109	1171	1.7
2629.5	2.1	13	2.1	62	773	1.8	30	3.9	94	884	1.3
2630.2	2.4	14	2.2	71	845	2.3	35	4.0	109	966	1.7
2630.9	2.2	14	2.9	72	872	1.7	31	5.2	110	997	1.2
2631.6	2.0	14	2.2	82	1088	2.2	29	4.1	125	1244	1.6
2632.3	1.7	15	2.0	77	865	1.9	25	3.6	118	989	1.4
2633.0	1.6	12	2.3	68	836	1.3	23	4.1	105	956	0.968
2633.7	1.7	15	2.5	79	871	2.4	24	4.5	121	996	1.7
2634.4	2.4	15	2.2	69	814	2.0	35	4.0	105	931	1.5
2635.1	2.1	13	2.3	79	925	1.3	30	4.2	121	1057	0.935
2635.8	2.8	16	2.8	81	1160	2.0	40	5.2	124	1327	1.5
2636.5	2.1	14	3.2	73	1089	1.9	30	5.8	111	1246	1.4
2637.2	4.1	19	2.5	85	991	1.6	60	4.5	131	1133	1.2
2637.9	2.9	15	2.3	86	1007	2.1	41	4.3	132	1152	1.5
2638.6	2.6	12	2.1	76	956	2.4	38	3.8	117	1093	1.7
2639.3	1.7	14	2.7	96	999	2.8	25	4.9	147	1142	2.1
2640.0	1.7	17	2.8	93	1078	2.6	25	5.0	143	1233	1.9
2640.7	2.1	14	2.9	89	1138	2.0	30	5.3	136	1301	1.5
2641.4	2.6	17	2.8	90	1231	1.9	37	5.1	137	1408	1.4
2642.1	2.4	14	2.6	96	1360	2.6	34	4.8	147	1555	1.9
2642.8	1.6	13	2.3	75	909	2.1	23	4.1	115	1040	1.5
2643.5	2.0	19	2.5	84	1229	1.8	29	4.5	128	1405	1.3
2644.2	2.4	15	2.6	109	1070	2.1	34	4.8	167	1224	1.5
2644.9	1.7	13	3.2	95	1101	2.4	25	5.9	145	1259	1.8
2645.6	2.5	16	2.6	93	1135	2.3	36	4.7	143	1297	1.7
2646.3	1.8	13	3.2	100	1215	1.9	26	5.8	153	1389	1.4
2647.0	2.8	15	2.9	89	1250	2.6	40	5.3	136	1429	1.9
2647.7	1.8	15	2.9	97	1244	2.3	26	5.4	148	1423	1.7
2648.4	2.7	14	2.8	89	1231	2.7	39	5.1	136	1408	1.9
2649.1	1.7	16	2.7	93	1228	2.2	24	4.9	142	1404	1.6
2649.8	2.2	15	2.8	93	1123	1.7	31	5.2	142	1284	1.2
2650.5	2.3	15	2.9	108	1441	3.1	33	5.2	165	1648	2.2
2651.2	1.9	15	3.1	94	1279	3.1	28	5.7	144	1462	2.2
2651.9	2.4	14	2.9	93	1327	1.9	35	5.2	142	1517	1.4
2652.6	2.5	13	3.0	82	1153	2.1	36	5.4	126	1318	1.6
2653.3	2.5	17	3.1	107	1690	2.3	37	5.6	164	1933	1.7
2654.0	2.2	16	2.7	93	1316	2.6	31	5.0	143	1505	1.9
2654.7	2.8	17	3.1	108	1430	2.8	40	5.6	166	1636	2.1



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2655.4	2.3	14	3.3	109	1542	2.4	34	6.0	167	1764	1.8
2656.1	2.4	16	3.5	99	1480	2.8	35	6.4	152	1692	2.1
2656.7	2.1	15	2.9	102	1425	2.5	30	5.3	156	1630	1.8
2657.4	2.1	14	3.1	100	1384	2.2	30	5.6	153	1582	1.6
2658.1	2.6	16	3.6	107	1462	2.1	37	6.6	163	1672	1.6
2658.8	1.7	14	3.2	106	1333	2.1	24	5.8	163	1524	1.5
2659.5	2.0	14	3.0	105	1451	2.4	29	5.5	162	1660	1.7
2660.2	2.5	12	3.1	103	1537	2.6	36	5.6	157	1758	1.9
2660.9	2.1	14	2.7	102	1538	1.9	30	5.0	156	1759	1.4
2661.6	3.1	15	3.0	100	1551	3.3	44	5.5	154	1774	2.4
2662.3	1.9	15	3.0	105	1682	2.0	28	5.5	160	1923	1.5
2663.0	2.0	13	3.2	96	1494	1.9	29	5.9	147	1709	1.4
2663.7	2.5	15	2.8	122	1616	3.4	36	5.0	187	1848	2.5
2664.4	2.3	15	3.1	119	1576	2.2	34	5.7	182	1802	1.6
2665.1	2.0	14	3.0	106	1505	2.6	29	5.4	162	1721	1.9
2665.8	2.8	15	3.0	99	1546	2.9	41	5.5	151	1768	2.1
2666.5	2.4	13	3.5	116	1621	2.8	35	6.4	177	1853	2.0
2667.2	1.7	15	3.0	112	1628	2.4	24	5.5	171	1862	1.7
2667.9	1.6	16	3.2	120	1582	2.3	24	5.9	183	1809	1.7
2668.6	2.2	15	3.1	104	1679	2.8	32	5.6	160	1920	2.1
2669.3	2.4	16	3.1	109	1647	2.8	35	5.7	167	1883	2.0
2670.0	1.6	16	2.9	115	1670	2.2	23	5.4	177	1910	1.6
2670.7	1.6	14	2.4	98	1532	2.6	23	4.3	150	1752	1.9
2671.4	1.9	14	3.2	113	1624	1.8	27	5.8	174	1858	1.3
2672.1	1.9	15	2.6	106	1625	2.0	28	4.8	162	1858	1.4
2672.8	2.0	14	3.1	112	1502	2.5	29	5.7	172	1718	1.8
2673.5	2.4	15	3.4	108	1715	2.7	34	6.1	166	1962	2.0
2674.2	2.5	16	2.5	103	1804	2.1	35	4.6	157	2063	1.6
2674.9	1.5	16	3.0	111	1763	2.3	21	5.5	171	2016	1.7
2675.6	1.8	17	3.1	118	1763	2.4	26	5.6	180	2016	1.8
2676.3	1.6	17	3.1	121	1688	2.1	23	5.6	186	1931	1.5
2677.0	1.6	14	2.5	107	1615	1.9	23	4.5	164	1847	1.4
2677.7	1.6	16	2.8	98	1793	2.6	23	5.1	151	2051	1.9
2678.4	1.6	16	3.0	109	1703	2.6	24	5.5	167	1947	1.9
2679.1	1.6	16	2.7	113	1671	2.3	24	4.9	173	1911	1.7
2679.8	1.9	16	2.7	115	1779	2.6	27	5.0	177	2034	1.9
2680.5	1.7	14	2.8	121	1633	1.5	24	5.1	185	1867	1.1
2681.2	1.1	15	2.5	95	1674	1.5	16	4.6	146	1914	1.1
2681.9	2.0	16	2.8	117	2000	1.5	29	5.1	180	2287	1.1
2682.6	1.6	13	2.1	106	1670	1.9	23	3.9	163	1910	1.4
2683.2	1.6	15	2.5	118	1945	2.2	23	4.6	180	2224	1.6
2683.9	1.3	16	2.3	106	1759	2.0	19	4.2	162	2011	1.5
2684.6	0.826	17	2.5	106	1747	2.2	12	4.6	163	1998	1.6
2685.3	1.3	13	2.3	103	1874	2.5	18	4.2	158	2142	1.8
2686.0	1.2	15	2.6	115	1672	2.3	17	4.7	177	1912	1.7
2686.7	1.2	14	2.2	112	1678	1.6	17	3.9	171	1919	1.2
2687.4	1.3	16	2.4	119	1696	2.1	18	4.3	182	1939	1.6
2688.1	1.5	15	2.6	93	1702	2.2	22	4.8	142	1946	1.6
2688.8	1.5	14	2.5	102	1604	2.7	21	4.5	156	1835	2.0
2689.5	0.970	15	1.9	96	1564	1.9	14	3.5	147	1788	1.4
2690.2	1.2	15	2.6	118	1754	3.5	17	4.7	181	2005	2.6
2690.9	1.1	14	2.5	97	1433	2.2	16	4.6	149	1638	1.6
2691.6	0.910	14	2.2	101	1791	2.1	13	3.9	154	2048	1.5
2692.3	1.1	14	2.1	93	1659	2.2	16	3.8	143	1897	1.6
2693.0	0.700	14	2.6	103	1625	1.7	10	4.7	158	1858	1.3
2693.7	1.0	17	2.1	100	1547	2.7	15	3.9	154	1769	1.9
2694.4	0.880	14	2.0	93	1515	1.3	13	3.6	142	1733	0.970
2695.1	0.850	14	1.8	84	1350	1.5	12	3.3	129	1544	1.1
2695.8	0.922	14	1.7	90	1526	2.1	13	3.2	138	1745	1.5
2696.5	0.684	13	1.8	99	1506	2.5	9.9	3.2	151	1722	1.8
2697.2	0.562	15	2.1	97	1434	2.7	8.1	3.9	148	1640	2.0
2697.9	0.762	13	1.4	101	1592	2.4	11	2.6	154	1821	1.8
2698.6	0.763	13	2.3	82	1323	2.7	11	4.2	126	1513	2.0
2699.3	1.0	14	1.9	93	1331	2.4	15	3.5	143	1522	1.7
2700.0	0.469	15	1.4	82	1530	1.5	6.8	2.5	125	1750	1.1
2700.7	0.878	15	1.7	85	1537	1.9	13	3.2	130	1758	1.4
2701.4	1.0	11	1.4	71	1398	1.3	15	2.5	109	1598	0.919
2702.1	0.770	12	1.6	84	1602	1.6	11	3.0	129	1832	1.2
2702.8	1.3	11	1.3	86	1419	2.5	19	2.4	132	1623	1.8
2703.5	0.892	12	1.2	82	1338	2.1	13	2.2	125	1530	1.5
2704.2	0.459	11	1.2	73	1432	1.5	6.6	2.3	112	1637	1.1
2704.9	0.764	11	1.2	72	1302	1.7	11	2.2	110	1489	1.2
2705.6	0.429	12	0.985	67	1272	1.8	6.2	1.8	102	1454	1.3
2706.3	0.966	13	1.1	69	1373	1.6	14	2.0	106	1570	1.2
2707.0	0.398	11	1.4	70	1307	2.4	5.7	2.6	107	1495	1.7
2707.7	0.975	9.9	1.2	63	1135	1.3	14	2.1	96	1298	0.951
2708.4	0.740	11	1.1	53	1265	1.9	11	2.1	81	1447	1.4
2709.1	0.337	14	1.6	72	1279	1.4	4.9	2.9	110	1462	1.0
2709.7	0.870	11	1.1	59	1245	2.4	13	1.9	91	1424	1.8
2710.4	1.2	12	0.849	72	1193	2.4	17	1.5	111	1364	1.8
2711.1	0.695	11	1.0	58	1334	1.9	10	1.9	89	1525	1.4



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Sample ID: 007

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.337	0.298	0.059	0.458	0.003	0.003					
Length (µm)											
2711.8	1.5	12	0.824	71	1435	1.6	22	1.5	108	1641	1.2
2712.5	0.981	13	1.2	54	1450	3.0	14	2.2	83	1658	2.2
2713.2	1.0	12	0.789	51	1264	2.5	15	1.4	78	1445	1.8
2713.9	0.946	9.5	1.0	50	1143	1.7	14	1.8	77	1307	1.3
2714.6	0.975	10	0.808	52	1144	1.8	14	1.5	80	1308	1.3
2715.3	1.3	13	1.1	57	1246	1.7	19	2.0	88	1424	1.2
2716.0	1.9	12	0.925	45	1040	2.4	27	1.7	69	1189	1.8
2716.7	1.1	10	0.743	48	1093	1.3	15	1.4	73	1250	0.913
2717.4	0.922	11	0.798	62	1114	1.8	13	1.5	95	1274	1.3
2718.1	1.9	13	0.719	44	1247	1.7	27	1.3	68	1426	1.2
2718.8	1.1	9.7	0.848	59	1217	2.1	16	1.5	91	1392	1.5
2719.5	1.8	15	0.753	47	1191	2.3	26	1.4	72	1362	1.7
2720.2	2.4	11	0.884	54	1225	2.4	34	1.6	82	1401	1.7
2720.9	2.0	12	1.1	55	1146	2.0	28	1.9	84	1311	1.4
2721.6	1.8	11	0.616	48	1087	2.3	26	1.1	74	1244	1.6
2722.3	2.1	10	0.949	50	1053	2.1	30	1.7	76	1205	1.5
2723.0	1.8	11	0.873	45	1113	2.9	26	1.6	68	1272	2.1
2723.7	2.7	14	1.3	52	1216	2.9	39	2.4	80	1390	2.2
2724.4	2.9	12	1.2	45	1049	1.3	42	2.1	68	1200	0.955
2725.1	3.0	11	1.4	45	1193	2.6	43	2.6	69	1364	1.9
2725.8	4.8	12	1.3	51	1044	2.6	70	2.3	78	1194	1.9
2726.5	3.4	13	1.5	54	1190	1.9	49	2.8	82	1360	1.4
2727.2	4.3	11	1.2	45	1039	2.0	62	2.2	69	1188	1.5
2727.9	4.4	10	1.4	65	1195	3.3	64	2.6	99	1366	2.4
2728.6	4.5	13	1.4	51	940	1.8	65	2.5	78	1075	1.3
2729.3	5.7	13	1.5	48	1036	2.1	82	2.7	73	1185	1.5
2730.0	4.9	12	1.5	43	944	2.9	71	2.8	66	1079	2.1
2730.7	5.3	13	1.2	55	1029	3.8	76	2.2	85	1176	2.7
2731.4	4.8	10	1.5	48	990	2.1	69	2.7	73	1132	1.5
2732.1	5.9	13	1.4	43	1202	2.1	86	2.6	66	1375	1.6
2732.8	4.5	12	1.4	49	1050	2.3	65	2.6	76	1201	1.7
2733.5	4.1	13	1.8	55	1028	2.5	59	3.3	84	1176	1.8
2734.2	4.4	12	1.4	49	1005	2.8	63	2.6	75	1150	2.1
2734.9	4.2	10	2.0	55	1018	3.1	61	3.6	84	1164	2.3
2735.5	4.0	8.9	2.1	48	1059	1.8	58	3.8	73	1211	1.3
2736.2	4.1	12	2.0	49	1141	2.1	59	3.7	75	1305	1.5
2736.9	5.0	13	1.9	57	1092	3.2	72	3.5	88	1248	2.3
2737.6	3.9	11	2.0	51	1076	2.8	57	3.6	79	1230	2.0
2738.3	3.6	11	1.9	52	1011	2.8	51	3.4	80	1156	2.1
2739.0	4.0	11	2.9	59	1325	2.7	58	5.3	90	1515	2.0
2739.7	5.4	15	2.0	54	1195	2.9	77	3.6	83	1366	2.1
2740.4	5.4	13	2.6	50	1159	2.8	78	4.7	77	1325	2.1
2741.1	3.9	12	2.3	54	1258	3.0	56	4.1	83	1438	2.2
2741.8	5.4	11	2.3	52	1152	3.2	77	4.2	80	1317	1.7
2742.5	4.5	11	2.1	55	1156	3.2	64	3.8	84	1322	2.3
2743.2	4.6	11	2.0	55	1117	2.7	66	3.6	85	1277	2.0
2743.9	5.7	13	2.4	62	1109	2.8	82	4.5	95	1268	2.1
2744.6	4.4	13	2.2	55	1155	2.0	64	4.0	85	1321	1.5
2745.3	6.4	15	2.3	61	1338	3.1	93	4.1	94	1530	2.2
2746.0	5.7	12	2.4	57	1246	2.2	82	4.5	88	1424	1.6
2746.7	5.1	14	2.1	64	1284	3.7	73	3.8	97	1468	2.7
2747.4	4.5	11	2.7	54	1138	2.1	65	4.9	83	1301	1.5
2748.1	5.0	12	2.5	53	1224	3.4	72	4.5	81	1399	2.5
2748.8	5.3	13	2.6	60	1435	3.1	77	4.7	91	1641	2.2
2749.5	3.9	14	2.7	61	1236	2.4	57	4.8	94	1413	1.7
2750.2	4.6	14	2.8	61	1319	2.6	67	5.1	94	1509	1.9
2750.9	3.2	11	2.3	68	1351	4.1	47	4.2	104	1545	3.0
2751.6	4.8	12	2.7	54	1184	1.9	69	4.8	82	1354	1.4
2752.3	4.9	13	2.6	67	1207	2.8	71	4.8	102	1381	2.0
2753.0	5.7	12	2.4	58	1187	2.8	83	4.5	89	1357	2.1
2753.7	4.5	15	2.8	65	1306	3.0	65	5.2	100	1493	2.2
2754.4	3.4	14	2.1	62	1198	3.0	49	3.8	94	1370	2.2
2755.1	4.1	12	2.1	60	1320	2.7	60	3.9	92	1509	2.0
2755.8	4.8	14	2.6	62	1351	2.5	69	4.7	95	1545	1.8
2756.5	4.5	15	2.3	62	1371	3.0	65	4.2	95	1567	2.2
2757.2	4.5	14	2.7	64	1394	2.4	65	5.0	98	1594	1.7
2757.9	3.9	14	2.4	62	1390	2.8	56	4.4	95	1590	2.1
2758.6	3.9	12	2.6	66	1147	2.1	56	4.7	101	1311	1.5
2759.3	4.1	10	2.3	61	1126	3.5	60	4.1	93	1287	2.5
2760.0	4.4	13	2.5	63	1396	2.3	64	4.5	96	1597	1.7
2760.7	3.8	14	2.2	57	1288	2.5	55	4.0	88	1473	1.8
2761.3	4.3	13	2.6	67	1309	2.9	62	4.7	103	1497	2.1
2762.0	3.7	13	2.9	64	1188	2.6	53	5.3	98	1359	1.9
2762.7	4.4	16	2.6	77	1397	2.5	63	4.7	118	1598	1.8
2763.4	4.6	14	2.5	75	1387	3.1	66	4.7	115	1586	2.3
2764.1	3.5	14	3.0	78	1349	2.5	51	5.4	119	1542	1.9
2764.8	3.8	15	2.8	69	1500	2.5	55	5.2	106	1715	1.8
2765.5	4.2	14	3.0	68	1416	3.1	61	5.5	104	1620	2.3
2766.2	4.4	13	2.7	71	1476	3.0	63	5.0	109	1688	2.2
2766.9	3.1	14	2.3	64	1413	2.7	45	4.3	97	1616	2.0
2767.6	3.3	13	2.5	70	1366	3.1	48	4.5	107	1562	2.3



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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2768.3	4.5	14	2.9	68	1634	2.6	64	5.4	104	1868	1.9
2769.0	3.8	15	2.2	66	1490	3.1	54	4.1	101	1704	2.3
2769.7	3.2	13	3.0	63	1329	2.9	47	5.5	97	1520	2.1
2770.4	3.8	14	3.1	66	1534	2.7	55	5.6	102	1754	2.0
2771.1	3.2	13	2.6	58	1209	2.6	46	4.8	89	1383	1.9
2771.8	2.9	15	2.6	69	1456	2.6	42	4.7	105	1665	1.9
2772.5	2.3	13	2.7	70	1315	1.6	34	5.0	107	1503	1.1
2773.2	2.6	14	3.1	73	1312	2.4	38	5.7	111	1500	1.7
2773.9	2.3	13	2.4	65	1167	3.0	33	4.4	100	1335	2.2
2774.6	2.9	14	3.1	65	1321	2.3	42	5.6	100	1511	1.7
2775.3	3.3	17	2.4	64	1427	2.7	47	4.3	98	1631	2.0
2776.0	2.3	14	2.3	55	1143	3.2	32	4.1	84	1307	2.3
2776.7	2.1	16	2.1	63	1260	2.5	31	3.9	96	1440	1.8
2777.4	3.3	14	2.3	61	1242	1.9	47	4.2	93	1421	1.4
2778.1	3.7	15	1.7	58	1232	2.8	53	3.0	89	1409	2.1
2778.8	2.7	11	2.5	60	1241	2.3	39	4.5	93	1420	1.7
2779.5	2.4	13	2.1	60	1086	2.9	35	3.9	92	1242	2.1
2780.2	3.4	15	2.4	73	1477	1.4	49	4.4	111	1689	1.0
2780.9	2.2	15	2.4	73	1263	3.1	31	4.3	112	1445	2.2
2781.6	1.1	13	1.7	53	1200	2.0	16	3.1	81	1373	1.4
2782.3	1.8	15	1.9	62	1368	1.9	26	3.5	96	1564	1.4
2783.0	2.1	14	2.1	58	1180	3.9	30	3.9	89	1349	2.8
2783.7	1.6	13	1.9	47	952	2.0	23	3.5	73	1088	1.5
2784.4	1.8	13	1.8	48	1183	2.4	27	3.2	73	1353	1.8
2785.1	1.7	13	1.7	47	1110	2.8	24	3.1	72	1269	2.1
2785.8	0.651	14	1.7	46	1104	2.7	9.4	3.0	70	1263	2.0
2786.5	0.994	13	1.6	54	1151	1.3	14	3.0	83	1316	0.940
2787.2	1.6	13	1.0	47	1339	1.7	22	1.9	72	1531	1.2
2787.8	0.840	9.2	0.819	32	999	1.7	12	1.5	49	1142	1.2
2788.5	0.674	12	1.3	43	1079	1.5	9.7	2.4	67	1234	1.1
2789.2	1.6	13	1.6	43	1003	1.2	23	3.0	66	1147	0.877
2789.9	0.467	12	0.951	42	1007	1.6	6.7	1.7	65	1152	1.2
2790.6	0.968	13	0.989	41	1147	2.6	14	1.8	62	1311	1.9
2791.3	0.729	13	0.995	36	1110	2.2	11	1.8	56	1269	1.6
2792.0	1.5	11	1.2	41	1040	2.8	22	2.3	64	1189	2.1
2792.7	0.809	12	1.1	33	957	1.7	12	2.0	51	1095	1.3
2793.4	0.934	12	0.855	37	1161	2.4	13	1.6	57	1327	1.8
2794.1	1.0	11	1.0	42	877	2.4	14	1.8	65	1003	1.8
2794.8	1.8	12	0.493	30	1122	2.3	26	0.899	46	1283	1.7
2795.5	1.1	14	1.1	37	997	2.1	15	2.1	57	1140	1.5
2796.2	1.5	15	0.618	41	983	1.7	22	1.1	62	1124	1.3
2796.9	0.757	13	0.863	28	960	1.8	11	1.6	43	1098	1.3
2797.6	0.681	12	0.746	27	991	2.0	9.8	1.4	42	1134	1.4
2798.3	0.918	14	1.0	32	1051	2.3	13	1.9	48	1202	1.7
2799.0	1.4	13	0.673	29	992	1.9	21	1.2	45	1135	1.4
2799.7	0.720	13	0.681	30	944	1.6	10	1.2	47	1080	1.2
2800.4	0.952	14	0.625	30	1011	1.8	14	1.1	47	1156	1.3
2801.1	0.795	13	0.792	36	1140	2.6	11	1.4	56	1304	1.9
2801.8	1.4	13	0.798	31	966	2.0	20	1.5	47	1105	1.5
2802.5	0.947	14	0.580	34	981	3.0	14	1.1	52	1122	2.2
2803.2	0.833	13	0.384	34	1008	1.9	12	0.700	52	1153	1.4
2803.9	0.914	16	0.634	29	1065	2.4	13	1.2	44	1218	1.8
2804.6	1.4	13	0.610	28	909	1.4	20	1.1	43	1039	1.0
2805.3	1.7	15	0.612	33	1181	2.5	24	1.1	51	1351	1.8
2806.0	1.0	14	0.562	30	1061	1.9	15	1.0	46	1213	1.4
2806.7	1.0	16	0.859	34	1151	3.0	15	1.6	52	1316	2.2
2807.4	0.407	13	0.621	36	1193	1.7	5.9	1.1	55	1364	1.3
2808.1	0.906	13	0.729	34	1149	1.5	13	1.3	52	1314	1.1
2808.8	0.905	14	0.627	33	1115	1.8	13	1.1	50	1275	1.3
2809.5	0.952	15	0.695	31	1168	1.8	14	1.3	48	1336	1.3
2810.2	0.826	13	0.404	30	921	1.7	12	0.737	46	1053	1.3
2810.9	1.5	13	0.576	29	1017	1.9	21	1.1	45	1162	1.4
2811.6	1.1	12	0.509	29	957	2.5	15	0.928	44	1095	1.9
2812.3	0.588	14	0.496	32	1058	2.1	8.5	0.904	50	1210	1.5
2813.0	1.1	16	0.863	37	1150	3.1	16	1.6	57	1315	2.3
2813.7	0.880	16	0.563	47	1206	2.4	13	1.0	72	1379	1.8
2814.3	0.620	13	0.563	37	1048	2.5	9.0	1.0	56	1198	1.8
2815.0	0.788	15	0.463	36	1245	3.0	11	0.844	55	1424	2.2
2815.7	0.693	15	0.584	36	1007	2.5	10	1.1	55	1152	1.8
2816.4	0.528	13	0.696	34	1117	2.4	7.6	1.3	53	1277	1.7
2817.1	0.787	14	0.426	37	1182	2.3	11	0.777	57	1351	1.7
2817.8	0.883	13	0.524	34	1147	2.8	13	0.955	52	1311	2.0
2818.5	0.799	13	0.677	29	1066	2.0	12	1.2	44	1218	1.5
2819.2	0.823	14	0.633	30	1291	3.1	12	1.2	47	1476	2.3
2819.9	0.691	15	0.677	36	1067	1.9	10.0	1.2	55	1220	1.4
2820.6	0.893	16	0.785	33	1064	2.2	13	1.4	50	1217	1.6
2821.3	1.3	14	0.554	31	1074	2.5	19	1.0	48	1229	1.8
2822.0	0.337	13	0.672	36	1186	2.0	4.9	1.2	56	1356	1.5
2822.7	1.1	14	0.404	34	1311	2.4	15	0.736	52	1499	1.7
2823.4	1.8	12	0.559	30	1012	1.5	26	1.0	47	1157	1.1
2824.1	1.3	15	0.491	38	1143	2.3	18	0.895	59	1307	1.7



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2824.8	0.998	11	0.807	34	1081	1.9	14	1.5	52	1236	1.4
2825.5	0.900	13	0.644	32	951	2.2	13	1.2	49	1087	1.6
2826.2	0.630	14	0.555	40	1087	1.6	9.1	1.0	61	1243	1.2
2826.9	0.868	13	0.597	42	1136	1.9	13	1.1	64	1299	1.4
2827.6	1.3	14	0.937	40	1196	1.8	18	1.7	61	1368	1.3
2828.3	1.2	13	0.599	30	975	1.9	18	1.1	45	1115	1.4
2829.0	0.762	14	0.623	36	1192	2.2	11	1.1	54	1363	1.6
2829.7	0.631	16	0.634	37	1035	2.3	9.1	1.2	56	1183	1.6
2830.4	0.996	16	0.520	40	1405	2.5	14	0.949	61	1607	1.8
2831.1	1.0	14	0.526	37	1102	2.3	15	0.959	56	1261	1.7
2831.8	1.8	12	0.766	36	1290	2.5	26	1.4	56	1475	1.9
2832.5	0.615	12	0.264	36	1065	2.3	8.9	0.481	56	1218	1.6
2833.2	1.7	14	0.489	36	986	1.7	24	0.892	55	1128	1.2
2833.9	1.7	15	0.402	34	1060	2.0	24	0.733	52	1212	1.5
2834.6	0.938	11	0.567	37	1060	2.8	14	1.0	56	1212	2.0
2835.3	1.2	15	0.792	32	1236	3.1	18	1.4	48	1413	2.2
2836.0	1.6	13	0.252	31	1027	1.7	24	0.459	48	1175	1.3
2836.7	1.4	14	0.589	36	1153	2.4	19	1.1	56	1318	1.8
2837.4	1.1	12	0.477	36	1028	2.4	16	0.870	55	1175	1.7
2838.1	0.768	12	0.492	36	1038	2.5	11	0.897	54	1187	1.8
2838.8	1.4	13	0.716	30	942	1.9	20	1.3	46	1077	1.4
2839.5	0.988	13	0.556	36	1214	2.7	14	1.0	56	1389	2.0
2840.2	0.915	15	0.500	28	944	2.4	13	0.911	43	1079	1.8
2840.9	1.3	12	0.677	41	1100	2.1	18	1.2	63	1258	1.5
2841.5	1.0	12	0.627	35	1180	2.1	15	1.1	54	1349	1.5
2842.2	0.688	13	0.516	37	1069	1.8	9.9	0.941	57	1222	1.3
2842.9	0.728	14	0.276	34	1039	2.4	11	0.504	52	1188	1.7
2843.6	0.513	14	0.608	37	1070	2.5	7.4	1.1	56	1223	1.8
2844.3	0.766	11	0.524	27	974	1.9	11	0.955	42	1114	1.4
2845.0	1.5	13	0.346	33	1101	2.5	21	0.631	51	1260	1.9
2845.7	0.885	15	0.572	30	1010	2.0	13	1.0	47	1155	1.5
2846.4	1.2	12	0.732	30	1045	2.5	17	1.3	47	1195	1.8
2847.1	1.5	14	0.407	30	1170	3.1	22	0.742	46	1338	2.3
2847.8	1.1	12	0.294	30	1018	2.7	16	0.537	46	1164	1.9
2848.5	1.6	12	0.378	31	964	2.9	24	0.690	47	1103	2.1
2849.2	0.842	14	0.443	30	947	2.3	12	0.809	45	1083	1.7
2849.9	0.459	10	0.452	27	900	2.9	6.6	0.825	41	1029	2.1
2850.6	0.907	11	0.450	23	892	1.5	13	0.820	35	1020	1.1
2851.3	1.3	12	0.456	27	1109	2.0	19	0.832	42	1268	1.5
2852.0	1.2	14	0.380	34	1212	3.8	17	0.692	52	1386	2.8
2852.7	1.1	13	0.391	30	1086	2.4	16	0.713	46	1242	1.8
2853.4	1.1	13	0.330	24	965	2.0	16	0.602	38	1104	1.5
2854.1	1.2	10	0.528	24	1052	1.8	17	0.964	37	1204	1.3
2854.8	1.0	13	0.431	33	1140	1.5	15	0.787	50	1304	1.1
2855.5	1.1	11	0.508	32	1057	1.9	16	0.927	48	1209	1.4
2856.2	1.4	10	0.346	27	1045	2.1	20	0.631	42	1195	1.5
2856.9	0.614	13	0.475	24	952	2.0	8.9	0.867	37	1089	1.5
2857.6	0.505	15	0.413	26	936	1.6	7.3	0.753	40	1070	1.2
2858.3	0.385	13	0.378	32	1094	2.7	5.6	0.689	49	1251	2.0
2859.0	0.523	12	0.481	25	994	2.2	7.5	0.878	38	1137	1.6
2859.7	0.717	11	0.421	25	1029	2.5	10	0.768	39	1176	1.9
2860.4	0.631	10	0.356	33	983	2.1	9.1	0.650	51	1124	1.5
2861.1	0.337	13	0.335	26	1052	2.1	4.9	0.610	39	1203	1.5
2861.8	0.975	11	0.437	25	1093	2.2	14	0.798	38	1250	1.6
2862.5	1.0	10	0.283	26	1091	2.3	15	0.515	40	1247	1.6
2863.2	1.1	11	0.457	24	969	1.2	16	0.833	37	1109	0.898
2863.9	0.685	14	0.496	32	1117	3.3	9.9	0.904	49	1277	2.4
2864.6	1.2	12	0.388	32	1111	2.4	18	0.708	49	1270	1.8
2865.3	1.8	11	0.266	27	892	2.4	26	0.485	41	1021	1.8
2866.0	1.2	12	0.167	28	1169	2.4	17	0.304	43	1337	1.8
2866.7	0.928	11	0.442	29	1093	2.3	13	0.805	44	1250	1.7
2867.4	0.696	11	0.436	32	1157	2.4	10	0.795	49	1323	1.7
2868.0	0.873	13	0.565	27	971	1.7	13	1.0	41	1110	1.2
2868.7	1.8	14	0.386	28	979	2.8	26	0.704	42	1120	2.0
2869.4	2.3	13	0.428	31	990	2.4	33	0.780	47	1132	1.7
2870.1	1.4	11	0.583	27	858	2.1	20	1.1	41	981	1.6
2870.8	2.6	15	0.657	32	1082	2.9	38	1.2	49	1238	2.1
2871.5	2.1	12	0.476	29	933	2.2	31	0.868	44	1066	1.6
2872.2	2.0	11	0.609	29	901	2.0	29	1.1	44	1030	1.5
2872.9	1.4	11	0.961	33	1099	1.5	20	1.8	50	1257	1.1
2873.6	1.9	13	0.879	38	1065	2.3	27	1.6	59	1217	1.7
2874.3	2.0	16	0.746	31	1005	2.2	29	1.4	48	1149	1.6
2875.0	0.989	12	0.828	35	1075	1.9	14	1.5	53	1230	1.4
2875.7	1.8	15	0.789	33	1041	1.4	26	1.4	50	1191	1.0
2876.4	2.1	13	0.721	35	1177	2.4	30	1.3	54	1346	1.8
2877.1	1.1	12	1.2	31	936	1.8	15	2.2	47	1070	1.3
2877.8	1.3	14	1.2	35	1117	2.6	19	2.1	54	1277	1.9
2878.5	1.1	15	0.675	44	1213	2.4	16	1.2	67	1387	1.7
2879.2	2.3	13	0.882	41	1328	3.0	33	1.6	62	1518	2.2
2879.9	1.9	15	1.1	35	1131	1.9	27	2.1	53	1293	1.4
2880.6	1.9	13	1.1	33	1063	2.0	27	2.1	51	1216	1.5



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2881.3	2.0	15	0.901	38	1114	3.1	29	1.6	58	1274	2.2
2882.0	1.8	14	1.1	36	1064	2.7	26	2.1	55	1216	2.0
2882.7	1.5	13	0.982	34	1239	2.9	22	1.8	52	1417	2.1
2883.4	1.6	16	0.965	40	1287	2.8	23	1.8	62	1471	2.0
2884.1	1.8	15	0.989	36	1070	1.3	25	1.8	55	1223	0.968
2884.8	1.4	15	0.521	36	1247	2.0	21	0.950	55	1426	1.4
2885.5	1.6	13	0.658	37	1228	2.3	23	1.2	57	1404	1.7
2886.2	1.1	14	1.1	30	1064	2.9	16	2.0	46	1217	2.1
2886.9	1.9	14	0.826	36	1136	2.7	28	1.5	55	1299	2.0
2887.6	2.0	13	0.836	28	1036	3.0	29	1.5	44	1185	2.2
2888.3	2.7	14	0.765	30	1137	2.7	40	1.4	46	1300	2.0
2889.0	2.2	13	0.704	28	985	2.6	32	1.3	42	1127	1.9
2889.7	1.9	15	0.953	31	922	2.6	28	1.7	48	1055	1.9
2890.4	2.8	13	0.570	34	1210	2.2	40	1.0	53	1384	1.6
2891.1	2.9	15	0.911	36	1076	2.4	42	1.7	56	1231	1.7
2891.8	2.7	16	1.5	38	1300	3.6	39	2.8	58	1487	2.6
2892.5	3.0	16	0.830	32	1096	1.4	44	1.5	49	1254	1.0
2893.2	3.3	15	0.899	42	1095	3.1	47	1.6	65	1252	2.3
2893.8	2.7	15	1.1	44	1522	3.4	38	2.0	67	1741	2.5
2894.5	2.8	16	1.2	35	1136	2.8	40	2.2	54	1299	2.0
2895.2	2.7	14	1.5	45	1296	2.5	38	2.8	68	1482	1.8
2895.9	2.1	15	0.984	36	1033	2.2	30	1.8	56	1181	1.6
2896.6	3.4	12	1.4	32	942	2.7	49	2.5	49	1078	2.0
2897.3	3.7	15	1.6	41	1218	3.1	53	2.8	62	1393	2.3
2898.0	1.4	10	1.3	35	1017	1.6	20	2.3	54	1163	1.2
2898.7	2.8	13	1.3	32	990	2.1	40	2.4	50	1132	1.6
2899.4	2.6	15	1.1	37	1254	1.9	38	2.1	56	1434	1.4
2900.1	3.9	13	1.6	34	1114	1.6	56	2.9	53	1274	1.2
2900.8	2.8	14	1.1	37	1168	2.3	40	2.0	56	1335	1.7
2901.5	4.0	16	1.2	34	1029	2.4	58	2.2	52	1177	1.7
2902.2	2.0	15	1.2	46	1335	2.1	28	2.3	70	1527	1.5
2902.9	2.5	15	0.963	33	993	2.2	36	1.8	51	1135	1.6
2903.6	2.7	13	0.949	34	1156	2.5	38	1.7	53	1322	1.8
2904.3	2.7	14	1.1	39	1272	2.6	39	2.0	60	1454	1.9
2905.0	3.4	17	1.0	35	999	2.5	49	1.9	53	1142	1.8
2905.7	3.4	15	1.3	34	1043	2.8	49	2.3	52	1192	2.1
2906.4	2.8	15	1.6	51	1277	2.5	41	2.9	79	1460	1.8
2907.1	2.8	14	1.2	32	1018	2.9	41	2.2	50	1164	2.1
2907.8	4.5	15	1.7	40	1264	2.2	65	3.1	61	1445	1.6
2908.5	3.8	15	1.5	36	1140	2.6	55	2.7	56	1304	1.9
2909.2	3.1	13	1.3	35	1120	2.6	45	2.4	54	1281	1.9
2909.9	3.5	16	1.6	43	1276	2.6	50	2.9	66	1459	1.9
2910.6	3.0	15	1.4	49	1179	2.6	44	2.6	76	1348	1.9
2911.3	4.1	16	1.4	42	1207	2.7	59	2.6	64	1381	2.0
2912.0	3.0	15	1.6	41	1189	2.1	43	2.9	62	1360	1.5
2912.7	3.3	16	1.9	48	1343	3.1	48	3.5	74	1535	2.3
2913.4	3.3	17	1.6	43	1242	2.4	47	2.9	66	1420	1.8
2914.1	3.5	17	1.8	44	1329	1.6	51	3.3	67	1520	1.2
2914.8	2.2	12	1.1	37	1146	2.0	32	2.0	56	1311	1.5
2915.5	2.0	13	1.4	45	1277	2.6	29	2.5	69	1461	1.9
2916.2	2.4	14	1.4	43	1175	2.9	34	2.6	65	1344	2.1
2916.9	2.9	15	1.7	36	1070	2.4	42	3.1	55	1224	1.7
2917.6	2.7	14	1.6	45	1019	2.5	39	3.0	69	1165	1.8
2918.3	2.8	15	1.6	50	1226	3.7	40	3.0	76	1402	2.7
2919.0	3.3	15	2.3	42	1399	4.2	47	4.2	65	1600	3.1
2919.7	3.0	15	1.8	46	1265	1.8	43	3.3	70	1447	1.3
2920.3	3.7	16	1.7	51	1130	3.5	53	3.1	78	1292	2.5
2921.0	2.3	15	1.7	48	1090	2.2	33	3.1	74	1247	1.6
2921.7	3.2	13	2.4	52	1334	2.6	46	4.3	79	1526	1.9
2922.4	3.5	16	2.1	49	1137	2.1	50	3.9	75	1300	1.6
2923.1	4.1	14	2.0	45	1196	2.3	60	3.6	69	1367	1.7
2923.8	3.4	14	2.1	43	1277	2.2	49	3.9	65	1460	1.6
2924.5	2.7	12	2.1	46	1113	1.4	39	3.9	71	1273	1.0
2925.2	3.6	16	1.8	48	1188	2.0	52	3.3	74	1359	1.5
2925.9	3.7	13	1.5	52	1332	2.7	53	2.8	80	1523	2.0
2926.6	4.4	16	1.9	56	1320	3.3	64	3.5	87	1509	2.4
2927.3	4.0	16	1.8	48	1134	2.6	58	3.2	74	1297	1.9
2928.0	3.4	15	1.9	55	1412	2.9	49	3.5	85	1615	2.1
2928.7	4.2	17	1.9	44	1233	2.8	61	3.4	67	1410	2.1
2929.4	3.8	15	2.5	49	1316	2.4	54	4.5	75	1505	1.8
2930.1	3.6	15	1.9	51	1131	1.4	51	3.4	78	1294	1.0
2930.8	3.2	14	2.1	46	1244	2.4	46	3.8	70	1422	1.8
2931.5	3.2	15	1.7	50	1324	3.2	46	3.1	77	1514	2.3
2932.2	3.3	16	1.9	50	1103	2.2	47	3.5	77	1261	1.6
2932.9	4.2	15	1.4	52	1162	2.9	61	2.5	79	1329	2.1
2933.6	4.0	12	1.9	40	1213	1.9	58	3.4	62	1387	1.4
2934.3	2.7	15	1.8	41	1199	2.7	39	3.2	62	1371	2.0
2935.0	4.0	17	2.5	49	1287	3.1	57	4.5	76	1471	2.3
2935.7	3.9	14	1.7	37	985	2.8	57	3.1	57	1126	2.1
2936.4	3.6	14	1.7	47	1262	2.3	52	3.2	72	1443	1.7
2937.1	3.0	16	2.1	46	1253	1.7	43	3.9	71	1433	1.2



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2937.8	3.6	14	1.8	45	1090	2.4	52	3.3	69	1246	1.7
2938.5	3.3	12	1.7	45	1114	2.1	47	3.1	69	1274	1.5
2939.2	2.5	14	1.8	51	1216	2.3	36	3.3	79	1391	1.7
2939.9	3.1	13	1.9	52	1183	2.7	45	3.5	80	1353	1.9
2940.6	2.7	12	1.5	50	1229	2.5	38	2.7	76	1405	1.9
2941.3	3.3	15	2.1	45	1191	2.1	48	3.9	70	1362	1.6
2942.0	4.2	14	2.0	47	1215	2.9	61	3.6	72	1389	2.1
2942.7	2.9	15	1.6	58	1314	3.3	42	2.8	89	1502	2.4
2943.4	3.7	13	1.8	48	1300	2.8	53	3.2	74	1487	2.1
2944.1	3.2	15	1.8	53	1253	1.8	47	3.3	82	1433	1.3
2944.8	3.0	16	1.6	54	1353	1.8	44	2.9	83	1547	1.3
2945.5	2.7	16	1.8	59	1426	2.6	38	3.2	90	1630	1.9
2946.1	3.0	15	2.4	55	1339	1.8	44	4.4	84	1531	1.3
2946.8	3.9	17	1.7	56	1504	3.8	56	3.2	86	1720	2.8
2947.5	3.3	13	2.1	62	1401	3.1	48	3.8	95	1602	2.3
2948.2	3.6	16	2.1	51	1129	2.4	53	3.8	78	1291	1.7
2948.9	3.0	16	2.0	49	1219	3.4	43	3.7	75	1394	2.5
2949.6	2.9	16	2.0	62	1490	1.7	42	3.6	95	1704	1.2
2950.3	3.2	15	2.3	56	1351	3.0	47	4.2	85	1545	2.2
2951.0	3.7	18	2.7	63	1307	2.4	54	4.9	96	1494	1.7
2951.7	2.8	16	1.9	55	1481	3.0	40	3.4	85	1693	2.2
2952.4	2.7	16	2.0	54	1259	2.3	40	3.6	83	1440	1.7
2953.1	2.8	15	1.7	55	1334	3.2	41	3.1	84	1525	2.3
2953.8	3.3	15	1.9	54	1330	2.6	48	3.5	83	1521	1.9
2954.5	2.4	15	2.1	49	1192	2.5	35	3.9	75	1363	1.8
2955.2	4.2	16	1.7	44	1086	2.1	61	3.1	68	1241	1.6
2955.9	2.5	15	1.5	51	1282	3.0	37	2.8	77	1466	2.2
2956.6	3.5	13	2.4	65	1538	3.7	50	4.4	100	1759	2.7
2957.3	2.4	14	2.0	61	1191	2.0	35	3.6	93	1362	1.5
2958.0	2.9	14	2.0	56	1357	2.9	42	3.7	86	1552	2.1
2958.7	3.2	15	2.0	47	1202	1.8	46	3.6	72	1374	1.3
2959.4	2.7	17	2.4	57	1418	3.4	38	4.3	87	1622	2.5
2960.1	2.7	15	2.5	55	1258	2.3	40	4.5	84	1439	1.7
2960.8	3.4	14	2.0	57	1432	2.2	49	3.6	87	1637	1.6
2961.5	3.4	19	1.8	52	1277	1.9	49	3.3	79	1460	1.4
2962.2	3.2	15	2.1	61	1454	3.4	46	3.8	93	1662	2.5
2962.9	2.9	14	2.1	49	1251	1.4	41	3.8	76	1431	1.1
2963.6	3.2	17	2.2	63	1554	3.5	47	3.9	96	1777	2.5
2964.3	3.1	15	2.0	54	1132	2.8	45	3.6	83	1294	2.1
2965.0	2.6	16	1.8	54	1286	3.1	37	3.2	83	1470	2.3
2965.7	2.3	16	2.0	54	1122	1.9	33	3.6	82	1283	1.4
2966.4	2.8	14	1.9	49	1211	2.4	40	3.5	76	1385	1.8
2967.1	3.5	13	1.8	53	1319	2.8	51	3.2	82	1508	2.0
2967.8	2.3	17	2.4	55	1285	2.4	34	4.4	85	1469	1.8
2968.5	2.7	16	1.8	53	1319	4.1	39	3.3	81	1509	3.0
2969.2	2.8	16	1.6	57	1312	2.0	41	3.0	87	1500	1.5
2969.9	2.2	16	1.3	42	960	1.6	32	2.4	65	1098	1.2
2970.6	2.4	16	1.6	51	1211	2.0	35	2.9	79	1384	1.4
2971.3	2.7	15	1.8	52	1380	4.0	39	3.2	80	1578	2.9
2971.9	2.9	16	1.5	49	1160	3.0	42	2.7	76	1326	2.2
2972.6	2.6	15	2.0	57	1425	3.0	37	3.6	88	1629	2.2
2973.3	3.3	16	2.0	52	1246	2.4	48	3.7	80	1425	1.8
2974.0	2.0	16	1.6	52	1250	2.9	28	2.8	80	1429	2.1
2974.7	2.0	18	1.4	50	1197	2.8	29	2.5	76	1368	2.1
2975.4	2.3	16	1.7	51	1426	2.4	34	3.1	77	1631	1.7
2976.1	2.1	18	1.8	52	1157	2.6	30	3.3	80	1323	1.9
2976.8	2.3	17	1.9	50	1132	2.3	33	3.4	77	1294	1.7
2977.5	2.5	14	1.4	56	1489	2.8	37	2.6	86	1703	2.1
2978.2	2.2	15	1.9	54	1120	2.0	32	3.4	83	1280	1.5
2978.9	2.8	15	1.5	64	1335	2.2	40	2.7	98	1527	1.6
2979.6	2.4	16	2.6	58	1341	2.1	34	4.7	89	1533	1.5
2980.3	1.9	18	2.0	54	1328	3.1	27	3.6	82	1519	2.3
2981.0	2.7	15	1.7	49	1158	1.8	39	3.2	76	1324	1.3
2981.7	2.5	15	1.3	47	1165	2.0	36	2.4	72	1333	1.4
2982.4	2.2	17	1.5	44	1188	2.1	32	2.8	67	1358	1.5
2983.1	1.4	16	1.3	50	1303	2.6	20	2.3	77	1490	1.9
2983.8	2.3	18	1.9	54	1283	2.9	33	3.5	82	1467	2.1
2984.5	1.7	15	1.9	50	1116	2.5	24	3.4	77	1276	1.8
2985.2	2.1	19	1.8	53	1274	3.3	30	3.3	82	1457	2.4
2985.9	1.3	18	1.5	49	1221	1.8	18	2.8	75	1397	1.3
2986.6	1.5	17	1.8	56	1179	2.0	22	3.2	86	1348	1.5
2987.3	1.9	18	1.8	55	1323	3.0	27	3.2	84	1512	2.2
2988.0	1.9	14	2.0	49	1239	1.8	28	3.6	75	1417	1.3
2988.7	2.0	15	1.6	52	1178	1.4	28	2.9	79	1348	1.0
2989.4	1.5	18	1.7	55	1152	2.4	22	3.2	85	1317	1.8
2990.1	1.8	15	1.6	65	1285	2.6	26	3.0	100	1470	1.9
2990.8	1.5	16	2.2	46	1366	2.2	22	4.0	71	1561	1.6
2991.5	1.3	19	1.7	60	1263	3.0	19	3.1	91	1445	2.2
2992.2	1.4	20	2.2	49	1357	2.2	20	3.9	76	1552	1.6
2992.9	1.5	16	2.0	51	1294	2.5	22	3.7	77	1480	1.8
2993.6	1.6	16	1.6	48	1208	2.9	24	2.9	74	1381	2.1



Minnow Environmental  
Sample ID: 007

Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2994.3	1.3	17	2.0	51	1189	2.9	18	3.7	78	1359	2.1
2995.0	2.0	16	1.7	54	1354	2.2	29	3.0	83	1548	1.6
2995.7	1.9	17	1.9	56	1420	3.3	28	3.5	86	1623	2.4
2996.4	1.6	17	1.4	51	1120	2.5	24	2.6	79	1281	1.8
2997.1	1.1	16	1.4	50	1084	2.0	16	2.6	77	1239	1.5
2997.8	1.7	20	1.6	54	1359	1.8	24	2.9	83	1554	1.3
2998.5	1.3	14	1.6	49	1120	1.7	19	2.9	75	1280	1.3
2999.1	1.0	16	1.6	42	997	1.7	15	3.0	65	1140	1.3
2999.8	0.917	15	1.6	54	1100	1.7	13	2.9	82	1258	1.3
3000.5	1.0	22	1.3	52	1314	3.2	15	2.4	79	1503	2.4
3001.2	1.4	20	1.4	56	1185	3.1	21	2.6	86	1355	2.3
3001.9	1.000	14	1.3	49	1175	1.4	14	2.4	75	1344	0.997
3002.6	0.590	15	1.4	49	1081	1.8	8.5	2.5	75	1236	1.3
3003.3	0.766	16	0.936	34	988	2.2	11	1.7	53	1129	1.6
3004.0	0.603	15	0.958	48	1050	1.9	8.7	1.7	73	1201	1.4
3004.7	0.908	15	1.5	52	1060	1.3	13	2.7	79	1212	0.940
3005.4	0.495	19	1.2	44	1138	2.2	7.1	2.1	67	1302	1.6
3006.1	0.860	17	1.2	47	1151	1.8	12	2.1	72	1316	1.3
3006.8	0.529	19	1.1	53	1360	1.8	7.6	1.9	81	1555	1.3
3007.5	0.522	15	1.2	49	1292	1.7	7.5	2.2	75	1477	1.3
3008.2	0.485	15	1.3	39	975	1.3	7.0	2.4	59	1115	0.930
3008.9	0.721	15	1.4	43	1249	1.7	10	2.5	66	1428	1.3
3009.6	0.355	15	1.1	41	1046	2.3	5.1	2.1	62	1196	1.7
3010.3	0.805	16	1.1	38	1104	2.3	12	2.0	59	1262	1.7
3011.0	0.442	15	1.3	40	884	1.8	6.4	2.3	61	1011	1.3
3011.7	0.402	18	1.3	38	1216	1.9	5.8	2.3	58	1390	1.4
3012.4	0.526	19	1.0	47	1030	2.0	7.6	1.8	72	1178	1.5
3013.1	0.337	16	1.1	50	1171	1.8	4.9	2.0	76	1339	1.3
3013.8	0.337	18	0.988	41	1342	2.3	4.9	1.8	64	1534	1.7
3014.5	0.581	17	0.733	39	971	1.9	8.4	1.3	59	1111	1.4
3015.2	0.337	16	0.899	37	1083	2.0	4.9	1.6	56	1239	1.4
3015.9	0.524	16	0.639	39	979	1.5	7.6	1.2	60	1120	1.1
3016.6	0.661	16	0.932	39	1148	2.4	9.5	1.7	60	1313	1.8
3017.3	0.337	15	1.1	33	1081	1.7	4.9	2.0	50	1236	1.2
3018.0	0.337	12	0.611	29	802	1.6	4.9	1.1	45	917	1.2
3018.7	0.538	15	0.631	28	913	2.2	7.8	1.2	43	1044	1.6
3019.4	0.337	16	0.700	39	1153	2.3	4.9	1.3	59	1318	1.7
3020.1	0.337	14	0.491	31	766	1.3	4.9	0.895	47	876	0.924
3020.8	0.337	17	0.555	28	1030	2.3	4.9	1.0	43	1177	1.7
3021.5	0.337	17	0.430	30	973	1.8	4.9	0.784	46	1113	1.3
3022.2	0.337	16	0.542	27	912	1.7	4.9	0.988	42	1042	1.2
3022.9	0.587	16	0.584	27	914	1.7	8.5	1.1	41	1045	1.2
3023.6	0.337	17	0.776	35	1081	1.8	4.9	1.4	54	1237	1.3
3024.3	0.337	16	0.366	24	1073	1.8	4.9	0.667	36	1226	1.3
3024.9	0.523	15	0.511	26	852	1.5	7.6	0.933	39	974	1.1
3025.6	0.337	17	0.465	26	913	1.6	4.9	0.848	39	1044	1.1
3026.3	0.337	16	0.514	21	851	1.5	4.9	0.937	33	973	1.1
3027.0	0.381	17	0.775	24	1015	1.9	5.5	1.4	37	1160	1.4
3027.7	0.430	16	0.291	25	863	2.0	6.2	0.530	39	987	1.5
3028.4	0.337	16	0.249	24	896	0.956	4.9	0.453	36	1025	0.697
3029.1	0.337	14	0.383	27	874	1.6	4.9	0.699	41	1000	1.2
3029.8	0.459	16	0.206	24	881	2.1	6.6	0.375	37	1007	1.6
3030.5	0.337	15	0.303	25	864	0.937	4.9	0.553	38	988	0.684
3031.2	0.337	14	0.234	22	797	2.3	4.9	0.427	33	911	1.7
3031.9	0.337	13	0.311	25	773	1.3	4.9	0.568	39	884	0.959
3032.6	0.337	14	0.335	20	815	1.1	4.9	0.611	31	932	0.771
3033.3	0.337	13	0.248	19	780	1.9	4.9	0.453	29	892	1.4
3034.0	0.337	18	0.328	22	948	1.2	4.9	0.599	34	1084	0.907
3034.7	0.770	16	0.339	19	771	2.4	11	0.618	28	882	1.8
3035.4	0.605	16	0.358	20	1027	2.0	8.7	0.652	31	1174	1.5
3036.1	0.520	13	0.261	15	753	1.2	7.5	0.477	23	861	0.842
3036.8	0.345	13	0.302	18	791	1.8	5.0	0.550	28	905	1.3
3037.5	0.476	17	0.313	19	743	1.8	6.9	0.571	30	850	1.3
3038.2	0.337	16	0.206	16	786	0.901	4.9	0.376	25	899	0.658
3038.9	0.337	13	0.276	27	804	1.8	4.9	0.504	41	920	1.3
3039.6	0.614	14	0.275	17	866	0.894	8.9	0.502	26	991	0.653
3040.3	0.614	17	0.188	17	923	1.8	8.9	0.342	27	1055	1.3
3041.0	0.356	16	0.151	18	826	1.6	5.1	0.275	27	944	1.2
3041.7	0.479	16	0.199	18	844	1.7	6.9	0.362	28	966	1.3
3042.4	0.605	13	0.304	19	775	1.7	8.7	0.555	30	886	1.3
3043.1	0.690	13	0.234	19	787	0.848	10.0	0.427	29	900	0.619
3043.8	0.735	14	0.149	19	740	1.7	11	0.272	29	846	1.3
3044.5	1.3	15	0.275	20	767	1.5	19	0.501	30	877	1.1
3045.2	1.0	18	0.503	21	816	1.7	14	0.918	33	934	1.2
3045.9	0.711	14	0.316	21	864	1.6	10	0.576	32	988	1.2
3046.6	1.4	15	0.415	20	1002	1.3	21	0.757	31	1146	0.945
3047.3	1.4	17	0.560	22	981	2.4	21	1.0	33	1122	1.8
3048.0	1.1	15	0.352	28	1040	1.4	15	0.642	43	1189	1.0
3048.7	0.859	16	0.446	23	907	1.4	12	0.813	35	1037	1.0
3049.4	0.942	18	0.606	24	1185	2.1	14	1.1	37	1355	1.5
3050.1	0.677	16	0.492	25	1258	1.3	9.8	0.897	39	1438	0.977



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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
3050.8	0.793	16	0.347	24	1026	2.9	11	0.632	36	1173	2.1
3051.5	1.0	16	0.323	27	1111	1.8	15	0.588	42	1271	1.3
3052.1	0.867	15	0.473	25	956	2.0	13	0.864	38	1093	1.5
3052.8	0.877	16	0.564	28	1218	1.4	13	1.0	43	1393	1.0
3053.5	0.918	15	0.656	26	1100	1.7	13	1.2	40	1258	1.2
3054.2	0.532	15	0.777	23	1104	2.1	7.7	1.4	35	1263	1.5
3054.9	1.0	14	0.695	24	1134	1.8	15	1.3	37	1297	1.3
3055.6	0.643	16	0.672	26	1345	1.9	9.3	1.2	40	1538	1.4
3056.3	0.893	16	0.668	24	1191	2.7	13	1.2	36	1362	2.0
3057.0	0.893	20	0.651	30	1185	2.9	13	1.2	46	1355	2.1
3057.7	1.1	20	0.684	33	1390	2.6	16	1.2	50	1590	1.9
3058.4	0.815	16	0.524	25	1191	1.7	12	0.956	39	1362	1.2
3059.1	0.690	16	0.715	26	1187	1.9	10.0	1.3	40	1357	1.4
3059.8	0.711	18	0.579	24	1227	1.8	10	1.1	37	1403	1.3
3060.5	0.772	19	0.593	26	1262	2.2	11	1.1	40	1443	1.6
3061.2	0.548	20	0.520	28	1289	2.1	7.9	0.948	42	1474	1.5
3061.9	0.785	17	0.413	29	1209	2.6	11	0.753	44	1382	1.9
3062.6	0.955	15	0.760	29	1336	2.3	14	1.4	45	1528	1.7
3063.3	0.651	16	0.800	33	1280	1.5	9.4	1.5	51	1463	1.1
3064.0	0.923	17	0.785	33	1237	1.4	13	1.4	50	1414	1.0
3064.7	0.827	16	0.680	34	1312	2.3	12	1.2	52	1500	1.7
3065.4	0.654	16	0.475	28	1166	2.0	9.4	0.866	43	1334	1.4
3066.1	0.337	17	0.549	30	1223	2.6	4.9	1.0	47	1398	1.9
3066.8	0.561	17	0.658	29	1235	2.3	8.1	1.2	44	1412	1.7
3067.5	0.337	17	0.560	31	1203	2.2	4.9	1.0	48	1375	1.6
3068.2	0.715	17	0.645	31	1192	2.2	10	1.2	47	1363	1.6
3068.9	0.467	16	0.594	29	1139	2.4	6.7	1.1	44	1303	1.7
3069.6	0.803	14	0.750	26	1214	1.6	12	1.4	40	1388	1.2
3070.3	0.615	18	0.703	31	1179	2.0	8.9	1.3	48	1349	1.4
3071.0	0.606	17	0.662	34	1242	2.3	8.7	1.2	52	1421	1.7
3071.7	0.630	17	0.562	34	1212	1.5	9.1	1.0	52	1386	1.1
3072.4	0.497	18	0.623	35	1408	2.4	7.2	1.1	54	1610	1.8
3073.1	0.404	18	0.600	29	1154	1.7	5.8	1.1	45	1320	1.3
3073.8	0.763	17	0.482	30	1130	2.7	11	0.880	46	1292	2.0
3074.5	0.569	16	0.608	30	1109	2.3	8.2	1.1	45	1268	1.7
3075.2	0.561	16	0.835	30	1262	2.3	8.1	1.5	46	1443	1.7
3075.9	0.386	14	0.531	29	1033	2.6	5.6	0.969	44	1181	1.9
3076.6	0.337	17	0.815	32	1239	3.3	4.9	1.5	49	1417	2.4
3077.3	0.552	18	0.932	26	1128	2.2	8.0	1.7	40	1290	1.6
3077.9	0.624	17	0.684	28	1115	1.9	9.0	1.2	43	1275	1.4
3078.6	0.337	14	0.485	28	1080	2.0	4.9	0.885	43	1235	1.4
3079.3	0.581	19	0.666	30	1198	2.6	8.4	1.2	46	1370	1.9
3080.0	0.337	15	0.599	29	1163	2.4	4.9	1.1	44	1330	1.7
3080.7	0.428	15	0.548	33	1214	2.0	6.2	1.000	51	1388	1.4
3081.4	0.650	16	0.698	28	1012	2.3	9.4	1.3	43	1157	1.7
3082.1	0.337	15	0.508	29	1130	1.5	4.9	0.927	44	1292	1.1
3082.8	0.735	17	0.859	32	1390	2.0	11	1.6	48	1590	1.5
3083.5	0.337	14	0.436	29	1014	1.8	4.9	0.795	44	1160	1.3
3084.2	0.337	15	0.759	29	1091	1.2	4.9	1.4	45	1247	0.893
3084.9	0.746	20	0.908	26	1307	2.0	11	1.7	40	1494	1.4
3085.6	0.337	20	0.319	33	1140	1.9	4.9	0.581	51	1303	1.4
3086.3	0.337	17	0.492	37	1197	1.8	4.9	0.897	57	1368	1.3
3087.0	0.337	16	0.596	29	979	1.8	4.9	1.1	45	1120	1.3
3087.7	0.337	18	0.586	28	1169	2.0	4.9	1.1	43	1337	1.5
3088.4	0.522	16	0.569	25	1010	1.3	7.5	1.0	38	1155	0.949
3089.1	0.451	18	0.688	29	1150	1.5	6.5	1.3	45	1315	1.1
3089.8	0.337	17	0.550	31	954	1.3	4.9	1.0	47	1091	0.967
3090.5	0.337	13	0.348	25	946	2.1	4.9	0.634	39	1081	1.5
3091.2	0.337	19	0.509	30	1290	1.5	4.9	0.928	47	1475	1.1
3091.9	0.412	19	0.679	27	1081	2.3	5.9	1.2	42	1236	1.7
3092.6	0.337	14	0.453	32	1244	2.5	4.9	0.826	50	1422	1.8
3093.3	0.395	18	0.393	20	756	1.7	5.7	0.717	31	864	1.2
3094.0	0.414	15	0.380	22	1029	1.7	6.0	0.693	33	1177	1.3
3094.7	0.337	16	0.422	26	1009	1.1	4.9	0.769	40	1154	0.770
3095.4	0.337	17	0.550	24	1234	2.2	4.9	1.0	36	1411	1.6
3096.1	0.337	22	0.653	25	1026	2.6	4.9	1.2	38	1173	1.9
3096.8	0.337	21	0.391	29	1220	2.6	4.9	0.713	44	1395	1.9
3097.5	0.413	19	0.568	24	1025	1.6	6.0	1.0	37	1172	1.1
3098.2	0.337	20	0.600	22	1047	1.9	4.9	1.1	34	1198	1.4
3098.9	0.411	22	0.393	19	1085	1.9	5.9	0.716	29	1241	1.4
3099.6	0.337	20	0.525	27	1018	2.0	4.9	0.957	41	1165	1.5
3100.3	0.337	18	0.487	18	883	1.4	4.9	0.888	27	1009	1.0
3101.0	0.337	18	0.342	24	882	1.3	4.9	0.623	37	1009	0.915
3101.7	0.641	21	0.618	21	973	1.9	9.2	1.1	32	1113	1.4
3102.4	0.337	23	0.490	21	1338	1.8	4.9	0.894	32	1530	1.3
3103.1	0.337	18	0.559	24	934	1.7	4.9	1.0	37	1069	1.2
3103.7	0.337	20	0.514	18	916	1.5	4.9	0.937	28	1047	1.1
3104.4	0.337	25	0.476	18	819	1.1	4.9	0.868	27	937	0.797
3105.1	0.337	25	0.533	18	951	1.5	4.9	0.972	27	1087	1.1
3105.8	0.337	20	0.834	16	848	1.4	4.9	1.5	25	970	1.0
3106.5	0.337	18	0.649	17	902	2.0	4.9	1.2	26	1032	1.5



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.337	0.298	0.059	0.458	0.003	0.003					
Length (µm)											
3107.2	0.337	24	0.750	17	930	1.2	4.9	1.4	26	1064	0.910
3107.9	0.433	24	0.644	21	847	2.2	6.3	1.2	32	969	1.6
3108.6	0.337	23	1.0	16	756	1.1	4.9	1.9	25	865	0.799
3109.3	0.462	24	0.772	13	820	1.7	6.7	1.4	20	938	1.2
3110.0	0.337	28	0.717	15	903	1.2	4.9	1.3	24	1033	0.858
3110.7	0.441	28	0.851	17	906	1.6	6.4	1.6	26	1036	1.2
3111.4	0.337	20	0.655	13	785	1.8	4.9	1.2	20	898	1.3
3112.1	0.337	26	0.797	15	727	1.3	4.9	1.5	22	832	0.925
3112.8	0.337	22	0.447	9.7	770	0.702	4.9	0.816	15	881	0.512
3113.5	0.337	29	0.361	15	787	1.1	4.9	0.659	23	900	0.835
3114.2	0.337	26	0.679	11	861	1.5	4.9	1.2	17	985	1.1
3114.9	0.337	24	0.670	12	716	1.5	4.9	1.2	18	819	1.1
3115.6	0.337	28	0.334	9.7	650	1.1	4.9	0.610	15	743	0.774
3116.3	0.337	23	0.533	12	714	1.3	4.9	0.972	19	817	0.973
3117.0	0.337	23	0.601	12	681	1.3	4.9	1.1	18	779	0.978
3117.7	0.337	26	0.477	11	677	1.2	4.9	0.871	17	774	0.880
3118.4	0.337	30	0.401	7.7	655	1.0	4.9	0.732	12	749	0.766
3119.1	0.337	42	0.549	11	737	1.7	4.9	1.0	17	843	1.2
3119.8	0.337	33	0.847	11	707	1.6	4.9	1.5	16	809	1.1
3120.5	0.359	40	0.507	8.1	628	1.2	5.2	0.925	12	718	0.910
3121.2	0.337	32	0.777	7.8	638	1.5	4.9	1.4	12	730	1.1
3121.9	0.337	37	0.680	9.2	712	1.4	4.9	1.2	14	814	1.0
3122.6	0.337	36	0.726	8.2	645	1.3	4.9	1.3	13	738	0.982
3123.3	0.348	45	0.489	7.7	631	1.3	5.0	0.892	12	722	0.981
3124.0	0.571	42	0.759	10	754	1.4	8.2	1.4	16	863	1.0
3124.7	0.337	40	0.627	5.9	644	0.685	4.9	1.1	9.0	737	0.500
3125.4	0.337	40	0.686	8.2	591	1.2	4.9	1.3	13	676	0.863
3126.1	0.337	41	0.808	10	667	1.5	4.9	1.5	15	762	1.1
3126.8	0.470	44	0.859	6.7	630	1.4	6.8	1.6	10	721	1.0
3127.5	0.337	38	0.769	4.9	653	1.3	4.9	1.4	7.5	747	0.977
3128.2	0.337	38	0.653	4.6	648	1.4	4.9	1.2	7.0	742	1.0
3128.9	0.426	36	0.563	7.9	630	1.1	6.2	1.0	12	720	0.797
3129.6	0.429	39	0.508	7.2	674	1.9	6.2	0.927	11	771	1.4
3130.2	0.337	35	0.546	4.6	584	0.927	4.9	0.996	7.1	668	0.677
3130.9	0.337	37	0.538	6.5	622	1.3	4.9	0.982	10.0	712	0.942
3131.6	0.337	38	0.581	4.6	544	1.2	4.9	1.1	7.0	622	0.864
3132.3	0.337	38	0.686	6.0	674	1.9	4.9	1.3	9.2	771	1.4
3133.0	0.337	40	0.565	6.3	642	1.1	4.9	1.0	9.7	734	0.807
3133.7	0.337	44	0.695	4.2	727	1.3	4.9	1.3	6.4	831	0.956
3134.4	0.337	49	0.900	4.3	643	1.6	4.9	1.6	6.7	736	1.2
3135.1	0.337	35	0.451	4.4	667	0.827	4.9	0.823	6.7	762	0.603
3135.8	0.337	38	0.827	6.2	637	1.4	4.9	1.5	9.5	728	1.0
3136.5	0.337	39	0.555	5.7	558	1.4	4.9	1.0	8.8	638	1.1
3137.2	0.337	43	1.1	5.4	682	1.6	4.9	2.0	8.3	780	1.2
3137.9	0.476	44	0.835	5.5	632	1.6	6.9	1.5	8.5	723	1.2
3138.6	0.337	40	0.872	5.9	606	1.2	4.9	1.6	9.1	693	0.863
3139.3	0.337	42	0.855	7.3	617	1.3	4.9	1.6	11	706	0.964
3140.0	0.337	41	0.840	6.1	660	1.2	4.9	1.5	9.3	755	0.875
3140.7	0.337	48	0.863	6.7	661	1.5	4.9	1.6	10	756	1.1
3141.4	0.337	49	1.1	7.4	595	0.771	4.9	1.9	11	680	0.563
3142.1	0.337	43	0.808	6.8	659	1.5	4.9	1.5	10	754	1.1
3142.8	0.337	39	0.815	4.0	531	1.6	4.9	1.5	6.1	607	1.2
3143.5	0.337	55	1.0	4.2	557	1.5	4.9	1.9	6.5	636	1.1
3144.2	0.337	50	0.881	7.9	601	1.3	4.9	1.6	12	687	0.975
3144.9	0.337	51	0.835	4.1	547	2.1	4.9	1.5	6.2	626	1.5
3145.6	0.785	73	1.1	8.4	665	1.7	11	2.0	13	760	1.2
3146.3	0.337	49	1.1	6.6	583	1.5	4.9	2.0	10	667	1.1
3147.0	0.337	51	1.0	4.8	652	2.4	4.9	1.9	7.4	746	1.7
3147.7	0.337	45	0.663	5.8	577	1.8	4.9	1.2	8.9	660	1.3
3148.4	0.337	44	0.972	5.9	647	1.2	4.9	1.8	9.0	740	0.889
3149.1	0.477	54	0.689	6.1	803	1.8	6.9	1.3	9.4	919	1.3
3149.8	0.835	53	0.974	5.2	576	1.4	12	1.8	8.0	659	1.0
3150.5	0.337	48	0.890	7.9	641	2.2	4.9	1.6	12	733	1.6
3151.2	0.337	48	0.844	5.1	575	1.1	4.9	1.5	7.8	658	0.802
3151.9	0.385	45	1.0	3.9	573	2.3	5.6	1.9	6.0	655	1.7
3152.6	0.337	53	0.865	4.2	499	1.5	4.9	1.6	6.4	570	1.1
3153.3	0.337	53	1.1	4.9	567	0.711	4.9	2.0	7.5	649	0.518
3154.0	0.337	50	0.885	6.2	584	1.8	4.9	1.6	9.5	668	1.3
3154.7	0.337	54	0.861	5.6	662	2.2	4.9	1.6	8.6	757	1.6
3155.4	0.337	56	0.853	6.2	584	0.865	4.9	1.6	9.5	668	0.631
3156.1	0.337	50	0.711	4.8	841	2.5	4.9	1.3	7.3	961	1.8
3156.8	0.337	46	0.720	7.0	585	1.1	4.9	1.3	11	669	0.779
3157.4	0.337	50	0.589	6.3	551	1.1	4.9	1.1	9.6	630	0.776
3158.1	0.583	53	0.961	6.6	726	1.8	8.4	1.8	10	830	1.3
3158.8	0.337	46	0.932	6.7	558	1.2	4.9	1.7	10	638	0.911
3159.5	0.337	49	0.945	8.0	487	1.1	4.9	1.7	12	557	0.769
3160.2	0.337	59	0.884	7.1	596	1.7	4.9	1.6	11	682	1.3
3160.9	0.353	75	0.951	9.8	641	3.4	5.1	1.7	15	733	2.5
3161.6	0.337	64	1.8	6.2	645	1.7	4.9	3.3	9.6	737	1.3
3162.3	0.337	59	1.2	9.4	572	1.3	4.9	2.2	14	654	0.938
3163.0	0.337	53	0.863	7.6	556	1.2	4.9	1.6	12	636	0.894



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Parameter DL (ppm) Length (µm)	7Li 0.337	24Mg 0.298	55Mn 0.059	66Zn 0.458	88Sr 0.003	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
3163.7	0.337	58	0.935	6.8	558	1.5	4.9	1.7	10	638	1.1
3164.4	0.337	53	0.956	11	599	1.5	4.9	1.7	17	685	1.1
3165.1	0.337	70	0.466	9.9	583	1.8	4.9	0.849	15	666	1.3
3165.8	0.337	45	0.771	6.5	536	1.1	4.9	1.4	10	613	0.834
3166.5	0.337	55	0.425	8.4	527	1.2	4.9	0.775	13	603	0.863
3167.2	0.337	75	1.2	6.4	653	2.8	4.9	2.2	9.8	747	2.0
3167.9	0.337	75	1.1	11	611	1.4	4.9	2.0	17	699	1.0
3168.6	0.337	67	1.0	9.5	556	1.4	4.9	1.9	15	635	1.0
3169.3	0.337	71	1.4	8.3	604	2.7	4.9	2.5	13	691	2.0
3170.0	0.337	62	1.4	6.1	564	0.960	4.9	2.6	9.4	645	0.701
3170.7	0.337	51	1.3	6.8	495	1.3	4.9	2.3	10	566	0.921
3171.4	0.337	76	1.3	7.5	593	1.5	4.9	2.3	12	678	1.1
3172.1	0.607	67	0.678	10	612	1.7	8.8	1.2	16	700	1.2
3172.8	0.337	71	1.1	11	653	1.4	4.9	1.9	16	747	0.997
3173.5	0.337	70	1.2	9.4	561	1.5	4.9	2.3	14	642	1.1
3174.2	0.427	55	0.969	7.0	631	2.0	6.2	1.8	11	721	1.5
3174.9	0.337	65	1.3	9.8	626	2.3	4.9	2.4	15	716	1.7
3175.6	0.400	59	0.908	5.7	528	1.1	5.8	1.7	8.7	603	0.824
3176.3	0.337	61	0.863	7.8	657	2.5	4.9	1.6	12	751	1.8
3177.0	0.337	61	0.620	7.1	578	1.5	4.9	1.1	11	660	1.1
3177.7	0.394	58	0.871	7.2	823	1.5	5.7	1.6	11	941	1.1
3178.4	0.337	58	0.729	11	610	1.5	4.9	1.3	17	698	1.1
3179.1	0.337	68	1.1	6.9	637	2.0	4.9	2.1	11	729	1.4
3179.8	0.337	80	1.5	7.8	560	0.927	4.9	2.6	12	640	0.676
3180.5	0.337	67	1.1	9.3	612	1.7	4.9	2.0	14	700	1.2
3181.2	0.337	73	1.0	12	578	2.1	4.9	1.9	18	661	1.6
3181.9	0.337	59	0.967	6.3	526	1.4	4.9	1.8	9.6	602	1.0
3182.6	0.337	55	0.742	9.3	479	1.3	4.9	1.4	14	548	0.965
3183.3	0.337	77	0.676	9.4	487	1.4	4.9	1.2	14	557	1.0
3183.9	0.647	91	1.4	12	646	1.4	9.3	2.6	19	739	0.999
3184.6	0.337	80	1.8	6.2	564	1.2	4.9	3.3	9.5	645	0.853
3185.3	0.580	120	1.7	14	742	2.6	8.4	3.1	21	849	1.9
3186.0	0.639	87	1.4	12	413	2.0	9.2	2.6	18	472	1.4
3186.7	0.337	103	2.2	11	616	1.6	4.9	4.0	16	704	1.2
3187.4	1.1	98	1.1	13	526	1.6	15	2.0	19	602	1.2
3188.1	0.337	81	1.8	9.9	495	1.6	4.9	3.3	15	566	1.2
3188.8	0.337	88	1.6	13	574	2.0	4.9	2.8	20	656	1.4
3189.5	0.337	81	1.3	10	411	0.698	4.9	2.5	16	470	0.509
3190.2	0.337	126	1.7	11	641	2.4	4.9	3.1	16	733	1.8
3190.9	0.337	102	1.4	9.2	493	0.887	4.9	2.5	14	563	0.647
3191.6	0.337	102	1.4	15	524	1.8	4.9	2.5	23	599	1.3
3192.3	0.346	98	1.5	12	567	3.0	5.0	2.8	18	649	2.2
3193.0	0.337	83	1.7	12	528	2.7	4.9	3.1	18	603	2.0
3193.7	0.337	109	2.2	16	483	1.5	4.9	4.0	25	552	1.1
3194.4	0.342	79	1.2	15	462	2.7	4.9	2.2	23	529	2.0
3195.1	0.337	114	2.2	14	737	2.9	4.9	4.1	22	843	2.1
3195.8	0.337	99	1.2	9.8	361	1.7	4.9	2.2	15	413	1.2
3196.5	0.680	81	1.1	15	448	1.5	9.8	2.0	22	513	1.1
3197.2	0.392	109	1.7	28	460	1.7	5.7	3.2	43	526	1.2
3197.9	0.337	115	1.8	20	724	1.8	4.9	3.4	31	828	1.3
3198.6	0.337	107	1.8	15	397	2.6	4.9	3.3	23	454	1.9
3199.3	0.374	89	1.7	28	394	2.2	5.4	3.0	43	451	1.6
3200.0	0.684	165	3.0	27	768	2.2	9.9	5.5	41	879	1.6
3200.7	1.2	163	2.3	29	593	4.8	18	4.1	44	678	3.5
3201.4	0.337	139	2.5	17	607	2.7	4.9	4.6	26	694	2.0
3202.1	0.337	157	2.5	13	538	1.6	4.9	4.5	20	615	1.2
3202.8	0.621	141	1.9	18	556	1.7	9.0	3.4	27	636	1.2
3203.5	1.9	126	2.5	17	480	2.4	27	4.6	26	549	1.7
3204.2	0.337	152	2.2	28	684	3.7	4.9	4.0	43	782	2.7
3204.9	0.337	181	4.8	28	863	0.003	4.9	8.8	43	987	0.002
3205.6	0.337	181	2.0	52	492	2.3	4.9	3.6	80	562	1.7
3206.3	0.451	128	2.3	21	600	4.2	6.5	4.2	33	686	3.1
3207.0	0.337	151	2.4	27	604	1.5	4.9	4.4	41	690	1.1
3207.7	0.337	162	2.6	15	478	2.1	4.9	4.7	24	547	1.5
3208.4	0.605	116	1.8	22	422	0.735	8.7	3.2	34	483	0.536
3209.1	1.3	105	1.7	24	453	0.938	18	3.2	38	519	0.684
3209.7	0.337	96	1.5	18	370	1.5	4.9	2.7	28	423	1.1
3210.4	0.933	106	1.7	19	379	1.0	13	3.0	30	434	0.744
3211.1	0.363	118	2.1	19	510	2.3	5.2	3.8	29	583	1.7
3211.8	0.337	123	2.6	21	811	1.9	4.9	4.7	32	927	1.4
3212.5	0.337	131	1.1	33	949	0.923	4.9	2.0	51	1085	0.673
3213.2	1.1	137	2.5	25	592	1.8	16	4.6	39	677	1.3
3213.9	0.890	139	2.1	16	525	2.0	13	3.8	25	601	1.5
3214.6	0.570	100	2.4	14	383	0.923	8.2	4.4	21	438	0.674
3215.3	0.337	107	1.6	20	409	1.2	4.9	2.9	31	468	0.854
3216.0	0.337	115	1.6	20	564	3.4	4.9	2.9	31	644	2.5
3216.7	0.794	111	1.6	22	399	1.3	11	2.9	34	457	0.945
3217.4	0.337	123	2.3	24	612	1.3	4.9	4.2	37	699	0.968
3218.1	0.337	143	1.7	25	492	2.8	4.9	3.2	39	563	2.0
3218.8	0.337	157	2.3	19	547	0.003	4.9	4.2	29	625	0.002
3219.5	0.571	151	2.2	29	602	1.8	8.2	4.0	44	689	1.3



Minnow Environmental  
Sample ID: 007

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.337	0.298	0.059	0.458	0.003	0.003					
Length (µm)											
3220.2	0.410	123	2.0	21	411	1.9	5.9	3.6	32	470	1.4
3220.9	1.4	173	1.8	28	513	2.2	20	3.3	43	586	1.6
3221.6	0.337	145	2.4	27	376	0.378	4.9	4.3	42	430	0.276
3222.3	0.776	200	3.1	20	937	1.8	11	5.7	30	1071	1.3
3223.0	0.337	209	2.1	23	819	1.8	4.9	3.8	35	937	1.3
3223.7	2.9	250	4.1	30	491	1.4	42	7.6	46	562	0.995
3224.4	0.515	252	4.2	42	570	1.5	7.4	7.7	65	651	1.1
3225.1	0.337	262	4.4	60	568	0.003	4.9	8.0	92	649	0.002
3225.8	1.8	330	3.0	61	784	1.9	26	5.5	94	897	1.4
3226.5	0.337	194	2.6	26	334	0.003	4.9	4.8	40	382	0.002
3227.2	0.337	297	4.2	36	442	1.7	4.9	7.7	55	506	1.2
3227.9	0.337	307	2.3	28	415	0.850	4.9	4.3	43	475	0.620
3228.6	1.1	309	5.6	31	688	0.003	16	10	48	786	0.002
3229.3	0.337	261	2.3	23	609	0.003	4.9	4.1	35	696	0.002
3230.0	0.337	283	5.3	45	388	3.7	4.9	9.6	69	444	2.7



Minnow Environmental  
Sample ID: 008

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
0.7	0.396	26	1.8	18	474	0.846	5.7	3.2	28	542	0.617
1.7	0.771	26	1.5	17	390	1.1	11	2.6	25	446	0.782
2.6	0.286	27	1.5	12	354	0.642	4.1	2.7	18	405	0.469
3.5	0.868	32	1.4	18	425	0.748	13	2.5	28	486	0.546
4.4	0.949	31	1.4	17	418	1.2	14	2.5	26	478	0.872
5.4	0.287	23	1.1	19	333	2.0	4.1	2.0	29	381	1.4
6.3	0.444	28	2.0	16	395	1.7	6.4	3.6	25	451	1.2
7.2	0.228	31	1.4	14	464	1.5	3.3	2.5	22	530	1.1
8.1	0.501	33	1.2	14	431	2.0	7.2	2.1	22	493	1.5
9.1	0.235	36	0.897	17	420	1.6	3.4	1.6	25	480	1.2
10.0	0.449	38	1.8	16	410	1.6	6.5	3.2	24	469	1.2
10.9	0.712	33	1.2	17	441	0.545	10	2.2	26	505	0.397
11.8	0.691	29	1.7	16	362	1.2	10.0	3.0	24	414	0.878
12.8	0.523	35	2.1	18	446	0.918	7.6	3.8	27	510	0.670
13.7	1.1	39	2.1	19	564	2.0	16	3.9	29	645	1.5
14.6	0.228	27	1.7	15	354	1.8	3.3	3.2	23	405	1.3
15.5	0.545	32	2.2	17	413	0.592	7.9	4.1	27	472	0.432
16.5	0.228	41	1.6	17	543	1.4	3.3	2.9	27	620	1.0
17.4	0.495	29	1.3	17	349	2.1	7.2	2.4	26	400	1.5
18.3	0.692	32	2.2	16	405	1.4	10.0	3.9	25	464	1.1
19.2	0.263	36	1.6	19	432	1.2	3.8	2.9	29	494	0.873
20.1	0.332	32	1.8	19	389	1.3	4.8	3.3	29	445	0.955
21.1	0.228	32	2.2	14	303	1.5	3.3	4.0	22	347	1.1
22.0	0.228	36	2.9	20	401	1.6	3.3	5.3	30	459	1.1
22.9	1.1	34	2.7	19	451	1.4	16	5.0	29	515	1.0
23.8	0.311	31	2.1	21	410	1.9	4.5	3.8	32	468	1.4
24.8	0.556	30	1.8	15	374	1.1	8.0	3.2	23	428	0.799
25.7	0.899	36	1.4	18	391	1.8	13	2.5	28	447	1.3
26.6	0.228	20	0.871	15	308	1.3	3.3	1.6	23	352	0.918
27.5	0.306	25	1.1	20	356	1.7	4.4	2.1	30	407	1.2
28.5	1.0	31	0.986	22	399	1.9	15	1.8	33	456	1.4
29.4	0.919	24	0.720	15	346	1.5	13	1.3	24	396	1.1
30.3	0.245	27	1.7	20	356	1.4	3.5	3.1	31	407	0.997
31.2	0.228	29	0.608	19	405	1.4	3.3	1.1	30	463	1.0
32.2	0.921	23	1.4	19	371	1.7	13	2.5	29	424	1.3
33.1	0.913	22	0.782	22	330	1.9	13	1.4	33	377	1.4
34.0	0.228	34	0.690	16	390	1.6	3.3	1.3	24	446	1.1
34.9	0.420	22	0.780	20	334	1.7	6.1	1.4	31	382	1.2
35.9	0.420	25	0.484	17	328	1.5	6.1	0.883	27	375	1.1
36.8	0.885	24	0.763	20	406	2.1	13	1.4	30	465	1.5
37.7	0.599	28	0.560	18	372	1.2	8.7	1.0	28	426	0.878
38.6	1.2	19	0.571	20	363	1.7	17	1.0	30	415	1.2
39.6	0.446	25	1.2	22	397	1.1	6.4	2.2	34	454	0.813
40.5	0.241	19	1.0	25	413	2.3	3.5	1.9	38	472	1.6
41.4	0.714	18	0.650	18	351	2.6	10	1.2	28	402	1.9
42.3	0.414	22	0.874	17	315	2.1	6.0	1.6	26	360	1.5
43.3	0.228	23	0.948	17	381	1.5	3.3	1.7	26	436	1.1
44.2	0.625	20	0.441	18	362	0.954	9.0	0.804	28	414	0.696
45.1	0.776	20	0.817	20	333	2.6	11	1.5	30	381	1.9
46.0	0.228	26	0.789	25	391	1.8	3.3	1.4	38	447	1.3
46.9	0.418	28	0.409	29	370	2.3	6.0	0.746	44	423	1.6
47.9	1.1	20	0.596	21	298	1.2	16	1.1	32	341	0.879
48.8	1.2	23	0.756	21	356	1.3	17	1.4	33	408	0.957
49.7	0.795	27	0.799	26	337	2.2	11	1.5	40	386	1.6
50.6	1.1	19	0.735	20	357	3.8	16	1.3	31	408	2.8
51.6	0.638	22	0.553	23	309	2.4	9.2	1.0	36	353	1.7
52.5	0.712	26	0.999	24	377	2.3	10	1.8	36	431	1.7
53.4	1.1	19	0.814	25	346	0.959	16	1.5	38	395	0.700
54.3	0.550	20	0.751	22	307	2.4	7.9	1.4	34	351	1.7
55.3	1.0	28	0.487	27	426	1.8	15	0.889	42	487	1.3
56.2	0.836	20	0.575	26	364	2.3	12	1.0	40	416	1.7
57.1	0.648	20	0.735	23	328	1.3	9.3	1.3	35	375	0.931
58.0	0.228	25	1.2	26	380	2.9	3.3	2.2	40	435	2.1
59.0	0.347	24	0.547	25	416	2.5	5.0	0.998	38	476	1.8
59.9	1.2	21	0.319	22	334	2.3	18	0.583	34	382	1.7
60.8	0.492	25	1.1	20	349	1.7	7.1	2.1	31	399	1.3
61.7	0.620	24	1.1	20	388	2.2	8.9	2.0	31	444	1.6
62.7	0.228	20	1.1	23	332	2.2	3.3	2.1	36	380	1.6
63.6	0.314	23	1.4	25	343	1.6	4.5	2.5	39	393	1.1
64.5	0.866	27	0.707	24	422	3.6	13	1.3	37	482	2.7
65.4	0.613	25	1.1	23	410	2.5	8.8	1.9	36	469	1.8
66.4	1.1	19	1.2	22	328	1.5	15	2.1	33	375	1.1
67.3	1.1	22	0.973	20	372	2.3	15	1.8	31	426	1.7
68.2	0.626	24	1.0	22	369	2.3	9.0	1.8	34	422	1.7
69.1	0.568	21	0.705	19	330	2.0	8.2	1.3	29	377	1.5
70.1	0.894	20	1.3	24	315	1.7	13	2.4	37	360	1.2
71.0	0.608	26	1.1	23	438	2.5	8.8	2.1	35	501	1.9
71.9	1.1	24	1.4	21	384	2.6	16	2.5	32	439	1.9
72.8	0.437	25	1.1	17	338	1.1	6.3	2.0	25	387	0.803
73.8	0.742	30	1.2	21	408	1.7	11	2.2	33	467	1.2
74.7	0.228	26	1.0	22	382	3.0	3.3	1.8	33	437	2.2



Minnow Environmental  
Sample ID: 008

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
75.6	0.764	30	1.5	23	369	2.4	11	2.7	35	422	1.8
76.5	0.483	29	1.2	24	427	1.4	7.0	2.2	36	488	1.0
77.4	0.732	30	1.6	22	386	1.7	11	3.0	34	442	1.2
78.4	0.712	28	3.0	19	412	2.2	10	5.4	29	471	1.6
79.3	0.369	31	1.8	21	390	2.4	5.3	3.4	31	445	1.8
80.2	3.6	43	4.1	26	507	1.8	52	7.4	40	579	1.3
81.1	0.970	41	5.4	29	364	1.2	14	9.8	44	417	0.895
82.1	0.712	39	5.6	22	397	2.4	10	10	34	454	1.7
83.0	1.1	44	8.7	26	350	1.6	16	16	39	401	1.2
83.9	0.682	39	3.3	23	360	2.0	9.8	6.0	35	411	1.5
84.8	1.2	42	4.0	21	321	2.2	17	7.3	32	367	1.6
85.8	0.956	41	4.2	30	377	2.8	14	7.7	46	431	2.0
86.7	0.466	35	3.5	26	397	2.5	6.7	6.4	39	455	1.8
87.6	0.590	33	3.1	27	346	2.4	8.5	5.6	41	396	1.7
88.5	0.242	30	3.1	27	357	3.6	3.5	5.7	42	409	2.6
89.5	0.606	36	2.9	29	382	2.4	8.7	5.2	44	436	1.8
90.4	0.555	29	1.8	24	372	2.0	8.0	3.3	37	425	1.4
91.3	0.420	34	2.0	25	374	2.9	6.1	3.7	38	428	2.1
92.2	0.648	23	1.9	21	307	2.9	9.4	3.4	33	351	2.1
93.2	0.536	28	3.1	25	328	1.1	7.7	5.7	38	375	0.785
94.1	0.228	29	3.2	18	376	3.3	3.3	5.9	28	431	2.4
95.0	0.842	31	4.4	26	341	2.5	12	8.1	40	389	1.8
95.9	0.547	30	6.0	27	327	2.8	7.9	11	41	373	2.0
96.9	0.828	32	4.4	27	361	2.5	12	8.1	41	412	1.8
97.8	0.829	32	3.9	25	353	1.7	12	7.1	39	404	1.3
98.7	0.228	30	4.6	18	415	3.1	3.3	8.5	27	475	2.2
99.6	0.345	35	3.7	28	409	2.5	5.0	6.7	43	468	1.8
100.5	0.235	36	3.6	29	360	1.9	3.4	6.6	44	411	1.4
101.5	0.520	35	2.2	25	366	1.7	7.5	4.0	38	419	1.2
102.4	0.867	28	1.1	25	303	2.6	13	2.0	38	346	1.9
103.3	0.228	28	1.9	19	356	2.4	3.3	3.4	29	407	1.7
104.2	0.669	26	1.5	26	379	2.9	9.7	2.8	40	434	2.1
105.2	0.796	21	0.838	29	336	2.3	11	1.5	44	385	1.7
106.1	0.228	18	1.2	25	295	1.5	3.3	2.1	39	337	1.1
107.0	1.0	22	1.2	27	360	1.3	15	2.2	42	411	0.925
107.9	0.575	25	0.839	30	382	1.4	8.3	1.5	46	437	0.990
108.9	0.482	22	1.3	31	316	2.8	7.0	2.3	48	362	2.0
109.8	0.287	28	1.4	32	373	2.1	4.1	2.5	50	426	1.6
110.7	0.437	19	1.1	24	291	1.4	6.3	2.0	36	333	1.0
111.6	0.365	20	1.4	31	339	1.8	5.3	2.5	48	388	1.3
112.6	0.228	24	1.3	32	447	3.1	3.3	2.4	49	511	2.3
113.5	0.676	23	0.714	42	379	2.6	9.8	1.3	64	433	1.9
114.4	0.394	19	0.834	26	335	2.0	5.7	1.5	39	383	1.4
115.3	0.542	16	1.0	30	402	1.9	7.8	1.9	46	459	1.4
116.3	0.402	15	0.745	31	319	2.5	5.8	1.4	47	365	1.8
117.2	0.473	18	0.690	34	362	1.4	6.8	1.3	52	414	1.0
118.1	1.0	17	0.988	32	333	2.3	15	1.8	48	381	1.7
119.0	0.338	19	0.758	34	361	2.9	4.9	1.4	51	413	2.1
120.0	0.228	16	0.207	35	396	2.8	3.3	0.378	53	453	2.0
120.9	0.459	17	0.703	33	340	1.9	6.6	1.3	50	389	1.4
121.8	0.228	14	0.950	30	293	2.1	3.3	1.7	46	335	1.5
122.7	0.569	16	0.566	35	388	0.997	8.2	1.0	54	443	0.728
123.7	0.228	15	0.508	33	294	2.8	3.3	0.927	51	336	2.0
124.6	1.2	14	0.681	32	355	1.8	17	1.2	49	406	1.3
125.5	0.649	15	0.597	40	326	2.0	9.4	1.1	62	373	1.5
126.4	0.576	14	0.679	36	343	2.3	8.3	1.2	55	392	1.7
127.3	0.714	14	0.480	36	301	0.686	10	0.875	55	344	0.500
128.3	0.404	15	0.643	30	346	1.0	5.8	1.2	47	396	0.736
129.2	0.566	12	0.703	36	322	1.7	8.2	1.3	56	369	1.2
130.1	0.228	9.4	0.715	28	269	1.1	3.3	1.3	43	307	0.815
131.0	0.448	11	0.816	36	315	1.2	6.5	1.5	55	360	0.869
132.0	0.884	15	0.349	31	329	2.6	13	0.636	48	377	1.9
132.9	0.228	12	0.183	40	303	2.8	3.3	0.335	62	346	2.1
133.8	0.520	14	0.614	36	347	2.0	7.5	1.1	55	397	1.4
134.7	0.228	15	0.573	42	380	2.0	3.3	1.0	64	434	1.5
135.7	0.228	12	0.548	37	326	2.0	3.3	1.0	57	373	1.4
136.6	0.920	9.9	0.634	35	274	2.2	13	1.2	53	314	1.6
137.5	0.672	15	0.798	43	358	1.5	9.7	1.5	67	409	1.1
138.4	0.626	15	0.710	43	352	2.1	9.0	1.3	65	402	1.5
139.4	0.578	11	0.687	36	288	3.2	8.3	1.3	55	329	2.3
140.3	0.904	17	0.584	47	378	3.3	13	1.1	72	433	2.4
141.2	0.894	14	0.795	31	287	1.6	13	1.5	48	329	1.1
142.1	0.228	13	0.596	42	313	2.0	3.3	1.1	65	358	1.5
143.1	0.321	15	1.1	36	323	1.9	4.6	2.1	55	369	1.4
144.0	0.354	17	0.675	50	367	2.9	5.1	1.2	76	419	2.1
144.9	0.615	12	0.335	38	361	1.8	8.9	0.612	58	412	1.3
145.8	0.302	13	0.542	39	295	2.6	4.4	0.989	61	337	1.9
146.8	0.618	13	0.568	38	317	1.8	8.9	1.0	58	363	1.3
147.7	0.951	17	0.557	46	379	2.0	14	1.0	70	433	1.4
148.6	0.728	11	0.283	41	346	3.3	11	0.515	63	396	2.4
149.5	0.671	13	0.761	44	326	2.1	9.7	1.4	67	373	1.5



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
150.5	0.244	16	0.415	49	360	2.9	3.5	0.756	75	412	2.1
151.4	0.328	9.5	0.350	35	256	2.0	4.7	0.638	54	292	1.5
152.3	0.929	11	0.938	39	305	3.4	13	1.7	60	349	2.5
153.2	0.328	14	0.589	50	341	3.7	4.7	1.1	77	390	2.7
154.1	0.527	14	0.362	42	300	4.1	7.6	0.661	64	343	3.0
155.1	0.228	13	0.969	45	280	4.4	3.3	1.8	68	320	3.2
156.0	0.623	16	0.927	52	358	2.2	9.0	1.7	80	409	1.6
156.9	1.5	14	0.667	48	301	3.3	21	1.2	74	344	2.4
157.8	0.359	13	0.540	45	346	4.3	5.2	0.984	69	396	3.1
158.8	0.939	10	0.647	40	340	2.4	14	1.2	62	389	1.7
159.7	0.311	16	0.869	49	295	4.8	4.5	1.6	74	338	3.5
160.6	0.228	11	1.1	48	292	4.6	3.3	2.0	73	334	3.3
161.5	0.228	14	0.769	46	286	3.7	3.3	1.4	71	327	2.7
162.5	0.611	19	0.834	42	356	3.7	8.8	1.5	65	407	2.7
163.4	0.609	14	1.2	64	288	5.6	8.8	2.1	98	329	4.1
164.3	0.525	15	1.0	60	314	7.5	7.6	1.9	91	359	5.5
165.2	0.228	14	1.1	49	324	8.4	3.3	1.9	75	370	6.1
166.2	0.228	15	0.645	54	292	8.3	3.3	1.2	82	334	6.1
167.1	0.684	14	1.1	46	279	8.0	9.9	2.1	71	320	5.8
168.0	0.228	15	1.2	53	300	6.3	3.3	2.2	81	343	4.6
168.9	0.228	14	1.2	49	287	7.9	3.3	2.2	76	329	5.7
169.9	0.699	14	1.3	59	290	14	10	2.3	90	331	10
170.8	0.444	16	1.6	53	323	12	6.4	3.0	82	370	8.7
171.7	0.327	16	1.5	57	328	6.0	4.7	2.7	87	375	4.4
172.6	0.297	11	1.3	59	252	9.9	4.3	2.4	90	288	7.2
173.6	0.797	16	1.3	53	268	10.0	12	2.3	81	307	7.3
174.5	0.228	14	1.2	58	334	11	3.3	2.3	90	381	7.9
175.4	0.228	12	1.7	50	299	9.9	3.3	3.0	77	342	7.2
176.3	0.228	14	1.4	48	233	9.6	3.3	2.5	73	266	7.0
177.2	0.420	16	1.5	65	315	11	6.1	2.7	99	360	7.7
178.2	0.228	15	0.865	65	268	11	3.3	1.6	100	307	8.2
179.1	0.228	13	1.6	55	250	14	3.3	3.0	84	285	9.9
180.0	0.228	13	1.3	74	295	12	3.3	2.4	113	338	8.9
180.9	0.781	19	1.4	74	340	14	11	2.5	114	389	10
181.9	0.966	13	1.7	59	266	10	14	3.2	90	304	7.4
182.8	0.691	12	1.5	58	238	12	10.0	2.7	90	272	8.9
183.7	0.514	14	2.2	65	299	11	7.4	3.9	99	342	8.4
184.6	0.488	16	1.1	72	266	13	7.0	2.1	111	304	9.2
185.6	0.401	14	1.4	62	274	14	5.8	2.5	94	314	10
186.5	0.228	18	1.6	74	346	13	3.3	3.0	114	395	9.6
187.4	0.231	14	1.3	66	296	15	3.3	2.4	101	339	11
188.3	0.678	15	1.6	66	288	15	9.8	2.9	101	330	11
189.3	0.826	14	1.2	66	303	13	12	2.2	101	347	9.5
190.2	0.890	13	1.2	70	312	14	13	2.3	107	356	10
191.1	0.228	14	2.0	72	239	13	3.3	3.6	111	274	9.2
192.0	1.2	18	1.3	54	261	14	18	2.4	83	298	10
193.0	0.237	18	2.0	67	294	13	3.4	3.7	103	336	9.8
193.9	0.396	13	1.3	60	229	12	5.7	2.3	92	262	9.0
194.8	0.937	15	1.6	61	263	14	14	2.9	94	301	10
195.7	0.387	16	1.6	56	308	14	5.6	2.9	85	352	10
196.7	0.471	13	1.8	72	257	13	6.8	3.4	110	294	9.8
197.6	1.1	14	1.9	65	257	12	16	3.5	99	294	8.7
198.5	1.2	19	2.0	76	325	14	17	3.7	116	371	9.9
199.4	0.406	14	1.3	68	285	12	5.9	2.3	104	326	9.0
200.4	0.228	13	2.0	71	267	11	3.3	3.6	108	305	8.2
201.3	0.721	19	1.9	72	316	15	10	3.5	110	361	11
202.2	0.384	18	1.5	66	295	11	5.5	2.6	101	337	8.0
203.1	0.228	14	1.8	75	240	11	3.3	3.3	115	275	8.1
204.0	0.228	19	1.6	63	295	11	3.3	2.9	97	337	7.8
205.0	0.462	16	1.5	56	254	9.4	6.7	2.8	85	291	6.8
205.9	0.612	17	1.6	75	246	9.9	8.8	2.9	115	281	7.2
206.8	0.660	18	1.8	69	301	11	9.5	3.4	105	344	7.8
207.7	0.520	22	1.5	89	304	10	7.5	2.8	136	347	7.5
208.7	0.228	16	1.7	70	277	7.4	3.3	3.1	108	317	5.4
209.6	0.228	19	1.2	65	262	7.8	3.3	2.2	99	300	5.7
210.5	0.228	23	2.5	67	282	6.2	3.3	4.5	103	322	4.5
211.4	0.326	19	2.0	78	299	6.9	4.7	3.6	119	342	5.0
212.4	0.663	16	2.0	70	290	6.7	9.6	3.7	108	332	4.9
213.3	0.749	20	1.7	65	307	7.2	11	3.1	100	351	5.2
214.2	0.482	19	1.5	72	258	9.1	7.0	2.7	110	296	6.6
215.1	0.674	16	1.3	65	244	4.3	9.7	2.4	100	278	3.2
216.1	0.357	16	1.3	49	242	4.6	5.2	2.4	76	277	3.4
217.0	0.228	17	1.6	69	277	5.0	3.3	2.9	106	317	3.6
217.9	1.2	17	1.6	58	295	4.6	17	2.9	89	337	3.4
218.8	0.582	22	1.5	62	301	5.3	8.4	2.8	95	344	3.9
219.8	0.228	23	1.2	68	318	3.9	3.3	2.1	105	364	2.9
220.7	0.228	17	1.7	59	279	5.3	3.3	3.0	90	319	3.9
221.6	0.674	14	1.3	55	273	3.0	9.7	2.4	85	312	2.2
222.5	1.2	22	1.4	57	301	4.6	18	2.5	88	344	3.4
223.5	0.228	20	1.2	63	268	3.3	3.3	2.2	96	306	2.4
224.4	0.719	20	1.1	62	281	2.8	10	2.0	95	322	2.0



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
225.3	0.228	20	1.5	67	304	3.6	3.3	2.8	102	348	2.7
226.2	0.713	19	0.649	59	299	3.2	10	1.2	90	342	2.3
227.2	1.2	22	1.5	79	307	2.8	17	2.7	121	351	2.0
228.1	0.228	20	1.5	70	335	2.8	3.3	2.7	108	383	2.0
229.0	0.228	23	1.5	72	286	2.9	3.3	2.7	110	327	2.1
229.9	0.232	18	1.5	69	265	3.8	3.3	2.8	105	303	2.7
230.8	0.415	22	0.875	52	274	3.3	6.0	1.6	80	313	2.4
231.8	0.843	19	1.2	67	336	3.8	12	2.2	103	384	2.8
232.7	0.694	19	1.3	60	314	2.6	10	2.4	92	359	1.9
233.6	0.559	18	1.2	65	281	2.4	8.1	2.2	100	321	1.8
234.5	0.843	25	1.5	64	324	3.7	12	2.7	98	371	2.7
235.5	0.228	18	1.7	54	273	3.2	3.3	3.1	83	313	2.3
236.4	0.520	19	1.2	61	288	2.6	7.5	2.1	93	329	1.9
237.3	0.619	21	1.0	71	363	3.3	8.9	1.9	108	415	2.4
238.2	0.319	18	1.5	68	340	3.3	4.6	2.7	104	389	2.4
239.2	0.382	18	1.8	64	290	2.1	5.5	3.3	97	331	1.5
240.1	0.709	22	1.2	56	357	2.5	10	2.1	86	408	1.8
241.0	0.764	20	0.917	70	332	1.9	11	1.7	108	380	1.4
241.9	0.412	16	1.3	61	262	2.0	5.9	2.3	93	300	1.4
242.9	0.390	21	1.5	52	319	2.0	5.6	2.8	79	364	1.4
243.8	0.442	18	1.1	59	294	2.0	6.4	1.9	91	336	1.4
244.7	0.228	20	1.3	59	299	2.4	3.3	2.3	90	341	1.8
245.6	0.228	16	1.4	62	325	2.4	3.3	2.6	95	371	1.7
246.6	0.813	18	1.2	58	343	1.7	12	2.1	89	392	1.2
247.5	0.625	19	1.2	55	261	1.8	9.0	2.2	84	299	1.3
248.4	0.570	21	1.7	64	326	1.9	8.2	3.1	99	373	1.4
249.3	0.853	20	1.4	62	371	2.1	12	2.6	95	424	1.5
250.3	1.2	18	1.1	57	253	3.0	17	2.0	88	289	2.2
251.2	0.417	19	1.1	48	275	2.0	6.0	2.0	73	315	1.4
252.1	0.730	22	1.5	64	359	3.3	11	2.7	98	411	2.4
253.0	0.354	18	0.936	58	309	3.3	5.1	1.7	89	354	2.4
254.0	0.460	16	0.912	49	254	1.5	6.6	1.7	75	291	1.1
254.9	0.636	20	1.3	65	332	2.2	9.2	2.3	99	380	1.6
255.8	0.228	20	1.5	64	346	1.5	3.3	2.7	98	396	1.1
256.7	0.228	18	1.2	51	284	2.7	3.3	2.2	78	325	2.0
257.6	0.473	16	1.4	56	285	2.9	6.8	2.6	86	325	2.2
258.6	0.826	18	0.885	59	348	2.2	12	1.6	91	397	1.6
259.5	0.520	16	0.998	51	311	1.7	7.5	1.8	79	355	1.2
260.4	0.808	16	1.6	57	305	1.3	12	2.9	87	348	0.922
261.3	0.344	17	1.2	54	313	2.1	5.0	2.2	83	358	1.5
262.3	0.293	17	1.3	53	319	2.4	4.2	2.4	82	365	1.8
263.2	0.459	15	1.3	60	335	2.2	6.6	2.4	93	383	1.6
264.1	0.568	17	1.1	51	325	2.6	8.2	1.9	78	372	1.9
265.0	0.228	16	1.0	50	287	2.3	3.3	1.9	77	329	1.7
266.0	0.347	18	1.0	50	275	2.7	5.0	1.8	77	314	2.0
266.9	0.401	17	0.991	47	292	2.3	5.8	1.8	72	334	1.7
267.8	1.2	14	0.954	55	360	2.3	17	1.7	84	412	1.7
268.7	0.445	15	0.875	51	259	2.2	6.4	1.6	79	296	1.6
269.7	0.228	17	1.4	46	245	2.4	3.3	2.5	71	280	1.7
270.6	0.338	16	1.0	39	292	1.5	4.9	1.8	60	334	1.1
271.5	0.559	13	1.1	53	282	1.8	8.1	1.9	81	322	1.3
272.4	0.228	11	0.619	45	261	2.8	3.3	1.1	69	299	2.0
273.4	1.0	15	0.658	51	367	1.6	15	1.2	78	420	1.2
274.3	0.228	16	0.962	47	331	2.8	3.3	1.8	71	379	2.1
275.2	0.273	12	1.1	46	282	1.7	3.9	2.0	70	322	1.3
276.1	0.446	14	0.586	45	337	1.5	6.4	1.1	69	385	1.1
277.1	0.407	14	0.975	39	305	1.7	5.9	1.8	59	349	1.2
278.0	0.297	11	0.706	39	195	1.6	4.3	1.3	59	223	1.2
278.9	0.228	13	0.978	50	349	2.3	3.3	1.8	77	399	1.7
279.8	0.228	15	0.783	47	281	1.8	3.3	1.4	72	322	1.3
280.7	0.300	11	0.773	43	304	0.813	4.3	1.4	66	348	0.593
281.7	0.228	12	0.731	44	312	3.0	3.3	1.3	68	357	2.2
282.6	0.569	13	0.646	34	342	1.9	8.2	1.2	53	391	1.4
283.5	0.297	12	1.0	45	305	2.2	4.3	1.9	68	349	1.6
284.4	0.228	12	0.720	31	221	1.8	3.3	1.3	48	252	1.3
285.4	0.344	13	0.656	42	345	1.9	5.0	1.2	65	395	1.4
286.3	0.388	10	0.958	39	319	2.1	5.6	1.7	60	365	1.5
287.2	0.424	13	0.894	39	276	1.000	6.1	1.6	60	316	0.730
288.1	0.621	17	0.471	43	323	4.1	9.0	0.860	67	369	3.0
289.1	0.228	10	0.769	31	290	2.1	3.3	1.4	48	332	1.6
290.0	0.289	13	0.776	35	312	1.6	4.2	1.4	53	357	1.2
290.9	0.292	10	0.914	38	287	1.3	4.2	1.7	58	328	0.967
291.8	0.282	11	0.382	31	301	2.6	4.1	0.697	48	345	1.9
292.8	0.556	12	0.601	32	265	2.8	8.0	1.1	49	303	2.1
293.7	0.258	10	0.349	27	277	0.817	3.7	0.637	41	317	0.596
294.6	0.228	14	0.868	28	306	1.9	3.3	1.6	42	350	1.4
295.5	0.544	14	0.541	30	309	2.6	7.8	0.987	47	353	1.9
296.5	0.228	11	0.469	33	290	1.2	3.3	0.856	51	332	0.865
297.4	0.401	11	0.469	24	272	2.1	5.8	0.855	36	311	1.6
298.3	0.405	10	0.591	27	303	1.9	5.8	1.1	42	346	1.4
299.2	0.274	10	0.402	29	323	2.3	4.0	0.733	45	369	1.6



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Sample ID: 008

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
300.2	0.499	9.6	0.650	30	334	1.1	7.2	1.2	46	382	0.823
301.1	0.362	12	0.418	27	295	2.2	5.2	0.762	42	337	1.6
302.0	0.581	13	0.471	31	331	2.1	8.4	0.859	47	378	1.5
302.9	0.277	11	0.498	33	252	1.5	4.0	0.909	50	289	1.1
303.9	1.1	13	0.390	32	402	2.2	15	0.711	49	460	1.6
304.8	0.228	13	0.620	30	286	1.3	3.3	1.1	45	327	0.917
305.7	0.707	12	0.710	23	329	1.2	10	1.3	35	376	0.900
306.6	0.337	11	0.713	25	320	1.9	4.9	1.3	38	366	1.4
307.5	0.638	14	0.690	26	309	1.4	9.2	1.3	40	353	1.0
308.5	0.415	8.0	0.485	24	281	1.7	6.0	0.885	38	322	1.3
309.4	0.536	11	0.637	24	250	2.1	7.7	1.2	37	286	1.5
310.3	0.228	12	0.407	27	307	2.2	3.3	0.742	41	351	1.6
311.2	0.469	9.8	0.611	24	238	2.3	6.8	1.1	37	272	1.6
312.2	0.640	10	0.673	23	314	1.2	9.2	1.2	35	359	0.906
313.1	0.858	12	0.403	26	315	1.8	12	0.735	40	360	1.3
314.0	0.228	9.2	0.550	26	348	2.1	3.3	1.0	40	398	1.5
314.9	0.228	9.0	0.594	22	255	1.5	3.3	1.1	34	292	1.1
315.9	0.716	12	0.858	24	267	2.4	10	1.6	36	305	1.7
316.8	0.228	13	0.733	24	361	2.0	3.3	1.3	37	412	1.4
317.7	0.228	13	0.462	32	319	2.0	3.3	0.842	49	365	1.5
318.6	0.228	10.0	0.667	27	271	1.5	3.3	1.2	42	309	1.1
319.6	0.547	13	0.410	23	302	1.1	7.9	0.747	36	345	0.801
320.5	0.274	14	0.644	24	281	2.4	4.0	1.2	36	321	1.7
321.4	0.444	11	0.688	21	257	1.5	6.4	1.3	33	294	1.1
322.3	0.228	11	0.414	24	252	1.3	3.3	0.754	37	288	0.936
323.3	0.377	11	0.369	28	299	1.9	5.4	0.673	42	341	1.4
324.2	0.319	9.7	0.424	22	202	1.7	4.6	0.772	34	231	1.3
325.1	0.662	11	0.445	27	260	2.3	9.6	0.812	42	298	1.7
326.0	0.450	14	0.754	33	309	2.7	6.5	1.4	50	353	1.9
327.0	0.228	15	0.426	30	245	1.1	3.3	0.777	46	280	0.806
327.9	1.6	10	0.768	19	275	2.3	23	1.4	29	314	1.7
328.8	0.298	12	0.536	27	300	2.4	4.3	0.978	42	343	1.8
329.7	0.501	13	0.653	22	252	1.5	7.2	1.2	33	288	1.1
330.7	1.1	12	0.439	24	259	3.4	16	0.800	37	296	2.5
331.6	0.228	12	0.589	24	286	2.6	3.3	1.1	37	327	1.9
332.5	0.228	12	0.916	34	290	3.7	3.3	1.7	52	332	2.7
333.4	0.603	12	0.634	27	209	1.9	8.7	1.2	42	239	1.4
334.3	0.794	11	0.783	29	247	2.4	11	1.4	44	283	1.7
335.3	0.689	16	0.672	33	294	3.0	10.0	1.2	51	336	2.2
336.2	0.228	12	0.440	26	251	2.4	3.3	0.802	39	287	1.7
337.1	0.657	16	0.723	28	257	2.8	9.5	1.3	43	294	2.1
338.0	0.228	14	0.753	32	272	1.8	3.3	1.4	49	311	1.3
339.0	0.705	11	0.726	32	236	2.1	10	1.3	48	270	1.5
339.9	0.228	13	0.555	31	231	1.9	3.3	1.0	47	265	1.4
340.8	0.228	14	1.2	31	306	1.9	3.3	2.2	48	350	1.4
341.7	0.727	16	0.877	31	208	3.6	10	1.6	48	238	2.6
342.7	0.228	9.7	0.882	27	204	0.872	3.3	1.6	42	233	0.636
343.6	0.488	16	1.1	28	255	2.8	7.0	2.0	43	292	2.1
344.5	0.382	13	0.723	29	178	2.5	5.5	1.3	44	204	1.8
345.4	0.228	7.9	1.0	38	258	2.4	3.3	1.9	59	295	1.8
346.4	0.952	12	1.1	36	247	3.2	14	2.1	56	282	2.3
347.3	1.1	17	0.862	46	269	2.1	16	1.6	70	308	1.6
348.2	0.325	12	0.775	38	216	2.8	4.7	1.4	58	247	2.1
349.1	0.706	10	1.2	35	213	2.0	10	2.3	53	243	1.4
350.1	0.442	13	0.965	33	256	3.2	6.4	1.8	51	292	2.3
351.0	0.708	11	1.2	34	203	2.1	10	2.1	52	232	1.6
351.9	0.793	12	1.0	41	223	2.0	11	1.9	62	255	1.5
352.8	0.415	13	0.906	41	302	3.1	6.0	1.7	63	345	2.3
353.8	0.309	10	0.741	32	175	2.5	4.5	1.4	49	201	1.8
354.7	0.597	13	1.3	35	203	3.4	8.6	2.3	54	232	2.5
355.6	1.0	15	1.5	51	295	2.1	15	2.8	79	338	1.5
356.5	0.286	13	1.3	41	223	1.8	4.1	2.3	63	255	1.3
357.5	0.308	12	1.2	47	202	1.7	4.5	2.1	72	231	1.2
358.4	0.544	13	1.4	42	241	3.6	7.9	2.6	65	275	2.6
359.3	0.914	14	1.0	63	251	3.1	13	1.9	97	287	2.2
360.2	1.2	12	1.3	56	227	2.2	17	2.3	86	260	1.6
361.1	0.228	11	1.4	42	237	1.6	3.3	2.6	65	271	1.1
362.1	0.228	13	1.9	44	309	4.1	3.3	3.4	67	353	3.0
363.0	0.401	11	2.1	62	215	2.5	5.8	3.8	96	246	1.8
363.9	0.374	10	2.4	45	156	2.7	5.4	4.3	70	178	1.9
364.8	1.3	15	1.1	54	294	2.3	19	2.0	83	336	1.7
365.8	0.287	12	1.3	53	246	2.9	4.1	2.3	81	281	2.1
366.7	1.2	13	1.9	43	224	2.9	17	3.4	66	256	2.1
367.6	0.228	17	1.7	56	275	2.2	3.3	3.1	87	315	1.6
368.5	0.882	11	1.6	55	240	2.7	13	3.0	85	274	2.0
369.5	0.762	15	1.6	59	203	2.5	11	2.9	91	232	1.9
370.4	1.0	12	2.4	50	221	2.2	14	4.3	76	253	1.6
371.3	1.7	16	1.8	68	281	3.0	25	3.3	105	321	2.2
372.2	1.1	11	1.3	55	231	3.8	16	2.3	85	264	2.8
373.2	0.691	13	2.0	66	220	2.5	10.0	3.7	101	252	1.9
374.1	1.2	16	2.0	52	264	1.5	18	3.6	80	302	1.1



Minnow Environmental  
Sample ID: 008

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
375.0	0.937	12	1.3	54	268	1.7	14	2.4	83	307	1.3
375.9	0.532	12	2.5	46	187	1.6	7.7	4.6	70	214	1.2
376.9	1.1	17	1.4	56	254	2.8	15	2.6	85	290	2.1
377.8	1.2	12	2.2	61	282	2.0	18	4.0	94	323	1.5
378.7	0.790	14	1.6	64	223	1.8	11	2.9	98	255	1.3
379.6	0.564	18	1.4	58	222	1.5	8.1	2.5	89	254	1.1
380.6	1.3	15	2.0	54	251	2.3	18	3.6	83	287	1.7
381.5	0.228	11	1.7	49	202	0.743	3.3	3.2	75	231	0.542
382.4	0.726	13	2.2	71	277	2.1	10	4.0	109	317	1.5
383.3	0.919	14	1.6	69	281	1.3	13	2.9	106	322	0.967
384.2	1.2	16	1.8	58	275	1.0	18	3.2	89	315	0.761
385.2	1.1	14	1.8	54	249	1.3	16	3.3	83	284	0.975
386.1	0.480	14	2.4	57	230	1.8	6.9	4.4	87	263	1.3
387.0	1.7	16	2.2	72	284	2.4	25	4.1	110	325	1.7
387.9	0.983	14	2.6	64	231	2.5	14	4.7	98	264	1.8
388.9	0.812	15	1.5	64	256	1.1	12	2.7	97	292	0.768
389.8	1.1	15	2.2	65	347	1.4	16	4.0	100	396	0.986
390.7	0.821	12	1.3	60	223	1.5	12	2.4	92	255	1.1
391.6	0.501	15	2.0	47	225	1.3	7.2	3.6	72	257	0.962
392.6	0.685	12	1.7	57	258	0.711	9.9	3.1	87	295	0.519
393.5	0.396	16	1.8	63	209	0.594	5.7	3.3	96	239	0.433
394.4	1.1	15	2.3	64	271	1.3	16	4.2	98	310	0.969
395.3	1.1	20	2.1	68	329	2.1	17	3.9	104	376	1.5
396.3	0.733	14	1.8	56	224	0.923	11	3.4	86	256	0.674
397.2	0.412	16	1.5	66	319	1.2	6.0	2.8	101	365	0.889
398.1	0.988	16	2.3	73	352	2.3	14	4.2	111	402	1.7
399.0	0.859	13	1.6	61	293	0.864	12	2.8	94	335	0.630
400.0	0.250	14	2.0	73	300	1.2	3.6	3.7	111	343	0.911
400.9	1.0	14	2.2	57	220	0.836	15	4.0	88	251	0.610
401.8	1.2	14	1.7	71	371	1.4	17	3.0	108	424	1.0
402.7	0.883	14	2.0	60	232	0.701	13	3.7	92	265	0.511
403.7	1.1	21	2.1	63	259	1.0	16	3.8	96	296	0.734
404.6	0.617	16	2.4	65	326	1.5	8.9	4.4	99	373	1.1
405.5	0.478	13	1.7	61	250	2.2	6.9	3.1	93	286	1.6
406.4	0.398	14	2.0	65	269	1.7	5.7	3.7	99	307	1.2
407.4	0.751	15	2.3	70	298	0.912	11	4.2	107	341	0.665
408.3	0.625	13	1.5	59	293	0.845	9.0	2.8	90	335	0.617
409.2	0.944	13	1.7	73	284	1.0	14	3.1	112	325	0.731
410.1	1.0	16	1.6	57	294	1.2	15	2.9	88	337	0.860
411.1	0.637	13	2.1	67	306	0.987	9.2	3.8	102	350	0.720
412.0	0.228	13	1.7	82	225	0.615	3.3	3.1	125	258	0.449
412.9	0.783	17	2.2	68	297	0.612	11	4.0	104	339	0.446
413.8	0.975	16	1.7	65	304	1.0	14	3.1	99	348	0.755
414.7	0.228	15	1.7	70	360	2.0	3.3	3.2	107	411	1.4
415.7	1.1	14	2.3	68	229	0.994	16	4.2	104	262	0.725
416.6	0.900	17	1.8	62	395	1.2	13	3.2	95	452	0.874
417.5	0.595	14	1.4	46	271	0.465	8.6	2.6	70	310	0.340
418.4	0.228	16	1.4	57	258	1.5	3.3	2.6	87	295	1.1
419.4	0.332	16	1.7	66	329	1.7	4.8	3.1	101	376	1.2
420.3	0.870	24	2.0	90	388	1.2	13	3.6	137	444	0.900
421.2	0.274	16	1.8	59	226	0.486	4.0	3.2	90	258	0.355
422.1	0.228	13	2.9	44	170	0.632	3.3	5.3	67	194	0.461
423.1	0.933	20	1.8	56	350	2.1	13	3.3	87	401	1.5
424.0	0.535	15	1.7	57	296	0.936	7.7	3.1	87	339	0.683
424.9	0.615	14	1.8	53	229	0.832	8.9	3.2	81	262	0.607
425.8	0.469	19	1.7	67	331	0.967	6.8	3.2	103	378	0.706
426.8	0.577	17	1.3	68	339	1.3	8.3	2.4	104	387	0.981
427.7	0.692	19	1.9	54	270	1.1	10.0	3.5	82	308	0.797
428.6	0.358	22	1.9	60	407	2.1	5.2	3.5	92	465	1.5
429.5	0.281	13	1.6	42	272	1.2	4.1	2.9	65	311	0.883
430.5	0.653	13	1.8	72	272	0.792	9.4	3.3	110	311	0.578
431.4	0.343	16	1.9	51	403	1.4	4.9	3.5	78	461	0.985
432.3	0.825	23	1.5	57	335	0.710	12	2.7	88	383	0.518
433.2	0.228	10	1.0	39	176	0.886	3.3	1.9	59	201	0.646
434.2	0.803	17	1.3	42	264	2.0	12	2.3	65	301	1.5
435.1	0.228	23	1.4	45	276	0.874	3.3	2.5	68	316	0.637
436.0	0.644	14	1.3	63	358	1.6	9.3	2.4	96	410	1.2
436.9	1.4	13	1.3	52	210	0.469	20	2.4	79	240	0.342
437.8	0.940	15	1.2	50	299	0.746	14	2.1	76	342	0.544
438.8	0.265	15	1.0	54	297	0.863	3.8	1.9	83	340	0.629
439.7	0.228	11	1.6	68	249	2.1	3.3	2.9	104	284	1.5
440.6	1.5	25	1.6	45	299	1.1	22	2.9	68	342	0.803
441.5	0.228	13	1.3	45	325	1.9	3.3	2.4	69	372	1.4
442.5	0.351	13	1.4	53	234	0.513	5.1	2.6	81	267	0.374
443.4	0.620	16	1.5	51	273	1.8	8.9	2.7	78	312	1.3
444.3	0.902	31	1.2	54	520	0.645	13	2.2	84	595	0.471
445.2	0.430	11	0.972	53	213	1.0	6.2	1.8	82	244	0.757
446.2	0.794	13	1.2	51	346	1.1	11	2.1	79	395	0.822
447.1	0.817	21	1.5	52	363	1.2	12	2.8	79	415	0.846
448.0	0.394	16	1.4	67	369	1.4	5.7	2.5	102	422	1.0
448.9	0.572	8.7	1.4	33	131	0.377	8.3	2.6	50	150	0.275



Minnow Environmental  
Sample ID: 008

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
449.9	0.926	34	1.6	60	516	1.5	13	2.9	91	590	1.1
450.8	0.228	15	1.5	62	369	0.894	3.3	2.7	95	421	0.652
451.7	0.412	7.2	1.2	43	181	1.6	5.9	2.1	65	207	1.2
452.6	0.565	14	1.3	45	321	0.738	8.2	2.4	69	367	0.539
453.6	0.739	19	0.886	46	403	0.248	11	1.6	71	461	0.181
454.5	0.228	7.5	0.806	45	144	0.400	3.3	1.5	68	164	0.291
455.4	0.570	9.6	1.5	37	215	1.1	8.2	2.7	57	245	0.797
456.3	0.228	24	0.848	47	249	1.4	3.3	1.5	71	285	1.0
457.3	0.353	11	1.2	63	226	0.726	5.1	2.2	97	258	0.530
458.2	0.228	7.8	1.0	25	131	1.1	3.3	1.9	38	149	0.770
459.1	0.549	14	1.4	29	458	0.098	7.9	2.6	44	524	0.071
460.0	0.302	10	0.799	59	251	1.2	4.4	1.5	90	287	0.869
461.0	0.228	4.9	0.754	26	118	0.407	3.3	1.4	39	135	0.297
461.9	0.376	15	1.7	56	379	1.1	5.4	3.1	85	434	0.785
462.8	0.775	19	0.633	47	323	1.5	11	1.2	72	369	1.1
463.7	0.456	8.4	0.761	41	244	0.797	6.6	1.4	63	279	0.581
464.7	0.228	12	1.7	36	175	1.0	3.3	3.1	56	200	0.759
465.6	1.1	20	1.2	38	339	1.5	16	2.2	58	387	1.1
466.5	0.404	13	0.561	59	324	1.1	5.8	1.0	90	370	0.784
467.4	0.968	14	1.4	50	254	1.5	14	2.5	77	291	1.1
468.3	0.416	22	1.1	52	637	0.588	6.0	1.9	79	729	0.429
469.3	0.358	17	0.652	51	281	0.952	5.2	1.2	78	321	0.695
470.2	0.475	6.7	0.930	25	118	0.759	6.9	1.7	38	135	0.554
471.1	0.724	41	2.0	44	356	1.1	10	3.6	68	408	0.806
472.0	0.228	13	0.529	35	205	0.462	3.3	0.965	53	234	0.337
473.0	0.228	9.7	0.823	41	205	0.862	3.3	1.5	63	234	0.629
473.9	0.510	10	1.4	39	248	0.328	7.4	2.6	59	283	0.239
474.8	0.361	21	0.732	51	486	0.509	5.2	1.3	78	556	0.372
475.7	0.228	6.6	0.669	38	142	0.662	3.3	1.2	58	162	0.483
476.7	0.666	19	1.6	38	246	1.3	9.6	2.8	59	282	0.942
477.6	0.593	23	1.2	45	652	0.438	8.6	2.3	69	745	0.320
478.5	0.228	15	0.597	61	374	0.630	3.3	1.1	94	428	0.460
479.4	0.370	7.1	1.0	33	141	0.893	5.3	1.9	50	161	0.651
480.4	0.228	31	1.2	42	394	0.703	3.3	2.1	65	450	0.513
481.3	0.328	17	0.924	32	275	1.3	4.7	1.7	49	315	0.943
482.2	0.442	8.7	0.699	30	170	0.769	6.4	1.3	46	194	0.561
483.1	0.782	21	1.2	35	371	0.674	11	2.1	53	424	0.492
484.1	0.228	16	0.937	32	251	0.981	3.3	1.7	49	288	0.716
485.0	0.335	9.3	0.972	27	174	0.587	4.8	1.8	41	199	0.428
485.9	0.376	12	0.875	33	270	0.663	5.4	1.6	51	309	0.483
486.8	0.757	28	1.6	36	360	0.387	11	2.8	55	412	0.282
487.8	0.452	10	0.797	31	200	0.876	6.5	1.5	48	229	0.639
488.7	0.388	10	1.5	25	186	0.335	5.6	2.7	38	212	0.244
489.6	0.458	17	1.1	33	466	0.945	6.6	2.1	51	533	0.689
490.5	0.337	11	0.613	27	250	0.795	4.9	1.1	42	286	0.580
491.4	0.392	12	1.4	40	251	1.0	5.7	2.5	61	287	0.760
492.4	0.603	13	1.7	27	241	1.2	8.7	3.0	42	276	0.853
493.3	0.635	26	0.488	34	275	0.735	9.2	0.889	52	315	0.536
494.2	0.864	12	0.778	35	258	1.0	12	1.4	54	295	0.747
495.1	0.506	18	1.2	32	268	1.5	7.3	2.2	49	306	1.1
496.1	0.228	16	1.6	35	410	0.937	3.3	2.9	53	469	0.684
497.0	0.228	10	1.0	35	243	1.6	3.3	1.8	54	278	1.2
497.9	1.1	14	1.3	28	198	2.0	16	2.4	42	226	1.4
498.8	1.4	35	1.1	45	764	0.804	20	1.9	69	873	0.587
499.8	0.793	13	1.1	33	255	0.798	11	2.1	51	291	0.582
500.7	0.228	10	0.934	24	226	1.7	3.3	1.7	37	258	1.2
501.6	0.228	14	0.866	25	269	1.5	3.3	1.6	38	307	1.1
502.5	0.228	16	1.2	32	520	1.1	3.3	2.1	48	594	0.834
503.5	0.675	13	1.2	38	224	2.6	9.7	2.2	59	256	1.9
504.4	0.917	16	1.7	33	241	0.604	13	3.1	50	276	0.441
505.3	0.228	15	0.916	29	324	0.811	3.3	1.7	44	370	0.592
506.2	0.596	12	0.715	29	230	0.828	8.6	1.3	45	263	0.604
507.2	0.278	8.6	1.3	18	250	0.987	4.0	2.4	28	286	0.720
508.1	0.620	18	1.3	30	586	1.9	9.0	2.4	45	670	1.4
509.0	0.235	7.9	0.601	30	163	1.5	3.4	1.1	46	186	1.1
509.9	0.767	9.8	0.822	30	249	2.0	11	1.5	46	285	1.5
510.9	0.712	19	1.8	37	483	1.7	10	3.3	56	553	1.3
511.8	0.228	14	0.660	19	370	0.924	3.3	1.2	29	424	0.674
512.7	0.378	8.2	0.894	23	168	1.2	5.5	1.6	35	193	0.908
513.6	1.2	24	1.5	21	485	0.894	17	2.8	32	555	0.652
514.5	0.228	15	0.882	22	375	1.2	3.3	1.6	34	429	0.900
515.5	0.300	5.5	0.925	19	125	1.4	4.3	1.7	30	143	0.994
516.4	0.355	13	1.3	23	312	1.3	5.1	2.4	35	357	0.927
517.3	0.228	22	1.1	28	681	1.1	3.3	2.1	43	779	0.780
518.2	0.228	10	0.568	41	311	2.6	3.3	1.0	62	355	1.9
519.2	0.855	10	1.3	15	211	2.1	12	2.3	23	242	1.6
520.1	0.601	22	0.894	19	757	1.1	8.7	1.6	30	866	0.769
521.0	0.233	6.6	0.493	23	178	1.2	3.4	0.900	35	203	0.854
521.9	0.457	7.3	1.4	23	170	0.496	6.6	2.5	35	194	0.362
522.9	0.548	19	1.6	24	361	0.961	7.9	3.0	37	412	0.701
523.8	0.481	21	0.667	44	555	1.1	6.9	1.2	67	635	0.828



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
524.7	0.228	5.5	0.708	18	179	1.4	3.3	1.3	28	205	1.1
525.6	0.228	18	1.7	19	486	1.5	3.3	3.1	29	555	1.1
526.6	0.228	13	0.775	18	418	1.6	3.3	1.4	28	478	1.2
527.5	0.228	5.7	0.999	21	141	0.814	3.3	1.8	32	161	0.594
528.4	0.228	8.4	1.1	17	244	1.7	3.3	2.0	26	279	1.2
529.3	0.228	16	1.1	24	402	0.966	3.3	1.9	37	460	0.705
530.3	0.228	8.2	0.183	21	242	1.5	3.3	0.335	32	277	1.1
531.2	0.367	8.6	1.3	19	206	2.9	5.3	2.3	29	236	2.1
532.1	1.3	26	1.2	22	636	0.692	19	2.2	33	727	0.505
533.0	0.228	8.9	0.472	20	272	1.1	3.3	0.860	31	311	0.767
534.0	0.395	8.0	0.890	25	162	2.1	5.7	1.6	38	186	1.5
534.9	0.445	21	1.2	24	497	2.6	6.4	2.1	37	568	1.9
535.8	0.228	16	0.305	36	616	2.1	3.3	0.557	55	705	1.5
536.7	0.228	4.0	0.611	13	135	0.924	3.3	1.1	20	154	0.674
537.7	0.264	12	1.2	14	328	1.9	3.8	2.1	22	376	1.4
538.6	0.435	17	0.921	24	482	1.9	6.3	1.7	37	551	1.4
539.5	0.480	5.4	0.433	19	158	1.4	6.9	0.790	29	181	1.0
540.4	0.499	11	1.1	19	246	3.0	7.2	2.0	30	281	2.2
541.3	0.228	15	0.757	15	442	1.8	3.3	1.4	24	505	1.3
542.3	0.228	9.3	0.538	18	262	1.6	3.3	0.982	27	299	1.2
543.2	0.228	5.1	0.444	8.2	141	1.6	3.3	0.809	13	161	1.2
544.1	0.228	16	1.1	17	421	1.4	3.3	2.1	27	481	1.1
545.0	0.237	8.2	0.584	14	222	1.5	3.4	1.1	21	254	1.1
546.0	0.228	8.3	0.829	19	238	1.8	3.3	1.5	29	272	1.3
546.9	0.228	9.4	0.846	15	385	2.3	3.3	1.5	23	440	1.7
547.8	0.405	20	0.715	22	359	1.6	5.8	1.3	33	410	1.2
548.7	0.383	5.1	0.349	15	174	1.6	5.5	0.636	23	199	1.2
549.7	0.786	12	1.0	17	276	0.990	11	1.8	26	316	0.723
550.6	0.434	15	0.791	12	437	1.0	6.3	1.4	19	500	0.748
551.5	0.228	8.0	0.566	7.8	147	1.9	3.3	1.0	12	168	1.4
552.4	0.530	8.0	0.607	17	185	1.8	7.6	1.1	26	212	1.3
553.4	0.497	23	0.879	17	601	1.4	7.2	1.6	25	688	1.0
554.3	0.228	9.8	0.183	22	215	1.2	3.3	0.335	34	246	0.910
555.2	0.228	4.2	0.183	8.6	138	0.706	3.3	0.335	13	158	0.515
556.1	0.228	13	0.553	15	362	1.4	3.3	1.0	23	415	1.0
557.1	0.556	12	0.333	20	279	0.972	8.0	0.607	30	319	0.709
558.0	0.395	5.7	0.321	12	145	1.5	5.7	0.586	18	166	1.1
558.9	0.690	12	0.398	15	304	1.7	10.0	0.727	23	347	1.3
559.8	0.548	12	0.444	16	498	1.2	7.9	0.810	24	570	0.904
560.8	0.228	4.9	0.377	19	229	1.5	3.3	0.688	29	262	1.1
561.7	0.228	11	0.703	14	231	1.6	3.3	1.3	21	264	1.2
562.6	0.816	11	0.357	15	556	1.6	12	0.652	23	636	1.2
563.5	0.228	9.0	0.183	14	223	1.0	3.3	0.335	22	255	0.762
564.5	0.228	8.7	0.183	21	244	2.0	3.3	0.335	32	279	1.4
565.4	0.660	20	0.890	15	455	0.570	9.5	1.6	23	521	0.416
566.3	0.503	18	0.443	30	506	1.3	7.3	0.807	46	579	0.975
567.2	0.228	6.2	0.324	12	141	1.6	3.3	0.591	18	161	1.2
568.1	0.330	15	1.1	11	330	0.944	4.8	2.0	17	377	0.689
569.1	0.374	16	0.530	18	375	1.2	5.4	0.966	28	429	0.878
570.0	0.228	5.7	0.744	15	131	1.0	3.3	1.4	23	150	0.757
570.9	0.483	10	0.949	17	230	1.1	7.0	1.7	26	263	0.831
571.8	0.855	25	0.494	15	614	0.821	12	0.901	24	702	0.599
572.8	0.228	6.3	0.378	21	317	1.3	3.3	0.690	32	362	0.943
573.7	0.879	7.9	0.594	7.7	119	0.678	13	1.1	12	136	0.495
574.6	0.524	23	1.7	24	643	2.1	7.6	3.0	37	735	1.5
575.5	0.228	12	0.684	19	212	0.821	3.3	1.2	29	243	0.599
576.5	0.228	8.2	0.474	20	236	1.7	3.3	0.864	31	270	1.2
577.4	0.228	17	0.837	18	321	1.3	3.3	1.5	27	367	0.928
578.3	0.228	16	0.415	21	426	0.835	3.3	0.758	32	487	0.609
579.2	0.228	6.0	0.495	12	131	0.851	3.3	0.903	19	150	0.621
580.2	0.228	8.4	0.565	10	256	1.8	3.3	1.0	16	293	1.3
581.1	0.620	24	0.635	22	636	1.8	9.0	1.2	34	727	1.3
582.0	0.257	6.1	0.409	18	172	1.3	3.7	0.746	28	196	0.942
582.9	0.489	8.6	1.1	19	187	1.7	7.1	2.0	30	214	1.3
583.9	0.684	24	0.892	24	565	0.853	9.9	1.6	37	646	0.622
584.8	0.378	14	0.502	40	414	0.397	5.4	0.915	61	474	0.290
585.7	0.228	6.9	0.616	20	168	0.623	3.3	1.1	30	192	0.454
586.6	0.620	13	1.4	17	376	0.353	8.9	2.6	26	430	0.258
587.6	0.381	15	0.583	24	375	0.558	5.5	1.1	36	429	0.407
588.5	0.396	6.9	0.564	24	177	0.795	5.7	1.0	37	203	0.580
589.4	0.228	10	1.5	24	273	0.131	3.3	2.8	37	312	0.096
590.3	0.228	21	0.684	29	590	0.917	3.3	1.2	44	675	0.669
591.2	0.228	6.4	0.411	28	216	1.0	3.3	0.749	42	247	0.757
592.2	0.228	13	1.3	22	203	1.0	3.3	2.5	34	232	0.764
593.1	1.4	31	1.7	40	844	2.2	20	3.2	61	965	1.6
594.0	0.228	7.7	0.601	25	160	0.672	3.3	1.1	38	183	0.490
594.9	0.228	7.2	1.6	39	205	1.3	3.3	2.9	60	235	0.944
595.9	0.536	22	1.6	32	407	1.4	7.7	2.8	50	465	1.0
596.8	0.665	14	0.458	36	435	0.924	9.6	0.836	55	497	0.674
597.7	0.228	5.4	0.676	22	120	0.826	3.3	1.2	33	137	0.603
598.6	0.228	14	1.6	19	287	0.972	3.3	3.0	30	329	0.709



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
599.6	0.735	22	0.677	36	395	1.8	11	1.2	55	452	1.3
600.5	0.342	7.8	0.604	42	218	2.1	4.9	1.1	64	249	1.5
601.4	0.950	9.2	1.3	21	214	1.2	14	2.4	33	244	0.854
602.3	0.763	27	1.8	43	819	0.757	11	3.3	66	937	0.553
603.3	0.228	7.6	0.526	29	199	0.889	3.3	0.959	45	228	0.649
604.2	0.438	8.6	1.2	17	134	1.1	6.3	2.3	26	153	0.807
605.1	1.0	24	2.1	30	494	0.146	15	3.8	47	565	0.106
606.0	0.401	8.5	0.671	32	231	0.806	5.8	1.2	49	264	0.588
607.0	0.345	4.7	0.938	37	137	1.0	5.0	1.7	56	156	0.761
607.9	1.1	14	1.9	29	350	1.7	15	3.5	45	400	1.2
608.8	0.228	17	0.931	56	602	1.1	3.3	1.7	85	688	0.801
609.7	0.228	6.6	0.517	29	179	1.1	3.3	0.943	45	205	0.798
610.7	0.609	14	1.7	28	300	0.311	8.8	3.1	42	343	0.227
611.6	0.432	17	1.3	38	524	0.454	6.2	2.4	59	599	0.331
612.5	0.228	6.7	0.550	30	166	1.2	3.3	1.0	47	190	0.844
613.4	0.228	5.5	1.2	26	209	0.962	3.3	2.2	40	239	0.702
614.4	0.282	18	1.1	53	661	0.337	4.1	2.0	82	755	0.246
615.3	0.228	14	0.866	52	269	0.851	3.3	1.6	80	308	0.621
616.2	0.342	6.3	1.1	28	148	1.3	4.9	2.1	43	169	0.960
617.1	0.228	30	1.9	30	435	1.2	3.3	3.5	46	497	0.861
618.0	0.272	16	0.580	42	288	0.986	3.9	1.1	65	329	0.720
619.0	0.724	9.1	1.2	38	158	0.769	10	2.1	58	181	0.561
619.9	1.1	19	1.4	40	332	0.541	16	2.6	62	380	0.394
620.8	0.263	39	0.967	50	677	1.1	3.8	1.8	76	774	0.832
621.7	0.228	6.1	0.679	31	137	0.690	3.3	1.2	47	157	0.504
622.7	0.228	8.2	1.3	23	191	0.796	3.3	2.4	35	219	0.580
623.6	0.228	20	1.6	31	482	0.806	3.3	2.8	48	551	0.588
624.5	0.228	11	0.902	33	201	0.181	3.3	1.6	50	230	0.132
625.4	0.979	15	0.993	43	215	1.0	14	1.8	66	245	0.758
626.4	0.322	28	1.7	37	561	0.873	4.7	3.1	57	642	0.637
627.3	0.228	19	0.566	33	272	1.0	3.3	1.0	50	311	0.761
628.2	0.640	7.5	1.2	24	165	1.0	9.2	2.2	37	189	0.750
629.1	0.346	14	2.0	35	354	0.863	5.0	3.7	54	404	0.630
630.1	0.384	18	1.4	33	284	0.821	5.5	2.5	51	325	0.599
631.0	0.228	8.2	0.908	36	135	0.432	3.3	1.7	56	155	0.315
631.9	0.299	9.1	1.7	22	156	0.706	4.3	3.1	34	178	0.515
632.8	0.228	32	1.1	38	409	1.5	3.3	2.0	58	468	1.1
633.8	0.228	16	0.668	37	268	1.3	3.3	1.2	56	306	0.951
634.7	0.472	8.4	0.833	23	208	0.823	6.8	1.5	36	238	0.601
635.6	0.228	19	2.2	38	614	1.5	3.3	4.1	58	702	1.1
636.5	0.228	17	0.880	36	336	1.5	3.3	1.6	55	385	1.1
637.5	0.228	10	1.3	38	239	2.0	3.3	2.3	58	273	1.5
638.4	1.3	18	1.6	27	360	1.5	19	2.8	41	411	1.1
639.3	0.228	19	0.884	49	568	0.971	3.3	1.6	76	650	0.709
640.2	0.748	13	0.669	47	235	1.2	11	1.2	72	269	0.861
641.2	0.358	12	1.3	20	261	0.524	5.2	2.4	31	298	0.382
642.1	0.228	17	1.1	24	332	0.588	3.3	1.9	37	379	0.429
643.0	0.245	8.5	0.605	27	156	0.523	3.5	1.1	42	179	0.382
643.9	0.228	9.0	1.1	24	168	0.513	3.3	2.0	37	193	0.374
644.8	0.305	15	1.2	31	641	1.3	4.4	2.1	47	733	0.963
645.8	0.228	14	0.975	35	256	1.4	3.3	1.8	53	293	1.0
646.7	0.678	11	0.999	28	214	1.6	9.8	1.8	42	245	1.2
647.6	0.601	24	1.5	19	421	0.785	8.7	2.7	29	482	0.573
648.5	0.228	12	0.511	24	253	1.6	3.3	0.932	36	290	1.1
649.5	0.228	6.8	0.872	23	173	1.3	3.3	1.6	36	198	0.956
650.4	0.228	15	1.1	24	257	1.2	3.3	1.9	36	293	0.839
651.3	0.854	22	0.915	29	480	1.3	12	1.7	44	549	0.975
652.2	0.228	6.8	0.609	14	146	0.361	3.3	1.1	21	167	0.263
653.2	0.228	12	0.967	14	232	0.733	3.3	1.8	22	266	0.535
654.1	1.2	25	1.0	31	658	1.4	17	1.9	48	753	1.0
655.0	0.228	6.5	0.357	21	132	0.722	3.3	0.652	32	151	0.527
655.9	0.426	7.5	1.1	19	174	1.3	6.2	2.1	29	199	0.941
656.9	0.873	18	1.2	19	396	0.905	13	2.1	28	453	0.661
657.8	0.228	15	0.514	25	346	1.3	3.3	0.937	38	396	0.929
658.7	0.270	5.5	0.785	15	134	1.1	3.9	1.4	23	154	0.777
659.6	0.228	20	1.4	15	405	1.6	3.3	2.5	23	463	1.1
660.6	0.228	16	0.389	21	414	0.418	3.3	0.710	33	473	0.305
661.5	0.228	5.1	0.907	17	130	0.775	3.3	1.7	26	148	0.565
662.4	0.228	11	1.3	16	268	0.818	3.3	2.5	24	307	0.597
663.3	0.228	28	0.695	27	659	0.927	3.3	1.3	42	754	0.677
664.3	0.228	4.4	0.366	13	188	0.408	3.3	0.667	21	215	0.298
665.2	0.319	9.5	1.0	12	147	1.4	4.6	1.9	18	168	1.0
666.1	0.228	16	0.869	7.6	313	0.972	3.3	1.6	12	358	0.709
667.0	0.228	6.5	0.451	14	175	0.377	3.3	0.822	21	200	0.275
667.9	0.228	3.9	0.672	13	154	1.3	3.3	1.2	20	177	0.973
668.9	0.649	20	1.7	20	473	1.3	9.4	3.1	30	541	0.950
669.8	0.632	14	0.277	26	198	0.406	9.1	0.505	40	226	0.296
670.7	0.839	12	0.923	33	291	2.1	12	1.7	51	333	1.5
671.6	0.521	16	1.4	16	395	1.7	7.5	2.6	25	451	1.2
672.6	0.228	15	0.498	18	418	0.369	3.3	0.908	28	478	0.269
673.5	0.487	6.8	0.895	15	152	1.4	7.0	1.6	23	174	0.993



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
674.4	0.535	9.4	1.3	15	187	1.4	7.7	2.4	24	213	1.0
675.3	0.228	25	0.695	24	570	0.301	3.3	1.3	37	652	0.220
676.3	0.228	7.0	0.245	20	229	0.984	3.3	0.447	31	262	0.718
677.2	0.432	6.2	0.638	13	149	1.3	6.2	1.2	19	170	0.981
678.1	0.601	20	0.820	17	492	0.902	8.7	1.5	26	563	0.658
679.0	0.228	11	0.638	18	318	1.3	3.3	1.2	28	364	0.947
680.0	0.258	5.4	0.910	20	140	1.5	3.7	1.7	31	160	1.1
680.9	0.339	20	1.3	20	358	1.7	4.9	2.4	31	409	1.2
681.8	0.358	18	0.603	28	570	0.641	5.2	1.1	43	652	0.468
682.7	0.228	5.3	0.597	18	108	0.764	3.3	1.1	27	123	0.558
683.7	0.797	9.1	1.7	13	182	1.5	12	3.0	20	208	1.1
684.6	0.228	23	0.595	15	483	1.2	3.3	1.1	24	553	0.875
685.5	0.367	6.0	0.358	20	188	0.886	5.3	0.652	30	215	0.646
686.4	0.259	6.8	0.959	16	127	0.929	3.7	1.7	24	145	0.678
687.4	0.697	23	1.3	25	610	1.2	10	2.4	38	697	0.892
688.3	0.274	15	0.796	29	425	0.616	4.0	1.5	44	486	0.450
689.2	0.228	3.8	0.649	13	115	1.1	3.3	1.2	19	131	0.802
690.1	0.800	28	0.955	21	465	1.4	12	1.7	32	532	1.0
691.1	0.228	14	0.613	30	412	0.332	3.3	1.1	46	472	0.242
692.0	0.260	6.4	0.755	28	143	1.1	3.8	1.4	43	163	0.816
692.9	0.821	16	1.6	26	294	0.852	12	2.9	40	336	0.621
693.8	0.586	19	0.764	26	508	0.880	8.5	1.4	39	581	0.642
694.7	0.228	8.8	0.449	18	181	1.1	3.3	0.820	28	207	0.787
695.7	0.378	12	1.2	17	227	0.779	5.5	2.2	26	259	0.568
696.6	1.3	25	0.998	26	525	1.1	18	1.8	40	600	0.793
697.5	0.271	10.0	0.479	32	249	1.2	3.9	0.873	48	285	0.850
698.4	0.228	6.8	0.964	34	190	0.821	3.3	1.8	52	217	0.599
699.4	0.228	23	1.2	38	578	0.161	3.3	2.2	58	661	0.117
700.3	0.228	19	0.968	37	619	0.837	3.3	1.8	56	708	0.611
701.2	0.318	6.9	0.622	20	100	0.555	4.6	1.1	31	115	0.405
702.1	0.228	19	2.0	23	418	1.3	3.3	3.7	35	478	0.926
703.1	0.553	21	1.1	28	403	1.5	8.0	2.1	43	461	1.1
704.0	0.353	5.4	0.533	28	132	0.696	5.1	0.973	42	151	0.508
704.9	0.411	14	2.4	35	323	0.729	5.9	4.4	54	369	0.532
705.8	0.343	26	0.882	37	637	1.2	4.9	1.6	56	728	0.906
706.8	0.228	12	0.593	47	307	1.5	3.3	1.1	72	351	1.1
707.7	0.515	10	0.836	22	165	1.4	7.4	1.5	34	188	1.0
708.6	0.228	21	3.4	29	491	0.803	3.3	6.2	44	561	0.586
709.5	0.816	12	0.928	25	218	0.967	12	1.7	38	249	0.706
710.5	0.228	5.9	1.2	21	156	1.1	3.3	2.2	33	178	0.786
711.4	0.696	18	2.4	29	468	1.5	10	4.4	45	536	1.1
712.3	0.742	18	0.549	36	325	0.934	11	1.0	56	371	0.682
713.2	0.228	8.4	0.901	19	186	1.1	3.3	1.6	29	212	0.795
714.2	0.519	15	1.9	30	305	0.778	7.5	3.4	46	349	0.568
715.1	0.228	21	1.0	31	511	0.506	3.3	1.9	47	584	0.369
716.0	0.228	8.4	0.702	35	195	1.4	3.3	1.3	53	223	1.0
716.9	0.288	9.8	1.3	30	199	1.4	4.2	2.4	46	227	1.1
717.8	0.750	28	1.4	36	743	0.744	11	2.6	55	850	0.543
718.8	0.228	13	1.3	37	328	0.741	3.3	2.3	56	375	0.540
719.7	0.495	7.2	1.1	30	161	0.860	7.1	2.1	45	184	0.628
720.6	0.228	23	2.2	44	661	1.1	3.3	4.0	67	756	0.800
721.5	0.228	15	0.661	22	356	0.593	3.3	1.2	33	407	0.433
722.5	0.667	8.8	0.849	43	176	0.574	9.6	1.5	66	201	0.418
723.4	0.228	19	2.0	32	403	0.402	3.3	3.6	50	461	0.293
724.3	0.767	21	0.916	45	673	0.737	11	1.7	69	769	0.538
725.2	0.228	7.4	0.773	42	209	0.856	3.3	1.4	64	239	0.625
726.2	0.228	10	1.8	26	167	0.666	3.3	3.4	40	191	0.486
727.1	0.529	25	1.3	34	713	1.1	7.6	2.3	52	815	0.776
728.0	0.462	14	0.808	68	387	1.1	6.7	1.5	104	442	0.796
728.9	0.409	8.9	1.5	38	235	1.3	5.9	2.8	58	268	0.979
729.9	0.913	26	1.7	38	684	1.1	13	3.1	58	782	0.808
730.8	0.373	22	0.985	46	448	0.526	5.4	1.8	71	513	0.384
731.7	0.555	7.8	1.1	26	164	1.3	8.0	2.0	39	187	0.938
732.6	0.228	18	1.8	31	297	0.484	3.3	3.2	47	339	0.353
733.6	0.549	20	0.822	30	213	1.1	7.9	1.5	46	243	0.768
734.5	0.330	6.4	0.693	26	168	0.431	4.8	1.3	39	192	0.315
735.4	0.399	11	1.7	35	236	1.1	5.8	3.0	54	270	0.774
736.3	0.228	17	1.5	39	677	1.1	3.3	2.6	60	774	0.791
737.3	1.2	11	1.0	66	349	1.9	17	1.9	101	400	1.4
738.2	0.584	7.7	0.866	21	158	1.1	8.4	1.6	32	180	0.790
739.1	0.273	33	2.0	33	696	0.840	3.9	3.7	51	796	0.613
740.0	0.228	12	0.742	39	282	0.701	3.3	1.4	60	322	0.511
740.9	0.228	7.6	1.1	44	216	0.608	3.3	2.0	67	247	0.444
741.9	0.621	27	2.4	38	426	0.617	9.0	4.3	58	487	0.450
742.8	0.276	20	0.955	49	471	1.1	4.0	1.7	75	538	0.821
743.7	0.228	6.7	1.1	29	207	0.625	3.3	2.0	44	236	0.456
744.6	1.0	30	1.1	41	544	2.8	15	2.0	62	622	2.0
745.6	0.265	20	1.1	25	352	1.3	3.8	2.1	38	403	0.968
746.5	0.399	8.3	1.1	31	185	0.618	5.8	2.0	48	212	0.451
747.4	0.548	9.6	1.5	21	235	1.1	7.9	2.8	32	268	0.775
748.3	0.674	18	1.9	46	707	1.4	9.7	3.5	71	808	0.987



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
749.3	0.228	16	0.922	45	443	0.510	3.3	1.7	69	506	0.372
750.2	0.228	8.0	1.3	28	217	0.695	3.3	2.4	43	248	0.507
751.1	1.2	29	2.6	35	647	1.7	17	4.7	54	740	1.2
752.0	0.228	9.9	1.0	33	494	1.2	3.3	1.8	51	565	0.865
753.0	0.228	7.4	1.1	28	188	1.1	3.3	2.1	43	215	0.787
753.9	0.251	13	2.1	27	311	1.1	3.6	3.8	41	355	0.832
754.8	0.228	31	1.1	40	525	1.5	3.3	2.1	61	600	1.1
755.7	0.228	8.1	0.672	30	212	0.348	3.3	1.2	46	242	0.254
756.7	0.228	11	1.7	22	271	0.583	3.3	3.0	34	310	0.425
757.6	0.552	36	1.2	36	602	0.973	8.0	2.2	55	688	0.710
758.5	0.347	11	0.681	29	288	0.611	5.0	1.2	44	329	0.446
759.4	0.228	16	2.0	37	320	1.0	3.3	3.7	56	366	0.756
760.4	1.2	40	2.3	36	474	1.2	17	4.2	55	542	0.842
761.3	0.532	23	0.988	29	413	0.511	7.7	1.8	44	472	0.373
762.2	0.651	16	1.2	32	289	1.0	9.4	2.2	49	330	0.743
763.1	1.1	25	1.5	26	368	0.576	16	2.7	40	421	0.420
764.1	0.449	29	0.724	25	491	1.7	6.5	1.3	38	561	1.2
765.0	0.230	10	0.769	27	172	0.574	3.3	1.4	42	197	0.419
765.9	0.331	23	1.0	34	455	2.3	4.8	1.8	52	520	1.7
766.8	1.0	35	1.2	32	582	2.4	15	2.2	49	665	1.7
767.7	0.228	12	0.791	32	246	1.3	3.3	1.4	50	281	0.969
768.7	0.451	10	1.3	17	176	0.698	6.5	2.4	25	201	0.509
769.6	0.754	20	1.5	30	341	1.2	11	2.7	46	390	0.840
770.5	0.228	15	0.698	32	307	0.704	3.3	1.3	49	351	0.513
771.4	0.228	18	1.2	26	227	2.0	3.3	2.3	39	260	1.5
772.4	0.228	25	2.0	31	482	0.340	3.3	3.6	48	551	0.248
773.3	0.614	21	0.829	32	484	0.939	8.9	1.5	48	553	0.685
774.2	0.228	7.2	1.0	17	178	0.774	3.3	1.8	26	203	0.565
775.1	0.453	19	1.9	18	242	0.491	6.5	3.5	28	277	0.358
776.1	0.228	24	1.2	26	187	0.450	3.3	2.2	40	213	0.328
777.0	0.515	11	1.6	42	286	1.4	7.4	2.8	64	326	1.0
777.9	0.228	12	1.2	33	284	2.1	3.3	2.1	51	325	1.6
778.8	1.3	28	0.806	23	528	1.2	18	1.5	36	604	0.894
779.8	0.228	13	0.936	18	236	1.2	3.3	1.7	28	270	0.849
780.7	0.397	11	1.5	19	176	1.4	5.7	2.8	30	202	1.0
781.6	0.228	28	1.1	30	238	1.5	3.3	2.0	46	272	1.1
782.5	0.573	14	1.3	29	331	0.860	8.3	2.3	45	378	0.628
783.5	0.426	13	1.0	22	235	1.1	6.2	1.8	34	268	0.783
784.4	0.510	15	1.2	23	281	0.892	7.4	2.1	35	322	0.651
785.3	0.228	18	1.4	36	321	1.4	3.3	2.6	55	367	1.0
786.2	0.613	14	0.988	50	427	3.6	8.9	1.8	77	488	2.6
787.2	0.228	21	1.4	31	348	1.4	3.3	2.6	47	397	1.0
788.1	1.0	15	1.2	27	484	1.3	15	2.1	42	554	0.980
789.0	0.228	9.6	1.4	27	249	1.5	3.3	2.5	41	284	1.1
789.9	0.394	10	1.5	32	262	0.930	5.7	2.7	49	300	0.678
790.8	0.228	26	1.9	39	779	1.5	3.3	3.5	59	891	1.1
791.8	0.228	16	0.761	31	333	1.1	3.3	1.4	48	381	0.777
792.7	0.254	13	1.2	27	232	1.0	3.7	2.3	41	266	0.758
793.6	0.313	23	1.5	27	397	0.417	4.5	2.8	41	454	0.305
794.5	0.514	19	1.1	44	287	1.2	7.4	2.1	67	329	0.848
795.5	0.565	9.5	0.985	25	205	1.2	8.2	1.8	39	234	0.847
796.4	0.228	21	1.5	37	310	0.545	3.3	2.7	57	354	0.398
797.3	0.421	25	1.2	32	345	0.867	6.1	2.2	48	395	0.633
798.2	0.228	11	0.992	26	184	0.608	3.3	1.8	40	210	0.444
799.2	0.228	16	0.991	24	181	0.491	3.3	1.8	37	207	0.358
800.1	0.468	29	1.6	32	473	1.8	6.7	2.8	49	541	1.3
801.0	0.300	12	0.699	36	244	1.3	4.3	1.3	55	279	0.975
801.9	0.321	14	0.961	42	249	0.686	4.6	1.8	65	285	0.500
802.9	0.870	27	1.6	34	234	0.903	13	2.8	51	267	0.659
803.8	0.295	20	0.988	29	312	0.393	4.3	1.8	45	357	0.287
804.7	0.524	10.0	0.651	26	147	1.1	7.6	1.2	39	168	0.775
805.6	0.228	25	1.2	30	407	0.812	3.3	2.2	46	466	0.593
806.6	0.779	24	1.4	28	416	1.4	11	2.6	42	476	0.988
807.5	0.228	8.7	1.3	38	184	1.9	3.3	2.3	57	210	1.4
808.4	1.4	15	2.0	32	294	1.9	20	3.6	48	336	1.4
809.3	0.228	16	1.2	38	340	0.741	3.3	2.1	58	389	0.540
810.3	0.438	11	1.1	25	317	0.992	6.3	1.9	39	362	0.724
811.2	0.747	17	1.6	31	261	1.7	11	2.9	48	299	1.3
812.1	0.811	22	1.2	35	560	1.4	12	2.3	54	640	1.0
813.0	0.228	12	1.1	26	251	1.4	3.3	2.0	39	287	0.992
814.0	0.603	6.3	1.4	26	169	0.279	8.7	2.6	40	193	0.204
814.9	0.399	15	1.3	38	296	1.1	5.8	2.3	58	338	0.833
815.8	0.509	20	1.4	30	266	1.2	7.4	2.5	47	305	0.841
816.7	0.756	9.7	1.7	37	316	2.4	11	3.1	56	361	1.7
817.7	0.744	15	2.0	35	342	1.4	11	3.6	54	391	1.0
818.6	0.469	21	1.7	36	445	1.1	6.8	3.0	55	508	0.807
819.5	0.244	8.3	1.3	36	229	0.883	3.5	2.4	55	262	0.645
820.4	0.480	9.3	1.4	28	264	0.945	6.9	2.5	43	302	0.690
821.3	0.728	14	1.2	40	416	2.0	11	2.2	61	475	1.4
822.3	0.228	12	1.1	41	409	1.0	3.3	2.0	63	467	0.743
823.2	0.502	7.8	1.3	26	158	1.7	7.3	2.4	40	180	1.2



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
824.1	1.1	25	1.8	40	519	1.4	16	3.2	61	594	1.0
825.0	0.229	12	0.716	25	221	0.829	3.3	1.3	39	253	0.605
826.0	0.228	12	1.1	50	382	1.5	3.3	2.0	76	437	1.1
826.9	0.537	12	2.0	34	342	1.1	7.8	3.6	52	392	0.787
827.8	0.487	13	2.0	45	673	0.423	7.0	3.6	69	770	0.308
828.7	0.248	9.2	1.4	40	277	1.5	3.6	2.6	62	317	1.1
829.7	0.385	11	2.3	29	275	0.449	5.6	4.1	45	314	0.328
830.6	0.371	14	1.6	42	278	0.792	5.4	2.9	65	318	0.578
831.5	0.561	12	1.2	39	322	0.733	8.1	2.1	59	368	0.535
832.4	0.477	15	1.2	45	346	1.6	6.9	2.2	69	396	1.1
833.4	0.258	17	1.2	37	393	1.1	3.7	2.2	57	449	0.768
834.3	0.706	12	1.0	52	220	0.844	10	1.9	79	251	0.616
835.2	0.280	14	1.4	35	355	1.0	4.0	2.6	54	406	0.741
836.1	0.658	9.9	1.2	45	291	1.3	9.5	2.2	69	333	0.931
837.1	0.478	11	1.6	35	300	0.353	6.9	2.9	54	344	0.258
838.0	0.480	12	1.4	45	328	0.355	6.9	2.6	69	375	0.259
838.9	0.228	13	1.4	40	323	1.5	3.3	2.6	61	370	1.1
839.8	1.1	11	1.1	43	497	0.651	16	2.0	66	569	0.475
840.8	0.810	15	2.0	50	413	0.937	12	3.6	77	473	0.684
841.7	0.228	16	1.3	38	311	0.791	3.3	2.4	58	356	0.577
842.6	0.700	9.8	1.2	38	380	0.604	10	2.1	58	435	0.441
843.5	1.2	15	1.8	33	360	0.886	17	3.2	51	412	0.646
844.4	0.705	11	2.0	38	312	0.504	10	3.7	58	357	0.368
845.4	0.228	11	1.5	41	355	1.1	3.3	2.7	63	406	0.799
846.3	0.744	18	1.5	52	317	1.3	11	2.7	79	363	0.944
847.2	0.281	15	1.4	39	430	1.4	4.1	2.5	60	491	1.0
848.1	0.674	12	1.4	44	339	0.817	9.7	2.6	68	387	0.596
849.1	0.672	13	1.5	53	363	1.2	9.7	2.7	80	415	0.854
850.0	0.505	14	1.7	43	385	1.3	7.3	3.2	66	440	0.927
850.9	0.228	12	2.5	46	371	0.468	3.3	4.6	71	424	0.342
851.8	0.897	12	1.3	52	400	0.511	13	2.3	80	457	0.373
852.8	0.915	15	1.6	56	389	0.788	13	3.0	86	445	0.575
853.7	0.298	10	1.5	41	330	1.6	4.3	2.8	63	377	1.2
854.6	0.228	17	1.8	53	525	1.2	3.3	3.2	80	600	0.869
855.5	0.369	14	1.1	42	292	0.540	5.3	2.0	64	334	0.394
856.5	1.4	13	0.974	42	391	1.4	20	1.8	64	448	1.0
857.4	0.228	16	1.6	55	419	1.3	3.3	2.9	84	479	0.928
858.3	0.914	11	1.5	44	420	0.848	13	2.8	67	481	0.618
859.2	0.300	11	1.5	39	321	1.6	4.3	2.7	59	367	1.2
860.2	0.461	15	1.9	35	316	0.574	6.7	3.5	53	362	0.419
861.1	0.419	13	0.824	35	295	0.489	6.1	1.5	54	337	0.357
862.0	0.666	15	1.0	50	424	1.6	9.6	1.8	77	485	1.2
862.9	0.659	16	1.3	40	347	0.684	9.5	2.4	61	397	0.499
863.9	0.332	11	1.6	38	495	0.829	4.8	2.9	58	566	0.605
864.8	1.4	14	1.1	42	474	1.0	20	2.1	65	542	0.743
865.7	0.322	8.5	1.1	25	201	0.634	4.6	2.0	38	230	0.462
866.6	0.342	18	1.4	39	333	1.1	4.9	2.6	60	381	0.803
867.6	0.516	15	1.6	49	389	0.602	7.4	2.9	75	444	0.439
868.5	0.228	13	1.2	35	287	0.641	3.3	2.3	54	328	0.468
869.4	0.228	14	1.3	43	386	0.809	3.3	2.4	66	441	0.590
870.3	0.273	17	1.4	41	327	0.739	3.9	2.6	63	374	0.539
871.3	0.346	9.9	0.941	29	255	0.870	5.0	1.7	44	291	0.635
872.2	0.228	17	1.3	44	404	1.5	3.3	2.4	68	462	1.1
873.1	0.298	16	1.4	43	606	0.533	4.3	2.6	66	693	0.389
874.0	0.749	13	1.4	34	330	0.645	11	2.5	53	377	0.471
874.9	0.228	13	1.7	49	389	0.904	3.3	3.1	75	445	0.659
875.9	0.558	23	1.4	42	344	0.606	8.1	2.5	64	394	0.442
876.8	0.729	17	0.905	52	419	0.802	11	1.7	80	479	0.585
877.7	0.228	11	1.1	27	219	0.645	3.3	2.0	41	251	0.470
878.6	0.228	23	0.671	39	319	0.853	3.3	1.2	59	364	0.622
879.6	0.926	17	1.0	38	380	1.5	13	1.9	58	434	1.1
880.5	0.572	16	1.1	39	447	1.9	8.3	2.0	60	511	1.4
881.4	0.294	16	1.3	32	319	1.5	4.2	2.3	49	365	1.1
882.3	0.228	20	1.5	42	616	0.800	3.3	2.7	64	705	0.584
883.3	0.228	15	0.874	38	277	0.463	3.3	1.6	59	317	0.338
884.2	0.228	19	0.824	32	343	1.9	3.3	1.5	49	392	1.4
885.1	0.299	22	2.1	37	539	0.673	4.3	3.8	57	616	0.491
886.0	0.424	18	0.822	33	241	0.648	6.1	1.5	51	276	0.473
887.0	0.228	8.9	0.695	26	158	0.687	3.3	1.3	40	181	0.501
887.9	0.683	19	1.7	31	388	1.1	9.9	3.1	48	444	0.780
888.8	0.754	25	0.904	42	487	0.914	11	1.6	64	557	0.667
889.7	0.228	15	1.1	31	405	1.4	3.3	2.1	47	463	1.0
890.7	0.242	16	1.5	28	265	1.1	3.5	2.8	43	303	0.802
891.6	0.357	27	1.0	37	446	1.5	5.2	1.9	56	510	1.1
892.5	0.397	12	0.719	19	209	0.692	5.7	1.3	29	239	0.505
893.4	0.228	17	1.1	29	279	0.900	3.3	2.0	44	319	0.657
894.4	0.228	23	1.2	29	347	0.512	3.3	2.3	45	396	0.373
895.3	0.228	17	0.546	40	238	0.804	3.3	0.996	62	272	0.586
896.2	0.228	12	1.4	32	207	0.738	3.3	2.6	49	237	0.538
897.1	0.858	23	1.5	29	398	0.864	12	2.8	44	455	0.630
898.0	0.435	21	1.3	27	563	0.764	6.3	2.3	41	643	0.557



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
899.0	0.228	9.6	0.852	36	204	0.709	3.3	1.6	56	233	0.517
899.9	0.228	18	1.3	39	477	0.326	3.3	2.4	61	545	0.238
900.8	0.292	28	0.978	31	526	0.790	4.2	1.8	47	602	0.576
901.7	0.228	8.8	0.598	31	203	0.934	3.3	1.1	47	232	0.681
902.7	0.315	13	1.1	22	250	0.932	4.6	1.9	34	286	0.680
903.6	0.268	19	1.4	24	381	0.970	3.9	2.5	37	436	0.708
904.5	0.228	19	0.558	32	302	0.924	3.3	1.0	49	345	0.674
905.4	0.507	11	1.1	29	245	0.662	7.3	2.1	45	280	0.483
906.4	0.474	21	1.7	28	327	1.5	6.8	3.1	44	374	1.1
907.3	0.228	19	1.0	34	502	0.332	3.3	1.8	53	574	0.242
908.2	0.403	7.2	0.731	20	195	0.467	5.8	1.3	31	223	0.340
909.1	0.299	23	2.0	38	501	1.4	4.3	3.7	58	573	0.992
910.1	0.466	23	0.478	27	496	1.1	6.7	0.872	41	568	0.803
911.0	0.228	14	0.879	18	263	0.503	3.3	1.6	28	301	0.367
911.9	0.228	10.0	0.967	24	264	0.748	3.3	1.8	37	302	0.545
912.8	0.228	20	1.6	35	453	1.2	3.3	2.8	54	518	0.900
913.8	0.677	11	0.598	39	305	0.628	9.8	1.1	60	349	0.458
914.7	0.404	19	1.1	36	356	1.2	5.8	2.0	55	407	0.842
915.6	0.265	30	0.771	27	693	0.980	3.8	1.4	41	793	0.715
916.5	0.228	19	0.665	24	208	0.265	3.3	1.2	37	238	0.193
917.5	0.573	15	0.712	66	420	2.4	8.3	1.3	101	480	1.7
918.4	0.486	23	0.498	31	291	0.856	7.0	0.908	47	333	0.625
919.3	0.388	16	0.875	33	476	0.800	5.6	1.6	50	544	0.584
920.2	0.228	8.4	0.774	23	230	0.578	3.3	1.4	35	263	0.421
921.1	0.348	13	1.3	25	371	1.1	5.0	2.3	38	425	0.816
922.1	0.228	17	0.629	27	330	1.6	3.3	1.1	42	377	1.1
923.0	0.228	12	0.618	25	263	1.1	3.3	1.1	38	300	0.776
923.9	0.701	11	1.2	23	282	1.7	10	2.1	35	323	1.2
924.8	0.228	21	0.895	28	375	0.905	3.3	1.6	43	429	0.660
925.8	0.276	11	0.511	18	224	0.787	4.0	0.932	27	257	0.575
926.7	0.228	12	0.995	26	237	0.723	3.3	1.8	40	271	0.528
927.6	0.685	20	1.0	27	496	0.659	9.9	1.9	42	568	0.481
928.5	0.500	13	0.701	19	309	0.984	7.2	1.3	29	353	0.718
929.5	0.288	11	0.610	25	225	0.927	4.2	1.1	38	257	0.677
930.4	0.767	20	0.888	24	378	1.1	11	1.6	37	432	0.778
931.3	0.228	14	1.6	33	285	0.420	3.3	2.9	50	326	0.306
932.2	0.228	15	0.797	38	323	1.7	3.3	1.5	59	369	1.2
933.2	0.246	16	0.491	26	336	1.4	3.5	0.896	40	385	1.000
934.1	0.425	20	0.958	27	393	1.8	6.1	1.7	42	450	1.3
935.0	0.228	14	0.994	38	509	1.6	3.3	1.8	59	582	1.1
935.9	0.228	8.0	1.1	20	187	1.5	3.3	2.0	31	214	1.1
936.9	0.644	19	0.765	22	608	0.984	9.3	1.4	34	696	0.718
937.8	0.361	13	1.1	25	305	0.637	5.2	1.9	39	349	0.465
938.7	0.228	11	1.1	31	285	1.6	3.3	2.0	47	325	1.2
939.6	0.228	17	1.2	23	435	2.0	3.3	2.2	36	497	1.5
940.6	0.228	15	0.990	22	296	1.2	3.3	1.8	33	339	0.899
941.5	0.252	7.3	0.599	17	192	0.901	3.6	1.1	27	219	0.658
942.4	0.921	23	1.1	25	434	0.705	13	2.1	39	496	0.514
943.3	0.252	12	1.2	29	295	1.3	3.6	2.2	44	338	0.912
944.3	0.379	16	1.4	29	394	1.2	5.5	2.6	44	450	0.877
945.2	0.406	10	0.730	18	250	0.713	5.9	1.3	27	286	0.520
946.1	0.228	11	0.932	18	295	1.5	3.3	1.7	28	338	1.1
947.0	0.228	12	0.918	18	327	0.421	3.3	1.7	28	374	0.307
947.9	0.228	13	1.0	17	290	1.4	3.3	1.9	26	332	1.0
948.9	0.228	11	1.1	17	328	0.962	3.3	1.9	26	375	0.702
949.8	0.286	12	1.3	18	322	0.643	4.1	2.4	27	369	0.469
950.7	0.228	9.4	1.1	16	258	1.1	3.3	2.1	25	295	0.796
951.6	0.926	15	0.452	15	283	0.912	13	0.824	23	324	0.665
952.6	0.228	12	0.812	20	396	2.0	3.3	1.5	31	453	1.4
953.5	0.228	9.8	0.770	15	234	0.583	3.3	1.4	23	267	0.426
954.4	0.362	13	1.3	20	323	1.6	5.2	2.4	31	370	1.1
955.3	0.228	11	0.773	18	320	0.928	3.3	1.4	27	366	0.677
956.3	0.228	13	0.729	18	314	1.1	3.3	1.3	28	359	0.819
957.2	0.228	12	0.434	18	318	1.000	3.3	0.792	27	364	0.730
958.1	0.296	18	0.420	17	239	0.633	4.3	0.766	25	273	0.462
959.0	0.378	11	0.907	13	281	1.1	5.5	1.7	20	321	0.816
960.0	0.228	11	0.578	19	304	1.4	3.3	1.1	29	348	0.990
960.9	0.228	13	0.604	19	337	0.977	3.3	1.1	29	386	0.713
961.8	0.228	13	0.856	19	427	1.5	3.3	1.6	29	489	1.1
962.7	0.329	12	0.697	19	330	1.3	4.8	1.3	30	377	0.947
963.7	0.417	20	0.699	20	334	1.2	6.0	1.3	31	382	0.899
964.6	0.228	12	1.0	17	271	0.880	3.3	1.9	26	310	0.642
965.5	0.274	7.9	0.618	9.6	177	0.320	4.0	1.1	15	203	0.233
966.4	0.264	11	0.884	14	310	1.4	3.8	1.6	22	354	1.1
967.4	0.417	15	0.578	17	434	0.859	6.0	1.1	25	496	0.627
968.3	0.493	11	0.639	14	403	0.971	7.1	1.2	21	461	0.709
969.2	0.228	7.0	0.684	14	197	0.503	3.3	1.2	21	225	0.367
970.1	0.323	9.8	0.689	27	525	0.875	4.7	1.3	41	601	0.639
971.1	0.228	13	0.986	22	462	1.8	3.3	1.8	34	528	1.3
972.0	0.228	9.5	0.782	18	233	1.3	3.3	1.4	27	266	0.944
972.9	0.228	11	1.2	18	314	2.0	3.3	2.1	28	359	1.5



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
973.8	0.228	17	0.516	17	363	0.777	3.3	0.940	26	415	0.567
974.7	0.228	8.6	0.348	10	186	1.1	3.3	0.635	16	213	0.772
975.7	0.228	13	0.728	18	251	0.983	3.3	1.3	27	287	0.717
976.6	0.799	13	0.592	21	471	1.0	12	1.1	32	538	0.734
977.5	0.228	7.8	0.746	18	231	1.5	3.3	1.4	28	264	1.1
978.4	0.228	13	0.829	14	219	1.1	3.3	1.5	22	251	0.768
979.4	0.420	18	1.0	15	209	0.615	6.1	1.8	23	239	0.449
980.3	0.255	12	0.686	17	276	1.0	3.7	1.3	27	315	0.760
981.2	0.228	11	0.823	13	191	0.667	3.3	1.5	20	218	0.487
982.1	0.262	12	0.734	15	267	0.711	3.8	1.3	23	305	0.518
983.1	0.228	12	0.723	16	297	1.3	3.3	1.3	25	340	0.943
984.0	0.228	11	0.784	23	335	1.8	3.3	1.4	36	384	1.3
984.9	0.228	14	1.0	21	297	0.882	3.3	1.9	32	339	0.643
985.8	0.675	10	0.678	18	312	0.516	9.7	1.2	28	357	0.377
986.8	0.228	14	0.683	25	346	1.5	3.3	1.2	38	396	1.1
987.7	0.262	8.4	0.780	13	185	1.0	3.8	1.4	19	211	0.736
988.6	0.228	12	1.8	25	356	1.3	3.3	3.4	39	407	0.944
989.5	0.228	16	0.683	18	262	1.4	3.3	1.2	28	300	1.0
990.5	0.228	12	0.902	40	284	0.649	3.3	1.6	62	325	0.473
991.4	0.457	15	1.3	15	343	0.917	6.6	2.4	24	393	0.669
992.3	0.228	12	0.792	26	333	1.6	3.3	1.4	39	381	1.1
993.2	0.819	16	0.842	45	466	1.4	12	1.5	68	533	1.0
994.2	0.228	7.3	1.2	17	254	0.604	3.3	2.1	26	290	0.441
995.1	0.228	24	1.1	24	609	1.4	3.3	1.9	36	697	1.0
996.0	0.228	10.0	0.582	21	184	1.5	3.3	1.1	33	211	1.1
996.9	0.823	9.1	1.1	21	196	2.1	12	2.1	32	224	1.6
997.9	0.384	18	0.562	26	574	1.6	5.5	1.0	40	656	1.1
998.8	0.228	12	0.541	27	293	1.1	3.3	0.986	41	334	0.838
999.7	0.228	6.0	0.698	17	180	1.1	3.3	1.3	26	205	0.771
1000.6	0.228	15	1.1	18	433	0.910	3.3	2.0	27	495	0.664
1001.5	0.228	17	0.615	24	281	0.545	3.3	1.1	37	321	0.398
1002.5	0.228	11	1.2	14	279	0.904	3.3	2.2	21	319	0.660
1003.4	0.539	20	0.748	22	513	1.1	7.8	1.4	34	586	0.811
1004.3	0.285	22	1.0	24	444	0.771	4.1	1.9	37	508	0.562
1005.2	0.228	11	0.760	21	240	0.937	3.3	1.4	32	275	0.683
1006.2	0.228	6.4	1.0	15	194	0.943	3.3	1.9	23	221	0.688
1007.1	0.528	15	0.693	24	321	2.5	7.6	1.3	37	367	1.8
1008.0	0.228	12	1.3	24	366	1.5	3.3	2.3	36	419	1.1
1008.9	0.228	12	1.4	20	307	1.1	3.3	2.6	31	351	0.790
1009.9	0.364	15	1.1	26	361	1.0	5.3	2.0	41	413	0.759
1010.8	0.321	13	0.771	11	260	0.758	4.6	1.4	18	298	0.553
1011.7	0.228	12	1.0	23	292	0.376	3.3	1.9	36	334	0.274
1012.6	0.228	11	1.5	18	227	0.916	3.3	2.8	28	260	0.668
1013.6	0.228	12	0.995	22	352	1.1	3.3	1.8	34	402	0.804
1014.5	0.228	12	0.817	28	271	1.1	3.3	1.5	43	310	0.807
1015.4	0.242	13	1.3	20	259	1.4	3.5	2.3	31	296	1.0
1016.3	0.228	20	0.880	21	445	1.1	3.3	1.6	32	508	0.838
1017.3	0.228	13	0.774	24	312	0.812	3.3	1.4	37	357	0.593
1018.2	0.383	15	0.817	36	348	0.863	5.5	1.5	55	398	0.629
1019.1	0.683	24	1.3	23	462	1.5	9.9	2.3	35	528	1.1
1020.0	0.228	13	0.677	24	312	1.1	3.3	1.2	36	357	0.803
1021.0	0.627	12	0.928	27	244	1.8	9.1	1.7	42	278	1.3
1021.9	0.228	20	0.739	22	361	0.950	3.3	1.3	34	413	0.693
1022.8	0.257	18	1.2	23	303	0.697	3.7	2.2	36	347	0.509
1023.7	0.228	17	1.2	35	275	1.0	3.3	2.2	54	315	0.740
1024.7	0.228	13	1.1	22	247	1.3	3.3	1.9	33	283	0.918
1025.6	0.585	20	0.978	24	361	0.635	8.4	1.8	36	413	0.463
1026.5	0.228	7.7	0.812	23	220	0.957	3.3	1.5	36	252	0.698
1027.4	0.633	7.8	1.1	20	224	0.638	9.1	2.1	31	256	0.465
1028.3	0.228	23	1.3	22	499	1.2	3.3	2.3	33	570	0.889
1029.3	0.228	12	0.758	23	268	1.2	3.3	1.4	35	306	0.884
1030.2	0.405	12	1.2	34	255	0.719	5.8	2.2	51	291	0.524
1031.1	0.228	26	0.978	26	477	1.7	3.3	1.8	40	545	1.2
1032.0	0.228	16	0.575	19	337	0.708	3.3	1.0	29	386	0.516
1033.0	0.283	9.2	1.2	23	195	0.669	4.1	2.1	35	223	0.488
1033.9	0.622	25	1.8	19	293	1.2	9.0	3.4	29	335	0.894
1034.8	0.228	23	0.700	21	451	1.6	3.3	1.3	32	516	1.2
1035.7	0.228	10	0.749	25	209	1.6	3.3	1.4	39	239	1.2
1036.7	0.826	14	1.1	23	258	1.3	12	1.9	35	296	0.951
1037.6	0.686	17	1.2	24	426	0.793	9.9	2.1	37	487	0.579
1038.5	0.228	10	0.368	17	300	0.273	3.3	0.671	27	343	0.199
1039.4	0.251	15	0.924	17	212	1.3	3.6	1.7	26	242	0.914
1040.4	0.336	13	0.887	15	235	0.960	4.8	1.6	22	268	0.700
1041.3	0.228	22	0.813	28	443	0.976	3.3	1.5	42	506	0.712
1042.2	0.228	5.6	0.535	15	120	0.792	3.3	0.976	23	138	0.578
1043.1	0.541	18	0.838	23	361	2.6	7.8	1.5	36	413	1.9
1044.1	0.228	21	0.784	19	469	0.824	3.3	1.4	30	536	0.601
1045.0	0.558	9.1	0.575	14	269	1.3	8.1	1.0	21	308	0.924
1045.9	0.430	17	1.0	22	306	0.762	6.2	1.9	33	350	0.556
1046.8	0.228	13	0.604	19	346	1.1	3.3	1.1	29	396	0.836
1047.8	0.228	12	0.651	19	279	0.844	3.3	1.2	29	318	0.616



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1048.7	0.228	13	0.991	21	354	2.7	3.3	1.8	31	404	2.0
1049.6	0.368	12	0.779	20	444	1.4	5.3	1.4	30	507	1.1
1050.5	0.228	16	0.647	14	178	0.965	3.3	1.2	21	204	0.704
1051.5	0.228	12	0.991	23	224	1.1	3.3	1.8	35	256	0.790
1052.4	0.289	19	0.840	13	302	0.408	4.2	1.5	20	346	0.298
1053.3	0.228	18	0.759	14	330	0.894	3.3	1.4	22	377	0.653
1054.2	0.228	8.6	0.556	16	163	0.779	3.3	1.0	25	186	0.568
1055.1	0.228	17	1.6	18	239	1.1	3.3	2.9	28	273	0.824
1056.1	0.228	23	1.2	20	491	1.3	3.3	2.2	30	562	0.952
1057.0	0.228	12	0.575	26	228	1.0	3.3	1.0	41	261	0.750
1057.9	0.275	14	0.895	15	178	0.786	4.0	1.6	23	203	0.573
1058.8	0.416	25	1.6	19	427	0.587	6.0	2.9	29	488	0.428
1059.8	0.228	11	0.766	25	257	1.0	3.3	1.4	38	294	0.757
1060.7	0.228	7.6	0.749	12	132	1.0	3.3	1.4	19	151	0.743
1061.6	0.848	28	1.4	17	335	2.1	12	2.5	25	383	1.5
1062.5	0.228	16	1.6	33	795	0.962	3.3	3.0	50	909	0.702
1063.5	0.349	10.0	0.972	21	172	1.2	5.0	1.8	31	197	0.901
1064.4	0.228	17	1.6	15	214	1.2	3.3	2.9	24	245	0.847
1065.3	0.228	20	0.865	20	497	1.1	3.3	1.6	30	568	0.787
1066.2	0.228	11	0.658	18	230	1.1	3.3	1.2	27	263	0.794
1067.2	0.228	13	1.4	20	228	1.3	3.3	2.5	30	261	0.914
1068.1	0.332	29	0.892	27	609	0.899	4.8	1.6	42	697	0.656
1069.0	0.228	14	0.723	20	370	1.9	3.3	1.3	31	423	1.4
1069.9	0.228	11	1.5	19	196	1.1	3.3	2.8	29	225	0.783
1070.9	0.545	20	1.7	21	468	1.4	7.9	3.1	33	536	1.000
1071.8	0.228	19	1.2	37	679	1.1	3.3	2.2	56	776	0.772
1072.7	0.381	12	1.5	30	200	1.4	5.5	2.7	46	228	0.988
1073.6	0.228	24	1.7	22	408	0.907	3.3	3.1	34	466	0.662
1074.6	0.504	28	1.3	25	327	0.885	7.3	2.3	38	374	0.645
1075.5	0.228	10	1.1	24	235	1.6	3.3	2.0	36	269	1.1
1076.4	0.228	12	1.3	23	291	0.561	3.3	2.4	35	333	0.410
1077.3	0.228	18	1.5	17	247	0.677	3.3	2.6	26	283	0.494
1078.3	0.228	15	0.965	34	420	2.0	3.3	1.8	52	480	1.4
1079.2	0.228	9.7	1.4	25	181	0.021	3.3	2.6	38	207	0.015
1080.1	0.317	23	2.2	25	504	1.0	4.6	3.9	39	576	0.732
1081.0	0.228	16	0.633	14	246	1.6	3.3	1.2	21	281	1.2
1081.9	0.244	15	1.9	21	212	1.3	3.5	3.5	33	243	0.971
1082.9	0.266	14	1.7	32	520	1.3	3.8	3.2	48	595	0.960
1083.8	0.264	14	1.4	28	281	0.715	3.8	2.6	43	321	0.522
1084.7	0.246	12	1.6	31	247	1.2	3.5	3.0	48	283	0.897
1085.6	0.745	15	0.767	32	301	0.774	11	1.4	50	344	0.564
1086.6	0.228	13	1.3	33	306	0.992	3.3	2.4	51	349	0.724
1087.5	0.239	16	1.5	37	298	0.585	3.4	2.7	56	341	0.427
1088.4	0.497	19	0.797	31	325	0.728	7.2	1.5	47	372	0.531
1089.3	0.228	14	1.3	28	365	1.3	3.3	2.3	43	418	0.951
1090.3	0.228	16	1.3	28	341	0.329	3.3	2.5	43	390	0.240
1091.2	0.344	18	1.0	31	250	0.607	5.0	1.9	48	286	0.443
1092.1	0.351	17	1.9	28	412	1.4	5.1	3.4	43	471	1.0
1093.0	0.228	16	0.912	50	336	1.0	3.3	1.7	76	384	0.753
1094.0	0.380	12	1.2	30	252	1.0	5.5	2.1	46	289	0.736
1094.9	0.424	12	1.2	37	267	1.3	6.1	2.2	56	305	0.914
1095.8	0.283	16	0.854	38	348	0.637	4.1	1.6	58	398	0.464
1096.7	0.228	13	1.2	32	279	0.456	3.3	2.1	49	319	0.333
1097.7	0.228	19	1.3	31	296	0.809	3.3	2.4	47	338	0.590
1098.6	0.228	14	1.0	35	239	1.3	3.3	1.8	54	273	0.939
1099.5	0.228	15	1.6	31	282	0.667	3.3	2.8	48	322	0.487
1100.4	0.228	18	1.3	33	308	1.3	3.3	2.3	51	352	0.958
1101.4	0.248	14	0.830	28	289	1.0	3.6	1.5	44	330	0.738
1102.3	0.705	16	0.685	28	246	1.0	10	1.2	43	281	0.730
1103.2	0.291	13	1.2	23	197	0.686	4.2	2.2	36	226	0.500
1104.1	0.228	14	1.3	27	204	0.839	3.3	2.4	41	234	0.612
1105.1	0.364	16	1.3	31	282	0.120	5.3	2.4	48	323	0.087
1106.0	0.545	16	0.999	29	266	1.2	7.9	1.8	45	304	0.872
1106.9	0.228	15	1.0	43	291	0.532	3.3	1.9	66	332	0.388
1107.8	0.228	13	1.0	33	262	0.887	3.3	1.9	50	299	0.647
1108.7	0.769	20	1.4	34	381	1.0	11	2.6	53	436	0.758
1109.7	0.228	21	0.788	41	352	0.763	3.3	1.4	64	403	0.557
1110.6	0.228	13	0.896	28	224	1.4	3.3	1.6	42	256	0.989
1111.5	1.1	15	1.1	32	334	1.1	15	3.2	50	382	0.767
1112.4	0.766	15	0.803	43	341	1.5	11	1.5	67	390	1.1
1113.4	0.686	12	1.3	30	299	0.712	9.9	2.4	47	342	0.520
1114.3	0.228	12	1.4	28	268	0.629	3.3	2.6	43	306	0.459
1115.2	0.228	19	1.0	35	343	1.0	3.3	1.8	54	392	0.747
1116.1	0.639	19	0.946	29	300	0.990	9.2	1.7	44	343	0.722
1117.1	0.262	14	0.617	30	361	1.1	3.8	1.1	46	412	0.781
1118.0	0.228	13	1.2	33	263	1.3	3.3	2.2	50	301	0.913
1118.9	0.345	20	1.3	29	303	0.612	5.0	2.4	44	347	0.446
1119.8	0.228	18	1.1	27	301	0.966	3.3	2.1	41	344	0.705
1120.8	0.330	17	1.8	31	398	1.6	4.8	3.4	48	455	1.2
1121.7	0.228	16	0.809	35	389	1.3	3.3	1.5	53	445	0.958
1122.6	0.228	17	1.3	30	442	0.867	3.3	2.4	46	505	0.633



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1123.5	0.498	17	0.907	51	347	0.730	7.2	1.7	78	396	0.532
1124.5	0.613	15	1.1	29	264	0.469	8.8	1.9	44	302	0.342
1125.4	0.426	14	0.898	26	336	1.0	6.1	1.6	40	384	0.733
1126.3	0.401	13	0.850	28	289	1.0	5.8	1.5	42	331	0.731
1127.2	0.228	13	0.779	25	309	1.3	3.3	1.4	39	354	0.923
1128.2	0.228	14	0.869	30	305	1.2	3.3	1.6	46	349	0.890
1129.1	0.804	15	0.827	36	542	1.7	12	1.5	55	620	1.2
1130.0	0.453	12	0.732	24	224	0.692	6.5	1.3	37	256	0.505
1130.9	0.228	10	1.3	23	234	0.540	3.3	2.4	35	267	0.394
1131.8	0.494	11	0.827	26	276	0.616	7.1	1.5	41	315	0.449
1132.8	0.502	11	0.814	25	241	0.679	7.2	1.5	38	275	0.495
1133.7	0.228	12	1.1	29	259	1.000	3.3	2.0	45	297	0.729
1134.6	0.398	19	1.2	31	441	0.706	5.7	2.2	47	504	0.515
1135.5	0.372	18	1.0	21	253	0.660	5.4	1.9	33	289	0.481
1136.5	0.769	17	0.663	32	324	1.3	11	1.2	49	371	0.979
1137.4	0.318	16	0.959	28	392	1.9	4.6	1.7	44	448	1.4
1138.3	0.285	14	0.575	28	291	1.6	4.1	1.0	42	332	1.1
1139.2	0.228	14	0.676	25	266	1.1	3.3	1.2	38	304	0.834
1140.2	0.228	9.9	1.3	20	265	0.702	3.3	2.4	30	303	0.512
1141.1	0.461	12	1.5	28	357	1.4	6.6	2.7	43	408	0.993
1142.0	0.228	14	0.883	30	382	1.000	3.3	1.6	46	437	0.729
1142.9	0.431	16	1.2	27	401	1.5	6.2	2.2	42	459	1.1
1143.9	0.228	12	0.830	22	285	0.929	3.3	1.5	34	326	0.678
1144.8	0.228	14	0.532	15	234	1.3	3.3	0.970	23	267	0.932
1145.7	0.418	17	0.994	26	357	1.2	6.0	1.8	39	408	0.871
1146.6	0.722	15	0.804	20	266	0.749	10	1.5	30	305	0.546
1147.6	0.458	13	0.966	20	481	1.2	6.6	1.8	31	550	0.888
1148.5	0.228	16	0.860	19	366	0.902	3.3	1.6	29	419	0.658
1149.4	0.228	17	0.535	17	286	1.6	3.3	0.976	26	328	1.2
1150.3	0.268	14	0.840	19	239	1.6	3.9	1.5	29	274	1.2
1151.3	0.228	12	0.726	9.1	239	0.550	3.3	1.3	14	273	0.401
1152.2	0.242	14	0.556	28	363	1.0	3.5	1.0	42	415	0.763
1153.1	0.228	9.0	1.2	18	279	0.644	3.3	2.2	28	319	0.470
1154.0	0.298	14	0.735	15	273	1.1	4.3	1.3	23	313	0.789
1155.0	0.228	8.1	1.0	12	210	0.465	3.3	1.9	19	240	0.339
1155.9	0.228	13	1.1	20	349	0.883	3.3	1.9	31	399	0.644
1156.8	0.228	14	0.720	10	237	0.688	3.3	1.3	16	271	0.502
1157.7	0.228	16	0.587	20	388	1.0	3.3	1.1	31	444	0.736
1158.6	0.326	15	1.4	20	318	1.8	4.7	2.6	31	364	1.3
1159.6	0.285	11	1.1	17	292	0.772	4.1	2.1	26	334	0.563
1160.5	0.228	14	0.931	18	309	0.411	3.3	1.7	28	353	0.300
1161.4	0.228	14	1.1	17	333	1.4	3.3	2.1	26	381	0.986
1162.3	0.228	14	0.745	15	248	0.535	3.3	1.4	23	283	0.391
1163.3	0.470	18	1.5	16	346	1.4	6.8	2.7	24	395	1.0
1164.2	0.228	15	0.759	16	297	1.1	3.3	1.4	25	339	0.803
1165.1	0.228	21	1.1	16	319	1.7	3.3	2.1	24	365	1.2
1166.0	0.228	15	1.2	14	342	1.7	3.3	2.1	22	391	1.2
1167.0	0.228	12	1.0	9.9	198	1.2	3.3	1.9	15	227	0.843
1167.9	0.228	24	1.2	15	347	1.8	3.3	2.2	23	397	1.3
1168.8	0.228	19	1.1	13	356	2.1	3.3	2.0	20	407	1.5
1169.7	0.228	14	1.2	16	249	0.620	3.3	2.2	24	285	0.452
1170.7	0.766	16	1.4	16	304	1.5	11	2.6	24	348	1.1
1171.6	0.228	18	1.3	20	392	0.234	3.3	2.3	31	448	0.171
1172.5	0.228	14	0.902	20	223	0.992	3.3	1.6	31	255	0.724
1173.4	0.228	17	1.1	14	251	0.749	3.3	2.0	21	287	0.547
1174.4	0.396	17	1.0	16	245	0.988	5.7	1.9	24	280	0.721
1175.3	0.607	16	1.3	17	381	1.4	8.8	2.3	26	436	1.0
1176.2	0.405	16	1.4	18	273	1.7	5.8	2.5	28	312	1.2
1177.1	0.228	21	1.6	22	461	1.5	3.3	2.9	34	527	1.1
1178.1	0.578	15	1.6	18	234	1.1	8.3	3.0	28	267	0.831
1179.0	0.236	12	1.4	14	230	0.638	3.4	2.6	22	263	0.465
1179.9	0.228	10	1.4	16	270	1.6	3.3	2.6	25	309	1.2
1180.8	0.228	13	1.3	18	248	1.1	3.3	2.3	27	284	0.835
1181.8	0.322	14	1.2	18	354	1.8	4.6	2.1	27	405	1.3
1182.7	0.320	9.5	0.997	13	159	0.983	4.6	1.8	19	182	0.717
1183.6	0.228	20	2.5	17	231	1.3	3.3	4.6	26	264	0.923
1184.5	0.228	11	1.8	18	241	0.585	3.3	3.2	27	275	0.427
1185.5	0.228	16	1.5	19	366	2.1	3.3	2.8	29	419	1.6
1186.4	0.228	10	1.7	18	327	0.508	3.3	3.2	27	374	0.371
1187.3	0.228	17	2.1	29	400	1.7	3.3	3.9	44	457	1.2
1188.2	0.228	7.1	1.2	12	163	1.2	3.3	2.1	19	187	0.895
1189.1	0.228	18	2.3	18	280	1.2	3.3	4.2	28	320	0.844
1190.1	0.334	16	1.7	18	630	0.752	4.8	3.1	28	720	0.549
1191.0	0.228	8.3	1.2	18	204	1.2	3.3	2.1	28	234	0.906
1191.9	0.228	13	1.6	20	302	1.4	3.3	3.0	31	345	1.0
1192.8	0.228	14	1.6	16	275	0.399	3.3	2.9	24	315	0.291
1193.8	0.496	14	0.992	18	228	0.379	7.2	1.8	28	260	0.277
1194.7	0.228	5.1	1.2	15	150	0.801	3.3	2.1	22	171	0.584
1195.6	0.228	20	1.6	16	340	0.944	3.3	2.9	25	389	0.689
1196.5	0.228	12	1.1	17	189	1.0	3.3	1.9	26	216	0.757
1197.5	0.228	17	1.6	17	287	1.7	3.3	3.0	27	328	1.2



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
1198.4	0.236	9.5	2.4	15	325	0.963	3.4	4.4	23	372	0.703
1199.3	0.276	13	1.6	15	364	2.0	4.0	2.9	23	416	1.5
1200.2	0.228	11	1.3	14	250	0.874	3.3	2.5	22	286	0.638
1201.2	0.228	19	1.7	24	353	2.2	3.3	3.2	36	403	1.6
1202.1	0.419	16	2.4	22	384	0.989	6.1	4.4	34	439	0.722
1203.0	0.228	9.3	1.4	20	197	0.644	3.3	2.5	31	225	0.470
1203.9	0.228	13	1.3	18	232	1.1	3.3	2.4	27	266	0.790
1204.9	0.228	14	1.5	21	219	1.6	3.3	2.6	33	251	1.2
1205.8	0.228	12	1.000	15	202	0.925	3.3	1.8	23	230	0.675
1206.7	0.324	13	1.3	26	348	2.1	4.7	2.4	39	398	1.5
1207.6	0.228	10	2.0	22	405	1.3	3.3	3.6	34	464	0.964
1208.6	0.371	15	1.5	25	305	1.2	5.4	2.8	39	349	0.871
1209.5	0.228	7.6	1.3	16	160	1.1	3.3	2.4	24	183	0.812
1210.4	0.498	25	1.2	24	346	1.8	7.2	2.2	37	396	1.3
1211.3	0.228	15	1.5	21	396	1.9	3.3	2.7	32	453	1.4
1212.3	0.228	18	1.6	24	360	2.2	3.3	2.9	37	412	1.6
1213.2	0.612	14	1.9	16	283	1.6	8.8	3.5	25	323	1.2
1214.1	0.228	11	1.6	23	432	1.6	3.3	3.0	36	494	1.1
1215.0	0.228	11	0.961	20	235	0.606	3.3	1.8	30	269	0.442
1215.9	0.228	13	2.0	17	259	1.2	3.3	3.6	26	296	0.856
1216.9	0.286	14	1.4	19	262	0.774	4.1	2.6	30	300	0.564
1217.8	0.228	15	2.1	20	300	0.877	3.3	3.9	31	343	0.640
1218.7	0.228	15	1.6	33	297	1.1	3.3	2.8	51	340	0.798
1219.6	0.782	15	1.3	22	316	1.2	11	2.3	34	361	0.900
1220.6	0.580	15	1.5	25	306	0.785	8.4	2.8	39	350	0.573
1221.5	0.228	11	1.6	19	210	1.1	3.3	2.8	30	240	0.823
1222.4	0.359	13	1.6	21	254	1.2	5.2	3.0	33	291	0.843
1223.3	0.310	12	1.5	23	303	1.6	4.5	2.7	35	346	1.1
1224.3	0.228	14	1.4	27	335	2.0	3.3	2.6	41	383	1.4
1225.2	0.353	17	1.4	28	348	1.4	5.1	2.5	44	398	1.0
1226.1	0.228	16	1.5	27	298	1.3	3.3	2.8	41	341	0.965
1227.0	0.228	16	1.9	37	351	0.985	3.3	3.5	57	401	0.719
1228.0	0.292	11	1.5	18	249	0.729	4.2	2.8	27	285	0.532
1228.9	0.228	17	1.4	24	311	1.6	3.3	2.5	36	356	1.2
1229.8	0.228	17	1.2	29	345	0.728	3.3	2.1	44	395	0.531
1230.7	0.445	11	1.5	27	218	1.3	6.4	2.7	41	249	0.927
1231.7	0.333	13	1.7	21	228	0.886	4.8	3.1	33	260	0.646
1232.6	0.267	28	1.6	22	313	0.845	3.9	3.0	33	358	0.617
1233.5	0.570	12	0.848	22	241	0.855	8.2	1.5	34	276	0.624
1234.4	0.228	15	1.4	26	352	1.5	3.3	2.5	40	403	1.1
1235.4	0.548	22	1.8	22	379	0.959	7.9	3.2	33	434	0.699
1236.3	0.228	13	1.1	24	270	1.2	3.3	2.1	37	309	0.909
1237.2	0.228	8.1	1.1	19	156	0.748	3.3	2.0	29	178	0.546
1238.1	0.275	23	0.842	33	495	2.6	4.0	1.5	51	566	1.9
1239.1	0.228	14	1.2	30	499	1.4	3.3	2.2	46	570	1.0
1240.0	0.228	10	0.936	24	226	1.3	3.3	1.7	37	258	0.929
1240.9	1.1	18	1.4	29	385	2.8	16	2.5	45	440	2.1
1241.8	0.228	23	1.7	29	346	0.802	3.3	3.1	44	395	0.585
1242.7	0.333	8.0	0.992	24	246	1.4	4.8	1.8	37	281	1.0
1243.7	0.228	20	1.5	25	255	2.5	3.3	2.7	38	291	1.8
1244.6	0.228	17	1.3	27	223	0.796	3.3	2.4	41	255	0.580
1245.5	0.228	14	0.909	24	323	1.0	3.3	1.7	37	370	0.751
1246.4	0.228	12	1.4	25	336	0.786	3.3	2.5	38	384	0.573
1247.4	0.380	18	1.1	25	442	1.5	5.5	2.0	38	505	1.1
1248.3	0.228	13	0.914	17	191	0.568	3.3	1.7	26	219	0.415
1249.2	0.228	17	1.1	22	310	0.869	3.3	2.0	34	354	0.634
1250.1	0.376	10	1.3	21	274	1.2	5.4	2.4	32	313	0.884
1251.1	0.228	13	1.1	27	263	1.1	3.3	2.0	41	301	0.817
1252.0	0.228	16	0.782	41	304	1.1	3.3	1.4	62	348	0.803
1252.9	0.228	13	0.842	21	252	0.680	3.3	1.5	32	289	0.496
1253.8	0.228	12	1.2	25	261	0.620	3.3	2.2	38	298	0.452
1254.8	0.361	17	1.5	23	304	0.511	5.2	2.7	36	347	0.373
1255.7	0.713	13	0.795	30	317	0.740	10	1.4	46	362	0.540
1256.6	0.228	13	1.4	20	365	0.896	3.3	2.6	31	418	0.653
1257.5	0.228	15	1.1	23	310	1.3	3.3	2.1	36	355	0.914
1258.5	0.228	18	1.1	24	301	1.1	3.3	2.1	37	344	0.797
1259.4	0.549	12	1.3	21	253	0.718	7.9	2.4	31	290	0.524
1260.3	0.228	16	1.2	25	308	0.905	3.3	2.1	39	353	0.660
1261.2	0.406	13	1.1	25	343	1.6	5.9	2.1	38	392	1.2
1262.2	0.299	13	1.2	24	334	1.2	4.3	2.1	37	382	0.890
1263.1	0.228	14	0.586	18	282	1.1	3.3	1.1	28	322	0.819
1264.0	0.228	14	1.2	23	302	0.797	3.3	2.2	36	346	0.582
1264.9	0.611	17	1.2	24	306	0.393	8.8	2.1	37	350	0.286
1265.9	0.337	11	0.742	23	279	0.719	4.9	1.4	35	319	0.524
1266.8	0.283	14	1.3	22	337	0.378	4.1	2.4	34	385	0.275
1267.7	0.416	13	1.3	27	301	1.6	6.0	2.3	42	344	1.2
1268.6	0.858	14	0.933	22	451	1.1	12	1.7	34	515	0.788
1269.5	0.459	13	1.1	20	320	1.8	6.6	1.9	31	365	1.3
1270.5	0.228	13	0.934	19	290	0.913	3.3	1.7	28	331	0.666
1271.4	0.610	11	1.2	22	320	1.5	8.8	2.2	34	366	1.1
1272.3	0.360	14	0.968	15	262	0.850	5.2	1.8	24	299	0.620



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1273.2	0.310	16	0.970	24	352	1.1	4.5	1.8	37	403	0.819
1274.2	0.228	17	0.940	18	319	1.3	3.3	1.7	28	365	0.930
1275.1	0.512	12	1.2	20	284	0.899	7.4	2.3	31	324	0.656
1276.0	0.318	16	1.0	18	358	1.9	4.6	1.9	27	410	1.4
1276.9	0.228	12	1.2	13	256	0.867	3.3	2.1	20	293	0.633
1277.9	0.228	15	1.1	16	285	1.2	3.3	2.0	25	326	0.902
1278.8	0.330	11	0.873	16	287	1.1	4.8	1.6	24	328	0.775
1279.7	0.228	15	0.883	14	249	1.0	3.3	1.6	22	285	0.746
1280.6	0.228	11	0.915	22	299	0.960	3.3	1.7	34	342	0.700
1281.6	0.228	14	0.925	18	358	0.689	3.3	1.7	27	410	0.503
1282.5	0.582	14	0.751	16	283	1.4	8.4	1.4	25	323	0.990
1283.4	0.250	14	0.922	14	348	1.3	3.6	1.7	22	398	0.912
1284.3	0.228	14	0.784	18	284	2.2	3.3	1.4	28	325	1.6
1285.3	0.482	13	0.947	17	341	1.6	7.0	1.7	26	390	1.1
1286.2	0.587	13	0.981	20	345	2.5	8.5	1.8	31	395	1.8
1287.1	0.228	10	0.808	17	300	2.0	3.3	1.5	26	343	1.4
1288.0	0.361	14	0.657	21	468	1.5	5.2	1.2	32	535	1.1
1289.0	0.302	8.8	0.729	11	205	1.5	4.4	1.3	17	235	1.1
1289.9	0.313	15	0.855	14	322	1.5	4.5	1.6	21	369	1.1
1290.8	0.228	14	0.378	17	243	1.3	3.3	0.689	25	278	0.941
1291.7	0.869	16	0.894	19	380	2.3	13	1.6	30	434	1.7
1292.6	0.228	20	0.810	17	341	0.996	3.3	1.5	26	390	0.727
1293.6	0.228	15	0.934	17	567	2.1	3.3	1.7	26	649	1.5
1294.5	0.228	13	0.541	15	292	1.1	3.3	0.987	24	333	0.798
1295.4	0.228	11	0.671	18	325	1.5	3.3	1.2	28	371	1.1
1296.3	0.566	22	1.2	20	334	2.2	8.2	2.2	30	382	1.6
1297.3	0.373	19	0.561	13	301	1.9	5.4	1.0	20	345	1.4
1298.2	0.228	15	0.819	17	341	1.4	3.3	1.5	26	390	1.0
1299.1	0.228	11	0.622	19	252	1.3	3.3	1.1	29	289	0.968
1300.0	0.228	17	0.245	19	334	1.4	3.3	0.447	29	382	1.0
1301.0	0.228	22	0.923	19	339	1.5	3.3	1.7	28	387	1.1
1301.9	0.228	13	0.975	15	339	2.7	3.3	1.8	23	388	2.0
1302.8	0.228	16	0.848	17	268	1.3	3.3	1.5	26	307	0.975
1303.7	0.228	18	0.435	22	402	2.9	3.3	0.794	34	460	2.1
1304.7	0.228	14	1.4	13	273	1.2	3.3	2.6	20	312	0.894
1305.6	0.508	14	0.374	19	696	1.5	7.3	0.682	29	796	1.1
1306.5	0.228	11	0.559	13	330	2.6	3.3	1.0	20	377	1.9
1307.4	0.285	9.0	0.765	7.5	167	1.7	4.1	1.4	12	192	1.2
1308.4	0.228	12	0.759	17	359	2.1	3.3	1.4	25	410	1.5
1309.3	0.333	18	0.635	19	337	2.3	4.8	1.2	29	385	1.7
1310.2	0.228	13	0.340	16	301	3.6	3.3	0.620	25	344	2.6
1311.1	0.228	18	0.588	13	284	1.3	3.3	1.1	20	325	0.914
1312.1	0.480	11	0.544	10	184	1.4	6.9	0.993	16	211	0.999
1313.0	0.228	18	1.4	16	339	2.4	3.3	2.5	24	388	1.7
1313.9	0.231	14	0.741	15	382	2.0	3.3	1.4	23	436	1.5
1314.8	0.228	18	0.654	12	205	1.6	3.3	1.2	19	235	1.2
1315.8	0.228	11	0.725	15	245	1.7	3.3	1.3	22	280	1.3
1316.7	0.228	10	0.910	12	233	2.0	3.3	1.7	18	267	1.5
1317.6	0.283	17	0.477	16	584	1.0	4.1	0.870	24	668	0.749
1318.5	0.681	8.9	0.556	18	236	0.749	9.8	1.0	28	269	0.546
1319.5	0.320	12	0.717	15	355	2.0	4.6	1.3	23	406	1.5
1320.4	0.269	16	0.783	12	264	1.2	3.9	1.4	18	301	0.892
1321.3	0.228	14	0.463	15	311	1.8	3.3	0.844	23	355	1.3
1322.2	0.228	14	0.904	23	395	3.5	3.3	1.6	36	452	2.5
1323.1	0.228	12	0.816	14	339	1.6	3.3	1.5	22	388	1.2
1324.1	0.228	8.5	0.472	16	306	1.6	3.3	0.860	24	349	1.2
1325.0	0.228	13	1.1	18	336	3.4	3.3	1.9	28	384	2.5
1325.9	0.228	11	0.651	14	308	2.1	3.3	1.2	21	353	1.6
1326.8	0.228	11	0.614	16	267	1.7	3.3	1.1	24	306	1.2
1327.8	0.228	13	0.862	12	315	2.5	3.3	1.6	19	360	1.8
1328.7	0.523	12	0.779	16	329	1.7	7.6	1.4	25	376	1.3
1329.6	0.228	9.1	0.791	17	278	1.7	3.3	1.4	26	317	1.2
1330.5	0.228	11	0.669	13	306	1.5	3.3	1.2	20	350	1.1
1331.5	0.228	12	0.490	12	265	1.9	3.3	0.893	19	303	1.4
1332.4	0.228	11	0.805	19	386	0.912	3.3	1.5	29	441	0.665
1333.3	0.228	12	1.1	13	242	1.6	3.3	2.0	20	277	1.2
1334.2	0.406	16	0.860	15	338	2.3	5.9	1.6	23	386	1.7
1335.2	0.228	12	0.713	16	295	1.5	3.3	1.3	25	337	1.1
1336.1	0.334	11	0.708	12	256	2.8	4.8	1.3	19	293	2.0
1337.0	0.242	15	0.852	17	342	3.8	3.5	1.6	26	391	2.8
1337.9	0.228	13	0.622	16	305	2.0	3.3	1.1	25	349	1.5
1338.9	0.228	11	1.1	21	263	1.8	3.3	2.0	32	301	1.3
1339.8	0.228	14	0.739	15	328	3.3	3.3	1.3	23	375	2.4
1340.7	0.228	13	0.784	15	346	1.2	3.3	1.4	23	396	0.907
1341.6	0.228	12	0.863	17	280	2.1	3.3	1.6	27	320	1.6
1342.6	0.228	14	0.964	19	301	1.5	3.3	1.8	29	344	1.1
1343.5	0.228	14	0.768	16	310	1.5	3.3	1.4	24	354	1.1
1344.4	0.228	12	0.718	22	297	2.2	3.3	1.3	33	339	1.6
1345.3	0.228	13	0.722	16	248	1.0	3.3	1.3	24	283	0.739
1346.2	0.355	11	0.503	17	314	2.2	5.1	0.917	27	360	1.6
1347.2	0.804	13	0.657	15	302	1.9	12	1.2	23	346	1.4



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1348.1	0.228	10	0.935	19	287	2.7	3.3	1.7	30	328	2.0
1349.0	0.228	11	0.733	18	291	1.9	3.3	1.3	28	333	1.4
1349.9	0.228	14	0.883	24	326	1.9	3.3	1.6	37	373	1.4
1350.9	0.228	11	1.0	23	259	1.8	3.3	1.9	36	296	1.3
1351.8	0.228	15	1.1	19	267	2.3	3.3	2.1	29	305	1.6
1352.7	0.304	16	1.1	20	347	2.6	4.4	1.9	30	396	1.9
1353.6	0.228	10	0.911	23	266	2.0	3.3	1.7	36	304	1.5
1354.6	0.228	13	0.616	18	279	2.4	3.3	1.1	27	319	1.7
1355.5	0.228	20	0.783	22	325	2.6	3.3	1.4	33	372	1.9
1356.4	0.228	17	0.937	20	321	2.7	3.3	1.7	30	367	2.0
1357.3	0.228	13	0.842	22	262	1.1	3.3	1.5	33	300	0.774
1358.3	0.228	12	1.2	23	195	2.0	3.3	2.2	35	223	1.5
1359.2	0.256	16	0.914	18	308	1.7	3.7	1.7	28	353	1.3
1360.1	0.228	14	0.817	21	313	2.1	3.3	1.5	33	358	1.5
1361.0	0.228	14	1.3	27	275	1.6	3.3	2.4	41	314	1.2
1362.0	0.524	16	1.5	20	320	2.2	7.6	2.8	30	366	1.6
1362.9	0.285	13	1.3	23	306	1.7	4.1	2.3	35	350	1.2
1363.8	0.228	14	0.937	19	218	1.3	3.3	1.7	29	249	0.954
1364.7	0.386	13	1.2	25	321	2.1	5.6	2.2	39	368	1.5
1365.7	0.346	13	0.641	23	286	1.1	5.0	1.2	35	327	0.812
1366.6	0.228	13	1.4	24	264	1.8	3.3	2.5	37	302	1.3
1367.5	0.437	15	1.2	24	314	1.9	6.3	2.2	36	359	1.4
1368.4	0.256	12	1.1	22	278	2.6	3.7	1.9	33	318	1.9
1369.4	0.228	11	1.1	30	352	1.8	3.3	2.0	46	402	1.3
1370.3	0.228	13	1.6	21	314	1.3	3.3	3.0	32	359	0.918
1371.2	0.228	14	0.963	35	318	1.7	3.3	1.8	54	363	1.2
1372.1	0.276	14	0.865	29	363	1.4	4.0	1.6	45	415	1.0
1373.0	0.284	17	0.888	26	320	3.8	4.1	1.6	39	366	2.7
1374.0	0.228	16	1.2	22	274	1.3	3.3	2.2	34	313	0.948
1374.9	0.228	14	1.1	26	317	1.3	3.3	2.0	40	362	0.949
1375.8	0.411	12	1.2	24	242	1.1	5.9	2.2	37	277	0.798
1376.7	0.228	15	1.1	25	402	3.7	3.3	2.0	39	460	2.7
1377.7	0.726	18	0.994	28	332	2.5	10	1.8	42	380	1.9
1378.6	0.394	16	1.2	26	358	2.3	5.7	2.2	39	410	1.7
1379.5	0.228	13	0.906	20	262	1.9	3.3	1.7	30	299	1.4
1380.4	0.329	10.0	1.4	17	204	1.7	4.7	2.5	26	234	1.2
1381.4	0.228	22	1.6	28	451	3.0	3.3	3.0	43	516	2.2
1382.3	0.599	18	0.698	23	235	0.850	8.6	1.3	35	268	0.620
1383.2	0.228	10	0.922	12	171	1.1	3.3	1.7	18	195	0.808
1384.1	0.228	24	0.965	25	288	2.0	3.3	1.8	38	329	1.4
1385.1	0.228	17	1.2	29	487	1.3	3.3	2.1	45	557	0.959
1386.0	0.262	12	1.1	35	335	2.9	3.8	2.1	54	384	2.1
1386.9	0.228	16	1.5	14	208	1.1	3.3	2.7	22	238	0.800
1387.8	0.228	21	1.3	28	523	1.3	3.3	2.3	43	599	0.967
1388.8	0.370	20	1.7	21	393	2.0	5.3	3.2	33	449	1.5
1389.7	0.228	22	0.733	21	309	2.0	3.3	1.3	33	353	1.4
1390.6	0.523	16	0.875	27	296	1.3	7.6	1.6	41	338	0.961
1391.5	0.281	17	0.988	23	296	1.3	4.1	1.8	35	338	0.956
1392.5	0.228	17	1.4	21	258	1.7	3.3	2.5	32	295	1.2
1393.4	0.553	16	1.5	27	417	1.3	8.0	2.8	41	477	0.973
1394.3	0.228	17	0.734	20	356	1.3	3.3	1.3	31	407	0.968
1395.2	0.313	23	1.1	37	357	2.1	4.5	2.0	57	409	1.6
1396.2	0.370	19	0.913	30	385	1.7	5.3	1.7	46	440	1.3
1397.1	0.514	26	0.892	29	355	1.3	7.4	1.6	44	406	0.944
1398.0	0.270	11	0.727	17	179	0.880	3.9	1.3	27	205	0.642
1398.9	0.228	23	1.1	24	272	0.852	3.3	1.9	37	311	0.622
1399.8	0.386	15	0.954	34	270	1.2	5.6	1.7	52	308	0.908
1400.8	0.228	16	0.752	31	232	0.956	3.3	1.4	47	266	0.697
1401.7	0.228	16	0.953	36	301	1.5	3.3	1.7	55	344	1.1
1402.6	0.228	12	1.3	24	230	0.756	3.3	2.3	37	263	0.551
1403.5	0.482	17	1.9	32	515	0.418	7.0	3.4	49	589	0.305
1404.5	0.323	19	1.3	30	346	1.0	4.7	2.4	46	396	0.746
1405.4	0.228	14	0.868	27	255	1.5	3.3	1.6	42	292	1.1
1406.3	0.228	15	0.953	28	376	1.5	3.3	1.7	44	430	1.1
1407.2	0.228	19	1.7	47	414	3.4	3.3	3.0	72	473	2.5
1408.2	0.228	19	0.971	40	377	0.982	3.3	1.8	61	431	0.717
1409.1	0.293	13	1.1	35	280	1.5	4.2	2.0	53	320	1.1
1410.0	0.395	15	1.3	31	309	2.3	5.7	2.4	48	354	1.7
1410.9	0.356	20	1.0	30	294	1.7	5.1	1.8	46	337	1.2
1411.9	0.228	19	1.2	38	286	1.6	3.3	2.2	59	327	1.2
1412.8	0.228	13	1.1	30	302	1.6	3.3	2.0	46	345	1.2
1413.7	0.228	14	0.985	27	292	1.2	3.3	1.8	41	334	0.886
1414.6	0.228	16	0.970	32	292	0.984	3.3	1.8	49	334	0.718
1415.6	0.228	16	1.2	34	310	0.790	3.3	2.1	53	355	0.576
1416.5	0.288	16	0.741	33	335	1.0	4.2	1.4	51	383	0.761
1417.4	0.228	15	0.828	32	291	1.6	3.3	1.5	48	333	1.2
1418.3	0.228	13	0.844	25	292	0.853	3.3	1.5	39	334	0.623
1419.3	0.299	17	0.901	37	319	1.6	4.3	1.6	57	365	1.2
1420.2	0.228	16	0.402	31	317	1.4	3.3	0.734	47	363	0.986
1421.1	0.228	11	1.1	29	245	1.2	3.3	1.9	44	281	0.887
1422.0	0.279	14	0.532	28	306	1.1	4.0	0.971	43	350	0.831



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
1423.0	0.386	17	1.1	39	331	1.4	5.6	1.9	60	378	1.0
1423.9	0.327	12	0.922	31	282	0.817	4.7	1.7	47	323	0.596
1424.8	0.228	12	0.593	27	278	1.3	3.3	1.1	41	318	0.922
1425.7	0.228	16	0.656	25	344	0.659	3.3	1.2	38	394	0.481
1426.6	0.499	13	0.743	29	312	1.3	7.2	1.4	45	356	0.916
1427.6	0.256	9.7	0.517	24	272	1.0	3.7	0.943	37	311	0.763
1428.5	0.228	14	0.546	25	314	0.906	3.3	0.996	38	359	0.661
1429.4	0.549	14	0.750	31	335	0.964	7.9	1.4	48	383	0.703
1430.3	0.228	13	1.1	22	277	1.5	3.3	1.9	34	317	1.1
1431.3	0.514	15	0.923	23	348	1.6	7.4	1.7	36	398	1.1
1432.2	0.228	12	0.544	21	353	0.959	3.3	0.993	33	403	0.700
1433.1	0.228	11	0.487	19	316	1.5	3.3	0.888	29	361	1.1
1434.0	0.254	11	0.484	21	275	1.0	3.7	0.882	33	314	0.755
1435.0	0.645	14	0.870	18	341	0.985	9.3	1.6	27	390	0.718
1435.9	0.272	11	0.549	23	286	0.861	3.9	1.0	35	327	0.628
1436.8	0.228	11	0.991	22	300	2.2	3.3	1.8	33	344	1.6
1437.7	0.228	13	1.1	20	365	1.7	3.3	2.0	31	418	1.2
1438.7	0.228	10	0.401	15	247	1.4	3.3	0.731	23	283	1.0
1439.6	0.228	8.4	0.680	19	297	1.6	3.3	1.2	30	340	1.2
1440.5	0.228	12	0.646	21	313	1.6	3.3	1.2	32	358	1.1
1441.4	0.228	14	0.554	19	346	2.0	3.3	1.0	29	396	1.4
1442.4	0.228	11	0.632	17	290	1.9	3.3	1.2	27	332	1.4
1443.3	0.592	12	0.640	15	296	1.7	8.5	1.2	22	338	1.2
1444.2	0.228	12	0.486	15	330	1.1	3.3	0.887	23	377	0.806
1445.1	0.228	11	0.858	17	293	1.5	3.3	1.6	26	335	1.1
1446.1	0.228	14	0.848	18	320	1.9	3.3	1.5	27	366	1.4
1447.0	0.228	11	0.685	18	302	1.6	3.3	1.2	28	345	1.2
1447.9	0.228	11	0.926	22	308	1.4	3.3	1.7	33	352	1.0
1448.8	0.228	12	0.725	17	295	1.8	3.3	1.3	27	337	1.3
1449.7	0.412	11	0.690	11	295	0.972	5.9	1.3	18	337	0.709
1450.7	0.228	12	0.990	15	283	1.1	3.3	1.8	23	324	0.816
1451.6	0.228	12	0.542	15	298	2.0	3.3	0.989	23	341	1.4
1452.5	0.228	11	0.536	16	313	1.4	3.3	0.977	24	358	0.988
1453.4	0.287	14	0.866	16	341	0.777	4.1	1.6	24	390	0.567
1454.4	0.228	11	0.415	16	297	0.891	3.3	0.756	24	339	0.650
1455.3	0.228	9.7	0.836	14	247	1.1	3.3	1.5	21	282	0.828
1456.2	0.228	13	0.620	21	375	1.1	3.3	1.1	32	429	0.785
1457.1	0.228	12	0.405	15	261	1.4	3.3	0.739	22	298	1.0
1458.1	0.228	10	0.537	15	343	1.3	3.3	0.980	22	393	0.971
1459.0	0.508	13	0.822	19	280	0.888	7.3	1.5	29	321	0.648
1459.9	0.228	13	0.450	17	304	0.381	3.3	0.821	26	347	0.278
1460.8	0.228	12	0.885	19	296	1.1	3.3	1.6	30	338	0.813
1461.8	0.228	13	0.694	14	302	1.3	3.3	1.3	21	345	0.933
1462.7	0.353	16	0.809	16	299	1.5	5.1	1.5	25	342	1.1
1463.6	0.375	14	0.546	16	258	0.884	5.4	0.996	24	295	0.645
1464.5	0.228	14	0.899	20	305	0.576	3.3	1.6	31	349	0.420
1465.5	0.228	14	0.686	19	361	1.1	3.3	1.3	30	412	0.810
1466.4	0.228	12	0.669	20	336	2.1	3.3	1.2	30	384	1.5
1467.3	0.442	12	0.822	13	243	0.214	6.4	1.5	20	278	0.156
1468.2	0.228	13	0.883	16	347	0.524	3.3	1.6	24	396	0.382
1469.2	0.423	14	0.708	21	285	1.2	6.1	1.3	32	326	0.911
1470.1	0.228	13	1.1	15	246	0.955	3.3	2.1	24	281	0.697
1471.0	0.363	15	0.736	20	319	1.4	5.2	1.3	30	365	1.0
1471.9	0.228	10	0.790	14	292	1.1	3.3	1.4	22	334	0.806
1472.9	0.228	15	0.502	12	247	1.4	3.3	0.915	19	283	1.0
1473.8	0.228	14	0.850	17	332	1.1	3.3	1.6	26	379	0.839
1474.7	0.426	11	1.1	19	323	1.4	6.1	2.0	28	369	1.0
1475.6	0.228	12	0.998	17	270	1.6	3.3	1.8	27	309	1.2
1476.5	0.228	14	0.743	16	279	1.4	3.3	1.4	25	319	0.997
1477.5	0.228	13	0.962	17	273	1.1	3.3	1.8	25	312	0.827
1478.4	0.631	17	0.874	17	400	1.3	9.1	1.6	27	458	0.983
1479.3	0.228	11	0.436	16	385	1.9	3.3	0.795	24	440	1.4
1480.2	0.296	12	0.500	16	292	1.9	4.3	0.911	25	334	1.4
1481.2	0.303	13	0.948	17	296	1.9	4.4	1.7	26	338	1.4
1482.1	0.277	9.1	0.436	17	272	1.3	4.0	0.796	26	311	0.918
1483.0	0.228	12	1.0	17	332	1.4	3.3	1.8	26	380	0.993
1483.9	0.472	13	0.518	17	350	0.974	6.8	0.945	26	401	0.710
1484.9	0.228	8.4	0.725	21	302	0.976	3.3	1.3	33	346	0.712
1485.8	0.228	11	0.283	16	284	1.1	3.3	0.516	24	324	0.827
1486.7	0.228	12	0.585	16	319	1.4	3.3	1.1	25	365	1.0
1487.6	0.228	9.0	0.769	15	254	1.4	3.3	1.4	23	290	1.0
1488.6	0.228	9.9	0.414	11	285	2.3	3.3	0.755	17	326	1.7
1489.5	0.228	9.6	0.327	14	346	1.2	3.3	0.596	21	396	0.872
1490.4	0.228	12	0.592	13	263	0.753	3.3	1.1	20	301	0.549
1491.3	0.475	11	0.473	13	328	1.9	6.9	0.862	20	375	1.4
1492.3	0.228	11	0.357	12	250	0.613	3.3	0.650	19	286	0.447
1493.2	0.228	10	0.285	15	314	2.2	3.3	0.519	23	360	1.6
1494.1	0.228	11	0.634	16	265	1.7	3.3	1.2	24	302	1.3
1495.0	0.286	11	0.451	16	265	0.775	4.1	0.822	25	303	0.565
1496.0	0.228	11	0.428	14	319	1.9	3.3	0.780	22	364	1.4
1496.9	0.228	10	0.593	15	272	1.6	3.3	1.1	23	311	1.1



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1497.8	0.228	11	0.586	15	254	1.4	3.3	1.1	22	291	1.0
1498.7	0.228	12	0.393	17	331	0.921	3.3	0.717	25	378	0.672
1499.7	0.228	10	0.472	17	280	1.4	3.3	0.860	26	321	1.0
1500.6	0.228	8.9	0.691	12	256	2.2	3.3	1.3	19	293	1.6
1501.5	0.228	13	0.750	15	299	0.922	3.3	1.4	23	342	0.673
1502.4	0.228	13	1.0	18	344	1.3	3.3	1.9	28	394	0.924
1503.3	0.260	9.2	0.786	14	277	1.3	3.8	1.4	22	317	0.949
1504.3	0.228	12	0.802	19	293	2.6	3.3	1.5	29	336	1.9
1505.2	0.228	12	0.890	21	316	2.1	3.3	1.6	32	362	1.5
1506.1	0.228	9.5	0.530	15	265	1.7	3.3	0.966	23	303	1.2
1507.0	0.228	11	0.853	16	276	2.0	3.3	1.6	25	315	1.4
1508.0	0.275	12	1.0	22	293	1.2	4.0	1.9	33	335	0.911
1508.9	0.228	12	0.798	17	279	1.5	3.3	1.5	26	319	1.1
1509.8	0.228	11	0.360	13	229	1.3	3.3	0.657	19	262	0.980
1510.7	0.228	14	0.354	17	295	2.5	3.3	0.645	26	337	1.8
1511.7	0.346	12	1.1	18	290	1.9	5.0	1.9	28	332	1.4
1512.6	0.228	12	0.630	16	244	0.920	3.3	1.1	24	279	0.671
1513.5	0.228	13	1.2	20	324	1.3	3.3	2.2	31	371	0.946
1514.4	0.228	14	0.820	21	328	1.2	3.3	1.5	31	375	0.873
1515.4	0.228	12	0.956	21	310	2.0	3.3	1.7	32	355	1.4
1516.3	0.826	11	0.822	26	286	1.3	12	1.5	40	327	0.958
1517.2	0.323	14	0.797	15	293	1.4	4.7	1.5	23	335	1.0
1518.1	0.228	7.9	0.820	20	236	0.641	3.3	1.5	31	270	0.468
1519.1	0.228	11	1.2	24	251	1.0	3.3	2.1	37	287	0.763
1520.0	0.283	15	0.853	18	290	1.3	4.1	1.6	28	332	0.936
1520.9	0.228	12	0.882	21	287	1.4	3.3	1.6	32	328	1.0
1521.8	0.260	11	1.2	22	298	1.7	3.8	2.2	33	341	1.2
1522.8	0.228	15	0.933	27	324	2.9	3.3	1.7	41	370	2.1
1523.7	0.228	14	1.1	23	324	1.9	3.3	2.0	35	371	1.4
1524.6	0.228	11	0.877	19	237	1.7	3.3	1.6	29	271	1.2
1525.5	0.228	11	1.2	21	317	1.1	3.3	2.2	33	363	0.776
1526.5	0.228	15	0.765	22	326	1.1	3.3	1.4	34	373	0.784
1527.4	0.255	12	1.0	21	231	1.6	3.7	1.9	32	264	1.2
1528.3	0.228	15	0.851	26	340	1.4	3.3	1.6	39	389	1.0
1529.2	0.228	14	0.929	23	304	1.6	3.3	1.7	35	348	1.1
1530.1	0.228	20	0.532	23	306	1.7	3.3	0.971	35	350	1.3
1531.1	0.342	16	0.725	26	482	1.6	4.9	1.3	39	551	1.2
1532.0	0.228	11	0.481	15	219	1.4	3.3	0.877	23	251	0.993
1532.9	0.228	17	0.640	20	337	3.9	3.3	1.2	30	385	2.8
1533.8	0.228	15	0.428	19	438	1.7	3.3	0.780	30	501	1.3
1534.8	0.258	14	0.320	23	362	3.2	3.7	0.584	36	414	2.3
1535.7	0.228	14	0.686	18	316	1.3	3.3	1.3	28	362	0.932
1536.6	0.228	13	0.691	18	433	1.9	3.3	1.3	28	495	1.4
1537.5	0.371	16	0.980	14	236	1.9	5.4	1.8	21	270	1.4
1538.5	0.236	17	0.795	21	355	2.4	3.4	1.4	32	405	1.7
1539.4	0.228	18	0.668	21	284	1.5	3.3	1.2	32	324	1.1
1540.3	0.814	15	0.508	21	283	1.8	12	0.927	33	324	1.3
1541.2	0.228	14	0.440	17	227	1.6	3.3	0.803	25	260	1.2
1542.2	0.228	12	0.668	16	280	1.7	3.3	1.2	24	320	1.2
1543.1	0.284	16	0.637	15	262	1.0	4.1	1.2	24	300	0.752
1544.0	0.228	13	0.844	35	317	2.4	3.3	1.5	54	362	1.7
1544.9	0.228	15	0.559	18	279	1.1	3.3	1.0	28	319	0.781
1545.9	0.228	15	0.741	17	249	1.000	3.3	1.4	26	285	0.730
1546.8	0.364	15	0.964	17	298	3.5	5.3	1.8	26	341	2.6
1547.7	0.371	14	0.785	24	314	1.6	5.4	1.4	37	359	1.2
1548.6	0.228	11	0.746	17	434	2.9	3.3	1.4	27	496	2.1
1549.6	0.228	13	0.828	16	308	1.3	3.3	1.5	25	352	0.932
1550.5	0.228	15	0.628	15	258	0.478	3.3	1.1	23	295	0.349
1551.4	0.228	14	0.767	20	348	2.0	3.3	1.4	31	398	1.4
1552.3	0.228	13	0.567	15	219	0.984	3.3	1.0	23	250	0.718
1553.3	0.228	14	0.905	19	290	1.7	3.3	1.7	29	331	1.2
1554.2	0.292	15	0.720	23	289	1.2	4.2	1.3	35	331	0.871
1555.1	0.228	15	0.691	21	297	2.0	3.3	1.3	32	339	1.5
1556.0	0.228	16	0.622	19	289	1.2	3.3	1.1	29	331	0.876
1556.9	0.228	19	0.771	23	307	2.1	3.3	1.4	36	351	1.6
1557.9	0.228	14	0.616	22	262	1.1	3.3	1.1	34	299	0.781
1558.8	0.228	13	0.478	14	275	1.3	3.3	0.873	22	315	0.971
1559.7	0.228	16	0.721	17	343	2.1	3.3	1.3	26	392	1.5
1560.6	0.228	12	0.398	19	299	1.4	3.3	0.726	29	342	0.992
1561.6	0.228	11	0.542	19	243	2.0	3.3	0.989	28	278	1.4
1562.5	0.228	13	0.903	18	291	1.0	3.3	1.6	27	333	0.763
1563.4	0.228	21	0.718	21	276	1.2	3.3	1.3	32	316	0.885
1564.3	0.608	12	0.409	18	270	1.2	8.8	0.746	28	309	0.861
1565.3	0.506	15	1.0	22	318	1.7	7.3	1.8	34	363	1.2
1566.2	0.334	14	0.707	18	278	1.9	4.8	1.3	28	317	1.4
1567.1	0.228	13	0.663	18	290	2.5	3.3	1.2	28	332	1.8
1568.0	0.744	14	0.871	20	258	1.1	11	1.6	31	295	0.783
1569.0	0.268	18	0.660	19	286	1.5	3.9	1.2	29	327	1.1
1569.9	0.228	13	0.447	20	237	1.6	3.3	0.815	30	272	1.2
1570.8	0.442	17	0.677	21	271	1.7	6.4	1.2	32	310	1.2
1571.7	0.228	14	1.0	21	317	1.2	3.3	1.8	32	362	0.899



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1572.7	0.655	14	1.0	18	286	1.1	9.4	1.9	28	327	0.833
1573.6	0.228	11	0.899	17	236	1.5	3.3	1.6	26	269	1.1
1574.5	0.228	14	0.581	22	313	1.7	3.3	1.1	34	358	1.2
1575.4	0.228	12	0.908	20	276	0.982	3.3	1.7	30	315	0.717
1576.4	0.228	12	0.497	23	269	1.1	3.3	0.906	35	308	0.824
1577.3	0.364	15	0.994	19	281	2.4	5.3	1.8	29	321	1.7
1578.2	0.261	13	0.642	16	274	1.2	3.8	1.2	25	313	0.864
1579.1	0.228	11	0.943	21	290	1.2	3.3	1.7	32	331	0.874
1580.1	0.228	11	0.879	18	252	1.3	3.3	1.6	27	289	0.925
1581.0	0.228	13	1.2	27	315	1.4	3.3	2.2	42	360	1.0
1581.9	0.228	14	0.520	19	259	0.933	3.3	0.948	29	296	0.681
1582.8	0.228	15	0.677	19	268	1.9	3.3	1.2	30	307	1.4
1583.8	0.538	15	0.755	21	286	0.108	7.8	1.4	31	328	0.079
1584.7	0.408	16	0.743	19	291	1.1	5.9	1.4	29	333	0.792
1585.6	0.404	12	1.4	19	275	1.6	5.8	2.6	30	314	1.1
1586.5	0.228	13	1.0	22	293	1.3	3.3	1.8	34	335	0.966
1587.4	0.228	17	0.685	22	329	1.5	3.3	1.2	34	376	1.1
1588.4	0.228	12	1.1	21	280	2.0	3.3	1.9	33	321	1.4
1589.3	0.458	19	0.900	23	336	0.397	6.6	1.6	35	384	0.290
1590.2	0.228	17	0.676	21	318	0.779	3.3	1.2	32	364	0.568
1591.1	0.228	15	0.663	20	287	1.0	3.3	1.2	31	328	0.745
1592.1	0.292	13	0.883	20	291	2.3	4.2	1.6	30	333	1.7
1593.0	0.268	16	0.927	19	295	1.3	3.9	1.7	29	337	0.977
1593.9	0.372	16	0.593	21	323	1.5	5.4	1.1	32	369	1.1
1594.8	0.555	13	0.868	17	268	1.7	8.0	1.6	27	306	1.2
1595.8	0.228	13	0.904	24	293	1.1	3.3	1.6	36	336	0.831
1596.7	0.228	13	0.792	22	352	2.3	3.3	1.4	33	402	1.7
1597.6	0.590	15	0.512	19	306	1.4	8.5	0.933	30	350	1.0
1598.5	0.228	15	0.597	19	297	2.0	3.3	1.1	30	340	1.5
1599.5	0.297	16	0.634	19	313	0.397	4.3	1.2	29	358	0.289
1600.4	0.228	17	0.662	20	294	2.2	3.3	1.2	30	336	1.6
1601.3	0.228	13	0.679	18	304	1.6	3.3	1.2	27	347	1.2
1602.2	0.228	15	0.954	20	300	1.3	3.3	1.7	31	343	0.912
1603.2	0.228	14	0.955	17	320	1.3	3.3	1.7	25	366	0.975
1604.1	0.228	14	0.404	17	282	1.7	3.3	0.737	25	322	1.3
1605.0	0.228	14	1.0	26	314	0.918	3.3	1.8	41	359	0.670
1605.9	0.352	17	0.837	16	349	0.878	5.1	1.5	24	400	0.640
1606.9	0.304	14	0.751	20	275	1.5	4.4	1.4	31	315	1.1
1607.8	0.228	16	1.5	20	294	0.746	3.3	2.7	31	337	0.544
1608.7	0.352	17	0.623	20	341	2.2	5.1	1.1	31	390	1.6
1609.6	0.228	15	1.1	17	288	1.9	3.3	1.9	26	329	1.4
1610.5	0.228	17	0.568	22	297	1.3	3.3	1.0	33	340	0.972
1611.5	0.228	16	1.1	17	318	0.883	3.3	1.9	26	363	0.644
1612.4	0.230	16	1.4	24	366	2.2	3.3	2.6	37	419	1.6
1613.3	0.228	15	0.749	24	297	1.1	3.3	1.4	36	340	0.767
1614.2	0.228	18	1.1	22	349	0.742	3.3	2.0	34	399	0.541
1615.2	0.228	15	1.1	17	383	1.1	3.3	2.0	27	438	0.793
1616.1	0.502	14	0.993	21	345	2.0	7.2	1.8	32	395	1.5
1617.0	0.228	14	0.721	22	376	1.7	3.3	1.3	33	430	1.2
1617.9	0.228	16	0.995	23	343	1.5	3.3	1.8	35	392	1.1
1618.9	0.228	16	0.790	23	322	2.4	3.3	1.4	36	368	1.7
1619.8	0.228	15	0.727	20	373	1.9	3.3	1.3	30	427	1.4
1620.7	0.228	17	1.3	28	427	2.3	3.3	2.3	43	489	1.7
1621.6	0.228	14	0.756	26	386	1.0	3.3	1.4	39	441	0.744
1622.6	0.334	14	1.0	22	317	2.6	4.8	1.9	34	363	1.9
1623.5	0.228	15	0.930	24	411	1.7	3.3	1.7	37	470	1.2
1624.4	0.233	15	0.925	23	407	2.0	3.4	1.7	36	465	1.5
1625.3	0.228	16	0.952	26	429	2.1	3.3	1.7	40	491	1.5
1626.3	0.228	15	0.572	24	349	1.5	3.3	1.0	37	400	1.1
1627.2	0.228	14	0.864	24	357	1.6	3.3	1.6	36	408	1.2
1628.1	0.228	14	0.866	23	360	2.1	3.3	1.6	35	412	1.6
1629.0	0.228	14	0.702	24	333	2.0	3.3	1.3	37	381	1.5
1630.0	0.228	17	0.854	22	374	1.6	3.3	1.6	34	427	1.2
1630.9	0.352	15	0.499	25	369	1.3	5.1	0.910	39	422	0.920
1631.8	0.228	13	1.1	22	360	2.4	3.3	1.9	33	412	1.8
1632.7	0.287	12	0.867	24	325	1.4	4.1	1.6	36	372	1.0
1633.7	0.228	9.8	0.851	22	341	1.5	3.3	1.6	34	390	1.1
1634.6	0.228	11	0.656	21	280	1.5	3.3	1.2	32	320	1.1
1635.5	0.228	13	0.375	19	343	2.5	3.3	0.685	29	392	1.8
1636.4	0.228	15	1.1	22	376	2.5	3.3	2.0	34	430	1.8
1637.3	0.228	14	0.949	20	297	1.8	3.3	1.7	30	339	1.3
1638.3	0.272	12	0.761	21	361	2.0	3.9	1.4	33	412	1.4
1639.2	0.228	12	1.0	20	367	2.9	3.3	1.9	30	419	2.1
1640.1	0.259	13	0.580	16	303	2.2	3.7	1.1	25	346	1.6
1641.0	0.228	12	0.647	29	288	1.9	3.3	1.2	44	329	1.4
1642.0	0.626	13	0.540	25	315	1.7	9.0	0.984	38	360	1.2
1642.9	0.228	15	0.865	24	317	1.8	3.3	1.6	37	362	1.3
1643.8	0.539	12	0.872	19	312	2.4	7.8	1.6	30	357	1.7
1644.7	0.228	15	0.575	20	373	2.1	3.3	1.0	30	427	1.5
1645.7	0.228	14	0.645	24	361	2.1	3.3	1.2	37	413	1.5
1646.6	0.228	12	0.547	21	328	1.8	3.3	0.997	33	375	1.3



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1647.5	0.381	18	0.607	26	368	1.8	5.5	1.1	40	421	1.3
1648.4	0.228	12	0.932	18	343	2.6	3.3	1.7	28	392	1.9
1649.4	0.452	14	0.659	25	311	2.0	6.5	1.2	38	356	1.5
1650.3	0.417	12	0.518	19	266	1.5	6.0	0.944	29	305	1.1
1651.2	0.228	11	1.0	22	345	1.9	3.3	1.9	34	395	1.4
1652.1	0.228	12	0.710	19	289	2.2	3.3	1.3	30	331	1.6
1653.1	0.228	13	1.0	18	291	1.5	3.3	1.9	27	333	1.1
1654.0	0.374	12	0.465	23	323	1.6	5.4	0.847	35	369	1.2
1654.9	0.228	11	1.0	20	326	2.7	3.3	1.9	31	373	2.0
1655.8	0.228	13	0.625	20	332	2.3	3.3	1.1	31	380	1.7
1656.8	0.366	12	0.614	18	327	1.3	5.3	1.1	28	374	0.955
1657.7	0.684	14	0.914	20	337	1.2	9.9	1.7	31	385	0.870
1658.6	0.228	13	0.859	17	315	1.8	3.3	1.6	27	361	1.3
1659.5	0.609	12	0.756	17	326	2.0	8.8	1.4	26	373	1.5
1660.5	0.228	16	0.512	18	328	1.6	3.3	0.933	28	375	1.2
1661.4	0.228	13	0.692	19	328	1.1	3.3	1.3	29	375	0.816
1662.3	0.228	11	0.498	16	312	1.9	3.3	0.908	25	357	1.4
1663.2	0.228	12	0.409	14	313	2.2	3.3	0.746	21	358	1.6
1664.1	0.228	20	0.540	17	304	1.4	3.3	0.984	26	348	1.0
1665.1	0.332	13	0.586	21	296	0.948	4.8	1.1	33	338	0.692
1666.0	0.228	12	0.567	20	282	0.941	3.3	1.0	30	322	0.687
1666.9	0.228	10	0.711	17	328	0.875	3.3	1.3	25	375	0.638
1667.8	0.228	12	0.484	18	292	2.0	3.3	0.882	27	334	1.4
1668.8	0.228	14	0.633	26	305	2.0	3.3	1.2	41	348	1.5
1669.7	0.228	13	1.0	23	346	2.2	3.3	1.9	35	396	1.6
1670.6	0.228	9.7	0.538	19	262	1.1	3.3	0.981	29	300	0.795
1671.5	0.228	12	0.941	23	296	0.735	3.3	1.7	36	339	0.537
1672.5	0.228	17	0.824	22	329	1.4	3.3	1.5	34	376	1.0
1673.4	0.228	14	0.610	21	292	2.4	3.3	1.1	32	334	1.7
1674.3	0.805	13	0.969	22	294	1.4	12	1.8	34	337	1.0
1675.2	0.228	13	0.776	25	315	1.6	3.3	1.4	38	360	1.2
1676.2	0.228	12	0.826	22	375	1.1	3.3	1.5	33	429	0.815
1677.1	0.228	11	1.2	24	302	1.4	3.3	2.2	37	346	1.0
1678.0	0.228	11	0.876	20	316	0.856	3.3	1.6	31	362	0.624
1678.9	0.354	14	0.780	22	356	0.500	5.1	1.4	34	407	0.364
1679.9	0.228	13	0.869	20	315	0.939	3.3	1.6	31	361	0.685
1680.8	0.365	11	0.389	21	316	1.7	5.3	0.709	32	362	1.2
1681.7	0.228	12	0.854	17	337	0.636	3.3	1.6	26	385	0.464
1682.6	0.228	13	1.1	21	276	0.788	3.3	1.9	33	316	0.575
1683.6	0.228	12	1.4	22	340	1.7	3.3	2.5	34	389	1.2
1684.5	0.228	15	0.803	21	354	1.4	3.3	1.5	32	405	0.990
1685.4	0.228	17	1.0	21	397	1.5	3.3	1.9	33	454	1.1
1686.3	0.228	9.5	0.603	19	288	1.5	3.3	1.1	29	329	1.1
1687.3	0.298	16	0.766	23	353	1.2	4.3	1.4	35	403	0.886
1688.2	0.228	13	0.848	25	354	0.632	3.3	1.5	38	405	0.461
1689.1	0.356	13	0.972	25	361	1.4	5.1	1.8	38	413	1.0
1690.0	0.293	10	1.4	25	327	1.5	4.2	2.5	38	374	1.1
1690.9	0.228	14	0.903	21	383	0.371	3.3	1.6	33	438	0.271
1691.9	0.228	12	1.0	24	341	1.2	3.3	1.9	36	390	0.901
1692.8	0.228	13	0.650	21	323	1.1	3.3	1.2	32	369	0.837
1693.7	0.392	16	0.797	25	375	1.1	5.7	1.5	38	429	0.818
1694.6	0.228	15	0.663	21	382	1.8	3.3	1.2	33	436	1.3
1695.6	0.415	11	0.726	21	326	0.980	6.0	1.3	32	373	0.715
1696.5	0.461	14	1.0	28	445	0.950	6.7	1.9	43	509	0.693
1697.4	0.228	14	0.738	28	407	1.7	3.3	1.3	43	465	1.2
1698.3	0.228	15	0.981	21	367	1.1	3.3	1.8	32	420	0.817
1699.3	0.228	16	1.1	20	381	1.4	3.3	2.0	30	435	1.0
1700.2	0.228	15	1.0	21	491	1.6	3.3	1.9	33	561	1.1
1701.1	0.228	13	0.848	20	446	1.4	3.3	1.5	31	510	1.0
1702.0	0.228	20	1.4	23	424	2.2	3.3	2.6	36	485	1.6
1703.0	0.676	14	0.743	26	420	2.1	9.8	1.4	40	480	1.5
1703.9	0.259	12	0.897	21	376	0.820	3.7	1.6	32	430	0.598
1704.8	0.228	16	0.864	18	367	1.2	3.3	1.6	28	419	0.853
1705.7	0.228	16	1.3	23	479	1.6	3.3	2.4	35	548	1.1
1706.7	0.274	14	0.887	18	381	0.616	4.0	1.6	27	436	0.449
1707.6	0.228	10	0.802	21	427	1.6	3.3	1.5	32	489	1.2
1708.5	0.364	18	1.3	22	490	1.4	5.3	2.4	34	560	1.0
1709.4	0.408	14	0.958	19	386	1.9	5.9	1.7	30	441	1.4
1710.4	0.228	14	0.795	20	437	1.2	3.3	1.4	30	500	0.872
1711.3	0.353	14	0.514	15	419	0.851	5.1	0.937	22	479	0.621
1712.2	0.228	15	1.1	16	374	1.3	3.3	1.9	25	428	0.975
1713.1	0.783	22	1.2	18	611	0.736	11	2.1	27	699	0.537
1714.1	0.580	19	0.555	19	706	1.1	8.4	1.0	30	807	0.820
1715.0	0.253	10	0.581	13	275	1.4	3.7	1.1	20	314	0.995
1715.9	0.527	19	0.880	15	680	1.6	7.6	1.6	24	778	1.2
1716.8	0.228	18	0.638	20	721	1.4	3.3	1.2	31	825	1.0
1717.7	0.228	13	0.834	16	406	2.2	3.3	1.5	24	465	1.6
1718.7	0.228	14	0.745	17	416	1.4	3.3	1.4	25	476	1.1
1719.6	0.953	16	0.645	19	504	1.1	14	1.2	29	576	0.801
1720.5	0.658	14	0.453	17	607	1.8	9.5	0.826	27	694	1.3
1721.4	0.374	12	0.584	13	348	1.2	5.4	1.1	20	398	0.899



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1722.4	0.388	15	1.1	16	479	1.3	5.6	2.0	24	547	0.922
1723.3	0.648	15	0.527	22	535	0.846	9.4	0.961	34	611	0.617
1724.2	0.635	11	0.518	14	426	0.436	9.2	0.945	21	487	0.318
1725.1	0.228	16	0.910	14	507	2.2	3.3	1.7	22	580	1.6
1726.1	0.228	18	0.691	22	645	1.1	3.3	1.3	34	737	0.815
1727.0	0.228	15	0.611	16	512	1.3	3.3	1.1	24	585	0.947
1727.9	0.447	17	0.666	15	476	0.558	6.5	1.2	23	544	0.407
1728.8	0.400	14	0.426	16	589	1.6	5.8	0.777	24	673	1.1
1729.8	0.228	16	0.665	14	513	1.8	3.3	1.2	22	587	1.3
1730.7	0.473	12	0.645	15	499	1.1	6.8	1.2	23	571	0.780
1731.6	0.858	16	0.900	18	712	2.0	12	1.6	27	814	1.5
1732.5	0.228	17	0.764	14	500	1.2	3.3	1.4	21	572	0.905
1733.5	0.228	16	0.850	22	512	0.892	3.3	1.6	34	586	0.651
1734.4	0.311	21	0.283	19	651	2.0	4.5	0.516	28	744	1.4
1735.3	0.228	18	1.0	15	573	2.1	3.3	1.8	24	655	1.5
1736.2	0.668	14	0.830	17	517	1.0	9.6	1.5	27	592	0.755
1737.2	0.344	15	0.639	17	509	1.1	5.0	1.2	26	582	0.809
1738.1	0.228	19	0.684	17	546	0.827	3.3	1.2	26	624	0.603
1739.0	0.228	14	0.774	19	548	1.8	3.3	1.4	29	627	1.3
1739.9	0.228	19	1.1	17	592	1.5	3.3	2.0	27	677	1.1
1740.8	0.228	24	0.890	23	685	1.4	3.3	1.6	35	784	1.0
1741.8	0.228	16	0.667	17	539	1.5	3.3	1.2	27	616	1.1
1742.7	0.462	17	1.2	15	491	1.0	6.7	2.2	23	561	0.763
1743.6	0.228	20	0.898	19	666	2.2	3.3	1.6	30	762	1.6
1744.5	0.228	20	0.515	14	612	1.1	3.3	0.939	22	699	0.808
1745.5	0.228	19	0.643	17	625	1.9	3.3	1.2	26	715	1.4
1746.4	0.999	19	0.958	14	667	1.2	14	1.7	21	763	0.839
1747.3	0.573	20	1.0	21	612	1.0	8.3	1.9	32	700	0.734
1748.2	0.839	16	0.783	16	554	0.522	12	1.4	24	634	0.381
1749.2	0.469	19	1.0	14	575	1.1	6.8	1.9	21	657	0.808
1750.1	0.228	23	1.1	16	841	1.1	3.3	2.1	25	962	0.779
1751.0	0.228	18	0.876	16	626	0.919	3.3	1.6	25	715	0.671
1751.9	0.251	19	0.540	15	679	0.929	3.6	0.985	23	776	0.678
1752.9	0.228	18	1.1	16	787	1.9	3.3	1.9	25	899	1.4
1753.8	0.228	19	1.4	15	760	1.8	3.3	2.6	24	870	1.3
1754.7	0.303	15	0.722	9.6	516	2.2	4.4	1.3	15	590	1.6
1755.6	0.818	15	0.563	16	672	0.849	12	1.0	24	769	0.619
1756.6	0.228	21	0.441	9.8	658	2.7	3.3	0.804	15	752	2.0
1757.5	0.228	19	0.501	16	723	1.7	3.3	0.914	24	827	1.2
1758.4	0.424	16	0.341	15	696	1.7	6.1	0.622	24	796	1.2
1759.3	0.228	20	0.672	13	892	1.1	3.3	1.2	19	1020	0.768
1760.3	0.587	23	0.766	13	717	1.2	8.5	1.4	20	820	0.861
1761.2	0.262	23	0.643	16	788	2.3	3.8	1.2	25	901	1.7
1762.1	0.423	23	0.600	12	632	1.7	6.1	1.1	18	723	1.2
1763.0	0.228	18	0.448	14	742	1.6	3.3	0.816	21	848	1.2
1764.0	0.362	18	0.771	12	793	2.5	5.2	1.4	19	907	1.8
1764.9	0.228	18	0.441	14	666	1.8	3.3	0.805	21	762	1.3
1765.8	0.228	20	0.533	13	756	2.2	3.3	0.972	20	864	1.6
1766.7	0.228	20	0.592	12	657	2.1	3.3	1.1	18	752	1.5
1767.6	0.271	17	0.501	13	642	3.0	3.9	0.914	20	734	2.2
1768.6	0.276	20	0.468	11	706	2.2	4.0	0.854	17	808	1.6
1769.5	0.228	21	0.725	12	684	1.5	3.3	1.3	18	782	1.1
1770.4	0.228	21	0.590	14	726	0.843	3.3	1.1	21	830	0.615
1771.3	0.834	17	0.284	11	677	0.475	12	0.518	17	774	0.346
1772.3	0.228	21	0.508	8.2	623	1.4	3.3	0.927	13	712	1.0
1773.2	0.843	22	0.567	9.7	701	1.1	12	1.0	15	802	0.832
1774.1	0.228	20	0.732	12	559	1.7	3.3	1.3	19	639	1.2
1775.0	0.228	20	0.471	13	618	0.943	3.3	0.859	20	707	0.688
1776.0	0.388	23	0.741	14	785	1.8	5.6	1.4	21	897	1.3
1776.9	0.228	16	0.622	11	662	1.7	3.3	1.1	16	758	1.2
1777.8	0.397	20	0.846	12	699	0.893	5.7	1.5	19	799	0.652
1778.7	0.228	29	0.487	17	817	1.1	3.3	0.888	26	934	0.775
1779.7	0.505	20	0.849	15	804	2.2	7.3	1.5	23	920	1.6
1780.6	0.228	21	0.818	12	716	1.9	3.3	1.5	18	819	1.4
1781.5	0.480	24	0.721	12	846	2.2	6.9	1.3	19	967	1.6
1782.4	0.465	22	0.945	13	869	1.7	6.7	1.7	20	994	1.2
1783.4	0.337	19	0.642	12	797	2.0	4.9	1.2	18	911	1.5
1784.3	0.496	22	0.508	11	728	1.5	7.2	0.927	17	833	1.1
1785.2	0.232	18	0.394	15	911	1.0	3.4	0.719	23	1041	0.734
1786.1	0.228	20	0.183	12	733	1.6	3.3	0.335	19	838	1.1
1787.1	0.374	20	0.796	19	818	1.4	5.4	1.5	29	936	0.988
1788.0	0.228	20	0.370	12	708	1.5	3.3	0.675	18	810	1.1
1788.9	0.478	20	0.635	9.5	811	1.5	6.9	1.2	15	927	1.1
1789.8	0.228	20	0.813	12	744	0.649	3.3	1.5	18	850	0.474
1790.8	0.348	20	0.702	32	829	1.9	5.0	1.3	50	948	1.4
1791.7	0.232	18	0.852	12	777	1.7	3.4	1.6	18	889	1.3
1792.6	0.365	20	0.534	10	827	0.654	5.3	0.974	16	946	0.477
1793.5	0.228	20	0.910	11	792	1.4	3.3	1.7	17	905	1.1
1794.5	0.307	18	0.450	9.7	786	2.1	4.4	0.820	15	899	1.5
1795.4	0.228	23	0.405	11	863	2.5	3.3	0.739	17	987	1.8
1796.3	0.715	16	0.849	11	782	2.2	10	1.5	16	895	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1797.2	0.228	23	0.999	15	721	1.8	3.3	1.8	22	824	1.3
1798.1	0.467	33	0.512	15	711	1.7	6.7	0.934	24	813	1.2
1799.1	0.228	25	0.541	11	1000	1.5	3.3	0.987	17	1143	1.1
1800.0	0.257	30	0.591	13	945	1.9	3.7	1.1	21	1080	1.4
1800.9	0.420	23	0.855	10	630	1.5	6.1	1.6	16	721	1.1
1801.8	0.427	33	0.679	16	1237	2.1	6.2	1.2	24	1415	1.6
1802.8	0.228	21	0.646	15	590	2.0	3.3	1.2	23	675	1.5
1803.7	0.228	18	0.712	11	497	1.6	3.3	1.3	17	568	1.2
1804.6	1.3	27	1.1	14	1044	3.1	19	1.9	21	1194	2.2
1805.5	0.228	24	1.0	16	1419	1.2	3.3	1.8	25	1622	0.851
1806.5	0.434	19	0.507	16	684	1.0	6.3	0.925	25	782	0.747
1807.4	0.228	26	0.928	20	739	0.848	3.3	1.7	31	845	0.618
1808.3	0.274	26	0.464	17	1136	2.0	3.9	0.846	26	1299	1.5
1809.2	0.228	20	0.874	14	564	1.8	3.3	1.6	22	645	1.3
1810.2	0.898	20	0.580	16	716	1.1	13	1.1	25	819	0.795
1811.1	0.318	28	1.3	17	567	2.5	4.6	2.4	27	648	1.8
1812.0	0.228	21	1.1	15	594	2.2	3.3	1.9	23	680	1.6
1812.9	0.524	17	0.522	16	479	0.920	7.6	0.952	24	548	0.671
1813.9	0.228	17	0.800	14	445	1.2	3.3	1.5	21	509	0.852
1814.8	0.337	20	0.756	23	645	1.4	4.9	1.4	35	737	1.0
1815.7	0.249	23	0.951	20	630	0.609	3.6	1.7	31	720	0.444
1816.6	0.228	18	0.924	19	477	1.1	3.3	1.7	30	545	0.794
1817.5	0.228	25	0.646	17	475	1.3	3.3	1.2	27	543	0.955
1818.5	0.228	18	0.884	16	454	1.3	3.3	1.6	24	519	0.936
1819.4	0.228	18	0.848	20	416	1.1	3.3	1.5	31	476	0.771
1820.3	0.274	18	0.614	14	388	1.7	4.0	1.1	22	444	1.3
1821.2	0.503	18	0.841	15	428	1.3	7.3	1.5	23	489	0.923
1822.2	0.228	15	0.552	22	425	1.7	3.3	1.0	33	486	1.2
1823.1	0.544	18	0.530	16	348	1.3	7.9	0.967	25	398	0.958
1824.0	0.228	15	0.722	16	360	0.502	3.3	1.3	25	412	0.366
1824.9	0.228	17	0.881	17	440	1.1	3.3	1.6	26	504	0.801
1825.9	0.228	17	0.489	16	326	0.812	3.3	0.892	24	372	0.592
1826.8	0.228	16	0.500	16	361	1.5	3.3	0.913	25	412	1.1
1827.7	0.518	21	0.325	15	434	1.0	7.5	0.592	24	496	0.759
1828.6	0.590	17	0.385	20	366	1.0	8.5	0.702	31	419	0.753
1829.6	0.228	20	0.208	21	351	1.5	3.3	0.379	33	401	1.1
1830.5	0.321	23	0.685	18	418	2.0	4.6	1.2	28	478	1.5
1831.4	0.228	18	0.524	15	335	0.822	3.3	0.956	23	384	0.600
1832.3	0.642	18	0.340	16	313	1.5	9.3	0.620	24	358	1.1
1833.3	0.488	21	0.748	12	323	1.3	7.0	1.4	18	369	0.947
1834.2	0.601	20	0.424	12	353	1.8	8.7	0.774	18	403	1.3
1835.1	0.228	16	0.409	14	316	1.3	3.3	0.745	21	362	0.925
1836.0	0.228	16	0.610	12	341	1.1	3.3	1.1	19	389	0.810
1837.0	0.228	19	0.401	15	322	0.490	3.3	0.731	23	368	0.358
1837.9	0.519	17	0.484	16	303	0.646	7.5	0.883	24	346	0.472
1838.8	0.622	16	0.272	15	306	2.3	9.0	0.497	24	350	1.7
1839.7	0.270	15	0.604	12	292	0.236	3.9	1.1	18	334	0.172
1840.7	0.228	19	0.361	17	344	0.521	3.3	0.659	27	393	0.380
1841.6	0.228	16	0.585	15	294	0.902	3.3	1.1	24	336	0.658
1842.5	0.228	18	0.627	17	322	0.527	3.3	1.1	25	368	0.385
1843.4	0.228	20	0.382	17	322	1.0	3.3	0.696	26	368	0.746
1844.4	0.838	18	0.329	16	288	0.521	12	0.600	25	329	0.380
1845.3	0.228	20	0.537	18	289	1.1	3.3	0.979	28	331	0.790
1846.2	0.228	18	0.304	14	346	0.670	3.3	0.554	22	395	0.489
1847.1	0.228	14	0.544	15	265	1.3	3.3	0.993	22	303	0.983
1848.0	0.228	17	0.466	13	288	1.3	3.3	0.850	20	329	0.916
1849.0	0.522	25	0.455	17	310	0.518	7.5	0.831	26	355	0.378
1849.9	0.468	19	0.408	15	276	1.3	6.8	0.745	23	316	0.946
1850.8	0.228	17	0.603	16	291	0.975	3.3	1.1	25	333	0.711
1851.7	0.228	20	0.479	15	313	0.769	3.3	0.874	22	358	0.561
1852.7	0.465	24	0.611	17	334	0.542	6.7	1.1	26	382	0.396
1853.6	0.449	20	0.833	15	275	1.4	6.5	1.5	23	314	0.990
1854.5	0.337	21	0.920	16	296	1.2	4.9	1.7	25	339	0.880
1855.4	0.228	25	0.502	20	324	1.5	3.3	0.916	31	371	1.1
1856.4	0.228	23	0.454	20	335	1.6	3.3	0.828	31	383	1.2
1857.3	0.386	21	0.256	16	275	0.450	5.6	0.467	25	315	0.329
1858.2	0.228	19	0.668	16	308	0.584	3.3	1.2	25	352	0.426
1859.1	0.392	16	0.288	15	273	0.457	5.7	0.526	23	312	0.333
1860.1	0.264	19	0.738	18	325	0.352	3.8	1.3	28	372	0.257
1861.0	0.228	19	0.582	18	289	1.7	3.3	1.1	28	331	1.2
1861.9	0.228	19	0.593	14	313	0.498	3.3	1.1	22	358	0.364
1862.8	0.228	18	0.462	15	286	0.867	3.3	0.842	23	327	0.632
1863.8	0.228	20	0.335	16	296	0.666	3.3	0.611	25	338	0.486
1864.7	0.228	18	0.432	15	305	1.2	3.3	0.787	23	349	0.908
1865.6	0.365	15	0.293	16	306	0.779	5.3	0.535	25	350	0.568
1866.5	0.228	16	0.483	19	301	1.2	3.3	0.881	28	344	0.854
1867.5	0.294	22	0.725	13	327	0.527	4.2	1.3	20	374	0.385
1868.4	0.228	16	0.791	15	277	1.1	3.3	1.4	23	317	0.810
1869.3	0.228	20	0.288	13	307	0.765	3.3	0.525	20	351	0.558
1870.2	0.350	16	0.183	13	296	1.1	5.1	0.335	20	339	0.823
1871.2	0.228	18	0.519	15	311	0.915	3.3	0.947	23	355	0.668



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1872.1	0.228	15	0.549	14	307	1.4	3.3	1.0	22	351	0.992
1873.0	0.228	21	1.1	13	341	0.259	3.3	2.0	19	390	0.189
1873.9	0.228	16	0.221	12	280	0.497	3.3	0.403	18	320	0.362
1874.8	0.228	16	0.286	12	261	1.0	3.3	0.522	18	299	0.754
1875.8	0.448	15	0.391	12	248	0.672	6.5	0.713	18	284	0.490
1876.7	0.656	18	0.348	14	315	1.0	9.5	0.635	21	360	0.741
1877.6	0.228	17	0.376	11	259	1.3	3.3	0.685	16	296	0.937
1878.5	0.228	16	0.771	10	312	1.8	3.3	1.4	16	357	1.3
1879.5	0.296	17	0.434	11	352	0.938	4.3	0.791	17	402	0.684
1880.4	0.228	17	0.463	14	304	0.744	3.3	0.845	22	348	0.543
1881.3	0.228	13	0.853	12	268	1.3	3.3	1.6	18	306	0.960
1882.2	0.429	18	0.501	10	322	0.500	6.2	0.914	16	368	0.365
1883.2	0.228	17	0.350	12	298	0.463	3.3	0.638	19	341	0.338
1884.1	0.228	11	0.197	8.9	288	0.587	3.3	0.359	14	330	0.428
1885.0	0.617	16	0.535	13	362	0.397	8.9	0.976	20	414	0.290
1885.9	0.332	16	0.383	14	324	1.2	4.8	0.698	22	370	0.867
1886.9	0.228	20	0.580	9.7	232	0.529	3.3	1.1	15	266	0.386
1887.8	0.228	16	0.421	11	265	0.479	3.3	0.767	17	303	0.349
1888.7	0.228	18	0.502	14	314	2.2	3.3	0.916	21	359	1.6
1889.6	0.228	19	0.183	13	325	0.815	3.3	0.335	19	372	0.595
1890.6	0.228	13	0.513	11	270	0.851	3.3	0.936	17	309	0.621
1891.5	0.304	23	0.445	12	327	0.405	4.4	0.812	18	374	0.296
1892.4	0.228	15	0.599	16	406	1.4	3.3	1.1	24	465	1.0
1893.3	0.228	31	0.476	14	386	0.867	3.3	0.868	21	441	0.633
1894.3	0.228	22	0.755	16	232	1.5	3.3	1.4	25	266	1.1
1895.2	0.230	17	0.346	16	193	0.574	3.3	0.630	25	221	0.418
1896.1	0.562	52	0.905	22	473	0.985	8.1	1.7	34	541	0.719
1897.0	0.228	33	0.689	22	389	0.812	3.3	1.3	34	445	0.593
1898.0	0.616	20	0.599	16	228	1.9	8.9	1.1	24	260	1.4
1898.9	0.228	43	0.740	19	355	1.2	3.3	1.3	29	406	0.856
1899.8	0.228	23	0.918	14	301	1.2	3.3	1.7	22	344	0.851
1900.7	0.228	24	0.713	16	258	0.825	3.3	1.3	24	295	0.602
1901.6	0.228	15	0.183	17	244	1.2	3.3	0.335	27	279	0.894
1902.6	0.228	24	0.626	15	321	1.2	3.3	1.1	23	367	0.886
1903.5	0.228	19	0.433	12	225	0.875	3.3	0.789	18	257	0.638
1904.4	0.781	17	0.377	9.3	184	0.807	11	0.688	14	210	0.589
1905.3	0.466	32	0.646	17	398	0.543	6.7	1.2	26	455	0.396
1906.3	0.228	21	0.413	18	274	1.2	3.3	0.753	28	314	0.869
1907.2	0.495	17	0.310	18	309	1.9	7.1	0.565	28	353	1.4
1908.1	0.228	21	0.892	15	342	0.800	3.3	1.6	23	392	0.584
1909.0	0.359	21	0.730	13	358	1.7	5.2	1.3	20	409	1.2
1910.0	0.228	16	0.595	13	229	0.905	3.3	1.1	19	262	0.660
1910.9	0.662	25	0.980	17	308	1.7	9.6	1.8	25	352	1.2
1911.8	0.228	18	1.0	12	400	1.6	3.3	1.9	19	457	1.2
1912.7	0.295	15	2.3	12	257	0.844	4.3	4.1	18	293	0.616
1913.7	0.403	15	0.529	15	263	0.950	5.8	0.965	23	301	0.693
1914.6	0.228	29	1.0	18	486	2.0	3.3	1.8	27	556	1.5
1915.5	0.250	19	0.837	8.9	197	0.444	3.6	1.5	14	226	0.324
1916.4	0.631	17	0.919	12	298	1.2	9.1	1.7	19	341	0.883
1917.4	0.228	17	0.629	17	441	1.5	3.3	1.1	26	505	1.1
1918.3	0.228	18	0.359	11	325	0.890	3.3	0.655	17	372	0.649
1919.2	0.275	10	0.700	9.5	170	0.895	4.0	1.3	15	194	0.653
1920.1	0.228	19	0.485	12	280	1.3	3.3	0.885	19	320	0.935
1921.1	0.445	31	1.1	21	530	1.4	6.4	2.0	33	607	1.0
1922.0	0.228	9.8	0.409	11	235	1.2	3.3	0.746	17	269	0.854
1922.9	0.228	13	0.325	12	253	1.3	3.3	0.593	18	289	0.957
1923.8	0.238	19	0.475	17	394	1.8	3.4	0.867	26	451	1.3
1924.8	0.331	13	0.674	16	262	1.9	4.8	1.2	25	300	1.4
1925.7	0.228	12	0.961	14	236	0.976	3.3	1.8	21	270	0.712
1926.6	0.228	21	0.730	19	358	0.612	3.3	1.3	30	410	0.446
1927.5	0.478	19	0.682	16	349	0.596	6.9	1.2	25	399	0.435
1928.4	0.456	9.8	0.393	9.9	179	0.885	6.6	0.717	15	204	0.645
1929.4	0.572	16	0.557	13	354	1.9	8.3	1.0	20	404	1.4
1930.3	0.428	15	0.470	22	423	1.0	6.2	0.857	34	483	0.737
1931.2	0.228	12	1.0	12	283	0.900	3.3	1.9	18	324	0.657
1932.1	0.619	11	0.739	13	292	1.3	8.9	1.3	20	333	0.964
1933.1	0.228	22	0.874	18	486	0.636	3.3	1.6	27	556	0.464
1934.0	0.228	12	0.627	14	264	0.846	3.3	1.1	22	302	0.618
1934.9	0.228	8.7	0.908	12	206	0.612	3.3	1.7	18	235	0.446
1935.8	0.228	14	0.938	20	404	1.1	3.3	1.7	31	462	0.775
1936.8	0.263	14	0.465	15	281	0.848	3.8	0.849	23	322	0.619
1937.7	0.228	12	0.975	23	317	0.944	3.3	1.8	35	363	0.688
1938.6	1.1	11	0.829	18	305	0.757	15	1.5	28	348	0.552
1939.5	0.302	12	0.743	18	352	0.540	4.4	1.4	28	402	0.394
1940.5	0.338	19	0.834	20	365	1.2	4.9	1.5	30	418	0.895
1941.4	0.228	11	0.601	20	265	0.926	3.3	1.1	31	303	0.676
1942.3	0.228	14	0.622	14	250	1.6	3.3	1.1	22	286	1.1
1943.2	0.228	17	1.5	23	457	2.4	3.3	2.7	36	522	1.7
1944.2	0.228	18	1.2	22	333	2.2	3.3	2.1	34	381	1.6
1945.1	0.228	20	0.835	19	258	0.815	3.3	1.5	29	294	0.595
1946.0	0.681	15	0.933	28	291	0.946	9.8	1.7	42	332	0.691



Minnow Environmental  
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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1946.9	0.228	14	0.859	25	323	2.2	3.3	1.6	38	369	1.6
1947.9	0.228	19	1.9	24	312	0.855	3.3	3.5	37	357	0.624
1948.8	0.228	16	1.2	19	357	1.9	3.3	2.2	29	408	1.4
1949.7	0.228	16	1.2	24	378	1.4	3.3	2.3	36	433	1.0
1950.6	0.228	16	1.1	17	298	0.614	3.3	2.1	26	341	0.448
1951.5	0.228	14	1.2	18	320	1.7	3.3	2.1	27	365	1.2
1952.5	0.313	19	1.0	25	402	1.7	4.5	1.9	38	459	1.2
1953.4	0.228	16	1.4	15	330	2.1	3.3	2.6	23	377	1.5
1954.3	0.228	17	0.988	19	327	1.4	3.3	1.8	29	373	1.0
1955.2	0.228	13	1.2	20	313	1.1	3.3	2.1	31	358	0.799
1956.2	0.228	11	1.4	24	370	0.680	3.3	2.6	37	423	0.496
1957.1	0.228	16	0.788	21	273	1.9	3.3	1.4	32	313	1.4
1958.0	0.228	16	1.1	25	337	2.4	3.3	2.0	38	385	1.8
1958.9	0.228	20	0.902	27	366	2.3	3.3	1.6	41	419	1.7
1959.9	0.228	12	0.968	17	295	1.5	3.3	1.8	27	338	1.1
1960.8	0.350	15	0.986	20	275	0.874	5.1	1.8	31	314	0.638
1961.7	0.517	17	1.1	20	337	1.0	7.5	2.0	31	385	0.758
1962.6	0.382	13	1.2	20	262	1.0	5.5	2.1	31	300	0.741
1963.6	0.350	14	1.3	19	275	1.1	5.1	2.4	29	314	0.822
1964.5	0.228	15	1.3	18	309	0.891	3.3	2.3	28	354	0.650
1965.4	0.717	17	0.789	22	362	1.5	10	1.4	33	414	1.1
1966.3	0.228	13	0.792	25	252	0.830	3.3	1.4	39	288	0.606
1967.3	0.285	15	1.3	16	327	1.2	4.1	2.4	25	373	0.850
1968.2	0.774	16	0.896	20	366	1.6	11	1.6	31	418	1.2
1969.1	0.727	16	0.841	23	312	0.882	10	1.5	35	356	0.644
1970.0	0.272	15	0.852	18	362	1.2	3.9	1.6	28	413	0.902
1971.0	0.228	17	1.1	17	286	0.711	3.3	2.0	26	327	0.519
1971.9	0.432	14	0.881	20	281	0.891	6.2	1.6	30	322	0.650
1972.8	0.228	15	0.897	19	348	1.0	3.3	1.6	30	398	0.741
1973.7	0.228	16	0.811	22	346	0.818	3.3	1.5	33	396	0.597
1974.7	0.422	16	0.768	16	292	1.4	6.1	1.4	24	334	1.0
1975.6	0.228	13	0.988	16	287	1.0	3.3	1.8	24	328	0.753
1976.5	0.228	19	0.539	17	328	0.675	3.3	0.983	26	375	0.492
1977.4	0.228	15	0.776	14	312	0.497	3.3	1.4	22	357	0.363
1978.4	0.228	11	0.552	16	277	0.702	3.3	1.0	25	317	0.512
1979.3	0.275	13	0.738	18	285	1.8	4.0	1.3	27	326	1.3
1980.2	0.228	16	0.713	17	332	1.2	3.3	1.3	26	380	0.903
1981.1	0.228	15	0.551	16	321	1.4	3.3	1.0	24	367	1.1
1982.0	0.228	15	0.871	18	299	0.781	3.3	1.6	27	342	0.570
1983.0	0.228	14	0.545	12	279	0.360	3.3	0.995	18	319	0.263
1983.9	0.228	13	0.822	17	323	0.931	3.3	1.5	26	370	0.679
1984.8	0.496	14	0.433	20	345	1.4	7.2	0.789	30	395	1.0
1985.7	0.482	14	0.807	14	287	1.1	7.0	1.5	22	328	0.796
1986.7	0.228	12	0.736	15	329	1.7	3.3	1.3	23	376	1.3
1987.6	0.228	13	0.475	19	307	0.892	3.3	0.866	29	351	0.651
1988.5	0.490	14	0.579	16	288	0.736	7.1	1.1	25	330	0.537
1989.4	0.335	14	0.945	14	284	0.837	4.8	1.7	22	324	0.611
1990.4	0.401	13	0.527	16	272	1.5	5.8	0.962	24	311	1.1
1991.3	0.228	11	0.853	14	306	1.7	3.3	1.6	22	350	1.2
1992.2	0.303	12	0.646	15	323	1.5	4.4	1.2	22	370	1.1
1993.1	0.375	13	0.399	17	328	1.2	5.4	0.728	26	375	0.880
1994.1	0.228	13	0.423	14	283	1.1	3.3	0.772	21	324	0.801
1995.0	0.228	11	0.560	15	297	0.230	3.3	1.0	22	340	0.168
1995.9	0.519	12	0.420	17	321	0.910	7.5	0.767	26	367	0.664
1996.8	0.228	13	0.479	16	294	1.4	3.3	0.873	24	336	1.0
1997.8	0.228	13	0.230	14	284	0.783	3.3	0.420	22	324	0.571
1998.7	0.290	12	0.617	14	295	0.785	4.2	1.1	21	337	0.573
1999.6	0.354	13	0.347	11	272	0.884	5.1	0.632	16	311	0.645
2000.5	0.228	12	0.728	13	280	0.529	3.3	1.3	20	320	0.386
2001.5	0.806	12	0.727	12	329	1.1	12	1.3	18	376	0.817
2002.4	0.228	12	0.366	16	300	0.934	3.3	0.668	24	343	0.682
2003.3	0.885	10.0	0.599	15	266	0.633	13	1.1	23	305	0.462
2004.2	0.228	13	0.289	16	302	1.0	3.3	0.527	25	345	0.750
2005.2	0.228	17	0.535	15	324	0.669	3.3	0.975	23	371	0.488
2006.1	0.228	12	0.262	14	222	0.863	3.3	0.479	22	254	0.630
2007.0	0.449	14	0.396	14	310	1.9	6.5	0.721	21	355	1.4
2007.9	0.228	23	0.857	17	295	0.798	3.3	1.6	26	338	0.582
2008.9	0.497	14	0.556	13	305	0.620	7.2	1.0	19	349	0.452
2009.8	0.228	17	0.689	13	282	1.0	3.3	1.3	21	322	0.740
2010.7	0.228	15	0.183	13	282	1.7	3.3	0.335	20	322	1.2
2011.6	0.228	9.4	0.453	12	285	1.0	3.3	0.826	18	326	0.761
2012.5	0.228	11	0.682	10	249	0.369	3.3	1.2	16	285	0.269
2013.5	0.548	14	0.512	11	322	1.9	7.9	0.934	17	369	1.4
2014.4	0.506	13	0.183	12	276	1.3	7.3	0.335	18	316	0.929
2015.3	0.572	11	0.183	11	254	1.1	8.3	0.335	18	290	0.822
2016.2	0.228	11	0.710	9.1	254	0.620	3.3	1.3	14	291	0.452
2017.2	0.228	12	0.293	12	265	0.464	3.3	0.534	18	304	0.339
2018.1	0.228	10	0.215	12	267	0.483	3.3	0.392	18	306	0.353
2019.0	0.228	11	0.486	6.8	248	0.608	3.3	0.886	10	283	0.444
2019.9	0.558	12	0.487	13	310	0.412	8.1	0.888	19	354	0.301
2020.9	0.228	13	0.223	13	281	0.757	3.3	0.406	19	321	0.553



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Sample ID: 008

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2021.8	0.638	13	0.853	10	260	1.4	9.2	1.6	16	298	0.994
2022.7	0.228	14	0.219	11	282	0.744	3.3	0.400	16	323	0.543
2023.6	0.228	9.5	0.501	13	305	1.5	3.3	0.913	20	349	1.1
2024.6	0.228	11	0.410	11	285	0.887	3.3	0.748	17	326	0.647
2025.5	0.228	14	0.609	8.7	325	1.4	3.3	1.1	13	371	1.0
2026.4	0.228	13	0.326	15	282	1.1	3.3	0.594	23	322	0.782
2027.3	0.505	14	0.721	10	257	1.4	7.3	1.3	15	293	1.0
2028.3	0.531	10	0.289	12	275	0.810	7.7	0.528	18	315	0.591
2029.2	0.228	14	0.574	12	339	1.7	3.3	1.0	19	387	1.2
2030.1	0.459	12	0.542	11	267	1.0	6.6	0.988	17	306	0.758
2031.0	0.228	16	0.788	11	246	1.4	3.3	1.4	16	281	1.0
2032.0	0.228	13	1.1	13	259	1.2	3.3	2.0	19	296	0.854
2032.9	0.373	19	1.5	12	275	1.1	5.4	2.8	18	314	0.805
2033.8	0.228	20	0.860	16	339	0.618	3.3	1.6	24	387	0.451
2034.7	0.228	13	0.755	15	225	0.816	3.3	1.4	23	257	0.596
2035.7	0.228	15	0.554	12	242	1.3	3.3	1.0	18	276	0.938
2036.6	0.228	18	0.807	13	321	1.6	3.3	1.5	20	367	1.2
2037.5	0.228	18	0.933	16	250	1.3	3.3	1.7	24	286	0.952
2038.4	0.228	11	1.1	10.0	241	1.6	3.3	2.0	15	276	1.2
2039.3	0.228	11	0.457	16	259	1.4	3.3	0.833	24	296	1.0
2040.3	0.228	11	0.838	13	334	1.0	3.3	1.5	19	382	0.744
2041.2	0.228	10.0	0.816	16	256	1.7	3.3	1.5	25	293	1.3
2042.1	0.228	16	1.3	16	330	1.5	3.3	2.3	25	377	1.1
2043.0	0.228	19	0.779	19	285	0.902	3.3	1.4	29	326	0.658
2044.0	0.268	17	0.699	19	350	1.7	3.9	1.3	28	400	1.2
2044.9	0.912	17	0.489	18	329	1.7	13	0.891	28	377	1.3
2045.8	0.228	18	0.682	14	397	1.8	3.3	1.2	21	454	1.3
2046.7	0.228	13	0.997	19	305	1.9	3.3	1.8	29	349	1.4
2047.7	0.228	14	1.1	17	294	1.6	3.3	2.0	26	337	1.1
2048.6	0.301	21	1.5	14	240	0.534	4.3	2.7	21	274	0.390
2049.5	0.228	15	0.962	17	307	1.3	3.3	1.8	26	351	0.955
2050.4	0.228	10	0.822	17	224	1.5	3.3	1.5	26	256	1.1
2051.4	0.287	21	2.2	17	348	1.2	4.1	4.0	26	398	0.854
2052.3	0.354	15	0.953	16	365	1.7	5.1	1.7	24	418	1.2
2053.2	0.228	11	1.1	21	284	2.4	3.3	2.0	32	325	1.8
2054.1	0.228	13	1.5	18	303	2.5	3.3	2.7	27	346	1.8
2055.1	2.0	21	1.7	23	338	1.3	29	3.1	35	386	0.927
2056.0	0.228	23	1.2	21	283	1.6	3.3	2.2	33	324	1.2
2056.9	0.448	22	1.6	24	246	1.5	6.5	2.9	36	281	1.1
2057.8	0.349	28	0.985	18	537	1.9	5.0	1.8	28	614	1.4
2058.8	0.228	19	1.5	23	255	1.4	3.3	2.7	35	291	1.0
2059.7	0.528	14	1.1	14	183	0.919	7.6	2.0	21	209	0.670
2060.6	0.570	26	0.952	20	429	1.4	8.2	1.7	31	490	1.0
2061.5	0.234	25	1.5	28	254	1.1	3.4	2.7	43	290	0.774
2062.5	0.228	13	1.1	23	270	1.5	3.3	2.0	36	309	1.1
2063.4	0.730	21	2.8	25	424	1.7	11	5.2	38	485	1.2
2064.3	0.228	14	0.942	21	451	1.8	3.3	1.7	33	516	1.3
2065.2	0.247	12	0.762	21	232	1.7	3.6	1.4	33	266	1.2
2066.1	0.228	17	1.3	19	270	0.438	3.3	2.4	29	308	0.320
2067.1	0.228	19	0.998	24	552	1.3	3.3	1.8	37	631	0.949
2068.0	0.228	17	0.695	26	296	1.2	3.3	1.3	40	338	0.895
2068.9	0.228	17	0.966	17	295	1.2	3.3	1.8	26	338	0.843
2069.8	0.228	19	1.6	18	424	1.3	3.3	2.9	27	485	0.933
2070.8	0.228	19	0.675	16	336	1.6	3.3	1.2	25	384	1.1
2071.7	0.459	13	0.939	22	254	1.0	6.6	1.7	34	290	0.733
2072.6	0.335	19	0.900	25	466	2.4	4.8	1.6	39	533	1.8
2073.5	0.228	25	0.758	24	433	1.4	3.3	1.4	36	495	0.988
2074.5	0.348	13	0.859	24	304	1.4	5.0	1.6	36	347	1.1
2075.4	0.391	22	1.4	20	267	0.573	5.6	2.6	30	305	0.418
2076.3	0.357	17	0.761	22	429	2.1	5.2	1.4	34	491	1.5
2077.2	0.556	23	1.9	24	450	1.6	8.0	3.5	37	515	1.2
2078.2	0.228	21	1.6	21	381	1.1	3.3	3.0	32	435	0.783
2079.1	0.228	26	1.1	17	269	1.0	3.3	2.1	26	308	0.761
2080.0	0.228	21	1.1	21	339	0.966	3.3	2.1	32	388	0.705
2080.9	0.555	20	1.3	21	338	1.3	8.0	2.3	32	386	0.917
2081.9	0.228	15	0.999	16	285	0.944	3.3	1.8	24	326	0.689
2082.8	0.228	17	1.0	18	341	1.1	3.3	1.8	28	389	0.821
2083.7	0.263	20	1.1	21	331	0.711	3.8	2.1	32	378	0.519
2084.6	0.228	17	0.649	20	298	1.1	3.3	1.2	30	341	0.821
2085.6	0.501	18	0.838	19	257	1.3	7.2	1.5	29	294	0.920
2086.5	0.228	23	1.3	22	359	0.877	3.3	2.3	33	410	0.640
2087.4	0.228	15	1.0	20	314	1.1	3.3	1.9	31	359	0.812
2088.3	0.513	17	0.827	16	301	0.900	7.4	1.5	25	345	0.657
2089.3	0.228	19	0.820	15	330	0.928	3.3	1.5	23	377	0.677
2090.2	0.638	18	1.4	22	331	0.738	9.2	2.5	34	379	0.538
2091.1	0.228	16	0.669	15	281	0.942	3.3	1.2	23	321	0.687
2092.0	0.228	19	1.1	21	309	1.8	3.3	2.0	32	353	1.3
2092.9	0.228	18	0.939	15	343	0.652	3.3	1.7	23	392	0.475
2093.9	0.228	17	0.805	24	346	1.3	3.3	1.5	36	396	0.918
2094.8	0.253	14	1.2	20	271	1.7	3.7	2.1	31	310	1.3
2095.7	0.656	17	1.3	16	365	1.1	9.5	2.3	24	417	0.835



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2096.6	0.228	15	0.898	21	342	0.777	3.3	1.6	32	391	0.567
2097.6	0.228	15	0.854	16	268	0.975	3.3	1.6	24	306	0.712
2098.5	0.229	18	1.1	21	354	1.1	3.3	2.0	32	405	0.828
2099.4	0.228	15	1.3	14	337	0.235	3.3	2.5	21	385	0.171
2100.3	0.228	14	0.666	14	286	0.937	3.3	1.2	22	328	0.684
2101.3	0.228	16	0.936	17	307	0.810	3.3	1.7	26	351	0.591
2102.2	0.228	17	0.578	17	329	0.859	3.3	1.1	26	376	0.627
2103.1	0.228	13	0.593	16	300	0.837	3.3	1.1	24	344	0.611
2104.0	0.265	13	0.713	15	278	0.719	3.8	1.3	23	318	0.525
2105.0	0.228	14	0.430	17	315	0.122	3.3	0.785	26	360	0.089
2105.9	0.228	10	0.642	16	311	0.776	3.3	1.2	25	355	0.566
2106.8	0.228	13	0.770	13	285	0.717	3.3	1.4	20	326	0.523
2107.7	0.228	14	1.1	12	322	0.798	3.3	1.9	18	368	0.582
2108.7	0.345	15	0.520	12	306	0.613	5.0	0.948	18	349	0.447
2109.6	0.228	12	0.569	16	275	1.1	3.3	1.0	24	314	0.796
2110.5	0.228	15	0.486	13	284	0.976	3.3	0.886	19	325	0.712
2111.4	0.228	15	0.240	12	321	0.677	3.3	0.438	19	367	0.494
2112.4	0.228	12	0.610	12	303	0.862	3.3	1.1	19	347	0.629
2113.3	0.228	12	0.382	14	237	0.587	3.3	0.697	21	271	0.428
2114.2	0.228	14	0.546	14	341	1.9	3.3	0.995	22	390	1.4
2115.1	0.228	15	0.673	14	255	0.990	3.3	1.2	22	291	0.723
2116.1	0.301	11	0.374	13	278	0.953	4.3	0.681	20	318	0.695
2117.0	0.228	13	0.359	10	327	0.783	3.3	0.655	16	374	0.571
2117.9	0.228	13	0.653	11	304	1.0	3.3	1.2	17	347	0.734
2118.8	0.228	11	0.798	9.3	249	0.352	3.3	1.5	14	284	0.257
2119.7	0.228	14	0.493	10	303	0.524	3.3	0.899	16	347	0.382
2120.7	0.228	14	0.501	12	341	0.570	3.3	0.915	18	390	0.416
2121.6	0.228	12	0.348	12	294	1.1	3.3	0.635	18	336	0.835
2122.5	0.228	9.5	0.645	11	251	0.651	3.3	1.2	17	288	0.475
2123.4	0.290	12	0.683	12	337	0.919	4.2	1.2	19	385	0.670
2124.4	0.400	11	0.439	9.1	320	0.109	5.8	0.801	14	365	0.079
2125.3	0.339	12	0.688	6.8	265	0.356	4.9	1.3	10	303	0.260
2126.2	0.228	11	0.605	9.8	306	0.812	3.3	1.1	15	350	0.592
2127.1	0.228	12	0.587	12	274	0.872	3.3	1.1	18	313	0.636
2128.1	0.609	11	0.265	10	261	0.824	8.8	0.484	16	299	0.601
2129.0	0.269	12	0.183	7.4	295	0.482	3.9	0.335	11	338	0.352
2129.9	0.599	13	0.295	9.0	307	0.385	8.6	0.537	14	351	0.281
2130.8	0.228	10	0.573	10	332	0.898	3.3	1.0	16	379	0.655
2131.8	0.228	12	0.183	8.9	264	1.2	3.3	0.335	14	301	0.859
2132.7	0.228	14	0.888	9.2	320	1.2	3.3	1.6	14	366	0.910
2133.6	0.228	9.4	0.409	7.5	279	1.1	3.3	0.746	12	319	0.774
2134.5	0.228	12	0.183	9.2	270	0.597	3.3	0.335	14	309	0.435
2135.5	0.228	14	0.497	11	309	0.799	3.3	0.907	16	353	0.583
2136.4	0.228	12	0.228	8.7	257	1.1	3.3	0.416	13	294	0.831
2137.3	0.352	11	0.375	7.0	282	0.751	5.1	0.684	11	322	0.548
2138.2	0.551	12	0.413	8.0	370	0.827	8.0	0.753	12	423	0.603
2139.2	0.376	12	0.401	8.1	314	0.260	5.4	0.732	12	359	0.189
2140.1	0.304	11	0.431	9.2	249	0.870	4.4	0.786	14	284	0.635
2141.0	0.228	14	0.402	9.4	299	1.0	3.3	0.733	14	342	0.761
2141.9	0.228	14	0.195	10	344	1.2	3.3	0.356	16	393	0.848
2142.9	0.228	13	0.214	12	281	1.2	3.3	0.390	19	321	0.889
2143.8	0.228	15	0.292	7.4	295	1.0	3.3	0.533	11	338	0.758
2144.7	0.228	13	0.379	10	329	0.758	3.3	0.691	15	376	0.553
2145.6	0.329	12	0.183	11	284	1.1	4.7	0.335	18	325	0.772
2146.5	0.228	12	0.235	9.5	261	0.818	3.3	0.428	15	299	0.597
2147.5	0.228	15	0.435	12	371	0.804	3.3	0.793	18	424	0.587
2148.4	0.228	13	0.448	11	301	0.720	3.3	0.818	16	344	0.526
2149.3	0.228	14	0.351	12	247	1.5	3.3	0.639	18	282	1.1
2150.2	0.228	12	0.690	11	305	0.887	3.3	1.3	17	349	0.647
2151.2	0.228	14	0.391	12	356	1.2	3.3	0.713	19	407	0.885
2152.1	0.228	12	0.601	9.3	230	0.953	3.3	1.1	14	263	0.695
2153.0	0.228	13	0.482	14	309	0.643	3.3	0.879	21	353	0.469
2153.9	0.228	12	0.323	11	306	1.4	3.3	0.590	17	350	1.0
2154.9	0.593	13	0.307	11	233	1.1	8.6	0.560	16	266	0.828
2155.8	0.228	16	0.392	15	304	0.725	3.3	0.715	23	347	0.529
2156.7	0.415	21	0.575	14	336	0.608	6.0	1.0	22	384	0.443
2157.6	0.336	14	0.740	18	287	1.2	4.8	1.3	27	329	0.877
2158.6	0.228	16	0.642	15	298	1.2	3.3	1.2	23	340	0.864
2159.5	0.228	17	0.454	18	360	0.916	3.3	0.828	27	411	0.668
2160.4	0.228	15	0.703	17	365	0.876	3.3	1.3	26	418	0.639
2161.3	0.228	13	0.874	12	240	0.888	3.3	1.6	19	274	0.648
2162.3	0.228	12	0.614	24	407	1.4	3.3	1.1	36	465	0.992
2163.2	0.228	15	0.949	24	300	0.856	3.3	1.7	37	343	0.624
2164.1	0.257	16	0.862	14	403	0.932	3.7	1.6	21	461	0.680
2165.0	0.228	16	0.736	15	314	1.5	3.3	1.3	23	359	1.1
2166.0	0.228	15	0.686	17	329	0.828	3.3	1.3	27	376	0.604
2166.9	0.228	12	0.865	17	301	0.838	3.3	1.6	26	345	0.611
2167.8	0.228	13	0.570	15	270	1.2	3.3	1.0	23	308	0.841
2168.7	0.228	17	0.807	18	296	1.4	3.3	1.5	28	339	1.0
2169.7	0.228	9.8	0.791	13	345	1.2	3.3	1.4	20	395	0.909
2170.6	0.228	14	0.457	13	258	0.198	3.3	0.833	20	295	0.144



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2171.5	0.228	12	0.811	11	246	1.3	3.3	1.5	17	281	0.979
2172.4	0.469	14	0.616	15	313	1.1	6.8	1.1	24	358	0.807
2173.3	0.228	15	0.875	15	251	1.4	3.3	1.6	23	287	1.0
2174.3	0.228	16	1.2	15	335	0.537	3.3	2.1	23	383	0.391
2175.2	0.228	15	1.1	18	340	1.2	3.3	2.1	28	389	0.888
2176.1	0.228	13	0.849	17	332	1.5	3.3	1.5	25	379	1.1
2177.0	0.228	14	1.3	18	274	0.761	3.3	2.4	27	313	0.556
2178.0	0.228	14	1.2	15	344	0.511	3.3	2.3	24	393	0.373
2178.9	0.228	17	1.3	22	300	1.5	3.3	2.4	33	343	1.1
2179.8	0.228	15	1.7	25	283	1.7	3.3	3.0	39	323	1.3
2180.7	0.228	25	1.1	24	305	0.444	3.3	2.1	36	349	0.324
2181.7	0.228	21	1.3	32	308	2.0	3.3	2.4	50	352	1.5
2182.6	0.480	27	3.2	36	296	1.7	6.9	5.9	55	339	1.2
2183.5	0.228	36	2.3	42	328	1.6	3.3	4.2	64	375	1.2
2184.4	0.228	38	2.5	47	336	1.3	3.3	4.5	72	384	0.970
2185.4	0.315	30	2.4	41	250	1.6	4.6	4.3	64	286	1.2
2186.3	0.482	34	3.1	33	287	2.8	7.0	5.7	50	328	2.0
2187.2	0.506	38	2.6	37	357	2.6	7.3	4.8	57	409	1.9
2188.1	0.228	31	2.5	37	332	1.1	3.3	4.6	56	380	0.787
2189.1	0.228	56	1.8	34	281	1.7	3.3	3.3	51	322	1.3
2190.0	0.228	32	2.0	36	317	1.7	3.3	3.7	56	363	1.3
2190.9	0.432	26	1.8	33	300	1.5	6.2	3.2	51	344	1.1
2191.8	0.228	23	2.0	34	305	1.5	3.3	3.7	52	349	1.1
2192.7	0.278	20	2.3	31	372	1.3	4.0	4.2	47	425	0.921
2193.7	0.504	21	1.7	23	301	1.1	7.3	3.1	35	344	0.806
2194.6	0.244	17	1.6	26	269	1.4	3.5	2.8	40	308	1.1
2195.5	0.228	18	2.2	28	285	1.2	3.3	4.0	43	326	0.910
2196.4	0.628	26	1.7	27	317	2.5	9.1	3.0	41	362	1.8
2197.4	0.470	19	1.5	24	282	2.0	6.8	2.8	37	323	1.5
2198.3	0.270	18	1.9	23	332	1.8	3.9	3.5	36	380	1.3
2199.2	0.591	19	2.1	24	306	2.9	8.5	3.9	37	350	2.1
2200.1	0.311	21	2.1	22	307	1.3	4.5	3.7	34	351	0.978
2201.1	0.414	18	1.7	24	326	2.3	6.0	3.1	37	372	1.7
2202.0	0.228	25	2.2	24	323	1.3	3.3	4.0	37	370	0.954
2202.9	0.228	23	2.0	27	358	2.4	3.3	3.6	42	409	1.8
2203.8	0.228	21	1.9	24	292	2.9	3.3	3.5	37	334	2.1
2204.8	0.228	21	2.2	25	342	1.7	3.3	3.9	38	391	1.2
2205.7	0.332	18	1.6	27	385	1.7	4.8	3.0	41	440	1.2
2206.6	0.228	15	1.7	20	265	1.5	3.3	3.2	31	303	1.1
2207.5	0.712	20	2.6	25	412	2.6	10	4.8	38	471	1.9
2208.5	0.485	14	1.5	16	307	2.3	7.0	2.7	24	352	1.7
2209.4	0.869	19	1.8	21	336	1.8	13	3.3	32	384	1.3
2210.3	0.228	14	1.6	22	347	1.0	3.3	2.9	33	397	0.743
2211.2	0.228	15	1.1	15	278	1.3	3.3	2.0	24	318	0.913
2212.2	0.228	12	1.1	12	197	1.6	3.3	2.0	19	226	1.2
2213.1	0.228	22	1.7	23	551	1.1	3.3	3.1	35	630	0.802
2214.0	0.228	11	0.942	18	266	1.8	3.3	1.7	27	304	1.3
2214.9	0.230	12	1.1	16	198	1.2	3.3	1.9	25	227	0.843
2215.9	0.534	17	2.0	23	393	1.8	7.7	3.6	35	449	1.3
2216.8	0.741	16	1.3	17	455	2.0	11	2.4	26	520	1.5
2217.7	0.228	14	1.1	14	251	0.557	3.3	2.1	22	287	0.406
2218.6	0.268	21	1.1	16	399	1.8	3.9	2.0	25	456	1.3
2219.6	0.228	18	0.872	16	442	1.2	3.3	1.6	25	505	0.889
2220.5	0.228	14	0.818	16	319	0.827	3.3	1.5	25	364	0.604
2221.4	0.228	14	0.617	19	349	2.0	3.3	1.1	29	399	1.5
2222.3	0.439	16	0.776	15	361	0.938	6.3	1.4	23	413	0.684
2223.2	0.228	15	0.609	11	301	1.1	3.3	1.1	17	345	0.794
2224.2	0.284	18	0.542	11	372	2.2	4.1	0.988	17	425	1.6
2225.1	0.293	11	0.429	12	371	0.794	4.2	0.783	18	424	0.580
2226.0	0.228	16	0.861	14	414	1.4	3.3	1.6	22	473	1.0
2226.9	0.228	16	0.603	9.2	404	1.8	3.3	1.1	14	462	1.3
2227.9	0.228	13	0.729	10	296	0.825	3.3	1.3	16	338	0.602
2228.8	0.530	12	0.691	12	349	1.7	7.7	1.3	19	399	1.3
2229.7	0.418	15	0.610	11	418	0.736	6.0	1.1	17	478	0.537
2230.6	0.228	13	0.807	11	293	0.762	3.3	1.5	16	335	0.556
2231.6	0.228	11	0.527	12	287	1.4	3.3	0.961	18	328	1.0
2232.5	0.228	16	0.617	9.0	386	1.1	3.3	1.1	14	441	0.808
2233.4	0.278	13	0.437	7.7	324	1.4	4.0	0.797	12	370	1.0
2234.3	0.228	11	0.325	8.7	338	0.589	3.3	0.593	13	386	0.430
2235.3	0.301	15	0.407	6.8	366	1.1	4.3	0.742	10	419	0.796
2236.2	0.228	14	0.559	8.2	377	1.6	3.3	1.0	13	431	1.2
2237.1	0.343	13	0.607	6.4	332	0.609	5.0	1.1	9.8	380	0.444
2238.0	0.290	13	0.296	5.0	304	0.254	4.2	0.539	7.7	348	0.185
2239.0	0.228	13	0.277	8.4	366	0.967	3.3	0.506	13	419	0.706
2239.9	0.228	9.5	0.212	6.8	293	0.476	3.3	0.386	10	335	0.347
2240.8	0.228	11	0.296	4.1	281	1.4	3.3	0.541	6.3	321	1.0
2241.7	0.228	14	0.339	5.6	319	1.1	3.3	0.619	8.6	364	0.814
2242.7	0.228	16	0.350	5.9	335	0.894	3.3	0.639	9.1	383	0.652
2243.6	0.329	13	0.380	5.7	261	0.941	4.8	0.693	8.8	299	0.687
2244.5	0.228	14	0.212	5.0	274	0.842	3.3	0.387	7.7	313	0.614
2245.4	0.298	12	0.183	6.3	321	0.807	4.3	0.335	9.6	367	0.589



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
2246.4	0.228	9.1	0.340	6.5	324	0.335	3.3	0.620	9.9	371	0.245
2247.3	0.303	12	0.403	4.5	266	0.647	4.4	0.735	6.9	304	0.472
2248.2	0.228	13	0.183	5.7	317	1.1	3.3	0.335	8.7	363	0.768
2249.1	0.228	12	0.183	8.2	347	1.1	3.3	0.335	13	396	0.779
2250.0	0.387	12	0.514	6.9	339	0.965	5.6	0.937	11	388	0.704
2251.0	0.279	17	0.192	7.5	358	0.757	4.0	0.350	11	410	0.552
2251.9	0.228	15	0.375	6.3	339	2.1	3.3	0.684	9.6	387	1.6
2252.8	0.228	15	0.200	8.7	354	0.789	3.3	0.364	13	405	0.576
2253.7	0.228	13	0.400	6.5	299	0.865	3.3	0.729	9.9	342	0.631
2254.7	0.228	14	0.376	6.9	336	1.7	3.3	0.686	11	385	1.2
2255.6	0.421	13	0.183	8.4	290	0.491	6.1	0.335	13	332	0.358
2256.5	0.228	12	0.421	6.9	315	1.2	3.3	0.767	11	361	0.885
2257.4	0.496	12	0.250	8.4	339	0.996	7.2	0.455	13	388	0.727
2258.4	0.228	11	0.249	6.4	327	2.6	3.3	0.454	9.9	374	1.9
2259.3	0.289	14	0.488	8.2	351	0.916	4.2	0.890	13	402	0.668
2260.2	0.228	14	0.366	10	402	1.9	3.3	0.668	16	460	1.4
2261.1	0.367	13	0.488	13	467	2.0	5.3	0.890	19	534	1.4
2262.1	0.898	13	0.239	6.1	359	1.3	13	0.436	9.3	411	0.959
2263.0	0.387	14	0.243	10	535	2.2	5.6	0.444	16	611	1.6
2263.9	0.817	14	0.921	11	522	2.6	12	1.7	17	597	1.9
2264.8	0.228	13	0.892	12	515	2.9	3.3	1.6	18	589	2.1
2265.8	0.588	13	0.856	15	658	2.8	8.5	1.6	23	752	2.1
2266.7	1.0	16	0.983	11	771	2.3	14	1.8	17	881	1.7
2267.6	0.992	13	0.974	15	687	4.2	14	1.8	22	786	3.1
2268.5	0.808	15	0.785	12	877	4.6	12	1.4	19	1003	3.4
2269.5	1.2	15	1.0	17	999	3.7	17	1.8	27	1142	2.7
2270.4	1.3	30	0.767	14	836	4.6	19	1.4	21	956	3.4
2271.3	1.2	15	0.962	16	932	5.6	17	1.8	25	1066	4.1
2272.2	0.606	16	1.2	14	1164	4.5	8.7	2.1	22	1331	3.3
2273.1	1.1	18	1.0	18	1136	4.4	16	1.8	28	1299	3.2
2274.1	0.650	16	1.4	21	1098	6.3	9.4	2.5	32	1255	4.6
2275.0	1.1	19	1.6	13	1246	3.8	16	2.9	20	1425	2.8
2275.9	1.0	17	1.4	18	1296	5.4	15	2.5	27	1482	3.9
2276.8	1.4	14	1.7	17	1258	3.4	20	3.1	26	1439	2.5
2277.8	0.744	18	1.4	18	1367	3.9	11	2.5	28	1563	2.8
2278.7	1.0	19	1.4	20	1766	4.7	15	2.6	31	2019	3.4
2279.6	0.490	14	1.2	18	1345	5.3	7.1	2.3	28	1538	3.9
2280.5	0.492	18	1.9	17	1636	4.7	7.1	3.4	26	1871	3.4
2281.5	0.738	19	1.5	24	1789	5.3	11	2.7	36	2045	3.9
2282.4	0.228	15	2.2	20	1734	4.0	3.3	4.0	31	1982	2.9
2283.3	0.636	25	1.6	21	1639	3.5	9.2	3.0	32	1875	2.6
2284.2	0.428	19	1.6	23	1735	4.1	6.2	2.9	35	1984	3.0
2285.2	0.352	18	1.9	27	1859	3.7	5.1	3.4	42	2126	2.7
2286.1	0.738	19	1.3	24	1662	4.7	11	2.4	37	1901	3.4
2287.0	0.344	18	2.0	36	1710	2.5	5.0	3.7	55	1955	1.8
2287.9	0.228	16	1.9	22	1554	4.0	3.3	3.4	33	1777	2.9
2288.9	0.228	25	2.5	27	2492	4.5	3.3	4.6	41	2849	3.3
2289.8	0.228	19	1.7	28	1987	4.0	3.3	3.2	43	2272	2.9
2290.7	0.582	25	1.3	24	1695	2.9	8.4	2.3	37	1939	2.1
2291.6	0.228	19	2.5	25	1824	2.4	3.3	4.5	38	2086	1.8
2292.6	0.228	26	1.0	19	1128	2.7	3.3	1.9	29	1290	2.0
2293.5	0.228	24	1.5	22	1944	3.2	3.3	2.8	34	2223	2.3
2294.4	0.228	19	1.4	29	2101	3.1	3.3	2.6	44	2403	2.2
2295.3	0.228	19	2.0	28	1698	3.9	3.3	3.7	44	1941	2.8
2296.2	0.228	23	1.7	25	1925	2.8	3.3	3.1	38	2201	2.0
2297.2	0.885	18	1.6	21	1631	3.1	13	3.0	33	1865	2.2
2298.1	0.228	19	1.8	25	1562	3.5	3.3	3.3	38	1786	2.5
2299.0	0.228	22	1.6	22	1664	1.6	3.3	3.0	34	1903	1.2
2299.9	0.228	18	1.6	25	1947	4.3	3.3	2.9	39	2227	3.1
2300.9	0.445	15	0.991	21	1589	2.9	6.4	1.8	32	1818	2.1
2301.8	0.228	18	1.3	20	1591	2.3	3.3	2.3	31	1820	1.7
2302.7	0.228	20	1.6	21	1789	2.1	3.3	2.9	33	2046	1.5
2303.6	0.228	16	1.3	18	1398	2.3	3.3	2.4	28	1599	1.7
2304.6	0.228	18	1.1	22	1333	2.3	3.3	2.0	34	1524	1.7
2305.5	0.228	22	1.9	22	1818	2.5	3.3	3.4	34	2079	1.8
2306.4	0.508	20	0.974	25	1563	2.6	7.3	1.8	39	1787	1.9
2307.3	0.228	16	1.1	23	1486	3.1	3.3	1.9	36	1699	2.2
2308.3	0.228	21	1.5	28	1542	4.3	3.3	2.7	43	1764	3.2
2309.2	0.228	20	1.4	22	1488	1.6	3.3	2.6	34	1701	1.2
2310.1	0.228	15	1.0	23	1420	3.0	3.3	1.9	35	1624	2.2
2311.0	0.634	16	1.1	18	1364	2.5	9.1	2.0	27	1560	1.9
2312.0	0.228	20	0.886	20	1516	3.0	3.3	1.6	30	1733	2.2
2312.9	0.228	18	1.1	29	1517	3.1	3.3	2.0	45	1735	2.2
2313.8	0.228	16	1.6	26	1640	4.2	3.3	3.0	40	1875	3.1
2314.7	0.552	20	0.981	21	1656	2.6	8.0	1.8	33	1893	1.9
2315.7	0.356	21	1.1	25	1913	2.8	5.1	1.9	39	2187	2.1
2316.6	0.228	19	0.911	27	1302	3.1	3.3	1.7	42	1488	2.2
2317.5	0.228	23	0.860	27	1596	2.1	3.3	1.6	42	1825	1.5
2318.4	0.260	17	1.4	29	1592	2.1	3.7	2.5	45	1820	1.6
2319.4	0.228	18	0.954	23	1451	2.6	3.3	1.7	36	1660	1.9
2320.3	0.560	18	1.0	21	1599	3.2	8.1	1.9	32	1828	2.3



Minnow Environmental  
Sample ID: 008

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
2321.2	0.585	21	1.3	23	1699	2.6	8.5	2.4	35	1942	1.9
2322.1	0.313	18	1.2	22	1462	2.8	4.5	2.3	34	1672	2.1
2323.0	0.236	16	0.792	22	1413	2.0	3.4	1.4	34	1616	1.5
2324.0	0.652	24	1.2	31	1606	3.6	9.4	2.3	47	1837	2.6
2324.9	0.285	19	1.1	23	1796	3.9	4.1	2.0	35	2054	2.8
2325.8	0.228	17	1.5	32	1411	3.0	3.3	2.7	48	1613	2.2
2326.7	0.265	18	1.3	19	1517	2.2	3.8	2.3	30	1734	1.6
2327.7	0.424	18	0.649	31	1626	3.7	6.1	1.2	48	1859	2.7
2328.6	0.228	19	0.783	29	1774	3.4	3.3	1.4	45	2028	2.5
2329.5	0.228	21	0.768	29	1530	2.7	3.3	1.4	44	1750	1.9
2330.4	0.228	23	1.2	24	1679	5.0	3.3	2.2	37	1920	3.7
2331.4	0.228	20	1.5	30	1652	2.7	3.3	2.7	46	1889	2.0
2332.3	0.228	19	1.2	29	1669	3.8	3.3	2.1	45	1908	2.8
2333.2	0.263	18	0.941	24	1653	2.3	3.8	1.7	36	1891	1.7
2334.1	0.583	18	0.943	21	1498	2.6	8.4	1.7	33	1713	1.9
2335.1	0.442	18	1.7	29	1578	3.4	6.4	3.0	44	1805	2.5
2336.0	0.316	23	1.3	27	1868	4.2	4.6	2.3	42	2136	3.1
2336.9	0.228	18	0.713	22	1646	2.4	3.3	1.3	34	1882	1.8
2337.8	0.228	16	0.986	29	1581	2.5	3.3	1.8	45	1808	1.8
2338.8	0.228	20	1.3	28	1624	3.6	3.3	2.3	44	1858	2.7
2339.7	0.228	20	0.765	34	1798	2.7	3.3	1.4	52	2056	2.0
2340.6	0.228	19	0.655	25	1551	3.3	3.3	1.2	38	1773	2.4
2341.5	0.410	17	1.5	31	1707	2.9	5.9	2.7	47	1952	2.1
2342.5	0.348	17	0.982	28	1487	1.5	5.0	1.8	42	1700	1.1
2343.4	0.228	13	1.1	21	1204	3.1	3.3	2.0	32	1377	2.3
2344.3	0.539	17	0.756	26	1451	5.1	7.8	1.4	41	1659	3.7
2345.2	0.228	18	1.3	24	1526	2.5	3.3	2.4	37	1745	1.8
2346.2	0.228	18	0.825	30	1277	2.9	3.3	1.5	46	1461	2.1
2347.1	0.228	17	0.885	32	1266	3.5	3.3	1.6	49	1448	2.6
2348.0	0.228	18	1.1	25	1433	2.3	3.3	1.9	38	1639	1.7
2348.9	0.309	17	0.708	29	1352	3.3	4.5	1.3	45	1546	2.4
2349.8	0.228	16	1.1	29	1225	3.0	3.3	2.1	45	1401	2.2
2350.8	0.228	19	1.7	25	1216	2.3	3.3	3.1	38	1390	1.7
2351.7	0.228	16	1.2	25	1177	2.3	3.3	2.2	39	1346	1.7
2352.6	0.228	13	0.853	24	1127	2.2	3.3	1.6	37	1289	1.6
2353.5	0.228	16	0.720	27	1187	2.9	3.3	1.3	42	1358	2.1
2354.5	0.351	18	1.2	25	1274	3.9	5.1	2.2	39	1457	2.9
2355.4	0.228	18	0.937	26	1241	2.9	3.3	1.7	39	1419	2.1
2356.3	0.228	14	1.1	23	999	2.8	3.3	2.0	35	1142	2.0
2357.2	0.228	16	0.747	29	1024	3.7	3.3	1.4	45	1171	2.7
2358.2	0.428	18	0.780	30	1034	4.1	6.2	1.4	46	1182	3.0
2359.1	0.440	17	1.2	29	1042	3.4	6.3	2.1	45	1192	2.5
2360.0	0.228	14	1.0	25	850	2.4	3.3	1.9	38	972	1.8
2360.9	0.228	16	0.478	26	1113	1.8	3.3	0.873	41	1273	1.3
2361.9	0.228	12	1.0	27	1265	3.4	3.3	1.9	41	1447	2.4
2362.8	0.458	15	0.739	31	962	2.1	6.6	1.3	47	1100	1.5
2363.7	0.228	14	1.1	28	1190	2.9	3.3	2.1	43	1360	2.1
2364.6	0.228	12	0.550	22	946	2.4	3.3	1.0	34	1082	1.7
2365.6	0.228	12	0.998	23	1160	3.4	3.3	1.8	35	1326	2.5
2366.5	0.449	15	0.622	27	1168	3.1	6.5	1.1	41	1336	2.2
2367.4	0.228	14	0.968	25	961	2.1	3.3	1.8	38	1099	1.6
2368.3	0.228	13	0.877	24	880	1.9	3.3	1.6	36	1007	1.4
2369.3	0.228	17	1.1	27	1170	2.8	3.3	2.0	42	1338	2.1
2370.2	0.228	13	0.681	29	1047	3.4	3.3	1.2	45	1197	2.5
2371.1	0.228	13	0.488	25	909	3.0	3.3	0.891	39	1039	2.2
2372.0	0.228	15	0.719	27	1014	2.8	3.3	1.3	42	1160	2.1
2372.9	0.228	14	1.0	19	1021	2.8	3.3	1.9	29	1167	2.1
2373.9	0.228	13	0.736	19	689	2.4	3.3	1.3	30	788	1.8
2374.8	0.228	13	0.515	21	876	2.1	3.3	0.940	32	1002	1.5
2375.7	0.228	12	0.656	18	816	2.6	3.3	1.2	28	933	1.9
2376.6	0.228	13	0.357	20	945	1.2	3.3	0.650	31	1081	0.889
2377.6	0.228	15	0.677	20	1022	3.5	3.3	1.2	30	1168	2.5
2378.5	0.491	13	0.741	20	782	1.8	7.1	1.4	31	895	1.3
2379.4	0.228	13	0.344	15	810	2.3	3.3	0.627	24	926	1.7
2380.3	0.228	9.8	0.183	20	1274	1.8	3.3	0.335	31	1457	1.3
2381.3	0.228	13	0.494	19	803	2.3	3.3	0.902	28	919	1.7
2382.2	0.228	14	0.497	19	952	3.0	3.3	0.906	30	1089	2.2
2383.1	0.228	9.6	0.469	18	715	1.6	3.3	0.856	28	818	1.1
2384.0	0.228	11	0.685	15	816	2.3	3.3	1.2	23	933	1.7
2385.0	0.472	13	0.499	13	790	2.0	6.8	0.910	20	904	1.5
2385.9	0.228	11	0.382	15	794	2.5	3.3	0.697	23	907	1.8
2386.8	0.228	11	0.183	14	667	2.6	3.3	0.335	21	762	1.9
2387.7	0.481	11	0.301	19	781	1.8	6.9	0.550	29	893	1.3
2388.7	0.228	12	0.352	11	836	2.1	3.3	0.642	16	956	1.6
2389.6	0.228	13	0.450	15	721	1.2	3.3	0.821	23	825	0.885
2390.5	0.228	9.7	0.183	12	866	3.3	3.3	0.335	18	990	2.4
2391.4	0.228	14	0.310	12	818	1.2	3.3	0.565	18	936	0.908
2392.4	0.717	9.8	0.183	9.2	730	3.1	10	0.335	14	835	2.2
2393.3	0.228	8.9	0.386	8.6	664	1.8	3.3	0.704	13	759	1.3
2394.2	0.228	14	0.208	11	933	1.2	3.3	0.380	17	1067	0.904
2395.1	0.377	8.0	0.183	8.1	756	2.8	5.4	0.335	12	864	2.0



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
2396.0	0.228	12	0.234	12	755	1.5	3.3	0.427	18	863	1.1
2397.0	0.228	15	0.199	6.9	976	1.9	3.3	0.363	11	1116	1.4
2397.9	0.228	16	0.324	7.7	879	1.7	3.3	0.592	12	1005	1.3
2398.8	0.228	11	0.217	7.2	920	2.4	3.3	0.396	11	1052	1.7
2399.7	0.228	14	0.547	11	1008	1.4	3.3	0.997	17	1152	0.988
2400.7	0.693	12	0.359	7.5	983	2.3	10	0.655	12	1124	1.7
2401.6	0.228	8.8	0.183	8.0	908	1.7	3.3	0.335	12	1038	1.2
2402.5	0.260	12	0.323	5.3	928	2.0	3.8	0.589	8.2	1061	1.5
2403.4	0.228	15	0.183	9.0	1136	1.9	3.3	0.335	14	1299	1.4
2404.4	0.314	12	0.252	9.6	1041	2.1	4.5	0.460	15	1190	1.6
2405.3	0.331	15	0.411	7.4	1042	2.1	4.8	0.749	11	1191	1.6
2406.2	0.228	19	0.440	5.5	1379	2.7	3.3	0.802	8.5	1577	2.0
2407.1	0.228	14	0.298	9.3	1149	2.0	3.3	0.544	14	1314	1.5
2408.1	0.489	16	0.577	10.0	1351	3.1	7.1	1.1	15	1545	2.3
2409.0	0.774	16	0.880	8.9	1170	1.1	11	1.6	14	1337	0.816
2409.9	0.360	9.5	0.713	8.9	1195	1.5	5.2	1.3	14	1366	1.1
2410.8	0.525	9.4	0.328	7.3	1285	2.2	7.6	0.598	11	1469	1.6
2411.8	0.516	10	0.362	9.4	1620	1.5	7.5	0.661	14	1853	1.1
2412.7	0.444	9.2	0.779	7.4	1223	1.7	6.4	1.4	11	1398	1.2
2413.6	0.906	17	0.948	9.2	1401	1.9	13	1.7	14	1602	1.4
2414.5	0.445	13	0.481	11	2212	2.3	6.4	0.877	17	2529	1.7
2415.5	0.228	7.2	0.509	9.6	1036	1.2	3.3	0.928	15	1185	0.873
2416.4	1.4	16	1.6	9.9	2006	2.3	20	2.9	15	2293	1.6
2417.3	0.740	21	0.719	12	1707	1.9	11	1.3	18	1951	1.4
2418.2	0.936	11	0.794	13	1881	1.3	14	1.4	20	2151	0.943
2419.2	1.0	11	1.2	8.1	1439	2.4	15	2.2	12	1646	1.8
2420.1	1.5	14	1.0	11	2909	2.9	22	1.8	17	3327	2.1
2421.0	0.941	11	0.924	12	1851	2.5	14	1.7	18	2116	1.8
2421.9	1.3	12	1.1	11	1485	1.7	19	2.1	17	1698	1.2
2422.8	1.8	17	1.2	10	2465	1.7	26	2.3	16	2819	1.3
2423.8	1.5	20	1.2	15	1901	2.5	22	2.2	23	2173	1.8
2424.7	1.4	15	0.756	12	1708	0.824	20	1.4	18	1953	0.601
2425.6	1.6	14	1.8	11	1763	1.9	23	3.2	17	2016	1.4
2426.5	0.799	12	1.2	9.5	1911	2.4	12	2.1	15	2185	1.7
2427.5	0.476	11	1.3	13	1731	1.6	6.9	2.3	19	1979	1.1
2428.4	2.7	13	1.6	13	2306	2.4	38	3.0	20	2637	1.7
2429.3	1.3	13	1.2	14	2411	2.7	18	2.3	21	2757	2.0
2430.2	0.931	12	0.554	5.5	1204	1.1	13	1.0	8.4	1377	0.780
2431.2	0.885	12	0.944	12	2010	3.6	13	1.7	18	2299	2.6
2432.1	1.8	14	1.8	14	2956	1.7	26	3.3	22	3381	1.2
2433.0	0.995	12	1.2	8.2	2108	1.6	14	2.1	13	2410	1.2
2433.9	1.2	9.7	0.990	10	1459	1.4	17	1.8	16	1669	1.0
2434.9	1.6	11	1.8	13	2214	2.3	24	3.3	20	2532	1.7
2435.8	1.7	14	1.1	12	3224	2.1	25	2.0	18	3686	1.5
2436.7	0.480	11	1.3	15	1858	2.4	6.9	2.4	23	2124	1.8
2437.6	2.2	12	1.5	9.6	2066	2.4	32	2.7	15	2363	1.7
2438.6	1.1	15	1.4	13	3103	0.789	15	2.6	20	3548	0.575
2439.5	1.3	11	0.964	16	2213	3.1	19	1.8	25	2531	2.3
2440.4	0.545	12	1.1	12	1760	1.7	7.9	2.0	19	2013	1.2
2441.3	0.807	13	2.3	18	3275	2.0	12	4.2	27	3745	1.5
2442.3	0.655	13	1.1	14	2396	2.5	9.5	2.0	22	2740	1.8
2443.2	0.926	9.7	1.1	8.8	1669	1.1	13	2.0	13	1909	0.776
2444.1	1.0	15	0.731	13	2929	3.3	15	1.3	20	3350	2.4
2445.0	0.353	13	1.2	12	2429	1.1	5.1	2.2	19	2778	0.817
2446.0	0.322	12	0.850	9.6	1926	1.7	4.6	1.6	15	2203	1.3
2446.9	0.228	13	0.873	13	2341	3.0	3.3	1.6	21	2677	2.2
2447.8	0.554	9.9	0.866	13	2243	2.8	8.0	1.6	20	2565	2.0
2448.7	0.926	19	0.791	9.5	2328	2.0	13	1.4	14	2662	1.5
2449.6	0.506	9.2	1.2	7.4	1537	1.3	7.3	2.2	11	1757	0.967
2450.6	0.454	11	0.783	9.2	1440	2.0	6.6	1.4	14	1646	1.5
2451.5	0.591	15	1.7	13	1890	1.9	8.5	3.0	20	2161	1.4
2452.4	0.252	13	1.1	9.0	2110	1.6	3.6	1.9	14	2413	1.2
2453.3	0.391	11	1.1	11	1739	2.1	5.6	1.9	17	1988	1.5
2454.3	0.228	16	1.5	9.8	1690	1.7	3.3	2.7	15	1932	1.2
2455.2	0.228	13	1.7	10	1774	2.3	3.3	3.1	16	2029	1.7
2456.1	0.228	14	1.1	9.9	1850	1.5	3.3	2.1	15	2115	1.1
2457.0	0.441	16	1.2	8.3	1739	2.2	6.4	2.2	13	1988	1.6
2458.0	0.243	17	1.4	14	2210	1.5	3.5	2.5	22	2527	1.1
2458.9	0.302	14	1.4	10	1860	3.2	4.4	2.5	15	2127	2.3
2459.8	0.228	13	1.2	16	1750	1.8	3.3	2.2	24	2002	1.3
2460.7	0.228	12	1.1	7.0	1647	1.9	3.3	2.1	11	1883	1.4
2461.7	0.531	14	0.802	8.8	1724	1.5	7.7	1.5	13	1971	1.1
2462.6	0.228	15	1.1	7.5	1646	1.5	3.3	2.0	11	1883	1.1
2463.5	0.228	15	1.2	8.5	1832	3.8	3.3	2.1	13	2095	2.8
2464.4	0.359	12	1.0	8.2	1747	1.5	5.2	1.9	13	1998	1.1
2465.4	0.228	11	1.1	8.2	1425	2.3	3.3	2.0	12	1630	1.7
2466.3	0.228	15	0.791	11	1451	2.1	3.3	1.4	17	1659	1.5
2467.2	0.228	12	0.659	7.1	1525	2.6	3.3	1.2	11	1744	1.9
2468.1	0.228	9.7	1.0	6.3	1354	2.2	3.3	1.9	9.7	1548	1.6
2469.1	0.228	10.0	0.705	6.6	1331	1.4	3.3	1.3	10	1522	1.0
2470.0	0.228	16	0.763	11	1572	1.6	3.3	1.4	17	1797	1.2



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2470.9	0.685	12	0.851	6.5	1348	0.951	9.9	1.6	9.9	1542	0.694
2471.8	0.531	10	0.773	9.2	1092	2.9	7.7	1.4	14	1249	2.1
2472.7	0.228	13	1.3	6.8	1221	3.4	3.3	2.3	10	1396	2.5
2473.7	0.228	14	1.0	8.1	1219	3.3	3.3	1.9	12	1394	2.4
2474.6	0.228	12	0.699	8.6	1058	2.2	3.3	1.3	13	1210	1.6
2475.5	0.470	13	0.844	9.5	1020	2.6	6.8	1.5	15	1167	1.9
2476.4	0.420	12	0.735	8.6	1278	3.1	6.1	1.3	13	1461	2.3
2477.4	0.512	12	0.663	8.1	1058	3.4	7.4	1.2	12	1210	2.5
2478.3	0.228	12	0.639	7.9	784	0.998	3.3	1.2	12	896	0.728
2479.2	0.300	14	0.673	8.9	1127	2.9	4.3	1.2	14	1289	2.1
2480.1	0.228	14	0.663	9.1	1024	2.5	3.3	1.2	14	1171	1.8
2481.1	0.565	12	0.675	7.9	923	1.8	8.2	1.2	12	1055	1.3
2482.0	0.228	10	0.659	5.7	914	1.4	3.3	1.2	8.7	1045	1.0
2482.9	0.228	16	0.502	8.9	1022	1.3	3.3	0.915	14	1168	0.959
2483.8	0.605	11	0.493	8.8	780	2.1	8.7	0.899	14	892	1.5
2484.8	0.228	16	0.460	7.3	987	1.5	3.3	0.839	11	1128	1.1
2485.7	0.405	16	0.502	8.2	913	2.5	5.8	0.916	13	1044	1.8
2486.6	0.560	15	0.403	5.5	825	1.6	8.1	0.735	8.5	944	1.2
2487.5	0.597	15	0.260	5.9	792	2.3	8.6	0.474	9.0	905	1.7
2488.5	0.228	15	0.459	5.2	949	1.2	3.3	0.836	8.0	1086	0.846
2489.4	0.228	14	0.475	6.6	888	2.1	3.3	0.866	10	1015	1.6
2490.3	0.513	13	0.472	7.0	759	1.4	7.4	0.861	11	868	0.986
2491.2	0.321	13	0.540	7.3	791	1.4	4.6	0.985	11	904	1.0
2492.2	0.228	14	0.240	7.8	844	1.9	3.3	0.438	12	965	1.4
2493.1	0.228	13	0.479	4.0	800	1.5	3.3	0.874	6.1	914	1.1
2494.0	0.735	13	0.430	6.0	852	2.2	11	0.785	9.3	974	1.6
2494.9	0.228	15	0.379	5.3	897	2.0	3.3	0.692	8.1	1025	1.5
2495.9	0.228	15	0.514	5.1	704	1.1	3.3	0.937	7.8	805	0.799
2496.8	0.254	14	0.344	7.6	728	0.805	3.7	0.627	12	832	0.588
2497.7	0.228	17	0.562	6.8	912	2.8	3.3	1.0	10	1043	2.1
2498.6	0.228	12	0.652	5.5	728	1.3	3.3	1.2	8.4	832	0.967
2499.5	0.228	15	0.726	4.5	741	2.1	3.3	1.3	6.9	848	1.6
2500.5	0.254	16	0.259	5.3	704	0.921	3.7	0.472	8.2	805	0.672
2501.4	0.228	13	0.524	5.5	775	2.6	3.3	0.956	8.4	886	1.9
2502.3	0.228	13	0.196	4.8	652	1.9	3.3	0.357	7.3	745	1.4
2503.2	0.228	15	0.489	4.6	929	1.8	3.3	0.891	7.0	1063	1.3
2504.2	0.228	18	0.392	5.2	950	2.2	3.3	0.715	7.9	1087	1.6
2505.1	0.228	14	0.691	5.1	807	1.9	3.3	1.3	7.8	923	1.4
2506.0	0.228	14	0.359	3.2	716	0.839	3.3	0.654	4.9	819	0.612
2506.9	0.228	14	0.183	3.2	745	0.992	3.3	0.335	4.8	852	0.724
2507.9	0.228	12	0.274	4.7	764	1.5	3.3	0.500	7.1	874	1.1
2508.8	0.504	12	0.410	4.6	680	1.1	7.3	0.748	7.1	778	0.806
2509.7	0.328	13	0.493	4.8	831	0.937	4.7	0.899	7.3	950	0.683
2510.6	0.228	13	0.211	3.5	798	1.6	3.3	0.384	5.3	912	1.1
2511.6	0.617	13	0.436	4.7	856	1.4	8.9	0.795	7.2	979	0.987
2512.5	0.228	13	0.550	2.7	765	1.1	3.3	1.0	4.2	875	0.811
2513.4	0.228	13	0.296	3.3	784	1.5	3.3	0.540	5.1	896	1.1
2514.3	0.363	10	0.292	3.8	724	0.775	5.2	0.532	5.8	827	0.565
2515.3	0.334	11	0.357	3.2	772	1.2	4.8	0.650	4.9	883	0.873
2516.2	0.573	12	0.435	2.8	848	0.749	8.3	0.794	4.2	969	0.546
2517.1	0.603	9.7	0.405	2.0	722	1.4	8.7	0.739	3.1	825	1.0
2518.0	0.451	11	0.183	1.5	697	1.0	6.5	0.335	2.2	797	0.744
2519.0	0.373	10	0.183	2.6	838	0.796	5.4	0.335	4.0	958	0.581
2519.9	0.249	9.1	0.226	4.2	1038	1.1	3.6	0.412	6.4	1187	0.824
2520.8	0.419	8.2	0.251	1.9	535	0.918	6.0	0.457	2.9	612	0.669
2521.7	0.460	11	0.671	2.7	852	1.5	6.6	1.2	4.1	974	1.1
2522.7	0.228	12	0.430	3.2	802	1.3	3.3	0.784	4.9	917	0.930
2523.6	0.228	9.7	0.263	2.4	673	1.1	3.3	0.479	3.7	770	0.768
2524.5	0.381	8.9	0.183	3.1	813	0.950	5.5	0.335	4.8	930	0.693
2525.4	0.228	12	0.183	2.2	826	1.3	3.3	0.335	3.4	945	0.949
2526.3	0.228	8.6	0.183	2.1	755	1.4	3.3	0.335	3.2	863	1.0
2527.3	0.228	11	0.183	1.5	795	1.5	3.3	0.335	2.4	909	1.1
2528.2	0.910	9.6	0.263	2.4	829	1.7	13	0.479	3.7	948	1.2
2529.1	0.461	9.6	0.183	2.0	695	0.808	6.6	0.335	3.1	794	0.590
2530.0	0.786	8.2	0.183	2.4	724	0.906	11	0.335	3.6	828	0.661
2531.0	0.472	11	0.183	1.5	719	0.229	6.8	0.335	2.2	822	0.167
2531.9	0.228	9.3	0.183	2.0	704	1.2	3.3	0.335	3.0	805	0.910
2532.8	0.390	8.6	0.183	1.7	727	0.920	5.6	0.335	2.6	831	0.671
2533.7	0.576	9.8	0.314	1.5	798	0.497	8.3	0.572	2.2	912	0.363
2534.7	0.325	10	0.183	3.1	794	0.810	4.7	0.335	4.7	908	0.591
2535.6	0.228	10	0.183	1.5	845	0.635	3.3	0.335	2.2	966	0.463
2536.5	0.469	11	0.183	1.5	875	0.822	6.8	0.335	2.2	1001	0.600
2537.4	0.228	10	0.183	1.5	741	1.7	3.3	0.335	2.2	848	1.2
2538.4	0.632	8.0	0.183	1.5	592	0.896	9.1	0.335	2.2	677	0.654
2539.3	0.698	7.8	0.243	2.4	654	1.3	10	0.443	3.6	748	0.976
2540.2	0.844	11	0.184	2.1	710	0.972	12	0.335	3.2	812	0.709
2541.1	0.411	9.3	0.183	1.5	674	1.6	5.9	0.335	2.2	770	1.1
2542.1	0.745	9.4	0.183	1.5	705	1.2	11	0.335	2.2	806	0.857
2543.0	1.5	7.7	0.183	1.6	804	0.760	21	0.335	2.5	919	0.554
2543.9	0.943	11	0.220	2.0	778	1.5	14	0.402	3.1	890	1.1
2544.8	1.6	10	0.205	1.6	692	1.2	23	0.374	2.5	791	0.853



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
2545.8	3.5	12	0.183	2.5	797	1.1	51	0.335	3.9	911	0.799
2546.7	1.8	12	0.183	2.8	682	1.4	26	0.335	4.3	780	1.0
2547.6	2.2	11	0.446	2.3	704	1.7	32	0.813	3.6	806	1.2
2548.5	4.4	13	0.374	1.7	773	1.0	64	0.681	2.7	883	0.760
2549.4	6.2	12	0.318	3.2	827	1.7	89	0.579	5.0	946	1.2
2550.4	3.6	9.4	0.386	3.3	710	2.7	52	0.704	5.1	812	1.9
2551.3	4.2	9.3	0.737	3.7	878	1.6	60	1.3	5.7	1005	1.2
2552.2	5.6	13	0.335	2.7	919	1.6	80	0.611	4.1	1050	1.2
2553.1	5.5	11	0.743	3.5	934	2.9	80	1.4	5.3	1068	2.1
2554.1	6.0	11	1.2	4.6	1086	2.8	87	2.2	7.0	1242	2.1
2555.0	5.8	12	1.9	3.3	1107	3.0	84	3.5	5.1	1266	2.2
2555.9	5.8	12	0.674	4.4	1307	5.4	84	1.2	6.7	1495	3.9
2556.8	5.9	9.3	1.5	2.8	1009	2.4	86	2.7	4.2	1154	1.8
2557.8	6.6	11	1.3	3.1	1127	2.3	95	2.4	4.8	1289	1.7
2558.7	10	12	1.8	3.4	1181	2.6	148	3.3	5.2	1350	1.9
2559.6	6.8	11	1.2	4.0	1123	2.4	98	2.2	6.2	1284	1.8
2560.5	6.6	12	1.2	4.9	1329	3.9	96	2.2	7.5	1520	2.8
2561.5	6.6	13	1.4	5.1	1524	3.7	95	2.6	7.9	1743	2.7
2562.4	7.5	12	1.6	5.5	1376	2.9	109	2.9	8.4	1574	2.1
2563.3	7.6	11	2.1	2.7	1334	3.4	110	3.8	4.1	1526	2.5
2564.2	6.2	13	1.9	4.2	1571	3.6	90	3.4	6.4	1797	2.6
2565.2	3.8	12	1.7	4.1	1515	4.2	55	3.1	6.3	1732	3.1
2566.1	5.5	13	1.5	5.8	1557	3.0	80	2.7	8.9	1780	2.2
2567.0	4.9	13	2.4	3.9	1562	3.2	71	4.4	6.0	1786	2.3
2567.9	4.0	8.5	1.3	4.9	1358	2.2	58	2.4	7.5	1553	1.6
2568.9	2.6	13	1.6	6.9	1393	4.0	37	2.9	11	1593	2.9
2569.8	4.0	12	1.8	4.8	1473	2.7	58	3.3	7.3	1684	2.0
2570.7	2.8	14	1.4	5.1	1657	2.3	41	2.6	7.9	1894	1.7
2571.6	1.9	11	1.4	6.5	1606	2.8	27	2.6	9.9	1837	2.1
2572.6	2.1	9.7	1.6	3.9	1458	4.0	31	2.9	5.9	1667	2.9
2573.5	1.8	11	1.3	9.4	1899	1.6	25	2.4	14	2172	1.1
2574.4	2.3	14	1.1	4.9	1661	3.3	34	2.1	7.5	1900	2.4
2575.3	0.933	11	1.4	3.6	1537	2.6	13	2.5	5.5	1758	1.9
2576.2	0.948	13	1.6	5.4	1699	2.0	14	2.9	8.3	1943	1.5
2577.2	0.965	11	1.3	5.1	1592	2.6	14	2.4	7.8	1821	1.9
2578.1	1.1	13	1.1	7.6	1534	3.4	16	2.1	12	1754	2.5
2579.0	0.652	10.0	1.2	4.7	1945	1.9	9.4	2.3	7.2	2225	1.4
2579.9	0.349	15	1.2	5.2	1992	2.3	5.0	2.2	8.0	2278	1.6
2580.9	0.572	10	1.6	6.7	1620	2.3	8.3	2.9	10	1852	1.7
2581.8	0.228	15	0.866	4.5	1530	1.5	3.3	1.6	6.9	1750	1.1
2582.7	0.280	17	1.1	7.4	1915	1.9	4.0	2.1	11	2190	1.4
2583.6	0.458	15	0.986	5.2	1803	1.5	6.6	1.8	8.0	2062	1.1
2584.6	0.391	14	0.938	7.1	2290	2.6	5.6	1.7	11	2619	1.9
2585.5	0.228	10	0.791	5.5	1490	1.5	3.3	1.4	8.4	1703	1.1
2586.4	0.228	12	0.864	5.4	1837	2.3	3.3	1.6	8.3	2101	1.7
2587.3	0.228	10	0.690	5.5	1736	1.6	3.3	1.3	8.5	1985	1.2
2588.3	0.228	13	0.789	5.1	1347	1.2	3.3	1.4	7.8	1540	0.878
2589.2	0.228	14	0.434	4.4	1766	1.9	3.3	0.792	6.7	2020	1.4
2590.1	0.344	14	0.759	5.3	1676	2.8	5.0	1.4	8.1	1917	2.1
2591.0	0.348	11	0.980	4.0	1635	2.5	5.0	1.8	6.2	1870	1.8
2592.0	0.228	15	0.658	6.0	1958	2.1	3.3	1.2	9.2	2239	1.6
2592.9	0.228	11	0.871	3.8	1354	1.9	3.3	1.6	5.9	1548	1.4
2593.8	0.256	13	0.801	5.4	1507	3.5	3.7	1.5	8.3	1723	2.6
2594.7	0.228	12	0.514	4.8	1635	2.0	3.3	0.937	7.4	1870	1.4
2595.7	0.228	14	0.573	4.8	1607	1.7	3.3	1.0	7.4	1838	1.3
2596.6	0.228	10	0.849	5.0	1398	1.0	3.3	1.5	7.6	1599	0.763
2597.5	0.228	13	0.581	5.6	1453	1.9	3.3	1.1	8.6	1662	1.4
2598.4	0.228	12	0.781	4.9	1396	2.1	3.3	1.4	7.6	1596	1.5
2599.4	0.228	11	0.874	6.2	1210	2.4	3.3	1.6	9.5	1384	1.8
2600.3	0.547	11	0.768	5.8	1435	1.4	7.9	1.4	8.9	1641	1.1
2601.2	0.228	15	0.960	6.2	1493	2.9	3.3	1.8	9.5	1707	2.1
2602.1	0.228	13	1.0	4.0	1164	1.6	3.3	1.8	6.1	1332	1.2
2603.0	0.228	15	0.934	6.4	1111	2.1	3.3	1.7	9.8	1270	1.5
2604.0	0.228	13	0.883	4.3	1161	2.4	3.3	1.6	6.6	1327	1.8
2604.9	0.228	13	0.906	5.7	1270	2.2	3.3	1.7	8.8	1453	1.6
2605.8	0.389	13	0.820	4.3	985	3.1	5.6	1.5	6.5	1126	2.3
2606.7	0.228	14	0.654	3.8	1122	1.6	3.3	1.2	5.8	1283	1.2
2607.7	0.228	12	0.525	4.2	1068	1.7	3.3	0.958	6.5	1221	1.2
2608.6	0.228	20	0.581	3.7	1016	3.0	3.3	1.1	5.6	1162	2.2
2609.5	0.228	14	0.840	3.9	1072	2.4	3.3	1.5	6.0	1226	1.8
2610.4	0.228	12	0.785	4.1	1076	2.8	3.3	1.4	6.3	1230	2.1
2611.4	0.228	11	0.470	3.9	751	1.2	3.3	0.857	5.9	858	0.905
2612.3	0.668	15	0.944	3.9	873	3.0	9.6	1.7	6.0	998	2.2
2613.2	0.228	13	0.236	3.8	1095	1.5	3.3	0.431	5.9	1252	1.1
2614.1	0.228	15	0.489	3.9	945	2.5	3.3	0.892	5.9	1081	1.8
2615.1	0.228	11	0.491	3.7	888	2.8	3.3	0.896	5.7	1016	2.0
2616.0	0.718	12	0.586	4.5	958	2.0	10	1.1	6.9	1095	1.5
2616.9	0.228	12	0.390	5.0	1110	2.1	3.3	0.711	7.7	1269	1.5
2617.8	0.251	12	0.183	1.8	907	1.5	3.6	0.335	2.8	1037	1.1
2618.8	0.533	15	0.490	3.4	1055	2.2	7.7	0.894	5.2	1207	1.6
2619.7	0.269	12	0.514	4.5	867	3.1	3.9	0.938	6.9	991	2.2



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2620.6	0.228	11	0.600	2.0	1029	2.4	3.3	1.1	3.0	1177	1.8
2621.5	0.228	12	0.183	2.1	872	2.3	3.3	0.335	3.2	997	1.7
2622.5	0.228	12	0.473	2.5	1007	1.4	3.3	0.862	3.9	1152	0.995
2623.4	0.228	12	0.483	4.5	911	2.2	3.3	0.881	6.9	1041	1.6
2624.3	0.347	9.7	0.279	2.1	839	0.991	5.0	0.508	3.3	959	0.723
2625.2	0.228	11	0.324	3.8	896	2.2	3.3	0.591	5.8	1024	1.6
2626.2	0.228	12	0.260	1.5	854	1.9	3.3	0.474	2.2	976	1.4
2627.1	0.643	13	0.280	1.6	780	1.5	9.3	0.511	2.4	892	1.1
2628.0	0.228	12	0.260	2.1	841	2.5	3.3	0.475	3.2	962	1.8
2628.9	0.346	9.9	0.183	2.0	966	1.5	5.0	0.335	3.1	1105	1.1
2629.8	0.459	8.1	0.316	3.2	755	1.4	6.6	0.575	4.9	863	1.0
2630.8	0.379	13	0.183	1.6	996	1.2	5.5	0.335	2.4	1139	0.890
2631.7	0.342	14	0.223	2.3	612	0.522	4.9	0.407	3.4	699	0.381
2632.6	0.228	6.6	0.255	1.6	754	1.0	3.3	0.465	2.4	862	0.745
2633.5	0.497	9.4	0.183	1.5	913	1.5	7.2	0.335	2.2	1044	1.1
2634.5	0.621	16	0.183	3.0	1010	0.673	9.0	0.335	4.6	1155	0.491
2635.4	0.707	9.5	0.216	2.4	857	1.9	10	0.394	3.7	980	1.4
2636.3	0.228	9.1	0.183	1.5	758	1.4	3.3	0.335	2.3	866	1.0
2637.2	0.281	12	0.255	1.5	1004	1.5	4.1	0.465	2.2	1148	1.1
2638.2	0.720	9.2	0.183	2.1	1050	1.4	10	0.335	3.2	1201	0.996
2639.1	0.228	10	0.248	1.8	775	1.5	3.3	0.451	2.7	886	1.1
2640.0	0.228	11	0.189	1.9	893	1.3	3.3	0.345	2.9	1021	0.914
2640.9	0.228	8.1	0.183	1.5	911	1.8	3.3	0.335	2.2	1041	1.3
2641.9	0.228	9.3	0.183	2.2	689	0.752	3.3	0.335	3.4	788	0.549
2642.8	0.228	7.9	0.289	1.7	706	0.524	3.3	0.527	2.6	807	0.382
2643.7	0.739	10.0	0.500	1.5	775	1.9	11	0.912	2.2	886	1.4
2644.6	0.266	8.9	0.183	1.5	745	1.3	3.8	0.335	2.2	852	0.970
2645.6	0.228	8.2	0.183	1.5	646	1.5	3.3	0.335	2.2	739	1.1
2646.5	0.502	9.7	0.183	1.5	709	1.2	7.2	0.335	2.2	811	0.883
2647.4	0.531	11	0.183	1.5	698	1.6	7.7	0.335	2.3	798	1.2
2648.3	1.7	7.6	0.183	1.5	742	2.1	24	0.335	2.2	848	1.5
2649.3	1.1	9.7	0.183	2.2	721	1.1	15	0.335	3.4	824	0.781
2650.2	1.8	12	0.183	4.0	692	2.8	26	0.335	6.1	792	2.1
2651.1	1.9	8.1	0.266	2.5	714	3.0	28	0.485	3.8	817	2.2
2652.0	2.3	8.7	0.198	1.5	772	4.9	33	0.361	2.2	883	3.6
2653.0	2.4	11	0.183	2.5	904	5.5	34	0.335	3.8	1033	4.0
2653.9	2.7	7.7	0.183	1.5	707	7.6	38	0.335	2.2	808	5.6
2654.8	2.5	6.8	0.338	2.0	665	9.5	36	0.617	3.1	760	6.9
2655.7	4.0	13	0.183	2.5	853	13	57	0.335	3.9	975	9.7
2656.6	3.5	11	0.576	4.3	829	13	50	1.1	6.5	948	9.8
2657.6	4.6	11	0.435	3.8	729	15	67	0.794	5.8	834	11
2658.5	5.1	11	0.977	4.8	826	20	73	1.8	7.3	944	15
2659.4	7.1	14	0.588	4.1	816	13	102	1.1	6.2	933	9.5
2660.3	4.8	9.5	0.775	2.4	791	19	69	1.4	3.6	905	14
2661.3	4.9	9.6	0.963	5.3	869	25	71	1.8	8.1	994	18
2662.2	5.9	14	0.543	3.1	1040	19	86	0.989	4.8	1189	14
2663.1	6.7	10	1.2	2.6	897	21	96	2.3	4.0	1025	16
2664.0	5.4	12	1.2	4.7	959	21	78	2.1	7.2	1097	15
2665.0	5.8	12	1.1	7.5	1179	19	84	2.1	12	1348	14
2665.9	4.6	11	0.963	4.7	978	18	67	1.8	7.1	1118	13
2666.8	4.7	11	1.5	4.1	891	18	68	2.7	6.3	1019	13
2667.7	4.2	12	1.6	5.1	1017	16	61	2.9	7.8	1163	12
2668.7	4.7	10	1.2	3.9	1064	16	68	2.3	5.9	1217	11
2669.6	4.4	12	1.4	4.0	1067	18	63	2.6	6.1	1220	13
2670.5	5.0	11	1.3	5.4	1227	21	73	2.4	8.3	1403	15
2671.4	2.8	11	1.4	5.3	1163	15	40	2.6	8.1	1330	11
2672.4	2.8	10	1.1	4.6	1135	16	40	2.0	7.0	1298	11
2673.3	3.5	13	0.872	5.8	1222	15	51	1.6	8.9	1398	11
2674.2	2.8	12	1.7	7.5	1460	14	40	3.2	11	1669	10
2675.1	1.7	13	1.3	7.5	1237	14	25	2.5	12	1415	10
2676.1	1.7	11	0.932	6.1	1266	10.0	24	1.7	9.4	1447	7.3
2677.0	2.2	13	1.2	5.4	1370	9.5	32	2.1	8.3	1567	6.9
2677.9	1.6	15	1.6	6.2	1687	13	24	2.9	9.5	1929	9.1
2678.8	0.765	11	1.3	5.2	1187	7.5	11	2.3	8.0	1358	5.4
2679.8	0.957	12	1.2	4.4	1495	7.4	14	2.2	6.8	1709	5.4
2680.7	0.672	11	0.806	5.1	1302	8.6	9.7	1.5	7.9	1489	6.3
2681.6	0.887	12	1.1	5.6	1454	7.3	13	2.0	8.6	1662	5.3
2682.5	0.228	12	1.4	7.1	1276	7.4	3.3	2.6	11	1459	5.4
2683.4	0.611	13	0.904	7.1	1624	4.8	8.8	1.6	11	1857	3.5
2684.4	0.295	10	1.1	6.1	1389	6.1	4.3	2.1	9.4	1589	4.4
2685.3	0.952	13	1.0	5.4	1334	5.3	14	1.9	8.3	1526	3.9
2686.2	0.319	13	0.760	6.5	1535	4.7	4.6	1.4	9.9	1756	3.4
2687.1	0.255	12	1.1	4.7	1591	4.7	3.7	1.9	7.2	1820	3.4
2688.1	0.535	12	1.0	6.9	1474	5.6	7.7	1.8	11	1686	4.1
2689.0	0.228	13	1.1	8.1	1682	7.8	3.3	1.9	12	1923	5.7
2689.9	0.228	14	0.932	7.3	2005	4.5	3.3	1.7	11	2293	3.3
2690.8	0.291	12	0.820	5.4	1374	5.9	4.2	1.5	8.3	1572	4.3
2691.8	0.228	14	1.1	6.9	1811	6.4	3.3	2.0	11	2071	4.7
2692.7	0.450	15	1.1	6.3	2107	5.6	6.5	2.1	9.7	2409	4.1
2693.6	0.228	12	1.1	5.8	1557	6.6	3.3	2.0	8.9	1780	4.8
2694.5	0.228	15	1.0	6.0	1724	6.1	3.3	1.9	9.2	1972	4.5



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
2695.5	0.228	14	0.785	8.4	2353	5.8	3.3	1.4	13	2690	4.2
2696.4	0.264	11	0.583	5.6	1365	4.8	3.8	1.1	8.6	1560	3.5
2697.3	0.311	11	0.905	6.2	1806	3.3	4.5	1.7	9.5	2065	2.4
2698.2	0.228	12	0.965	6.6	1969	3.8	3.3	1.8	10	2252	2.8
2699.2	0.228	14	1.5	6.5	1902	3.8	3.3	2.7	9.9	2175	2.8
2700.1	0.228	13	0.805	3.5	1562	3.5	3.3	1.5	5.4	1786	2.6
2701.0	0.228	16	0.789	5.9	2088	5.0	3.3	1.4	9.1	2388	3.7
2701.9	0.228	13	0.875	6.2	1791	3.6	3.3	1.6	9.5	2048	2.6
2702.9	0.228	10	0.810	5.7	1472	3.4	3.3	1.5	8.8	1683	2.5
2703.8	0.228	15	1.8	7.7	1903	4.4	3.3	3.2	12	2176	3.2
2704.7	0.228	14	0.519	3.6	1674	3.6	3.3	0.946	5.5	1914	2.6
2705.6	0.269	15	0.694	5.4	1589	4.1	3.9	1.3	8.2	1817	3.0
2706.6	0.228	14	0.791	6.4	1553	3.9	3.3	1.4	9.8	1776	2.9
2707.5	0.228	15	0.801	4.3	1757	3.4	3.3	1.5	6.5	2009	2.5
2708.4	0.228	13	1.0	5.0	1525	4.7	3.3	1.9	7.7	1744	3.4
2709.3	0.228	14	0.890	6.6	1627	4.6	3.3	1.6	10	1861	3.3
2710.2	0.228	13	1.1	2.8	1438	4.3	3.3	2.0	4.3	1644	3.1
2711.2	0.337	13	0.566	5.9	1669	4.0	4.9	1.0	9.0	1909	2.9
2712.1	0.516	13	0.974	5.6	1418	3.3	7.5	1.8	8.6	1622	2.4
2713.0	0.258	12	0.771	5.6	1112	2.8	3.7	1.4	8.5	1271	2.0
2713.9	0.605	16	1.2	6.0	1442	3.7	8.7	2.3	9.2	1649	2.7
2714.9	0.813	12	0.804	4.3	1066	3.3	12	1.5	6.6	1219	2.4
2715.8	0.315	13	0.722	4.3	1226	3.3	4.5	1.3	6.6	1402	2.4
2716.7	0.228	12	0.992	5.1	1346	3.7	3.3	1.8	7.8	1539	2.7
2717.6	0.517	11	0.365	6.8	1156	2.8	7.5	0.666	10	1322	2.1
2718.6	0.228	16	1.1	3.5	973	3.0	3.3	1.9	5.4	1113	2.2
2719.5	0.228	15	0.861	6.9	1339	4.4	3.3	1.6	11	1531	3.2
2720.4	0.228	13	0.891	5.9	953	2.3	3.3	1.6	9.0	1090	1.7
2721.3	0.228	14	0.609	6.4	1061	3.1	3.3	1.1	9.8	1214	2.2
2722.3	0.228	15	0.524	5.1	1019	3.8	3.3	0.956	7.7	1165	2.7
2723.2	0.228	15	0.583	6.6	1040	2.2	3.3	1.1	10	1190	1.6
2724.1	0.325	11	0.717	5.0	1046	3.0	4.7	1.3	7.6	1196	2.2
2725.0	0.228	14	1.1	5.1	997	2.7	3.3	2.0	7.9	1140	2.0
2726.0	0.228	16	0.788	6.1	938	3.1	3.3	1.4	9.3	1072	2.3
2726.9	0.228	13	0.423	4.2	897	2.1	3.3	0.772	6.5	1026	1.5
2727.8	0.228	15	0.574	5.3	970	3.0	3.3	1.0	8.1	1109	2.2
2728.7	0.228	15	0.520	4.2	914	2.0	3.3	0.948	6.5	1045	1.5
2729.7	0.228	14	0.698	5.6	930	2.0	3.3	1.3	8.6	1063	1.5
2730.6	0.228	11	0.524	3.8	711	2.2	3.3	0.955	5.8	813	1.6
2731.5	0.228	14	0.421	2.9	816	1.5	3.3	0.768	4.4	933	1.1
2732.4	0.265	12	0.534	3.9	896	3.0	3.8	0.975	6.0	1025	2.2
2733.4	0.228	13	0.419	4.3	781	4.4	3.3	0.765	6.6	893	3.2
2734.3	0.567	13	0.704	5.2	827	2.4	8.2	1.3	7.9	946	1.7
2735.2	0.228	14	0.398	4.4	974	2.9	3.3	0.727	6.8	1113	2.1
2736.1	0.228	16	0.684	3.3	812	3.0	3.3	1.2	5.1	929	2.2
2737.0	0.228	12	0.369	4.6	783	3.2	3.3	0.672	7.1	896	2.4
2738.0	0.261	12	0.731	3.3	889	1.8	3.8	1.3	5.0	1017	1.3
2738.9	0.228	11	0.413	3.9	665	2.6	3.3	0.753	5.9	761	1.9
2739.8	0.461	8.2	0.772	4.2	681	2.4	6.7	1.4	6.4	778	1.8
2740.7	0.228	13	0.487	2.7	869	2.3	3.3	0.888	4.1	994	1.7
2741.7	0.228	12	0.424	4.2	791	2.6	3.3	0.773	6.5	905	1.9
2742.6	0.477	13	0.416	3.5	738	2.4	6.9	0.759	5.3	844	1.8
2743.5	0.228	11	0.371	3.2	791	2.5	3.3	0.677	4.9	904	1.9
2744.4	0.245	13	0.359	5.9	776	2.8	3.5	0.655	9.1	887	2.0
2745.4	0.228	12	0.476	3.2	764	2.3	3.3	0.869	4.9	874	1.7
2746.3	0.313	12	0.334	3.9	761	2.1	4.5	0.609	6.0	870	1.6
2747.2	0.228	14	0.486	1.5	820	2.3	3.3	0.887	2.2	938	1.7
2748.1	0.228	13	0.357	2.8	791	2.9	3.3	0.652	4.3	905	2.1
2749.1	0.228	11	0.433	1.9	722	2.7	3.3	0.790	2.9	826	2.0
2750.0	0.228	15	0.291	3.6	767	2.2	3.3	0.531	5.5	877	1.6
2750.9	0.228	11	0.504	3.1	864	2.0	3.3	0.919	4.8	988	1.5
2751.8	0.228	12	0.183	2.3	739	2.1	3.3	0.335	3.6	845	1.6
2752.8	0.228	9.0	0.418	2.6	741	2.5	3.3	0.762	3.9	847	1.9
2753.7	0.228	14	0.183	3.2	790	2.7	3.3	0.335	4.9	903	1.9
2754.6	0.228	9.4	0.183	2.1	784	3.0	3.3	0.335	3.2	896	2.2
2755.5	0.228	9.2	0.369	2.2	696	2.4	3.3	0.672	3.4	796	1.8
2756.5	0.228	13	0.278	2.9	850	3.0	3.3	0.506	4.4	972	2.2
2757.4	0.228	9.8	0.183	1.5	752	2.1	3.3	0.335	2.2	860	1.6
2758.3	0.246	11	0.223	1.8	715	2.9	3.6	0.407	2.8	818	2.1
2759.2	0.228	11	0.183	2.6	872	3.9	3.3	0.335	4.0	997	2.8
2760.2	0.228	11	0.183	1.5	710	1.5	3.3	0.335	2.2	812	1.1
2761.1	0.228	8.0	0.489	1.9	675	2.0	3.3	0.891	2.9	772	1.4
2762.0	0.228	9.1	0.183	1.5	717	2.5	3.3	0.335	2.2	820	1.8
2762.9	0.272	9.5	0.183	1.6	801	2.0	3.9	0.335	2.4	916	1.4
2763.8	0.228	8.6	0.395	1.5	754	2.2	3.3	0.720	2.2	862	1.6
2764.8	0.344	11	0.337	1.5	605	2.3	5.0	0.614	2.2	691	1.7
2765.7	0.228	11	0.214	1.5	909	1.8	3.3	0.390	2.2	1039	1.3
2766.6	0.368	10	0.183	1.5	790	1.5	5.3	0.335	2.2	903	1.1
2767.5	0.228	8.6	0.183	1.7	785	3.2	3.3	0.335	2.5	898	2.3
2768.5	0.228	10.0	0.183	1.5	811	1.3	3.3	0.335	2.2	928	0.940
2769.4	0.228	12	0.333	1.5	791	2.7	3.3	0.607	2.2	905	2.0



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
2770.3	0.228	8.1	0.183	2.0	655	3.0	3.3	0.335	3.0	749	2.2
2771.2	0.261	11	0.237	1.5	744	1.8	3.8	0.433	2.2	851	1.3
2772.2	0.228	11	0.183	2.8	734	1.7	3.3	0.335	4.4	839	1.3
2773.1	0.228	11	0.253	1.5	747	2.9	3.3	0.461	2.2	854	2.1
2774.0	0.228	9.0	0.183	1.5	690	2.0	3.3	0.335	2.2	789	1.4
2774.9	0.593	10	0.183	1.5	802	2.5	8.6	0.335	2.2	917	1.8
2775.9	0.228	10	0.183	1.5	667	2.9	3.3	0.335	2.3	763	2.1
2776.8	0.228	10.0	0.183	2.2	566	1.2	3.3	0.335	3.3	647	0.864
2777.7	0.228	11	0.183	1.5	680	1.7	3.3	0.335	2.2	778	1.3
2778.6	0.433	11	0.183	1.5	614	1.9	6.2	0.335	2.2	702	1.4
2779.6	0.228	10	0.183	1.5	661	1.1	3.3	0.335	2.2	756	0.768
2780.5	0.228	9.3	0.183	1.5	660	1.0	3.3	0.335	2.2	755	0.766
2781.4	0.228	12	0.252	1.5	508	2.0	3.3	0.460	2.2	581	1.5
2782.3	0.228	9.8	0.183	1.5	720	1.3	3.3	0.335	2.2	824	0.957
2783.3	0.228	12	0.183	1.5	670	1.7	3.3	0.335	2.2	767	1.2
2784.2	0.228	11	0.183	1.6	524	0.430	3.3	0.335	2.5	599	0.314
2785.1	0.228	12	0.205	1.5	524	1.1	3.3	0.374	2.2	599	0.767
2786.0	0.258	12	0.206	1.5	548	0.699	3.7	0.375	2.2	626	0.510
2787.0	0.228	13	0.183	1.7	626	1.1	3.3	0.335	2.6	715	0.799
2787.9	0.441	10	0.183	1.5	487	0.885	6.4	0.335	2.2	557	0.646
2788.8	0.228	13	0.183	1.8	562	1.7	3.3	0.335	2.7	643	1.2
2789.7	0.264	16	0.358	1.5	523	1.3	3.8	0.652	2.2	599	0.965
2790.6	0.437	12	0.183	1.5	490	0.323	6.3	0.335	2.2	561	0.236
2791.6	0.228	13	0.183	2.4	511	1.4	3.3	0.335	3.7	584	1.0
2792.5	0.228	13	0.183	1.5	586	1.6	3.3	0.335	2.2	670	1.2
2793.4	0.228	10	0.183	2.0	524	1.4	3.3	0.335	3.0	599	0.986
2794.3	0.307	11	0.210	2.4	569	0.690	4.4	0.384	3.7	651	0.503
2795.3	0.562	14	0.183	1.5	495	1.6	8.1	0.335	2.2	566	1.2
2796.2	0.228	11	0.183	1.5	460	0.474	3.3	0.335	2.2	526	0.346
2797.1	0.228	9.8	0.354	1.5	391	0.876	3.3	0.645	2.3	447	0.639
2798.0	0.228	14	0.340	1.5	523	0.795	3.3	0.619	2.2	598	0.580
2799.0	0.228	13	0.183	1.5	445	1.3	3.3	0.335	2.2	509	0.914
2799.9	0.228	10	0.453	2.6	452	0.534	3.3	0.826	4.0	516	0.390
2800.8	0.228	9.1	0.237	3.1	433	0.946	3.3	0.432	4.8	495	0.690
2801.7	0.228	11	0.675	1.5	678	0.993	3.3	1.2	2.2	775	0.725
2802.7	0.350	11	0.308	1.5	434	0.826	5.1	0.562	2.2	497	0.602
2803.6	0.228	14	0.183	1.5	501	0.844	3.3	0.335	2.3	572	0.616
2804.5	0.555	13	0.183	1.5	560	0.692	8.0	0.335	2.2	640	0.505
2805.4	0.313	13	0.319	2.5	552	0.991	4.5	0.582	3.8	632	0.723
2806.4	0.228	13	0.254	1.5	506	1.3	3.3	0.463	2.2	578	0.927
2807.3	0.380	11	0.372	1.5	610	1.6	5.5	0.679	2.2	697	1.2
2808.2	0.405	12	0.474	1.5	446	1.8	5.9	0.865	2.3	510	1.3
2809.1	0.228	8.5	0.331	1.5	457	0.662	3.3	0.603	2.2	523	0.483
2810.1	0.228	14	0.214	1.5	504	0.974	3.3	0.390	2.2	576	0.710
2811.0	0.228	13	0.225	2.7	582	0.505	3.3	0.410	4.1	666	0.369
2811.9	0.401	9.8	0.183	1.5	491	0.587	5.8	0.335	2.2	562	0.429
2812.8	0.228	10	0.325	2.3	513	0.709	3.3	0.593	3.6	587	0.518
2813.8	0.228	11	0.183	1.5	581	1.0	3.3	0.335	2.2	665	0.753
2814.7	0.807	8.7	0.183	1.5	408	0.577	12	0.335	2.2	467	0.421
2815.6	0.228	10	0.566	1.6	500	1.8	3.3	1.0	2.5	571	1.3
2816.5	0.346	14	0.183	1.5	618	0.739	5.0	0.335	2.2	707	0.539
2817.4	0.228	10	0.316	2.0	541	1.0	3.3	0.576	3.1	618	0.739
2818.4	0.228	11	0.336	1.5	460	0.733	3.3	0.612	2.2	526	0.535
2819.3	0.410	10	0.390	1.5	513	1.7	5.9	0.711	2.2	587	1.2
2820.2	0.228	9.3	0.183	1.5	595	0.948	3.3	0.335	2.2	681	0.692
2821.1	0.291	9.3	0.183	1.5	417	0.306	4.2	0.335	2.2	476	0.223
2822.1	0.228	12	0.183	1.5	666	1.8	3.3	0.335	2.3	762	1.3
2823.0	0.228	12	0.183	2.2	641	1.1	3.3	0.335	3.4	733	0.788
2823.9	0.228	7.6	0.183	1.5	418	1.1	3.3	0.335	2.2	478	0.770
2824.8	0.228	8.0	0.183	1.9	471	1.1	3.3	0.335	2.9	539	0.790
2825.8	0.228	11	0.183	1.5	614	0.770	3.3	0.335	2.2	702	0.562
2826.7	0.266	9.3	0.183	1.5	555	1.8	3.8	0.335	2.2	634	1.3
2827.6	0.228	9.0	0.251	1.5	502	1.6	3.3	0.458	2.2	574	1.1
2828.5	0.293	8.1	0.183	1.5	590	1.1	4.2	0.335	2.2	675	0.776
2829.5	0.320	8.4	0.183	1.5	506	1.5	4.6	0.335	2.2	579	1.1
2830.4	0.228	7.2	0.183	1.5	496	1.0	3.3	0.335	2.2	567	0.758
2831.3	0.276	8.3	0.183	1.5	565	1.0	4.0	0.335	2.2	646	0.731
2832.2	0.297	12	0.183	2.0	569	0.805	4.3	0.335	3.1	651	0.587
2833.2	0.622	9.4	0.183	1.5	531	1.7	9.0	0.335	2.2	607	1.2
2834.1	0.370	8.3	0.183	1.5	561	1.6	5.3	0.335	2.2	642	1.2
2835.0	0.228	10	0.183	1.5	612	1.2	3.3	0.335	2.2	700	0.900
2835.9	0.228	7.1	0.183	1.5	462	0.352	3.3	0.335	2.2	529	0.257
2836.9	0.306	9.7	0.183	1.5	517	1.1	4.4	0.335	2.2	591	0.809
2837.8	0.653	8.4	0.183	1.6	588	1.9	9.4	0.335	2.5	672	1.4
2838.7	0.336	9.9	0.183	1.8	592	1.2	4.9	0.335	2.8	677	0.878
2839.6	0.277	8.6	0.198	1.5	489	1.3	4.0	0.362	2.2	559	0.943
2840.5	0.340	7.1	0.183	1.7	469	1.2	4.9	0.335	2.6	537	0.887
2841.5	0.239	12	0.332	1.5	655	1.2	3.4	0.606	2.2	749	0.862
2842.4	0.228	7.8	0.183	1.5	698	1.1	3.3	0.335	2.2	798	0.837
2843.3	0.228	7.4	0.183	1.5	639	1.2	3.3	0.335	2.2	731	0.900
2844.2	0.228	9.9	0.183	2.2	769	1.5	3.3	0.335	3.4	879	1.1



Minnow Environmental  
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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
2845.2	0.403	11	0.588	1.5	838	0.710	5.8	1.1	2.2	958	0.518
2846.1	0.924	12	0.395	2.5	792	1.7	13	0.721	3.8	905	1.3
2847.0	0.845	13	0.393	1.5	942	2.1	12	0.717	2.2	1077	1.5
2847.9	1.8	10	0.634	2.2	1073	2.6	26	1.2	3.3	1227	1.9
2848.9	1.5	9.6	0.451	2.1	1133	2.1	22	0.823	3.2	1296	1.5
2849.8	3.0	13	0.768	3.3	1173	1.4	44	1.4	5.1	1341	1.1
2850.7	2.7	14	0.779	2.0	1437	2.2	39	1.4	3.1	1644	1.6
2851.6	1.2	13	0.702	1.5	1251	0.988	18	1.3	2.2	1431	0.721
2852.6	1.1	14	0.628	2.0	1376	1.1	16	1.1	3.1	1573	0.834
2853.5	1.4	11	0.873	1.8	1602	2.2	20	1.6	2.8	1831	1.6
2854.4	1.2	13	0.682	1.5	1275	2.4	18	1.2	2.3	1458	1.7
2855.3	1.5	11	1.4	2.2	1625	2.8	21	2.5	3.3	1859	2.0
2856.3	2.5	13	1.0	1.6	1600	1.5	36	1.8	2.5	1829	1.1
2857.2	1.4	12	1.4	1.5	1702	1.7	20	2.6	2.3	1946	1.2
2858.1	1.0	12	1.1	2.9	1579	1.8	15	1.9	4.4	1806	1.3
2859.0	0.971	15	0.823	2.7	1638	2.1	14	1.5	4.1	1873	1.5
2860.0	1.3	16	1.4	4.2	1822	1.7	19	2.6	6.4	2083	1.3
2860.9	1.8	11	1.2	4.2	1628	2.1	26	2.2	6.4	1861	1.5
2861.8	0.842	11	1.2	2.2	1455	1.7	12	2.2	3.4	1663	1.2
2862.7	1.8	15	1.3	3.6	1870	1.7	27	2.4	5.6	2138	1.3
2863.7	1.0	14	1.3	5.2	1957	2.8	15	2.4	8.0	2238	2.0
2864.6	1.3	16	1.3	4.0	1973	2.4	19	2.4	6.2	2256	1.7
2865.5	0.713	15	1.0	3.9	1692	1.2	10	1.9	6.0	1935	0.904
2866.4	1.2	16	1.6	3.6	1766	1.9	17	3.0	5.5	2020	1.4
2867.3	1.3	15	1.3	1.8	1535	1.7	18	2.4	2.7	1755	1.2
2868.3	0.397	15	0.946	3.6	1720	2.4	5.7	1.7	5.5	1967	1.8
2869.2	0.554	17	1.4	2.7	1877	1.5	8.0	2.5	4.2	2146	1.1
2870.1	0.228	17	1.4	3.3	1604	1.6	3.3	2.6	5.1	1834	1.1
2871.0	0.228	14	1.5	3.5	1601	1.2	3.3	2.7	5.4	1831	0.850
2872.0	0.228	18	1.3	2.1	1721	1.7	3.3	2.4	3.2	1968	1.2
2872.9	0.835	17	1.2	4.6	1828	2.0	12	2.2	7.0	2090	1.4
2873.8	0.228	13	1.4	2.1	1482	2.6	3.3	2.5	3.2	1695	1.9
2874.7	0.228	15	0.864	3.6	1693	1.6	3.3	1.6	5.6	1936	1.2
2875.7	0.345	16	0.913	3.3	1638	1.9	5.0	1.7	5.0	1873	1.4
2876.6	0.228	14	1.6	5.7	1663	1.1	3.3	3.0	8.8	1901	0.833
2877.5	0.228	15	1.3	3.6	1748	2.9	3.3	2.4	5.5	1999	2.1
2878.4	0.228	18	1.1	3.1	1616	3.1	3.3	2.0	4.7	1847	2.2
2879.4	0.228	19	0.927	3.0	1575	2.7	3.3	1.7	4.6	1801	2.0
2880.3	0.428	17	1.2	3.7	1584	2.8	6.2	2.2	5.6	1811	2.0
2881.2	0.442	21	1.3	4.5	1712	1.6	6.4	2.3	6.9	1958	1.1
2882.1	0.589	16	0.760	3.2	1465	1.7	8.5	1.4	4.9	1675	1.3
2883.1	0.228	17	0.777	3.5	1662	2.3	3.3	1.4	5.4	1901	1.7
2884.0	0.570	17	1.2	4.0	1752	1.6	8.2	2.1	6.2	2004	1.2
2884.9	0.780	20	0.849	4.0	1567	1.4	11	1.5	6.1	1792	0.989
2885.8	0.444	18	1.6	3.4	1581	2.0	6.4	2.9	5.1	1808	1.5
2886.8	0.228	21	1.1	1.5	1582	2.4	3.3	1.9	2.2	1809	1.7
2887.7	0.344	22	0.998	3.0	1580	2.0	5.0	1.8	4.6	1807	1.4
2888.6	0.228	17	0.527	3.8	1300	2.5	3.3	0.960	5.9	1487	1.8
2889.5	0.683	23	0.848	1.8	1462	2.4	9.9	1.5	2.7	1671	1.7
2890.5	0.228	26	1.5	3.3	1527	1.0	3.3	2.7	5.1	1747	0.756
2891.4	0.228	18	0.818	2.5	1394	2.1	3.3	1.5	3.9	1594	1.5
2892.3	0.324	25	0.997	2.7	1257	2.3	4.7	1.8	4.1	1437	1.7
2893.2	0.228	20	0.711	4.5	1441	4.4	3.3	1.3	6.9	1648	3.2
2894.1	0.228	20	0.804	2.8	1311	1.6	3.3	1.5	4.2	1499	1.2
2895.1	0.228	23	0.667	3.3	1498	3.1	3.3	1.2	5.0	1714	2.3
2896.0	0.228	20	0.924	1.6	1235	1.5	3.3	1.7	2.4	1412	1.1
2896.9	0.228	21	1.3	4.8	1287	2.5	3.3	2.4	7.4	1472	1.8
2897.8	0.412	21	0.541	4.2	1416	3.1	5.9	0.987	6.5	1619	2.2
2898.8	0.228	19	1.3	3.8	1287	2.0	3.3	2.3	5.9	1471	1.5
2899.7	0.228	24	1.0	4.7	1301	1.4	3.3	1.8	7.2	1488	1.0
2900.6	0.228	19	1.2	2.0	1081	1.3	3.3	2.1	3.0	1237	0.915
2901.5	0.228	21	0.787	2.8	1078	2.0	3.3	1.4	4.3	1232	1.4
2902.5	0.228	22	1.0	3.8	1234	1.1	3.3	1.9	5.9	1411	0.837
2903.4	0.263	23	0.968	4.0	1048	2.4	3.8	1.8	6.1	1198	1.7
2904.3	0.228	19	0.661	2.1	944	2.5	3.3	1.2	3.2	1079	1.8
2905.2	0.228	28	0.951	4.2	1126	1.5	3.3	1.7	6.4	1287	1.1
2906.2	1.1	20	0.844	3.5	1178	1.8	17	1.5	5.4	1347	1.3
2907.1	0.228	16	0.578	1.9	867	2.6	3.3	1.1	3.0	992	1.9
2908.0	0.228	22	0.723	3.2	1123	2.7	3.3	1.3	4.9	1285	2.0
2908.9	0.418	24	1.2	4.4	1037	2.9	6.0	2.1	6.8	1186	2.1
2909.9	0.228	18	0.522	4.2	801	2.5	3.3	0.952	6.5	916	1.8
2910.8	0.228	20	1.2	3.8	941	1.9	3.3	2.1	5.8	1076	1.4
2911.7	0.275	20	0.646	3.3	933	1.2	4.0	1.2	5.1	1067	0.910
2912.6	0.228	21	0.503	3.3	774	1.8	3.3	0.917	5.1	885	1.3
2913.6	0.228	18	0.774	2.1	802	1.8	3.3	1.4	3.2	918	1.3
2914.5	0.228	20	0.927	1.9	862	1.8	3.3	1.7	2.9	985	1.3
2915.4	0.228	20	0.183	3.1	919	2.9	3.3	0.335	4.8	1051	2.1
2916.3	0.228	15	0.357	3.7	743	2.0	3.3	0.651	5.7	850	1.5
2917.2	0.228	17	0.682	2.2	863	1.5	3.3	1.2	3.3	987	1.1
2918.2	0.228	18	0.216	3.1	827	0.982	3.3	0.394	4.8	946	0.716
2919.1	0.228	16	0.286	3.7	758	1.2	3.3	0.522	5.7	867	0.839



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
2920.0	0.228	21	0.323	3.7	806	2.1	3.3	0.589	5.7	922	1.5
2920.9	0.620	22	0.637	1.9	1035	1.8	9.0	1.2	2.9	1183	1.3
2921.9	0.234	14	0.317	4.2	720	1.3	3.4	0.577	6.4	824	0.932
2922.8	0.228	19	0.440	4.4	773	1.5	3.3	0.803	6.7	884	1.1
2923.7	0.358	21	0.538	3.7	916	0.376	5.2	0.981	5.7	1048	0.274
2924.6	0.228	16	0.383	1.6	745	1.3	3.3	0.698	2.5	852	0.968
2925.6	0.228	19	0.415	2.8	809	2.3	3.3	0.757	4.2	925	1.7
2926.5	0.228	21	0.453	1.5	753	1.3	3.3	0.826	2.2	861	0.981
2927.4	0.228	20	0.721	2.2	834	1.1	3.3	1.3	3.4	953	0.835
2928.3	0.228	15	0.252	1.9	685	1.2	3.3	0.460	3.0	784	0.902
2929.3	0.228	17	0.412	1.5	808	1.5	3.3	0.752	2.2	924	1.1
2930.2	0.228	20	0.538	1.6	776	1.0	3.3	0.980	2.5	887	0.745
2931.1	0.228	14	0.439	3.5	606	1.2	3.3	0.800	5.3	693	0.891
2932.0	0.228	18	0.304	1.9	819	1.6	3.3	0.555	2.9	937	1.2
2933.0	0.266	14	0.389	1.7	749	1.3	3.8	0.710	2.6	856	0.970
2933.9	0.228	15	0.183	1.6	707	0.822	3.3	0.335	2.5	808	0.600
2934.8	0.324	14	0.289	2.3	656	0.809	4.7	0.527	3.5	750	0.590
2935.7	0.228	16	0.686	1.5	759	1.2	3.3	1.3	2.3	868	0.869
2936.7	0.228	14	0.183	2.7	700	0.356	3.3	0.335	4.1	800	0.260
2937.6	0.228	12	0.257	1.5	651	0.797	3.3	0.468	2.2	744	0.582
2938.5	0.291	16	0.264	2.0	784	1.9	4.2	0.481	3.0	897	1.4
2939.4	0.228	17	0.345	2.5	763	1.4	3.3	0.630	3.8	873	1.0
2940.4	0.228	14	0.585	2.3	725	0.901	3.3	1.1	3.6	829	0.657
2941.3	0.389	16	0.258	1.8	686	1.1	5.6	0.470	2.8	784	0.838
2942.2	0.228	14	0.269	1.5	718	0.939	3.3	0.491	2.2	821	0.685
2943.1	0.228	15	0.256	1.5	777	0.764	3.3	0.467	2.2	889	0.557
2944.1	0.228	15	0.394	1.5	814	0.656	3.3	0.719	2.2	931	0.479
2945.0	0.228	12	0.269	1.5	829	1.7	3.3	0.490	2.2	948	1.2
2945.9	0.228	11	0.238	1.5	603	0.571	3.3	0.434	2.2	689	0.416
2946.8	0.228	14	0.183	1.5	778	0.618	3.3	0.335	2.2	889	0.451
2947.7	0.305	17	0.412	1.5	774	0.546	4.4	0.751	2.2	885	0.398
2948.7	0.228	11	0.183	1.5	649	1.3	3.3	0.335	2.2	742	0.970
2949.6	0.228	15	0.427	1.7	832	1.6	3.3	0.779	2.6	951	1.2
2950.5	0.228	14	0.183	1.5	672	1.1	3.3	0.335	2.2	768	0.796
2951.4	0.228	14	0.403	2.0	786	0.943	3.3	0.735	3.1	898	0.688
2952.4	0.228	9.9	0.362	1.5	711	0.724	3.3	0.659	2.2	813	0.528
2953.3	0.228	11	0.355	1.5	749	1.0	3.3	0.647	2.2	856	0.756
2954.2	0.228	12	0.183	1.5	802	0.755	3.3	0.335	2.2	917	0.551
2955.1	0.228	11	0.183	1.5	640	1.4	3.3	0.335	2.2	732	1.0
2956.1	0.228	12	0.280	1.5	643	0.618	3.3	0.511	2.2	736	0.451
2957.0	0.228	11	0.183	1.5	845	0.737	3.3	0.335	2.2	966	0.538
2957.9	0.228	9.2	0.290	1.5	730	1.0	3.3	0.529	2.2	834	0.764
2958.8	0.228	11	0.299	1.5	749	0.716	3.3	0.545	2.2	857	0.522
2959.8	0.228	13	0.183	1.6	767	1.2	3.3	0.335	2.4	877	0.896
2960.7	0.228	14	0.268	1.5	798	0.665	3.3	0.489	2.2	913	0.485
2961.6	0.228	13	0.183	1.5	620	0.473	3.3	0.335	2.2	709	0.345
2962.5	0.382	14	0.183	1.5	873	0.815	5.5	0.335	2.2	998	0.595
2963.5	0.228	12	0.183	1.5	710	0.761	3.3	0.335	2.2	812	0.555
2964.4	0.282	12	0.318	1.5	651	1.1	4.1	0.581	2.2	745	0.839
2965.3	0.228	11	0.225	1.5	684	1.4	3.3	0.411	2.2	782	1.0
2966.2	0.228	12	0.404	1.7	786	1.2	3.3	0.737	2.6	899	0.890
2967.2	0.228	9.9	0.183	1.5	615	2.1	3.3	0.335	2.2	703	1.5
2968.1	0.327	13	0.263	1.5	683	0.699	4.7	0.480	2.2	781	0.510
2969.0	0.228	13	0.183	1.5	888	0.530	3.3	0.335	2.2	1015	0.387
2969.9	9.4	1899	71	126	849	7.6	136	130	193	971	5.5
2970.8	13	1204	7.4	174	773	321	188	13	266	884	234
2971.8	9.7	7.5	0.183	1.5	451	0.155	141	0.335	2.2	516	0.113
2972.7	0.299	14	0.183	1.5	769	3.0	4.3	0.335	2.2	879	2.2
2973.6	0.228	16	0.273	1.5	966	0.358	3.3	0.499	2.2	1104	0.261
2974.5	0.228	6.3	0.183	1.5	430	0.585	3.3	0.335	2.2	492	0.427
2975.5	0.228	10	0.183	1.5	774	1.1	3.3	0.335	2.2	886	0.816
2976.4	0.228	18	0.183	1.5	1077	1.3	3.3	0.335	2.2	1232	0.913
2977.3	0.766	10	0.242	1.5	630	1.8	11	0.441	2.2	720	1.3
2978.2	0.228	8.2	0.183	1.5	636	1.3	3.3	0.335	2.2	727	0.982
2979.2	0.228	17	0.183	1.5	708	0.795	3.3	0.335	2.2	810	0.580
2980.1	0.922	13	0.183	1.7	611	2.0	13	0.335	2.6	699	1.5
2981.0	0.228	7.1	0.183	1.5	546	0.831	3.3	0.335	2.2	625	0.606
2981.9	0.228	12	0.183	1.5	703	0.544	3.3	0.335	2.2	804	0.397
2982.9	0.228	9.2	0.183	1.5	745	0.936	3.3	0.335	2.2	852	0.683
2983.8	0.233	6.9	0.183	1.5	425	1.1	3.4	0.335	2.2	486	0.794
2984.7	0.228	12	0.183	1.5	561	1.7	3.3	0.335	2.2	642	1.3
2985.6	0.228	18	0.183	1.5	888	1.1	3.3	0.335	2.2	1016	0.821
2986.6	0.228	9.9	0.183	1.5	569	0.113	3.3	0.335	2.2	650	0.082
2987.5	0.322	9.6	0.183	1.5	614	1.2	4.6	0.335	2.2	702	0.841
2988.4	0.228	11	0.183	1.5	678	1.5	3.3	0.335	2.2	776	1.1
2989.3	0.228	8.0	0.235	1.8	545	0.624	3.3	0.429	2.8	623	0.456
2990.3	0.228	9.7	0.183	1.8	473	0.586	3.3	0.335	2.7	540	0.428
2991.2	0.512	14	0.183	1.6	532	0.899	7.4	0.335	2.5	609	0.656
2992.1	0.555	15	0.211	1.5	1008	0.410	8.0	0.385	2.2	1153	0.299
2993.0	0.228	8.9	0.183	1.5	532	0.402	3.3	0.335	2.2	608	0.293
2994.0	0.530	13	0.266	1.5	598	0.660	7.6	0.486	2.2	683	0.482



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2994.9	0.228	13	0.183	1.5	605	0.593	3.3	0.335	2.2	692	0.432
2995.8	0.228	9.6	0.183	1.5	442	0.878	3.3	0.335	2.2	506	0.641
2996.7	0.228	14	0.183	1.5	525	1.2	3.3	0.335	2.2	600	0.874
2997.6	0.228	18	0.183	1.5	948	1.1	3.3	0.335	2.2	1084	0.808
2998.6	0.228	11	0.183	1.5	413	1.0	3.3	0.335	2.2	473	0.751
2999.5	0.335	11	0.183	1.5	467	0.473	4.8	0.335	2.3	534	0.345
3000.4	0.334	14	0.183	1.5	567	0.599	4.8	0.335	2.2	649	0.437
3001.3	0.228	12	0.183	1.5	520	1.2	3.3	0.335	2.2	595	0.886
3002.3	0.228	10	0.183	1.5	448	0.346	3.3	0.335	2.2	512	0.253
3003.2	0.228	14	0.183	1.6	530	0.808	3.3	0.335	2.4	606	0.590
3004.1	0.228	13	0.183	1.5	597	1.5	3.3	0.335	2.2	683	1.1
3005.0	0.228	10	0.183	1.5	343	0.352	3.3	0.335	2.2	392	0.257
3006.0	0.228	13	0.183	1.5	453	0.905	3.3	0.335	2.2	517	0.660
3006.9	0.228	15	0.183	1.5	777	0.229	3.3	0.335	2.2	888	0.167
3007.8	0.582	12	0.183	1.5	396	0.761	8.4	0.335	2.2	453	0.555
3008.7	0.228	12	0.216	1.5	425	0.858	3.3	0.394	2.2	486	0.626
3009.7	0.228	23	0.183	1.8	416	0.486	3.3	0.335	2.8	475	0.354
3010.6	0.228	11	0.183	1.5	502	0.555	3.3	0.335	2.2	574	0.405
3011.5	0.228	8.4	0.183	1.5	313	0.503	3.3	0.335	2.2	358	0.367
3012.4	0.228	17	0.183	1.5	438	0.937	3.3	0.335	2.2	500	0.684
3013.4	0.228	14	0.183	1.5	569	0.271	3.3	0.335	2.2	651	0.197
3014.3	0.228	6.8	0.183	1.5	279	0.444	3.3	0.335	2.2	319	0.324
3015.2	0.228	11	0.266	1.5	559	0.525	3.3	0.486	2.2	639	0.383
3016.1	0.228	19	0.357	1.5	666	0.231	3.3	0.651	2.2	761	0.169
3017.1	0.228	9.2	0.313	3.0	353	0.627	3.3	0.571	4.7	404	0.458
3018.0	0.228	11	0.385	2.3	437	0.698	3.3	0.702	3.5	499	0.509
3018.9	0.228	16	0.183	1.5	689	1.3	3.3	0.335	2.2	788	0.977
3019.8	0.398	11	0.264	1.5	391	0.820	5.7	0.481	2.2	447	0.598
3020.8	0.271	12	0.183	1.5	471	0.610	3.9	0.335	2.2	538	0.445
3021.7	0.685	16	0.183	1.5	630	1.2	9.9	0.335	2.2	720	0.872
3022.6	0.228	12	0.266	1.6	414	0.945	3.3	0.485	2.5	473	0.690
3023.5	0.298	8.7	0.501	1.5	416	0.529	4.3	0.913	2.2	476	0.386
3024.4	0.624	13	0.608	1.6	547	0.677	9.0	1.1	2.4	625	0.494
3025.4	0.313	15	0.183	1.5	742	0.704	4.5	0.335	2.2	849	0.514
3026.3	0.228	7.0	0.239	1.5	281	0.345	3.3	0.436	2.2	321	0.252
3027.2	0.431	11	0.192	1.5	441	0.503	6.2	0.351	2.2	504	0.367
3028.1	0.288	23	0.183	1.5	705	1.0	4.2	0.335	2.2	806	0.762
3029.1	0.228	8.9	0.454	1.5	413	0.506	3.3	0.828	2.2	472	0.369
3030.0	0.277	10.0	0.467	1.5	463	1.0	4.0	0.851	2.2	529	0.732
3030.9	0.790	15	0.183	1.5	706	0.681	11	0.335	2.2	807	0.497
3031.8	0.240	8.7	0.245	1.5	439	1.1	3.5	0.446	2.2	502	0.795
3032.8	0.228	7.2	0.183	1.5	363	0.448	3.3	0.335	2.2	415	0.327
3033.7	0.228	12	0.337	1.5	594	0.535	3.3	0.616	2.2	679	0.390
3034.6	0.228	13	0.183	1.5	908	1.1	3.3	0.335	2.2	1038	0.771
3035.5	0.228	9.5	0.183	1.5	533	0.747	3.3	0.335	2.2	610	0.545
3036.5	0.228	13	0.183	1.6	579	0.764	3.3	0.335	2.5	663	0.557
3037.4	0.303	17	0.242	1.5	896	0.265	4.4	0.441	2.2	1024	0.194
3038.3	0.390	11	0.183	1.5	472	1.4	5.6	0.335	2.2	540	1.0
3039.2	0.384	12	0.309	1.7	585	0.821	5.6	0.564	2.7	669	0.599
3040.2	0.228	16	0.421	1.5	797	1.3	3.3	0.767	2.2	912	0.926
3041.1	0.597	11	0.183	1.8	671	1.0	8.6	0.335	2.8	767	0.762
3042.0	0.228	17	0.404	1.5	660	1.5	3.3	0.737	2.2	755	1.1
3042.9	0.488	13	0.396	1.5	735	0.237	7.0	0.722	2.2	841	0.173
3043.9	0.484	13	0.214	1.7	825	0.727	7.0	0.390	2.6	943	0.530
3044.8	0.254	8.2	0.449	1.5	722	1.1	3.7	0.819	2.2	826	0.798
3045.7	1.2	15	0.312	1.5	1039	2.4	17	0.569	2.2	1189	1.7
3046.6	0.901	17	0.324	1.5	1350	1.7	13	0.590	2.2	1544	1.2
3047.5	0.564	11	0.484	1.5	763	1.6	8.1	0.883	2.2	873	1.1
3048.5	1.3	13	0.586	1.5	934	0.560	19	1.1	2.2	1068	0.409
3049.4	0.946	16	1.1	2.8	1162	1.8	14	2.0	4.2	1328	1.3
3050.3	1.2	13	0.546	3.0	1055	2.3	17	0.996	4.6	1206	1.7
3051.2	1.6	10	1.2	2.0	1076	2.0	24	2.1	3.1	1230	1.5
3052.2	1.2	16	0.499	2.6	1408	2.3	18	0.911	4.0	1610	1.7
3053.1	1.1	11	0.721	2.4	1339	2.1	15	1.3	3.6	1531	1.5
3054.0	1.0	8.0	0.793	1.5	714	1.5	14	1.4	2.2	816	1.1
3054.9	2.4	13	0.505	1.5	1202	1.4	35	0.922	2.2	1375	1.1
3055.9	1.6	14	0.911	1.5	1534	1.9	23	1.7	2.2	1754	1.4
3056.8	1.6	13	0.959	1.8	1177	1.2	23	1.7	2.7	1346	0.862
3057.7	0.809	18	1.1	3.4	1579	2.3	12	2.0	5.2	1806	1.6
3058.6	1.5	18	0.603	2.8	1673	2.0	22	1.1	4.3	1913	1.4
3059.6	1.4	12	0.552	1.6	1313	1.4	20	1.0	2.4	1502	1.0
3060.5	0.950	15	0.747	4.8	1443	1.4	14	1.4	7.4	1651	1.0
3061.4	0.740	15	0.856	2.4	1640	0.898	11	1.6	3.6	1875	0.655
3062.3	0.830	13	0.797	2.6	1312	1.1	12	1.5	4.0	1501	0.786
3063.3	0.672	10	0.693	1.5	972	2.2	9.7	1.3	2.2	1112	1.6
3064.2	0.266	17	0.891	3.2	1544	0.598	3.8	1.6	4.9	1766	0.436
3065.1	0.275	19	0.555	1.5	1599	2.0	4.0	1.0	2.2	1828	1.5
3066.0	0.327	15	0.692	2.2	1261	1.3	4.7	1.3	3.3	1442	0.940
3067.0	0.472	16	0.382	2.6	1399	1.1	6.8	0.696	3.9	1599	0.813
3067.9	0.228	18	0.833	2.2	1711	0.943	3.3	1.5	3.3	1956	0.688
3068.8	0.434	12	0.619	3.2	993	1.4	6.3	1.1	4.8	1135	1.0



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
3069.7	0.228	13	0.761	2.6	1193	0.913	3.3	1.4	4.0	1365	0.666
3070.6	0.228	17	0.560	2.0	1150	1.1	3.3	1.0	3.1	1315	0.826
3071.6	0.228	14	0.265	3.0	1160	1.3	3.3	0.484	4.6	1326	0.950
3072.5	0.228	14	0.693	1.8	952	2.6	3.3	1.3	2.8	1089	1.9
3073.4	0.228	18	0.615	1.9	1411	1.4	3.3	1.1	2.9	1613	1.0
3074.3	0.252	17	0.902	2.6	1102	1.0	3.6	1.6	4.1	1260	0.752
3075.3	0.566	13	0.414	2.7	688	0.488	8.2	0.755	4.2	787	0.356
3076.2	0.931	18	0.466	2.3	980	0.666	13	0.850	3.6	1120	0.486
3077.1	0.555	16	0.689	1.9	1013	0.974	8.0	1.3	3.0	1159	0.711
3078.0	0.271	9.7	0.183	1.7	565	0.676	3.9	0.335	2.6	646	0.493
3079.0	0.228	16	0.953	2.9	942	1.1	3.3	1.7	4.5	1077	0.778
3079.9	0.228	18	0.222	3.4	1124	0.627	3.3	0.405	5.1	1285	0.457
3080.8	0.325	12	0.375	1.7	685	1.0	4.7	0.683	2.7	783	0.762
3081.7	0.228	13	0.935	1.5	810	1.4	3.3	1.7	2.2	926	1.0
3082.7	0.468	17	0.547	2.4	887	1.2	6.8	0.997	3.7	1014	0.907
3083.6	0.228	13	0.560	1.5	898	0.497	3.3	1.0	2.2	1027	0.362
3084.5	0.228	11	0.371	2.1	670	0.697	3.3	0.677	3.2	766	0.509
3085.4	0.277	19	0.436	1.5	908	1.0	4.0	0.796	2.2	1038	0.733
3086.4	0.228	13	0.183	1.7	760	1.5	3.3	0.335	2.6	870	1.1
3087.3	0.274	7.7	0.292	2.6	581	0.980	4.0	0.532	4.0	665	0.715
3088.2	0.469	13	0.277	1.9	772	0.686	6.8	0.505	2.9	883	0.501
3089.1	0.228	20	0.305	1.5	816	1.5	3.3	0.557	2.2	933	1.1
3090.1	0.228	9.7	0.251	4.4	663	1.1	3.3	0.458	6.7	758	0.816
3091.0	0.433	12	0.191	1.6	688	1.1	6.3	0.349	2.5	787	0.796
3091.9	0.375	13	0.498	2.3	833	1.2	5.4	0.908	3.5	953	0.880
3092.8	0.242	11	0.183	1.5	671	0.322	3.5	0.335	2.2	768	0.235
3093.8	0.228	8.5	0.291	1.5	519	0.538	3.3	0.530	2.2	593	0.393
3094.7	0.309	14	0.280	1.9	772	0.553	4.5	0.511	3.0	883	0.404
3095.6	0.228	14	0.414	1.5	760	2.0	3.3	0.755	2.2	869	1.4
3096.5	0.228	11	0.183	2.3	630	0.323	3.3	0.335	3.5	721	0.236
3097.4	0.932	13	0.582	1.5	778	0.729	13	1.1	2.2	890	0.532
3098.4	0.458	11	0.428	1.5	664	1.0	6.6	0.781	2.2	759	0.756
3099.3	0.293	14	0.183	2.5	634	1.6	4.2	0.335	3.8	725	1.2
3100.2	0.608	11	0.183	2.8	726	0.525	8.8	0.335	4.2	830	0.383
3101.1	0.862	15	0.183	1.5	897	1.2	12	0.335	2.2	1026	0.907
3102.1	0.790	12	0.228	1.5	618	1.3	11	0.416	2.2	706	0.916
3103.0	0.228	12	0.491	1.6	818	0.815	3.3	0.896	2.5	935	0.595
3103.9	0.971	13	0.183	1.5	762	1.4	14	0.335	2.2	871	1.0
3104.8	0.844	11	0.303	1.7	750	1.6	12	0.553	2.6	857	1.2
3105.8	0.894	13	0.544	2.2	662	0.992	13	0.993	3.3	757	0.724
3106.7	1.2	15	0.434	1.5	721	0.697	18	0.792	2.2	824	0.509
3107.6	0.938	14	0.183	1.7	925	1.5	14	0.335	2.6	1058	1.1
3108.5	0.761	12	0.387	2.4	658	0.837	11	0.705	3.6	752	0.611
3109.5	1.3	12	0.183	1.5	782	1.6	19	0.335	2.2	894	1.2
3110.4	2.1	13	0.183	1.5	956	1.9	31	0.335	2.2	1094	1.4
3111.3	1.4	12	0.453	2.5	689	1.6	20	0.827	3.8	788	1.1
3112.2	1.9	11	0.309	2.4	769	2.3	28	0.563	3.7	879	1.7
3113.2	2.5	17	0.438	3.0	1074	1.9	36	0.799	4.6	1228	1.4
3114.1	1.7	13	0.494	2.6	937	1.9	25	0.902	4.0	1071	1.4
3115.0	2.7	10	0.183	1.5	847	1.9	39	0.335	2.2	968	1.4
3115.9	3.3	17	0.904	3.9	1259	1.3	47	1.6	6.0	1440	0.963
3116.9	2.0	16	0.602	2.4	1336	2.0	29	1.1	3.7	1527	1.4
3117.8	1.8	12	0.837	2.3	845	1.4	26	1.5	3.6	967	1.0
3118.7	2.7	16	0.673	2.7	1308	2.6	39	1.2	4.1	1496	1.9
3119.6	3.1	18	0.727	4.3	1537	1.9	44	1.3	6.6	1758	1.4
3120.5	1.4	12	0.435	1.9	1001	1.8	20	0.794	2.9	1144	1.3
3121.5	1.7	17	0.906	4.3	1400	1.3	25	1.7	6.5	1601	0.926
3122.4	1.5	17	0.589	2.3	1480	2.4	22	1.1	3.6	1693	1.8
3123.3	2.0	13	0.881	2.5	1156	0.805	29	1.6	3.9	1322	0.587
3124.2	1.7	11	0.629	3.2	1075	1.5	25	1.1	4.9	1229	1.1
3125.2	1.8	18	0.790	2.7	1610	1.4	26	1.4	4.1	1841	1.0
3126.1	1.2	16	1.0	1.5	1582	3.3	17	1.9	2.2	1809	2.4
3127.0	1.0	14	0.857	3.4	1206	1.8	15	1.6	5.3	1379	1.3
3127.9	1.2	18	0.785	4.5	1708	1.6	17	1.4	6.8	1953	1.2
3128.9	1.2	19	0.781	3.5	1585	1.1	18	1.4	5.4	1813	0.771
3129.8	0.642	14	0.949	3.9	1366	1.9	9.3	1.7	6.0	1562	1.4
3130.7	0.969	20	0.725	4.0	1632	1.3	14	1.3	6.2	1867	0.918
3131.6	0.909	18	0.778	5.3	1585	1.7	13	1.4	8.1	1813	1.3
3132.6	1.3	15	0.729	1.7	1632	1.9	19	1.3	2.6	1866	1.4
3133.5	0.340	19	0.869	3.5	1483	3.4	4.9	1.6	5.4	1696	2.5
3134.4	0.922	22	0.275	3.7	1596	1.7	13	0.502	5.6	1825	1.3
3135.3	0.273	17	0.793	4.0	1449	2.2	3.9	1.4	6.1	1657	1.6
3136.3	0.541	19	0.469	3.3	1376	1.4	7.8	0.855	5.0	1573	1.0
3137.2	0.357	20	0.568	4.1	1561	1.7	5.2	1.0	6.3	1785	1.2
3138.1	1.0	22	0.593	1.8	1553	1.3	15	1.1	2.8	1776	0.965
3139.0	0.228	20	0.830	2.5	1215	2.3	3.3	1.5	3.8	1389	1.7
3140.0	0.228	22	0.575	2.7	1401	1.1	3.3	1.0	4.1	1602	0.804
3140.9	0.228	20	0.450	2.9	1261	1.5	3.3	0.820	4.5	1442	1.1
3141.8	0.228	22	0.183	3.5	1136	2.3	3.3	0.335	5.4	1300	1.7
3142.7	0.228	22	0.349	2.8	1120	1.8	3.3	0.637	4.4	1280	1.3
3143.6	0.433	24	0.788	3.7	1301	1.9	6.3	1.4	5.7	1487	1.4



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
3144.6	0.838	19	0.232	3.4	1175	1.9	12	0.423	5.1	1343	1.4
3145.5	0.738	19	0.404	4.0	938	1.0	11	0.736	6.2	1073	0.763
3146.4	0.228	22	0.293	4.2	1203	1.3	3.3	0.535	6.5	1376	0.963
3147.3	0.277	17	0.183	1.7	1102	1.9	4.0	0.335	2.7	1261	1.4
3148.3	0.228	17	0.273	3.0	1064	1.3	3.3	0.498	4.5	1217	0.978
3149.2	0.645	19	0.771	1.9	1100	0.747	9.3	1.4	2.9	1258	0.545
3150.1	0.228	26	0.414	4.1	1143	0.777	3.3	0.755	6.3	1307	0.567
3151.0	0.228	14	0.375	3.3	823	1.2	3.3	0.684	5.0	941	0.900
3152.0	0.228	20	0.513	3.4	925	0.605	3.3	0.936	5.2	1057	0.442
3152.9	0.228	15	0.183	2.1	1004	0.842	3.3	0.335	3.2	1148	0.614
3153.8	0.228	15	0.183	2.2	853	0.871	3.3	0.335	3.3	976	0.636
3154.7	0.371	14	0.273	1.5	778	1.4	5.3	0.497	2.3	889	1.0
3155.7	0.228	15	0.464	2.6	1116	1.1	3.3	0.847	4.0	1276	0.780
3156.6	0.296	16	0.212	2.2	733	1.1	4.3	0.386	3.4	838	0.773
3157.5	0.427	11	0.241	2.6	669	0.424	6.2	0.440	4.0	765	0.309
3158.4	0.228	13	0.183	1.5	821	1.2	3.3	0.335	2.2	939	0.848
3159.4	0.228	12	0.187	1.8	936	0.960	3.3	0.342	2.8	1070	0.700
3160.3	0.228	11	0.183	2.3	606	0.842	3.3	0.335	3.5	693	0.614
3161.2	0.228	14	0.254	1.6	804	1.6	3.3	0.464	2.4	919	1.2
3162.1	0.228	16	0.183	1.8	884	0.725	3.3	0.335	2.8	1010	0.529
3163.1	0.228	11	0.183	1.5	647	0.686	3.3	0.335	2.3	740	0.500
3164.0	0.228	15	0.183	1.5	916	0.963	3.3	0.335	2.2	1047	0.702
3164.9	0.228	15	0.199	1.5	1442	0.919	3.3	0.363	2.2	1650	0.670
3165.8	0.228	13	0.273	2.2	776	0.847	3.3	0.497	3.4	887	0.618
3166.8	0.228	14	0.183	1.5	718	0.752	3.3	0.335	2.2	821	0.548
3167.7	0.228	19	0.240	1.5	906	0.263	3.3	0.437	2.2	1036	0.192
3168.6	0.228	14	0.183	1.5	798	0.590	3.3	0.335	2.2	913	0.430
3169.5	0.228	12	0.183	2.2	778	0.658	3.3	0.335	3.3	890	0.480
3170.4	0.716	15	0.183	1.5	906	0.968	10	0.335	2.2	1036	0.707
3171.4	0.228	19	0.183	1.5	766	0.622	3.3	0.335	2.2	876	0.453
3172.3	0.228	15	0.448	2.1	742	1.2	3.3	0.817	3.2	849	0.847
3173.2	0.228	16	0.199	1.7	761	1.3	3.3	0.362	2.5	871	0.959
3174.1	0.228	15	0.183	2.2	675	0.220	3.3	0.335	3.4	772	0.161
3175.1	0.228	14	0.183	1.5	656	1.2	3.3	0.335	2.2	750	0.902
3176.0	0.228	15	0.183	1.8	889	1.9	3.3	0.335	2.7	1017	1.4
3176.9	0.228	20	0.320	1.5	701	0.691	3.3	0.583	2.2	801	0.504
3177.8	0.326	14	0.262	1.5	720	1.3	4.7	0.477	2.2	823	0.936
3178.8	0.228	11	0.183	2.1	619	0.600	3.3	0.335	3.2	707	0.438
3179.7	0.228	18	0.215	2.6	874	1.6	3.3	0.392	4.0	1000	1.1
3180.6	0.288	18	0.198	1.5	1167	0.781	4.2	0.361	2.2	1334	0.570
3181.5	0.265	13	0.183	1.5	699	1.3	3.8	0.335	2.2	799	0.973
3182.5	0.228	16	0.321	2.1	696	1.4	3.3	0.585	3.2	796	1.0
3183.4	0.228	21	0.183	1.7	929	1.3	3.3	0.335	2.5	1063	0.968
3184.3	0.228	17	0.183	1.9	775	0.625	3.3	0.335	2.9	886	0.456
3185.2	0.484	15	0.333	1.5	801	0.727	7.0	0.607	2.2	916	0.530
3186.2	0.228	15	0.183	1.5	1195	1.6	3.3	0.335	2.2	1367	1.2
3187.1	0.228	13	0.334	1.8	802	1.3	3.3	0.609	2.8	917	0.983
3188.0	0.309	15	0.356	2.3	701	1.3	4.5	0.650	3.5	801	0.970
3188.9	0.611	16	0.183	2.9	901	1.9	8.8	0.335	4.5	1030	1.4
3189.9	0.228	15	0.183	1.7	857	1.1	3.3	0.335	2.7	980	0.827
3190.8	0.228	15	0.207	2.0	748	0.929	3.3	0.377	3.1	856	0.678
3191.7	0.228	15	0.415	1.8	806	0.594	3.3	0.758	2.7	922	0.433
3192.6	0.369	19	0.183	3.0	1071	1.6	5.3	0.335	4.6	1225	1.2
3193.6	0.228	13	0.401	2.7	688	1.2	3.3	0.732	4.1	787	0.889
3194.5	0.228	17	0.379	1.5	719	0.938	3.3	0.690	2.2	822	0.684
3195.4	0.228	16	0.467	1.9	852	1.1	3.3	0.852	2.9	975	0.825
3196.3	0.228	13	0.384	1.5	822	0.769	3.3	0.701	2.3	940	0.561
3197.2	0.297	17	0.237	1.5	926	2.2	4.3	0.431	2.2	1059	1.6
3198.2	0.373	17	0.332	2.0	932	0.795	5.4	0.606	3.1	1066	0.580
3199.1	0.228	15	0.183	2.1	809	0.862	3.3	0.335	3.2	925	0.629
3200.0	0.531	14	0.204	1.7	685	1.3	7.7	0.372	2.7	784	0.935
3200.9	0.297	15	0.183	2.5	1011	1.2	4.3	0.335	3.8	1156	0.885
3201.9	0.228	16	0.183	1.7	928	0.685	3.3	0.335	2.6	1061	0.500
3202.8	0.269	10	0.276	1.6	515	1.1	3.9	0.503	2.5	589	0.814
3203.7	0.228	15	0.446	1.5	702	0.663	3.3	0.813	2.2	802	0.484
3204.6	0.228	17	0.381	1.8	864	1.7	3.3	0.695	2.7	988	1.2
3205.6	0.228	11	0.183	2.4	685	0.683	3.3	0.335	3.6	783	0.499
3206.5	0.245	16	0.304	3.7	690	0.664	3.5	0.555	5.7	790	0.484
3207.4	0.228	19	0.231	2.3	858	0.919	3.3	0.422	3.5	981	0.671
3208.3	0.453	14	0.183	2.2	815	1.1	6.5	0.335	3.4	932	0.832
3209.3	0.228	13	0.183	1.7	695	1.2	3.3	0.335	2.7	795	0.881
3210.2	0.228	20	0.459	1.5	845	1.2	3.3	0.837	2.2	966	0.868
3211.1	0.228	17	0.183	1.6	848	0.987	3.3	0.335	2.4	969	0.720
3212.0	0.228	14	0.232	2.9	711	0.692	3.3	0.423	4.5	813	0.505
3213.0	0.377	14	0.270	3.1	890	1.8	5.4	0.492	4.8	1018	1.3
3213.9	0.228	20	0.183	3.8	957	1.3	3.3	0.335	5.8	1095	0.975
3214.8	0.431	18	0.296	3.1	718	0.755	6.2	0.540	4.8	821	0.551
3215.7	0.228	15	0.251	3.7	730	1.1	3.3	0.457	5.7	835	0.815
3216.7	0.496	20	0.249	2.0	893	1.1	7.2	0.455	3.1	1021	0.818
3217.6	0.228	13	0.183	2.7	661	0.862	3.3	0.335	4.2	755	0.629
3218.5	0.228	16	0.208	2.0	697	1.2	3.3	0.379	3.1	796	0.864



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
3219.4	0.228	19	0.183	2.9	719	0.559	3.3	0.335	4.4	822	0.408
3220.4	0.245	15	0.223	1.5	741	1.5	3.5	0.406	2.2	847	1.1
3221.3	0.228	13	0.183	2.9	484	0.548	3.3	0.335	4.4	554	0.400
3222.2	0.228	18	0.183	3.4	814	1.1	3.3	0.335	5.2	931	0.788
3223.1	0.228	17	0.263	2.6	870	0.652	3.3	0.480	3.9	995	0.475
3224.0	0.228	15	0.238	2.3	580	0.846	3.3	0.434	3.6	663	0.617
3225.0	0.417	17	0.547	3.4	740	1.4	6.0	0.998	5.2	847	0.989
3225.9	0.228	24	0.183	4.1	1091	0.829	3.3	0.335	6.3	1247	0.605
3226.8	0.228	15	0.200	3.9	771	0.678	3.3	0.364	6.0	882	0.495
3227.7	0.228	16	0.499	1.8	650	0.469	3.3	0.910	2.7	744	0.342
3228.7	0.228	19	0.183	5.2	904	1.9	3.3	0.335	7.9	1034	1.4
3229.6	0.228	17	0.183	2.4	714	1.4	3.3	0.335	3.6	817	1.1
3230.5	0.228	13	0.183	1.9	522	0.888	3.3	0.335	3.0	597	0.648
3231.4	0.784	19	0.217	2.1	730	0.987	11	0.396	3.3	835	0.720
3232.4	0.228	16	0.183	2.5	753	0.812	3.3	0.335	3.8	861	0.592
3233.3	0.257	13	0.183	2.6	589	0.933	3.7	0.335	3.9	673	0.681
3234.2	0.750	17	0.183	2.7	757	0.515	11	0.335	4.2	866	0.376
3235.1	0.228	17	0.183	1.5	916	0.535	3.3	0.335	2.2	1048	0.390
3236.1	0.228	13	0.305	3.6	668	0.892	3.3	0.557	5.5	764	0.651
3237.0	0.228	13	0.349	2.4	591	0.428	3.3	0.637	3.6	675	0.312
3237.9	0.228	17	0.183	2.4	794	0.742	3.3	0.335	3.7	908	0.542
3238.8	0.228	12	0.341	2.0	638	1.0	3.3	0.623	3.0	730	0.752
3239.8	0.228	11	0.240	2.7	506	1.3	3.3	0.437	4.1	578	0.915
3240.7	0.504	18	0.471	2.2	869	0.373	7.3	0.859	3.4	994	0.272
3241.6	0.228	17	0.183	2.9	770	0.676	3.3	0.335	4.4	880	0.493
3242.5	0.228	15	0.183	2.2	557	1.5	3.3	0.335	3.4	637	1.1
3243.5	0.228	15	0.417	2.2	678	0.249	3.3	0.761	3.4	775	0.182
3244.4	0.366	14	0.183	2.6	775	0.517	5.3	0.335	3.9	886	0.378
3245.3	0.507	11	0.183	3.5	610	0.662	7.3	0.335	5.3	697	0.483
3246.2	0.228	11	0.409	2.2	610	0.880	3.3	0.747	3.3	697	0.642
3247.2	0.228	17	0.183	1.5	645	0.974	3.3	0.335	2.3	737	0.710
3248.1	0.228	12	0.183	2.8	539	0.633	3.3	0.335	4.3	616	0.462
3249.0	0.228	12	0.183	1.8	501	1.2	3.3	0.335	2.8	573	0.901
3249.9	0.228	18	0.183	2.8	667	0.640	3.3	0.335	4.3	763	0.467
3250.8	0.228	14	0.183	2.8	619	0.763	3.3	0.335	4.3	707	0.556
3251.8	0.228	13	0.227	2.5	590	0.905	3.3	0.413	3.8	675	0.660
3252.7	0.228	14	0.265	1.5	618	1.1	3.3	0.482	2.2	707	0.770
3253.6	0.228	17	0.253	3.7	815	0.568	3.3	0.461	5.6	932	0.415
3254.5	0.228	11	0.183	1.5	480	0.569	3.3	0.335	2.2	549	0.415
3255.5	0.228	14	0.280	1.5	700	0.834	3.3	0.510	2.2	801	0.609
3256.4	0.228	15	0.183	2.5	1101	0.230	3.3	0.335	3.8	1259	0.168
3257.3	0.228	13	0.183	2.7	613	0.929	3.3	0.335	4.1	701	0.678
3258.2	0.682	14	0.183	2.7	563	0.827	9.8	0.335	4.2	644	0.604
3259.2	0.273	16	0.183	1.5	852	1.4	3.9	0.335	2.2	974	0.996
3260.1	0.228	12	0.183	1.5	578	0.328	3.3	0.335	2.2	661	0.239
3261.0	0.228	10	0.255	1.5	491	0.715	3.3	0.465	2.2	562	0.521
3261.9	0.508	15	0.183	1.8	589	0.633	7.3	0.335	2.7	673	0.462
3262.9	0.228	17	0.183	1.5	626	1.0	3.3	0.335	2.2	715	0.755
3263.8	0.293	8.9	0.184	1.6	501	0.414	4.2	0.336	2.4	573	0.302
3264.7	0.307	10	0.211	1.5	536	0.692	4.4	0.385	2.2	613	0.505
3265.6	0.939	17	0.183	2.6	717	1.3	14	0.335	3.9	820	0.972
3266.6	0.228	10	0.183	1.5	385	0.378	3.3	0.335	2.2	440	0.276
3267.5	0.281	12	0.183	2.9	563	0.375	4.1	0.335	4.5	644	0.274
3268.4	0.228	15	0.183	1.5	638	0.727	3.3	0.335	2.2	729	0.530
3269.3	0.543	11	0.183	1.5	526	0.229	7.8	0.335	2.2	601	0.167
3270.3	0.228	10	0.183	1.5	472	0.495	3.3	0.335	2.2	539	0.361
3271.2	0.228	13	0.270	1.5	585	0.532	3.3	0.492	2.2	669	0.388
3272.1	0.228	13	0.280	1.5	610	0.552	3.3	0.510	2.2	698	0.403
3273.0	0.228	10	0.183	1.5	477	0.322	3.3	0.335	2.2	545	0.235
3273.9	0.291	15	0.183	1.5	611	0.388	4.2	0.335	2.2	699	0.283
3274.9	0.331	14	0.183	1.5	680	0.467	4.8	0.335	2.2	778	0.341
3275.8	0.228	9.3	0.183	1.5	368	0.339	3.3	0.335	2.2	421	0.247
3276.7	0.228	11	0.183	1.5	486	0.734	3.3	0.335	2.2	555	0.535
3277.6	0.228	17	0.183	1.5	777	0.625	3.3	0.335	2.2	889	0.456
3278.6	0.350	11	0.183	1.5	387	1.1	5.1	0.335	2.2	442	0.831
3279.5	0.228	11	0.183	1.5	507	1.2	3.3	0.335	2.2	580	0.860
3280.4	0.228	16	0.263	1.5	579	0.785	3.3	0.480	2.2	662	0.573
3281.3	0.228	9.7	0.242	1.5	502	0.355	3.3	0.441	2.2	574	0.259
3282.3	0.228	7.6	0.183	1.5	325	1.0	3.3	0.335	2.2	372	0.748
3283.2	0.228	15	0.183	1.5	535	0.788	3.3	0.335	2.2	612	0.575
3284.1	0.228	12	0.183	1.5	601	0.334	3.3	0.335	2.2	688	0.243
3285.0	0.228	5.8	0.183	1.5	244	0.621	3.3	0.335	2.2	279	0.453
3286.0	0.343	11	0.183	1.5	554	0.615	5.0	0.335	2.2	633	0.449
3286.9	0.234	15	0.183	1.5	710	0.280	3.4	0.335	2.2	811	0.204
3287.8	0.510	9.9	0.183	1.5	468	1.0	7.4	0.335	2.2	535	0.747
3288.7	0.615	14	0.355	1.5	495	0.952	8.9	0.648	2.2	566	0.695
3289.7	0.228	20	0.223	1.9	686	0.629	3.3	0.406	2.9	784	0.459
3290.6	0.228	8.7	0.183	1.5	459	0.698	3.3	0.335	2.2	525	0.509
3291.5	0.504	7.1	0.183	1.5	399	0.880	7.3	0.335	2.2	456	0.642
3292.4	0.228	12	0.205	1.5	654	1.1	3.3	0.374	2.2	748	0.790
3293.4	0.294	12	0.183	1.5	707	0.661	4.2	0.335	2.2	809	0.482



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
3294.3	0.228	7.5	0.183	1.5	383	0.807	3.3	0.335	2.2	438	0.589
3295.2	0.228	13	0.277	1.5	604	0.967	3.3	0.506	2.2	691	0.706
3296.1	0.228	16	0.259	1.5	785	0.806	3.3	0.473	2.2	898	0.588
3297.1	0.228	9.6	0.183	1.5	471	0.671	3.3	0.335	2.2	539	0.489
3298.0	0.228	10	0.273	1.5	610	1.4	3.3	0.498	2.2	697	0.996
3298.9	0.291	22	0.183	1.5	1109	0.920	4.2	0.335	2.2	1268	0.671
3299.8	0.316	9.9	0.282	2.2	639	1.6	4.6	0.514	3.4	730	1.2
3300.7	0.228	8.5	0.183	1.5	588	1.1	3.3	0.335	2.2	673	0.797
3301.7	0.269	16	0.183	1.5	834	0.729	3.9	0.335	2.2	954	0.532
3302.6	0.379	11	0.183	1.5	759	1.6	5.5	0.335	2.2	868	1.2
3303.5	0.228	5.8	0.183	1.5	487	1.2	3.3	0.335	2.2	557	0.850
3304.4	0.228	16	0.183	1.5	837	1.4	3.3	0.335	2.2	957	1.0
3305.4	0.228	13	0.183	1.5	1013	1.5	3.3	0.335	2.2	1158	1.1
3306.3	0.265	7.2	0.183	1.5	562	1.1	3.8	0.335	2.2	642	0.831
3307.2	0.522	10	0.183	1.5	913	1.1	7.5	0.335	2.2	1043	0.785
3308.1	0.235	11	0.183	1.5	1167	1.0	3.4	0.335	2.2	1335	0.741
3309.1	0.228	9.0	0.183	1.5	691	1.3	3.3	0.335	2.2	791	0.965
3310.0	0.228	9.9	0.192	1.5	764	1.7	3.3	0.350	2.2	874	1.2
3310.9	0.228	13	0.183	1.5	1078	1.1	3.3	0.335	2.2	1233	0.829
3311.8	0.610	9.0	0.266	1.5	892	2.4	8.8	0.484	2.2	1020	1.7
3312.8	0.306	9.2	0.183	1.5	633	1.4	4.4	0.335	2.2	724	1.1
3313.7	0.228	15	0.253	1.5	1001	1.9	3.3	0.462	2.2	1145	1.4
3314.6	0.355	11	0.285	1.5	1275	0.886	5.1	0.520	2.2	1458	0.647
3315.5	0.228	5.8	0.251	1.5	722	2.0	3.3	0.458	2.2	826	1.5
3316.5	0.351	13	0.436	1.5	1273	2.3	5.1	0.795	2.2	1456	1.7
3317.4	0.228	13	0.286	1.5	1287	1.6	3.3	0.522	2.2	1471	1.2
3318.3	0.228	9.8	0.212	1.5	802	2.1	3.3	0.387	2.2	917	1.5
3319.2	0.228	10	0.265	1.5	1048	2.8	3.3	0.483	2.2	1198	2.0
3320.2	0.228	15	0.183	1.5	1116	1.4	3.3	0.335	2.2	1276	0.985
3321.1	0.339	10	0.183	1.5	1123	1.7	4.9	0.335	2.2	1284	1.2
3322.0	0.228	11	0.214	1.5	875	1.1	3.3	0.390	2.2	1001	0.780
3322.9	0.228	13	0.253	1.5	1018	1.1	3.3	0.461	2.2	1164	0.829
3323.9	0.228	11	0.196	1.5	961	2.6	3.3	0.357	2.2	1099	1.9
3324.8	0.228	7.2	0.371	1.5	767	2.3	3.3	0.677	2.2	877	1.7
3325.7	0.228	14	0.545	1.5	1119	1.8	3.3	0.995	2.2	1280	1.3
3326.6	0.596	15	0.231	1.5	1280	1.5	8.6	0.422	2.2	1464	1.1
3327.5	0.228	8.0	0.183	1.5	700	2.5	3.3	0.335	2.2	801	1.8
3328.5	0.410	13	0.390	1.5	1255	3.0	5.9	0.711	2.2	1435	2.2
3329.4	0.228	18	0.183	1.5	1681	2.2	3.3	0.335	2.2	1922	1.6
3330.3	0.228	14	0.457	1.5	1061	2.6	3.3	0.833	2.2	1213	1.9
3331.2	0.228	14	0.184	1.5	1043	3.9	3.3	0.336	2.2	1193	2.9
3332.2	0.953	16	0.183	1.5	1445	2.0	14	0.335	2.2	1653	1.5
3333.1	0.228	13	0.400	1.5	1327	0.990	3.3	0.729	2.2	1517	0.722
3334.0	0.228	10	0.183	1.5	1169	2.2	3.3	0.335	2.2	1336	1.6
3334.9	0.228	14	0.318	1.5	1503	2.7	3.3	0.581	2.2	1718	2.0
3335.9	0.348	14	0.371	1.5	2154	2.5	5.0	0.677	2.2	2463	1.8
3336.8	0.228	13	0.253	2.3	1516	3.7	3.3	0.461	3.6	1733	2.7
3337.7	0.228	14	0.449	1.5	1370	1.6	3.3	0.819	2.3	1567	1.1
3338.6	0.270	16	0.215	1.5	1370	1.2	3.9	0.392	2.2	1567	0.895
3339.6	0.324	11	0.515	1.9	1356	1.9	4.7	0.940	2.9	1550	1.4
3340.5	0.715	14	0.686	1.5	1333	2.5	10	1.3	2.2	1524	1.8
3341.4	0.516	13	0.249	2.0	1355	2.7	7.5	0.454	3.0	1550	2.0
3342.3	0.228	10	0.320	1.5	1238	2.8	3.3	0.583	2.2	1415	2.0
3343.3	0.228	13	0.307	2.7	1222	2.8	3.3	0.559	4.2	1398	2.1
3344.2	0.342	14	0.455	2.3	1393	3.1	4.9	0.830	3.5	1593	2.2
3345.1	0.287	9.5	0.420	2.3	1613	4.2	4.1	0.766	3.4	1845	3.1
3346.0	0.228	10	0.248	2.0	1052	1.7	3.3	0.453	3.0	1203	1.2
3347.0	0.605	13	0.395	1.5	1345	2.8	8.7	0.720	2.2	1538	2.0
3347.9	0.228	13	0.548	1.5	1442	2.2	3.3	1.000	2.2	1649	1.6
3348.8	0.228	11	0.290	2.9	1218	2.8	3.3	0.529	4.5	1393	2.0
3349.7	0.517	12	0.282	2.6	1290	2.4	7.5	0.514	4.0	1476	1.7
3350.7	0.228	15	0.183	2.7	1343	2.5	3.3	0.335	4.2	1536	1.8
3351.6	0.281	12	0.183	1.8	1226	2.8	4.1	0.335	2.7	1402	2.1
3352.5	0.228	11	0.288	1.5	1124	1.6	3.3	0.525	2.2	1285	1.2
3353.4	0.228	12	0.399	2.4	1257	1.5	3.3	0.727	3.7	1438	1.1
3354.3	0.228	13	0.311	1.8	1300	1.8	3.3	0.568	2.8	1486	1.3
3355.3	0.228	6.4	0.183	1.5	646	1.1	3.3	0.335	2.2	739	0.810
3356.2	0.228	14	0.183	2.6	1228	1.3	3.3	0.335	4.0	1404	0.938
3357.1	0.232	15	0.183	1.5	1220	1.1	3.3	0.335	2.3	1395	0.838
3358.0	0.228	9.1	0.291	1.5	921	1.2	3.3	0.530	2.3	1053	0.852
3359.0	0.228	13	0.372	1.7	1194	2.0	3.3	0.678	2.6	1365	1.5
3359.9	0.228	18	0.355	1.5	1243	1.9	3.3	0.647	2.2	1421	1.4
3360.8	0.228	12	0.278	2.1	1048	1.6	3.3	0.507	3.3	1198	1.2
3361.7	0.228	12	0.324	1.5	886	1.5	3.3	0.591	2.2	1013	1.1
3362.7	0.228	16	0.183	2.0	1084	1.7	3.3	0.335	3.0	1240	1.3
3363.6	0.228	14	0.383	2.7	904	1.9	3.3	0.698	4.1	1034	1.4
3364.5	0.228	12	0.183	2.0	806	1.1	3.3	0.335	3.1	922	0.831
3365.4	0.228	15	0.244	3.5	721	1.2	3.3	0.445	5.4	824	0.890
3366.4	0.228	14	0.270	2.9	762	1.1	3.3	0.492	4.5	872	0.789
3367.3	0.228	9.8	0.183	3.2	520	0.705	3.3	0.335	4.9	595	0.514
3368.2	0.228	15	0.402	1.5	688	1.4	3.3	0.732	2.2	787	1.0



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
3369.1	0.228	14	0.437	1.9	886	1.1	3.3	0.796	2.9	1013	0.826
3370.1	0.228	11	0.300	1.5	611	2.3	3.3	0.547	2.2	698	1.7
3371.0	0.228	13	0.278	1.5	612	1.2	3.3	0.507	2.2	700	0.904
3371.9	0.228	14	0.348	1.5	656	1.0	3.3	0.635	2.2	750	0.742
3372.8	0.228	12	0.183	2.7	733	1.2	3.3	0.335	4.1	838	0.883
3373.8	0.228	8.6	0.372	1.5	519	0.315	3.3	0.678	2.2	594	0.230
3374.7	0.553	12	0.183	2.7	691	0.845	8.0	0.335	4.1	790	0.616
3375.6	0.228	12	0.190	2.5	501	0.757	3.3	0.347	3.8	572	0.552
3376.5	0.364	9.4	0.183	1.5	468	0.534	5.3	0.335	2.2	536	0.389
3377.5	0.228	15	0.183	3.2	553	0.577	3.3	0.335	4.9	632	0.421
3378.4	0.228	16	0.183	4.8	637	0.687	3.3	0.335	7.4	728	0.501
3379.3	0.228	8.6	0.183	3.3	440	0.808	3.3	0.335	5.0	503	0.589
3380.2	0.228	18	0.473	4.0	505	0.374	3.3	0.862	6.1	577	0.273
3381.1	0.228	14	0.459	5.6	491	0.562	3.3	0.837	8.6	561	0.410
3382.1	0.228	19	0.234	4.0	458	1.1	3.3	0.426	6.1	523	0.776
3383.0	0.497	14	6.1	5.8	455	0.872	7.2	11	8.9	520	0.636
3383.9	0.228	16	0.243	3.8	580	0.407	3.3	0.443	5.9	663	0.297
3384.8	0.280	14	0.255	1.8	555	0.888	4.0	0.464	2.7	635	0.648
3385.8	0.228	12	0.183	1.7	437	0.776	3.3	0.335	2.5	500	0.566
3386.7	0.228	15	0.183	6.0	507	0.816	3.3	0.335	9.2	579	0.595
3387.6	0.228	14	0.251	2.8	579	1.3	3.3	0.458	4.2	662	0.916
3388.5	0.228	10	0.183	1.5	408	0.447	3.3	0.335	2.2	467	0.326
3389.5	0.309	13	0.315	2.6	639	1.1	4.5	0.575	4.0	731	0.818
3390.4	0.269	14	0.244	2.2	571	0.727	3.9	0.445	3.4	653	0.531
3391.3	0.228	11	0.183	2.4	524	1.1	3.3	0.335	3.6	599	0.795
3392.2	0.228	14	0.305	1.5	513	0.891	3.3	0.556	2.2	587	0.650
3393.2	0.228	13	0.183	1.5	593	1.8	3.3	0.335	2.2	678	1.3
3394.1	0.363	11	0.183	1.5	507	1.3	5.2	0.335	2.2	580	0.941
3395.0	0.488	9.7	0.183	1.5	541	0.236	7.0	0.335	2.2	619	0.172
3395.9	0.228	14	0.256	1.5	545	1.2	3.3	0.467	2.2	624	0.840
3396.9	0.228	12	0.183	1.5	638	1.1	3.3	0.335	2.2	730	0.833
3397.8	0.228	8.4	0.183	1.5	400	1.6	3.3	0.335	2.2	457	1.1
3398.7	0.231	13	0.183	2.3	746	2.0	3.3	0.335	3.5	853	1.5
3399.6	0.228	15	0.436	2.3	631	1.5	3.3	0.795	3.6	722	1.1
3400.6	0.604	9.2	0.206	2.7	536	1.9	8.7	0.375	4.1	613	1.4
3401.5	0.228	12	0.378	1.5	876	2.2	3.3	0.689	2.2	1002	1.6
3402.4	0.918	19	0.521	2.2	951	1.7	13	0.949	3.4	1088	1.2
3403.3	0.824	12	0.384	1.5	909	2.4	12	0.699	2.2	1039	1.7
3404.2	0.579	9.9	0.417	3.4	886	1.8	8.4	0.761	5.2	1013	1.3
3405.2	0.980	12	0.452	3.6	1130	3.4	14	0.824	5.5	1292	2.5
3406.1	0.608	13	0.854	1.5	1145	2.7	8.8	1.6	2.2	1310	2.0
3407.0	0.228	10	0.502	1.6	938	2.5	3.3	0.916	2.4	1072	1.8
3407.9	0.798	13	0.719	2.2	1401	2.9	12	1.3	3.4	1602	2.1
3408.9	0.758	15	0.473	1.5	1353	2.9	11	0.863	2.2	1547	2.1
3409.8	0.690	11	0.697	2.5	1018	1.5	10.0	1.3	3.8	1165	1.1
3410.7	1.1	14	0.642	1.6	1327	3.1	16	1.2	2.5	1517	2.3
3411.6	0.573	18	0.803	3.3	1815	2.8	8.3	1.5	5.1	2076	2.0
3412.6	0.553	13	0.609	2.6	1296	2.6	8.0	1.1	4.0	1482	1.9
3413.5	0.646	19	0.956	2.7	1503	2.8	9.3	1.7	4.2	1718	2.0
3414.4	0.659	17	0.819	1.5	1543	1.9	9.5	1.5	2.2	1764	1.4
3415.3	0.365	15	0.389	3.3	1395	3.3	5.3	0.710	5.1	1595	2.4
3416.3	0.459	10	0.324	2.1	1079	2.2	6.6	0.591	3.2	1233	1.6
3417.2	0.873	17	1.2	4.8	1809	2.1	13	2.2	7.4	2068	1.6
3418.1	0.669	17	0.518	2.6	1830	3.5	9.7	0.944	3.9	2093	2.6
3419.0	0.228	13	0.449	2.6	1125	2.2	3.3	0.820	3.9	1287	1.6
3420.0	0.228	17	0.654	3.5	1486	1.7	3.3	1.2	5.4	1699	1.2
3420.9	0.228	18	0.504	1.9	1378	2.2	3.3	0.919	2.9	1575	1.6
3421.8	0.228	12	0.309	2.7	1111	1.7	3.3	0.563	4.2	1270	1.3
3422.7	0.228	16	0.761	3.1	1308	3.0	3.3	1.4	4.7	1496	2.2
3423.7	0.228	16	0.355	3.1	1321	1.3	3.3	0.647	4.8	1510	0.946
3424.6	0.401	12	0.325	2.0	925	1.5	5.8	0.593	3.0	1058	1.1
3425.5	0.228	14	0.392	4.1	1070	2.0	3.3	0.715	6.3	1223	1.4
3426.4	0.228	13	0.457	2.4	1052	2.1	3.3	0.834	3.7	1203	1.5
3427.4	0.228	16	0.324	2.1	1169	2.1	3.3	0.592	3.3	1336	1.5
3428.3	0.228	9.3	0.200	2.6	814	1.4	3.3	0.364	3.9	931	1.0
3429.2	0.228	19	0.183	2.3	939	1.9	3.3	0.335	3.6	1074	1.4
3430.1	0.228	23	0.291	2.2	1466	1.8	3.3	0.531	3.4	1676	1.3
3431.0	0.228	11	0.183	2.1	819	0.676	3.3	0.335	3.2	936	0.493
3432.0	0.294	13	0.496	1.5	1009	0.932	4.3	0.905	2.3	1154	0.680
3432.9	0.228	25	0.389	2.1	919	1.2	3.3	0.710	3.2	1050	0.881
3433.8	0.316	11	0.183	4.3	804	1.4	4.6	0.335	6.6	920	0.993
3434.7	0.228	9.6	0.278	2.2	646	0.811	3.3	0.506	3.4	739	0.591
3435.7	0.461	15	0.273	2.5	778	0.676	6.7	0.497	3.9	889	0.493
3436.6	0.228	15	0.183	8.3	925	1.4	3.3	0.335	13	1058	1.0
3437.5	0.228	12	0.183	1.5	603	0.968	3.3	0.335	2.2	690	0.706
3438.4	0.228	9.0	0.705	1.8	600	1.4	3.3	1.3	2.7	686	1.0
3439.4	0.294	28	1.3	4.8	875	3.5	4.2	2.4	7.3	1001	2.5
3440.3	0.228	38	2.8	9.0	614	2.2	3.3	5.0	14	702	1.6
3441.2	0.228	49	3.2	6.0	666	1.5	3.3	5.7	9.2	761	1.1
3442.1	0.228	47	3.1	10	714	1.7	3.3	5.6	16	816	1.2
3443.1	0.228	46	4.2	8.5	737	2.9	3.3	7.6	13	843	2.1



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
3444.0	0.308	51	4.2	13	694	3.5	4.5	7.6	20	793	2.6
3444.9	0.228	61	4.4	10	692	4.2	3.3	8.1	16	792	3.1
3445.8	0.228	56	5.0	14	581	2.9	3.3	9.1	22	665	2.2
3446.8	0.419	61	5.9	13	572	1.5	6.0	11	20	654	1.1
3447.7	0.228	72	5.2	13	583	2.1	3.3	9.5	19	667	1.5
3448.6	0.228	64	5.0	14	622	2.6	3.3	9.1	22	712	1.9
3449.5	0.549	82	7.4	19	614	2.9	7.9	14	29	702	2.1
3450.5	0.344	124	8.3	23	640	3.9	5.0	15	36	732	2.8
3451.4	0.228	149	9.6	34	617	2.8	3.3	18	52	706	2.1
3452.3	0.361	132	9.9	34	674	5.0	5.2	18	53	770	3.6
3453.2	0.644	168	10	37	611	3.2	9.3	19	57	698	2.4
3454.2	0.228	178	12	50	521	6.0	3.3	22	77	596	4.3
3455.1	0.228	185	14	43	606	5.5	3.3	25	66	693	4.0
3456.0	0.228	176	14	43	447	5.5	3.3	26	66	511	4.0
3456.9	0.269	208	14	58	527	3.4	3.9	25	89	603	2.5
3457.8	0.228	236	20	83	522	4.0	3.3	37	128	597	2.9
3458.8	0.228	347	31	100	506	7.7	3.3	57	153	579	5.6
3459.7	0.228	422	32	159	600	9.5	3.3	59	244	686	7.0
3460.6	0.565	383	27	110	679	10.0	8.1	49	168	776	7.3
3461.5	1.1	450	33	128	368	17	15	61	195	421	13
3462.5	5.9	1002	81	279	484	12	85	147	428	553	8.6
3463.4	2.0	1311	84	386	575	7.8	29	154	592	658	5.7
3464.3	0.228	1321	95	548	494	32	3.3	173	839	564	23
3465.2	0.228	1360	75	399	411	23	3.3	138	611	469	17
3466.2	0.228	2023	106	429	791	35	3.3	193	658	905	25
3467.1	0.228	1750	88	521	605	21	3.3	160	798	691	15
3468.0	0.228	1803	119	508	624	41	3.3	217	778	713	30
3468.9	8.7	1845	84	527	502	12	126	154	808	575	8.5
3469.9	0.228	2017	102	661	703	4.2	3.3	186	1013	804	3.1
3470.8	16	1964	109	679	478	29	238	198	1041	547	21
3471.7	5.5	2357	153	714	649	43	79	280	1093	743	31
3472.6	6.9	2240	123	591	723	26	100	224	906	826	19
3473.6	0.228	1807	93	641	834	21	3.3	169	983	954	15
3474.5	0.228	1470	84	447	657	43	3.3	153	686	751	32
3475.4	0.228	1357	78	390	508	21	3.3	142	597	581	15
3476.3	13	1806	89	492	584	17	191	162	753	668	12
3477.3	0.228	1881	96	474	543	24	3.3	175	727	621	17
3478.2	0.228	2120	119	681	801	28	3.3	217	1044	915	21
3479.1	1.7	1941	108	660	744	39	24	197	1012	851	28
3480.0	0.228	1986	114	550	750	40	3.3	208	842	857	30
3480.9	0.228	1988	111	582	703	25	3.3	202	892	804	18
3481.9	1.9	1872	97	761	624	26	27	176	1165	713	19
3482.8	7.0	1887	108	703	631	39	101	197	1077	721	28
3483.7	0.228	2117	138	803	744	30	3.3	251	1230	851	22
3484.6	7.2	1964	126	716	673	27	104	230	1097	770	19
3485.6	6.2	2011	116	453	621	35	90	211	694	710	25
3486.5	0.228	2053	117	605	545	22	3.3	213	928	623	16
3487.4	2.0	1667	112	646	725	14	29	205	990	829	10
3488.3	0.228	1070	54	365	389	8.2	3.3	98	559	445	6.0
3489.3	0.228	2053	111	817	748	17	3.3	203	1252	856	12
3490.2	0.228	1901	121	628	730	42	3.3	221	963	835	31
3491.1	11	1405	100	515	522	28	163	182	789	596	21
3492.0	0.228	1418	106	676	565	46	3.3	193	1035	646	33
3493.0	0.228	2084	156	737	706	23	3.3	284	1130	808	17
3493.9	17	1835	118	806	613	30	243	216	1235	701	22
3494.8	0.228	1989	113	750	740	77	3.3	206	1149	846	56
3495.7	4.5	508	38	252	283	16	64	70	386	324	12
3496.7	0.892	362	27	131	132	7.0	13	50	201	150	5.1
3497.6	9.2	1743	180	744	512	25	133	328	1141	586	18
3498.5	0.228	2098	179	977	588	27	3.3	327	1497	672	20
3499.4	0.228	1959	130	739	701	17	3.3	236	1132	801	12
3500.4	0.228	1850	108	780	711	38	3.3	198	1195	813	28
3501.3	2.4	1885	124	799	701	27	34	226	1225	801	20
3502.2	0.228	1861	103	518	555	23	3.3	187	794	635	16
3503.1	0.228	2310	120	762	672	51	3.3	219	1168	769	38
3504.1	20	1779	119	872	562	23	289	217	1337	643	17
3505.0	0.228	1363	93	633	653	18	3.3	169	970	747	13
3505.9	0.228	1801	95	890	569	29	3.3	173	1363	651	21
3506.8	9.3	1686	102	948	598	17	135	186	1453	684	12
3507.7	0.228	1701	99	646	690	32	3.3	180	990	789	23
3508.7	0.228	1320	61	445	398	25	3.3	112	682	456	18
3509.6	6.7	2096	111	802	614	26	97	203	1229	702	19
3510.5	6.9	1884	123	852	563	27	100	225	1306	644	20
3511.4	0.228	2142	105	788	969	41	3.3	192	1208	1108	30
3512.4	0.228	1291	83	393	358	46	3.3	152	603	409	33
3513.3	17	1894	97	658	639	22	240	176	1009	730	16
3514.2	0.228	2358	115	756	570	41	3.3	210	1158	652	30
3515.1	0.228	2335	119	887	700	231	3.3	217	1359	801	169
3516.1	0.228	293	24	136	64	2.9	3.3	44	208	74	2.1
3517.0	0.228	2125	146	1265	1047	84	3.3	266	1938	1197	61
3517.9	0.228	1730	156	1068	607	21	3.3	285	1637	694	16



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Sample ID: 008

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
3518.8	0.228	1668	127	917	599	60	3.3	231	1405	685	44
3519.8	0.228	2195	226	1026	1166	107	3.3	412	1572	1334	78
3520.7	18	2133	193	1047	2614	81	262	353	1604	2989	59
3521.6	0.228	1893	169	889	555	58	3.3	309	1363	635	42
3522.5	0.228	387	29	149	111	9.7	3.3	53	228	126	7.1
3523.5	0.228	2572	189	692	935	109	3.3	345	1060	1069	80
3524.4	16	2613	185	1306	815	68	226	338	2001	932	49
3525.3	0.228	1567	87	626	389	6.0	3.3	159	959	445	4.4
3526.2	0.228	979	123	337	190	39	3.3	225	517	217	28
3527.2	20	2532	115	1042	679	12	294	210	1596	776	8.5
3528.1	0.228	2289	125	654	607	28	3.3	227	1002	694	20
3529.0	0.228	842	56	257	546	20	3.3	102	394	625	15
3529.9	9.2	682	30	424	190	17	133	54	650	218	12



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
0.5	3.8	33	2.1	58	941	0.570	54	3.8	90	1077	0.416
1.4	3.3	31	2.7	64	815	0.507	47	4.9	97	933	0.370
2.3	2.7	34	2.6	64	830	0.535	40	4.8	98	949	0.391
3.2	2.8	33	3.0	66	848	0.391	40	5.5	102	969	0.285
4.2	2.4	32	2.1	60	725	1.5	34	3.8	92	829	1.1
5.1	3.3	28	1.7	62	818	0.679	47	3.1	95	935	0.495
6.0	2.5	33	2.5	57	716	0.823	36	4.5	88	819	0.601
6.9	1.9	30	1.8	67	797	0.676	27	3.4	103	911	0.493
7.8	2.5	29	2.2	64	813	1.7	36	4.0	99	930	1.3
8.8	3.0	33	2.1	61	983	0.876	43	3.9	94	1124	0.639
9.7	2.7	33	2.6	55	804	0.696	39	4.7	84	919	0.508
10.6	2.1	24	2.3	59	729	0.835	30	4.1	91	834	0.609
11.5	3.3	30	2.0	59	827	1.5	47	3.6	90	946	1.1
12.5	2.4	30	2.2	65	932	2.0	34	4.0	99	1065	1.4
13.4	1.9	27	2.1	53	672	0.522	27	3.8	81	768	0.381
14.3	2.7	26	2.2	46	800	0.837	39	3.9	70	915	0.611
15.2	3.8	32	2.4	52	864	0.660	54	4.4	80	988	0.481
16.2	1.6	24	2.3	57	808	1.1	23	4.2	88	924	0.809
17.1	2.8	26	3.0	53	784	0.123	40	5.4	81	897	0.090
18.0	3.4	29	1.9	51	911	0.827	49	3.5	78	1041	0.604
18.9	2.4	28	2.0	52	752	1.5	34	3.6	80	860	1.1
19.9	3.5	25	2.9	56	780	0.630	50	5.3	86	892	0.459
20.8	2.9	33	1.6	55	811	0.539	42	3.0	84	928	0.394
21.7	2.4	29	1.6	45	822	0.625	35	2.9	69	940	0.456
22.6	1.8	27	1.8	42	708	1.3	27	3.3	64	809	0.969
23.6	3.0	31	2.3	44	971	0.595	44	4.2	68	1111	0.434
24.5	2.2	31	2.0	62	945	1.2	32	3.7	94	1080	0.854
25.4	2.8	28	1.7	47	844	0.871	40	3.1	73	965	0.636
26.3	3.0	24	1.8	43	666	0.620	43	3.4	66	762	0.453
27.3	2.9	32	3.0	49	1038	0.924	41	5.5	75	1187	0.674
28.2	1.6	29	1.8	42	796	0.611	22	3.4	64	910	0.446
29.1	1.5	29	1.6	49	784	0.277	21	2.9	75	896	0.202
30.0	2.5	42	2.0	45	998	0.789	36	3.7	69	1142	0.575
31.0	2.4	28	1.6	46	937	0.970	35	3.0	70	1071	0.708
31.9	2.3	26	1.8	42	809	0.642	33	3.2	65	925	0.468
32.8	3.8	28	1.8	51	1012	0.770	55	3.3	78	1157	0.562
33.7	2.4	28	2.1	54	911	1.1	35	3.8	83	1042	0.814
34.6	1.1	19	1.7	54	909	0.842	16	3.0	82	1039	0.615
35.6	2.0	26	1.7	43	1018	0.611	29	3.1	66	1164	0.446
36.5	2.2	18	1.6	44	773	0.538	32	2.9	67	884	0.393
37.4	2.9	20	1.3	58	935	0.432	42	2.4	89	1069	0.315
38.3	2.6	21	2.6	48	1024	0.997	38	4.8	74	1171	0.728
39.3	1.6	19	1.8	37	830	0.129	22	3.3	57	949	0.094
40.2	2.1	22	1.1	34	844	0.767	30	2.1	53	966	0.560
41.1	2.4	17	1.9	34	831	0.569	35	3.4	52	950	0.415
42.0	2.6	19	2.3	38	1054	0.310	37	4.3	58	1205	0.227
43.0	1.9	17	1.9	34	1148	0.890	27	3.5	52	1313	0.650
43.9	1.3	17	1.5	35	888	0.639	18	2.7	54	1016	0.466
44.8	2.8	20	2.0	41	895	1.0	40	3.6	62	1023	0.733
45.7	1.4	22	1.9	38	1012	0.428	20	3.4	58	1158	0.313
46.7	1.9	13	1.3	33	896	0.711	27	2.4	51	1025	0.519
47.6	2.6	24	1.6	32	863	0.669	37	3.0	49	987	0.488
48.5	3.8	27	2.3	69	1214	0.774	55	4.1	105	1388	0.565
49.4	1.5	21	1.4	42	838	1.1	22	2.6	64	958	0.773
50.4	0.462	18	0.924	30	857	0.598	6.7	1.7	46	980	0.436
51.3	2.2	22	1.3	33	1037	0.897	31	2.4	50	1186	0.655
52.2	1.6	20	1.2	44	1180	0.787	24	2.2	67	1349	0.574
53.1	2.2	21	0.947	33	921	0.985	32	1.7	50	1053	0.719
54.1	2.2	28	2.8	40	1130	1.3	31	5.1	62	1292	0.916
55.0	1.9	23	0.896	36	1344	0.137	28	1.6	55	1537	0.100
55.9	2.3	17	1.7	44	925	0.899	33	3.0	68	1057	0.656
56.8	2.1	18	1.8	30	849	0.695	30	3.2	45	971	0.507
57.8	2.2	28	2.1	34	1133	0.348	31	3.9	52	1296	0.254
58.7	1.7	15	1.3	51	1058	0.747	25	2.3	78	1210	0.545
59.6	1.4	18	1.8	40	828	1.4	20	3.2	61	947	1.0
60.5	2.7	27	1.6	42	1144	1.4	39	2.9	64	1308	0.997
61.4	1.7	22	1.8	43	1103	0.879	24	3.3	66	1261	0.642
62.4	1.1	14	2.0	45	773	1.1	16	3.6	69	884	0.787
63.3	3.5	25	2.5	35	1070	1.1	50	4.6	53	1224	0.819
64.2	0.995	25	0.937	40	940	0.941	14	1.7	61	1075	0.687
65.1	1.4	13	1.9	40	761	0.471	20	3.4	61	870	0.344
66.1	2.8	24	2.4	45	1131	0.797	40	4.4	69	1294	0.582
67.0	1.6	25	2.1	51	1175	1.0	24	3.8	78	1344	0.734
67.9	1.4	17	1.4	40	812	0.895	20	2.5	61	928	0.653
68.8	1.6	15	2.2	37	828	0.676	24	4.1	56	947	0.493
69.8	2.8	27	1.9	45	1358	0.361	40	3.4	70	1553	0.264
70.7	0.760	23	1.9	43	1085	0.753	11	3.5	66	1241	0.549
71.6	1.3	20	1.7	47	977	0.021	19	3.0	72	1118	0.015
72.5	2.5	26	2.4	48	1169	0.304	36	4.4	73	1337	0.222
73.5	2.1	22	1.3	45	1202	2.6	30	2.3	69	1374	1.9
74.4	1.4	18	1.8	51	802	1.5	20	3.2	78	917	1.1



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
75.3	2.8	22	2.1	50	1066	0.626	41	3.8	76	1219	0.456
76.2	1.9	25	1.4	43	1234	0.139	28	2.5	65	1412	0.102
77.2	1.1	18	1.5	48	957	0.442	16	2.8	74	1094	0.323
78.1	2.4	17	2.0	36	952	0.789	34	3.7	55	1089	0.576
79.0	3.6	20	2.8	44	1208	0.864	52	5.1	68	1382	0.631
79.9	1.8	18	1.2	46	1045	0.986	26	2.2	70	1195	0.719
80.9	2.0	15	1.8	42	733	0.558	28	3.3	65	838	0.407
81.8	3.3	24	2.6	47	890	0.302	48	4.8	73	1018	0.220
82.7	1.8	18	1.4	43	857	0.820	26	2.6	66	980	0.598
83.6	2.3	18	1.7	63	969	0.699	33	3.2	96	1108	0.510
84.5	2.6	22	1.9	57	1114	1.3	38	3.5	88	1274	0.964
85.5	2.2	24	1.8	46	1339	1.3	31	3.3	71	1531	0.945
86.4	2.0	21	1.8	67	1106	0.723	29	3.3	103	1265	0.528
87.3	2.4	15	2.0	47	961	0.879	34	3.7	72	1099	0.641
88.2	1.4	17	1.7	48	1287	0.466	21	3.0	74	1471	0.340
89.2	2.7	19	1.7	56	1095	0.864	39	3.2	85	1252	0.630
90.1	2.4	19	1.6	46	903	0.438	35	2.9	71	1032	0.319
91.0	2.0	17	2.0	56	1046	1.5	29	3.6	86	1196	1.1
91.9	2.0	17	2.2	59	910	0.949	28	4.0	91	1041	0.692
92.9	2.7	17	1.7	50	989	0.776	39	3.0	77	1131	0.566
93.8	2.1	20	1.5	58	1069	1.0	31	2.7	88	1222	0.756
94.7	1.2	18	1.6	58	1133	0.698	17	2.9	89	1296	0.510
95.6	1.2	15	1.7	52	838	0.814	17	3.1	80	958	0.594
96.6	2.1	21	2.5	57	1239	1.3	31	4.6	87	1416	0.973
97.5	2.6	19	1.5	45	967	0.829	37	2.7	69	1105	0.605
98.4	2.2	22	2.1	60	830	0.730	32	3.8	92	949	0.532
99.3	2.4	18	2.5	66	1052	0.898	35	4.6	101	1204	0.655
100.3	2.2	19	2.3	56	999	1.8	31	4.1	86	1142	1.3
101.2	1.9	22	1.9	60	1064	0.663	28	3.4	92	1217	0.484
102.1	1.8	20	2.0	52	841	1.1	27	3.6	79	962	0.812
103.0	1.8	16	1.7	57	774	0.902	26	3.1	87	885	0.658
104.0	2.1	22	2.4	72	904	0.514	30	4.4	110	1034	0.375
104.9	1.8	15	2.1	52	733	0.254	26	3.9	79	838	0.185
105.8	2.7	21	1.9	62	1202	0.843	40	3.5	96	1375	0.615
106.7	2.0	16	1.5	61	815	0.747	29	2.8	93	932	0.545
107.7	2.4	20	2.3	57	885	1.5	35	4.2	87	1012	1.1
108.6	2.9	18	1.7	53	822	1.2	42	3.1	81	941	0.878
109.5	1.8	19	1.8	61	995	0.892	27	3.2	94	1138	0.651
110.4	3.0	17	2.0	73	905	1.4	43	3.7	112	1035	0.987
111.4	1.8	17	2.4	51	800	0.791	25	4.4	78	915	0.577
112.3	1.9	18	1.8	48	935	1.1	28	3.3	74	1070	0.816
113.2	2.3	21	2.1	49	905	1.6	33	3.9	76	1035	1.2
114.1	2.1	20	2.0	72	1072	1.0	30	3.7	110	1226	0.750
115.0	2.0	21	2.8	55	1095	0.743	29	5.1	84	1252	0.542
116.0	1.3	23	2.0	71	1028	0.143	19	3.7	110	1175	0.104
116.9	2.5	20	1.9	64	986	1.4	36	3.5	97	1127	1.0
117.8	2.8	20	1.5	65	923	0.603	41	2.7	99	1055	0.440
118.7	1.6	20	1.8	59	865	0.920	23	3.3	90	989	0.671
119.7	1.3	20	1.7	75	929	2.4	18	3.2	115	1062	1.8
120.6	1.5	20	2.3	68	865	1.8	21	4.2	104	989	1.3
121.5	2.8	25	2.5	47	964	0.445	40	4.5	72	1102	0.325
122.4	1.3	17	1.1	60	784	0.872	19	2.0	92	897	0.636
123.4	2.1	19	2.1	65	900	1.4	30	3.8	99	1029	0.985
124.3	1.6	23	2.0	65	1092	0.885	23	3.7	99	1249	0.646
125.2	2.0	18	1.7	55	768	1.6	29	3.0	85	879	1.2
126.1	2.7	18	1.8	56	873	1.3	39	3.3	85	998	0.924
127.1	2.3	23	2.4	53	1125	0.584	33	4.3	81	1287	0.426
128.0	1.5	24	2.1	70	989	0.443	21	3.8	108	1131	0.323
128.9	2.2	15	2.0	55	813	0.755	32	3.6	85	929	0.551
129.8	1.6	20	3.0	58	1000	0.707	22	5.5	89	1144	0.516
130.8	1.1	17	2.0	69	1100	1.5	15	3.6	106	1257	1.1
131.7	1.8	19	1.9	59	1147	0.869	27	3.5	90	1312	0.634
132.6	2.6	20	1.8	50	780	1.3	38	3.3	77	892	0.936
133.5	1.7	28	2.2	54	1130	0.983	25	4.0	83	1292	0.717
134.5	1.8	19	1.8	67	1061	1.5	25	3.3	103	1213	1.1
135.4	0.981	16	2.0	53	895	1.7	14	3.7	81	1023	1.3
136.3	2.7	20	1.6	52	901	0.784	40	2.9	80	1031	0.572
137.2	1.4	18	2.0	64	1015	1.4	20	3.6	98	1161	1.0
138.1	1.5	19	2.2	61	884	0.410	22	4.0	94	1010	0.299
139.1	2.4	19	2.3	61	1036	1.3	35	4.2	94	1185	0.979
140.0	2.6	24	1.9	53	1042	1.1	38	3.4	81	1192	0.820
140.9	2.0	15	1.5	58	764	0.648	28	2.7	89	873	0.473
141.8	0.655	15	1.9	56	734	1.3	9.5	3.5	86	839	0.952
142.8	2.0	24	2.5	66	1134	2.0	29	4.5	101	1296	1.4
143.7	1.6	15	1.8	56	746	0.818	22	3.3	86	853	0.597
144.6	1.1	14	1.8	46	779	1.3	15	3.2	70	891	0.939
145.5	1.6	19	1.7	58	1118	0.591	23	3.1	88	1278	0.432
146.5	1.2	20	1.7	49	814	0.247	17	3.1	75	931	0.180
147.4	1.3	15	2.3	56	757	1.4	19	4.3	85	865	1.0
148.3	1.8	22	1.7	57	896	1.0	26	3.2	87	1025	0.761
149.2	2.2	21	2.0	55	970	0.929	32	3.7	84	1110	0.678



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
150.2	2.2	25	2.1	87	1353	0.733	32	3.8	133	1547	0.535
151.1	3.1	17	2.1	61	900	1.1	45	3.8	93	1029	0.784
152.0	1.9	22	2.1	59	1070	0.617	27	3.9	90	1223	0.450
152.9	1.6	17	1.4	47	808	0.967	23	2.6	72	924	0.705
153.9	2.6	19	2.2	52	980	1.6	37	4.0	80	1121	1.2
154.8	1.0	20	1.3	44	920	0.546	15	2.4	68	1052	0.398
155.7	1.3	19	1.7	60	856	0.906	19	3.1	93	979	0.661
156.6	1.1	14	1.8	52	837	1.0	16	3.2	80	958	0.761
157.6	2.3	20	1.7	57	957	1.7	34	3.1	87	1095	1.2
158.5	1.9	17	1.4	61	956	0.657	28	2.6	93	1094	0.479
159.4	1.9	14	1.8	49	791	1.0	27	3.3	75	904	0.758
160.3	2.6	17	1.4	56	1244	1.2	37	2.6	86	1422	0.903
161.3	1.4	17	2.0	67	905	0.946	20	3.7	102	1035	0.690
162.2	1.7	18	1.6	48	1037	1.6	25	3.0	73	1186	1.1
163.1	0.704	18	1.1	63	1057	0.629	10	2.0	96	1208	0.459
164.0	1.6	19	1.8	49	897	0.827	23	3.3	75	1025	0.603
164.9	2.0	13	1.6	59	951	1.1	29	3.0	90	1087	0.796
165.9	1.2	17	1.3	52	768	0.755	18	2.4	80	878	0.551
166.8	1.3	20	1.4	51	969	0.819	18	2.5	78	1108	0.598
167.7	2.0	20	1.3	71	1052	1.3	28	2.3	109	1203	0.966
168.6	2.5	19	1.4	46	826	1.0	35	2.5	71	944	0.747
169.6	1.2	19	1.3	47	902	0.833	17	2.4	72	1031	0.607
170.5	1.9	22	1.8	57	1012	0.975	27	3.3	87	1157	0.712
171.4	1.3	16	1.4	49	853	0.963	18	2.5	75	975	0.703
172.3	1.7	18	1.9	49	854	1.4	24	3.4	75	977	1.0
173.3	1.8	21	1.6	55	1290	0.876	26	2.9	84	1476	0.639
174.2	1.3	19	1.5	61	890	0.544	18	2.8	93	1018	0.397
175.1	1.3	18	1.7	62	860	1.1	19	3.0	94	984	0.838
176.0	1.2	22	1.4	70	1206	0.823	18	2.5	107	1379	0.601
177.0	1.8	18	2.0	53	1135	0.982	26	3.6	82	1298	0.716
177.9	1.9	18	1.3	57	972	0.613	27	2.4	87	1111	0.447
178.8	1.3	15	1.8	49	876	0.798	19	3.2	75	1002	0.582
179.7	1.3	17	1.8	51	958	1.1	18	3.2	78	1095	0.811
180.7	1.7	19	2.1	58	1010	0.947	25	3.9	89	1155	0.691
181.6	1.7	15	2.0	52	920	0.769	25	3.6	79	1052	0.561
182.5	1.6	16	1.6	51	1067	1.6	24	2.9	77	1220	1.1
183.4	0.822	17	1.8	65	1069	0.484	12	3.2	100	1222	0.353
184.4	1.5	17	1.6	60	977	0.742	21	2.9	92	1118	0.541
185.3	1.9	19	1.3	63	1222	0.995	28	2.4	96	1398	0.726
186.2	1.1	14	1.5	51	993	1.2	16	2.8	78	1135	0.904
187.1	1.2	14	1.3	56	821	0.799	18	2.4	86	938	0.583
188.1	1.8	16	1.5	44	918	0.636	27	2.6	67	1049	0.464
189.0	1.8	17	0.994	47	788	0.623	26	1.8	71	901	0.455
189.9	1.9	16	1.8	47	814	1.1	27	3.3	72	931	0.808
190.8	2.7	17	1.6	46	842	0.280	38	2.9	70	962	0.204
191.7	2.2	19	1.3	47	801	1.2	31	2.3	73	916	0.881
192.7	1.9	17	1.8	51	1077	0.586	27	3.3	78	1231	0.428
193.6	0.757	15	1.5	70	1026	1.5	11	2.8	107	1173	1.1
194.5	1.6	15	1.3	37	749	0.782	23	2.3	57	857	0.571
195.4	1.8	13	0.835	49	831	0.975	26	1.5	75	950	0.712
196.4	1.1	12	1.6	43	722	0.113	16	2.8	65	826	0.083
197.3	2.0	22	1.7	49	1058	0.800	29	3.0	75	1210	0.584
198.2	2.3	23	1.6	57	874	0.513	33	3.0	87	1000	0.374
199.1	1.7	18	1.3	51	1076	1.4	25	2.4	78	1231	1.0
200.1	1.7	17	1.6	43	904	1.2	25	2.8	65	1033	0.872
201.0	1.7	17	1.6	40	960	1.2	24	3.0	62	1097	0.856
201.9	1.6	17	1.3	51	770	0.766	23	2.4	77	880	0.559
202.8	1.5	18	1.7	42	998	0.146	22	3.1	64	1141	0.107
203.8	2.0	23	1.2	40	897	1.6	29	2.2	62	1026	1.2
204.7	0.597	16	1.3	52	997	0.534	8.6	2.4	79	1140	0.390
205.6	1.4	9.7	1.1	38	566	0.858	20	2.0	58	648	0.626
206.5	3.1	20	1.5	49	1115	0.558	44	2.8	75	1274	0.407
207.5	1.9	23	0.962	55	1097	0.328	28	1.8	85	1255	0.239
208.4	1.3	13	1.5	38	770	0.899	19	2.8	59	880	0.656
209.3	1.9	19	1.5	45	971	1.7	28	2.7	69	1110	1.2
210.2	1.1	23	0.995	47	1005	1.7	16	1.8	71	1149	1.2
211.2	0.797	16	1.0	46	794	1.3	12	1.9	70	908	0.942
212.1	1.9	18	1.0	32	786	1.1	28	1.8	50	899	0.786
213.0	1.2	22	1.1	36	1066	1.2	17	1.9	55	1219	0.884
213.9	1.1	20	0.811	39	787	0.419	16	1.5	61	900	0.305
214.9	1.9	17	1.7	41	837	0.441	27	3.0	63	957	0.322
215.8	2.5	27	1.7	42	1098	1.4	36	3.1	65	1255	1.0
216.7	1.6	20	0.663	48	1162	0.730	23	1.2	74	1329	0.532
217.6	1.4	14	1.0	41	908	0.940	20	1.9	63	1039	0.685
218.5	1.8	23	0.901	38	920	0.833	25	1.6	59	1052	0.608
219.5	1.4	15	1.3	44	1064	0.360	20	2.4	68	1217	0.263
220.4	1.5	16	1.2	47	759	0.392	22	2.2	72	868	0.286
221.3	0.958	18	0.740	46	1001	0.985	14	1.3	71	1144	0.719
222.2	1.7	20	0.721	50	1122	1.3	24	1.3	76	1283	0.917
223.2	1.4	15	0.995	40	931	0.904	20	1.8	61	1065	0.660
224.1	2.0	17	1.0	41	1051	1.9	29	1.9	63	1202	1.4



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
225.0	2.2	19	1.1	39	1156	0.909	32	1.9	59	1321	0.663
225.9	1.1	16	0.840	40	1005	1.6	16	1.5	61	1149	1.2
226.9	2.4	14	1.1	42	1101	0.616	34	2.1	64	1259	0.449
227.8	1.2	11	0.956	33	765	0.842	18	1.7	50	875	0.614
228.7	2.3	16	1.1	35	1020	1.2	33	1.9	53	1166	0.880
229.6	1.4	17	1.3	37	1198	1.7	21	2.4	56	1369	1.2
230.6	2.6	14	0.587	37	908	0.117	37	1.1	56	1039	0.085
231.5	0.763	12	0.614	26	946	1.1	11	1.1	39	1082	0.792
232.4	3.3	15	0.760	48	1224	1.2	47	1.4	73	1400	0.885
233.3	1.1	14	0.662	36	918	0.791	16	1.2	55	1050	0.577
234.3	0.807	12	1.1	35	1009	0.426	12	2.1	54	1154	0.311
235.2	2.2	16	0.616	51	1597	0.516	32	1.1	79	1826	0.376
236.1	2.5	18	1.2	43	1043	1.0	36	2.2	65	1193	0.762
237.0	1.2	19	0.600	21	811	0.837	18	1.1	32	927	0.611
238.0	2.1	17	1.0	34	1047	0.843	30	1.9	52	1197	0.615
238.9	1.0	14	0.741	39	1089	0.986	15	1.4	59	1245	0.719
239.8	2.1	13	0.530	35	811	0.919	30	0.967	54	927	0.671
240.7	1.6	16	0.768	32	1090	0.262	23	1.4	49	1247	0.191
241.6	1.2	17	0.789	36	1158	0.523	17	1.4	55	1324	0.382
242.6	1.4	16	0.995	38	890	0.945	20	1.8	58	1017	0.689
243.5	1.7	19	1.2	36	982	0.456	24	2.2	55	1123	0.332
244.4	1.7	15	1.1	40	1470	0.342	25	2.0	61	1681	0.250
245.3	1.2	14	1.3	34	972	0.764	17	2.3	52	1111	0.557
246.3	1.6	16	0.850	33	1439	0.769	23	1.5	50	1646	0.561
247.2	1.6	16	1.1	32	926	0.837	23	2.0	49	1059	0.611
248.1	2.2	15	0.579	32	961	0.380	32	1.1	49	1099	0.277
249.0	2.2	12	1.2	34	781	0.935	32	2.2	52	893	0.682
250.0	2.0	17	0.887	37	1240	0.501	30	1.6	56	1417	0.365
250.9	1.2	14	0.299	28	788	0.382	17	0.546	43	901	0.278
251.8	1.6	18	1.8	32	957	1.4	23	3.2	49	1094	1.1
252.7	1.4	17	0.807	35	1175	0.435	21	1.5	53	1343	0.318
253.7	1.1	15	1.0	34	867	0.517	16	1.8	52	992	0.377
254.6	1.8	17	1.4	31	1120	1.4	26	2.6	48	1280	1.0
255.5	1.9	15	1.1	41	1024	1.1	27	2.0	63	1171	0.835
256.4	1.4	17	1.6	36	1005	1.1	20	2.9	56	1149	0.768
257.4	1.6	17	0.791	39	983	1.3	23	1.4	60	1124	0.945
258.3	2.0	18	0.868	30	1059	0.576	29	1.6	46	1211	0.420
259.2	2.4	16	1.5	44	1097	1.2	34	2.7	68	1255	0.856
260.1	0.923	14	1.1	37	851	0.402	13	2.1	57	973	0.294
261.1	1.9	15	1.4	29	885	0.739	27	2.5	45	1012	0.539
262.0	3.2	15	1.0	50	1159	1.1	46	1.8	76	1325	0.811
262.9	1.7	17	1.3	30	923	1.0	25	2.3	46	1056	0.762
263.8	3.4	18	1.3	38	1241	0.786	49	2.4	59	1419	0.573
264.8	1.7	23	1.6	34	1106	0.448	25	2.9	52	1265	0.327
265.7	1.4	14	1.0	38	725	0.898	20	1.9	59	829	0.655
266.6	1.5	15	0.920	37	1009	1.8	21	1.7	56	1154	1.3
267.5	2.5	16	0.841	43	843	0.700	37	1.5	66	964	0.510
268.4	1.7	16	1.6	42	953	1.8	25	3.0	64	1090	1.3
269.4	1.6	17	1.4	39	823	0.969	23	2.5	59	941	0.707
270.3	1.5	20	0.989	41	1123	1.6	21	1.8	63	1284	1.2
271.2	0.974	19	0.927	45	1044	0.425	14	1.7	69	1194	0.310
272.1	1.5	15	1.3	45	884	0.771	21	2.4	69	1010	0.562
273.1	2.2	20	1.3	40	963	0.704	32	2.3	61	1101	0.513
274.0	1.3	14	1.3	40	866	1.1	19	2.4	62	991	0.771
274.9	2.1	18	1.2	44	921	1.6	30	2.2	68	1053	1.1
275.8	2.2	16	0.912	48	1022	1.2	32	1.7	73	1169	0.846
276.8	2.5	19	1.3	36	833	1.9	36	2.4	55	952	1.4
277.7	2.9	20	1.4	65	1131	0.828	42	2.6	100	1293	0.604
278.6	2.4	16	1.2	40	900	1.2	35	2.3	61	1030	0.893
279.5	2.0	17	1.5	43	936	1.5	29	2.8	66	1070	1.1
280.5	3.1	15	1.5	33	746	1.6	45	2.7	51	853	1.2
281.4	1.4	13	1.8	48	932	2.2	20	3.3	73	1066	1.6
282.3	1.6	16	1.5	50	1031	2.7	23	2.7	76	1178	1.9
283.2	2.0	15	1.5	49	915	1.4	28	2.7	75	1046	1.0
284.2	1.9	17	1.6	47	1182	2.0	27	2.9	73	1352	1.4
285.1	1.4	12	1.4	51	890	1.4	21	2.6	78	1017	1.0
286.0	2.6	15	2.1	51	793	1.1	38	3.8	78	906	0.821
286.9	1.2	16	1.3	52	734	0.727	17	2.4	80	840	0.530
287.9	1.1	12	1.1	38	616	1.6	15	2.0	59	704	1.1
288.8	1.7	14	1.2	44	861	1.4	24	2.3	68	984	1.0
289.7	3.9	22	1.4	63	1153	0.515	57	2.6	96	1319	0.376
290.6	1.6	11	1.4	39	743	1.5	23	2.5	60	849	1.1
291.5	1.2	11	1.4	46	928	1.6	18	2.5	71	1061	1.2
292.5	1.5	15	1.9	50	1076	0.934	22	3.4	76	1230	0.681
293.4	2.7	14	0.831	47	809	1.3	38	1.5	73	926	0.923
294.3	1.4	15	1.2	42	795	0.888	21	2.2	64	909	0.648
295.2	1.4	17	1.1	40	1029	1.6	21	2.0	61	1177	1.1
296.2	1.3	15	1.7	40	810	1.7	19	3.2	61	927	1.2
297.1	1.3	14	1.6	50	961	1.2	19	3.0	77	1099	0.881
298.0	1.3	16	1.2	48	889	2.1	19	2.2	73	1017	1.6
298.9	0.980	16	1.6	52	924	1.4	14	3.0	80	1057	1.0



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
299.9	1.4	16	1.2	34	639	0.873	21	2.2	52	731	0.637
300.8	2.2	13	1.5	39	652	1.2	32	2.8	59	746	0.880
301.7	2.1	21	1.6	40	994	0.735	31	2.9	61	1136	0.536
302.6	1.1	12	1.3	35	682	0.666	16	2.4	54	780	0.486
303.6	2.1	11	1.7	35	763	1.2	30	3.0	54	872	0.863
304.5	1.6	17	1.4	40	851	1.6	23	2.5	61	973	1.1
305.4	1.7	15	1.4	45	996	2.7	24	2.5	69	1139	1.9
306.3	1.1	16	1.9	41	960	0.586	16	3.5	63	1098	0.428
307.3	1.7	18	1.7	42	753	2.5	25	3.0	65	862	1.9
308.2	1.2	16	1.1	46	948	1.4	17	2.1	70	1084	1.0
309.1	1.8	14	1.7	38	894	0.394	27	3.2	59	1022	0.288
310.0	1.1	13	1.6	36	726	0.270	16	3.0	56	830	0.197
311.0	1.9	15	0.956	38	867	1.1	27	1.7	58	992	0.782
311.9	1.4	18	1.7	60	1166	0.844	20	3.1	91	1333	0.616
312.8	0.602	17	1.4	42	797	0.811	8.7	2.5	65	911	0.592
313.7	1.8	15	1.2	43	775	0.861	26	2.2	66	886	0.628
314.7	1.6	15	0.748	39	921	1.7	22	1.4	60	1053	1.2
315.6	1.7	16	1.2	45	1108	1.2	24	2.3	70	1267	0.882
316.5	1.0	16	1.4	43	821	0.776	15	2.5	65	938	0.566
317.4	0.945	13	0.922	40	884	1.4	14	1.7	61	1010	1.0
318.3	1.3	20	1.8	45	969	1.8	19	3.2	69	1108	1.3
319.3	2.0	20	1.6	44	954	1.2	29	2.8	68	1091	0.872
320.2	1.2	15	1.5	44	1023	0.965	17	2.7	68	1170	0.704
321.1	1.4	14	1.1	44	833	1.1	20	1.9	67	952	0.830
322.0	1.8	15	1.8	32	642	1.5	26	3.2	49	734	1.1
323.0	1.1	16	0.755	37	778	1.5	16	1.4	57	890	1.1
323.9	1.0	15	1.2	44	1048	0.497	15	2.1	67	1198	0.363
324.8	2.7	24	1.2	40	870	1.1	39	2.2	62	995	0.824
325.7	1.9	19	1.2	33	752	1.5	28	2.2	50	860	1.1
326.7	1.8	17	1.3	40	859	1.4	26	2.3	61	982	0.998
327.6	1.5	15	0.890	43	909	1.1	21	1.6	66	1039	0.834
328.5	1.5	16	1.7	47	950	1.3	21	3.1	72	1086	0.925
329.4	2.3	13	0.890	36	907	1.3	34	1.6	55	1037	0.978
330.4	1.7	15	1.6	51	929	0.423	25	2.8	78	1063	0.309
331.3	1.9	17	1.3	42	962	0.973	27	2.4	64	1100	0.710
332.2	2.5	16	0.977	39	938	0.600	37	1.8	60	1073	0.438
333.1	2.2	17	1.6	33	800	0.697	32	3.0	50	915	0.509
334.1	1.8	16	0.816	35	890	1.1	26	1.5	53	1017	0.829
335.0	2.8	16	0.966	36	927	0.830	41	1.8	56	1060	0.606
335.9	1.6	16	0.995	31	834	1.0	23	1.8	47	954	0.731
336.8	1.4	13	1.4	36	739	1.4	20	2.5	54	845	0.989
337.8	3.0	15	1.2	37	1085	1.3	43	2.2	57	1241	0.981
338.7	1.3	16	0.896	37	911	0.933	19	1.6	57	1042	0.681
339.6	1.3	16	0.707	43	777	1.2	18	1.3	65	888	0.866
340.5	1.3	16	1.2	40	671	1.8	19	2.2	61	767	1.3
341.5	2.0	22	1.5	45	1096	1.3	29	2.8	68	1253	0.913
342.4	1.6	15	1.4	45	900	0.966	23	2.5	70	1030	0.705
343.3	2.2	15	2.0	51	847	0.926	32	3.6	78	969	0.676
344.2	1.4	16	1.4	45	1032	2.0	20	2.6	69	1180	1.4
345.1	1.5	14	1.0	51	1058	1.1	22	1.9	78	1210	0.795
346.1	0.835	15	1.8	42	653	1.5	12	3.2	65	746	1.1
347.0	1.9	14	1.5	40	962	1.0	27	2.7	61	1100	0.731
347.9	0.604	18	1.2	52	1000	1.6	8.7	2.1	79	1144	1.1
348.8	2.0	13	1.6	40	933	2.1	29	2.8	61	1067	1.5
349.8	1.8	13	1.4	46	924	1.5	27	2.6	70	1056	1.1
350.7	1.9	14	1.4	40	992	1.4	27	2.5	61	1134	1.0
351.6	1.8	17	1.3	42	865	1.1	27	2.5	64	989	0.776
352.5	1.0	18	1.2	39	876	1.7	15	2.2	60	1001	1.2
353.5	2.4	16	1.6	52	1030	1.5	35	2.8	80	1177	1.1
354.4	1.5	15	1.0	38	888	2.1	22	1.9	59	1016	1.5
355.3	2.7	18	1.4	44	891	1.6	39	2.5	67	1019	1.2
356.2	3.0	20	1.8	55	1077	2.4	43	3.4	85	1231	1.7
357.2	1.2	19	1.0	35	877	0.926	17	1.9	54	1003	0.676
358.1	1.3	15	1.0	31	713	1.4	19	1.8	48	816	1.0
359.0	1.4	20	2.0	39	773	2.1	20	3.7	60	884	1.5
359.9	2.3	18	1.1	50	1156	2.0	33	2.0	77	1321	1.5
360.9	1.3	18	1.8	55	1107	1.9	19	3.2	84	1266	1.4
361.8	1.8	15	0.962	41	814	1.3	26	1.8	63	931	0.943
362.7	2.3	19	1.7	38	855	0.725	33	3.1	59	978	0.529
363.6	2.4	17	1.3	30	721	1.4	35	2.4	46	825	1.1
364.6	1.5	13	1.4	43	760	2.3	22	2.5	66	869	1.7
365.5	1.9	17	1.8	58	1328	1.6	28	3.4	89	1519	1.2
366.4	2.3	20	2.2	47	1014	2.2	33	4.0	72	1159	1.6
367.3	1.8	15	1.3	41	771	0.845	26	2.3	63	882	0.616
368.3	1.7	21	1.4	45	920	2.5	25	2.5	69	1052	1.8
369.2	1.2	16	0.867	41	818	0.494	18	1.6	63	936	0.361
370.1	1.2	16	1.4	42	781	1.4	18	2.5	64	893	1.0
371.0	2.3	16	1.4	48	794	1.2	33	2.6	74	908	0.861
371.9	1.8	17	1.4	47	886	1.7	25	2.6	72	1013	1.2
372.9	2.1	14	1.4	51	858	1.5	31	2.6	79	981	1.1
373.8	2.0	18	1.6	46	1010	1.5	29	2.8	70	1155	1.1



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
374.7	2.4	22	2.0	70	1084	0.913	34	3.6	107	1240	0.666
375.6	2.0	18	1.2	50	1076	2.4	29	2.1	76	1230	1.8
376.6	3.0	20	1.9	47	804	1.2	43	3.4	72	919	0.902
377.5	0.940	17	1.7	49	1387	2.3	14	3.1	75	1586	1.7
378.4	1.6	13	1.6	45	677	1.9	23	3.0	69	774	1.4
379.3	1.4	18	2.1	47	977	1.8	20	3.9	73	1117	1.3
380.3	2.1	17	2.2	58	949	0.260	30	4.1	89	1085	0.190
381.2	1.5	21	1.5	47	793	0.898	21	2.7	72	907	0.655
382.1	1.9	15	1.9	42	909	1.3	27	3.5	65	1040	0.940
383.0	1.7	17	2.1	47	1012	1.1	24	3.9	72	1157	0.778
384.0	1.4	19	1.8	50	858	1.3	20	3.3	76	981	0.940
384.9	2.0	13	1.9	46	766	1.5	29	3.5	71	876	1.1
385.8	1.4	17	1.4	49	699	1.7	20	2.6	75	799	1.2
386.7	2.6	20	2.3	48	1049	0.942	38	4.1	74	1199	0.687
387.7	1.4	20	2.3	61	891	0.325	21	4.3	94	1019	0.237
388.6	2.7	20	1.9	54	1028	0.823	39	3.5	83	1175	0.600
389.5	1.8	16	2.1	45	681	1.4	26	3.8	69	779	1.0
390.4	1.8	18	2.2	62	997	0.868	27	4.0	95	1140	0.633
391.4	1.3	18	1.9	64	978	0.288	18	3.4	98	1118	0.210
392.3	2.1	16	2.0	44	864	0.406	31	3.6	68	988	0.296
393.2	2.1	19	1.1	57	807	0.708	31	2.1	87	923	0.516
394.1	2.0	15	1.6	37	674	0.891	29	2.9	57	770	0.650
395.1	2.2	18	2.9	43	959	1.1	32	5.3	66	1096	0.804
396.0	1.9	20	1.5	62	1180	1.3	27	2.6	95	1349	0.964
396.9	1.8	15	1.8	54	937	1.2	26	3.2	83	1072	0.900
397.8	1.1	18	3.0	51	911	1.1	16	5.4	79	1042	0.776
398.7	2.5	21	2.0	55	958	0.435	36	3.6	85	1095	0.317
399.7	2.0	13	1.6	42	619	0.637	29	3.0	64	708	0.465
400.6	1.8	16	2.3	56	825	0.888	27	4.2	86	943	0.648
401.5	1.0	15	2.6	43	749	0.846	15	4.8	66	856	0.618
402.4	3.0	21	2.6	62	900	0.443	44	4.8	95	1029	0.323
403.4	2.2	19	1.9	49	728	1.2	32	3.5	75	833	0.841
404.3	2.1	15	2.4	49	810	1.1	30	4.4	75	926	0.805
405.2	2.4	23	2.6	62	1139	1.8	34	4.7	95	1303	1.3
406.1	0.788	20	2.0	43	864	0.632	11	3.6	65	988	0.461
407.1	1.6	14	2.0	37	606	0.111	23	3.6	57	693	0.081
408.0	2.4	17	2.1	49	877	0.288	34	3.8	74	1002	0.210
408.9	2.2	20	2.6	67	1129	0.175	32	4.8	103	1291	0.128
409.8	3.0	21	2.8	53	972	0.948	44	5.2	81	1112	0.692
410.8	1.6	20	1.7	51	1169	0.737	23	3.1	78	1337	0.538
411.7	2.2	19	2.3	63	1071	0.452	32	4.2	96	1225	0.330
412.6	3.2	13	3.1	62	926	0.623	46	5.6	95	1059	0.455
413.5	3.0	21	2.7	58	1015	1.3	44	4.9	89	1161	0.952
414.5	1.5	19	2.0	47	1065	1.7	22	3.7	72	1218	1.2
415.4	1.7	16	1.3	52	955	1.1	25	2.4	80	1092	0.797
416.3	1.3	17	1.5	39	586	0.081	19	2.7	59	670	0.059
417.2	1.7	15	2.1	48	961	0.240	25	3.8	73	1099	0.175
418.2	2.1	19	1.9	61	1200	1.4	30	3.4	93	1372	0.989
419.1	1.7	17	1.7	44	873	0.410	24	3.1	67	999	0.299
420.0	2.6	14	2.5	51	860	0.563	38	4.5	78	984	0.411
420.9	2.2	19	1.8	44	725	0.356	31	3.3	68	829	0.260
421.9	2.0	17	2.0	53	948	0.625	29	3.6	82	1084	0.456
422.8	2.3	17	1.5	55	943	0.782	33	2.8	84	1079	0.570
423.7	2.3	20	2.0	46	934	1.3	33	3.6	70	1068	0.917
424.6	2.7	16	1.9	51	909	0.021	39	3.5	79	1040	0.015
425.5	2.6	17	2.4	48	821	0.021	38	4.5	73	938	0.015
426.5	1.7	18	2.2	52	736	0.929	24	4.1	80	842	0.678
427.4	1.9	17	2.1	53	1055	0.728	27	3.7	81	1207	0.531
428.3	3.0	18	2.0	49	961	1.1	43	3.7	75	1099	0.832
429.2	2.2	16	1.8	60	992	0.837	32	3.3	92	1134	0.611
430.2	2.3	19	2.2	43	985	0.451	33	4.0	66	1126	0.329
431.1	2.2	17	2.8	41	729	0.660	32	5.0	63	834	0.481
432.0	1.9	15	2.7	45	888	0.296	28	4.9	69	1015	0.216
432.9	0.738	18	1.9	56	1117	1.2	11	3.4	86	1277	0.856
433.9	1.9	18	2.1	63	916	1.1	27	3.9	96	1047	0.835
434.8	1.7	13	2.1	52	674	0.371	25	3.8	80	771	0.271
435.7	2.1	20	2.7	54	910	0.304	30	4.9	82	1040	0.222
436.6	1.5	20	2.3	49	948	0.594	22	4.2	75	1084	0.434
437.6	2.2	16	2.0	39	638	0.524	32	3.7	60	729	0.382
438.5	2.1	18	2.1	42	1106	0.617	30	3.9	64	1265	0.450
439.4	1.6	22	1.9	58	1210	0.967	23	3.4	89	1384	0.705
440.3	2.1	17	2.2	49	783	0.630	30	4.0	75	896	0.459
441.3	2.3	22	2.8	63	1062	0.999	33	5.1	96	1215	0.729
442.2	1.5	15	2.2	60	969	0.781	22	3.9	91	1108	0.570
443.1	1.4	17	1.9	52	659	0.783	20	3.4	80	754	0.571
444.0	1.7	22	1.9	53	997	0.636	24	3.5	82	1141	0.464
445.0	0.854	17	1.9	41	680	0.343	12	3.5	63	777	0.250
445.9	1.3	15	2.0	51	793	1.2	19	3.6	78	907	0.843
446.8	1.3	12	1.9	42	642	1.1	19	3.5	65	735	0.774
447.7	2.0	19	3.0	55	1065	1.3	29	5.4	85	1217	0.938
448.7	1.9	18	2.3	52	971	0.667	27	4.1	80	1110	0.487



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
449.6	1.3	14	1.8	43	711	1.2	19	3.4	65	813	0.845
450.5	1.7	15	3.2	52	627	0.655	25	5.8	80	717	0.478
451.4	2.0	23	2.1	65	1093	0.473	29	3.8	99	1250	0.345
452.4	1.2	16	1.4	55	821	0.886	18	2.6	84	939	0.646
453.3	3.3	18	2.1	59	920	0.630	48	3.9	91	1052	0.460
454.2	1.5	22	1.8	50	949	1.5	22	3.3	77	1085	1.1
455.1	1.1	14	1.6	39	697	0.947	16	2.9	60	797	0.691
456.0	2.1	16	2.7	65	814	1.3	30	4.9	100	930	0.939
457.0	2.1	21	2.4	48	973	1.1	30	4.4	73	1112	0.782
457.9	2.2	17	1.7	65	1073	2.2	32	3.1	100	1227	1.6
458.8	1.5	12	1.7	44	628	0.599	21	3.2	68	718	0.437
459.7	2.6	20	2.6	53	1130	1.8	38	4.8	81	1292	1.3
460.7	1.0	18	1.9	49	909	1.1	15	3.5	74	1039	0.817
461.6	1.8	16	1.5	56	841	1.1	26	2.7	86	962	0.813
462.5	1.7	17	1.9	50	976	1.6	25	3.6	76	1116	1.2
463.4	1.6	17	1.9	65	903	1.1	22	3.5	99	1033	0.766
464.4	2.2	17	1.6	53	684	1.0	32	3.0	82	783	0.758
465.3	1.3	24	2.4	54	718	1.1	19	4.3	82	822	0.802
466.2	1.6	24	1.4	43	1207	1.9	22	2.5	65	1380	1.4
467.1	1.6	18	1.8	51	717	1.0	22	3.3	79	819	0.738
468.1	2.2	16	2.1	59	972	0.607	32	3.9	90	1111	0.443
469.0	1.5	20	2.5	54	1138	0.462	22	4.5	82	1301	0.337
469.9	1.2	17	2.2	71	800	1.0	18	4.0	109	915	0.730
470.8	1.3	20	2.7	62	961	1.4	19	5.0	95	1099	1.0
471.8	2.3	21	2.6	58	938	0.021	34	4.8	88	1073	0.015
472.7	1.2	16	1.5	55	784	1.3	17	2.8	85	897	0.961
473.6	1.1	16	2.3	42	700	0.518	16	4.2	64	800	0.378
474.5	2.6	22	2.2	57	1023	0.506	37	4.0	87	1170	0.369
475.5	1.2	17	2.5	56	1129	0.642	17	4.6	85	1291	0.468
476.4	1.2	16	2.0	54	726	1.6	18	3.6	82	830	1.1
477.3	3.3	16	2.2	55	935	0.475	47	4.1	84	1069	0.346
478.2	1.8	22	2.6	70	1037	0.314	25	4.8	108	1186	0.229
479.1	1.2	14	2.3	58	736	1.8	17	4.2	88	842	1.3
480.1	1.8	17	2.2	61	1064	1.5	26	4.0	94	1216	1.1
481.0	2.1	20	2.4	65	889	1.7	30	4.4	100	1017	1.3
481.9	1.9	14	1.8	47	783	0.376	28	3.4	72	895	0.275
482.8	2.1	16	2.2	67	946	0.720	30	4.0	103	1082	0.525
483.8	2.2	18	2.4	54	1076	1.2	32	4.3	82	1230	0.849
484.7	1.8	15	1.9	51	964	0.269	26	3.5	78	1102	0.196
485.6	1.4	16	2.0	62	999	0.421	20	3.6	95	1143	0.307
486.5	2.2	16	2.7	62	1170	0.823	31	5.0	95	1338	0.601
487.5	1.4	16	1.8	47	766	0.872	21	3.2	73	876	0.636
488.4	1.5	16	1.6	37	671	0.585	22	3.0	57	767	0.426
489.3	2.5	17	2.4	65	1128	0.786	36	4.4	99	1290	0.574
490.2	1.5	14	2.2	48	880	2.1	22	4.1	74	1006	1.5
491.2	1.2	22	2.0	50	1264	1.9	17	3.6	77	1445	1.4
492.1	2.1	14	1.3	50	793	1.1	30	2.3	76	907	0.809
493.0	2.5	19	2.3	41	882	0.992	35	4.1	63	1008	0.724
493.9	1.6	21	1.4	63	1258	1.6	23	2.6	97	1439	1.2
494.9	1.6	17	1.8	42	774	1.6	23	3.3	65	885	1.2
495.8	2.1	16	1.9	29	704	2.1	30	3.4	44	805	1.5
496.7	2.2	16	1.8	34	924	1.4	32	3.3	52	1056	0.999
497.6	1.4	17	1.4	48	805	1.5	21	2.6	73	920	1.1
498.6	1.1	15	1.7	48	838	2.4	16	3.2	74	959	1.7
499.5	1.9	18	1.8	42	578	0.744	28	3.3	64	661	0.543
500.4	1.3	24	1.2	46	1407	2.1	18	2.2	71	1609	1.5
501.3	2.1	18	1.4	46	620	0.978	30	2.6	71	709	0.714
502.3	3.7	17	1.6	36	970	1.3	53	2.8	55	1109	0.921
503.2	2.8	22	1.7	38	1384	2.4	41	3.0	58	1583	1.8
504.1	1.3	13	1.5	92	787	2.0	19	2.8	140	900	1.5
505.0	1.4	23	1.6	47	952	1.5	21	2.9	72	1089	1.1
505.9	2.0	20	1.6	41	733	1.7	29	2.9	63	838	1.2
506.9	1.4	16	1.4	51	885	2.3	20	2.6	79	1012	1.7
507.8	1.6	22	1.2	43	876	3.1	23	2.1	65	1001	2.2
508.7	2.3	17	1.6	46	1064	1.2	33	3.0	70	1217	0.847
509.6	1.8	16	1.2	39	762	1.2	26	2.2	60	871	0.878
510.6	1.7	18	1.6	46	898	1.4	25	2.9	71	1027	1.0
511.5	1.6	17	1.3	37	860	1.1	24	2.4	56	983	0.829
512.4	1.2	15	1.6	48	788	1.2	17	3.0	73	901	0.857
513.3	1.4	17	1.8	43	935	0.965	20	3.2	66	1069	0.704
514.3	1.8	15	1.2	39	1129	1.2	26	2.2	60	1291	0.897
515.2	2.5	20	1.4	47	1199	1.3	37	2.6	73	1371	0.917
516.1	1.2	12	1.6	32	789	1.6	18	2.8	49	902	1.2
517.0	2.4	17	1.8	38	772	1.1	35	3.3	58	883	0.815
518.0	1.9	20	1.6	52	1165	2.1	28	3.0	79	1332	1.5
518.9	0.613	15	0.793	46	875	1.1	8.8	1.4	70	1001	0.806
519.8	1.2	14	1.6	45	765	2.9	18	2.9	69	875	2.1
520.7	1.7	14	1.9	34	809	1.9	24	3.4	53	926	1.4
521.7	1.5	16	1.2	39	1141	3.1	22	3.9	60	1305	2.3
522.6	2.3	14	2.1	31	835	2.6	34	2.2	48	955	1.9
523.5	1.8	14	1.4	48	861	1.9	25	2.6	74	985	1.4



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Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
524.4	2.3	24	0.794	39	1243	1.6	33	1.4	59	1422	1.2
525.4	1.3	12	1.1	39	777	0.938	19	1.9	60	888	0.685
526.3	1.3	15	1.3	39	926	2.5	18	2.3	60	1059	1.8
527.2	2.3	27	1.5	30	1361	1.5	34	2.6	46	1557	1.1
528.1	1.1	11	0.852	35	831	1.7	17	1.6	53	950	1.2
529.1	0.545	9.3	1.1	33	731	2.6	7.9	2.0	50	835	1.9
530.0	2.1	18	1.2	33	763	1.2	30	2.2	50	873	0.841
530.9	1.4	15	0.727	42	917	1.9	20	1.3	65	1049	1.4
531.8	1.5	20	1.5	45	873	2.1	21	2.7	69	999	1.5
532.7	1.3	20	1.1	40	939	1.5	19	2.0	61	1074	1.1
533.7	1.4	16	0.707	36	838	1.6	20	1.3	55	958	1.2
534.6	2.1	15	1.4	35	918	2.7	30	2.5	53	1050	1.9
535.5	1.8	13	1.2	30	911	1.5	26	2.1	46	1042	1.1
536.4	2.1	16	0.766	33	743	3.0	30	1.4	51	850	2.2
537.4	1.3	14	0.980	38	793	1.8	19	1.8	59	907	1.3
538.3	1.7	16	0.804	30	646	1.9	24	1.5	46	739	1.4
539.2	2.4	24	0.746	40	1017	0.949	34	1.4	62	1163	0.693
540.1	1.6	14	1.0	35	1131	1.5	23	1.9	53	1294	1.1
541.1	1.2	8.3	0.812	25	615	0.794	17	1.5	39	703	0.579
542.0	1.7	16	1.3	33	890	1.2	25	2.3	51	1018	0.906
542.9	1.8	15	1.1	32	834	2.5	27	2.0	48	954	1.8
543.8	1.3	13	0.779	28	776	2.8	19	1.4	42	887	2.0
544.8	1.5	17	1.2	34	987	2.2	22	2.1	53	1129	1.6
545.7	0.659	15	0.921	22	938	1.7	9.5	1.7	33	1072	1.2
546.6	0.889	11	0.824	29	719	0.725	13	1.5	45	822	0.529
547.5	1.4	13	1.1	30	703	2.1	20	2.0	47	804	1.5
548.5	2.2	15	0.706	32	857	0.860	32	1.3	49	980	0.628
549.4	0.726	17	0.872	36	842	1.8	10	1.6	56	962	1.3
550.3	1.3	13	0.863	17	594	0.976	19	1.6	26	680	0.712
551.2	1.6	17	1.4	33	939	0.825	24	2.5	51	1074	0.602
552.2	1.3	19	0.992	32	1192	0.999	19	1.8	49	1363	0.729
553.1	1.6	13	0.633	27	751	1.7	23	1.2	41	859	1.2
554.0	1.6	16	0.800	29	1262	1.9	22	1.5	45	1443	1.4
554.9	1.5	19	0.797	25	952	1.5	22	1.5	38	1089	1.1
555.9	1.3	15	0.573	27	672	0.999	19	1.0	41	768	0.729
556.8	2.3	13	1.2	39	1205	1.8	33	2.1	60	1378	1.3
557.7	0.883	22	1.1	26	1353	1.4	13	2.1	40	1548	1.0
558.6	0.617	13	0.375	20	824	1.5	8.9	0.683	31	942	1.1
559.5	1.1	11	0.828	28	814	1.7	16	1.5	43	931	1.2
560.5	1.4	18	1.1	24	1204	0.771	20	2.0	37	1377	0.562
561.4	2.2	17	0.821	35	1145	2.2	32	1.5	54	1309	1.6
562.3	1.6	14	0.806	23	800	1.1	24	1.5	36	915	0.791
563.2	1.7	19	0.987	25	1031	1.2	24	1.8	38	1180	0.871
564.2	1.4	18	0.933	29	1153	1.4	20	1.7	44	1319	1.0
565.1	1.1	15	0.739	18	829	1.2	16	1.3	28	948	0.853
566.0	0.482	14	0.755	21	784	1.1	7.0	1.4	32	897	0.793
566.9	1.5	18	0.844	22	1129	0.810	21	1.5	34	1291	0.591
567.9	2.2	17	0.264	33	1088	1.1	32	0.481	51	1244	0.839
568.8	0.704	9.3	0.572	18	539	1.2	10	1.0	28	616	0.840
569.7	1.8	16	0.764	16	873	0.794	26	1.4	25	998	0.579
570.6	0.882	12	0.415	21	928	0.512	13	0.757	32	1061	0.374
571.6	0.869	6.1	0.343	14	507	0.203	13	0.626	22	580	0.148
572.5	1.5	15	0.362	21	828	0.560	21	0.661	33	947	0.409
573.4	1.8	15	0.772	33	1631	1.7	26	1.4	51	1865	1.2
574.3	0.647	13	0.268	26	870	1.7	9.3	0.488	40	995	1.2
575.3	1.0	15	0.614	16	1045	1.2	15	1.1	24	1195	0.898
576.2	1.2	14	0.569	19	772	0.866	18	1.0	28	882	0.632
577.1	0.816	12	0.434	22	836	0.522	12	0.791	34	956	0.381
578.0	0.409	15	0.431	21	1191	1.2	5.9	0.786	32	1362	0.894
579.0	0.716	11	0.514	26	1037	0.763	10	0.938	40	1185	0.557
579.9	0.800	15	0.362	28	1334	1.2	12	0.661	43	1526	0.847
580.8	1.5	12	0.375	19	785	0.493	22	0.684	29	898	0.359
581.7	1.1	15	0.744	17	1130	1.9	15	1.4	26	1292	1.4
582.6	1.0	17	0.492	26	1134	0.592	15	0.897	40	1297	0.432
583.6	0.780	12	0.519	16	958	1.3	11	0.946	24	1096	0.922
584.5	1.2	14	0.611	23	874	0.944	17	1.1	35	999	0.689
585.4	1.0	13	0.636	20	741	0.440	15	1.2	31	848	0.321
586.3	0.895	12	0.527	18	656	0.457	13	0.962	28	750	0.334
587.3	0.963	10	0.563	22	801	1.0	14	1.0	33	916	0.739
588.2	0.534	14	0.458	21	1139	0.970	7.7	0.835	32	1303	0.708
589.1	0.714	10	0.526	18	844	1.2	10	0.960	27	965	0.845
590.0	1.1	8.0	0.363	20	767	1.7	16	0.662	30	877	1.2
591.0	1.5	15	0.402	22	1195	0.851	21	0.733	33	1366	0.621
591.9	2.0	12	0.612	22	1087	1.4	29	1.1	34	1243	1.0
592.8	1.4	11	0.591	21	933	1.1	21	1.1	32	1067	0.806
593.7	1.2	14	0.274	15	1088	0.922	17	0.500	24	1244	0.673
594.7	1.3	11	0.189	17	1439	0.352	19	0.345	26	1645	0.257
595.6	0.849	9.4	0.389	10	641	0.309	12	0.710	16	733	0.225
596.5	1.0	8.8	0.759	19	992	0.584	14	1.4	29	1134	0.426
597.4	1.2	16	0.660	18	1034	1.0	18	1.2	28	1182	0.734
598.4	1.8	10	0.386	24	1058	0.629	26	0.704	38	1210	0.459



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
599.3	1.5	16	0.441	19	1063	0.697	21	0.804	28	1216	0.508
600.2	2.4	18	0.527	17	1061	0.418	35	0.962	26	1213	0.305
601.1	0.966	9.6	0.559	24	1035	1.2	14	1.0	37	1184	0.859
602.1	1.3	11	0.372	19	939	0.924	19	0.678	30	1074	0.674
603.0	1.8	11	0.803	28	1238	0.580	26	1.5	42	1415	0.423
603.9	1.6	11	0.352	21	1259	0.497	23	0.642	32	1440	0.363
604.8	2.0	10	0.460	20	1093	0.108	29	0.839	31	1250	0.079
605.8	1.2	10	0.632	18	1099	0.882	18	1.2	28	1256	0.643
606.7	1.0	17	0.309	23	1064	0.768	15	0.564	35	1216	0.561
607.6	0.228	6.6	0.336	18	987	0.769	3.3	0.613	28	1129	0.561
608.5	1.1	8.9	0.703	13	650	1.1	16	1.3	20	743	0.828
609.4	1.6	11	0.322	20	1377	0.684	23	0.586	31	1574	0.499
610.4	1.3	10.0	0.483	30	1473	0.729	18	0.881	46	1684	0.532
611.3	1.1	10	0.232	21	1000	1.1	16	0.423	32	1144	0.830
612.2	1.8	11	0.478	19	876	0.021	26	0.871	29	1002	0.015
613.1	0.889	10	0.368	17	985	0.915	13	0.671	27	1127	0.667
614.1	0.720	9.2	0.488	17	749	1.1	10	0.890	26	856	0.783
615.0	2.0	15	0.542	24	1187	1.2	29	0.989	37	1357	0.877
615.9	2.0	22	0.586	23	1435	0.645	28	1.1	35	1641	0.471
616.8	0.980	10	0.381	21	845	0.905	14	0.695	31	967	0.661
617.8	2.2	9.7	0.643	21	1309	0.851	32	1.2	33	1497	0.621
618.7	0.893	9.7	0.310	24	1206	0.724	13	0.566	36	1379	0.528
619.6	0.598	9.9	0.287	17	662	0.892	8.6	0.523	25	756	0.651
620.5	0.904	7.0	0.432	16	644	0.549	13	0.787	25	737	0.401
621.5	3.0	13	0.596	20	1501	0.834	43	1.1	30	1717	0.608
622.4	1.8	16	0.205	27	1311	0.604	27	0.374	41	1499	0.441
623.3	0.836	10	0.496	21	949	0.488	12	0.904	31	1085	0.356
624.2	2.5	15	0.292	24	1430	0.472	36	0.533	37	1635	0.344
625.2	1.5	12	0.564	32	1694	0.524	22	1.0	49	1937	0.382
626.1	0.898	10	0.629	25	925	0.525	13	1.1	38	1058	0.383
627.0	0.882	12	0.492	19	913	1.2	13	0.897	30	1044	0.853
627.9	2.0	11	0.474	23	1490	0.460	28	0.864	36	1704	0.335
628.9	1.2	10	0.406	21	808	0.318	17	0.740	31	924	0.232
629.8	1.2	7.6	0.473	17	990	0.594	17	0.862	26	1132	0.433
630.7	1.6	16	0.468	20	1186	0.366	23	0.854	31	1356	0.267
631.6	1.0	8.7	0.205	21	1290	0.781	15	0.374	32	1476	0.570
632.6	0.812	5.9	0.390	25	854	0.658	12	0.711	39	976	0.480
633.5	1.6	11	0.506	33	1390	0.146	23	0.922	50	1589	0.106
634.4	1.4	15	0.477	21	1532	0.500	20	0.869	32	1752	0.364
635.3	0.289	9.1	0.183	22	1019	0.756	4.2	0.335	34	1165	0.552
636.2	1.4	12	0.593	25	871	0.590	21	1.1	39	996	0.430
637.2	0.552	14	0.368	26	1924	0.280	8.0	0.671	41	2201	0.205
638.1	0.708	9.6	0.348	25	923	0.682	10	0.635	39	1056	0.498
639.0	2.2	13	0.504	31	1296	0.850	32	0.918	48	1482	0.620
639.9	1.6	21	0.563	27	1476	0.739	23	1.0	42	1688	0.539
640.9	1.1	11	0.337	22	1186	0.660	16	0.615	34	1357	0.482
641.8	1.2	10	0.388	14	792	0.092	17	0.708	22	905	0.067
642.7	0.747	11	0.368	25	1230	0.236	11	0.671	38	1407	0.172
643.6	1.0	12	0.196	22	1288	0.746	15	0.357	33	1473	0.544
644.6	0.794	10	0.433	26	1223	0.752	11	0.791	40	1398	0.548
645.5	1.1	12	0.382	29	1040	0.540	16	0.697	44	1190	0.394
646.4	1.4	14	0.421	21	1188	0.893	20	0.769	33	1359	0.651
647.3	0.464	8.7	0.183	23	779	0.236	6.7	0.335	35	890	0.172
648.3	1.9	12	0.183	19	1006	0.248	28	0.335	28	1150	0.181
649.2	1.5	14	0.311	27	1555	1.2	22	0.567	41	1778	0.873
650.1	1.1	9.1	0.376	19	740	0.582	15	0.686	29	847	0.424
651.0	0.503	7.9	0.446	17	758	0.567	7.3	0.813	26	867	0.414
652.0	0.816	12	0.338	29	1315	0.284	12	0.616	45	1504	0.207
652.9	0.737	12	0.421	22	925	0.472	11	0.768	34	1058	0.344
653.8	0.659	8.1	0.320	24	867	0.677	9.5	0.583	37	992	0.494
654.7	1.2	10	0.590	25	837	0.642	17	1.1	38	957	0.469
655.7	0.760	13	0.914	26	959	1.0	11	1.7	40	1097	0.734
656.6	0.964	7.9	0.423	21	843	0.791	14	0.772	32	963	0.577
657.5	0.784	11	0.632	30	1114	0.247	11	1.2	47	1274	0.180
658.4	1.3	14	0.446	31	1235	0.286	18	0.814	48	1412	0.209
659.4	1.2	11	0.439	30	935	0.541	17	0.800	46	1069	0.395
660.3	0.873	11	0.601	32	982	1.2	13	1.1	49	1123	0.879
661.2	2.0	17	0.579	30	943	0.459	29	1.1	46	1079	0.335
662.1	1.7	16	0.808	37	1030	0.114	24	1.5	56	1178	0.083
663.0	0.540	7.1	0.481	33	865	0.478	7.8	0.878	50	989	0.349
664.0	1.6	12	0.524	29	1187	0.909	23	0.956	45	1358	0.663
664.9	1.5	14	0.795	37	1170	1.2	22	1.5	57	1338	0.865
665.8	0.785	9.1	0.640	16	530	0.072	11	1.2	25	606	0.053
666.7	1.2	9.8	0.851	34	1221	0.807	17	1.6	53	1396	0.588
667.7	1.3	17	0.772	35	1405	0.669	19	1.4	54	1607	0.488
668.6	0.751	11	0.419	30	944	0.773	11	0.764	46	1079	0.564
669.5	0.884	12	0.937	32	961	0.254	13	1.7	49	1099	0.186
670.4	1.6	19	0.644	31	1193	0.265	24	1.2	48	1364	0.193
671.4	2.3	15	0.854	41	1305	0.406	33	1.6	63	1492	0.297
672.3	0.694	12	0.739	29	1204	0.739	10	1.3	44	1377	0.539
673.2	2.0	16	1.0	29	1159	0.392	29	1.9	45	1325	0.286



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
674.1	1.6	11	1.4	32	998	0.228	23	2.5	49	1141	0.166
675.1	1.1	9.1	0.819	25	623	0.402	16	1.5	39	712	0.294
676.0	1.7	13	1.6	38	1157	0.848	25	3.0	59	1323	0.618
676.9	2.1	15	0.703	42	1194	0.532	30	1.3	65	1366	0.388
677.8	1.4	14	1.3	44	1315	0.689	21	2.4	68	1503	0.503
678.8	2.3	16	1.1	34	899	0.607	34	2.1	52	1028	0.443
679.7	1.7	17	1.4	46	1484	0.708	25	2.6	70	1697	0.517
680.6	1.5	13	0.931	32	726	0.884	22	1.7	50	830	0.645
681.5	2.2	17	1.1	39	957	0.664	32	2.0	60	1094	0.484
682.5	1.9	10	0.895	32	1016	0.674	27	1.6	50	1162	0.492
683.4	1.5	12	1.4	38	1303	0.863	22	2.5	58	1490	0.630
684.3	1.7	13	0.629	36	1071	0.435	25	1.1	56	1225	0.317
685.2	1.4	18	1.4	33	1193	0.688	21	2.6	50	1365	0.502
686.2	2.0	13	0.798	29	785	0.804	30	1.5	45	897	0.587
687.1	2.1	13	1.5	45	942	0.774	30	2.7	69	1077	0.565
688.0	2.3	16	1.2	51	1114	0.830	32	2.2	78	1273	0.606
688.9	1.6	16	1.5	39	1302	1.2	23	2.7	60	1489	0.854
689.8	2.3	14	0.893	43	846	0.681	33	1.6	66	967	0.497
690.8	2.3	9.7	1.2	40	842	0.376	33	2.2	61	963	0.274
691.7	3.1	19	0.785	37	1121	0.500	45	1.4	57	1282	0.365
692.6	1.5	13	0.940	44	937	0.572	22	1.7	67	1071	0.417
693.5	1.4	8.2	1.2	54	974	0.726	21	2.2	83	1113	0.530
694.5	2.6	15	1.3	49	1380	0.612	37	2.4	75	1578	0.447
695.4	2.1	17	0.934	36	1518	0.733	31	1.7	55	1736	0.535
696.3	1.3	13	1.2	49	833	0.690	18	2.2	75	953	0.504
697.2	3.7	18	1.5	35	1070	0.289	53	2.8	54	1224	0.211
698.2	1.7	13	1.2	35	1242	0.233	24	2.2	53	1420	0.170
699.1	2.0	11	1.0	49	942	1.1	29	1.9	76	1078	0.830
700.0	3.3	14	1.1	46	1023	0.353	48	2.0	71	1170	0.257
700.9	2.9	19	0.929	35	1362	0.425	42	1.7	54	1557	0.310
701.9	2.0	16	1.2	45	1114	0.674	29	2.3	69	1274	0.492
702.8	1.8	15	0.910	43	1189	0.874	26	1.7	66	1360	0.638
703.7	1.9	14	0.622	39	1240	0.387	27	1.1	59	1418	0.283
704.6	2.4	16	0.924	90	1410	0.855	35	1.7	138	1612	0.624
705.6	1.3	9.0	1.2	26	707	0.629	19	2.1	40	809	0.459
706.5	2.6	11	1.3	36	1096	1.3	38	2.4	55	1253	0.964
707.4	2.4	16	1.3	39	1530	0.884	35	2.4	60	1749	0.645
708.3	2.4	17	0.945	56	1385	1.2	34	1.7	86	1583	0.892
709.3	1.9	14	1.5	22	785	0.748	28	2.6	34	897	0.546
710.2	2.5	16	1.0	42	1862	1.3	36	1.9	64	2130	0.974
711.1	1.6	10	0.675	35	669	0.702	23	1.2	54	765	0.513
712.0	1.9	11	1.1	51	1157	1.1	28	1.9	78	1323	0.774
713.0	2.3	18	1.3	34	1744	0.267	33	2.5	52	1995	0.195
713.9	1.4	10	0.419	22	649	0.181	20	0.764	34	742	0.132
714.8	2.2	13	0.601	33	803	0.434	32	1.1	50	919	0.317
715.7	2.0	18	1.4	28	905	0.395	29	2.5	44	1034	0.289
716.7	1.9	18	1.4	37	1216	0.508	28	2.5	57	1391	0.371
717.6	1.5	15	1.2	40	911	2.4	22	2.2	61	1042	1.8
718.5	2.0	11	1.0	33	942	1.9	29	1.8	50	1077	1.4
719.4	1.9	17	0.733	28	1355	1.2	28	1.3	43	1549	0.894
720.3	1.4	15	0.912	42	1109	1.3	20	1.7	64	1268	0.925
721.3	2.5	18	0.836	30	977	1.5	36	1.5	46	1117	1.1
722.2	1.4	19	0.477	26	946	1.5	21	0.869	40	1081	1.1
723.1	0.994	11	0.610	27	867	0.918	14	1.1	41	991	0.670
724.0	1.7	13	1.1	39	860	2.3	25	1.9	60	983	1.7
725.0	2.8	18	0.797	28	1121	1.0	40	1.5	42	1282	0.739
725.9	1.1	16	0.567	22	1397	1.2	15	1.0	34	1597	0.871
726.8	1.3	11	0.619	19	638	0.497	18	1.1	29	729	0.363
727.7	1.2	13	0.680	25	779	1.4	17	1.2	38	891	1.0
728.7	1.7	21	0.746	30	1314	1.7	25	1.4	45	1503	1.3
729.6	1.1	11	0.485	32	710	1.0	16	0.884	49	811	0.743
730.5	2.9	13	0.703	25	922	1.7	41	1.3	39	1054	1.2
731.4	1.8	17	1.1	28	1078	1.5	26	2.0	43	1233	1.1
732.4	1.2	12	0.694	41	1023	1.3	18	1.3	62	1170	0.922
733.3	1.3	8.4	0.571	17	657	1.4	19	1.0	26	751	0.996
734.2	2.2	18	0.887	25	969	1.2	32	1.6	38	1108	0.900
735.1	2.2	19	0.818	28	1352	0.996	32	1.5	42	1546	0.727
736.1	1.3	11	0.509	33	793	1.4	19	0.928	50	907	0.988
737.0	3.3	17	1.2	27	1082	0.952	47	2.2	42	1238	0.694
737.9	1.2	15	1.0	25	1265	1.0	17	1.8	38	1447	0.759
738.8	1.4	13	0.439	25	897	1.2	20	0.801	38	1025	0.901
739.8	1.8	12	0.797	18	750	1.8	26	1.5	27	858	1.3
740.7	0.655	17	0.735	17	1019	1.1	9.5	1.3	26	1166	0.771
741.6	0.701	10	0.896	23	604	0.903	10	1.6	35	691	0.659
742.5	1.2	12	0.699	19	924	1.9	17	1.3	29	1056	1.4
743.5	1.3	17	0.436	20	1080	3.0	19	0.796	30	1235	2.2
744.4	1.9	18	0.532	23	1667	1.6	27	0.970	35	1906	1.1
745.3	0.526	14	0.498	18	938	1.6	7.6	0.908	28	1072	1.1
746.2	1.8	14	0.648	11	727	1.7	26	1.2	17	831	1.2
747.1	1.8	17	0.322	19	1667	1.1	25	0.587	29	1906	0.809
748.1	1.4	11	0.970	22	770	1.7	21	1.8	34	881	1.2



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
749.0	1.9	14	0.979	15	969	1.6	27	1.8	22	1108	1.1
749.9	2.1	18	0.559	19	1114	2.5	31	1.0	29	1273	1.8
750.8	1.0	11	0.576	22	1051	1.5	15	1.1	34	1202	1.1
751.8	1.3	11	0.487	17	971	2.7	19	0.888	25	1111	2.0
752.7	1.4	20	0.423	14	1368	1.4	21	0.771	21	1564	1.0
753.6	1.1	16	0.317	14	1025	0.862	15	0.578	22	1172	0.629
754.5	0.762	9.2	0.455	12	672	1.4	11	0.830	19	768	1.0
755.5	2.1	17	0.628	18	1182	2.1	31	1.1	27	1352	1.5
756.4	1.9	15	0.489	15	1802	1.8	27	0.891	23	2061	1.3
757.3	1.2	11	0.400	16	769	1.8	17	0.730	24	879	1.3
758.2	1.5	8.6	0.584	18	1021	0.610	21	1.1	27	1167	0.445
759.2	0.956	16	0.644	17	1612	1.9	14	1.2	26	1843	1.4
760.1	1.1	10	0.284	15	732	1.3	16	0.518	24	837	0.960
761.0	1.1	11	0.682	12	1086	0.950	16	1.2	18	1242	0.693
761.9	1.2	18	0.183	17	1801	0.839	17	0.335	26	2060	0.612
762.9	1.8	10	0.411	15	1023	0.321	25	0.749	24	1170	0.234
763.8	1.2	10	0.656	12	786	1.1	17	1.2	19	899	0.785
764.7	1.5	14	0.238	8.7	1154	0.802	22	0.435	13	1320	0.585
765.6	1.1	11	0.183	16	1041	1.9	16	0.335	25	1191	1.4
766.6	1.7	12	0.338	13	935	2.5	25	0.616	20	1070	1.8
767.5	2.3	16	0.227	17	1370	1.1	33	0.414	26	1566	0.832
768.4	1.5	18	0.183	16	1913	1.4	21	0.335	24	2188	0.991
769.3	0.892	9.3	0.318	13	764	0.938	13	0.581	20	873	0.685
770.2	2.1	12	0.800	11	1117	0.510	30	1.5	17	1277	0.372
771.2	1.2	16	0.594	15	1925	1.5	17	1.1	24	2202	1.1
772.1	0.845	8.0	0.238	11	1055	0.800	12	0.434	16	1207	0.584
773.0	1.3	9.5	0.287	11	803	1.3	19	0.523	17	918	0.980
773.9	1.4	15	0.461	15	1464	1.6	21	0.840	23	1674	1.1
774.9	1.0	11	0.422	17	1287	1.8	15	0.770	26	1472	1.3
775.8	1.3	7.8	0.207	8.6	764	0.984	19	0.378	13	874	0.718
776.7	1.6	14	0.611	14	1311	1.4	24	1.1	22	1499	0.987
777.6	0.923	11	0.354	11	1186	1.4	13	0.645	16	1357	1.0
778.6	0.643	9.8	0.443	11	754	1.6	9.3	0.808	17	862	1.1
779.5	2.0	12	0.751	14	1044	0.568	29	1.4	22	1194	0.415
780.4	0.673	15	0.573	18	1529	0.666	9.7	1.0	28	1748	0.486
781.3	1.0	9.7	0.401	22	1315	0.786	15	0.732	34	1504	0.574
782.3	1.1	11	0.893	12	1265	1.3	16	1.6	18	1447	0.971
783.2	1.3	14	0.335	12	1323	0.572	19	0.611	19	1513	0.417
784.1	0.381	7.6	0.520	15	867	0.393	5.5	0.948	23	991	0.287
785.0	1.6	9.2	0.665	16	780	0.480	23	1.2	24	892	0.350
786.0	1.6	18	0.225	18	1493	1.6	23	0.410	28	1707	1.1
786.9	1.4	11	0.621	14	907	0.493	21	1.1	22	1037	0.359
787.8	1.3	8.5	0.729	22	827	0.759	19	1.3	34	946	0.554
788.7	1.2	18	1.1	18	1137	0.551	17	2.1	28	1301	0.402
789.7	1.2	18	0.832	16	1361	0.899	17	1.5	25	1557	0.656
790.6	0.945	9.0	0.622	20	826	0.828	14	1.1	31	944	0.604
791.5	1.5	13	0.992	18	1172	1.1	22	1.8	28	1341	0.782
792.4	1.0	9.9	0.948	22	898	0.377	15	1.7	34	1027	0.275
793.4	0.980	11	0.601	17	863	0.570	14	1.1	26	987	0.416
794.3	1.4	13	1.0	21	872	0.520	20	1.9	32	998	0.379
795.2	1.2	14	1.2	17	1023	0.761	18	2.2	26	1170	0.555
796.1	1.1	10	1.1	22	1064	0.289	16	1.9	33	1216	0.211
797.0	1.2	11	1.1	29	1187	0.575	17	2.0	45	1358	0.419
798.0	0.720	10	1.5	26	1243	1.0	10	2.6	39	1421	0.730
798.9	1.4	13	0.903	25	1077	0.645	20	1.6	39	1232	0.471
799.8	1.5	11	1.5	26	910	0.362	21	2.7	39	1040	0.264
800.7	0.903	13	1.6	18	792	0.126	13	3.0	28	906	0.092
801.7	1.2	12	1.2	17	796	0.503	17	2.1	26	910	0.367
802.6	0.884	8.9	1.9	24	785	1.3	13	3.5	37	898	0.950
803.5	1.4	12	1.6	25	955	0.539	20	2.9	38	1092	0.393
804.4	0.785	10	1.3	21	765	0.458	11	2.3	33	875	0.334
805.4	0.795	9.4	1.8	26	819	0.700	11	3.2	40	937	0.511
806.3	1.8	14	1.3	26	900	0.531	26	2.4	40	1029	0.388
807.2	0.986	14	1.5	28	861	0.396	14	2.8	43	985	0.289
808.1	0.960	9.6	1.2	22	774	0.357	14	2.1	33	885	0.260
809.1	0.580	13	1.4	27	757	0.914	8.4	2.6	41	866	0.667
810.0	0.377	14	1.8	30	866	0.276	5.4	3.2	45	990	0.202
810.9	0.848	15	1.5	40	922	0.751	12	2.8	61	1054	0.548
811.8	1.5	9.9	1.1	34	749	1.0	21	2.0	53	857	0.747
812.8	1.2	14	1.7	29	703	0.574	17	3.2	44	804	0.419
813.7	1.3	14	2.3	33	901	0.912	19	4.1	50	1031	0.666
814.6	1.3	15	2.3	29	738	1.7	19	4.1	45	844	1.2
815.5	0.896	13	2.0	27	678	0.359	13	3.7	41	776	0.262
816.5	1.3	14	2.4	32	794	0.679	19	4.4	49	908	0.496
817.4	1.4	10	1.7	33	615	0.500	20	3.1	50	703	0.365
818.3	1.1	13	2.1	35	740	0.457	16	3.7	54	846	0.334
819.2	0.819	14	2.2	40	778	0.726	12	4.0	61	890	0.530
820.2	1.3	17	2.3	43	856	0.133	18	4.1	66	979	0.097
821.1	0.949	15	2.3	35	689	0.414	14	4.2	54	788	0.302
822.0	0.859	15	2.7	36	681	0.120	12	5.0	55	779	0.088
822.9	0.760	9.0	1.7	29	621	0.557	11	3.1	44	710	0.406



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
823.8	0.928	13	1.7	29	700	0.321	13	3.0	45	800	0.234
824.8	1.3	13	2.6	37	856	0.966	18	4.7	56	978	0.705
825.7	0.755	14	2.1	49	614	0.805	11	3.8	76	703	0.587
826.6	1.5	9.2	1.9	34	489	0.609	22	3.4	53	560	0.444
827.5	1.8	13	2.7	36	624	0.964	26	4.9	56	713	0.704
828.5	0.787	16	3.0	39	674	1.1	11	5.6	60	770	0.833
829.4	1.2	16	3.0	31	490	0.694	17	5.4	47	560	0.506
830.3	0.908	15	2.2	49	670	0.396	13	4.0	75	767	0.289
831.2	0.653	17	2.5	49	735	0.288	9.4	4.6	75	840	0.210
832.2	1.6	19	2.4	52	687	0.758	23	4.4	80	785	0.553
833.1	1.0	11	2.6	43	539	0.756	15	4.8	67	616	0.552
834.0	1.7	20	2.9	39	684	0.386	24	5.2	60	782	0.281
834.9	0.724	16	2.8	42	651	0.772	10	5.1	65	744	0.563
835.9	1.2	13	2.7	37	522	0.120	17	4.9	57	597	0.087
836.8	1.7	17	2.8	44	644	0.545	24	5.1	68	737	0.398
837.7	0.733	14	3.0	40	546	1.2	11	5.5	62	624	0.857
838.6	1.0	14	3.4	44	658	0.584	15	6.2	67	752	0.426
839.6	1.1	14	2.2	35	515	0.703	17	4.0	54	589	0.513
840.5	1.6	19	3.7	47	678	0.540	24	6.7	73	776	0.394
841.4	0.746	14	3.2	40	522	0.356	11	5.8	61	597	0.260
842.3	2.6	16	2.6	49	579	1.2	37	4.8	75	662	0.906
843.3	1.9	16	3.6	46	644	0.767	28	6.5	71	737	0.560
844.2	0.917	17	2.7	40	539	0.243	13	4.9	61	616	0.177
845.1	1.8	15	3.1	37	620	0.793	25	5.6	57	709	0.579
846.0	1.3	17	2.7	51	559	0.294	19	5.0	78	640	0.214
847.0	1.6	15	2.4	40	474	0.668	23	4.4	61	542	0.487
847.9	0.955	15	2.3	33	504	0.668	14	4.1	50	576	0.487
848.8	1.2	13	2.1	28	477	0.641	18	3.9	44	546	0.468
849.7	0.877	17	2.4	37	479	0.471	13	4.4	56	548	0.344
850.6	0.759	18	2.6	49	611	0.903	11	4.7	75	699	0.659
851.6	1.1	14	2.8	48	511	0.490	15	5.1	74	584	0.357
852.5	0.973	18	3.1	43	627	0.623	14	5.6	66	716	0.454
853.4	1.4	15	2.2	39	496	0.556	20	4.0	59	567	0.406
854.3	0.751	13	3.0	36	524	0.800	11	5.4	55	600	0.584
855.3	1.2	16	2.6	42	494	0.362	17	4.7	64	565	0.264
856.2	1.1	13	2.9	39	553	0.260	16	5.3	60	633	0.190
857.1	1.1	16	2.5	44	461	0.392	15	4.6	68	528	0.286
858.0	0.816	15	2.1	32	423	0.883	12	3.9	49	484	0.644
859.0	0.730	18	3.1	42	535	0.467	11	5.7	64	612	0.341
859.9	1.7	22	2.1	41	399	0.347	24	3.9	63	456	0.253
860.8	0.770	11	2.3	41	345	0.336	11	4.2	63	395	0.245
861.7	0.686	19	3.1	39	492	0.816	9.9	5.6	60	563	0.595
862.7	0.752	21	2.5	44	831	0.397	11	4.5	67	950	0.290
863.6	1.1	16	1.8	37	390	0.793	16	3.4	57	446	0.579
864.5	0.976	18	3.6	39	453	1.3	14	6.6	61	518	0.984
865.4	1.3	21	1.8	40	492	0.249	19	3.3	61	563	0.182
866.4	0.976	11	1.6	32	552	0.423	14	2.9	50	402	0.309
867.3	1.8	13	2.6	41	523	0.237	25	4.8	62	598	0.173
868.2	0.914	23	2.1	39	609	0.367	13	3.8	59	696	0.268
869.1	1.2	17	1.9	48	494	0.389	17	3.5	73	565	0.284
870.1	1.0	9.8	1.7	30	309	0.727	15	3.1	46	353	0.530
871.0	2.1	21	2.5	42	597	0.634	31	4.5	65	682	0.463
871.9	0.333	15	2.3	43	536	0.474	4.8	4.2	66	613	0.346
872.8	0.544	14	2.4	37	450	0.856	7.8	4.3	56	515	0.625
873.7	1.5	15	2.9	28	423	0.613	22	5.3	43	484	0.447
874.7	0.774	23	2.2	34	625	0.611	11	3.9	52	715	0.446
875.6	0.821	15	2.2	49	462	1.3	12	4.0	76	528	0.966
876.5	0.437	16	1.9	34	372	0.667	6.3	3.4	51	425	0.487
877.4	1.8	23	1.8	31	472	0.522	26	3.2	47	540	0.381
878.4	0.907	15	1.9	33	559	0.612	13	3.4	51	639	0.446
879.3	0.516	14	1.9	36	505	1.6	7.4	3.5	55	578	1.2
880.2	1.2	16	1.9	32	449	0.628	17	3.5	49	514	0.458
881.1	0.771	14	1.5	35	514	0.415	11	2.8	54	588	0.303
882.1	0.914	9.6	1.4	38	371	0.467	13	2.6	58	424	0.341
883.0	1.6	16	2.0	30	388	0.745	23	3.6	46	443	0.544
883.9	1.5	25	1.4	34	600	0.311	21	2.5	52	686	0.227
884.8	0.903	14	0.888	30	381	0.631	13	1.6	46	436	0.460
885.8	1.9	18	1.6	34	418	1.3	27	2.8	52	477	0.960
886.7	2.0	25	1.1	34	757	0.425	29	1.9	52	866	0.310
887.6	0.723	12	1.3	26	382	0.529	10	2.3	39	437	0.386
888.5	0.875	13	1.2	26	429	0.709	13	2.2	40	491	0.517
889.5	1.9	17	1.8	46	395	0.455	28	3.2	70	452	0.332
890.4	1.6	23	1.2	27	602	0.406	23	2.2	42	688	0.296
891.3	0.466	9.0	0.761	14	244	0.600	6.7	1.4	22	279	0.438
892.2	2.4	17	1.7	35	438	0.810	34	3.1	54	501	0.591
893.2	0.775	28	0.810	30	612	0.612	11	1.5	45	700	0.447
894.1	0.270	9.5	0.580	36	300	0.300	3.9	1.1	55	343	0.219
895.0	1.9	12	1.7	17	302	0.465	27	3.1	26	346	0.340
895.9	0.863	20	1.5	33	734	0.692	12	2.8	50	840	0.505
896.9	0.632	13	0.975	23	446	0.786	9.1	1.8	36	510	0.574
897.8	1.1	12	1.2	16	290	0.775	17	2.2	24	331	0.566



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Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
898.7	0.825	18	1.2	25	525	0.394	12	2.3	38	600	0.287
899.6	1.2	13	0.477	25	388	0.525	17	0.869	39	444	0.383
900.5	0.961	9.9	0.692	19	315	0.556	14	1.3	30	360	0.406
901.5	1.2	14	1.2	22	382	0.477	18	2.2	34	437	0.348
902.4	0.867	20	0.989	21	429	0.348	13	1.8	33	491	0.254
903.3	1.5	9.7	0.878	18	281	0.336	22	1.6	28	321	0.245
904.2	1.7	10	0.789	23	462	0.684	24	1.4	35	528	0.499
905.2	0.679	17	0.808	24	585	0.536	9.8	1.5	37	669	0.391
906.1	0.864	9.2	0.657	19	262	0.090	12	1.2	29	299	0.065
907.0	1.5	8.7	0.856	14	257	0.256	21	1.6	21	294	0.187
907.9	1.6	26	1.3	26	631	0.611	23	2.4	40	721	0.445
908.9	1.1	12	0.548	21	456	0.204	16	1.000	32	521	0.149
909.8	0.868	8.5	0.618	17	341	0.822	13	1.1	25	390	0.600
910.7	1.1	12	1.3	19	398	0.461	16	2.3	29	455	0.336
911.6	2.0	16	1.3	29	601	0.875	29	2.3	44	687	0.639
912.6	1.4	10	0.514	26	303	0.821	20	0.938	40	347	0.599
913.5	1.5	17	0.903	18	382	0.805	21	1.6	27	437	0.587
914.4	2.1	24	0.670	26	837	1.8	31	1.2	39	957	1.3
915.3	1.1	11	0.642	22	284	0.534	16	1.2	33	325	0.390
916.3	1.7	14	0.513	21	347	0.762	24	0.936	33	397	0.556
917.2	0.701	23	0.752	28	557	0.786	10	1.4	42	637	0.573
918.1	1.2	15	0.778	18	357	0.265	18	1.4	27	408	0.193
919.0	1.6	14	0.576	24	385	0.671	22	1.1	37	440	0.490
920.0	2.7	14	0.666	15	453	0.442	38	1.2	23	518	0.323
920.9	1.2	16	0.705	19	625	0.639	17	1.3	29	715	0.466
921.8	1.0	10	0.361	12	317	1.0	15	0.659	18	362	0.742
922.7	1.3	12	0.752	19	326	0.519	19	1.4	29	373	0.379
923.6	1.7	17	0.700	22	585	0.797	24	1.3	34	669	0.582
924.6	0.679	13	0.525	14	358	0.397	9.8	0.957	21	410	0.290
925.5	0.898	13	0.609	15	336	0.972	13	1.1	23	384	0.709
926.4	1.7	24	0.752	19	626	0.785	25	1.4	29	716	0.573
927.3	0.976	16	0.690	13	428	1.1	14	1.3	20	489	0.779
928.3	0.885	12	0.652	12	298	0.517	13	1.2	18	341	0.377
929.2	0.579	11	0.462	17	439	0.649	8.4	0.842	26	502	0.473
930.1	1.3	16	0.513	17	328	0.908	19	0.936	26	375	0.662
931.0	0.975	15	0.368	20	495	0.281	14	0.672	30	566	0.205
932.0	1.9	18	1.0	17	416	0.466	28	1.9	26	476	0.340
932.9	1.7	19	0.677	18	575	0.869	25	1.2	28	658	0.634
933.8	0.510	6.6	0.303	13	252	0.298	7.4	0.552	20	288	0.218
934.7	1.1	13	1.0	19	431	0.779	16	1.8	29	493	0.568
935.7	1.9	17	0.450	11	499	0.352	27	0.821	17	571	0.257
936.6	1.1	11	0.491	19	328	0.721	16	0.896	30	375	0.526
937.5	1.0	9.9	1.0	16	486	0.564	15	1.9	24	556	0.412
938.4	0.621	21	0.588	10	583	1.2	9.0	1.1	16	667	0.902
939.4	1.5	16	0.461	18	515	0.850	21	0.840	28	589	0.620
940.3	1.1	7.4	0.636	14	331	0.817	15	1.2	22	379	0.596
941.2	1.1	13	0.734	10	290	0.336	16	1.3	16	332	0.245
942.1	2.0	18	0.530	17	548	1.2	29	0.967	26	627	0.873
943.1	0.913	9.7	0.434	19	462	0.339	13	0.791	29	528	0.248
944.0	2.3	14	0.825	19	506	1.2	33	1.5	30	578	0.876
944.9	0.963	18	0.398	16	626	1.6	14	0.726	24	716	1.1
945.8	0.940	9.6	0.366	12	293	0.286	14	0.667	18	335	0.209
946.8	0.891	10	0.532	16	347	0.444	13	0.971	25	397	0.324
947.7	1.4	14	0.492	14	493	0.690	21	0.897	22	564	0.504
948.6	0.998	11	0.356	17	438	0.932	14	0.650	25	501	0.680
949.5	1.4	10	0.938	13	306	0.312	20	1.7	20	350	0.228
950.4	2.3	18	1.2	14	533	1.1	33	2.3	21	610	0.773
951.4	0.735	15	0.783	15	446	1.0	11	1.4	22	511	0.763
952.3	1.2	10	0.668	17	373	0.617	18	1.2	25	426	0.450
953.2	1.2	15	0.825	19	536	1.3	17	1.5	29	612	0.967
954.1	1.2	17	0.533	16	529	0.984	17	0.973	25	605	0.718
955.1	0.918	11	0.492	12	326	0.921	13	0.898	18	372	0.672
956.0	1.0	14	0.720	16	402	1.0	14	1.3	24	460	0.732
956.9	0.534	16	0.525	18	593	0.830	7.7	0.958	28	678	0.606
957.8	0.392	10	0.691	21	362	1.1	5.7	1.3	32	414	0.791
958.8	1.3	13	1.2	13	445	0.852	19	2.1	20	509	0.622
959.7	1.5	16	0.632	13	421	0.478	21	1.2	20	481	0.349
960.6	1.5	15	1.0	21	409	0.842	22	1.8	32	467	0.614
961.5	1.5	12	1.1	17	522	1.1	21	2.0	26	596	0.824
962.5	0.390	13	0.952	11	394	1.1	5.6	1.7	17	450	0.814
963.4	0.915	12	0.806	17	587	0.806	13	1.5	27	672	0.588
964.3	0.884	9.8	0.908	16	305	0.384	13	1.7	25	349	0.280
965.2	1.4	17	1.1	15	560	0.673	20	2.0	22	640	0.491
966.2	1.2	16	0.608	16	524	0.670	18	1.1	25	599	0.489
967.1	1.4	10	0.583	15	314	0.877	20	1.1	22	359	0.640
968.0	2.0	13	1.8	14	469	0.966	29	3.2	22	537	0.705
968.9	1.6	25	1.3	16	726	1.1	23	2.4	24	830	0.784
969.9	0.986	12	0.886	14	339	0.457	14	1.6	21	388	0.334
970.8	0.644	8.7	0.821	17	295	0.471	9.3	1.5	26	338	0.344
971.7	1.3	12	0.979	18	570	1.5	18	1.8	28	652	1.1
972.6	1.1	14	1.1	29	692	0.751	16	1.9	45	791	0.548



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
973.6	0.724	6.5	0.790	13	247	0.744	10	1.4	19	283	0.543
974.5	1.7	16	1.2	15	428	0.954	24	2.2	23	489	0.696
975.4	0.888	16	1.1	16	658	1.1	13	2.0	24	753	0.806
976.3	0.856	12	1.0	15	349	0.966	12	1.8	23	399	0.705
977.2	1.4	16	1.3	12	341	1.0	20	2.3	19	390	0.733
978.2	2.0	17	1.2	12	554	1.7	28	2.2	18	633	1.2
979.1	1.7	11	1.1	18	420	0.552	24	2.1	27	480	0.403
980.0	1.4	13	1.2	14	392	0.648	21	2.1	22	448	0.473
980.9	1.4	14	0.733	20	623	1.6	20	1.3	30	712	1.2
981.9	0.914	11	1.2	15	342	0.961	13	2.2	23	391	0.701
982.8	0.526	8.8	1.2	14	334	1.5	7.6	2.3	22	381	1.1
983.7	1.7	14	0.688	18	427	1.0	25	1.3	28	488	0.764
984.6	0.569	12	1.0	23	461	0.638	8.2	1.9	36	527	0.466
985.6	0.706	8.8	1.0	17	320	1.2	10	1.9	26	366	0.909
986.5	1.1	15	1.6	13	466	1.2	16	2.8	21	533	0.864
987.4	1.0	19	1.3	18	437	1.2	15	2.4	28	499	0.910
988.3	1.5	10	0.967	19	378	1.3	22	1.8	29	432	0.952
989.3	0.866	10	1.1	17	372	0.634	12	2.1	26	425	0.463
990.2	1.1	10	1.2	18	494	0.952	16	2.2	27	565	0.695
991.1	0.917	12	0.812	19	427	1.0	13	1.5	29	488	0.753
992.0	1.2	12	0.807	17	465	1.4	18	1.5	25	532	1.0
993.0	1.4	9.4	1.1	17	407	0.818	20	2.0	26	466	0.597
993.9	1.8	13	1.7	17	370	0.524	25	3.1	26	423	0.382
994.8	1.1	9.1	1.0	19	296	1.2	15	1.9	29	339	0.908
995.7	1.5	12	1.2	21	602	2.0	22	2.2	31	689	1.4
996.7	0.802	14	1.3	22	567	1.9	12	2.5	33	649	1.4
997.6	0.612	11	0.996	31	417	1.1	8.8	1.8	47	477	0.799
998.5	2.0	14	2.0	21	403	0.266	30	3.7	32	461	0.194
999.4	1.1	12	1.9	18	494	0.863	16	3.4	28	565	0.629
1000.3	0.863	9.2	0.977	19	330	0.760	12	1.8	29	378	0.555
1001.3	1.3	12	1.3	22	340	0.522	18	2.4	33	388	0.381
1002.2	2.2	17	0.932	25	507	1.2	31	1.7	39	580	0.909
1003.1	1.3	12	1.6	24	431	1.4	19	2.9	37	493	1.0
1004.0	1.4	9.7	2.0	17	375	0.588	21	3.6	26	429	0.429
1005.0	1.9	12	1.6	26	443	1.5	27	2.8	40	506	1.1
1005.9	0.785	12	1.8	24	677	0.777	11	3.2	36	774	0.567
1006.8	0.763	9.6	1.5	24	383	0.859	11	2.8	37	438	0.627
1007.7	1.1	15	1.4	21	479	1.1	16	2.6	33	548	0.832
1008.7	1.0	15	1.9	26	501	0.421	15	3.5	40	573	0.307
1009.6	0.844	7.9	0.974	17	326	1.2	12	1.8	26	373	0.864
1010.5	1.0	10	1.6	26	423	0.958	15	2.9	40	484	0.699
1011.4	1.4	18	1.7	24	527	0.971	20	3.1	36	603	0.708
1012.4	1.1	9.8	1.8	26	287	0.451	16	3.2	40	328	0.329
1013.3	1.4	11	1.7	21	393	0.983	20	3.2	32	450	0.717
1014.2	2.8	15	1.7	24	485	0.835	41	3.1	37	554	0.609
1015.1	1.7	11	1.5	24	401	0.910	24	2.7	37	459	0.664
1016.1	1.5	13	1.5	25	444	1.0	21	2.8	39	508	0.745
1017.0	2.0	13	2.4	34	591	0.733	28	4.4	52	676	0.535
1017.9	1.5	19	2.3	30	552	0.689	22	4.2	46	632	0.503
1018.8	0.627	8.3	2.6	20	284	0.830	9.0	4.7	31	325	0.606
1019.8	1.3	14	1.8	24	468	0.421	19	3.3	37	535	0.307
1020.7	2.0	11	2.5	24	436	1.3	28	4.6	36	498	0.914
1021.6	0.931	13	2.4	37	432	0.820	13	4.4	56	494	0.598
1022.5	1.7	13	2.4	26	321	0.596	24	4.4	40	367	0.435
1023.4	1.2	16	2.4	22	438	0.336	17	4.5	33	501	0.245
1024.4	1.7	12	2.0	28	450	0.873	25	3.7	42	514	0.637
1025.3	1.8	11	1.9	28	273	1.1	27	3.5	43	312	0.803
1026.2	2.6	14	3.4	32	429	0.435	37	6.2	49	491	0.317
1027.1	2.0	16	1.8	31	788	1.2	30	3.3	47	901	0.860
1028.1	1.6	10	1.7	28	280	0.801	23	3.1	43	320	0.585
1029.0	2.5	13	3.1	32	440	1.2	36	5.7	49	504	0.854
1029.9	1.9	15	2.2	23	549	0.526	28	4.0	35	628	0.383
1030.8	1.0	12	2.0	37	390	1.4	15	3.7	56	446	1.0
1031.8	1.7	12	3.8	29	392	0.557	25	6.9	45	449	0.406
1032.7	0.844	17	3.2	32	535	0.994	12	5.9	49	611	0.725
1033.6	2.2	11	2.8	38	449	0.709	32	5.1	58	514	0.517
1034.5	1.9	11	3.0	35	324	0.228	27	5.4	53	370	0.166
1035.5	2.2	18	2.7	37	495	1.2	32	4.9	57	566	0.905
1036.4	2.2	13	2.0	37	440	0.278	32	3.7	57	503	0.203
1037.3	1.4	14	2.4	31	356	0.854	20	4.4	48	407	0.623
1038.2	1.6	13	5.4	32	430	1.1	23	9.9	49	491	0.771
1039.2	1.3	23	2.7	36	548	0.272	18	5.0	56	626	0.198
1040.1	1.5	13	2.4	38	366	0.546	22	4.4	59	419	0.399
1041.0	1.2	13	2.6	29	415	1.1	17	4.8	44	475	0.784
1041.9	1.9	20	2.8	28	483	0.537	27	5.1	42	552	0.392
1042.9	1.8	12	2.7	47	326	0.504	25	4.9	72	372	0.368
1043.8	2.5	12	3.4	30	290	0.704	36	6.3	47	331	0.514
1044.7	3.4	21	3.7	37	611	0.751	49	6.7	57	699	0.548
1045.6	1.7	19	4.0	37	491	0.520	25	7.2	57	562	0.380
1046.6	0.941	8.8	2.7	36	322	0.362	14	4.9	55	369	0.264
1047.5	2.0	16	3.9	32	415	0.387	28	7.2	50	474	0.282



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1048.4	2.7	19	3.4	36	479	0.569	38	6.2	55	548	0.415
1049.3	2.0	17	2.9	43	501	0.129	30	5.3	67	573	0.094
1050.2	2.1	14	3.4	34	477	0.580	30	6.3	51	545	0.423
1051.2	1.6	16	2.4	30	409	0.228	22	4.3	46	468	0.167
1052.1	1.4	14	3.3	56	507	0.249	20	6.1	85	579	0.181
1053.0	0.780	12	2.9	40	480	1.0	11	5.3	62	549	0.734
1053.9	2.8	23	3.5	35	491	0.948	41	6.3	54	561	0.692
1054.9	1.3	13	2.8	32	393	0.608	19	5.1	49	450	0.443
1055.8	0.927	12	2.9	31	302	0.756	13	5.3	48	346	0.552
1056.7	2.5	15	4.1	32	436	0.744	35	7.5	49	498	0.543
1057.6	2.2	19	4.1	39	597	0.960	32	7.5	59	682	0.701
1058.6	1.3	9.6	3.0	36	349	0.196	18	5.4	56	399	0.143
1059.5	2.7	18	4.1	33	384	0.785	40	7.4	50	439	0.573
1060.4	2.5	20	2.4	35	561	1.2	35	4.4	54	642	0.853
1061.3	1.3	10	2.8	30	263	0.252	18	5.1	45	301	0.184
1062.3	1.6	18	4.0	43	378	0.860	23	7.3	66	432	0.628
1063.2	1.2	25	2.8	35	728	1.2	18	5.2	53	832	0.871
1064.1	2.2	12	2.4	49	390	0.870	31	4.3	74	446	0.634
1065.0	1.5	10	2.6	22	248	0.590	21	4.7	34	284	0.431
1066.0	3.1	18	3.7	29	433	0.498	45	6.8	45	495	0.363
1066.9	2.0	21	2.7	32	627	0.853	29	5.0	50	717	0.622
1067.8	1.4	11	2.1	28	323	0.565	20	3.9	42	369	0.412
1068.7	1.7	12	4.0	33	343	1.1	25	7.4	50	392	0.819
1069.7	2.0	23	3.1	41	597	1.2	28	5.6	63	682	0.867
1070.6	2.8	13	2.5	66	408	0.462	40	4.5	102	467	0.337
1071.5	2.9	17	3.5	26	394	0.752	41	6.4	40	450	0.548
1072.4	1.9	19	2.6	26	269	0.849	28	4.7	41	307	0.619
1073.4	1.4	11	1.7	27	325	0.283	20	3.1	42	372	0.207
1074.3	1.3	9.0	3.0	27	334	0.401	19	5.5	41	382	0.292
1075.2	2.7	14	3.9	30	475	0.274	39	7.1	45	544	0.200
1076.1	1.4	16	2.6	28	496	0.585	20	4.7	43	567	0.427
1077.0	2.0	12	2.2	31	276	1.2	29	4.0	48	316	0.879
1078.0	3.6	15	3.5	32	467	1.6	52	6.5	48	534	1.1
1078.9	2.2	25	2.9	42	637	0.460	31	5.3	65	728	0.335
1079.8	1.3	8.5	1.9	28	369	0.573	19	3.5	44	422	0.418
1080.7	1.9	12	3.5	36	462	0.696	28	6.4	56	528	0.508
1081.7	2.2	21	3.2	39	635	1.1	32	5.8	59	726	0.835
1082.6	0.539	12	1.9	38	379	0.864	7.8	3.4	58	433	0.630
1083.5	1.8	9.4	2.3	27	266	0.649	26	4.1	41	304	0.474
1084.4	2.5	19	3.1	30	626	0.580	35	5.6	46	715	0.423
1085.4	1.7	14	3.5	39	445	0.958	25	6.4	59	509	0.699
1086.3	1.5	11	2.3	31	356	0.805	21	4.1	48	407	0.588
1087.2	3.3	15	3.1	44	546	0.708	48	5.7	67	624	0.517
1088.1	1.9	16	3.4	32	511	0.529	28	6.2	50	584	0.386
1089.1	1.3	9.7	2.3	31	285	0.673	19	4.1	48	326	0.491
1090.0	1.7	15	4.3	28	432	1.1	25	7.9	44	494	0.799
1090.9	3.2	20	3.4	40	828	0.962	46	6.3	61	947	0.702
1091.8	1.2	11	1.4	18	262	0.625	18	2.5	27	299	0.456
1092.8	1.9	11	2.2	33	344	1.3	27	4.0	50	394	0.939
1093.7	1.8	20	3.5	31	598	0.776	26	6.4	47	684	0.566
1094.6	1.4	12	2.0	40	473	0.740	21	3.7	61	541	0.540
1095.5	1.5	8.0	2.1	31	287	0.475	22	3.8	47	328	0.346
1096.5	2.5	14	1.9	31	511	0.569	36	3.4	47	584	0.415
1097.4	1.7	20	2.8	35	464	0.901	25	5.2	54	531	0.658
1098.3	0.868	12	1.9	23	326	0.949	13	3.4	35	373	0.692
1099.2	2.3	14	2.7	28	523	0.941	33	4.8	43	598	0.686
1100.2	2.3	20	2.7	37	458	1.1	33	4.9	56	524	0.821
1101.1	1.4	9.4	1.6	28	291	0.991	21	2.9	43	332	0.723
1102.0	2.0	14	2.0	24	288	0.558	29	3.7	37	330	0.407
1102.9	2.0	13	1.9	26	384	0.767	29	3.5	40	439	0.559
1103.8	1.1	11	2.0	27	419	0.239	16	3.7	42	479	0.174
1104.8	1.7	7.8	1.6	32	296	0.937	24	2.9	49	339	0.684
1105.7	2.1	16	2.1	34	356	1.1	31	3.8	52	407	0.827
1106.6	2.0	12	2.2	36	330	0.223	29	4.0	56	378	0.163
1107.5	0.523	7.0	1.4	20	230	0.770	7.6	2.6	30	263	0.562
1108.5	1.4	15	2.2	31	386	0.650	21	3.9	47	441	0.474
1109.4	2.6	13	2.4	26	721	0.613	37	4.4	40	824	0.447
1110.3	1.3	10	1.2	27	307	0.684	19	2.2	42	350	0.499
1111.2	2.0	17	2.1	38	495	0.790	29	3.8	58	566	0.576
1112.2	1.2	17	1.9	29	573	1.0	17	3.4	44	656	0.756
1113.1	1.3	13	1.1	30	372	0.519	18	2.0	46	426	0.379
1114.0	2.1	12	1.8	27	376	0.666	31	3.3	42	430	0.486
1114.9	1.6	18	1.7	29	668	0.886	23	3.1	44	764	0.647
1115.9	1.1	13	0.988	33	386	0.938	17	1.8	50	441	0.685
1116.8	0.720	8.6	1.8	17	244	0.673	10	3.3	26	279	0.491
1117.7	1.3	12	1.6	28	337	0.615	18	2.9	43	385	0.449
1118.6	1.8	21	1.5	37	690	0.699	26	2.7	56	789	0.510
1119.6	1.2	9.7	1.3	25	288	0.274	17	2.3	39	330	0.200
1120.5	2.2	15	2.3	31	374	1.1	32	4.2	47	427	0.769
1121.4	1.6	25	1.2	27	671	1.6	23	2.1	42	767	1.2
1122.3	1.9	12	1.4	39	394	0.619	27	2.6	60	451	0.452



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1123.3	1.1	13	1.6	20	289	0.732	16	2.9	31	331	0.534
1124.2	2.1	19	1.4	36	606	0.623	30	2.6	55	693	0.455
1125.1	1.7	14	0.985	38	363	0.464	24	1.8	58	415	0.339
1126.0	1.6	12	1.6	25	296	0.700	22	3.0	39	338	0.511
1127.0	1.3	12	1.3	27	505	0.380	19	2.4	41	577	0.277
1127.9	1.5	15	1.3	37	426	0.253	21	2.3	57	487	0.185
1128.8	1.3	11	0.893	16	240	0.631	18	1.6	25	274	0.461
1129.7	2.0	16	1.6	23	326	0.335	28	2.9	35	373	0.244
1130.6	2.0	16	1.7	22	580	1.1	29	3.2	33	663	0.805
1131.6	0.576	12	0.904	40	398	0.254	8.3	1.6	61	455	0.185
1132.5	1.1	12	1.1	25	387	0.424	16	1.9	38	443	0.310
1133.4	0.996	15	1.0	25	398	0.400	14	1.8	38	455	0.292
1134.3	1.3	10	1.5	38	424	0.662	19	2.8	58	484	0.483
1135.3	1.6	11	1.1	21	358	1.1	24	2.1	33	409	0.832
1136.2	1.4	14	1.1	21	376	2.1	20	2.0	33	431	1.5
1137.1	1.4	13	1.2	23	384	1.1	20	2.1	36	439	0.783
1138.0	1.3	13	0.982	23	346	0.310	19	1.8	35	396	0.226
1139.0	1.4	18	1.2	24	409	0.584	20	2.2	37	467	0.426
1139.9	0.889	15	1.4	17	495	0.478	13	2.5	27	566	0.349
1140.8	0.880	11	0.952	25	386	0.563	13	1.7	38	441	0.411
1141.7	2.4	14	0.969	32	460	0.282	35	1.8	49	526	0.206
1142.7	1.0	11	1.5	19	253	0.380	15	2.7	30	289	0.277
1143.6	1.1	13	1.4	20	409	0.758	16	2.6	31	467	0.553
1144.5	1.2	14	1.3	19	443	0.527	18	2.3	30	507	0.385
1145.4	0.575	11	0.838	22	312	0.123	8.3	1.5	34	357	0.090
1146.4	1.4	13	0.757	16	382	1.1	21	1.4	25	437	0.803
1147.3	1.0	14	0.953	17	368	0.221	15	1.7	26	421	0.161
1148.2	1.1	15	0.738	19	373	1.4	15	1.3	29	427	0.991
1149.1	0.774	15	1.1	19	414	0.452	11	2.1	29	474	0.330
1150.1	1.2	14	1.0	26	366	1.0	18	1.8	40	419	0.742
1151.0	1.0	8.6	1.2	15	260	0.545	14	2.2	23	298	0.398
1151.9	0.572	8.8	0.636	15	343	1.3	8.3	1.2	22	392	0.977
1152.8	1.5	14	1.0	24	395	1.2	22	1.9	37	452	0.901
1153.7	0.911	12	0.618	21	395	0.614	13	1.1	32	451	0.448
1154.7	1.3	19	0.912	15	403	0.375	19	1.7	23	461	0.274
1155.6	1.9	15	0.807	18	406	0.802	27	1.5	27	465	0.585
1156.5	1.4	13	0.563	20	369	0.441	21	1.0	31	421	0.322
1157.4	0.972	12	0.751	16	384	0.568	14	1.4	25	439	0.414
1158.4	0.844	11	0.774	17	313	0.618	12	1.4	26	358	0.451
1159.3	1.1	17	0.620	17	352	1.0	15	1.1	27	402	0.740
1160.2	1.6	11	0.790	18	309	1.2	24	1.4	27	354	0.859
1161.1	1.3	12	0.742	15	601	1.5	18	1.4	23	687	1.1
1162.1	2.3	15	1.1	24	421	0.622	33	1.9	36	482	0.454
1163.0	1.2	17	0.377	20	448	0.482	17	0.688	30	513	0.351
1163.9	0.522	11	0.547	15	335	1.1	7.5	0.998	23	384	0.792
1164.8	1.1	12	0.681	15	344	0.446	16	1.2	24	393	0.326
1165.8	1.2	16	0.422	19	391	1.0	17	0.770	29	447	0.766
1166.7	0.829	14	0.473	16	367	1.1	12	0.863	25	420	0.779
1167.6	0.976	25	0.649	16	369	0.859	14	1.2	25	422	0.627
1168.5	1.5	15	0.916	23	426	0.634	21	1.7	35	487	0.462
1169.5	0.610	15	0.722	20	349	0.822	8.8	1.3	30	399	0.600
1170.4	1.4	11	0.517	15	304	0.767	20	0.943	23	348	0.560
1171.3	1.1	16	0.627	13	369	0.434	16	1.1	20	422	0.317
1172.2	2.0	11	0.885	13	464	0.587	28	1.6	21	530	0.428
1173.2	0.959	12	0.650	13	319	1.6	14	1.2	19	364	1.1
1174.1	1.7	15	1.0	20	392	0.508	25	1.9	30	449	0.370
1175.0	1.4	11	0.637	13	320	0.509	20	1.2	20	366	0.371
1175.9	2.1	15	0.512	20	396	1.3	30	0.934	31	452	0.950
1176.9	0.903	14	0.795	16	322	0.661	13	1.4	25	368	0.482
1177.8	1.5	16	0.983	14	378	0.922	22	1.8	22	433	0.673
1178.7	0.715	9.7	0.661	10	319	0.457	10	1.2	16	365	0.334
1179.6	1.2	14	0.741	15	452	0.712	18	1.4	22	516	0.520
1180.5	1.3	9.6	0.680	12	258	0.731	18	1.2	19	295	0.533
1181.5	1.5	13	0.577	12	353	0.892	22	1.1	19	403	0.651
1182.4	0.860	11	0.896	15	415	0.689	12	1.6	23	474	0.503
1183.3	1.3	12	0.653	18	418	1.5	18	1.2	27	478	1.1
1184.2	0.898	13	0.823	15	353	1.1	13	1.5	22	404	0.771
1185.2	1.2	14	0.579	14	515	2.0	18	1.1	22	588	1.5
1186.1	1.1	11	0.460	9.5	272	0.577	15	0.838	15	311	0.421
1187.0	0.879	14	0.707	13	432	0.937	13	1.3	20	494	0.683
1187.9	1.9	14	0.800	13	332	0.366	27	1.5	21	380	0.267
1188.9	0.984	13	0.862	18	444	0.395	14	1.6	28	508	0.288
1189.8	1.3	13	0.593	18	368	0.731	19	1.1	28	421	0.534
1190.7	0.475	11	0.829	15	340	0.987	6.9	1.5	23	388	0.720
1191.6	0.869	11	1.2	15	500	1.3	13	2.2	23	571	0.919
1192.6	0.674	12	0.756	11	363	0.869	9.7	1.4	18	415	0.634
1193.5	0.582	9.5	0.873	13	300	0.933	8.4	1.6	19	343	0.681
1194.4	1.2	13	0.813	16	528	0.991	18	1.5	25	604	0.723
1195.3	1.6	13	0.724	22	478	1.2	23	1.3	33	546	0.887
1196.3	1.0	13	0.692	20	347	1.6	14	1.3	31	397	1.2
1197.2	0.649	15	0.839	14	488	1.0	9.4	1.5	22	558	0.745



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
1198.1	0.969	11	0.579	16	328	0.850	14	1.1	25	375	0.620
1199.0	0.250	8.0	1.0	13	308	0.937	3.6	1.9	20	352	0.684
1200.0	0.788	13	0.948	14	331	1.0	11	1.7	21	378	0.761
1200.9	1.4	16	1.1	13	504	0.965	21	2.1	20	577	0.704
1201.8	0.709	11	0.802	13	256	1.6	10	1.5	21	293	1.1
1202.7	1.3	12	1.1	13	358	1.0	19	1.9	20	410	0.733
1203.7	0.847	19	0.792	18	474	0.751	12	1.4	27	542	0.548
1204.6	0.921	9.8	0.854	17	241	0.335	13	1.6	26	275	0.244
1205.5	1.6	12	1.5	14	353	0.746	23	2.8	22	404	0.544
1206.4	0.661	14	0.914	15	519	0.522	9.5	1.7	23	594	0.381
1207.3	0.469	8.1	0.477	15	307	1.1	6.8	0.871	23	351	0.771
1208.3	0.521	7.9	1.4	17	268	1.1	7.5	2.6	27	306	0.833
1209.2	1.1	16	1.1	13	450	0.422	15	1.9	19	514	0.308
1210.1	0.654	15	0.450	24	463	0.734	9.4	0.822	37	529	0.535
1211.0	0.282	7.4	0.813	15	244	1.2	4.1	1.5	23	279	0.886
1212.0	1.3	16	0.939	13	389	0.649	19	1.7	19	445	0.474
1212.9	0.423	15	1.7	15	543	1.3	6.1	3.1	23	621	0.925
1213.8	0.785	7.5	0.764	11	220	0.427	11	1.4	17	251	0.311
1214.7	1.8	11	1.9	20	323	0.820	26	3.4	31	369	0.598
1215.7	1.4	20	1.0	14	547	1.4	20	1.9	22	625	1.0
1216.6	0.762	9.2	0.743	16	246	1.7	11	1.4	25	282	1.2
1217.5	0.488	12	1.1	18	328	0.758	7.0	2.1	28	375	0.553
1218.4	1.3	15	1.7	18	394	0.618	19	3.0	27	450	0.451
1219.4	0.492	10	0.577	19	388	0.764	7.1	1.1	30	444	0.558
1220.3	0.536	9.7	1.2	16	266	1.2	7.7	2.2	24	304	0.882
1221.2	1.0	11	1.7	16	415	0.338	15	3.1	25	474	0.247
1222.1	1.4	17	1.4	24	492	0.808	20	2.6	37	563	0.590
1223.1	1.2	9.6	1.0	24	320	1.4	17	1.9	37	366	1.0
1224.0	1.9	15	1.8	14	338	1.2	27	3.4	22	386	0.848
1224.9	0.549	22	1.8	22	547	1.1	7.9	3.3	33	626	0.832
1225.8	0.562	5.9	0.845	18	206	0.762	8.1	1.5	28	235	0.556
1226.8	0.823	7.3	1.8	20	268	0.481	12	3.4	31	306	0.351
1227.7	1.5	17	1.3	21	469	0.561	22	2.4	32	536	0.409
1228.6	0.781	12	1.2	22	309	1.0	11	2.1	34	354	0.734
1229.5	0.285	7.9	1.0	16	269	1.7	4.1	1.8	24	307	1.2
1230.4	1.3	14	1.0	19	396	0.780	19	1.8	30	453	0.569
1231.4	0.228	12	0.781	20	425	0.601	3.3	1.4	30	486	0.438
1232.3	0.658	9.7	1.2	15	238	0.969	9.5	2.2	23	273	0.707
1233.2	0.935	13	1.2	24	323	0.685	13	2.2	36	370	0.500
1234.1	0.814	19	0.902	30	559	0.721	12	1.6	46	639	0.526
1235.1	1.1	6.3	1.3	21	260	0.930	15	2.5	32	297	0.678
1236.0	1.5	8.8	1.4	18	279	0.720	22	2.5	28	319	0.525
1236.9	1.2	21	1.4	19	451	0.594	18	2.6	29	516	0.434
1237.8	0.689	9.7	1.2	29	212	0.775	9.9	2.2	44	242	0.566
1238.8	0.497	7.8	2.3	21	256	0.107	7.2	4.1	32	293	0.078
1239.7	1.2	13	1.2	19	436	0.678	17	2.2	30	499	0.495
1240.6	0.509	11	1.8	31	492	0.934	7.3	3.3	47	563	0.681
1241.5	0.983	8.5	1.3	18	286	0.642	14	2.4	28	328	0.469
1242.5	1.8	21	1.3	25	397	0.405	26	2.4	38	454	0.295
1243.4	0.475	12	1.2	20	417	0.614	6.9	2.1	30	477	0.448
1244.3	0.260	5.2	0.965	14	168	0.540	3.8	1.8	22	193	0.394
1245.2	1.2	10	2.6	25	308	0.839	18	4.7	39	353	0.613
1246.2	0.997	19	1.3	29	366	1.2	14	2.4	45	419	0.856
1247.1	0.670	6.6	1.2	30	243	0.193	9.7	2.2	45	278	0.141
1248.0	1.5	13	2.2	30	315	1.1	22	4.0	46	360	0.784
1248.9	0.602	17	1.9	19	375	0.596	8.7	3.5	29	429	0.435
1249.9	1.2	9.1	1.1	22	236	0.678	17	2.0	34	270	0.495
1250.8	0.664	6.9	1.4	22	228	0.629	9.6	2.5	33	260	0.459
1251.7	0.401	11	1.7	27	321	0.860	5.8	3.1	41	367	0.627
1252.6	1.1	12	1.4	26	282	0.434	16	2.5	40	322	0.316
1253.6	0.534	14	1.2	32	413	0.842	7.7	2.2	49	473	0.614
1254.5	0.520	9.9	1.9	20	297	0.465	7.5	3.4	31	339	0.339
1255.4	0.314	9.4	1.9	33	312	0.296	4.5	3.4	50	357	0.216
1256.3	1.3	12	1.5	34	325	0.745	19	2.7	51	372	0.543
1257.2	0.660	10	2.6	24	292	0.958	9.5	4.8	37	334	0.699
1258.2	1.2	13	1.1	20	412	1.3	18	2.0	30	471	0.946
1259.1	0.633	13	1.7	37	319	0.879	9.1	3.1	57	364	0.642
1260.0	0.958	7.0	1.5	19	241	0.260	14	2.8	30	276	0.190
1260.9	0.811	12	1.4	22	321	0.834	12	2.5	34	367	0.609
1261.9	0.998	17	1.5	25	379	0.749	14	2.8	38	433	0.547
1262.8	0.921	7.0	1.9	20	204	0.335	13	3.4	31	233	0.244
1263.7	1.9	14	2.1	26	340	0.393	28	3.8	39	389	0.287
1264.6	0.928	15	2.0	22	341	1.1	13	3.7	34	390	0.825
1265.6	0.621	11	1.1	18	263	0.638	9.0	2.0	27	301	0.466
1266.5	1.1	11	1.7	25	300	0.321	15	3.2	39	343	0.234
1267.4	1.5	16	1.7	32	517	0.563	22	3.2	49	592	0.411
1268.3	0.547	11	1.1	17	217	0.386	7.9	1.9	27	249	0.282
1269.3	0.805	11	2.2	23	210	0.401	12	4.0	35	240	0.292
1270.2	0.725	18	1.5	19	254	0.346	10	2.8	29	291	0.253
1271.1	1.2	12	1.4	40	307	0.890	17	2.6	61	351	0.649
1272.0	1.5	12	1.2	32	340	1.3	21	2.3	49	389	0.971



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1273.0	0.922	12	1.4	33	333	0.675	13	2.6	50	381	0.493
1273.9	0.721	13	1.6	24	346	1.2	10	2.9	36	395	0.853
1274.8	0.378	9.6	1.4	19	223	0.167	5.5	2.6	30	254	0.122
1275.7	0.948	13	2.2	20	222	0.551	14	4.0	31	254	0.402
1276.7	0.953	16	1.8	26	331	0.772	14	3.3	40	379	0.563
1277.6	1.5	14	0.941	45	326	0.913	22	1.7	68	373	0.666
1278.5	1.1	15	1.6	25	320	1.7	16	2.9	39	366	1.2
1279.4	0.962	20	0.957	24	462	0.843	14	1.7	37	528	0.615
1280.3	0.361	12	1.5	27	264	0.105	5.2	2.7	42	301	0.077
1281.3	0.984	12	1.3	31	293	0.738	14	2.4	47	335	0.539
1282.2	0.628	13	1.5	31	404	0.989	9.1	2.7	48	462	0.721
1283.1	0.423	16	1.7	36	305	0.123	6.1	3.0	54	349	0.090
1284.0	0.495	12	1.7	26	306	0.770	7.2	3.1	40	350	0.562
1285.0	0.820	10	1.1	32	343	0.791	12	2.0	50	392	0.577
1285.9	0.920	12	1.7	27	297	0.495	13	3.2	41	339	0.361
1286.8	1.0	13	1.7	34	324	0.355	15	3.0	53	370	0.259
1287.7	0.850	11	2.2	28	257	0.853	12	4.0	44	294	0.622
1288.7	0.947	16	1.3	25	229	0.932	14	2.3	38	262	0.680
1289.6	0.934	12	2.1	24	227	0.323	13	3.8	37	259	0.236
1290.5	1.3	10	1.1	30	281	0.557	19	2.0	46	322	0.407
1291.4	1.3	13	1.7	37	421	1.0	18	3.2	56	481	0.749
1292.4	0.412	12	2.0	30	269	0.375	6.0	3.6	46	307	0.274
1293.3	0.811	11	1.8	27	242	0.281	12	3.2	42	277	0.205
1294.2	2.0	14	1.4	30	326	1.2	29	2.5	47	373	0.846
1295.1	1.1	16	1.6	30	314	0.371	17	2.9	45	359	0.271
1296.1	1.0	12	1.4	31	347	1.2	15	2.5	48	397	0.899
1297.0	1.4	13	1.4	26	298	0.833	21	2.5	40	341	0.607
1297.9	0.878	16	1.2	26	425	1.2	13	2.3	40	486	0.849
1298.8	0.632	10	1.1	32	260	0.610	9.1	2.0	49	297	0.445
1299.8	1.1	8.9	2.0	23	223	0.179	15	3.7	35	255	0.131
1300.7	1.2	13	1.9	30	271	0.253	17	3.5	46	309	0.185
1301.6	1.3	13	0.965	27	322	0.587	19	1.8	41	368	0.428
1302.5	1.3	14	1.9	47	421	1.0	19	3.6	72	481	0.733
1303.5	2.8	21	1.3	29	484	0.622	41	2.4	44	553	0.454
1304.4	1.0	16	1.7	21	321	0.533	15	3.2	31	367	0.389
1305.3	0.824	9.5	1.5	26	199	0.251	12	2.7	39	228	0.183
1306.2	0.594	15	1.5	35	368	0.612	8.6	2.8	54	420	0.447
1307.2	1.1	21	1.1	30	312	0.364	16	2.1	46	357	0.266
1308.1	0.703	11	1.5	30	265	0.515	10	2.6	46	303	0.376
1309.0	0.512	13	1.8	30	271	0.806	7.4	3.3	46	310	0.588
1309.9	0.813	20	1.6	24	398	1.3	12	3.0	36	455	0.961
1310.8	0.623	13	1.2	26	286	0.664	9.0	2.1	39	327	0.484
1311.8	1.1	7.1	1.7	25	214	0.547	15	3.1	39	244	0.399
1312.7	0.534	15	1.5	30	324	0.477	7.7	2.8	46	370	0.348
1313.6	1.5	15	1.4	39	389	1.000	21	2.5	60	445	0.730
1314.5	0.284	10	1.3	31	302	0.637	4.1	2.3	48	345	0.465
1315.5	0.228	12	1.2	28	368	0.268	3.3	2.1	43	420	0.196
1316.4	1.3	20	1.5	28	603	0.682	18	2.8	42	689	0.498
1317.3	0.669	8.7	0.963	28	204	0.725	9.7	1.8	43	233	0.529
1318.2	0.797	12	2.3	32	319	0.510	12	4.3	49	365	0.372
1319.2	1.0	26	1.7	37	527	1.3	15	3.1	57	602	0.954
1320.1	1.1	13	1.9	31	286	0.813	16	3.4	48	327	0.594
1321.0	0.990	13	1.5	25	327	0.802	14	2.7	38	374	0.585
1321.9	1.0	17	1.2	27	292	0.477	15	2.1	41	334	0.348
1322.9	1.0	12	1.4	33	335	0.218	15	2.5	51	383	0.159
1323.8	1.0	8.8	1.0	26	256	0.587	15	1.9	40	293	0.428
1324.7	0.919	12	2.3	33	397	0.401	13	4.1	51	454	0.292
1325.6	1.6	13	1.8	26	462	0.421	24	3.3	39	528	0.307
1326.6	1.1	11	1.6	44	341	0.263	15	2.8	67	389	0.192
1327.5	1.2	13	1.6	30	306	0.634	18	2.9	46	350	0.463
1328.4	1.2	20	1.7	27	298	0.631	18	3.2	41	341	0.460
1329.3	0.337	7.8	1.0	29	215	0.348	4.9	1.9	44	246	0.254
1330.3	1.4	10	1.6	24	351	0.334	21	2.8	36	401	0.243
1331.2	1.2	23	2.5	26	278	1.2	17	4.6	39	318	0.878
1332.1	1.1	12	1.2	41	418	0.274	16	2.3	63	478	0.200
1333.0	0.957	9.2	1.1	25	287	0.520	14	2.1	39	328	0.380
1334.0	1.5	17	1.7	32	426	1.6	21	3.1	49	487	1.2
1334.9	0.446	16	1.1	36	412	0.268	6.4	2.0	56	472	0.195
1335.8	0.228	12	0.901	25	228	0.659	3.3	1.6	38	260	0.481
1336.7	0.969	14	2.0	31	415	0.463	14	3.6	48	475	0.338
1337.6	0.780	17	1.5	23	378	0.499	11	2.7	35	432	0.364
1338.6	1.1	12	1.2	25	251	0.413	16	2.2	38	287	0.301
1339.5	1.5	16	1.8	31	275	0.633	22	3.3	47	315	0.462
1340.4	1.7	14	1.1	24	342	0.634	24	2.1	37	391	0.462
1341.3	1.2	15	1.5	25	315	0.780	17	2.8	39	360	0.569
1342.3	0.800	12	1.1	33	325	0.512	12	2.1	51	372	0.374
1343.2	2.0	14	1.3	33	307	0.908	28	2.3	51	351	0.662
1344.1	1.7	20	1.3	37	463	1.0	24	2.4	56	529	0.746
1345.0	1.5	15	1.3	28	312	0.718	22	2.3	44	357	0.524
1346.0	0.958	13	0.878	29	311	0.276	14	1.6	44	356	0.201
1346.9	1.4	14	1.1	32	287	1.2	20	2.0	49	329	0.873



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
1347.8	0.743	15	0.920	27	260	0.355	11	1.7	41	298	0.259
1348.7	1.4	13	1.1	36	340	0.640	20	2.0	55	389	0.467
1349.7	1.5	19	1.1	26	261	0.214	22	2.0	39	298	0.156
1350.6	1.5	15	1.8	30	393	0.763	22	3.3	45	449	0.557
1351.5	1.3	14	0.406	27	316	0.527	19	0.740	41	362	0.385
1352.4	0.963	16	0.700	26	278	0.447	14	1.3	40	317	0.326
1353.4	1.2	16	0.890	29	369	0.408	17	1.6	44	422	0.297
1354.3	1.1	12	1.1	30	296	0.558	16	2.0	46	339	0.407
1355.2	2.1	13	0.983	36	264	0.391	31	1.8	55	301	0.285
1356.1	1.3	16	1.1	30	394	0.690	18	1.9	46	451	0.503
1357.1	0.582	11	0.868	22	200	0.254	8.4	1.6	33	228	0.185
1358.0	1.7	16	1.0	24	265	0.389	25	1.9	37	303	0.284
1358.9	1.5	13	0.874	31	269	0.115	22	1.6	47	308	0.084
1359.8	0.923	12	0.975	23	252	0.692	13	1.8	35	288	0.505
1360.7	1.1	15	1.3	37	346	0.653	16	2.3	57	396	0.476
1361.7	1.7	18	0.951	26	352	0.695	25	1.7	40	402	0.507
1362.6	1.0	15	1.2	31	290	0.121	15	2.2	47	332	0.088
1363.5	0.390	11	1.1	29	279	0.475	5.6	2.0	44	319	0.346
1364.4	0.604	18	0.632	33	380	0.307	8.7	1.2	50	434	0.224
1365.4	1.2	11	0.887	22	285	0.635	17	1.6	34	325	0.463
1366.3	0.962	11	0.876	17	191	0.276	14	1.6	26	218	0.201
1367.2	1.4	17	0.964	35	304	0.750	20	1.8	53	348	0.547
1368.1	1.3	17	0.994	21	355	0.350	19	1.8	32	406	0.255
1369.1	1.5	13	1.2	28	247	0.420	22	2.2	43	282	0.306
1370.0	1.5	13	1.1	25	264	0.816	21	1.9	39	302	0.595
1370.9	1.2	21	1.0	24	399	0.781	17	1.9	37	456	0.570
1371.8	1.3	12	1.2	27	347	0.153	19	2.2	41	397	0.111
1372.8	0.605	13	0.779	21	243	0.599	8.7	1.4	31	277	0.437
1373.7	1.3	14	1.3	33	294	0.299	19	2.3	50	336	0.218
1374.6	0.981	14	1.2	29	330	0.661	14	2.2	45	378	0.482
1375.5	1.7	14	1.1	23	276	0.328	25	2.1	36	316	0.239
1376.5	1.2	15	0.545	22	287	0.265	18	0.995	34	328	0.193
1377.4	1.5	14	0.687	25	295	1.3	22	1.3	38	338	0.962
1378.3	1.8	13	1.2	23	309	0.588	26	2.1	35	353	0.429
1379.2	1.2	19	0.331	24	331	0.632	17	0.604	37	379	0.461
1380.2	1.4	12	1.3	19	336	0.817	20	2.5	29	384	0.596
1381.1	1.6	13	0.444	27	306	0.431	23	0.810	42	350	0.314
1382.0	1.3	16	0.618	25	340	0.021	19	1.1	38	389	0.015
1382.9	0.757	10	0.803	19	219	0.330	11	1.5	29	251	0.241
1383.9	1.4	11	0.949	19	253	0.920	20	1.7	29	290	0.672
1384.8	1.3	15	0.666	22	302	0.528	19	1.2	34	345	0.386
1385.7	1.2	14	0.478	26	287	0.806	18	0.871	40	328	0.588
1386.6	0.930	12	0.354	22	242	0.021	13	0.646	34	277	0.015
1387.5	0.693	16	0.623	21	301	0.270	10	1.1	32	344	0.197
1388.5	0.853	13	0.649	22	371	0.603	12	1.2	33	424	0.440
1389.4	1.9	17	0.803	22	303	0.803	27	1.5	34	347	0.586
1390.3	1.7	16	0.601	20	358	0.628	24	1.1	31	409	0.458
1391.2	0.548	12	0.829	20	328	0.242	7.9	1.5	31	375	0.176
1392.2	1.5	12	0.785	22	296	0.917	22	1.4	33	338	0.669
1393.1	1.2	12	0.593	25	279	0.550	17	1.1	38	318	0.401
1394.0	0.778	12	0.536	17	283	0.876	11	0.977	27	323	0.639
1394.9	0.637	14	0.696	19	294	0.885	9.2	1.3	29	336	0.646
1395.9	1.000	14	0.322	21	288	0.498	14	0.587	33	329	0.363
1396.8	1.8	17	0.872	25	313	0.725	27	1.6	38	358	0.529
1397.7	2.7	17	0.836	20	401	0.998	39	1.5	31	458	0.728
1398.6	1.3	12	0.585	20	290	0.774	18	1.1	30	332	0.565
1399.6	1.4	13	0.802	20	295	0.474	20	1.5	30	337	0.346
1400.5	1.5	14	0.524	22	396	0.966	22	0.955	33	453	0.705
1401.4	1.2	12	0.410	19	287	0.494	17	0.748	29	328	0.360
1402.3	0.957	13	0.774	17	313	0.276	14	1.4	26	358	0.201
1403.3	1.3	15	0.446	18	327	0.286	18	0.814	27	374	0.208
1404.2	1.3	15	0.582	25	325	1.2	19	1.1	39	372	0.894
1405.1	1.4	13	0.527	14	259	0.418	20	0.962	22	296	0.305
1406.0	1.8	15	0.478	22	348	0.629	26	0.872	33	398	0.459
1407.0	1.7	18	0.612	16	352	0.509	25	1.1	24	403	0.371
1407.9	1.2	15	0.541	16	301	0.717	18	0.987	25	344	0.523
1408.8	0.566	8.2	0.754	6.7	134	0.282	8.2	1.4	10	153	0.206
1409.7	0.919	12	0.830	15	198	0.110	13	1.5	23	227	0.080
1410.7	1.2	11	0.540	17	265	0.532	18	0.985	26	303	0.388
1411.6	1.1	13	0.977	20	348	0.675	16	1.8	30	398	0.492
1412.5	1.5	15	0.400	15	295	0.726	21	0.730	23	338	0.530
1413.4	1.4	17	0.430	18	276	1.2	20	0.783	27	316	0.885
1414.3	1.3	16	0.514	16	335	1.1	19	0.937	25	383	0.791
1415.3	1.8	15	0.576	20	300	0.136	26	1.1	30	343	0.099
1416.2	1.2	12	0.432	18	347	0.918	18	0.787	27	397	0.670
1417.1	1.2	15	0.832	15	301	0.601	17	1.5	23	344	0.439
1418.0	1.5	18	0.813	16	307	0.439	22	1.5	25	351	0.320
1419.0	1.2	15	0.538	14	300	0.933	18	0.982	21	343	0.681
1419.9	1.2	11	0.653	19	288	1.1	17	1.2	29	329	0.817
1420.8	1.1	15	0.719	16	319	0.281	15	1.3	24	365	0.205
1421.7	0.523	15	0.334	18	358	0.637	7.6	0.608	27	409	0.465



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1422.7	2.4	15	0.616	17	264	0.953	34	1.1	26	302	0.695
1423.6	1.1	16	0.337	14	316	0.257	16	0.615	22	362	0.188
1424.5	0.633	11	0.331	18	341	0.279	9.1	0.604	28	390	0.204
1425.4	1.2	15	0.445	17	324	0.671	18	0.811	26	371	0.489
1426.4	1.9	16	0.548	14	283	0.896	28	0.999	22	323	0.654
1427.3	1.1	12	0.470	17	391	0.708	15	0.856	25	447	0.517
1428.2	0.854	12	0.487	15	304	0.685	12	0.889	23	347	0.499
1429.1	1.2	16	0.735	19	331	0.415	17	1.3	30	378	0.303
1430.1	1.2	14	0.502	16	367	0.909	17	0.915	25	420	0.664
1431.0	1.0	14	0.534	12	341	0.985	15	0.973	19	390	0.719
1431.9	0.713	12	0.537	15	298	1.6	10	0.979	24	340	1.1
1432.8	0.228	13	0.456	14	313	1.2	3.3	0.831	22	358	0.908
1433.8	0.732	17	0.729	18	363	1.3	11	1.3	27	415	0.956
1434.7	1.4	14	0.432	14	284	1.0	20	0.787	22	325	0.763
1435.6	1.4	14	0.602	15	339	0.842	20	1.1	23	388	0.615
1436.5	1.4	16	0.362	14	366	0.845	20	0.661	22	418	0.616
1437.5	0.939	16	0.692	8.0	347	0.021	14	1.3	12	396	0.015
1438.4	0.993	9.5	0.289	11	258	0.996	14	0.528	16	295	0.726
1439.3	1.4	15	0.485	10	408	0.584	21	0.885	16	467	0.426
1440.2	0.715	13	0.504	13	342	1.1	10	0.919	19	391	0.829
1441.1	1.4	11	0.529	13	306	1.4	20	0.964	20	350	1.0
1442.1	1.5	17	0.668	15	370	1.2	22	1.2	22	423	0.845
1443.0	0.875	13	0.706	13	356	0.702	13	1.3	20	407	0.512
1443.9	0.888	13	0.485	9.8	304	1.6	13	0.884	15	347	1.1
1444.8	1.6	13	0.450	12	364	1.1	23	0.820	19	417	0.780
1445.8	1.1	11	0.522	10	295	1.4	16	0.952	16	337	1.0
1446.7	1.5	20	0.675	9.1	316	1.3	22	1.2	14	361	0.914
1447.6	1.2	16	0.622	13	318	0.430	18	1.1	20	364	0.314
1448.5	0.828	15	0.469	9.6	270	1.5	12	0.856	15	309	1.1
1449.5	1.3	20	1.0	13	336	0.485	19	1.9	20	384	0.354
1450.4	0.949	18	0.467	15	375	0.299	14	0.852	23	429	0.218
1451.3	2.5	19	0.357	16	436	1.6	36	0.651	24	498	1.1
1452.2	1.2	14	0.621	14	351	0.981	17	1.1	22	401	0.716
1453.2	1.1	14	0.747	11	301	1.0	16	1.4	16	344	0.760
1454.1	1.0	12	0.279	13	348	1.1	15	0.509	20	398	0.775
1455.0	1.0	14	0.535	11	362	0.970	15	0.975	16	414	0.708
1455.9	0.905	16	0.232	12	334	1.3	13	0.423	18	382	0.958
1456.9	0.930	13	0.786	11	305	1.2	13	1.4	17	349	0.899
1457.8	1.3	16	0.639	14	362	0.744	18	1.2	21	414	0.543
1458.7	0.661	14	0.201	16	372	1.2	9.5	0.366	24	426	0.868
1459.6	1.1	17	0.654	9.3	220	0.985	15	1.2	14	252	0.718
1460.6	1.5	16	0.312	14	368	2.3	21	0.569	22	421	1.6
1461.5	2.3	15	0.554	13	386	0.778	33	1.0	19	442	0.567
1462.4	1.6	10	0.486	8.9	324	0.958	23	0.886	14	371	0.699
1463.3	0.829	12	0.379	15	322	1.5	12	0.691	23	368	1.1
1464.2	1.4	13	0.453	12	355	1.6	20	0.825	19	406	1.2
1465.2	0.704	11	0.567	11	292	0.624	10	1.0	16	334	0.455
1466.1	1.2	12	0.609	11	310	0.279	18	1.1	16	354	0.203
1467.0	0.786	15	0.394	10	341	0.697	11	0.718	15	389	0.508
1467.9	0.807	11	0.404	12	341	0.859	12	0.736	19	390	0.627
1468.9	1.4	13	0.440	8.7	300	0.663	20	0.802	13	343	0.484
1469.8	1.9	13	0.183	8.6	363	0.889	28	0.335	13	415	0.649
1470.7	2.0	14	0.660	13	333	0.656	29	1.2	20	380	0.479
1471.6	0.952	10	0.425	10	309	0.901	14	0.776	16	353	0.657
1472.6	1.6	14	0.441	7.2	317	1.2	23	0.805	11	363	0.843
1473.5	0.770	14	0.419	10	361	1.2	11	0.764	16	413	0.900
1474.4	0.764	10	0.316	8.7	334	0.612	11	0.576	13	382	0.447
1475.3	0.917	13	0.346	14	312	0.807	13	0.632	21	357	0.589
1476.3	0.827	15	0.378	9.9	344	0.733	12	0.689	15	394	0.534
1477.2	1.2	10	0.478	15	382	0.429	18	0.871	23	437	0.313
1478.1	1.0	12	0.536	11	347	0.847	15	0.978	17	397	0.618
1479.0	0.865	16	0.426	8.1	384	1.5	12	0.777	12	439	1.1
1480.0	0.884	13	0.652	11	338	1.0	13	1.2	16	386	0.759
1480.9	1.2	11	0.664	12	346	1.3	17	1.2	18	395	0.915
1481.8	1.5	18	0.738	17	370	0.459	22	1.3	27	424	0.335
1482.7	0.863	12	0.469	11	409	0.765	12	0.856	16	468	0.558
1483.7	0.358	9.1	0.279	11	305	1.5	5.2	0.508	17	349	1.1
1484.6	1.8	16	0.433	12	373	1.4	26	0.790	19	427	1.0
1485.5	1.6	13	0.304	14	373	0.727	23	0.554	22	427	0.530
1486.4	2.0	9.9	0.183	9.2	350	1.1	30	0.335	14	401	0.794
1487.4	1.5	10	0.304	9.8	323	0.139	22	0.554	15	370	0.101
1488.3	1.1	15	0.436	7.0	357	0.280	16	0.796	11	408	0.204
1489.2	1.8	12	0.344	14	343	0.801	26	0.627	21	392	0.585
1490.1	0.833	11	0.183	7.3	301	1.2	12	0.335	11	344	0.895
1491.0	1.1	15	0.338	8.4	341	0.655	16	0.616	13	389	0.478
1492.0	1.1	11	0.218	11	355	0.956	16	0.397	16	406	0.697
1492.9	0.833	13	0.476	12	336	1.9	12	0.867	18	384	1.4
1493.8	0.955	14	0.620	9.6	378	0.611	14	1.1	15	432	0.446
1494.7	1.3	11	0.358	9.1	347	0.553	18	0.653	14	396	0.404
1495.7	0.682	11	0.447	7.7	317	0.947	9.8	0.816	12	363	0.691
1496.6	1.0	13	0.223	10	369	2.0	15	0.406	16	422	1.4



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Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1497.5	0.472	15	0.513	10	452	2.2	6.8	0.935	15	517	1.6
1498.4	2.1	14	0.183	9.2	386	1.3	31	0.335	14	442	0.962
1499.4	1.2	11	0.183	6.8	277	0.574	17	0.335	10	317	0.418
1500.3	0.751	13	0.529	8.5	417	1.0	11	0.965	13	477	0.761
1501.2	0.736	13	0.183	12	319	0.388	11	0.335	18	364	0.283
1502.1	1.4	14	0.568	7.4	317	0.260	20	1.0	11	363	0.190
1503.1	1.3	13	0.486	7.2	407	1.9	18	0.886	11	465	1.4
1504.0	0.650	14	0.626	9.2	421	1.2	9.4	1.1	14	482	0.854
1504.9	0.681	13	0.546	11	372	0.810	9.8	0.995	18	425	0.591
1505.8	1.0	13	0.448	9.9	348	0.402	14	0.817	15	398	0.293
1506.8	0.584	11	0.582	8.5	324	0.578	8.4	1.1	13	370	0.422
1507.7	0.765	11	0.183	11	376	0.738	11	0.335	16	430	0.538
1508.6	1.4	12	0.745	10	352	1.1	20	1.4	16	403	0.791
1509.5	1.6	13	0.406	11	416	1.4	23	0.741	17	475	1.1
1510.5	1.3	11	0.405	11	322	0.858	18	0.739	17	368	0.626
1511.4	0.722	8.1	0.236	10	372	0.898	10	0.430	16	426	0.655
1512.3	0.509	12	0.662	10	334	0.658	7.3	1.2	16	382	0.480
1513.2	0.699	11	0.493	9.0	361	1.1	10	0.899	14	413	0.811
1514.1	0.876	12	0.362	7.5	344	1.3	13	0.661	11	393	0.941
1515.1	2.3	15	0.255	12	350	1.1	33	0.466	19	400	0.812
1516.0	0.429	12	0.338	7.9	374	1.1	6.2	0.616	12	428	0.768
1516.9	1.6	9.6	0.346	9.5	392	0.792	24	0.631	15	449	0.578
1517.8	1.1	13	0.424	8.4	328	0.829	16	0.772	13	375	0.605
1518.8	1.1	13	0.224	13	336	0.558	16	0.408	20	384	0.407
1519.7	1.1	11	0.295	8.1	339	0.758	16	0.537	12	388	0.553
1520.6	0.950	8.9	0.362	10	320	1.2	14	0.659	16	366	0.845
1521.5	1.6	12	0.347	8.3	377	1.2	22	0.632	13	431	0.887
1522.5	0.855	13	0.661	8.5	314	1.4	12	1.2	13	359	1.0
1523.4	0.784	9.2	0.324	11	391	0.695	11	0.592	17	447	0.507
1524.3	1.6	12	0.405	9.1	386	1.2	23	0.738	14	441	0.870
1525.2	1.2	11	0.628	13	377	1.1	17	1.1	20	431	0.810
1526.2	0.806	8.8	0.523	10	286	0.646	12	0.954	16	327	0.471
1527.1	1.0	9.8	0.457	10	350	1.5	15	0.834	16	400	1.1
1528.0	1.1	15	0.183	12	380	1.4	15	0.335	19	434	1.0
1528.9	1.2	15	0.359	7.1	300	2.3	17	0.655	11	343	1.7
1529.9	1.3	9.6	0.554	10	330	1.9	18	1.0	15	377	1.4
1530.8	0.699	10	0.597	8.4	356	1.1	10	1.1	13	407	0.803
1531.7	0.791	11	0.396	11	319	0.275	11	0.722	16	364	0.201
1532.6	0.652	10.0	0.484	11	397	0.731	9.4	0.883	17	453	0.533
1533.6	0.569	12	0.740	10	360	1.2	8.2	1.3	16	412	0.862
1534.5	0.842	11	1.0	8.3	338	1.2	12	1.8	13	386	0.905
1535.4	1.2	9.5	0.893	13	256	0.787	17	1.6	20	293	0.574
1536.3	0.888	10	0.623	10	310	0.782	13	1.1	16	354	0.571
1537.3	0.838	12	0.742	9.4	364	0.808	12	1.4	14	416	0.589
1538.2	0.888	11	0.402	12	360	1.000	13	0.733	19	412	0.730
1539.1	1.2	9.8	0.658	12	324	0.522	17	1.2	19	370	0.381
1540.0	0.451	7.9	0.707	8.2	286	0.914	6.5	1.3	13	327	0.667
1541.0	0.764	11	0.672	11	334	0.333	11	1.2	17	382	0.243
1541.9	0.331	8.8	0.707	9.8	299	0.404	4.8	1.3	15	342	0.294
1542.8	1.3	8.2	0.499	11	219	0.569	18	0.911	17	250	0.415
1543.7	1.7	12	0.750	11	302	1.1	24	1.4	17	345	0.796
1544.6	1.6	10	0.799	10	317	1.6	24	1.5	16	362	1.2
1545.6	0.905	9.8	0.624	13	314	0.873	13	1.1	19	359	0.637
1546.5	0.698	12	0.933	9.2	324	1.3	10	1.7	14	371	0.912
1547.4	0.228	9.9	0.710	12	290	0.536	3.3	1.3	19	331	0.391
1548.3	0.771	11	0.817	13	266	0.793	11	1.5	19	304	0.579
1549.3	0.228	11	0.424	13	335	0.691	3.3	0.774	20	383	0.504
1550.2	0.548	11	0.956	14	357	1.6	7.9	1.7	22	408	1.1
1551.1	1.0	11	0.904	16	369	0.516	15	1.6	24	423	0.376
1552.0	0.739	9.0	0.730	16	292	0.760	11	1.3	25	334	0.554
1553.0	1.7	10	0.897	16	504	0.619	24	1.6	25	577	0.452
1553.9	1.2	9.6	2.1	15	421	1.3	18	3.8	23	481	0.970
1554.8	0.239	9.1	0.575	10	224	0.687	3.4	1.0	16	257	0.501
1555.7	0.996	13	1.2	18	344	0.400	14	2.1	27	394	0.292
1556.7	0.859	11	1.2	19	318	0.607	12	2.2	29	363	0.443
1557.6	1.2	13	1.1	15	400	0.659	18	2.0	23	458	0.481
1558.5	0.228	12	0.855	15	390	1.0	3.3	1.6	22	446	0.745
1559.4	0.665	8.9	0.533	17	333	1.1	9.6	0.972	25	380	0.771
1560.4	1.0	12	1.1	18	288	0.693	15	2.0	27	329	0.506
1561.3	1.9	12	1.2	15	338	0.456	27	2.2	24	387	0.333
1562.2	0.592	13	1.2	18	303	1.2	8.5	2.2	28	346	0.876
1563.1	1.2	12	1.0	13	301	1.1	17	1.9	20	344	0.794
1564.1	0.228	13	0.997	23	365	1.2	3.3	1.8	36	417	0.866
1565.0	0.854	13	1.7	19	337	0.546	12	3.2	30	386	0.399
1565.9	0.533	9.0	1.2	20	289	0.968	7.7	2.3	31	330	0.706
1566.8	0.803	12	0.838	16	295	1.6	12	1.5	24	337	1.1
1567.7	0.716	15	1.1	20	321	0.996	10	2.1	30	367	0.727
1568.7	0.705	7.9	0.722	22	210	0.412	10	1.3	34	240	0.301
1569.6	0.849	14	1.1	25	357	1.5	12	2.0	39	409	1.1
1570.5	0.556	9.5	1.4	22	325	0.876	8.0	2.5	33	371	0.639
1571.4	0.828	8.7	1.5	18	313	0.774	12	2.7	28	358	0.564



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1572.4	0.228	9.7	1.3	17	241	0.726	3.3	2.3	26	276	0.530
1573.3	1.0	8.9	1.3	18	236	0.848	15	2.4	28	269	0.619
1574.2	1.4	14	1.5	19	332	1.2	20	2.7	30	380	0.875
1575.1	1.0	13	1.9	20	254	1.3	15	3.5	30	290	0.917
1576.1	0.793	12	0.866	22	324	0.943	11	1.6	34	370	0.688
1577.0	0.856	9.8	1.6	14	246	1.2	12	3.0	22	281	0.863
1577.9	0.820	20	1.4	30	481	0.790	12	2.6	46	551	0.576
1578.8	0.432	6.4	1.1	23	192	0.228	6.2	2.0	35	220	0.166
1579.8	0.840	13	1.7	26	265	0.242	12	3.1	40	303	0.176
1580.7	1.0	15	1.7	24	316	0.518	15	3.1	37	361	0.378
1581.6	0.682	13	1.1	30	242	0.990	9.8	1.9	47	277	0.722
1582.5	0.848	7.6	1.1	20	247	0.692	12	2.1	30	282	0.505
1583.5	1.1	13	1.6	26	377	0.551	16	2.9	40	431	0.402
1584.4	1.2	9.2	2.0	30	359	1.3	17	3.6	46	411	0.915
1585.3	0.436	12	1.1	31	307	0.934	6.3	2.1	47	351	0.681
1586.2	0.483	11	1.7	28	291	0.290	7.0	3.1	43	333	0.212
1587.2	0.736	19	1.3	23	469	0.652	11	2.4	34	537	0.476
1588.1	0.421	9.7	0.787	21	165	0.021	6.1	1.4	32	189	0.015
1589.0	1.5	13	1.4	20	230	0.917	22	2.5	31	263	0.669
1589.9	0.937	13	1.3	18	205	0.230	14	2.4	27	235	0.168
1590.9	1.4	12	1.2	24	245	0.909	20	2.3	37	281	0.663
1591.8	1.6	14	1.7	38	307	0.986	23	3.1	59	351	0.719
1592.7	0.374	10.0	0.937	24	255	0.686	5.4	1.7	37	291	0.500
1593.6	0.998	17	1.7	22	251	1.0	14	3.1	34	286	0.730
1594.5	1.3	9.7	1.4	28	292	0.735	19	2.5	42	334	0.536
1595.5	0.951	15	1.3	24	307	0.776	14	2.4	37	351	0.566
1596.4	0.683	18	1.6	20	342	0.360	9.9	3.0	30	391	0.263
1597.3	0.650	8.8	1.0	16	166	0.487	9.4	1.9	24	190	0.356
1598.2	0.699	11	1.9	17	221	0.494	10	3.5	27	253	0.360
1599.2	1.2	14	1.5	25	344	1.7	17	2.8	39	394	1.2
1600.1	0.791	12	0.911	25	333	0.134	11	1.7	38	381	0.098
1601.0	0.971	15	1.4	26	293	0.423	14	2.5	40	335	0.309
1601.9	0.228	12	1.2	23	435	0.745	3.3	2.1	35	498	0.543
1602.9	0.414	11	1.0	22	317	0.889	6.0	1.8	34	362	0.648
1603.8	1.0	13	1.3	26	241	0.566	15	2.3	40	276	0.413
1604.7	1.3	12	0.596	25	319	1.4	18	1.1	38	365	1.0
1605.6	0.303	12	1.0	22	297	1.3	4.4	1.9	34	339	0.957
1606.6	1.6	13	1.1	23	290	0.279	24	2.0	35	332	0.204
1607.5	0.986	12	0.621	25	321	1.3	14	1.1	39	367	0.953
1608.4	1.3	13	0.618	19	230	0.738	19	1.1	29	263	0.539
1609.3	0.802	17	0.785	25	293	0.998	12	1.4	38	336	0.728
1610.3	0.715	17	0.920	22	307	0.708	10	1.7	33	351	0.516
1611.2	0.843	13	0.440	20	257	0.368	12	0.802	31	294	0.268
1612.1	1.2	15	0.769	18	230	0.455	17	1.4	28	264	0.332
1613.0	0.899	12	0.407	24	317	0.575	13	0.742	37	362	0.419
1614.0	1.3	12	0.447	20	290	1.1	19	0.816	31	332	0.791
1614.9	0.578	14	0.906	18	271	0.517	8.3	1.7	27	309	0.377
1615.8	0.901	15	0.534	31	329	2.1	13	0.975	48	377	1.6
1616.7	2.9	17	0.616	23	314	0.702	42	1.1	35	359	0.512
1617.7	0.927	18	0.458	13	224	0.300	13	0.835	20	256	0.219
1618.6	1.8	16	0.362	23	289	0.931	26	0.660	36	331	0.680
1619.5	1.2	14	1.1	23	343	1.2	17	1.9	35	392	0.869
1620.4	0.608	16	0.653	20	314	0.820	8.8	1.2	30	360	0.598
1621.3	0.962	12	0.663	17	295	0.600	14	1.2	27	338	0.438
1622.3	1.1	13	0.719	14	205	0.675	15	1.3	22	234	0.492
1623.2	0.678	14	0.346	19	268	0.942	9.8	0.631	30	306	0.687
1624.1	0.457	11	0.479	19	267	0.710	6.6	0.873	29	305	0.518
1625.0	1.8	14	0.566	12	297	1.6	26	1.0	19	340	1.2
1626.0	0.994	14	0.290	16	337	1.6	14	0.528	24	386	1.2
1626.9	0.513	17	0.607	11	412	1.4	7.4	1.1	17	471	1.0
1627.8	0.890	15	0.427	18	359	2.3	13	0.779	27	411	1.7
1628.7	1.4	14	0.247	16	293	1.3	20	0.450	24	335	0.982
1629.7	0.609	16	0.252	17	313	1.1	8.8	0.459	25	358	0.806
1630.6	1.2	13	0.314	13	311	0.945	17	0.573	20	356	0.690
1631.5	1.0	15	0.604	13	276	0.987	15	1.1	20	315	0.720
1632.4	1.5	16	0.203	12	276	0.634	21	0.370	18	316	0.463
1633.4	0.798	11	0.676	11	245	0.511	12	1.2	17	280	0.373
1634.3	0.867	9.7	0.606	7.5	211	0.911	13	1.1	12	242	0.665
1635.2	2.0	10	0.678	16	293	0.747	29	1.2	25	335	0.545
1636.1	1.2	11	0.574	13	270	0.939	18	1.0	20	308	0.685
1637.1	1.1	12	0.758	15	322	1.2	16	1.4	24	369	0.883
1638.0	1.0	11	0.387	14	325	1.4	15	0.705	21	372	0.990
1638.9	0.605	10	0.427	11	270	0.720	8.7	0.778	17	309	0.526
1639.8	0.632	10	0.507	12	289	0.499	9.1	0.925	18	331	0.364
1640.8	0.604	15	0.382	9.0	335	0.403	8.7	0.697	14	383	0.294
1641.7	0.568	11	0.484	12	294	1.2	8.2	0.883	18	336	0.840
1642.6	1.2	13	0.516	15	325	1.6	18	0.941	23	371	1.1
1643.5	1.1	14	0.701	12	320	0.697	16	1.3	18	366	0.509
1644.4	0.689	12	0.525	16	280	1.5	9.9	0.957	25	320	1.1
1645.4	1.0	10	0.688	12	284	0.822	15	1.3	18	325	0.600
1646.3	0.716	13	0.747	15	330	1.3	10	1.4	23	377	0.935



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1647.2	0.428	13	0.754	11	309	1.1	6.2	1.4	18	353	0.767
1648.1	0.270	12	0.807	11	317	0.515	3.9	1.5	17	363	0.376
1649.1	0.821	9.7	0.638	10	241	0.441	12	1.2	16	276	0.322
1650.0	0.341	11	0.825	12	312	0.892	4.9	1.5	18	357	0.650
1650.9	0.604	12	0.719	13	459	1.8	8.7	1.3	20	525	1.3
1651.8	0.503	12	0.463	13	311	0.650	7.3	0.844	19	355	0.474
1652.8	0.286	8.1	0.615	13	217	1.3	4.1	1.1	20	248	0.940
1653.7	0.469	12	0.896	16	284	0.716	6.8	1.6	25	324	0.522
1654.6	1.0	11	0.520	14	285	1.6	15	0.948	22	326	1.2
1655.5	0.563	8.6	0.299	13	213	0.816	8.1	0.545	19	243	0.595
1656.5	0.836	13	1.5	16	374	0.612	12	2.8	24	427	0.447
1657.4	1.4	13	0.457	12	409	0.642	20	0.833	18	468	0.468
1658.3	0.317	12	0.428	14	289	1.2	4.6	0.780	22	330	0.888
1659.2	1.0	11	0.816	17	284	0.888	15	1.5	26	325	0.648
1660.2	0.733	11	0.558	11	265	1.0	11	1.0	16	303	0.761
1661.1	1.0	12	0.632	20	294	2.7	14	1.2	30	336	1.9
1662.0	0.625	11	0.501	13	268	0.994	9.0	0.914	19	307	0.725
1662.9	0.730	9.9	0.273	13	256	1.7	11	0.498	20	292	1.2
1663.9	0.714	14	0.791	17	279	1.6	10	1.4	25	319	1.1
1664.8	1.3	12	1.1	16	229	0.678	19	2.0	24	262	0.495
1665.7	0.988	17	0.606	15	352	1.3	14	1.1	23	402	0.927
1666.6	0.867	17	0.531	19	393	0.821	13	0.968	29	449	0.599
1667.6	0.228	7.0	0.566	7.9	144	0.892	3.3	1.0	12	165	0.651
1668.5	0.631	17	0.989	17	367	0.850	9.1	1.8	26	419	0.620
1669.4	0.442	18	0.612	13	311	0.947	6.4	1.1	20	355	0.691
1670.3	0.563	6.1	0.405	12	127	1.1	8.1	0.739	19	145	0.827
1671.2	1.2	10.0	1.3	14	279	1.4	18	2.3	22	319	1.0
1672.2	1.4	24	0.783	14	686	1.5	20	1.4	21	785	1.1
1673.1	0.563	10.0	0.721	14	235	0.902	8.1	1.3	22	268	0.658
1674.0	2.1	14	0.820	14	249	1.5	31	1.5	21	285	1.1
1674.9	0.948	21	0.631	12	304	1.4	14	1.2	18	347	1.0
1675.9	0.490	13	0.358	15	282	0.633	7.1	0.652	22	322	0.462
1676.8	0.363	9.3	0.531	11	183	0.442	5.2	0.968	17	209	0.323
1677.7	1.6	11	0.525	9.8	458	1.4	24	0.958	15	523	1.0
1678.6	0.919	16	0.540	14	498	0.649	13	0.984	22	569	0.474
1679.6	0.463	7.7	0.326	11	163	0.829	6.7	0.595	17	187	0.605
1680.5	1.8	19	0.606	11	277	0.532	26	1.1	17	317	0.388
1681.4	0.973	19	0.472	11	452	1.1	14	0.861	17	517	0.835
1682.3	0.651	7.2	0.309	7.0	171	0.735	9.4	0.564	11	195	0.536
1683.3	0.662	10	0.980	9.2	232	1.6	9.6	1.8	14	265	1.2
1684.2	1.2	20	0.647	10	401	1.7	17	1.2	16	459	1.2
1685.1	0.767	12	0.468	13	264	0.615	11	0.854	20	302	0.449
1686.0	0.467	12	0.400	9.4	243	1.1	6.7	0.730	14	278	0.797
1687.0	1.2	16	0.892	10	374	1.1	17	1.6	16	428	0.804
1687.9	0.228	11	0.568	11	284	1.1	3.3	1.0	16	324	0.817
1688.8	1.1	10	0.476	8.3	285	0.939	15	0.868	13	326	0.685
1689.7	1.0	12	0.189	11	290	0.981	15	0.345	16	332	0.716
1690.7	0.591	13	0.356	11	342	0.609	8.5	0.650	17	391	0.444
1691.6	0.525	8.1	0.183	6.4	167	0.465	7.6	0.335	9.8	191	0.340
1692.5	0.368	14	0.367	20	395	1.8	5.3	0.670	31	452	1.3
1693.4	0.737	14	0.479	9.1	296	0.831	11	0.874	14	339	0.606
1694.3	0.342	11	0.261	16	336	1.5	4.9	0.476	25	385	1.1
1695.3	0.418	8.3	0.279	10	301	0.213	6.0	0.509	16	344	0.155
1696.2	0.663	13	0.420	11	305	0.894	9.6	0.766	17	349	0.652
1697.1	0.487	8.9	0.347	10	272	1.0	7.0	0.632	15	311	0.761
1698.0	0.302	12	0.443	6.4	453	0.575	4.4	0.808	9.8	518	0.420
1699.0	0.804	13	0.647	8.8	325	0.569	12	1.2	14	371	0.415
1699.9	0.480	8.9	0.290	9.3	309	1.4	6.9	0.529	14	353	1.0
1700.8	0.439	11	0.445	12	290	0.942	6.3	0.811	18	332	0.687
1701.7	0.228	13	0.449	7.0	286	1.2	3.3	0.819	11	328	0.857
1702.7	1.5	9.9	0.265	7.0	276	0.764	21	0.484	11	315	0.557
1703.6	0.990	12	0.374	6.1	299	1.2	14	0.682	9.3	342	0.850
1704.5	0.715	11	0.747	7.6	334	0.994	10	1.4	12	382	0.725
1705.4	0.228	11	0.183	10.0	277	1.1	3.3	0.335	15	317	0.834
1706.4	0.913	11	0.270	13	341	1.6	13	0.492	19	390	1.2
1707.3	0.611	11	0.420	8.1	350	1.1	8.8	0.766	12	400	0.803
1708.2	0.539	11	0.427	9.9	310	0.978	7.8	0.780	15	354	0.714
1709.1	0.989	9.6	0.183	8.6	260	0.617	14	0.335	13	297	0.450
1710.1	1.1	15	0.183	9.0	307	0.600	16	0.335	14	351	0.438
1711.0	0.664	15	0.384	9.2	358	0.896	9.6	0.701	14	409	0.653
1711.9	0.602	16	0.348	8.4	286	0.539	8.7	0.635	13	327	0.393
1712.8	1.2	14	0.183	13	272	1.1	17	0.335	19	312	0.788
1713.8	0.933	15	0.183	8.9	333	0.756	13	0.335	14	380	0.552
1714.7	0.440	14	0.247	11	306	1.5	6.3	0.451	17	350	1.1
1715.6	0.729	14	0.195	8.6	289	0.722	11	0.356	13	331	0.527
1716.5	1.2	16	0.183	6.6	325	0.874	17	0.335	10	371	0.637
1717.5	1.2	12	0.217	9.8	309	0.680	17	0.396	15	354	0.496
1718.4	0.602	15	0.679	8.7	301	0.538	8.7	1.2	13	344	0.393
1719.3	0.788	15	0.264	9.4	287	1.0	11	0.482	14	328	0.741
1720.2	0.791	12	0.258	10	319	1.7	11	0.471	16	365	1.2
1721.1	0.600	12	0.413	11	281	0.537	8.7	0.753	16	322	0.391



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1722.1	1.2	12	0.389	10	294	0.761	17	0.709	16	337	0.555
1723.0	0.391	18	0.841	8.8	346	2.1	5.6	1.5	14	396	1.5
1723.9	1.1	13	0.183	12	291	1.4	16	0.335	18	333	0.987
1724.8	1.2	14	0.317	11	259	0.954	18	0.578	16	297	0.696
1725.8	1.6	16	0.347	12	326	0.894	24	0.633	19	373	0.652
1726.7	0.228	12	0.494	9.4	307	0.694	3.3	0.901	14	351	0.506
1727.6	0.673	12	0.204	14	298	1.2	9.7	0.373	21	341	0.885
1728.5	0.792	14	0.183	11	327	0.985	11	0.335	18	374	0.719
1729.5	0.692	14	0.219	7.4	330	0.962	10.0	0.399	11	377	0.702
1730.4	1.4	12	0.579	14	316	1.0	20	1.1	21	361	0.732
1731.3	0.964	16	0.538	12	335	1.6	14	0.980	18	383	1.1
1732.2	1.1	16	0.610	9.0	363	0.711	15	1.1	14	415	0.518
1733.2	1.3	15	0.445	12	285	1.3	19	0.812	18	326	0.917
1734.1	1.2	14	0.484	9.9	334	0.765	17	0.883	15	382	0.558
1735.0	1.2	17	0.387	7.2	329	0.824	17	0.706	11	376	0.601
1735.9	0.843	14	0.316	12	313	0.676	12	0.576	19	358	0.493
1736.9	1.3	11	0.280	12	260	1.2	19	0.511	18	297	0.881
1737.8	1.1	18	0.476	14	386	1.7	17	0.868	21	441	1.3
1738.7	1.1	15	0.383	9.2	310	0.267	16	0.699	14	355	0.195
1739.6	0.738	14	0.508	9.9	259	1.3	11	0.927	15	296	0.955
1740.6	0.588	15	0.211	14	338	0.793	8.5	0.385	21	386	0.579
1741.5	1.5	19	0.605	12	347	2.0	21	1.1	19	396	1.4
1742.4	0.782	12	0.385	13	270	0.754	11	0.702	20	309	0.550
1743.3	1.5	15	0.561	8.8	281	2.0	22	1.0	14	321	1.4
1744.3	0.919	14	0.215	13	359	0.129	13	0.392	21	411	0.094
1745.2	0.952	14	0.565	11	332	0.415	14	1.0	17	379	0.303
1746.1	0.670	11	0.306	11	247	0.474	9.7	0.559	17	282	0.346
1747.0	0.596	12	0.639	9.5	314	0.938	8.6	1.2	15	359	0.685
1747.9	0.664	15	0.311	14	412	1.8	9.6	0.567	21	471	1.3
1748.9	1.0	11	0.343	10	273	1.5	15	0.625	15	312	1.1
1749.8	0.819	14	0.303	13	331	1.5	12	0.553	20	379	1.1
1750.7	1.1	17	0.329	12	343	0.563	16	0.601	19	392	0.411
1751.6	0.912	11	0.183	11	292	0.739	13	0.335	17	334	0.539
1752.6	0.670	15	0.183	9.1	341	0.663	9.7	0.335	14	390	0.484
1753.5	0.525	13	0.649	7.8	310	0.816	7.6	1.2	12	354	0.595
1754.4	0.615	13	0.225	7.5	290	0.363	8.9	0.410	12	331	0.265
1755.3	1.3	14	0.587	13	302	0.545	18	1.1	21	345	0.398
1756.3	1.9	15	0.423	10	361	0.828	28	0.771	16	412	0.604
1757.2	0.629	12	0.260	8.7	289	0.497	9.1	0.475	13	331	0.363
1758.1	0.832	12	0.344	14	311	0.937	12	0.628	22	356	0.684
1759.0	0.757	13	0.183	9.4	332	1.5	11	0.335	14	380	1.1
1760.0	1.1	12	0.208	11	345	0.458	16	0.380	17	394	0.334
1760.9	0.661	8.5	0.388	8.6	228	0.586	9.5	0.708	13	261	0.427
1761.8	1.2	13	0.221	9.5	295	0.830	17	0.403	15	337	0.606
1762.7	1.3	13	0.277	8.9	368	0.902	19	0.505	14	421	0.658
1763.7	0.382	11	0.541	7.5	292	0.855	5.5	0.987	11	334	0.624
1764.6	0.318	12	0.183	7.9	252	0.593	4.6	0.335	12	288	0.433
1765.5	0.277	14	0.309	5.9	311	0.662	4.0	0.564	9.0	356	0.483
1766.4	0.270	13	0.238	8.6	284	0.645	3.9	0.434	13	325	0.470
1767.4	1.3	13	0.252	8.0	269	0.546	18	0.460	12	308	0.398
1768.3	1.9	13	0.647	9.7	358	1.1	28	1.2	15	409	0.772
1769.2	0.365	12	0.351	10	351	0.405	5.3	0.640	16	401	0.296
1770.1	1.5	11	0.381	9.1	312	1.5	22	0.696	14	356	1.1
1771.1	0.971	11	0.337	5.8	277	0.786	14	0.615	8.9	317	0.574
1772.0	0.451	12	0.355	7.1	325	0.688	6.5	0.648	11	371	0.502
1772.9	0.661	11	0.273	8.2	263	0.918	9.5	0.498	13	301	0.670
1773.8	0.499	10.0	0.333	5.4	277	1.6	7.2	0.607	8.3	316	1.1
1774.7	0.228	10	0.241	8.4	345	1.2	3.3	0.439	13	395	0.883
1775.7	0.228	11	0.214	7.6	257	0.816	3.3	0.391	12	293	0.595
1776.6	1.1	11	0.199	8.3	293	0.749	15	0.363	13	335	0.546
1777.5	0.936	11	0.183	4.6	331	1.1	14	0.335	7.1	379	0.803
1778.4	1.8	12	0.357	7.4	341	1.1	27	0.650	11	389	0.810
1779.4	0.658	12	0.183	6.5	273	1.3	9.5	0.335	10	313	0.956
1780.3	0.943	12	0.353	7.8	336	1.5	14	0.644	12	384	1.1
1781.2	0.508	13	0.210	7.5	323	0.391	7.3	0.383	12	370	0.285
1782.1	0.577	10	0.461	7.4	302	1.0	8.3	0.840	11	346	0.758
1783.1	0.480	11	0.259	6.7	284	0.998	6.9	0.473	10	324	0.728
1784.0	0.748	16	0.699	6.3	340	1.6	11	1.3	9.7	389	1.2
1784.9	0.882	9.8	0.183	4.9	286	1.1	13	0.335	7.4	328	0.784
1785.8	0.981	11	0.265	5.2	321	1.4	14	0.483	8.0	367	1.1
1786.8	1.1	11	0.242	9.2	394	1.4	16	0.442	14	451	0.999
1787.7	0.501	11	0.493	5.0	332	1.2	7.2	0.899	7.7	379	0.855
1788.6	0.796	9.7	0.501	6.3	319	1.2	11	0.914	9.6	364	0.856
1789.5	1.3	11	0.375	3.3	263	0.859	18	0.685	5.0	301	0.627
1790.5	0.700	14	0.183	8.6	310	0.413	10	0.335	13	354	0.301
1791.4	0.582	10	0.304	9.6	284	0.520	8.4	0.555	15	325	0.380
1792.3	1.1	13	0.224	8.0	332	0.843	16	0.409	12	379	0.615
1793.2	1.3	14	0.421	4.2	355	0.895	18	0.767	6.4	406	0.653
1794.2	1.3	9.1	0.183	7.3	282	0.681	18	0.335	11	322	0.497
1795.1	0.747	8.8	0.456	6.1	241	0.720	11	0.831	9.4	276	0.525
1796.0	0.791	13	0.190	6.1	315	1.8	11	0.346	9.3	360	1.3



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1796.9	0.608	12	0.519	7.8	293	0.820	8.8	0.946	12	335	0.598
1797.9	0.994	11	0.655	7.5	292	0.746	14	1.2	12	333	0.544
1798.8	0.672	12	0.538	5.4	301	0.665	9.7	0.982	8.3	345	0.485
1799.7	1.6	13	0.332	8.1	306	0.903	23	0.605	12	350	0.659
1800.6	1.2	12	0.282	4.7	282	0.676	18	0.515	7.3	322	0.493
1801.5	0.719	11	0.611	6.8	315	1.000	10	1.1	10	360	0.729
1802.5	1.1	14	0.499	8.6	297	0.741	15	0.910	13	340	0.541
1803.4	0.615	10	0.322	7.1	323	0.689	8.9	0.587	11	369	0.503
1804.3	0.351	11	0.562	7.2	260	1.3	5.1	1.0	11	298	0.960
1805.2	0.947	13	0.630	9.1	320	0.413	14	1.1	14	366	0.301
1806.2	1.1	11	0.505	8.9	300	1.9	16	0.920	14	343	1.4
1807.1	0.938	9.9	0.698	6.5	267	0.887	14	1.3	9.9	305	0.647
1808.0	1.7	13	0.471	5.6	259	0.744	25	0.859	8.6	296	0.543
1808.9	0.741	10	0.414	11	635	1.2	11	0.756	17	726	0.860
1809.9	0.771	11	0.679	8.6	239	0.907	11	1.2	13	273	0.662
1810.8	1.4	12	0.444	8.0	277	0.497	21	0.809	12	317	0.363
1811.7	0.610	13	0.696	7.6	238	1.6	8.8	1.3	12	273	1.2
1812.6	0.889	9.2	0.613	9.4	229	1.0	13	1.1	14	261	0.732
1813.6	1.1	12	0.622	10	254	0.823	16	1.1	15	291	0.601
1814.5	1.1	13	0.639	8.9	244	0.695	15	1.2	14	279	0.507
1815.4	1.2	12	0.678	7.2	246	1.1	17	1.2	11	281	0.790
1816.3	0.465	11	0.749	12	278	1.7	6.7	1.4	18	318	1.3
1817.3	1.0	12	1.0	9.8	304	1.5	15	1.9	15	348	1.1
1818.2	1.0	11	0.541	11	286	1.5	15	0.986	17	328	1.1
1819.1	0.290	11	0.900	9.4	285	1.8	4.2	1.6	14	326	1.3
1820.0	0.404	13	0.646	9.1	317	1.2	5.8	1.2	14	362	0.881
1821.0	0.560	10	0.586	12	324	1.5	8.1	1.1	18	370	1.1
1821.9	1.2	11	0.695	11	258	1.2	17	1.3	16	295	0.884
1822.8	0.228	15	1.1	11	321	1.4	3.3	2.0	17	367	0.996
1823.7	1.0	12	0.775	9.5	302	0.702	15	1.4	15	345	0.512
1824.6	0.604	12	0.748	14	260	0.814	8.7	1.4	21	297	0.594
1825.6	0.946	11	0.663	10	301	1.4	14	1.2	15	345	1.0
1826.5	0.720	14	0.543	15	321	0.425	10	0.990	23	367	0.310
1827.4	0.859	13	0.633	12	251	1.3	12	1.2	18	287	0.923
1828.3	0.938	10	1.1	12	288	1.8	14	2.0	19	329	1.3
1829.3	2.3	14	1.1	16	350	0.866	33	2.0	24	401	0.632
1830.2	0.959	11	0.745	12	266	1.0	14	1.4	18	304	0.758
1831.1	0.595	8.9	1.0	15	237	1.1	8.6	1.9	23	271	0.783
1832.0	1.2	13	0.992	16	310	0.709	18	1.8	25	355	0.517
1833.0	0.740	16	1.3	20	325	0.881	11	2.5	31	371	0.643
1833.9	0.870	13	1.4	16	222	1.2	13	2.6	25	254	0.840
1834.8	1.2	12	0.880	15	249	1.6	17	1.6	23	285	1.2
1835.7	0.336	12	1.5	18	360	1.5	4.8	2.8	27	412	1.1
1836.7	0.396	13	1.2	16	249	0.972	5.7	2.2	24	285	0.709
1837.6	0.624	13	1.1	17	249	0.868	9.0	2.0	26	284	0.633
1838.5	1.1	19	1.6	20	384	1.2	16	3.0	30	439	0.886
1839.4	0.876	9.9	0.740	15	270	1.6	13	1.3	24	308	1.1
1840.4	0.969	16	1.3	17	431	0.917	14	2.4	25	493	0.669
1841.3	0.722	17	1.9	18	322	1.1	10	3.4	28	368	0.837
1842.2	0.637	13	0.816	18	265	1.1	9.2	1.5	28	303	0.828
1843.1	1.1	15	1.1	15	250	1.1	16	2.0	23	285	0.825
1844.1	0.722	14	0.719	27	361	1.3	10	1.3	41	412	0.943
1845.0	1.1	18	1.0	19	297	1.8	16	1.9	29	340	1.3
1845.9	1.1	19	1.3	19	349	0.999	15	2.3	28	399	0.729
1846.8	1.0	16	1.3	19	250	1.3	15	2.4	30	286	0.974
1847.8	1.2	20	1.6	17	282	0.988	18	3.0	26	322	0.721
1848.7	0.742	15	0.861	16	237	0.956	11	1.6	25	271	0.698
1849.6	0.328	15	1.1	15	256	1.1	4.7	1.9	24	293	0.806
1850.5	0.804	16	1.1	17	265	1.4	12	2.1	26	304	1.0
1851.4	1.2	16	1.2	21	467	0.793	18	2.2	32	535	0.579
1852.4	0.228	17	0.973	17	247	0.981	3.3	1.8	26	283	0.715
1853.3	0.504	15	0.816	20	264	0.916	7.3	1.5	30	302	0.668
1854.2	0.785	14	1.3	16	254	1.9	11	2.5	25	290	1.4
1855.1	0.387	21	1.1	23	259	1.3	5.6	2.1	35	296	0.955
1856.1	1.8	19	0.735	19	306	2.2	26	1.3	29	350	1.6
1857.0	0.972	20	1.1	20	234	1.5	14	2.1	30	268	1.1
1857.9	0.700	18	1.1	22	295	1.6	10	2.1	33	337	1.2
1858.8	0.638	16	1.2	17	231	1.0	9.2	2.3	27	264	0.733
1859.8	0.678	19	1.2	18	294	1.5	9.8	2.3	28	336	1.1
1860.7	1.3	16	1.1	14	229	1.3	19	2.1	22	262	0.940
1861.6	0.826	14	1.3	18	294	0.880	12	2.3	27	336	0.642
1862.5	1.8	19	1.4	20	307	0.723	27	2.6	31	351	0.527
1863.5	1.1	18	0.953	22	307	0.820	16	1.7	34	351	0.598
1864.4	0.703	16	1.3	19	255	0.977	10	2.5	30	292	0.713
1865.3	1.0	17	1.3	18	280	0.451	15	2.3	27	320	0.329
1866.2	1.2	18	1.6	19	301	0.446	17	3.0	29	344	0.325
1867.2	0.585	13	0.639	21	260	1.0	8.4	1.2	33	297	0.764
1868.1	0.583	18	1.3	21	289	1.2	8.4	2.3	32	330	0.862
1869.0	0.677	17	1.4	24	324	1.4	9.8	2.6	37	371	1.0
1869.9	0.776	14	1.2	16	306	1.4	11	2.3	24	350	1.0
1870.9	0.485	13	0.846	20	301	1.5	7.0	1.5	31	344	1.1



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Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1871.8	0.296	19	1.5	21	307	1.4	4.3	2.7	32	351	1.0
1872.7	0.782	14	0.513	24	321	1.4	11	0.936	37	367	1.0
1873.6	0.429	11	0.775	15	207	1.0	6.2	1.4	23	237	0.732
1874.6	0.763	16	1.1	19	252	2.2	11	2.0	30	288	1.6
1875.5	0.613	16	0.793	18	281	1.7	8.9	1.4	28	321	1.2
1876.4	0.421	15	1.2	20	253	2.1	6.1	2.2	30	289	1.5
1877.3	1.2	17	1.3	17	267	3.2	18	2.4	26	305	2.3
1878.2	1.2	21	1.3	24	297	0.865	17	2.4	37	340	0.631
1879.2	0.961	17	0.779	21	250	2.6	14	1.4	32	286	1.9
1880.1	1.1	14	0.888	20	275	1.4	16	1.6	31	315	1.0
1881.0	0.830	18	1.3	18	310	1.7	12	2.4	27	354	1.3
1881.9	0.387	16	0.914	17	243	1.3	5.6	1.7	26	278	0.955
1882.9	0.685	13	0.908	17	221	1.6	9.9	1.7	26	253	1.2
1883.8	0.575	15	1.1	14	251	1.3	8.3	2.0	22	287	0.947
1884.7	0.723	16	1.1	18	296	2.3	10	2.0	27	338	1.7
1885.6	1.1	12	1.1	17	252	1.8	17	1.9	26	288	1.3
1886.6	1.1	15	0.994	14	282	2.0	17	1.8	22	323	1.5
1887.5	0.974	18	1.1	18	316	1.6	14	2.0	28	361	1.2
1888.4	0.892	17	0.658	15	282	1.6	13	1.2	23	322	1.2
1889.3	1.3	14	0.845	15	270	2.5	19	1.5	23	309	1.8
1890.3	1.3	15	0.589	12	330	2.2	18	1.1	19	377	1.6
1891.2	1.2	15	0.500	15	258	3.8	17	0.912	23	295	2.8
1892.1	1.1	15	0.318	16	237	2.5	15	0.579	25	271	1.8
1893.0	0.859	19	0.664	11	273	1.6	12	1.2	17	312	1.2
1894.0	0.559	17	1.1	12	247	1.6	8.1	2.0	19	282	1.2
1894.9	0.443	14	0.681	12	265	2.3	6.4	1.2	18	303	1.7
1895.8	0.508	15	0.822	13	270	0.923	7.3	1.5	20	308	0.673
1896.7	0.316	15	0.420	11	251	1.8	4.6	0.765	17	287	1.3
1897.7	1.1	14	0.854	15	246	1.9	16	1.6	24	281	1.4
1898.6	1.1	14	0.437	13	290	3.2	16	0.797	20	332	2.3
1899.5	1.2	17	0.658	17	291	2.5	17	1.2	26	333	1.8
1900.4	0.639	16	0.440	11	272	3.0	9.2	0.802	17	311	2.2
1901.4	1.2	12	0.622	14	282	1.8	17	1.1	21	323	1.3
1902.3	1.1	18	0.658	16	436	3.7	16	1.2	24	498	2.7
1903.2	1.1	15	0.915	14	258	2.6	16	1.7	21	295	1.9
1904.1	1.2	14	0.547	11	244	2.1	17	0.998	17	280	1.5
1905.0	0.779	12	0.489	7.1	180	2.4	11	0.892	11	206	1.7
1906.0	0.795	13	0.500	9.4	203	1.5	11	0.912	14	232	1.1
1906.9	1.2	13	0.497	12	243	2.4	17	0.907	19	278	1.7
1907.8	1.2	15	0.586	12	269	2.2	17	1.1	18	307	1.6
1908.7	0.943	16	0.464	12	286	2.4	14	0.846	18	327	1.8
1909.7	0.615	13	0.626	11	259	1.9	8.9	1.1	17	296	1.4
1910.6	0.727	11	0.553	10	216	2.7	10	1.0	16	247	2.0
1911.5	1.1	12	0.724	14	321	2.8	15	1.3	21	367	2.0
1912.4	1.8	15	0.416	9.6	349	3.6	26	0.759	15	399	2.6
1913.4	0.682	12	0.414	10	241	3.0	9.8	0.756	15	275	2.2
1914.3	0.228	16	0.490	6.9	276	2.1	3.3	0.894	11	316	1.5
1915.2	1.4	14	0.392	11	338	2.4	20	0.714	17	387	1.8
1916.1	0.680	9.5	0.488	5.9	249	1.8	9.8	0.890	9.1	284	1.3
1917.1	0.995	12	0.609	7.5	304	2.4	14	1.1	12	348	1.8
1918.0	0.881	13	0.399	10	281	2.6	13	0.728	16	321	1.9
1918.9	0.715	13	0.504	8.7	297	1.7	10	0.918	13	340	1.2
1919.8	0.513	10	0.570	7.4	253	2.5	7.4	1.0	11	289	1.9
1920.8	0.862	12	0.356	4.5	311	1.4	12	0.650	6.8	356	1.0
1921.7	1.7	13	0.434	10	312	1.4	25	0.792	15	357	1.0
1922.6	1.3	8.9	0.770	6.5	260	1.7	19	1.4	10	298	1.3
1923.5	0.785	11	0.734	8.4	316	2.2	11	1.3	13	361	1.6
1924.5	1.1	13	0.952	10	283	0.924	16	1.7	16	324	0.674
1925.4	0.266	9.9	0.183	9.8	261	2.1	3.8	0.335	15	299	1.5
1926.3	0.625	10	0.622	6.9	255	2.1	9.0	1.1	11	292	1.5
1927.2	1.3	12	0.832	14	276	1.3	18	1.5	21	316	0.939
1928.2	1.1	10	0.508	8.5	266	1.1	16	0.927	13	304	0.828
1929.1	1.3	9.8	0.816	7.8	240	1.3	18	1.5	12	274	0.976
1930.0	1.5	9.1	0.731	11	259	1.3	22	1.3	17	296	0.972
1930.9	0.873	11	0.737	12	273	2.1	13	1.3	18	312	1.5
1931.8	1.5	11	0.820	12	246	1.7	22	1.5	19	282	1.3
1932.8	1.5	9.5	0.533	9.5	277	2.0	22	0.971	15	316	1.5
1933.7	0.768	11	0.685	13	281	1.2	11	1.2	21	321	0.899
1934.6	1.4	9.4	0.337	11	223	1.3	20	0.615	17	255	0.963
1935.5	0.411	14	1.2	11	236	1.3	5.9	2.1	16	270	0.920
1936.5	0.589	11	0.891	10	266	1.1	8.5	1.6	16	305	0.774
1937.4	0.939	11	1.3	12	275	0.505	14	2.3	19	314	0.368
1938.3	0.556	11	1.1	14	263	1.4	8.0	1.9	21	300	1.0
1939.2	1.0	11	1.2	13	278	1.4	15	2.2	20	318	1.0
1940.2	0.432	10	1.0	12	287	1.7	6.2	1.9	18	328	1.3
1941.1	0.694	11	1.7	12	247	0.826	10	3.0	18	282	0.603
1942.0	0.714	13	1.0	15	281	0.993	10	1.9	24	322	0.724
1942.9	0.381	15	1.2	17	313	0.997	5.5	2.3	27	357	0.727
1943.9	1.8	12	1.0	15	257	1.5	25	1.9	23	294	1.1
1944.8	0.804	14	1.2	17	335	1.9	12	2.2	26	383	1.4
1945.7	0.876	13	1.3	12	323	1.3	13	2.4	19	369	0.927



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1946.6	0.423	11	1.5	16	264	1.4	6.1	2.7	24	302	1.0
1947.6	0.571	13	1.5	17	266	0.899	8.2	2.7	26	304	0.656
1948.5	0.533	16	1.7	12	289	0.549	7.7	3.1	18	331	0.401
1949.4	0.462	13	0.987	15	280	0.849	6.7	1.8	23	321	0.619
1950.3	1.4	14	1.3	20	260	1.2	21	2.4	31	298	0.863
1951.3	0.754	15	1.8	16	330	1.0	11	3.2	24	377	0.765
1952.2	0.505	12	1.2	13	242	0.909	7.3	2.2	21	277	0.664
1953.1	0.757	13	1.9	17	242	0.399	11	3.5	26	277	0.291
1954.0	0.475	14	1.5	18	292	1.6	6.9	2.8	28	334	1.2
1955.0	0.519	12	0.906	18	268	0.807	7.5	1.7	27	307	0.589
1955.9	0.290	12	1.3	14	260	0.975	4.2	2.5	22	297	0.711
1956.8	0.745	18	1.5	18	317	2.1	11	2.7	27	362	1.5
1957.7	1.0	13	1.6	15	268	0.971	15	3.0	23	306	0.708
1958.6	0.228	13	1.2	19	287	1.1	3.3	2.1	30	329	0.802
1959.6	0.532	12	1.3	9.7	243	1.2	7.7	2.4	15	278	0.876
1960.5	0.475	15	1.6	17	302	2.2	6.9	2.9	26	345	1.6
1961.4	0.339	14	0.944	15	269	0.758	4.9	1.7	24	308	0.553
1962.3	0.633	16	2.0	19	293	1.1	9.1	3.7	29	335	0.832
1963.3	1.0	15	1.7	15	298	0.978	15	3.0	23	341	0.713
1964.2	1.7	11	1.6	17	270	0.935	24	2.8	25	309	0.682
1965.1	0.770	12	1.6	19	308	1.4	11	2.9	29	352	1.0
1966.0	0.362	14	1.8	19	328	1.8	5.2	3.3	29	375	1.3
1967.0	1.4	13	1.9	20	287	1.2	21	3.4	31	329	0.867
1967.9	0.228	11	1.7	20	251	1.6	3.3	3.1	31	287	1.2
1968.8	0.526	15	1.7	17	284	1.1	7.6	3.0	26	324	0.797
1969.7	0.837	14	1.9	21	279	1.2	12	3.4	32	319	0.886
1970.7	0.532	12	1.3	20	337	1.4	7.7	2.3	31	386	1.0
1971.6	1.0	11	1.8	17	265	1.1	15	3.3	26	303	0.797
1972.5	0.228	12	2.0	16	293	1.2	3.3	3.6	25	336	0.873
1973.4	0.987	13	1.9	16	265	0.616	14	3.4	24	303	0.450
1974.4	0.497	10	2.1	24	250	0.903	7.2	3.9	36	286	0.659
1975.3	0.613	11	1.7	19	299	0.826	8.8	3.0	30	342	0.603
1976.2	1.4	15	1.7	23	306	1.2	20	3.0	36	350	0.899
1977.1	0.824	13	1.5	26	318	1.6	12	2.7	39	363	1.2
1978.1	1.1	14	1.6	23	327	0.395	16	2.9	35	374	0.288
1979.0	0.577	13	2.3	25	309	0.897	8.3	4.1	39	353	0.654
1979.9	0.554	10	1.4	20	266	0.244	8.0	2.5	31	304	0.178
1980.8	0.368	13	1.6	24	295	0.824	5.3	2.9	37	337	0.601
1981.8	1.0	16	2.5	26	347	1.1	15	4.6	41	396	0.775
1982.7	0.364	11	1.4	26	271	1.1	5.3	2.6	40	310	0.816
1983.6	0.424	12	2.2	22	284	1.0	6.1	4.0	34	325	0.759
1984.5	0.624	12	0.955	21	272	0.992	9.0	1.7	32	311	0.724
1985.4	0.652	12	1.4	22	294	0.385	9.4	2.6	33	337	0.281
1986.4	0.341	15	1.4	22	266	0.507	4.9	2.5	34	304	0.370
1987.3	0.461	12	2.0	28	296	1.1	6.7	3.7	43	339	0.826
1988.2	0.638	11	1.4	22	290	0.887	9.2	2.6	34	331	0.647
1989.1	0.674	14	1.7	23	259	0.597	9.7	3.2	35	297	0.436
1990.1	0.921	11	1.3	21	298	1.1	13	2.4	32	341	0.819
1991.0	0.889	17	1.2	27	300	0.712	13	2.3	41	343	0.520
1991.9	1.3	11	1.3	20	271	1.5	19	2.3	30	310	1.1
1992.8	0.850	14	1.2	23	251	1.1	12	2.3	36	287	0.821
1993.8	0.625	17	0.957	25	300	1.1	9.0	1.7	38	343	0.817
1994.7	0.993	15	1.5	23	311	1.1	14	2.7	36	356	0.785
1995.6	0.851	14	1.2	26	259	1.0	12	2.3	40	296	0.730
1996.5	0.228	16	1.5	23	297	1.5	3.3	2.7	35	340	1.1
1997.5	1.5	15	1.0	23	287	0.757	21	1.8	36	329	0.552
1998.4	0.943	11	0.765	22	226	1.2	14	1.4	33	258	0.863
1999.3	0.639	17	1.2	24	307	0.861	9.2	2.1	37	351	0.628
2000.2	1.3	19	0.943	25	308	1.5	19	1.7	38	352	1.1
2001.2	0.464	13	0.869	30	274	0.964	6.7	1.6	47	313	0.703
2002.1	0.926	15	1.5	26	290	1.4	13	2.7	40	332	0.995
2003.0	0.863	17	1.2	30	351	1.4	12	2.3	46	401	1.0
2003.9	1.7	14	0.584	26	317	1.2	24	1.1	39	362	0.898
2004.9	0.723	10	0.645	32	322	1.4	10	1.2	50	368	1.0
2005.8	0.687	18	1.1	20	324	0.955	9.9	2.0	31	371	0.697
2006.7	1.4	17	1.2	27	305	1.1	21	2.1	42	349	0.824
2007.6	0.814	18	1.1	24	254	0.837	12	2.1	36	291	0.611
2008.5	0.940	19	0.997	22	304	0.967	14	1.8	33	348	0.705
2009.5	0.654	18	0.619	26	317	1.4	9.4	1.1	39	362	1.0
2010.4	0.735	13	0.708	22	266	1.7	11	1.3	34	305	1.2
2011.3	0.927	14	0.904	23	273	0.751	13	1.6	35	312	0.548
2012.2	1.5	15	0.798	21	333	0.932	22	1.5	32	381	0.680
2013.2	0.459	16	0.772	18	284	1.3	6.6	1.4	28	324	0.959
2014.1	0.736	18	0.816	22	273	1.6	11	1.5	33	312	1.1
2015.0	0.426	17	0.750	17	300	1.3	6.2	1.4	26	343	0.955
2015.9	0.616	18	0.255	20	279	1.3	8.9	0.464	31	319	0.984
2016.9	1.2	14	0.804	20	239	1.1	17	1.5	30	273	0.787
2017.8	1.4	18	0.864	17	302	0.690	20	1.6	26	345	0.504
2018.7	0.761	14	0.315	19	315	0.947	11	0.574	29	360	0.691
2019.6	0.807	16	0.714	19	267	0.778	12	1.3	29	306	0.567
2020.6	1.1	15	0.568	16	328	0.499	16	1.0	25	375	0.364



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2021.5	0.912	17	0.737	17	293	0.533	13	1.3	25	335	0.389
2022.4	0.882	15	0.428	17	282	1.7	13	0.781	27	323	1.2
2023.3	0.825	15	0.471	17	255	1.6	12	0.859	26	292	1.2
2024.3	1.7	18	0.338	17	292	1.6	24	0.616	26	333	1.2
2025.2	1.7	17	0.195	14	271	1.0	24	0.355	21	310	0.738
2026.1	0.598	15	0.596	12	245	0.472	8.6	1.1	18	280	0.344
2027.0	0.455	15	0.734	20	346	0.977	6.6	1.3	30	396	0.713
2028.0	1.5	18	0.366	11	297	1.3	21	0.667	16	340	0.935
2028.9	0.717	14	0.452	43	247	0.250	10	0.824	66	282	0.182
2029.8	0.725	12	0.394	15	284	1.0	10	0.719	22	324	0.753
2030.7	0.617	16	0.524	13	301	0.981	8.9	0.956	20	344	0.716
2031.6	0.826	17	0.277	11	293	0.662	12	0.505	16	335	0.483
2032.6	0.826	11	0.424	9.5	207	1.3	12	0.772	15	237	0.981
2033.5	1.1	16	0.752	12	287	1.1	15	1.4	19	328	0.835
2034.4	1.5	17	0.251	12	274	1.5	22	0.458	18	313	1.1
2035.3	0.796	9.0	0.329	8.8	214	0.753	11	0.601	13	244	0.550
2036.3	1.4	14	0.422	7.4	259	0.688	21	0.770	11	296	0.502
2037.2	0.815	15	0.183	8.2	276	0.786	12	0.335	13	315	0.574
2038.1	1.3	13	0.183	12	227	0.514	18	0.335	18	259	0.375
2039.0	1.6	13	0.356	9.8	234	0.830	23	0.649	15	268	0.605
2040.0	1.5	19	0.661	11	303	0.433	22	1.2	16	347	0.316
2040.9	0.556	11	0.183	11	245	0.750	8.0	0.335	17	280	0.547
2041.8	1.3	12	0.573	11	259	0.667	19	1.0	17	296	0.486
2042.7	1.8	14	0.458	10.0	269	0.412	25	0.836	15	308	0.300
2043.7	0.936	16	0.183	11	254	0.824	14	0.335	16	290	0.601
2044.6	0.405	9.7	0.198	7.4	222	0.118	5.9	0.361	11	254	0.086
2045.5	1.6	14	0.188	11	263	1.1	23	0.343	18	301	0.814
2046.4	1.1	15	0.192	12	326	1.3	15	0.351	18	373	0.937
2047.4	1.2	8.6	0.183	7.8	213	0.452	17	0.335	12	243	0.330
2048.3	1.5	14	0.314	7.9	310	0.751	21	0.572	12	354	0.548
2049.2	1.3	13	0.183	7.2	350	0.865	19	0.335	11	400	0.631
2050.1	1.3	11	0.183	12	240	1.3	18	0.335	19	274	0.983
2051.1	0.965	12	0.517	7.7	225	0.602	14	0.944	12	257	0.439
2052.0	0.778	17	0.220	9.0	282	0.690	11	0.402	14	323	0.503
2052.9	0.474	11	0.286	42	242	1.2	6.8	0.522	65	276	0.900
2053.8	1.2	12	0.183	9.8	234	0.766	17	0.335	15	267	0.559
2054.8	1.5	15	0.384	11	296	0.896	21	0.701	18	338	0.654
2055.7	0.956	13	0.183	11	250	1.3	14	0.335	17	286	0.924
2056.6	1.0	14	0.378	76	266	1.2	14	0.689	116	304	0.859
2057.5	1.7	12	0.859	51	310	1.0	24	1.6	78	354	0.732
2058.4	1.2	13	0.185	8.3	271	1.5	17	0.337	13	310	1.1
2059.4	0.987	10.0	0.196	11	286	1.5	14	0.357	17	327	1.1
2060.3	1.1	15	0.454	8.2	267	0.895	16	0.827	13	306	0.653
2061.2	1.4	12	0.336	9.8	248	0.474	20	0.612	15	283	0.346
2062.1	2.3	15	0.428	11	276	0.515	33	0.781	16	315	0.376
2063.1	0.647	14	0.644	7.3	282	1.5	9.3	1.2	11	323	1.1
2064.0	1.1	15	0.618	9.7	255	0.739	15	1.1	15	291	0.539
2064.9	1.1	13	0.345	12	248	0.981	16	0.629	19	284	0.716
2065.8	0.377	15	0.569	9.8	259	1.4	5.4	1.0	15	296	1.0
2066.8	0.765	15	0.582	12	263	1.6	11	1.1	18	301	1.2
2067.7	0.280	13	0.313	16	248	0.399	4.0	0.570	24	284	0.291
2068.6	1.5	11	0.252	11	244	0.848	21	0.460	16	279	0.619
2069.5	1.7	18	0.183	296	299	0.626	25	0.335	454	342	0.457
2070.5	1.1	13	0.432	7.9	283	1.0	16	0.789	12	324	0.765
2071.4	0.948	11	0.527	9.1	249	0.885	14	0.962	14	285	0.646
2072.3	0.780	13	0.722	14	268	1.4	11	1.3	21	307	1.0
2073.2	1.6	17	0.623	14	303	0.770	23	1.1	22	347	0.561
2074.2	1.2	12	0.563	12	220	0.707	18	1.0	18	251	0.516
2075.1	0.492	11	0.827	11	235	1.0	7.1	1.5	16	269	0.746
2076.0	0.393	15	0.664	19	299	0.731	5.7	1.2	29	342	0.534
2076.9	1.8	16	0.561	16	272	0.972	27	1.0	25	311	0.709
2077.9	0.836	14	0.406	12	215	1.4	12	0.740	18	246	0.989
2078.8	0.829	16	0.451	9.4	280	1.2	12	0.822	14	320	0.861
2079.7	0.752	13	0.311	9.5	282	0.801	11	0.567	15	322	0.584
2080.6	0.535	15	0.255	14	243	1.5	7.7	0.465	21	278	1.1
2081.5	1.0	17	0.364	7.7	288	0.513	15	0.663	12	329	0.375
2082.5	1.7	16	0.566	10	292	0.792	24	1.0	16	333	0.578
2083.4	0.443	13	0.282	7.6	277	0.812	6.4	0.515	12	316	0.593
2084.3	0.228	14	0.328	9.0	243	0.987	3.3	0.599	14	278	0.720
2085.2	1.7	16	0.286	10	318	0.963	24	0.522	16	363	0.703
2086.2	1.1	12	0.183	9.3	294	0.488	15	0.335	14	336	0.356
2087.1	1.1	13	0.312	9.7	285	1.5	15	0.569	15	326	1.1
2088.0	1.5	17	0.538	9.7	313	1.1	21	0.981	15	358	0.774
2088.9	1.1	15	0.457	6.8	290	0.828	16	0.833	10	332	0.604
2089.9	1.4	11	0.435	8.1	241	0.922	20	0.794	12	276	0.673
2090.8	1.3	12	0.197	9.2	259	1.2	18	0.360	14	296	0.905
2091.7	1.1	15	0.386	8.8	343	0.374	16	0.704	13	393	0.273
2092.6	1.1	11	0.595	10	292	0.523	15	1.1	16	334	0.382
2093.6	0.818	12	0.183	8.1	283	1.2	12	0.335	12	324	0.866
2094.5	0.760	14	0.388	12	350	1.5	11	0.708	19	401	1.1
2095.4	1.3	16	0.229	9.8	319	1.1	19	0.417	15	365	0.838



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2096.3	1.6	11	0.183	8.8	258	1.4	24	0.335	13	296	1.0
2097.3	1.1	17	0.509	8.0	298	1.6	17	0.928	12	341	1.2
2098.2	0.737	13	0.183	9.3	312	1.0	11	0.335	14	357	0.765
2099.1	1.1	14	0.289	12	262	1.4	16	0.528	19	299	1.0
2100.0	0.665	14	0.534	10	278	1.9	9.6	0.973	16	318	1.4
2101.0	0.930	15	0.262	11	286	0.627	13	0.478	17	327	0.457
2101.9	0.425	12	0.367	11	260	0.912	6.1	0.669	16	297	0.665
2102.8	0.985	13	0.472	6.2	290	0.798	14	0.862	9.5	332	0.582
2103.7	1.3	13	0.599	10	284	1.1	18	1.1	16	325	0.817
2104.7	0.460	16	0.672	13	333	1.4	6.6	1.2	20	381	1.0
2105.6	1.3	11	0.577	11	216	1.4	19	1.1	16	247	1.0
2106.5	1.3	15	0.715	14	274	0.620	19	1.3	22	314	0.453
2107.4	0.904	14	0.893	11	290	0.796	13	1.6	16	332	0.581
2108.3	0.808	11	0.779	12	272	1.3	12	1.4	18	311	0.951
2109.3	1.2	13	1.1	11	401	1.7	18	2.0	17	458	1.2
2110.2	0.851	13	0.505	9.6	298	0.875	12	0.921	15	341	0.639
2111.1	0.691	12	0.856	13	274	1.2	10.0	1.6	20	313	0.902
2112.0	2.5	13	37	44	269	1.5	35	67	67	308	1.1
2113.0	1.3	13	0.659	16	341	1.8	19	1.2	24	390	1.3
2113.9	0.664	12	0.822	13	276	2.5	9.6	1.5	19	316	1.8
2114.8	1.6	14	0.995	15	279	2.1	23	1.8	24	319	1.5
2115.7	0.617	16	0.865	14	317	1.7	8.9	1.6	22	362	1.2
2116.7	1.1	14	0.925	16	279	0.493	15	1.7	24	319	0.360
2117.6	0.916	15	1.3	14	265	1.2	13	2.3	22	303	0.906
2118.5	0.756	18	0.900	17	349	1.1	11	1.6	26	399	0.767
2119.4	0.581	13	1.1	10	248	0.931	8.4	2.0	16	283	0.679
2120.4	0.702	16	1.8	14	286	0.371	10	3.3	21	327	0.270
2121.3	0.990	14	1.9	72	294	0.532	14	3.5	110	336	0.388
2122.2	1.3	12	1.2	12	265	0.574	19	2.2	18	303	0.419
2123.1	0.912	17	1.2	15	277	0.366	13	2.2	23	317	0.267
2124.1	0.760	14	0.969	15	298	1.1	11	1.8	23	341	0.817
2125.0	1.5	16	2.2	16	287	2.0	22	4.1	24	328	1.5
2125.9	0.826	15	1.5	17	319	1.1	12	2.8	26	364	0.798
2126.8	0.552	12	1.4	12	240	0.546	8.0	2.5	19	275	0.399
2127.8	0.443	10	2.2	14	347	1.000	6.4	4.0	22	397	0.730
2128.7	1.2	17	1.3	16	444	1.6	17	2.3	25	508	1.1
2129.6	0.596	11	0.932	14	211	0.436	8.6	1.7	21	241	0.318
2130.5	0.522	9.1	1.9	14	219	0.929	7.5	3.5	21	251	0.678
2131.5	1.1	20	1.9	13	379	1.1	15	3.5	20	433	0.776
2132.4	0.263	17	1.6	16	341	1.5	3.8	3.0	24	390	1.1
2133.3	0.455	13	1.4	13	253	0.924	6.6	2.6	20	290	0.674
2134.2	0.938	18	2.8	16	423	1.2	14	5.2	24	483	0.907
2135.1	1.5	14	1.5	15	225	1.1	22	2.7	22	258	0.819
2136.1	0.276	14	2.1	14	262	1.6	4.0	3.8	22	300	1.2
2137.0	2.0	17	2.0	17	362	0.937	29	3.6	26	413	0.684
2137.9	0.635	13	1.4	25	343	0.629	9.2	2.6	39	392	0.459
2138.8	0.613	11	1.9	23	378	1.2	8.8	3.4	35	433	0.907
2139.8	1.3	16	2.3	19	351	0.899	19	4.2	29	402	0.656
2140.7	1.6	11	1.9	15	271	0.913	23	3.5	23	310	0.666
2141.6	0.924	12	1.7	19	323	1.6	13	3.1	29	370	1.2
2142.5	1.3	17	1.9	20	314	0.576	19	3.5	31	359	0.420
2143.5	1.5	15	1.6	21	329	1.9	22	3.0	32	376	1.4
2144.4	0.857	16	1.3	21	301	0.687	12	2.3	33	345	0.501
2145.3	0.655	19	1.8	23	328	0.735	9.5	3.3	35	375	0.536
2146.2	0.981	17	1.8	20	350	0.719	14	3.3	31	400	0.524
2147.2	0.452	15	1.5	27	328	0.132	6.5	2.8	41	375	0.096
2148.1	0.598	14	1.6	24	325	0.535	8.6	3.0	37	371	0.390
2149.0	0.917	14	2.3	26	346	0.587	13	4.1	40	396	0.428
2149.9	0.931	14	2.3	20	322	0.820	13	4.1	31	369	0.598
2150.9	1.1	13	1.9	20	259	1.2	16	3.4	31	296	0.875
2151.8	1.0	16	1.4	24	372	1.2	15	2.6	37	426	0.884
2152.7	0.777	14	1.1	24	282	0.876	11	1.9	37	322	0.639
2153.6	0.877	15	1.3	24	271	0.772	13	2.4	37	310	0.563
2154.6	0.683	13	1.4	23	266	1.1	9.9	2.6	35	305	0.799
2155.5	0.957	14	1.6	24	314	1.2	14	2.9	37	359	0.852
2156.4	0.715	14	1.4	22	324	1.1	10	2.5	34	371	0.837
2157.3	0.926	9.4	1.2	24	267	1.1	13	2.1	36	305	0.790
2158.3	0.415	16	1.6	24	368	1.1	6.0	3.0	37	421	0.792
2159.2	0.508	15	1.5	26	498	0.657	7.3	2.7	40	569	0.479
2160.1	0.826	15	1.0	25	310	1.1	12	1.9	38	355	0.799
2161.0	1.0	18	1.7	25	316	1.2	15	3.1	38	361	0.881
2161.9	1.0	14	0.877	25	334	0.810	14	1.6	39	382	0.591
2162.9	0.851	13	0.988	30	269	1.2	12	1.8	45	308	0.900
2163.8	0.382	15	0.750	28	307	1.3	5.5	1.4	43	351	0.938
2164.7	0.640	18	1.0	25	324	1.3	9.2	1.8	38	371	0.947
2165.6	0.876	15	0.991	30	357	1.0	13	1.8	45	408	0.752
2166.6	0.769	16	0.953	27	297	0.682	11	1.7	41	340	0.497
2167.5	1.0	15	0.808	29	329	0.021	15	1.5	44	376	0.015
2168.4	0.891	15	0.977	27	287	0.389	13	1.8	42	328	0.284
2169.3	0.474	14	0.917	24	289	0.365	6.8	1.7	37	331	0.266
2170.3	1.0	16	0.996	28	304	0.688	15	1.8	44	348	0.502



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2171.2	0.868	17	1.1	24	303	1.0	13	2.0	37	346	0.745
2172.1	0.649	17	0.773	26	279	0.903	9.4	1.4	40	319	0.659
2173.0	0.786	16	1.2	26	282	1.9	11	2.2	40	323	1.4
2174.0	0.494	17	0.831	23	294	1.3	7.1	1.5	36	336	0.938
2174.9	1.5	17	0.969	23	279	1.3	21	1.8	35	319	0.982
2175.8	0.996	17	1.2	27	328	1.3	14	2.3	41	375	0.985
2176.7	0.749	20	0.958	27	271	1.5	11	1.7	41	310	1.1
2177.7	0.778	17	0.597	26	335	1.4	11	1.1	40	383	1.0
2178.6	1.5	20	0.849	35	325	1.4	22	1.5	54	372	1.1
2179.5	1.0	21	1.4	23	315	2.5	15	2.5	35	360	1.8
2180.4	0.662	17	1.1	26	301	0.943	9.6	2.0	40	345	0.688
2181.4	0.263	15	0.665	25	270	2.3	3.8	1.2	38	309	1.7
2182.3	1.5	19	1.2	27	337	2.2	22	2.1	42	385	1.6
2183.2	1.8	17	0.826	27	296	0.660	25	1.5	41	339	0.482
2184.1	1.2	17	1.1	28	302	1.2	17	2.1	43	345	0.865
2185.0	1.8	20	0.569	22	321	2.1	27	1.0	34	367	1.6
2186.0	1.0	19	0.799	26	315	2.0	15	1.5	40	360	1.4
2186.9	0.829	16	0.521	19	259	1.3	12	0.951	29	297	0.980
2187.8	1.1	18	1.0	21	280	1.3	16	1.9	32	320	0.926
2188.7	0.362	19	0.646	23	311	3.0	5.2	1.2	35	355	2.2
2189.7	0.823	16	0.843	19	268	1.8	12	1.5	29	307	1.3
2190.6	0.622	16	0.501	18	264	1.7	9.0	0.913	28	302	1.2
2191.5	0.911	20	0.868	18	310	1.3	13	1.6	27	354	0.979
2192.4	0.781	18	0.538	22	257	2.0	11	0.981	33	294	1.5
2193.4	0.277	20	1.3	27	299	1.9	4.0	2.3	41	342	1.4
2194.3	0.811	18	0.394	20	307	1.7	12	0.718	31	351	1.2
2195.2	0.966	16	0.655	21	292	1.6	14	1.2	32	334	1.1
2196.1	0.821	18	0.921	20	269	2.0	12	1.7	31	308	1.5
2197.1	0.855	23	0.892	16	309	2.6	12	1.6	25	353	1.9
2198.0	0.540	21	0.737	15	311	1.1	7.8	1.3	23	356	0.818
2198.9	0.626	21	1.1	19	288	2.8	9.0	1.9	30	330	2.1
2199.8	0.329	18	0.466	14	243	0.365	4.7	0.850	22	278	0.266
2200.8	1.1	20	0.844	17	277	0.752	17	1.5	26	317	0.548
2201.7	0.228	19	0.663	14	241	1.1	3.3	1.2	21	276	0.793
2202.6	0.983	16	0.557	18	292	2.2	14	1.0	27	334	1.6
2203.5	1.3	19	0.618	15	250	0.986	19	1.1	24	286	0.720
2204.5	1.6	29	0.638	19	394	2.0	23	1.2	29	451	1.4
2205.4	0.228	17	0.868	20	342	1.3	3.3	1.6	30	392	0.944
2206.3	0.640	21	0.863	15	280	2.3	9.2	1.6	23	320	1.7
2207.2	0.818	20	1.0	19	291	1.6	12	1.8	30	333	1.2
2208.1	0.786	17	0.758	18	239	1.0	11	1.4	28	273	0.739
2209.1	1.6	19	0.386	19	305	3.8	23	0.704	29	349	2.8
2210.0	1.6	23	0.917	17	278	1.6	24	1.7	26	318	1.2
2210.9	0.614	24	0.462	15	232	1.7	8.9	0.843	24	265	1.3
2211.8	1.1	15	0.368	17	238	0.963	16	0.671	26	272	0.703
2212.8	0.461	17	0.453	16	255	0.595	6.6	0.826	25	291	0.434
2213.7	0.778	21	0.965	12	446	1.4	11	1.8	18	511	1.0
2214.6	0.501	12	0.840	14	208	0.396	7.2	1.5	21	238	0.289
2215.5	0.698	17	0.775	17	349	1.1	10	1.4	27	400	0.791
2216.5	0.761	14	0.698	13	234	1.1	11	1.3	19	268	0.818
2217.4	0.955	15	0.464	12	241	1.4	14	0.846	19	276	1.0
2218.3	1.1	18	0.566	18	264	1.6	16	1.0	27	302	1.2
2219.2	0.769	18	0.804	19	337	2.1	11	1.5	30	385	1.6
2220.2	0.362	15	0.645	16	273	0.674	5.2	1.2	24	312	0.492
2221.1	0.401	16	0.495	18	297	0.596	5.8	0.903	27	340	0.435
2222.0	0.792	16	0.396	13	271	0.843	11	0.723	21	309	0.615
2222.9	0.445	16	0.317	14	272	1.2	6.4	0.578	22	311	0.896
2223.9	1.8	16	0.424	17	284	1.2	25	0.773	26	325	0.912
2224.8	0.766	15	0.250	13	267	1.2	11	0.457	20	305	0.896
2225.7	1.3	18	0.660	13	294	0.727	18	1.2	20	336	0.530
2226.6	0.738	14	0.209	10	225	0.389	11	0.381	15	257	0.284
2227.6	1.3	15	0.369	12	279	1.1	19	0.672	18	319	0.838
2228.5	0.956	12	0.602	13	319	0.842	14	1.1	21	365	0.614
2229.4	0.798	13	0.399	14	285	0.850	12	0.728	21	326	0.620
2230.3	0.436	8.6	0.348	9.5	193	1.3	6.3	0.635	14	221	0.934
2231.3	1.3	16	0.674	11	223	0.897	19	1.2	17	255	0.654
2232.2	1.1	17	0.334	14	296	1.4	15	0.608	22	339	1.0
2233.1	0.498	13	0.183	13	231	1.7	7.2	0.335	20	264	1.2
2234.0	0.691	16	0.183	9.6	278	1.4	10.0	0.335	15	318	1.0
2234.9	1.5	14	0.237	12	299	0.741	21	0.432	19	342	0.541
2235.9	1.2	11	0.183	8.9	202	1.1	17	0.335	14	231	0.777
2236.8	1.2	9.9	0.262	8.3	239	1.6	17	0.478	13	273	1.2
2237.7	0.585	15	0.274	11	347	0.922	8.4	0.500	16	397	0.672
2238.6	1.6	13	0.234	12	292	1.5	23	0.427	18	334	1.1
2239.6	0.702	13	0.427	8.3	235	2.1	10	0.778	13	268	1.5
2240.5	1.7	17	0.183	11	277	0.798	24	0.335	16	317	0.582
2241.4	0.740	9.8	0.183	9.3	228	0.921	11	0.335	14	260	0.672
2242.3	1.2	12	0.783	11	263	1.3	17	1.4	17	301	0.913
2243.3	1.8	12	0.183	12	314	0.888	27	0.335	18	359	0.648
2244.2	0.980	298	0.370	9.0	268	2.5	14	0.675	14	306	1.8
2245.1	1.0	15	0.183	11	275	0.548	15	0.335	17	315	0.400



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Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2246.0	1.0	12	0.183	8.5	286	2.4	15	0.335	13	327	1.8
2247.0	1.7	11	0.183	12	240	1.4	25	0.335	18	275	1.0
2247.9	1.5	14	0.559	13	241	1.2	22	1.0	20	275	0.862
2248.8	1.7	13	0.641	13	295	1.8	25	1.2	20	337	1.3
2249.7	1.3	19	0.273	12	281	1.5	18	0.498	19	321	1.1
2250.7	0.928	13	0.183	9.2	267	1.3	13	0.335	14	306	0.918
2251.6	1.0	14	0.327	8.7	258	0.985	15	0.597	13	295	0.719
2252.5	1.3	15	0.239	11	320	1.2	19	0.435	17	366	0.875
2253.4	0.887	14	0.399	10	252	1.0	13	0.728	16	289	0.762
2254.4	1.8	19	0.183	13	250	1.4	26	0.335	21	286	1.0
2255.3	0.971	20	0.715	12	301	0.998	14	1.3	19	344	0.728
2256.2	1.0	18	0.595	14	339	0.833	15	1.1	22	387	0.607
2257.1	0.823	16	0.276	13	267	1.2	12	0.503	19	306	0.872
2258.1	1.1	20	0.632	12	267	1.1	16	1.2	18	305	0.816
2259.0	1.3	18	0.463	12	280	0.841	19	0.845	19	321	0.613
2259.9	1.2	18	0.308	15	265	1.8	17	0.561	23	303	1.3
2260.8	1.1	13	0.242	8.9	257	0.923	16	0.442	14	294	0.673
2261.7	0.525	16	0.616	14	269	0.267	7.6	1.1	21	307	0.195
2262.7	1.3	21	0.270	14	311	1.3	19	0.492	21	356	0.966
2263.6	0.727	18	0.301	14	267	1.0	10	0.548	22	305	0.737
2264.5	1.3	19	0.520	12	271	1.1	19	0.948	18	310	0.801
2265.4	0.997	17	0.341	13	296	0.877	14	0.621	21	339	0.640
2266.4	1.4	13	0.410	15	271	0.803	20	0.748	23	310	0.586
2267.3	1.4	15	0.507	16	289	1.2	20	0.924	24	331	0.879
2268.2	0.228	15	0.438	10	295	0.713	3.3	0.798	16	338	0.520
2269.1	1.1	13	0.245	9.8	302	1.6	15	0.447	15	345	1.2
2270.1	0.770	11	0.191	7.5	205	1.3	11	0.349	11	235	0.914
2271.0	0.697	17	0.695	8.7	360	0.551	10	1.3	13	411	0.402
2271.9	1.0	13	0.183	10	259	0.650	15	0.335	16	296	0.474
2272.8	0.765	13	0.217	9.2	279	2.3	11	0.395	14	319	1.7
2273.8	1.9	15	0.183	11	336	1.4	27	0.335	17	384	1.0
2274.7	0.517	16	0.183	8.9	372	0.803	7.5	0.335	14	425	0.586
2275.6	0.902	11	0.399	9.0	224	1.5	13	0.728	14	257	1.1
2276.5	1.4	12	0.217	9.2	218	0.827	21	0.396	14	249	0.603
2277.5	1.2	15	0.255	9.2	327	0.412	17	0.466	14	374	0.301
2278.4	1.1	12	0.298	7.7	228	1.3	16	0.543	12	260	0.932
2279.3	0.896	9.9	0.311	8.4	257	1.2	13	0.568	13	294	0.886
2280.2	1.8	13	0.341	9.7	282	0.929	25	0.623	15	323	0.678
2281.2	1.1	14	0.183	7.9	253	0.737	16	0.335	12	289	0.538
2282.1	1.4	12	0.211	7.7	253	0.926	21	0.385	12	289	0.676
2283.0	1.4	16	0.342	11	295	1.8	21	0.623	16	338	1.3
2283.9	1.0	14	0.183	11	314	1.5	15	0.335	17	359	1.1
2284.9	0.758	13	0.412	111	275	0.400	11	0.752	170	315	0.292
2285.8	2.0	12	0.183	8.5	263	1.1	29	0.335	13	301	0.775
2286.7	1.5	18	0.183	8.3	286	0.938	22	0.335	13	327	0.684
2287.6	1.1	13	0.183	9.0	315	0.547	16	0.335	14	360	0.399
2288.5	0.695	14	0.227	10	280	1.2	10	0.414	16	321	0.904
2289.5	0.940	15	0.490	12	290	1.7	14	0.894	19	332	1.2
2290.4	1.1	12	0.291	9.9	330	1.0	17	0.531	15	377	0.732
2291.3	1.4	14	0.312	10.0	311	1.1	20	0.568	15	356	0.783
2292.2	1.4	16	0.183	9.6	330	1.2	21	0.335	15	377	0.851
2293.2	1.2	16	0.480	11	289	1.4	18	0.876	16	331	0.990
2294.1	0.852	13	0.261	12	250	1.4	12	0.475	18	286	1.0
2295.0	1.6	14	0.235	10.0	282	1.3	22	0.429	15	322	0.936
2295.9	1.9	17	0.384	9.8	297	1.4	27	0.700	15	340	0.997
2296.9	2.1	13	0.183	12	309	1.5	30	0.335	18	353	1.1
2297.8	1.6	15	0.461	9.2	324	1.7	23	0.841	14	370	1.2
2298.7	1.5	15	0.196	13	337	0.488	21	0.357	20	386	0.356
2299.6	1.6	12	0.351	11	241	0.686	23	0.639	17	275	0.501
2300.6	0.928	13	0.292	12	312	1.3	13	0.532	18	357	0.918
2301.5	1.5	13	0.397	17	331	0.769	22	0.723	27	378	0.561
2302.4	0.850	11	0.267	11	253	0.689	12	0.488	17	290	0.503
2303.3	1.1	11	0.183	9.5	242	0.996	16	0.335	15	277	0.727
2304.3	2.6	16	0.183	14	312	1.1	37	0.335	22	357	0.831
2305.2	1.7	14	0.275	11	335	1.1	24	0.502	17	384	0.772
2306.1	0.976	13	0.376	13	302	1.6	14	0.686	19	346	1.2
2307.0	1.4	17	0.412	13	279	1.9	20	0.751	20	319	1.4
2308.0	1.6	14	0.397	13	303	2.0	24	0.724	20	347	1.4
2308.9	1.1	10	0.487	13	274	2.5	16	0.889	20	313	1.9
2309.8	0.468	13	0.312	12	269	0.727	6.8	0.569	19	308	0.530
2310.7	0.805	14	0.586	12	310	1.3	12	1.1	19	355	0.947
2311.6	1.2	12	0.475	15	259	1.3	18	0.867	23	297	0.916
2312.6	1.2	15	0.452	10	261	1.5	17	0.824	16	299	1.1
2313.5	1.3	15	0.773	12	330	1.5	19	1.4	18	378	1.1
2314.4	1.1	14	0.341	16	345	1.6	15	0.622	25	394	1.2
2315.3	0.541	11	0.433	11	260	1.1	7.8	0.790	16	298	0.785
2316.3	0.730	14	0.939	14	347	1.3	11	1.7	22	397	0.953
2317.2	0.345	14	0.584	16	353	1.0	5.0	1.1	24	404	0.753
2318.1	0.495	11	0.581	13	291	1.3	7.1	1.1	20	333	0.939
2319.0	0.532	16	0.793	19	320	2.5	7.7	1.4	29	366	1.8
2320.0	1.4	16	0.917	16	333	1.6	20	1.7	24	381	1.2



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2320.9	0.306	12	0.657	13	285	1.0	4.4	1.2	21	326	0.752
2321.8	0.228	15	0.422	14	334	1.7	3.3	0.769	21	382	1.2
2322.7	1.4	12	0.774	19	358	0.276	20	1.4	29	409	0.201
2323.7	0.399	14	1.1	14	285	1.3	5.8	2.0	22	326	0.984
2324.6	0.300	12	0.781	13	269	1.2	4.3	1.4	20	308	0.902
2325.5	1.5	16	0.741	17	360	1.7	21	1.4	26	411	1.2
2326.4	1.1	13	0.441	21	315	1.9	15	0.805	32	361	1.4
2327.4	0.228	13	0.731	12	345	0.973	3.3	1.3	18	395	0.710
2328.3	1.3	16	1.4	14	361	1.1	19	2.5	22	413	0.819
2329.2	0.809	18	0.907	18	364	1.2	12	1.7	27	416	0.856
2330.1	0.228	11	0.804	15	287	1.3	3.3	1.5	22	328	0.962
2331.1	0.816	15	1.0	18	283	1.1	12	1.9	27	324	0.767
2332.0	0.823	15	0.923	15	332	2.0	12	1.7	23	380	1.5
2332.9	0.332	13	0.744	15	264	1.1	4.8	1.4	23	302	0.817
2333.8	0.933	14	1.3	18	309	0.959	13	2.4	28	354	0.700
2334.8	0.709	14	1.7	18	315	1.3	10	3.0	28	360	0.927
2335.7	1.0	15	1.2	19	299	1.5	15	2.3	29	341	1.1
2336.6	0.440	15	1.2	19	274	1.2	6.3	2.2	29	313	0.886
2337.5	1.2	16	0.993	19	288	1.2	18	1.8	29	329	0.876
2338.4	0.422	13	0.997	16	301	1.0	6.1	1.8	24	344	0.756
2339.4	0.719	13	1.1	14	276	0.637	10	2.0	21	316	0.465
2340.3	0.413	13	1.5	18	343	0.885	6.0	2.7	28	392	0.645
2341.2	0.831	14	0.964	18	335	1.5	12	1.8	28	383	1.1
2342.1	0.345	15	1.0	23	369	1.0	5.0	1.9	35	422	0.753
2343.1	0.522	14	2.1	15	271	1.2	7.5	3.7	23	309	0.859
2344.0	0.228	17	1.6	21	312	1.2	3.3	2.9	33	357	0.867
2344.9	0.554	16	1.4	29	278	0.873	8.0	2.6	44	317	0.637
2345.8	1.4	17	1.9	17	356	0.980	20	3.5	26	407	0.715
2346.8	0.579	15	1.4	19	370	0.649	8.4	2.5	29	423	0.473
2347.7	0.594	17	0.995	21	281	1.3	8.6	1.8	32	321	0.949
2348.6	0.228	16	1.4	23	316	0.649	3.3	2.6	35	361	0.474
2349.5	0.696	18	1.9	20	332	1.9	10	3.4	31	379	1.4
2350.5	0.642	20	1.7	21	299	1.0	9.3	3.1	32	341	0.745
2351.4	0.545	13	1.7	19	289	0.858	7.9	3.1	29	330	0.626
2352.3	0.381	14	1.5	17	255	0.464	5.5	2.7	26	292	0.339
2353.2	0.604	16	2.0	22	285	1.4	8.7	3.7	34	325	1.1
2354.2	0.583	17	1.8	23	291	1.5	8.4	3.3	35	332	1.1
2355.1	0.261	20	1.9	25	278	1.4	3.8	3.5	38	318	1.0
2356.0	0.259	16	1.7	17	285	0.870	3.7	3.0	26	326	0.635
2356.9	0.794	17	1.9	31	273	1.0	11	3.4	47	312	0.747
2357.9	0.742	12	2.0	16	265	0.763	11	3.7	24	303	0.557
2358.8	0.228	18	2.3	23	336	1.1	3.3	4.2	35	384	0.796
2359.7	0.957	19	2.1	26	326	0.645	14	3.8	40	372	0.471
2360.6	0.251	17	2.1	18	270	0.844	3.6	3.8	27	309	0.616
2361.6	0.492	18	1.9	27	305	0.379	7.1	3.4	41	349	0.276
2362.5	0.538	20	1.9	23	349	1.3	7.8	3.5	35	400	0.918
2363.4	0.228	19	1.9	22	260	1.1	3.3	3.5	34	297	0.820
2364.3	0.818	16	1.8	24	344	0.789	12	3.2	37	394	0.575
2365.2	0.520	20	2.0	25	352	0.400	7.5	3.6	39	403	0.292
2366.2	0.331	20	1.8	26	313	1.1	4.8	3.2	40	358	0.814
2367.1	0.568	18	2.1	26	300	0.636	8.2	3.9	39	343	0.464
2368.0	0.228	18	1.6	23	363	1.1	3.3	2.9	36	415	0.774
2368.9	0.575	22	1.4	29	315	0.775	8.3	2.6	45	360	0.566
2369.9	0.496	19	2.0	27	283	0.641	7.2	3.7	41	324	0.468
2370.8	0.438	22	1.9	29	299	2.2	6.3	3.5	44	342	1.6
2371.7	0.862	21	1.0	30	321	1.1	12	1.8	47	367	0.833
2372.6	0.615	18	1.9	27	263	1.8	8.9	3.5	42	301	1.3
2373.6	0.489	20	1.3	26	280	2.6	7.1	2.4	40	321	1.9
2374.5	0.971	22	1.4	27	299	1.2	14	2.6	41	341	0.864
2375.4	1.2	21	1.7	28	301	1.5	17	3.2	43	344	1.1
2376.3	1.2	25	1.7	34	310	0.533	18	3.1	52	354	0.389
2377.3	1.3	28	2.2	36	338	1.4	19	4.0	55	386	1.0
2378.2	0.491	21	1.5	32	275	0.892	7.1	2.8	49	314	0.651
2379.1	1.4	24	1.5	29	300	1.8	20	2.8	44	343	1.3
2380.0	0.579	23	1.1	29	321	1.4	8.4	2.1	44	367	1.0
2381.0	0.607	20	1.8	30	283	0.755	8.8	3.3	46	323	0.551
2381.9	0.632	20	1.4	31	258	1.2	9.1	2.6	48	295	0.905
2382.8	0.547	22	1.5	42	375	2.4	7.9	2.8	65	429	1.8
2383.7	0.641	24	1.3	29	280	1.1	9.2	2.4	44	321	0.833
2384.7	0.887	29	1.6	32	274	1.8	13	2.9	48	314	1.3
2385.6	0.586	18	0.878	25	219	0.834	8.5	1.6	38	251	0.608
2386.5	0.703	21	0.932	31	284	1.6	10	1.7	47	324	1.2
2387.4	0.959	20	1.2	34	308	1.8	14	2.2	52	353	1.3
2388.4	0.731	20	0.906	26	294	1.3	11	1.7	39	337	0.950
2389.3	0.228	25	1.5	31	333	2.5	3.3	2.6	47	381	1.8
2390.2	1.1	22	1.0	37	318	1.1	16	1.9	57	363	0.837
2391.1	0.329	22	1.0	28	354	1.9	4.8	1.9	44	404	1.4
2392.0	0.317	14	1.3	19	175	0.859	4.6	2.4	29	200	0.627
2393.0	0.673	21	1.4	24	342	1.3	9.7	2.6	37	391	0.963
2393.9	0.862	28	1.6	27	287	2.2	12	2.8	42	328	1.6
2394.8	0.786	16	0.594	19	183	1.2	11	1.1	29	209	0.873



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2395.7	1.1	24	0.902	27	233	1.1	16	1.6	41	266	0.837
2396.7	0.254	35	0.819	22	319	1.5	3.7	1.5	33	364	1.1
2397.6	0.304	16	0.855	20	176	0.935	4.4	1.6	31	201	0.682
2398.5	0.490	23	1.2	14	235	0.889	7.1	2.1	22	269	0.649
2399.4	0.915	22	1.1	18	220	0.734	13	2.1	28	251	0.536
2400.4	0.646	20	0.520	19	179	0.573	9.3	0.948	29	205	0.418
2401.3	0.654	21	0.643	22	267	1.4	9.4	1.2	34	305	0.991
2402.2	0.528	20	0.652	18	279	1.5	7.6	1.2	28	319	1.1
2403.1	0.553	18	0.404	19	250	1.1	8.0	0.736	29	286	0.838
2404.1	0.228	17	0.739	17	243	1.1	3.3	1.3	26	278	0.791
2405.0	0.228	19	0.646	20	286	1.1	3.3	1.2	30	327	0.817
2405.9	0.574	18	0.601	22	295	1.2	8.3	1.1	33	338	0.870
2406.8	0.278	15	0.669	14	248	1.1	4.0	1.2	22	283	0.779
2407.8	1.4	21	0.532	19	368	0.965	20	0.970	29	420	0.704
2408.7	0.740	23	0.467	17	289	0.921	11	0.852	26	330	0.672
2409.6	0.636	10	0.496	9.0	144	0.317	9.2	0.905	14	164	0.231
2410.5	1.1	14	0.515	13	218	0.478	16	0.939	19	249	0.349
2411.5	0.846	24	0.754	13	456	0.749	12	1.4	20	522	0.547
2412.4	0.417	12	0.463	14	200	1.4	6.0	0.845	21	228	1.0
2413.3	0.379	16	0.752	8.9	225	0.695	5.5	1.4	14	258	0.507
2414.2	1.1	28	0.324	10	366	1.3	16	0.591	15	418	0.916
2415.2	1.2	17	0.426	12	368	1.2	17	0.776	19	420	0.884
2416.1	0.504	10	0.453	6.5	149	0.599	7.3	0.825	10.0	170	0.437
2417.0	2.2	17	0.497	12	344	0.850	32	0.907	19	393	0.620
2417.9	0.660	24	0.183	9.5	292	1.0	9.5	0.335	15	334	0.759
2418.8	0.473	13	0.183	50	163	0.209	6.8	0.335	77	186	0.152
2419.8	1.0	20	0.345	8.4	248	0.888	15	0.629	13	283	0.648
2420.7	0.708	25	0.430	6.7	297	0.417	10	0.784	10	339	0.304
2421.6	0.228	15	0.392	6.8	194	0.553	3.3	0.714	10	222	0.404
2422.5	0.563	16	0.411	7.1	231	0.286	8.1	0.750	11	264	0.209
2423.5	0.467	21	0.333	7.8	258	0.858	6.7	0.607	12	295	0.626
2424.4	0.639	13	0.376	8.3	227	0.681	9.2	0.685	13	260	0.497
2425.3	0.498	16	0.490	6.3	221	0.773	7.2	0.893	9.7	252	0.564
2426.2	1.2	19	0.233	8.9	328	0.688	17	0.426	14	375	0.502
2427.2	1.1	14	0.183	9.5	308	1.2	16	0.335	15	353	0.907
2428.1	1.1	14	0.476	7.6	238	1.3	15	0.867	12	273	0.980
2429.0	0.996	16	0.351	6.7	237	1.1	14	0.640	10	271	0.820
2429.9	0.452	18	0.457	8.8	283	0.689	6.5	0.833	14	323	0.503
2430.9	1.2	14	0.691	9.0	209	0.787	17	1.3	14	239	0.574
2431.8	0.642	18	0.653	7.6	268	1.2	9.3	1.2	12	307	0.843
2432.7	1.2	21	0.236	9.5	306	0.738	17	0.431	15	349	0.539
2433.6	0.645	16	0.183	9.2	245	0.767	9.3	0.335	14	280	0.560
2434.6	0.674	17	0.455	7.0	203	1.2	9.7	0.829	11	232	0.877
2435.5	0.637	19	0.369	9.5	267	0.859	9.2	0.672	15	305	0.627
2436.4	0.709	16	0.534	10	262	0.701	10	0.973	16	299	0.512
2437.3	0.409	14	0.536	9.9	218	1.0	5.9	0.978	15	249	0.732
2438.3	1.5	19	0.470	11	277	1.3	21	0.857	16	317	0.935
2439.2	0.600	18	0.314	11	268	0.808	8.7	0.572	16	307	0.590
2440.1	1.2	16	0.575	11	255	0.710	18	1.0	18	292	0.518
2441.0	0.986	20	0.585	11	327	1.7	14	1.1	16	374	1.3
2442.0	1.3	19	0.452	8.4	262	1.1	19	0.825	13	300	0.800
2442.9	1.1	20	0.709	9.6	241	1.1	16	1.3	15	276	0.788
2443.8	0.356	18	0.374	11	262	0.529	5.1	0.683	18	299	0.386
2444.7	0.864	18	0.697	14	293	0.413	12	1.3	21	335	0.301
2445.6	0.908	21	0.734	10	243	0.530	13	1.3	15	278	0.387
2446.6	0.886	17	0.589	12	246	0.649	13	1.1	18	281	0.473
2447.5	0.480	15	0.837	8.5	248	0.370	6.9	1.5	13	284	0.270
2448.4	1.6	19	0.479	14	279	1.2	22	0.874	22	320	0.889
2449.3	1.3	16	0.971	13	242	0.649	18	1.8	19	277	0.473
2450.3	0.228	18	0.892	9.7	260	0.509	3.3	1.6	15	298	0.371
2451.2	0.955	20	0.616	15	263	1.0	14	1.1	23	300	0.754
2452.1	0.659	17	0.465	13	236	0.257	9.5	0.847	20	270	0.187
2453.0	0.579	15	0.590	9.4	248	1.2	8.4	1.1	14	283	0.857
2454.0	1.1	15	0.938	11	268	0.880	16	1.7	17	307	0.642
2454.9	0.766	16	1.2	12	221	0.490	11	2.1	19	253	0.357
2455.8	1.1	17	0.605	9.9	238	0.127	15	1.1	15	273	0.093
2456.7	0.499	20	1.4	13	269	1.2	7.2	2.5	19	308	0.893
2457.7	0.652	15	0.808	14	251	0.907	9.4	1.5	21	287	0.662
2458.6	1.0	13	1.1	12	209	0.903	15	2.0	18	239	0.659
2459.5	0.807	16	1.5	13	275	1.0	12	2.8	19	315	0.733
2460.4	0.710	17	0.787	12	236	1.0	10	1.4	19	270	0.737
2461.4	0.276	15	0.921	14	228	0.392	4.0	1.7	22	261	0.286
2462.3	0.228	16	0.973	12	263	0.429	3.3	1.8	18	301	0.313
2463.2	0.346	15	0.965	9.6	261	0.384	5.0	1.8	15	298	0.280
2464.1	1.0	17	0.989	18	259	0.545	15	1.8	27	296	0.398
2465.1	0.228	16	1.4	13	242	0.970	3.3	2.5	20	277	0.708
2466.0	0.394	16	1.3	15	289	0.734	5.7	2.4	23	330	0.536
2466.9	0.228	17	1.0	13	264	0.273	3.3	1.9	21	302	0.199
2467.8	0.228	13	1.2	14	210	0.499	3.3	2.1	21	241	0.364
2468.8	0.735	17	1.2	15	296	1.0	11	2.2	22	338	0.745
2469.7	0.696	17	0.997	17	273	0.271	10	1.8	26	312	0.198



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2470.6	0.846	14	0.782	20	227	0.404	12	1.4	30	260	0.295
2471.5	0.436	17	1.0	16	321	0.319	6.3	1.9	25	367	0.233
2472.4	0.685	18	1.8	16	299	0.541	9.9	3.4	24	342	0.395
2473.4	0.397	13	0.819	16	225	0.729	5.7	1.5	25	257	0.532
2474.3	0.228	18	1.8	16	249	1.0	3.3	3.2	24	284	0.754
2475.2	0.228	13	1.2	18	262	0.632	3.3	2.1	27	299	0.461
2476.1	0.600	14	1.3	15	260	1.1	8.7	2.4	23	298	0.788
2477.1	0.265	15	1.3	15	276	0.249	3.8	2.4	23	315	0.182
2478.0	0.429	17	1.8	16	280	0.920	6.2	3.3	25	321	0.671
2478.9	0.228	13	1.3	15	276	1.1	3.3	2.3	23	315	0.803
2479.8	0.228	12	1.4	20	254	0.899	3.3	2.5	31	291	0.656
2480.8	0.699	16	1.7	16	275	0.832	10	3.1	24	315	0.607
2481.7	0.762	17	1.7	17	245	0.538	11	3.1	26	280	0.393
2482.6	0.909	12	1.1	16	260	0.935	13	2.0	25	297	0.682
2483.5	0.259	13	1.4	14	249	0.743	3.7	2.6	21	285	0.542
2484.5	0.228	15	1.6	15	298	1.4	3.3	3.0	23	341	0.985
2485.4	0.632	11	1.0	15	219	0.752	9.1	1.9	23	251	0.549
2486.3	0.337	17	1.5	15	260	1.0	4.9	2.7	23	297	0.735
2487.2	0.286	13	1.6	19	281	1.1	4.1	3.0	29	321	0.800
2488.2	0.228	14	0.922	17	267	0.491	3.3	1.7	26	306	0.358
2489.1	0.274	15	1.9	16	259	0.919	3.9	3.5	24	296	0.670
2490.0	0.355	15	1.4	18	294	0.661	5.1	2.6	27	337	0.483
2490.9	0.228	17	1.2	16	254	0.523	3.3	2.2	24	290	0.382
2491.9	0.777	14	1.1	19	281	0.271	11	1.9	30	322	0.197
2492.8	0.502	16	1.5	16	258	0.912	7.3	2.8	24	295	0.666
2493.7	0.562	18	1.0	20	311	0.502	8.1	1.9	30	356	0.366
2494.6	0.477	11	0.904	22	217	0.426	6.9	1.6	33	248	0.311
2495.5	0.228	13	1.2	17	246	0.131	3.3	2.2	25	282	0.095
2496.5	0.370	20	0.897	21	286	0.551	5.3	1.6	33	327	0.402
2497.4	0.362	14	1.1	22	286	0.402	5.2	2.0	33	327	0.293
2498.3	0.397	12	0.895	15	208	1.0	5.7	1.6	23	238	0.754
2499.2	1.1	20	1.5	20	298	0.864	15	2.7	31	341	0.630
2500.2	0.826	16	0.861	18	271	0.662	12	1.6	27	310	0.483
2501.1	0.454	13	0.867	20	235	1.1	6.6	1.6	30	269	0.812
2502.0	0.228	13	0.926	20	250	0.712	3.3	1.7	31	286	0.520
2502.9	0.841	19	0.771	17	256	0.118	12	1.4	26	293	0.086
2503.9	0.833	15	0.913	26	232	0.856	12	1.7	40	265	0.625
2504.8	0.228	17	0.630	18	250	1.0	3.3	1.1	28	286	0.734
2505.7	0.458	20	0.772	22	286	0.558	6.6	1.4	34	328	0.407
2506.6	0.430	13	0.371	26	252	1.3	6.2	0.676	40	288	0.963
2507.6	0.580	13	0.578	17	206	0.458	8.4	1.1	26	236	0.334
2508.5	0.646	18	0.764	19	297	0.431	9.3	1.4	30	339	0.315
2509.4	0.256	17	0.286	22	261	1.1	3.7	0.521	34	298	0.808
2510.3	0.228	9.7	0.398	18	167	0.989	3.3	0.726	27	191	0.722
2511.3	1.0	16	0.979	19	231	0.522	15	1.8	29	264	0.381
2512.2	0.683	17	0.620	21	341	0.611	9.9	1.1	32	390	0.445
2513.1	0.564	14	0.575	17	204	1.0	8.1	1.0	26	233	0.742
2514.0	0.846	19	0.583	19	241	0.267	12	1.1	30	275	0.195
2515.0	0.228	16	0.705	17	239	0.668	3.3	1.3	27	273	0.487
2515.9	0.228	15	0.829	22	222	0.829	3.3	1.5	34	254	0.605
2516.8	0.397	16	0.491	17	238	0.852	5.7	0.896	26	273	0.622
2517.7	0.228	18	0.820	19	276	1.1	3.3	1.5	29	316	0.834
2518.6	0.663	19	0.210	19	258	1.2	9.6	0.383	30	295	0.867
2519.6	0.228	13	0.542	14	198	0.930	3.3	0.989	22	227	0.678
2520.5	0.652	16	0.365	18	239	0.646	9.4	0.665	27	273	0.471
2521.4	0.933	17	0.620	19	240	0.130	13	1.1	29	275	0.095
2522.3	0.228	13	0.183	19	192	0.428	3.3	0.335	29	220	0.312
2523.3	0.456	20	0.461	16	268	0.274	6.6	0.842	25	307	0.200
2524.2	1.0	18	0.728	18	248	0.887	15	1.3	28	284	0.647
2525.1	0.228	14	0.694	19	210	0.237	3.3	1.3	29	240	0.173
2526.0	0.578	18	0.271	18	232	0.911	8.3	0.494	27	266	0.665
2527.0	0.356	18	0.505	19	325	0.798	5.1	0.921	29	371	0.582
2527.9	0.635	16	0.401	17	223	0.790	9.2	0.731	26	256	0.577
2528.8	0.394	16	0.310	20	213	1.2	5.7	0.565	31	244	0.882
2529.7	1.5	19	0.547	20	290	1.0	22	0.997	31	331	0.736
2530.7	0.947	17	0.611	19	288	0.638	14	1.1	29	329	0.466
2531.6	0.228	13	0.554	15	209	0.737	3.3	1.0	23	239	0.538
2532.5	0.228	19	0.845	16	249	0.987	3.3	1.5	25	285	0.720
2533.4	1.1	17	0.380	20	270	1.5	16	0.693	31	309	1.1
2534.4	0.771	16	0.319	18	213	0.493	11	0.582	28	244	0.360
2535.3	0.491	20	0.607	19	256	0.506	7.1	1.1	29	293	0.369
2536.2	0.228	15	0.404	15	275	1.6	3.3	0.737	24	315	1.2
2537.1	0.915	20	0.838	13	274	1.5	13	1.5	20	314	1.1
2538.1	0.947	16	0.736	20	258	0.638	14	1.3	31	295	0.466
2539.0	0.980	14	0.646	14	279	0.488	14	1.2	22	319	0.356
2539.9	0.494	17	0.392	18	256	0.509	7.1	0.715	28	293	0.371
2540.8	0.724	16	0.331	17	254	0.771	10	0.604	27	290	0.563
2541.8	1.1	16	0.452	14	240	0.763	16	0.824	22	275	0.557
2542.7	0.455	16	0.563	14	247	0.589	6.6	1.0	22	282	0.429
2543.6	0.546	17	0.436	20	225	0.984	7.9	0.795	31	257	0.718
2544.5	0.272	16	0.910	14	265	0.783	3.9	1.7	22	303	0.571



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
2545.4	0.306	14	0.406	16	235	0.685	4.4	0.740	25	269	0.500
2546.4	0.921	17	0.216	19	231	1.1	13	0.393	29	264	0.791
2547.3	1.1	14	0.731	14	235	1.1	16	1.3	22	269	0.837
2548.2	0.412	21	0.417	17	259	0.884	6.0	0.761	26	296	0.645
2549.1	0.228	14	0.673	20	291	1.4	3.3	1.2	31	332	1.0
2550.1	0.228	14	0.418	14	213	1.2	3.3	0.762	22	244	0.887
2551.0	1.1	18	0.228	13	267	0.856	15	0.415	20	306	0.625
2551.9	0.228	15	0.598	13	298	0.792	3.3	1.1	20	341	0.578
2552.8	0.362	10	0.312	17	202	0.664	5.2	0.569	26	231	0.484
2553.8	1.4	16	0.456	9.4	245	0.770	20	0.832	14	280	0.562
2554.7	0.727	19	0.301	12	319	0.514	10	0.548	18	365	0.375
2555.6	0.228	11	0.207	14	196	0.789	3.3	0.378	22	224	0.576
2556.5	0.833	15	0.606	12	255	0.803	12	1.1	18	291	0.586
2557.5	0.907	21	0.183	13	356	0.580	13	0.335	21	407	0.423
2558.4	0.635	11	0.488	10	217	0.510	9.2	0.889	16	248	0.372
2559.3	0.720	10.0	0.364	6.1	180	0.631	10	0.664	9.3	206	0.460
2560.2	0.752	19	0.603	14	377	1.0	11	1.1	22	431	0.763
2561.2	0.668	17	0.350	13	376	1.2	9.6	0.638	21	430	0.878
2562.1	0.747	9.8	0.212	11	229	0.796	11	0.386	17	262	0.581
2563.0	1.5	18	0.183	9.4	264	1.6	22	0.335	14	302	1.1
2563.9	0.565	25	0.358	11	440	1.1	8.1	0.652	16	503	0.835
2564.9	0.405	9.7	0.501	12	200	0.629	5.8	0.913	19	229	0.459
2565.8	0.290	16	0.596	10	244	1.3	4.2	1.1	15	279	0.915
2566.7	0.553	18	0.229	11	495	1.0	8.0	0.417	16	566	0.741
2567.6	0.691	12	0.185	13	264	0.546	10.0	0.338	20	301	0.398
2568.6	0.640	10	0.542	6.9	193	1.1	9.2	0.989	11	221	0.832
2569.5	0.881	22	0.714	4.4	281	0.354	13	1.3	6.8	322	0.258
2570.4	0.803	11	0.183	9.5	298	1.0	12	0.335	14	341	0.754
2571.3	0.434	9.0	0.183	5.2	166	0.783	6.3	0.335	8.0	189	0.571
2572.2	0.228	16	0.476	6.7	333	0.736	3.3	0.868	10	381	0.537
2573.2	1.2	21	0.308	5.2	440	0.885	17	0.561	7.9	503	0.646
2574.1	0.881	5.9	0.212	3.8	103	0.485	13	0.387	5.8	118	0.354
2575.0	1.4	14	0.650	5.1	285	1.5	20	1.2	7.9	326	1.1
2575.9	0.909	14	0.455	6.2	322	1.1	13	0.830	9.5	368	0.825
2576.9	0.577	8.0	0.183	5.6	183	0.777	8.3	0.335	8.6	210	0.567
2577.8	0.476	9.8	0.375	4.8	278	0.726	6.9	0.683	7.3	318	0.530
2578.7	0.473	16	0.231	6.2	346	1.2	6.8	0.421	9.6	396	0.846
2579.6	1.1	10	0.243	5.4	243	0.582	16	0.443	8.3	278	0.424
2580.6	0.659	8.5	0.183	5.1	175	0.635	9.5	0.335	7.8	200	0.464
2581.5	1.2	15	0.251	4.0	291	0.150	17	0.458	6.2	333	0.109
2582.4	1.3	13	0.287	5.5	258	0.965	18	0.523	8.4	295	0.704
2583.3	0.361	6.8	0.183	5.2	159	0.651	5.2	0.335	8.0	182	0.475
2584.3	1.8	14	0.709	5.2	352	0.825	26	1.3	8.0	402	0.602
2585.2	1.4	17	0.337	6.2	288	0.916	20	0.614	9.6	329	0.669
2586.1	0.407	8.7	0.183	5.2	217	1.2	5.9	0.335	8.0	249	0.911
2587.0	1.0	12	0.336	3.8	246	0.650	15	0.612	5.8	282	0.475
2588.0	1.1	27	0.183	5.3	387	0.837	17	0.335	8.1	443	0.611
2588.9	0.260	9.4	0.183	6.5	236	0.872	3.8	0.335	10.0	270	0.636
2589.8	1.3	9.3	0.304	3.3	191	1.3	19	0.555	5.1	218	0.953
2590.7	2.2	20	0.183	4.6	305	0.906	32	0.335	7.0	348	0.661
2591.7	0.559	12	0.183	8.3	276	1.0	8.1	0.335	13	316	0.740
2592.6	0.598	7.3	0.188	3.7	115	0.566	8.6	0.343	5.6	131	0.413
2593.5	1.2	13	0.672	6.8	292	0.307	17	1.2	10	334	0.224
2594.4	0.407	17	0.317	8.1	459	0.606	5.9	0.578	12	524	0.442
2595.4	1.1	9.5	0.183	7.9	168	0.833	16	0.335	12	192	0.608
2596.3	1.2	11	0.400	8.7	251	0.462	18	0.730	13	287	0.337
2597.2	1.0	16	0.614	5.8	341	0.757	15	1.1	8.9	390	0.553
2598.1	0.512	14	0.183	8.5	228	1.2	7.4	0.335	13	261	0.874
2599.0	1.2	12	0.839	10	248	1.1	17	1.5	15	284	0.818
2600.0	0.831	16	0.505	6.3	319	1.5	12	0.921	9.7	365	1.1
2600.9	1.2	12	0.563	8.1	195	1.1	18	1.0	12	223	0.819
2601.8	1.0	8.8	0.701	6.1	182	0.447	15	1.3	9.4	209	0.326
2602.7	1.5	16	1.1	9.8	286	1.2	22	2.0	15	327	0.860
2603.7	0.502	17	0.844	6.2	340	1.2	7.3	1.5	9.5	389	0.857
2604.6	0.474	11	0.526	5.9	194	1.1	6.8	0.960	9.0	222	0.809
2605.5	1.8	14	1.1	11	249	1.0	25	2.0	17	284	0.740
2606.4	0.435	17	0.935	8.3	296	0.811	6.3	1.7	13	338	0.592
2607.4	0.464	9.3	0.722	10	191	0.843	6.7	1.3	16	219	0.615
2608.3	0.343	14	1.2	8.9	241	0.767	4.9	2.2	14	275	0.560
2609.2	0.228	18	1.4	9.5	266	0.687	3.3	2.6	14	304	0.501
2610.1	0.369	12	1.2	8.7	234	0.549	5.3	2.2	13	267	0.400
2611.1	0.461	13	1.1	7.6	210	0.419	6.7	2.0	12	240	0.306
2612.0	0.549	16	1.2	11	279	1.1	7.9	2.2	17	319	0.832
2612.9	0.228	17	0.900	12	252	0.667	3.3	1.6	18	288	0.487
2613.8	0.732	13	1.1	7.4	215	1.0	11	2.0	11	246	0.760
2614.8	0.469	16	1.9	11	252	1.1	6.8	3.5	16	288	0.839
2615.7	0.444	14	0.881	12	287	0.404	6.4	1.6	19	328	0.294
2616.6	0.506	12	1.1	11	232	1.4	7.3	2.0	18	265	1.1
2617.5	0.466	15	1.6	11	294	0.568	6.7	2.9	17	336	0.414
2618.5	0.273	20	1.5	14	270	0.784	3.9	2.8	22	309	0.572
2619.4	0.228	15	1.1	12	217	0.506	3.3	2.1	18	248	0.369



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2620.3	0.599	16	1.6	9.2	238	0.536	8.6	2.9	14	272	0.391
2621.2	0.469	13	0.965	11	282	0.860	6.8	1.8	17	322	0.627
2622.2	0.228	12	1.5	12	251	0.371	3.3	2.8	18	287	0.270
2623.1	0.469	14	0.848	12	238	0.238	6.8	1.5	18	273	0.174
2624.0	0.441	15	1.2	13	268	0.673	6.4	2.1	21	307	0.491
2624.9	0.431	14	1.2	9.1	241	0.525	6.2	2.2	14	276	0.383
2625.8	0.345	14	1.1	11	227	0.383	5.0	2.0	17	260	0.279
2626.8	0.594	13	1.3	14	305	0.127	8.6	2.3	21	348	0.093
2627.7	0.228	14	0.969	14	276	0.648	3.3	1.8	21	316	0.473
2628.6	0.390	15	0.716	13	259	0.355	5.6	1.3	20	296	0.259
2629.5	0.759	14	0.874	14	240	0.400	11	1.6	22	275	0.292
2630.5	0.639	16	0.822	14	219	0.121	9.2	1.5	21	250	0.088
2631.4	0.875	13	0.927	13	241	0.381	13	1.7	20	276	0.278
2632.3	0.694	12	0.751	14	218	0.219	10	1.4	21	250	0.160
2633.2	0.228	18	1.1	13	256	1.2	3.3	2.0	20	292	0.855
2634.2	0.621	18	0.830	13	251	0.864	9.0	1.5	19	287	0.630
2635.1	0.760	15	0.882	13	207	0.116	11	1.6	20	237	0.085
2636.0	0.228	17	0.739	16	265	0.417	3.3	1.3	25	303	0.304
2636.9	0.342	16	0.766	12	250	0.122	4.9	1.4	18	286	0.089
2637.9	0.228	14	0.585	13	212	0.240	3.3	1.1	19	243	0.175
2638.8	0.658	15	1.3	11	237	0.388	9.5	2.4	17	271	0.283
2639.7	0.359	21	0.771	15	252	0.533	5.2	1.4	23	288	0.389
2640.6	0.523	16	0.980	16	228	0.129	7.6	1.8	24	261	0.094
2641.6	0.583	14	0.753	13	228	0.389	8.4	1.4	20	261	0.284
2642.5	1.1	17	0.965	17	276	0.551	16	1.8	26	315	0.402
2643.4	0.253	13	1.2	15	250	0.483	3.7	2.2	24	286	0.352
2644.3	0.980	13	0.705	16	210	0.735	14	1.3	24	241	0.537
2645.3	0.517	14	0.509	11	270	0.668	7.5	0.928	17	309	0.488
2646.2	0.228	20	0.665	15	310	0.260	3.3	1.2	22	354	0.190
2647.1	0.228	13	0.972	18	220	0.352	3.3	1.8	27	251	0.257
2648.0	0.228	15	0.904	15	249	0.128	3.3	1.6	23	285	0.093
2649.0	0.482	16	0.871	13	223	0.119	7.0	1.6	20	255	0.087
2649.9	0.518	15	0.871	17	231	0.806	7.5	1.6	27	265	0.588
2650.8	0.412	14	0.633	15	235	0.247	5.9	1.2	23	268	0.180
2651.7	0.577	18	0.746	14	232	0.778	8.3	1.4	21	265	0.568
2652.6	0.228	16	0.542	14	232	0.356	3.3	0.989	22	265	0.260
2653.6	0.682	15	0.727	12	203	0.360	9.8	1.3	18	232	0.263
2654.5	0.228	17	0.624	13	241	0.826	3.3	1.1	21	276	0.603
2655.4	0.228	15	0.966	13	264	0.533	3.3	1.8	20	302	0.389
2656.3	0.687	15	0.434	16	210	0.855	9.9	0.791	24	240	0.624
2657.3	0.604	15	0.416	15	298	0.815	8.7	0.759	23	341	0.595
2658.2	0.228	17	0.638	12	238	0.891	3.3	1.2	19	272	0.650
2659.1	0.980	14	0.585	11	206	0.117	14	1.1	17	236	0.085
2660.0	0.860	14	0.640	13	209	0.697	12	1.2	20	239	0.509
2661.0	1.0	14	0.547	13	235	0.538	14	0.997	20	269	0.393
2661.9	0.386	13	0.564	81	223	0.589	5.6	1.0	124	255	0.430
2662.8	0.695	15	0.397	12	204	0.896	10	0.724	19	234	0.654
2663.7	0.681	14	0.577	13	244	0.481	9.8	1.1	20	279	0.351
2664.7	0.541	13	0.491	16	216	0.361	7.8	0.896	24	247	0.263
2665.6	0.270	15	0.744	13	245	0.645	3.9	1.4	20	281	0.471
2666.5	0.528	15	0.654	15	255	0.545	7.6	1.2	23	291	0.397
2667.4	0.440	15	0.517	11	260	0.224	6.4	0.942	17	298	0.163
2668.4	0.812	13	0.183	12	201	0.326	12	0.335	19	230	0.238
2669.3	0.755	13	0.410	13	250	0.939	11	0.749	19	286	0.685
2670.2	0.718	16	0.453	9.9	249	0.893	10	0.826	15	285	0.652
2671.1	0.228	14	0.375	15	249	0.364	3.3	0.684	22	285	0.266
2672.1	0.228	13	0.527	9.5	211	0.580	3.3	0.961	15	241	0.423
2673.0	0.764	16	0.436	11	232	0.860	11	0.795	17	266	0.628
2673.9	0.228	15	0.640	8.7	224	0.121	3.3	1.2	13	256	0.089
2674.8	0.273	13	0.241	11	235	1.2	3.9	0.439	17	269	0.862
2675.8	0.383	17	0.649	10	269	0.859	5.5	1.2	16	307	0.627
2676.7	0.503	15	0.399	8.8	281	0.782	7.3	0.728	13	322	0.570
2677.6	0.644	11	0.210	9.5	205	1.4	9.3	0.384	14	235	1.0
2678.5	0.823	13	0.613	7.8	244	0.218	12	1.1	12	279	0.159
2679.4	0.529	17	0.788	7.5	270	0.407	7.6	1.4	11	308	0.297
2680.4	0.751	12	0.441	11	216	1.2	11	0.804	17	247	0.878
2681.3	0.330	10	0.589	8.0	213	0.616	4.8	1.1	12	243	0.449
2682.2	0.382	14	0.681	6.0	256	1.000	5.5	1.2	9.2	293	0.729
2683.1	0.676	13	0.183	8.2	242	0.599	9.8	0.335	13	277	0.437
2684.1	0.476	9.4	0.474	3.0	157	1.0	6.9	0.864	4.6	179	0.760
2685.0	0.300	14	0.405	5.2	243	0.427	4.3	0.738	8.0	278	0.311
2685.9	0.424	16	0.183	6.5	269	1.2	6.1	0.335	10.0	308	0.854
2686.8	0.335	10	0.339	6.1	190	0.511	4.8	0.618	9.3	217	0.373
2687.8	1.3	15	0.648	8.4	282	0.449	19	1.2	13	322	0.328
2688.7	0.564	22	0.264	6.2	335	0.504	8.1	0.482	9.5	384	0.368
2689.6	0.832	9.6	0.225	7.4	213	0.486	12	0.410	11	243	0.355
2690.5	0.651	11	0.301	4.2	223	0.514	9.4	0.549	6.5	255	0.375
2691.5	0.843	18	0.348	3.5	343	0.328	12	0.635	5.4	392	0.239
2692.4	0.828	11	0.370	3.8	202	0.445	12	0.674	5.8	232	0.325
2693.3	0.729	8.4	0.229	3.8	167	1.5	11	0.418	5.8	191	1.1
2694.2	0.472	15	0.195	4.9	274	1.6	6.8	0.356	7.5	313	1.2



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
2695.2	0.523	13	0.183	4.7	245	0.266	7.6	0.335	7.3	280	0.194
2696.1	0.522	9.1	0.191	3.0	161	0.621	7.5	0.348	4.6	184	0.453
2697.0	1.2	13	0.587	4.2	232	0.269	17	1.1	6.4	265	0.196
2697.9	1.2	19	0.183	7.7	531	0.801	17	0.335	12	607	0.584
2698.9	0.312	9.7	0.183	5.6	166	0.380	4.5	0.335	8.5	190	0.277
2699.8	1.4	8.7	0.285	4.5	239	0.147	20	0.519	6.9	274	0.108
2700.7	1.2	17	0.183	4.6	319	0.750	17	0.335	7.0	364	0.548
2701.6	0.646	8.3	0.183	4.0	189	0.251	9.3	0.335	6.2	217	0.183
2702.5	1.4	9.8	0.316	3.7	191	1.5	20	0.577	5.7	218	1.1
2703.5	0.892	14	0.305	4.6	267	0.521	13	0.556	7.0	305	0.380
2704.4	0.848	11	0.381	3.2	265	0.495	12	0.695	4.9	303	0.361
2705.3	0.296	7.1	0.392	3.2	159	0.885	4.3	0.715	4.9	182	0.646
2706.2	0.622	16	0.291	5.4	301	0.556	9.0	0.531	8.2	344	0.406
2707.2	0.702	16	0.183	6.8	350	0.554	10	0.335	10	400	0.404
2708.1	0.736	7.4	0.262	4.4	150	0.860	11	0.479	6.7	171	0.627
2709.0	1.4	13	0.183	6.0	287	1.2	21	0.335	9.2	328	0.864
2709.9	1.4	17	0.183	2.9	274	0.021	20	0.335	4.4	313	0.015
2710.9	0.596	7.3	0.362	4.8	178	0.232	8.6	0.660	7.4	204	0.169
2711.8	1.5	10	0.288	4.3	206	0.992	22	0.526	6.6	235	0.724
2712.7	0.664	24	0.242	8.0	270	1.3	9.6	0.442	12	309	0.964
2713.6	0.802	10	0.188	5.5	230	0.231	12	0.342	8.4	264	0.169
2714.6	0.801	10	0.274	3.6	178	1.2	12	0.500	5.5	203	0.861
2715.5	1.8	15	0.700	5.2	258	0.303	26	1.3	8.0	295	0.221
2716.4	0.531	16	0.259	7.4	575	0.647	7.7	0.473	11	658	0.472
2717.3	0.412	7.6	0.183	9.6	128	0.368	5.9	0.335	15	147	0.269
2718.3	0.412	15	0.183	8.6	205	0.457	5.9	0.335	13	234	0.333
2719.2	0.228	15	0.594	10	247	1.6	3.3	1.1	15	283	1.2
2720.1	0.228	12	0.183	7.3	177	0.874	3.3	0.335	11	203	0.637
2721.0	0.228	11	0.306	11	246	0.830	3.3	0.558	17	281	0.606
2722.0	1.0	15	0.219	6.9	259	0.407	15	0.399	11	296	0.297
2722.9	0.402	11	0.618	11	234	0.987	5.8	1.1	16	267	0.720
2723.8	0.510	14	0.631	5.9	180	0.505	7.4	1.2	9.0	206	0.368
2724.7	0.382	17	0.262	11	264	0.280	5.5	0.478	18	302	0.204
2725.7	0.582	15	0.753	11	223	0.257	8.4	1.4	17	255	0.187
2726.6	0.464	15	0.544	7.1	177	0.600	6.7	0.993	11	203	0.437
2727.5	0.228	17	1.0	8.6	245	0.852	3.3	1.9	13	281	0.621
2728.4	0.228	16	0.457	7.7	238	0.967	3.3	0.833	12	272	0.706
2729.4	0.915	12	0.477	11	193	0.534	13	0.870	17	220	0.390
2730.3	0.298	13	1.0	9.2	257	0.713	4.3	1.9	14	294	0.521
2731.2	0.444	16	1.3	8.2	269	1.1	6.4	2.3	13	308	0.795
2732.1	0.228	12	0.817	9.5	183	1.1	3.3	1.5	15	209	0.801
2733.0	1.1	15	1.4	12	215	0.800	15	2.5	18	246	0.583
2734.0	0.364	15	1.3	9.8	250	0.542	5.3	2.4	15	286	0.395
2734.9	0.347	11	1.4	10	217	0.515	5.0	2.5	16	248	0.376
2735.8	0.247	12	1.5	8.3	192	0.470	3.6	2.8	13	219	0.343
2736.7	0.565	16	1.7	10	273	0.435	8.2	3.1	16	312	0.318
2737.7	0.228	17	1.0	12	313	0.670	3.3	1.8	18	358	0.489
2738.6	0.228	11	0.874	8.0	201	0.938	3.3	1.6	12	229	0.684
2739.5	0.408	16	2.0	12	263	0.607	5.9	3.7	18	300	0.443
2740.4	0.305	18	0.984	15	272	0.139	4.4	1.8	23	311	0.102
2741.4	0.228	12	0.898	12	199	0.449	3.3	1.6	19	227	0.328
2742.3	0.747	17	1.3	15	240	0.930	11	2.3	23	275	0.678
2743.2	0.541	22	0.532	12	355	0.841	7.8	0.971	18	406	0.614
2744.1	0.550	12	1.0	12	213	0.118	7.9	1.9	18	244	0.086
2745.1	0.228	12	1.1	9.9	197	0.546	3.3	2.0	15	226	0.399
2746.0	0.387	21	1.3	11	290	0.429	5.6	2.3	18	331	0.313
2746.9	0.429	12	1.0	13	282	0.522	6.2	1.9	19	322	0.381
2747.8	0.228	12	1.1	14	212	0.223	3.3	2.1	22	243	0.162
2748.8	0.410	14	1.1	13	242	0.373	5.9	2.0	19	277	0.272
2749.7	0.854	15	0.890	13	270	0.408	12	1.6	21	308	0.298
2750.6	1.7	15	1.1	12	226	0.379	24	2.0	19	258	0.276
2751.5	1.6	19	1.4	9.8	265	0.687	23	2.5	15	303	0.502
2752.5	0.228	19	0.705	9.4	273	0.639	3.3	1.3	14	312	0.466
2753.4	0.549	15	0.740	14	239	0.616	7.9	1.4	21	273	0.449
2754.3	0.411	14	0.848	14	234	0.374	5.9	1.5	22	267	0.273
2755.2	0.342	15	0.922	11	251	0.379	4.9	1.7	18	287	0.277
2756.1	0.702	12	0.808	13	225	0.370	10	1.5	20	257	0.270
2757.1	0.261	13	0.904	15	246	0.625	3.8	1.6	23	282	0.456
2758.0	0.660	16	0.529	16	239	1.0	9.5	0.965	25	273	0.766
2758.9	0.364	17	0.915	16	276	0.129	5.3	1.7	25	315	0.094
2759.8	0.619	17	0.827	13	220	0.241	8.9	1.5	20	252	0.176
2760.8	0.496	16	0.896	12	240	0.511	7.2	1.6	18	275	0.373
2761.7	0.228	16	0.690	23	275	0.257	3.3	1.3	35	315	0.188
2762.6	0.613	14	0.789	64	215	0.361	8.9	1.4	98	246	0.264
2763.5	0.459	14	0.568	11	228	0.833	6.6	1.0	17	261	0.608
2764.5	0.363	19	0.681	12	248	0.403	5.2	1.2	19	283	0.294
2765.4	0.228	17	0.550	16	261	0.542	3.3	1.0	25	298	0.395
2766.3	0.437	14	0.457	12	203	0.907	6.3	0.834	19	232	0.662
2767.2	0.228	22	0.533	14	270	0.658	3.3	0.972	21	309	0.480
2768.2	0.423	17	0.469	13	231	0.546	6.1	0.856	19	265	0.399
2769.1	0.228	16	0.761	12	190	0.349	3.3	1.4	18	218	0.254



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2770.0	0.304	16	0.588	12	286	0.726	4.4	1.1	19	328	0.529
2770.9	0.228	19	0.512	13	275	0.377	3.3	0.934	20	315	0.275
2771.9	0.228	16	0.698	15	183	0.783	3.3	1.3	24	210	0.571
2772.8	0.228	17	1.1	15	241	0.255	3.3	2.1	23	275	0.186
2773.7	0.228	19	0.818	13	232	0.125	3.3	1.5	19	265	0.091
2774.6	0.228	21	0.560	14	230	1.0	3.3	1.0	22	263	0.754
2775.6	0.618	15	0.736	15	198	0.117	8.9	1.3	22	226	0.085
2776.5	0.529	20	0.568	14	323	0.594	7.6	1.0	22	369	0.433
2777.4	0.507	16	0.572	11	238	0.109	7.3	1.0	17	272	0.079
2778.3	0.228	13	0.862	14	193	0.332	3.3	1.6	22	221	0.242
2779.3	0.380	18	0.956	12	222	0.851	5.5	1.7	19	254	0.621
2780.2	0.228	22	0.591	16	430	0.582	3.3	1.1	24	492	0.425
2781.1	0.802	16	0.361	14	188	0.350	12	0.658	21	215	0.255
2782.0	1.2	17	1.2	17	203	0.376	17	2.1	26	233	0.274
2783.0	0.359	26	1.2	12	274	0.534	5.2	2.1	18	313	0.390
2783.9	0.652	17	0.649	17	188	0.645	9.4	1.2	26	215	0.471
2784.8	0.402	16	0.617	16	196	0.021	5.8	1.1	25	225	0.015
2785.7	0.878	18	0.432	21	280	0.562	13	0.788	32	320	0.410
2786.6	0.801	19	0.363	19	374	0.902	12	0.662	29	427	0.658
2787.6	0.228	11	0.637	12	148	0.426	3.3	1.2	18	169	0.311
2788.5	0.753	28	0.750	15	240	0.595	11	1.4	23	274	0.434
2789.4	0.293	26	0.533	17	343	0.417	4.2	0.973	27	393	0.304
2790.3	0.545	14	0.525	22	182	1.2	7.9	0.958	33	208	0.897
2791.3	1.2	17	0.821	14	252	0.463	17	1.5	22	288	0.338
2792.2	0.513	26	0.765	19	276	0.127	7.4	1.4	29	316	0.092
2793.1	0.694	16	0.438	15	170	0.490	10	0.798	24	195	0.358
2794.0	0.496	19	0.739	14	196	0.381	7.2	1.3	21	225	0.278
2795.0	0.914	24	0.809	18	245	0.140	13	1.5	27	281	0.102
2795.9	0.228	14	0.666	16	174	0.512	3.3	1.2	24	199	0.374
2796.8	0.438	14	0.879	15	171	0.491	6.3	1.6	22	195	0.358
2797.7	0.990	24	1.2	17	228	0.118	14	2.2	26	260	0.086
2798.7	0.520	23	1.1	17	264	0.264	7.5	2.0	26	302	0.193
2799.6	0.228	16	0.828	22	227	1.5	3.3	1.5	33	260	1.1
2800.5	1.4	18	1.2	17	229	0.431	20	2.2	26	262	0.315
2801.4	0.978	27	0.791	17	451	0.282	14	1.4	25	515	0.205
2802.4	0.228	9.7	0.536	13	123	0.383	3.3	0.978	19	141	0.280
2803.3	1.0	15	1.1	14	181	0.247	15	2.1	22	207	0.180
2804.2	0.671	22	1.1	15	270	0.753	9.7	2.0	23	309	0.549
2805.1	0.711	19	0.684	21	216	0.313	10	1.2	32	247	0.229
2806.1	0.754	16	0.519	13	172	0.482	11	0.947	19	197	0.352
2807.0	0.766	22	0.749	17	204	0.541	11	1.4	26	233	0.395
2807.9	0.228	15	0.691	13	202	0.920	3.3	1.3	20	231	0.671
2808.8	1.1	17	0.742	14	236	0.808	16	1.4	22	270	0.590
2809.8	0.476	21	0.980	19	264	0.432	6.9	1.8	30	302	0.316
2810.7	0.260	22	0.929	24	254	0.495	3.7	1.7	36	290	0.361
2811.6	0.554	19	0.717	15	215	0.873	8.0	1.3	23	246	0.637
2812.5	0.953	23	0.646	14	222	0.642	14	1.2	22	254	0.469
2813.4	0.228	21	0.359	14	263	0.837	3.3	0.655	21	301	0.610
2814.4	0.327	16	0.524	11	194	0.610	4.7	0.955	16	222	0.445
2815.3	0.776	20	0.626	12	224	0.623	11	1.1	18	256	0.454
2816.2	0.763	19	0.436	11	222	0.736	11	0.795	17	254	0.537
2817.1	0.892	21	0.305	8.4	225	0.786	13	0.556	13	257	0.573
2818.1	0.507	18	0.660	9.5	247	1.2	7.3	1.2	15	283	0.866
2819.0	0.753	20	0.573	5.8	252	0.262	11	1.0	8.8	288	0.191
2819.9	0.671	19	0.365	8.0	199	0.354	9.7	0.666	12	227	0.258
2820.8	1.0	18	0.316	7.3	225	1.6	15	0.577	11	258	1.2
2821.8	0.520	23	0.215	7.4	234	1.1	7.5	0.392	11	267	0.788
2822.7	0.652	23	0.238	4.7	285	0.384	9.4	0.434	7.2	326	0.280
2823.6	0.745	16	0.183	2.6	220	0.660	11	0.335	4.0	251	0.482
2824.5	0.228	16	0.355	4.2	216	0.549	3.3	0.647	6.4	247	0.400
2825.5	0.567	17	0.450	7.4	411	0.585	8.2	0.821	11	470	0.427
2826.4	0.537	8.8	0.183	3.7	153	0.518	7.8	0.335	5.7	175	0.378
2827.3	0.464	8.9	0.333	4.0	129	0.660	6.7	0.607	6.2	148	0.482
2828.2	0.637	22	0.613	4.3	344	0.281	9.2	1.1	6.6	393	0.205
2829.2	0.346	16	0.491	3.2	233	0.645	5.0	0.895	4.9	266	0.471
2830.1	0.468	6.6	0.183	2.3	123	0.331	6.8	0.335	3.6	141	0.241
2831.0	1.4	15	0.326	4.2	306	0.781	21	0.595	6.4	350	0.570
2831.9	0.322	26	0.209	2.7	496	0.021	4.7	0.380	4.2	567	0.015
2832.9	0.764	5.6	0.183	1.6	102	0.517	11	0.335	2.4	116	0.377
2833.8	0.331	14	0.796	2.6	289	1.3	4.8	1.5	4.0	330	0.927
2834.7	0.564	34	0.183	2.4	570	0.338	8.1	0.335	3.7	652	0.247
2835.6	0.363	7.7	0.183	3.8	142	0.778	5.2	0.335	5.8	163	0.568
2836.6	1.5	9.5	0.289	2.0	177	0.625	22	0.527	3.1	202	0.456
2837.5	1.9	20	0.459	2.3	404	0.446	28	0.838	3.5	462	0.325
2838.4	0.765	8.3	0.183	2.3	205	0.828	11	0.335	3.5	234	0.604
2839.3	0.411	6.6	0.249	1.5	112	0.160	5.9	0.455	2.2	128	0.117
2840.2	2.6	16	0.461	2.5	270	0.712	37	0.840	3.9	308	0.520
2841.2	1.0	18	0.371	1.7	472	0.170	14	0.677	2.6	539	0.124
2842.1	0.740	4.0	0.183	2.0	106	0.865	11	0.335	3.1	121	0.631
2843.0	2.1	18	0.705	1.6	277	0.590	30	1.3	2.5	317	0.430
2843.9	1.1	24	0.240	1.5	447	0.752	16	0.438	2.2	512	0.548



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
2844.9	0.506	6.5	0.183	1.5	160	0.796	7.3	0.335	2.2	183	0.581
2845.8	1.4	12	0.183	1.8	199	1.6	20	0.335	2.8	227	1.1
2846.7	0.744	18	0.183	1.7	241	0.587	11	0.335	2.7	276	0.429
2847.6	0.541	6.7	0.200	1.5	164	0.673	7.8	0.365	2.2	187	0.491
2848.6	1.2	12	0.183	1.5	239	0.799	17	0.335	2.2	273	0.583
2849.5	1.6	17	0.183	1.7	317	0.640	23	0.335	2.6	362	0.467
2850.4	1.0	13	0.183	1.5	303	0.644	15	0.335	2.2	347	0.470
2851.3	0.878	4.9	0.183	1.5	104	0.724	13	0.335	2.2	119	0.528
2852.3	2.5	15	0.572	2.4	325	0.554	36	1.0	3.7	371	0.405
2853.2	1.3	25	0.183	1.7	414	0.141	18	0.335	2.7	473	0.103
2854.1	0.740	5.7	0.183	1.5	132	0.649	11	0.335	2.2	151	0.473
2855.0	0.671	8.8	0.183	2.6	219	0.448	9.7	0.335	4.1	251	0.327
2856.0	0.877	13	0.183	1.5	499	2.1	13	0.335	2.2	571	1.5
2856.9	1.0	7.0	0.183	1.8	143	0.731	15	0.335	2.8	164	0.533
2857.8	1.4	6.5	0.412	1.5	171	0.227	20	0.751	2.2	196	0.166
2858.7	2.0	24	0.183	2.7	338	2.0	29	0.335	4.1	386	1.4
2859.7	0.693	12	0.183	1.5	252	0.986	10	0.335	2.2	288	0.720
2860.6	0.667	4.0	0.183	1.5	92	0.656	9.6	0.335	2.2	105	0.479
2861.5	0.228	16	0.366	1.5	357	0.190	3.3	0.668	2.2	409	0.138
2862.4	0.939	22	0.183	2.3	397	0.832	14	0.335	3.6	454	0.607
2863.3	0.254	5.5	0.183	1.5	88	0.993	3.7	0.335	2.2	101	0.724
2864.3	1.7	16	0.183	2.5	263	0.898	24	0.335	3.9	301	0.655
2865.2	1.3	36	0.230	1.8	571	0.851	18	0.420	2.8	652	0.621
2866.1	0.419	5.6	0.183	2.5	151	0.980	6.0	0.335	3.9	173	0.715
2867.0	1.3	13	0.211	1.7	204	0.927	19	0.385	2.6	234	0.676
2868.0	0.809	21	0.264	2.0	437	0.282	12	0.482	3.1	499	0.206
2868.9	0.407	9.8	0.321	2.3	282	1.2	5.9	0.585	3.6	323	0.912
2869.8	0.440	6.1	0.183	1.5	117	0.788	6.4	0.335	2.2	134	0.575
2870.7	1.8	20	0.183	1.5	379	0.550	26	0.335	2.2	433	0.401
2871.7	0.228	15	0.391	2.3	243	0.604	3.3	0.713	3.5	278	0.441
2872.6	0.283	9.4	0.183	2.8	182	1.6	4.1	0.335	4.4	208	1.2
2873.5	2.0	18	0.956	1.5	326	0.758	28	1.7	2.2	373	0.553
2874.4	0.777	26	0.449	1.5	663	0.343	11	0.819	2.2	758	0.250
2875.4	0.228	8.0	0.334	4.4	127	0.565	3.3	0.610	6.7	145	0.412
2876.3	0.785	13	1.2	1.8	279	1.7	11	2.1	2.8	319	1.3
2877.2	0.883	26	0.749	1.5	452	0.782	13	1.4	2.2	517	0.571
2878.1	0.456	9.5	0.594	2.6	187	0.948	6.6	1.1	4.0	214	0.692
2879.1	0.228	8.4	0.631	2.4	205	1.4	3.3	1.2	3.6	235	1.0
2880.0	0.661	22	1.0	2.2	304	1.0	9.5	1.9	3.4	348	0.749
2880.9	0.685	13	0.372	4.0	210	0.852	9.9	0.679	6.1	240	0.622
2881.8	0.276	6.6	0.551	1.5	117	0.428	4.0	1.0	2.3	134	0.313
2882.8	0.874	14	0.828	2.6	252	0.340	13	1.5	4.0	289	0.248
2883.7	0.228	20	0.744	3.3	318	0.590	3.3	1.4	5.0	364	0.430
2884.6	0.271	12	0.556	4.1	207	0.777	3.9	1.0	6.3	237	0.567
2885.5	1.5	13	1.7	5.3	249	0.852	21	3.0	8.1	285	0.621
2886.4	0.516	23	1.2	3.1	352	0.398	7.5	2.2	4.8	403	0.290
2887.4	0.228	14	0.967	4.1	190	1.3	3.3	1.8	6.4	218	0.978
2888.3	0.544	16	1.3	2.6	211	0.987	7.8	2.3	4.0	241	0.720
2889.2	0.245	18	0.341	4.0	276	0.486	3.5	0.622	6.1	316	0.355
2890.1	0.575	15	0.894	3.3	245	0.443	8.3	1.6	5.1	280	0.323
2891.1	0.543	16	0.845	2.8	252	0.987	7.8	1.5	4.3	288	0.720
2892.0	0.653	22	1.1	3.4	269	0.732	9.4	2.0	5.2	308	0.534
2892.9	0.518	17	0.839	5.2	299	1.1	7.5	1.5	7.9	342	0.786
2893.8	0.475	18	0.859	2.0	207	0.614	6.9	1.6	3.1	237	0.448
2894.8	0.804	21	1.5	5.2	264	0.796	12	2.7	8.0	302	0.580
2895.7	0.390	19	1.2	4.6	255	0.475	5.6	2.1	7.0	291	0.347
2896.6	0.228	14	0.614	3.7	190	0.511	3.3	1.1	5.7	217	0.373
2897.5	0.683	19	1.6	4.4	245	0.402	9.9	2.9	6.8	280	0.294
2898.5	0.228	24	0.732	3.1	245	0.797	3.3	1.3	4.8	280	0.581
2899.4	0.228	19	1.0	2.7	211	0.479	3.3	1.9	4.1	241	0.349
2900.3	0.415	18	0.949	3.0	203	0.506	6.0	1.7	4.5	232	0.369
2901.2	0.395	22	1.4	4.6	298	0.438	5.7	2.6	7.1	341	0.320
2902.2	0.228	21	0.816	5.5	277	0.130	3.3	1.5	8.5	316	0.095
2903.1	0.538	16	0.932	6.0	204	0.359	7.8	1.7	9.3	233	0.262
2904.0	0.897	20	0.757	2.9	228	0.391	13	1.4	4.5	261	0.285
2904.9	0.228	20	0.946	2.5	310	0.539	3.3	1.7	3.9	354	0.394
2905.9	1.1	18	0.845	5.4	219	0.565	16	1.5	8.3	250	0.412
2906.8	0.771	25	0.864	3.9	247	0.993	11	1.6	6.0	283	0.725
2907.7	0.617	31	0.595	2.9	250	0.272	8.9	1.1	4.5	285	0.199
2908.6	0.658	18	0.814	4.6	205	0.782	9.5	1.5	7.0	235	0.571
2909.6	0.738	17	0.882	3.4	189	0.654	11	1.6	5.2	217	0.477
2910.5	0.364	25	0.815	5.2	261	0.540	5.2	1.5	8.0	299	0.394
2911.4	0.448	19	0.810	3.4	271	0.696	6.5	1.5	5.2	309	0.508
2912.3	0.415	15	0.696	2.5	139	0.559	6.0	1.3	3.8	159	0.408
2913.2	0.893	26	0.967	5.7	257	0.861	13	1.8	8.7	294	0.628
2914.2	0.279	25	0.735	3.3	280	0.666	4.0	1.3	5.0	320	0.486
2915.1	0.530	11	0.342	3.1	119	0.068	7.7	0.624	4.7	136	0.050
2916.0	1.1	28	2.3	3.6	240	0.737	16	4.2	5.5	275	0.538
2916.9	0.285	25	0.519	4.1	330	0.406	4.1	0.947	6.4	377	0.296
2917.9	0.358	18	0.631	4.3	155	0.437	5.2	1.2	6.7	177	0.318
2918.8	0.746	24	0.381	3.3	214	0.440	11	0.695	5.0	245	0.321



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2919.7	0.803	33	0.644	4.1	323	0.152	12	1.2	6.3	370	0.111
2920.6	0.296	16	0.851	3.3	244	0.708	4.3	1.6	5.1	279	0.517
2921.6	0.605	13	0.511	2.3	154	0.443	8.7	0.932	3.5	176	0.323
2922.5	0.964	24	0.512	5.2	280	0.773	14	0.934	8.0	320	0.564
2923.4	0.228	21	0.785	3.2	269	0.785	3.3	1.4	4.9	307	0.573
2924.3	0.684	15	0.283	2.6	148	0.603	9.9	0.516	4.0	169	0.440
2925.3	0.382	24	0.822	3.0	213	0.569	5.5	1.5	4.6	243	0.415
2926.2	0.953	31	0.531	5.1	327	1.4	14	0.968	7.7	374	1.0
2927.1	0.640	15	0.627	5.4	205	0.453	9.2	1.1	8.3	234	0.330
2928.0	1.5	17	0.855	2.6	202	1.2	22	1.6	3.9	231	0.901
2929.0	0.570	31	0.778	5.0	272	0.439	8.2	1.4	7.7	311	0.320
2929.9	0.376	12	0.203	3.1	152	0.879	5.4	0.370	4.7	174	0.642
2930.8	1.1	20	0.648	3.3	188	0.975	16	1.2	5.0	215	0.712
2931.7	2.3	40	1.2	4.8	268	0.435	33	2.1	7.3	306	0.318
2932.7	0.343	22	0.800	4.5	210	1.0	5.0	1.5	6.9	241	0.749
2933.6	0.651	16	0.423	2.7	161	0.522	9.4	0.771	4.1	185	0.381
2934.5	1.4	25	0.715	1.9	252	0.946	21	1.3	2.8	288	0.690
2935.4	0.483	27	0.489	2.1	327	1.2	7.0	0.892	3.2	374	0.865
2936.3	0.486	13	0.319	4.7	160	0.481	7.0	0.581	7.2	183	0.351
2937.3	1.3	22	0.945	4.0	197	0.504	19	1.7	6.1	226	0.367
2938.2	0.446	25	0.384	2.2	222	0.543	6.4	0.701	3.4	254	0.396
2939.1	0.248	18	0.224	4.1	199	1.2	3.6	0.409	6.2	228	0.849
2940.0	0.872	15	0.361	2.5	252	0.558	13	0.658	3.8	289	0.407
2941.0	0.717	23	0.818	4.8	270	0.853	10	1.5	7.4	309	0.622
2941.9	0.228	21	0.244	3.4	217	0.797	3.3	0.446	5.2	248	0.581
2942.8	0.405	23	0.623	3.6	200	0.368	5.9	1.1	5.5	229	0.269
2943.7	0.636	23	0.788	4.0	249	1.7	9.2	1.4	6.1	285	1.3
2944.7	0.804	20	0.238	4.7	232	0.905	12	0.434	7.2	265	0.661
2945.6	0.252	18	0.841	4.1	212	0.967	3.6	1.5	6.2	242	0.705
2946.5	0.847	22	0.442	5.5	262	0.369	12	0.805	8.4	300	0.270
2947.4	0.744	23	0.454	3.1	285	0.838	11	0.828	4.7	326	0.611
2948.4	0.571	20	0.550	5.2	206	0.640	8.2	1.0	8.0	235	0.467
2949.3	0.629	20	0.413	2.9	216	1.1	9.1	0.753	4.5	247	0.822
2950.2	0.500	23	0.183	4.4	250	1.0	7.2	0.335	6.7	286	0.758
2951.1	0.568	23	0.455	5.5	243	0.789	8.2	0.830	8.4	277	0.576
2952.1	0.615	14	0.431	2.5	174	0.724	8.9	0.786	3.9	200	0.528
2953.0	0.931	22	0.619	6.7	271	0.682	13	1.1	10	310	0.498
2953.9	0.825	25	0.700	5.0	346	0.879	12	1.3	7.6	396	0.642
2954.8	0.450	15	0.536	1.9	151	0.536	6.5	0.978	2.9	172	0.391
2955.8	0.596	22	0.804	3.4	251	0.668	8.6	1.5	5.3	287	0.488
2956.7	0.543	24	0.397	7.5	300	0.987	7.8	0.724	12	343	0.720
2957.6	0.638	16	0.403	5.0	206	0.451	9.2	0.734	7.7	236	0.329
2958.5	0.466	23	0.646	6.1	270	1.1	6.7	1.2	9.4	308	0.833
2959.5	0.993	23	0.312	3.6	271	0.398	14	0.569	5.5	310	0.291
2960.4	0.815	20	0.425	7.8	199	0.718	12	0.775	12	228	0.524
2961.3	0.228	20	0.660	5.3	166	0.917	3.3	1.2	8.1	190	0.669
2962.2	0.639	22	0.605	3.5	397	0.021	9.2	1.1	5.4	455	0.015
2963.1	1.2	21	0.712	7.3	257	0.233	18	1.3	11	294	0.170
2964.1	0.234	9.4	0.364	3.0	95	0.241	3.4	0.664	4.5	108	0.176
2965.0	0.982	20	0.582	6.4	227	0.137	14	1.1	9.8	259	0.100
2965.9	0.653	25	0.486	9.2	297	0.584	9.4	0.886	14	339	0.426
2966.8	0.444	14	0.296	3.6	159	0.342	6.4	0.541	5.6	182	0.250
2967.8	0.463	22	0.276	6.6	252	0.862	6.7	0.503	10	288	0.629
2968.7	0.391	23	0.340	5.6	266	0.581	5.6	0.620	8.6	304	0.424
2969.6	0.548	19	0.678	8.4	243	0.708	7.9	1.2	13	278	0.517
2970.5	0.228	20	0.568	7.4	248	0.626	3.3	1.0	11	283	0.457
2971.5	0.995	24	0.625	6.2	286	0.998	14	1.1	9.6	328	0.728
2972.4	0.418	18	0.311	9.2	190	0.847	6.0	0.566	14	217	0.618
2973.3	0.959	13	0.698	5.1	204	0.021	14	1.3	7.8	233	0.015
2974.2	1.0	25	0.674	7.1	265	0.846	15	1.2	11	303	0.617
2975.2	0.604	22	0.416	8.2	324	0.814	8.7	0.758	13	370	0.594
2976.1	0.388	12	0.273	4.7	107	0.539	5.6	0.499	7.3	122	0.394
2977.0	0.477	25	0.661	6.6	239	0.433	6.9	1.2	10	274	0.316
2977.9	1.2	32	0.578	6.0	279	0.606	18	1.1	9.2	319	0.442
2978.9	0.626	14	0.624	9.1	180	0.369	9.0	1.1	14	206	0.269
2979.8	0.928	19	0.785	5.7	243	1.0	13	1.4	8.8	278	0.762
2980.7	0.828	19	0.666	6.7	303	0.140	12	1.2	10	347	0.102
2981.6	0.360	14	0.332	7.7	181	0.466	5.2	0.605	12	207	0.340
2982.6	0.325	17	1.1	7.4	206	0.729	4.7	1.9	11	235	0.532
2983.5	0.924	23	0.309	6.6	245	0.141	13	0.564	10	280	0.103
2984.4	1.2	19	0.546	8.6	249	1.1	18	0.995	13	285	0.786
2985.3	1.2	16	0.374	5.3	180	0.487	17	0.683	8.1	206	0.355
2986.2	0.667	22	0.826	6.1	261	1.1	9.6	1.5	9.4	299	0.766
2987.2	0.435	24	0.798	9.3	319	0.530	6.3	1.5	14	364	0.387
2988.1	0.228	10	0.331	5.2	141	0.409	3.3	0.604	8.0	161	0.298
2989.0	0.852	23	0.501	8.3	263	1.5	12	0.913	13	301	1.1
2989.9	1.0	25	0.549	6.3	255	1.1	15	1.0	9.7	291	0.795
2990.9	0.279	13	0.396	7.5	170	0.204	4.0	0.722	12	195	0.149
2991.8	0.975	22	0.612	7.2	198	0.977	14	1.1	11	227	0.713
2992.7	1.1	27	0.518	7.8	316	1.2	16	0.945	12	361	0.844
2993.6	0.569	17	0.594	7.9	227	0.905	8.2	1.1	12	260	0.660



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2994.6	0.454	16	0.237	5.1	177	0.714	6.5	0.433	7.8	202	0.521
2995.5	1.1	23	0.433	7.5	304	0.978	16	0.790	12	348	0.713
2996.4	0.298	24	0.532	7.8	272	0.668	4.3	0.970	12	311	0.488
2997.3	0.365	17	0.451	7.9	163	0.332	5.3	0.823	12	187	0.242
2998.3	1.6	21	1.3	9.9	234	1.3	23	2.3	15	268	0.970
2999.2	1.7	27	0.870	7.3	444	1.2	24	1.6	11	508	0.886
3000.1	0.959	16	0.225	8.7	234	0.418	14	0.410	13	267	0.305
3001.0	1.2	19	0.317	6.2	205	0.117	17	0.578	9.4	234	0.086
3002.0	0.868	31	0.598	8.0	316	0.415	13	1.1	12	361	0.302
3002.9	1.0	14	0.255	8.1	203	0.325	14	0.464	12	232	0.237
3003.8	0.681	12	0.507	4.9	149	0.830	9.8	0.924	7.5	171	0.606
3004.7	1.6	20	0.327	7.5	251	0.700	23	0.596	12	287	0.511
3005.7	0.886	17	0.366	9.5	341	0.649	13	0.668	15	390	0.473
3006.6	0.395	7.2	0.183	3.3	103	0.231	5.7	0.335	5.1	118	0.168
3007.5	1.1	20	0.446	6.9	267	0.873	16	0.813	11	305	0.637
3008.4	1.0	26	0.415	4.2	274	1.6	14	0.756	6.5	314	1.2
3009.4	1.2	13	0.183	6.3	193	0.866	17	0.335	9.7	221	0.632
3010.3	1.3	20	1.0	6.7	270	0.324	19	1.9	10	309	0.236
3011.2	1.0	24	0.183	5.9	295	0.741	15	0.335	9.0	337	0.541
3012.1	0.228	14	0.464	9.5	230	0.982	3.3	0.845	14	263	0.717
3013.0	0.608	14	0.820	5.4	231	0.544	8.8	1.5	8.3	264	0.397
3014.0	0.928	14	0.183	5.6	253	0.443	13	0.335	8.5	289	0.323
3014.9	0.228	14	0.501	6.2	306	0.704	3.3	0.914	9.6	350	0.514
3015.8	0.994	10	0.388	5.7	192	0.672	14	0.707	8.7	220	0.490
3016.7	0.971	18	0.262	3.3	293	0.280	14	0.478	5.1	335	0.204
3017.7	0.421	21	0.394	6.7	447	0.642	6.1	0.719	10	511	0.469
3018.6	0.465	8.8	0.229	3.6	136	0.825	6.7	0.417	5.5	156	0.602
3019.5	0.550	14	1.1	5.6	255	1.3	7.9	1.9	8.7	291	0.939
3020.4	0.762	28	0.381	6.9	409	0.021	11	0.695	11	468	0.015
3021.4	0.492	11	0.251	4.0	155	0.388	7.1	0.458	6.1	177	0.283
3022.3	0.763	14	0.183	2.6	214	0.612	11	0.335	4.0	245	0.447
3023.2	0.969	20	0.286	3.5	342	0.620	14	0.522	5.3	391	0.452
3024.1	0.700	14	0.183	4.3	296	0.997	10	0.335	6.7	339	0.727
3025.1	0.347	7.5	0.373	2.1	119	0.547	5.0	0.680	3.2	137	0.399
3026.0	1.7	22	0.425	2.5	363	0.600	24	0.775	3.8	415	0.438
3026.9	0.577	17	0.183	1.5	400	0.386	8.3	0.335	2.2	457	0.281
3027.8	0.228	4.6	0.243	1.8	89	0.513	3.3	0.443	2.7	101	0.374
3028.8	0.228	16	0.413	1.6	362	1.6	3.3	0.753	2.4	414	1.1
3029.7	1.1	34	0.679	2.0	460	0.021	17	1.2	3.0	526	0.015
3030.6	0.664	8.0	0.418	3.5	132	0.388	9.6	0.762	5.4	151	0.283
3031.5	1.9	14	0.470	3.0	225	0.996	27	0.857	4.6	257	0.726
3032.5	1.2	36	0.228	1.8	574	0.332	17	0.416	2.7	656	0.242
3033.4	0.829	17	0.183	1.5	261	0.820	12	0.335	2.2	298	0.598
3034.3	0.515	11	0.183	1.7	198	1.1	7.4	0.335	2.6	226	0.780
3035.2	0.828	33	0.433	3.3	505	0.365	12	0.790	5.0	578	0.266
3036.2	0.886	12	0.506	2.5	330	0.567	13	0.922	3.8	377	0.413
3037.1	0.353	6.1	0.183	1.5	104	0.561	5.1	0.335	2.2	119	0.409
3038.0	2.2	19	0.253	2.0	315	0.630	32	0.461	3.1	360	0.460
3038.9	0.462	24	0.183	2.4	524	1.4	6.7	0.335	3.7	599	1.0
3039.8	0.235	7.4	0.291	1.5	129	1.1	3.4	0.530	2.2	148	0.773
3040.8	1.6	17	0.413	1.7	325	0.705	23	0.753	2.6	372	0.514
3041.7	1.0	31	0.183	1.5	622	0.487	15	0.335	2.4	712	0.355
3042.6	0.274	7.5	0.183	1.8	126	0.021	4.0	0.335	2.7	144	0.015
3043.5	0.847	10	0.295	1.5	178	1.0	12	0.537	2.3	203	0.754
3044.5	1.0	25	0.183	1.5	423	0.544	15	0.335	2.2	484	0.397
3045.4	0.871	11	0.204	2.8	221	1.2	13	0.372	4.3	253	0.842
3046.3	0.620	7.0	0.183	1.5	125	1.6	8.9	0.335	2.2	142	1.2
3047.2	2.0	13	0.426	1.5	257	0.601	29	0.776	2.2	294	0.439
3048.2	1.3	17	0.238	1.5	388	1.0	18	0.434	2.2	444	0.763
3049.1	0.527	7.2	0.183	1.9	129	0.562	7.6	0.335	2.9	147	0.410
3050.0	1.9	17	0.504	1.9	247	0.892	27	0.919	2.9	283	0.651
3050.9	1.5	25	0.183	2.7	322	0.769	22	0.335	4.1	369	0.561
3051.9	0.874	10	0.183	1.5	164	0.381	13	0.335	2.2	188	0.278
3052.8	0.328	11	0.289	3.3	247	1.1	4.7	0.527	5.1	283	0.803
3053.7	0.839	15	0.266	1.5	279	1.3	12	0.484	2.2	319	0.974
3054.6	0.692	9.3	0.286	2.5	199	0.712	10.0	0.522	3.8	227	0.519
3055.6	0.987	12	0.430	2.0	175	0.813	14	0.785	3.1	200	0.593
3056.5	1.8	15	0.622	1.7	293	0.650	26	1.1	2.6	335	0.474
3057.4	0.288	18	0.220	4.5	292	0.826	4.2	0.401	6.9	334	0.603
3058.3	0.300	12	0.265	2.2	190	1.3	4.3	0.483	3.4	217	0.948
3059.3	0.717	15	0.572	2.5	252	0.641	10	1.0	3.8	288	0.468
3060.2	0.659	19	0.345	1.5	309	1.5	9.5	0.629	2.2	354	1.1
3061.1	0.346	11	0.687	3.6	184	0.635	5.0	1.3	5.5	210	0.464
3062.0	1.2	16	0.603	3.8	228	0.702	17	1.1	5.8	261	0.512
3063.0	0.836	18	0.609	4.2	317	1.5	12	1.1	6.5	362	1.1
3063.9	0.228	13	0.443	2.5	214	0.803	3.3	0.807	3.8	244	0.586
3064.8	0.669	13	1.0	3.5	191	0.593	9.7	1.9	5.3	219	0.433
3065.7	0.805	17	0.613	3.7	419	0.280	12	1.1	5.6	479	0.205
3066.6	0.313	13	0.559	3.5	224	0.702	4.5	1.0	5.4	256	0.512
3067.6	0.504	11	0.458	2.4	227	1.0	7.3	0.834	3.6	260	0.745
3068.5	1.6	17	1.4	3.8	261	0.561	23	2.5	5.8	298	0.409



Minnow Environmental  
Sample ID: 009

Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
3069.4	0.577	17	0.810	2.9	282	0.385	8.3	1.5	4.4	323	0.281
3070.3	0.336	7.3	0.449	2.9	135	0.535	4.9	0.819	4.4	154	0.390
3071.3	0.530	15	1.8	3.8	273	1.1	7.6	3.2	5.9	312	0.803
3072.2	0.316	19	0.687	2.8	346	0.603	4.6	1.3	4.3	396	0.440
3073.1	0.738	15	0.786	4.1	206	0.918	11	1.4	6.3	236	0.670
3074.0	0.520	16	0.877	3.0	275	0.312	7.5	1.6	4.6	315	0.228
3075.0	0.381	18	0.959	4.5	274	0.567	5.5	1.7	6.9	314	0.413
3075.9	0.228	17	0.537	3.1	238	0.021	3.3	0.979	4.7	272	0.015
3076.8	0.627	12	0.750	3.0	197	0.443	9.1	1.4	4.6	226	0.323
3077.7	1.1	15	0.775	3.8	297	0.926	15	1.4	5.8	340	0.676
3078.7	0.447	12	0.988	4.9	286	0.545	6.5	1.8	7.6	327	0.397
3079.6	0.490	8.9	0.741	4.6	190	0.438	7.1	1.4	7.1	218	0.320
3080.5	0.883	17	1.2	4.5	252	1.6	13	2.2	6.8	289	1.1
3081.4	0.589	18	0.697	3.1	290	0.394	8.5	1.3	4.7	332	0.287
3082.4	0.701	12	0.381	2.9	222	0.370	10	0.696	4.5	253	0.270
3083.3	0.394	17	0.702	4.1	259	0.734	5.7	1.3	6.3	296	0.535
3084.2	0.467	17	0.507	1.8	251	0.568	6.7	0.925	2.8	287	0.415
3085.1	0.323	12	0.370	6.0	260	0.480	4.7	0.674	9.3	297	0.350
3086.1	0.672	15	0.648	4.4	207	0.865	9.7	1.2	6.7	237	0.631
3087.0	1.0	15	0.508	2.3	247	0.373	14	0.926	3.6	283	0.272
3087.9	0.742	16	0.248	2.9	205	0.234	11	0.453	4.5	235	0.171
3088.8	0.878	11	0.709	4.3	233	0.419	13	1.3	6.6	267	0.306
3089.8	0.522	19	0.333	6.1	328	0.021	7.5	0.607	9.4	375	0.015
3090.7	0.652	20	0.213	2.3	304	0.929	9.4	0.389	3.5	348	0.678
3091.6	0.552	14	0.362	4.1	186	0.326	8.0	0.661	6.3	213	0.238
3092.5	0.889	15	0.333	2.7	257	0.857	13	0.607	4.1	294	0.625
3093.4	0.296	18	0.226	2.3	298	0.135	4.3	0.412	3.6	341	0.099
3094.4	0.483	12	0.465	2.0	194	0.432	7.0	0.848	3.1	222	0.315
3095.3	0.559	14	0.556	2.6	224	0.889	8.1	1.0	4.0	256	0.648
3096.2	0.642	23	0.583	2.9	284	0.720	9.3	1.1	4.4	325	0.525
3097.1	0.521	15	0.241	3.5	198	0.307	7.5	0.439	5.4	226	0.224
3098.1	0.351	11	0.390	4.0	156	0.362	5.1	0.712	6.2	179	0.264
3099.0	0.475	18	0.622	1.5	296	0.578	6.9	1.1	2.2	338	0.422
3099.9	0.694	18	0.455	3.5	493	0.826	10	0.830	5.4	564	0.602
3100.8	0.432	8.8	0.272	3.5	139	0.460	6.2	0.497	5.3	159	0.336
3101.8	0.943	28	1.0	1.9	232	0.272	14	1.8	3.0	266	0.198
3102.7	0.310	27	0.201	2.6	389	0.742	4.5	0.366	4.0	444	0.542
3103.6	0.688	15	0.251	3.0	187	0.130	9.9	0.458	4.6	213	0.095
3104.5	0.530	15	0.286	2.7	235	0.408	7.7	0.522	4.2	269	0.298
3105.5	1.0	25	0.185	2.4	336	0.269	15	0.338	3.7	385	0.197
3106.4	0.464	13	0.243	2.1	180	0.521	6.7	0.443	3.2	205	0.380
3107.3	1.2	25	0.383	3.8	234	0.743	17	0.699	5.9	268	0.542
3108.2	1.2	24	0.231	2.0	272	0.335	17	0.421	3.1	311	0.245
3109.2	0.228	15	0.257	1.5	214	0.696	3.3	0.468	2.3	245	0.508
3110.1	0.965	15	0.183	5.1	258	0.774	14	0.335	7.8	294	0.565
3111.0	1.4	20	0.293	2.8	289	0.500	20	0.534	4.3	330	0.365
3111.9	0.453	19	0.183	2.7	209	0.230	6.5	0.335	4.2	239	0.168
3112.9	0.738	14	0.209	1.5	239	0.654	11	0.381	2.2	274	0.477
3113.8	1.2	21	0.366	4.1	223	0.385	17	0.667	6.3	255	0.281
3114.7	0.922	28	0.212	2.6	230	0.459	13	0.387	3.9	263	0.335
3115.6	0.228	14	0.241	1.8	236	0.344	3.3	0.440	2.7	270	0.251
3116.6	0.429	13	0.531	2.3	178	0.768	6.2	0.969	3.5	203	0.560
3117.5	1.5	26	0.514	2.4	279	0.378	22	0.937	3.6	319	0.276
3118.4	0.503	15	0.401	4.1	254	0.677	7.3	0.732	6.3	290	0.494
3119.3	0.228	14	0.183	1.9	168	1.2	3.3	0.335	2.9	192	0.870
3120.2	2.3	20	0.326	1.5	334	0.699	33	0.595	2.3	382	0.510
3121.2	0.966	23	0.183	2.3	320	0.725	14	0.335	3.5	365	0.529
3122.1	1.3	16	0.232	4.1	193	0.247	19	0.423	6.3	221	0.181
3123.0	0.878	19	0.401	3.8	269	0.778	13	0.732	5.9	307	0.568
3123.9	0.527	31	0.385	2.7	293	0.268	7.6	0.701	4.2	335	0.195
3124.9	0.616	12	0.285	2.1	205	0.610	8.9	0.519	3.3	235	0.445
3125.8	1.2	15	0.359	1.9	242	0.121	17	0.655	3.0	276	0.089
3126.7	1.3	23	0.485	2.6	346	1.0	18	0.885	3.9	396	0.750
3127.6	0.675	16	0.183	2.8	238	0.668	9.7	0.335	4.3	272	0.488
3128.6	0.580	14	0.183	2.8	193	0.574	8.4	0.335	4.3	221	0.419
3129.5	0.468	16	0.312	1.5	362	1.1	6.8	0.570	2.2	414	0.799
3130.4	0.398	20	0.284	2.7	518	0.608	5.7	0.518	4.1	593	0.444
3131.3	0.485	8.7	0.183	2.1	121	0.393	7.0	0.335	3.3	139	0.286
3132.3	0.576	22	0.348	1.9	294	0.895	8.3	0.634	3.0	337	0.653
3133.2	0.494	31	0.183	3.2	655	0.601	7.1	0.335	4.9	749	0.439
3134.1	0.352	5.5	0.281	2.0	116	0.554	5.1	0.512	3.1	133	0.404
3135.0	3.1	19	0.622	2.5	289	0.697	44	1.1	3.8	330	0.509
3136.0	1.2	32	0.270	3.8	334	1.0	17	0.492	5.8	382	0.750
3136.9	0.798	11	0.295	2.2	219	0.278	12	0.539	3.3	250	0.203
3137.8	0.855	11	0.183	2.7	221	0.824	12	0.335	4.2	252	0.601
3138.7	0.409	16	0.217	2.5	500	0.582	5.9	0.395	3.9	572	0.425
3139.7	0.879	14	0.183	1.5	271	0.848	13	0.335	2.2	310	0.618
3140.6	0.430	9.4	0.183	2.6	191	1.2	6.2	0.335	4.0	219	0.850
3141.5	1.0	19	0.183	2.3	262	0.134	15	0.335	3.5	299	0.098
3142.4	0.546	18	0.364	1.8	382	0.135	7.9	0.664	2.8	437	0.098
3143.3	0.907	9.8	0.525	2.9	211	2.3	13	0.958	4.4	241	1.7



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
3144.3	1.2	15	0.183	2.2	324	0.786	17	0.335	3.4	370	0.574
3145.2	0.748	31	0.183	3.5	479	0.141	11	0.335	5.3	548	0.103
3146.1	0.367	6.3	0.183	1.5	134	0.579	5.3	0.335	2.2	153	0.422
3147.0	0.582	8.9	0.190	1.5	180	0.724	8.4	0.347	2.2	206	0.528
3148.0	0.576	26	0.183	1.5	340	1.2	8.3	0.335	2.2	389	0.902
3148.9	0.566	11	0.234	1.5	264	0.635	8.2	0.427	2.2	302	0.463
3149.8	0.623	6.1	0.183	1.5	104	0.508	9.0	0.335	2.3	119	0.371
3150.7	2.7	20	0.388	1.5	407	1.0	39	0.708	2.2	466	0.730
3151.7	0.695	16	0.211	1.7	466	0.779	10	0.385	2.5	532	0.569
3152.6	0.478	7.0	0.183	2.1	136	0.338	6.9	0.335	3.2	156	0.246
3153.5	1.1	17	0.183	2.4	302	0.547	17	0.335	3.6	345	0.399
3154.4	0.228	25	0.183	1.5	558	0.984	3.3	0.335	2.2	638	0.718
3155.4	0.696	6.2	0.224	1.5	126	0.171	10	0.409	2.2	144	0.125
3156.3	0.340	8.2	0.202	1.5	186	1.3	4.9	0.369	2.2	213	0.929
3157.2	1.1	26	0.295	1.5	339	0.961	16	0.538	2.2	387	0.701
3158.1	0.460	6.0	0.183	1.5	221	0.474	6.6	0.335	2.2	253	0.346
3159.1	0.500	7.3	0.183	1.7	166	1.9	7.2	0.335	2.7	190	1.4
3160.0	1.1	22	0.183	1.5	278	0.589	16	0.335	2.2	318	0.430
3160.9	0.634	11	0.302	1.9	278	0.654	9.1	0.551	3.0	318	0.477
3161.8	0.906	11	0.310	1.7	207	1.7	13	0.565	2.6	236	1.3
3162.8	0.772	13	0.319	2.6	311	0.595	11	0.582	4.0	356	0.434
3163.7	0.450	13	0.183	1.5	318	0.160	6.5	0.335	2.2	364	0.117
3164.6	0.607	7.7	0.183	1.5	170	0.880	8.8	0.335	2.2	194	0.642
3165.5	1.4	15	1.7	1.7	236	0.996	20	3.1	2.6	270	0.726
3166.5	1.5	21	0.703	1.5	437	0.774	22	1.3	2.2	500	0.565
3167.4	0.812	15	0.183	1.5	190	0.520	12	0.335	2.2	218	0.379
3168.3	1.5	12	0.345	1.5	351	1.7	22	0.630	2.2	402	1.2
3169.2	0.228	13	0.705	1.5	276	0.588	3.3	1.3	2.2	315	0.429
3170.1	0.228	15	0.303	2.0	241	0.518	3.3	0.553	3.0	276	0.378
3171.1	0.228	13	0.279	1.5	220	1.2	3.3	0.508	2.2	251	0.876
3172.0	0.228	16	0.500	1.5	274	0.418	3.3	0.912	2.2	314	0.305
3172.9	0.868	14	0.588	1.8	230	0.466	13	1.1	2.7	264	0.340
3173.8	0.600	14	0.314	2.7	245	0.537	8.7	0.573	4.1	280	0.392
3174.8	0.747	18	0.183	2.0	263	0.394	11	0.335	3.1	301	0.287
3175.7	0.785	20	0.359	2.0	300	0.695	11	0.654	3.0	343	0.507
3176.6	1.1	12	0.390	1.9	240	0.635	16	0.711	3.0	275	0.463
3177.5	1.0	16	0.183	3.1	271	0.442	15	0.335	4.8	310	0.323
3178.5	0.463	20	0.433	2.5	314	0.420	6.7	0.790	3.8	359	0.307
3179.4	0.445	16	0.325	1.5	240	0.692	6.4	0.593	2.2	274	0.505
3180.3	0.762	14	0.345	2.0	241	1.2	11	0.630	3.1	276	0.897
3181.2	0.337	17	0.324	1.5	243	0.247	4.9	0.591	2.2	278	0.180
3182.2	0.228	12	0.473	1.8	219	0.244	3.3	0.862	2.7	250	0.178
3183.1	0.959	17	0.294	2.1	251	0.560	14	0.535	3.3	288	0.409
3184.0	0.624	17	0.183	1.5	280	0.417	9.0	0.335	2.3	320	0.304
3184.9	0.834	17	0.183	1.7	306	0.804	12	0.335	2.7	350	0.587
3185.9	0.786	18	0.183	1.9	233	0.757	11	0.335	2.9	267	0.553
3186.8	0.285	16	0.218	1.5	241	0.021	4.1	0.397	2.2	276	0.015
3187.7	0.228	18	0.340	1.7	284	0.126	3.3	0.620	2.6	324	0.092
3188.6	0.405	16	0.183	1.5	268	0.868	5.8	0.335	2.2	306	0.633
3189.6	0.379	19	0.329	1.5	259	0.991	5.5	0.600	2.2	296	0.723
3190.5	0.692	20	0.347	1.5	274	0.241	10.0	0.632	2.2	313	0.176
3191.4	0.650	17	0.183	2.4	222	0.123	9.4	0.335	3.7	254	0.090
3192.3	0.730	16	0.397	1.5	300	0.385	11	0.724	2.2	343	0.281
3193.3	0.661	20	0.382	1.5	293	0.741	9.5	0.697	2.2	335	0.541
3194.2	0.514	16	0.183	1.6	253	0.396	7.4	0.335	2.4	290	0.289
3195.1	0.858	13	0.412	1.9	250	0.344	12	0.751	2.9	286	0.251
3196.0	0.324	18	0.282	1.5	251	0.848	4.7	0.514	2.2	287	0.619
3196.9	0.465	19	0.366	1.5	277	0.710	6.7	0.668	2.2	317	0.518
3197.9	0.870	16	0.183	1.5	234	0.021	13	0.335	2.2	267	0.015
3198.8	1.2	17	0.251	1.9	270	1.1	17	0.457	2.9	309	0.798
3199.7	0.340	14	0.183	1.5	274	0.505	4.9	0.335	2.3	314	0.369
3200.6	0.422	15	0.183	2.6	253	1.0	6.1	0.335	3.9	289	0.755
3201.6	0.698	19	0.183	1.5	252	0.691	10	0.335	2.2	288	0.504
3202.5	1.0	14	0.503	1.5	278	1.1	15	0.918	2.2	318	0.829
3203.4	0.796	15	0.183	1.5	248	0.122	11	0.335	2.2	283	0.089
3204.3	0.402	9.7	0.183	1.5	189	1.2	5.8	0.335	2.2	217	0.862
3205.3	0.675	15	0.183	1.5	250	0.356	9.7	0.335	2.2	286	0.260
3206.2	0.470	18	0.229	1.5	357	0.427	6.8	0.418	2.3	408	0.312
3207.1	1.0	15	0.353	1.5	244	1.0	14	0.644	2.2	280	0.733
3208.0	1.1	15	0.418	1.5	254	0.376	16	0.763	2.2	291	0.274
3209.0	0.265	26	0.233	1.5	268	0.505	3.8	0.425	2.3	306	0.368
3209.9	0.421	12	0.183	2.5	220	1.4	6.1	0.335	3.9	251	1.0
3210.8	0.296	11	0.183	1.5	159	0.228	4.3	0.335	2.2	182	0.166
3211.7	1.6	19	0.217	1.6	339	0.816	24	0.396	2.4	388	0.595
3212.7	1.3	17	0.183	1.8	291	0.684	19	0.335	2.7	333	0.499
3213.6	0.558	7.7	0.214	1.5	130	0.630	8.1	0.390	2.2	149	0.460
3214.5	1.9	19	0.302	1.5	328	0.820	27	0.551	2.2	375	0.598
3215.4	1.2	26	0.183	1.6	433	1.1	17	0.335	2.5	496	0.774
3216.4	0.669	12	0.198	1.8	174	0.428	9.7	0.361	2.7	199	0.312
3217.3	1.7	17	0.423	1.5	315	0.654	25	0.772	2.2	361	0.477
3218.2	0.608	22	0.213	1.5	436	1.3	8.8	0.388	2.2	498	0.922



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
3219.1	0.619	8.7	0.301	1.5	169	0.178	8.9	0.549	2.3	194	0.130
3220.0	0.823	11	0.215	1.5	181	1.1	12	0.392	2.2	207	0.830
3221.0	0.391	23	0.519	1.5	292	0.286	5.6	0.946	2.2	334	0.209
3221.9	1.1	16	0.235	1.6	364	0.438	16	0.429	2.4	417	0.320
3222.8	0.807	13	0.494	1.5	184	0.764	12	0.901	2.2	211	0.557
3223.7	2.3	21	0.390	2.0	273	0.756	33	0.712	3.0	313	0.552
3224.7	0.852	20	0.183	2.8	332	0.750	12	0.335	4.3	380	0.548
3225.6	0.228	8.2	0.235	1.8	150	0.460	3.3	0.428	2.7	172	0.335
3226.5	1.6	18	0.678	2.0	304	0.470	24	1.2	3.1	348	0.343
3227.4	0.416	36	0.210	1.5	403	0.148	6.0	0.382	2.2	461	0.108
3228.4	0.439	10	0.459	1.5	165	0.338	6.3	0.838	2.2	189	0.246
3229.3	1.0	11	0.590	1.5	220	0.687	15	1.1	2.2	252	0.501
3230.2	1.2	20	0.183	1.5	528	0.787	17	0.335	2.3	603	0.574
3231.1	1.2	13	0.448	2.1	257	0.949	17	0.817	3.2	294	0.692
3232.1	0.438	11	0.183	1.5	153	0.789	6.3	0.335	2.2	174	0.576
3233.0	1.2	18	0.453	1.5	268	0.738	17	0.826	2.2	306	0.538
3233.9	0.752	13	0.399	1.5	257	0.846	11	0.729	2.2	293	0.618
3234.8	0.228	8.9	0.203	1.5	150	0.700	3.3	0.371	2.2	172	0.511
3235.8	1.8	18	0.710	1.5	314	0.659	26	1.3	2.2	359	0.481
3236.7	1.2	17	0.358	1.5	308	0.767	18	0.653	2.2	353	0.560
3237.6	0.558	8.2	0.183	1.5	171	0.217	8.0	0.335	2.2	196	0.158
3238.5	1.2	13	0.290	1.5	265	1.4	17	0.528	2.2	303	1.0
3239.5	0.675	19	0.183	2.7	300	0.604	9.7	0.335	4.1	343	0.441
3240.4	1.2	12	0.183	1.5	224	0.933	18	0.335	2.2	256	0.681
3241.3	0.850	13	0.388	1.5	270	0.448	12	0.708	2.2	309	0.327
3242.2	0.862	16	0.424	6.1	240	0.831	12	0.774	9.4	275	0.606
3243.2	0.598	13	0.378	1.5	271	0.670	8.6	0.690	2.2	309	0.489
3244.1	0.830	15	0.373	1.5	208	0.730	12	0.680	2.2	237	0.533
3245.0	0.722	17	0.183	2.3	247	0.281	10	0.335	3.6	283	0.205
3245.9	0.397	17	0.183	1.6	260	0.021	5.7	0.335	2.4	298	0.015
3246.8	0.493	13	0.360	1.5	235	1.0	7.1	0.657	2.2	269	0.748
3247.8	1.2	14	0.253	1.5	277	0.824	17	0.461	2.2	316	0.601
3248.7	1.4	23	0.266	1.6	336	1.2	20	0.485	2.5	384	0.839
3249.6	0.593	14	0.245	1.5	204	7.8	8.6	0.448	2.2	233	5.7
3250.5	0.991	18	0.410	1.5	276	0.579	14	0.748	2.2	315	0.423
3251.5	0.611	18	0.252	1.5	243	0.823	8.8	0.460	2.2	278	0.601
3252.4	0.450	16	0.489	1.5	247	0.548	6.5	0.891	2.2	283	0.400
3253.3	0.628	15	0.290	1.5	233	0.496	9.1	0.529	2.2	266	0.362
3254.2	0.710	18	0.638	1.5	311	0.561	10	1.2	2.3	355	0.409
3255.2	0.581	17	0.183	2.4	237	0.784	8.4	0.335	3.7	271	0.572
3256.1	0.228	19	0.235	1.5	226	1.3	3.3	0.428	2.2	258	0.934
3257.0	0.571	19	0.929	1.5	260	0.908	8.2	1.7	2.2	297	0.663
3257.9	0.663	36	0.352	2.2	218	0.639	9.6	0.643	3.4	249	0.466
3258.9	0.882	30	0.889	2.5	252	1.3	13	1.6	3.8	288	0.960
3259.8	1.2	32	0.725	3.4	242	0.687	17	1.3	5.2	277	0.501
3260.7	0.601	29	1.3	4.4	257	0.947	8.7	2.3	6.8	293	0.691
3261.6	1.4	36	1.1	6.7	263	0.875	20	1.9	10	300	0.638
3262.6	1.1	41	1.4	5.6	244	0.660	15	2.6	8.5	279	0.482
3263.5	1.0	42	1.5	3.4	235	1.3	15	2.7	5.3	269	0.915
3264.4	0.841	46	1.7	6.0	224	1.8	12	3.2	9.2	256	1.3
3265.3	0.884	57	2.0	7.3	272	2.0	13	3.6	11	311	1.5
3266.3	0.843	46	1.4	4.2	203	1.2	12	2.6	6.4	233	0.876
3267.2	1.1	42	1.4	3.5	228	1.6	15	2.5	5.3	261	1.1
3268.1	1.2	42	1.8	4.6	228	2.0	18	3.2	7.0	261	1.4
3269.0	0.914	48	1.7	6.8	217	1.0	13	3.2	10	248	0.751
3269.9	0.935	71	2.6	12	218	1.5	13	4.8	19	249	1.1
3270.9	1.3	44	2.3	9.4	178	1.2	18	4.1	14	204	0.881
3271.8	0.293	60	2.1	13	226	0.975	4.2	3.8	20	258	0.712
3272.7	0.730	50	2.4	8.6	285	1.3	11	4.4	13	325	0.977
3273.6	2.2	69	3.0	13	267	0.715	32	5.5	20	306	0.522
3274.6	1.8	74	5.5	14	232	2.1	25	10.0	22	265	1.5
3275.5	0.732	62	2.9	16	259	2.2	11	5.2	24	296	1.6
3276.4	0.870	69	5.4	20	243	2.1	13	9.9	31	278	1.6
3277.3	1.0	82	4.2	26	192	1.3	15	7.6	41	220	0.952
3278.3	2.0	84	7.2	21	273	4.6	29	13	33	312	3.3
3279.2	1.9	103	6.2	26	277	3.4	27	11	40	317	2.5
3280.1	1.7	96	4.6	27	178	3.0	24	8.4	41	204	2.2
3281.0	1.5	134	10	37	260	3.7	22	18	57	297	2.7
3282.0	1.1	134	8.3	51	343	3.7	16	15	79	392	2.7
3282.9	0.228	114	14	48	189	1.7	3.3	26	74	216	1.3
3283.8	0.228	172	18	53	267	7.9	3.3	33	81	306	5.8
3284.7	1.1	148	15	66	269	5.1	16	28	100	308	3.7
3285.7	0.228	170	13	117	201	2.0	3.3	24	179	230	1.5
3286.6	1.6	190	21	117	207	4.4	24	38	180	236	3.2
3287.5	2.5	250	22	160	377	5.0	36	41	245	431	3.6
3288.4	0.228	294	29	195	348	1.9	3.3	53	300	398	1.4
3289.4	0.581	237	30	150	191	7.3	8.4	54	230	218	5.4
3290.3	4.3	413	42	203	301	8.5	62	77	311	344	6.2
3291.2	0.926	434	41	304	325	2.8	13	75	466	372	2.0
3292.1	12	416	40	654	1305	9.3	175	74	1003	1492	6.8
3293.1	0.228	437	61	314	318	3.6	3.3	111	481	364	2.6



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.228	0.272	0.183	1.5	0.494	0.021					
Length (µm)											
3294.0	3.6	479	35	342	268	0.021	53	64	524	307	0.015
3294.9	6.3	489	63	302	291	8.2	90	115	462	332	6.0
3295.8	9.0	442	38	305	261	8.4	129	70	467	299	6.1
3296.7	15	304	26	190	174	2.5	214	48	291	199	1.8
3297.7	0.228	759	51	404	623	11	3.3	94	620	713	8.0
3298.6	1.6	591	58	347	1159	4.9	23	107	531	1326	3.6
3299.5	13	638	55	436	236	0.021	188	101	669	269	0.015
3300.4	6.4	586	50	396	189	13	93	91	606	216	9.3
3301.4	10	366	58	364	221	89	149	106	558	253	65
3302.3	1.7	652	40	410	291	0.021	24	73	629	332	0.015
3303.2	0.228	319	39	224	174	12	3.3	71	343	199	8.5
3304.1	11	526	62	290	236	16	160	112	445	270	11
3305.1	7.3	314	35	330	121	0.021	105	63	505	138	0.015
3306.0	0.228	602	71	583	305	0.021	3.3	130	893	349	0.015
3306.9	10	204	29	164	96	2.5	145	53	251	110	1.8
3307.8	4.0	439	37	274	185	13	57	67	420	212	9.5
3308.8	26	720	74	592	302	7.7	381	135	908	346	5.6
3309.7	8.3	780	79	681	305	0.021	120	145	1044	348	0.015
3310.6	2.8	694	69	1019	250	0.021	41	126	1561	286	0.015
3311.5	13	326	36	472	343	3.8	186	66	723	392	2.7
3312.5	0.228	545	340	716	158	0.021	3.3	621	1098	180	0.015
3313.4	3.9	180	18	211	58	2.5	56	33	323	66	1.8
3314.3	8.0	229	18	336	84	3.7	116	34	516	96	2.7
3315.2	0.228	838	74	744	328	0.021	3.3	134	1140	375	0.015
3316.2	0.228	780	66	864	286	0.021	3.3	120	1325	326	0.015
3317.1	17	430	43	488	136	16	248	79	748	155	12
3318.0	9.6	420	34	208	269	0.021	138	62	319	308	0.015
3318.9	0.228	888	120	1043	407	14	3.3	219	1598	465	9.9
3319.9	4.3	813	207	947	216	0.021	62	378	1451	247	0.015
3320.8	0.228	1009	89	1074	777	13	3.3	163	1646	889	9.6
3321.7	0.228	809	120	686	236	12	3.3	219	1051	270	9.1
3322.6	26	988	117	1337	284	0.021	376	214	2049	324	0.015
3323.5	15	1120	119	953	298	0.021	223	217	1461	341	0.015
3324.5	5.8	1348	164	1414	239	73	84	300	2167	273	53
3325.4	49	940	60	2286	239	17	703	110	3503	274	13
3326.3	18	1095	144	1743	243	19	261	263	2671	278	14
3327.2	0.228	1009	131	1037	346	91	3.3	240	1590	396	66
3328.2	16	812	109	1319	240	34	228	199	2021	274	25
3329.1	6.6	1117	151	2232	364	20	95	275	3421	416	15
3330.0	0.228	163	25	244	30	2.7	3.3	46	374	34	2.0
3330.9	0.228	1822	177	72234	467	24	3.3	322	110698	534	18
3331.9	40	1631	179	21675	247	52	576	327	33217	282	38
3332.8	23	1285	108	9172	267	49	329	197	14057	306	36
3333.7	40	924	72	950	754	0.021	584	132	1455	863	0.015
3334.6	0.228	1573	80	3268	248	0.021	3.3	147	5008	284	0.015
3335.6	3.5	164	23	370	33	0.021	50	42	566	38	0.015
3336.5	64	1285	168	4326	1313	29	919	306	6629	1502	21
3337.4	0.228	748	128	1616	106	23	3.3	234	2476	122	17
3338.3	0.228	997	156	3883	128	23	3.3	284	5951	147	17
3339.3	0.228	1386	205	7996	304	31	3.3	375	12254	348	23
3340.2	24	718	82	1006	119	32	352	149	1542	136	23
3341.1	134	1467	176	2052	99	39	1934	320	3145	113	28
3342.0	9.7	845	139	2070	194	0.021	139	253	3172	222	0.015
3343.0	12	875	149	2447	147	0.021	168	272	3749	168	0.015
3343.9	3.7	468	87	799	78	23	53	159	1225	89	17
3344.8	68	2123	229	3447	2347	0.021	984	417	5283	2684	0.015
3345.7	0.228	2987	283	5187	169	54	3.3	517	7948	193	39
3346.6	84	1857	233	3150	145	0.021	1217	424	4828	166	0.015
3347.6	131	3595	345	2774	225	60	1888	630	4251	257	44
3348.5	22	379	42	509	39	20	313	77	779	45	15
3349.4	216	2075	591	3238	2126	0.021	3123	1079	4962	2432	0.015
3350.3	131	2477	406	4367	1141	0.021	1884	740	6693	1305	0.015
3351.3	0.228	2312	451	4693	32	0.021	3.3	823	7192	36	0.015
3352.2	0.228	3129	436	4378	280	132	3.3	795	6710	320	96
3353.1	0.228	1994	601	3497	139	0.021	3.3	1096	5359	159	0.015
3354.0	95	3208	366	3558	154	0.021	1375	668	5453	176	0.015
3355.0	0.228	4357	255	6219	84	94	3.3	464	9530	96	69
3355.9	6.2	152	15	253	7.6	0.021	90	27	387	8.7	0.015
3356.8	119	3087	281	5164	114	0.021	1711	513	7913	130	0.015
3357.7	0.228	3675	238	4213	57	470	3.3	434	6457	65	343
3358.7	64	1625	11	1145	110	0.021	925	21	1754	126	0.015
3359.6	20	1542	140	1800	37	0.021	293	255	2758	42	0.015
3360.5	0.228	2935	1177	5462	176	0.021	3.3	2146	8371	201	0.015
3361.4	0.228	2822	1013	3750	103	60	3.3	1847	5747	118	44
3362.4	0.228	4674	567	7646	368	0.021	3.3	1035	11718	421	0.015
3363.3	0.228	3098	384	3649	65	43	3.3	700	5591	75	32
3364.2	407	7526	452	8225	28	101	5877	825	12604	32	73
3365.1	0.228	5009	354	5934	40	493	3.3	645	9094	46	359
3366.1	0.228	7207	3734	9041	72	81	3.3	6809	13856	82	59
3367.0	0.228	6701	593	9836	128	0.021	3.3	1082	15073	146	0.015
3367.9	300	10497	591	11876	0.494	107	4337	1077	18200	0.565	78



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Parameter DL (ppm) Length (µm)	7Li 0.228	24Mg 0.272	55Mn 0.183	66Zn 1.5	88Sr 0.494	137Ba 0.021	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
3368.8	84	5708	464	10740	0.494	181	1207	845	16459	0.565	132
3369.8	132	10474	1478	20141	0.494	0.021	1903	2696	30866	0.565	0.015
3370.7	37	20192	525	13881	121	0.021	527	957	21273	138	0.015
3371.6	0.228	6944	991	12821	87	261	3.3	1808	19648	99	190
3372.5	0.228	8655	1664	52389	29	104	3.3	3034	80286	33	76
3373.4	119	8523	498	24250	0.494	257	1715	908	37163	0.565	188
3374.4	55	10767	747	20462	7026	0.021	792	1362	31358	8035	0.015
3375.3	340	9345	676	13926	0.494	1045	4913	1232	21342	0.565	762
3376.2	0.228	728	63	1545	5.0	10	3.3	114	2367	5.7	7.6
3377.1	163	5222	449	9987	20	74	2352	819	15305	23	54
3378.1	271	12805	909	26118	0.494	0.021	3912	1658	40026	0.565	0.015
3379.0	61	13537	1584	22920	0.494	0.021	879	2889	35125	0.565	0.015
3379.9	0.228	13416	1027	28400	0.494	366	3.3	1873	43522	0.565	267
3380.8	15	995	75	1815	0.494	33	217	137	2782	0.565	24
3381.8	0.228	19547	1068	31138	0.494	287	3.3	1949	47719	0.565	209
3382.7	0.228	11392	1080	24720	0.494	0.021	3.3	1969	37884	0.565	0.015
3383.6	477	9538	415	19470	0.494	0.021	6883	756	29838	0.565	0.015
3384.5	0.228	16211	1166	13572	0.494	0.021	3.3	2126	20799	0.565	0.015
3385.5	177	11220	982	22519	0.494	0.021	2557	1790	34511	0.565	0.015
3386.4	22	3301	163	6506	5215	0.021	318	297	9970	5964	0.015
3387.3	0.228	14402	523	31532	0.494	239	3.3	954	48322	0.565	175
3388.2	0.228	14125	1121	33306	0.494	0.021	3.3	2044	51041	0.565	0.015
3389.2	0.228	40678	786	19746	0.494	197	3.3	1433	30260	0.565	144
3390.1	348	12611	884	155788	0.494	0.021	5026	1611	238746	0.565	0.015
3391.0	72	13497	920	24368	0.494	447	1035	1678	37344	0.565	326
3391.9	0.228	15109	1468	28241	0.494	279	3.3	2678	43279	0.565	203
3392.9	0.228	12367	659	37503	0.494	0.021	3.3	1202	57473	0.565	0.015
3393.8	380	25399	1388	33192	0.494	0.021	5485	2531	50867	0.565	0.015
3394.7	0.228	25841	1061	37625	0.494	0.021	3.3	1935	57660	0.565	0.015
3395.6	477	14244	587	27078	0.494	0.021	6887	1070	41497	0.565	0.015
3396.6	1389	16024	1302	44997	0.494	834	20057	2375	68959	0.565	609
3397.5	0.228	641	42	1151	0.494	0.021	3.3	77	1764	0.565	0.015
3398.4	0.228	7148	749	25651	0.494	0.021	3.3	1366	39311	0.565	0.015
3399.3	107	16445	873	27230	0.494	0.021	1542	1592	41730	0.565	0.015
3400.2	102	18458	917	29521	0.494	0.021	1479	1672	45241	0.565	0.015
3401.2	0.228	9184	1798	28343	0.494	703	3.3	3280	43436	0.565	513
3402.1	310	12270	715	23937	4109	0.021	4482	1303	36684	4699	0.015
3403.0	0.228	15773	837	28765	0.494	0.021	3.3	1527	44082	0.565	0.015
3403.9	67	9432	337	14986	0.494	0.021	960	614	22966	0.565	0.015
3404.9	5.8	970	47	1450	0.494	0.021	83	86	2222	0.565	0.015
3405.8	122	21319	1191	27149	0.494	0.021	1768	2172	41605	0.565	0.015
3406.7	745	17197	1648	28995	1104	0.021	10761	3005	44435	1262	0.015
3407.6	0.228	21055	1523	155239	0.494	0.021	3.3	2777	237904	0.565	0.015
3408.6	0.228	21645	807	50627	0.494	0.021	3.3	1472	77586	0.565	0.015
3409.5	221	4719	416	12017	0.494	290	3187	758	18417	0.565	211
3410.4	105	9989	936	19330	0.494	316	1510	1707	29624	0.565	231
3411.3	0.228	2558	179	10557	0.494	0.021	3.3	327	16179	0.565	0.015
3412.3	1123	13151	1490	48794	0.494	400	16216	2718	74777	0.565	292
3413.2	0.228	11275	1175	41040	0.494	295	3.3	2143	62893	0.565	215
3414.1	0.228	19094	795	224320	0.494	0.021	3.3	1449	343771	0.565	0.015
3415.0	152	19435	1125	43834	0.494	0.021	2197	2052	67176	0.565	0.015
3416.0	0.228	15318	630	39752	0.494	543	3.3	1148	60920	0.565	396
3416.9	1163	18947	1430	49773	0.494	0.021	16795	2609	76277	0.565	0.015
3417.8	197	23563	80	75615	0.494	596	2843	145	115880	0.565	435
3418.7	0.228	265	0.183	1111	245	0.021	3.3	0.335	1702	281	0.015
3419.7	0.228	22023	728	135921	0.494	1125	3.3	1327	208300	0.565	821
3420.6	0.228	8661	345	22158	0.494	0.021	3.3	629	33957	0.565	0.015
3421.5	0.228	3021	0.183	18284	0.494	0.021	3.3	0.335	28021	0.565	0.015
3422.4	853	4774	0.183	14768	0.494	0.021	12315	0.335	22632	0.565	0.015
3423.4	965	3447	399	8265	0.494	0.021	13928	727	12666	0.565	0.015
3424.3	0.228	19377	0.183	114149	19894	0.021	3.3	0.335	174934	22749	0.015



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
0.5	2.1	177	0.533	0.534	1033	6.8	30	0.972	0.818	1181	4.9
1.2	0.490	140	2.1	9.2	1052	0.007	7.1	3.7	14	1203	0.005
1.9	1.3	96	0.700	13	725	1.9	19	1.3	19	829	1.4
2.6	0.490	72	0.105	9.0	687	1.8	7.1	0.192	14	786	1.3
3.3	0.490	55	0.079	2.1	676	2.2	7.1	0.143	3.2	773	1.6
4.0	0.490	47	0.689	7.2	706	1.1	7.1	1.3	11	807	0.811
4.7	1.2	46	0.190	3.4	736	1.1	18	0.346	5.2	841	0.809
5.3	0.490	31	0.079	3.5	541	1.3	7.1	0.143	5.3	619	0.935
6.0	0.490	28	0.279	2.5	564	1.4	7.1	0.509	3.8	645	1.1
6.7	0.490	24	0.079	4.7	608	1.3	7.1	0.143	7.2	695	0.934
7.4	0.490	25	0.137	4.9	713	1.0	7.1	0.250	7.5	815	0.731
8.1	0.646	21	0.092	5.4	607	1.2	9.3	0.167	8.3	694	0.873
8.8	0.490	20	0.088	4.7	599	0.958	7.1	0.161	7.2	685	0.699
9.5	0.490	17	0.079	3.7	620	0.690	7.1	0.143	5.7	709	0.503
10.2	0.490	16	0.079	4.5	567	1.7	7.1	0.143	7.0	649	1.2
10.9	0.490	15	0.113	6.5	545	1.2	7.1	0.206	10.0	623	0.844
11.6	0.490	14	0.155	5.8	520	0.852	7.1	0.282	8.9	595	0.622
12.3	0.490	21	0.079	5.5	596	0.765	7.1	0.143	8.4	681	0.558
13.0	0.490	14	0.261	4.3	646	0.992	7.1	0.476	6.5	739	0.724
13.7	0.490	15	0.079	3.8	553	0.615	7.1	0.143	5.8	633	0.449
14.4	0.490	15	0.260	3.4	600	0.494	7.1	0.475	5.1	687	0.360
15.1	0.490	14	0.079	4.6	585	1.1	7.1	0.143	7.0	669	0.819
15.8	0.490	14	0.293	5.7	574	0.867	7.1	0.534	8.7	656	0.632
16.5	0.490	20	0.079	2.0	543	0.149	7.1	0.143	3.1	621	0.109
17.2	0.490	13	0.277	1.9	536	1.1	7.1	0.505	2.9	613	0.785
17.9	0.490	11	0.304	5.3	549	0.298	7.1	0.554	8.1	627	0.218
18.6	0.490	14	0.098	2.9	574	0.429	7.1	0.179	4.5	656	0.313
19.3	0.692	10	0.079	3.2	553	0.834	10.0	0.143	4.9	632	0.608
20.0	0.490	12	0.373	2.6	592	0.275	7.1	0.680	4.0	677	0.201
20.7	0.490	12	0.079	4.4	575	0.584	7.1	0.143	6.7	658	0.426
21.4	0.490	12	0.201	2.0	708	0.444	7.1	0.367	3.1	809	0.324
22.1	0.490	16	0.079	3.9	600	0.958	7.1	0.143	6.0	686	0.699
22.8	0.490	14	0.132	5.3	621	0.872	7.1	0.241	8.2	710	0.636
23.5	0.490	12	0.079	2.9	578	0.617	7.1	0.143	4.5	661	0.450
24.2	0.490	11	0.079	1.7	650	0.824	7.1	0.143	2.6	744	0.601
24.9	0.490	12	0.122	3.5	670	1.2	7.1	0.222	5.3	766	0.881
25.6	0.490	14	0.174	4.2	604	0.512	7.1	0.317	6.4	691	0.374
26.3	0.490	11	0.164	4.9	562	1.2	7.1	0.300	7.6	642	0.885
27.0	0.490	14	0.079	2.4	615	0.620	7.1	0.143	3.6	703	0.452
27.7	0.490	12	0.216	4.4	593	0.118	7.1	0.393	6.7	678	0.086
28.4	0.490	14	0.260	3.8	883	0.897	7.1	0.474	5.9	1010	0.655
29.1	0.490	14	0.079	1.8	635	1.1	7.1	0.143	2.8	726	0.815
29.8	0.490	12	0.109	3.1	562	1.3	7.1	0.198	4.7	643	0.962
30.5	0.490	12	0.079	3.7	625	1.1	7.1	0.143	5.6	715	0.804
31.1	0.490	12	0.140	4.0	729	0.990	7.1	0.255	6.2	834	0.722
31.8	0.490	14	0.085	3.4	676	0.499	7.1	0.156	5.2	773	0.364
32.5	0.490	14	0.101	3.9	674	0.894	7.1	0.185	6.0	771	0.652
33.2	0.490	14	0.163	2.3	654	0.360	7.1	0.298	3.5	748	0.263
33.9	0.490	11	0.285	1.6	638	0.922	7.1	0.520	2.4	730	0.673
34.6	0.490	12	0.079	4.2	785	0.964	7.1	0.143	6.5	898	0.703
35.3	0.490	11	0.403	2.3	659	0.845	7.1	0.735	3.5	754	0.616
36.0	0.490	13	0.221	3.7	659	1.8	7.1	0.403	5.6	754	1.3
36.7	0.490	12	0.218	3.6	808	0.484	7.1	0.398	5.5	924	0.353
37.4	0.490	9.0	0.128	3.2	690	1.0	7.1	0.233	4.9	788	0.742
38.1	0.490	11	0.260	1.6	685	1.2	7.1	0.475	2.4	783	0.845
38.8	0.490	13	0.079	4.6	691	1.0	7.1	0.143	7.0	790	0.765
39.5	0.490	15	0.118	3.9	718	0.783	7.1	0.216	6.0	821	0.571
40.2	0.490	12	0.288	3.0	709	1.1	7.1	0.525	4.7	810	0.779
40.9	0.490	12	0.199	3.6	684	1.1	7.1	0.363	5.5	782	0.788
41.6	0.490	14	0.288	4.2	647	0.855	7.1	0.526	6.4	740	0.624
42.3	0.490	15	0.463	5.0	748	0.916	7.1	0.844	7.6	855	0.669
43.0	0.928	16	0.370	3.0	752	0.988	13	0.674	4.6	860	0.721
43.7	0.490	14	0.319	2.6	680	0.888	7.1	0.582	4.1	778	0.648
44.4	0.490	17	0.464	4.9	716	1.2	7.1	0.846	7.6	818	0.862
45.1	0.490	18	0.641	3.9	742	1.5	7.1	1.2	5.9	848	1.1
45.8	0.490	20	0.711	4.6	719	1.0	7.1	1.3	7.0	822	0.749
46.5	0.490	20	0.540	4.3	679	0.741	7.1	0.985	6.5	777	0.541
47.2	0.490	18	0.402	4.0	703	1.0	7.1	0.733	6.1	804	0.757
47.9	0.490	23	0.574	3.2	747	1.5	7.1	1.0	4.9	854	1.1
48.6	0.490	22	0.588	3.6	743	1.5	7.1	1.1	5.4	849	1.1
49.3	0.490	18	0.319	4.1	716	0.757	7.1	0.581	6.3	818	0.552
50.0	0.490	16	0.389	5.0	694	1.2	7.1	0.709	7.6	793	0.843
50.7	0.490	14	0.264	2.8	754	0.995	7.1	0.482	4.3	862	0.726
51.4	0.490	17	0.272	4.9	700	1.8	7.1	0.497	7.6	801	1.3
52.1	0.490	18	0.191	5.4	748	1.0	7.1	0.348	8.2	855	0.757
52.8	0.490	13	0.126	2.8	709	1.1	7.1	0.230	4.2	811	0.814
53.5	0.490	15	0.240	4.5	690	0.679	7.1	0.438	6.9	789	0.495
54.2	0.490	14	0.456	5.1	736	1.2	7.1	0.831	7.8	842	0.847
54.9	0.490	14	0.428	5.0	778	1.4	7.1	0.780	7.7	890	1.0
55.6	0.490	11	0.079	5.2	720	0.570	7.1	0.143	7.9	823	0.416
56.3	0.490	12	0.174	4.2	717	0.858	7.1	0.317	6.4	819	0.626



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
57.0	0.517	14	0.209	4.8	747	0.931	7.5	0.382	7.4	854	0.680
57.7	0.490	12	0.164	6.3	761	1.6	7.1	0.299	9.7	870	1.2
58.3	0.490	8.5	0.259	4.0	792	0.989	7.1	0.472	6.2	905	0.721
59.0	0.490	11	0.081	4.1	796	0.800	7.1	0.147	6.3	910	0.584
59.7	0.490	8.3	0.079	3.4	690	1.1	7.1	0.143	5.3	789	0.838
60.4	0.490	12	0.079	4.4	822	0.973	7.1	0.143	6.7	940	0.710
61.1	0.490	7.7	0.079	5.5	750	1.0	7.1	0.143	8.5	858	0.730
61.8	0.490	11	0.079	4.0	682	0.753	7.1	0.143	6.1	780	0.550
62.5	0.490	7.2	0.079	4.3	774	1.1	7.1	0.143	6.7	885	0.839
63.2	0.490	9.9	0.079	7.9	786	0.959	7.1	0.143	12	899	0.700
63.9	0.490	8.1	0.079	4.8	743	1.0	7.1	0.143	7.3	850	0.737
64.6	0.490	6.6	0.079	5.3	734	0.932	7.1	0.143	8.1	839	0.680
65.3	0.490	8.2	0.219	4.0	733	1.3	7.1	0.399	6.1	838	0.929
66.0	0.490	8.2	0.094	6.7	831	0.916	7.1	0.172	10	950	0.668
66.7	0.490	7.8	0.079	5.6	791	1.7	7.1	0.143	8.6	905	1.2
67.4	0.490	7.7	0.079	5.4	811	1.1	7.1	0.143	8.2	927	0.809
68.1	0.490	6.8	0.134	7.1	932	2.4	7.1	0.244	11	1065	1.7
68.8	0.490	7.5	0.079	3.9	837	0.753	7.1	0.143	5.9	957	0.549
69.5	0.490	9.7	0.079	3.7	852	1.7	7.1	0.143	5.6	974	1.3
70.2	0.490	11	0.079	6.1	902	1.1	7.1	0.143	9.3	1031	0.797
70.9	0.490	7.7	0.196	5.6	955	2.0	7.1	0.358	8.5	1092	1.5
71.6	0.490	6.1	0.079	3.1	846	0.958	7.1	0.143	4.7	967	0.699
72.3	0.490	6.3	0.079	3.7	851	1.6	7.1	0.143	5.7	973	1.2
73.0	0.490	7.0	0.079	4.5	949	0.876	7.1	0.143	6.9	1085	0.639
73.7	0.490	7.9	0.079	4.1	958	1.4	7.1	0.143	6.4	1096	1.1
74.4	0.490	7.6	0.079	4.0	923	0.979	7.1	0.143	6.1	1056	0.714
75.1	0.490	6.9	0.079	5.4	950	0.838	7.1	0.143	8.2	1086	0.612
75.8	0.490	8.1	0.079	3.2	907	1.9	7.1	0.143	4.9	1038	1.4
76.5	0.490	7.8	0.079	5.0	972	2.1	7.1	0.143	7.7	1111	1.5
77.2	0.490	7.0	0.079	5.0	932	1.8	7.1	0.143	7.6	1066	1.3
77.9	0.778	7.4	0.117	7.1	938	1.5	11	0.213	11	1073	1.1
78.6	0.490	7.0	0.153	5.2	929	1.3	7.1	0.280	8.0	1062	0.933
79.3	0.490	7.4	0.154	6.7	980	1.2	7.1	0.282	10	1121	0.876
80.0	0.490	8.5	0.174	5.8	984	2.0	7.1	0.317	8.9	1125	1.4
80.7	0.490	7.6	0.149	9.4	974	1.6	7.1	0.272	14	1114	1.1
81.4	0.490	7.6	0.218	8.2	991	1.5	7.1	0.398	13	1133	1.1
82.1	0.490	9.5	0.137	9.3	1160	1.6	7.1	0.251	14	1327	1.1
82.8	0.490	8.5	0.226	10	1157	2.0	7.1	0.412	15	1324	1.5
83.5	0.490	9.2	0.169	9.8	1182	2.0	7.1	0.308	15	1352	1.4
84.2	0.490	7.1	0.366	12	1173	1.7	7.1	0.668	18	1341	1.3
84.8	0.490	9.2	0.285	14	1352	2.1	7.1	0.521	21	1546	1.5
85.5	0.490	8.8	0.366	12	1543	3.0	7.1	0.668	19	1764	2.2
86.2	0.490	9.9	0.591	18	1661	3.3	7.1	1.1	27	1899	2.4
86.9	0.490	9.2	0.395	14	1574	2.9	7.1	0.720	21	1800	2.1
87.6	0.490	8.9	0.381	16	1826	2.7	7.1	0.695	24	2088	2.0
88.3	0.490	8.2	0.418	16	1952	3.3	7.1	0.762	25	2233	2.4
89.0	0.490	9.2	0.818	23	2226	3.4	7.1	1.5	35	2546	2.5
89.7	0.490	11	0.433	19	2438	2.7	7.1	0.790	29	2788	1.9
90.4	0.490	9.7	0.693	22	2494	3.0	7.1	1.3	33	2852	2.2
91.1	0.490	9.8	0.704	18	2337	3.4	7.1	1.3	28	2673	2.5
91.8	0.490	8.5	0.813	17	2342	3.0	7.1	1.5	25	2678	2.2
92.5	0.820	10	0.746	20	2401	3.3	12	1.4	30	2745	2.4
93.2	1.0	8.7	0.986	21	2376	3.8	15	1.8	32	2717	2.8
93.9	1.4	9.1	0.892	21	2423	2.9	20	1.6	31	2770	2.1
94.6	0.769	9.3	0.938	23	2611	3.3	11	1.7	35	2986	2.4
95.3	1.9	7.3	0.712	20	2366	2.8	28	1.3	30	2705	2.1
96.0	2.2	9.2	1.2	15	2250	3.2	32	2.1	24	2573	2.3
96.7	2.4	8.8	1.3	16	2182	2.0	35	2.3	25	2495	1.5
97.4	1.7	7.3	0.707	17	2015	3.1	24	1.3	26	2304	2.2
98.1	3.1	6.7	0.727	16	1928	2.1	45	1.3	25	2205	1.6
98.8	2.2	8.5	0.726	15	1898	3.7	32	1.3	23	2170	2.7
99.5	2.4	7.1	0.726	12	1555	3.2	34	1.3	19	1779	2.4
100.2	1.6	7.6	0.485	12	1427	2.3	23	0.884	19	1632	1.7
100.9	2.2	7.9	0.457	11	1384	2.4	32	0.833	17	1583	1.7
101.6	1.3	6.8	0.474	9.7	1218	2.4	19	0.865	15	1393	1.8
102.3	1.8	6.4	0.426	8.5	1281	2.5	26	0.777	13	1465	1.8
103.0	0.908	6.0	0.322	8.9	1292	2.8	13	0.587	14	1478	2.0
103.7	0.646	7.7	0.221	9.6	1251	2.1	9.3	0.404	15	1431	1.5
104.4	1.3	8.0	0.155	6.2	1201	1.5	18	0.283	9.5	1373	1.1
105.1	1.2	6.6	0.096	9.3	1279	1.1	17	0.175	14	1463	0.805
105.8	0.768	7.1	0.079	7.4	1189	1.5	11	0.143	11	1360	1.1
106.5	0.490	7.3	0.248	7.5	1207	2.1	7.1	0.453	11	1381	1.5
107.2	0.636	5.5	0.079	4.6	1232	2.0	9.2	0.143	7.1	1409	1.5
107.9	0.490	6.7	0.243	6.3	1212	1.1	7.1	0.443	9.7	1386	0.789
108.6	0.490	7.0	0.087	4.9	1123	1.3	7.1	0.158	7.5	1285	0.954
109.3	0.490	7.0	0.079	5.5	1328	1.9	7.1	0.143	8.4	1519	1.4
110.0	0.490	7.9	0.079	5.5	1222	1.9	7.1	0.143	8.5	1397	1.4
110.6	0.490	8.0	0.139	5.2	1101	1.7	7.1	0.253	8.0	1259	1.2
111.3	0.490	7.1	0.294	6.2	1121	1.2	7.1	0.535	9.5	1282	0.886
112.0	0.490	7.0	0.100	4.9	1238	1.4	7.1	0.182	7.5	1416	1.0
112.7	0.490	7.5	0.079	7.2	1122	1.6	7.1	0.143	11	1283	1.2



Minnow Environmental  
Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.4	0.583	7.3	0.079	10	1277	1.6	8.4	0.143	16	1461	1.2
114.1	0.490	8.6	0.214	10	1017	2.2	7.1	0.391	16	1163	1.6
114.8	0.490	8.5	0.349	8.9	1100	1.5	7.1	0.636	14	1258	1.1
115.5	0.490	8.4	0.169	7.5	1184	1.4	7.1	0.307	11	1353	1.0
116.2	0.645	6.5	0.219	9.0	1038	1.5	9.3	0.399	14	1187	1.1
116.9	0.490	7.2	0.289	10	1002	1.3	7.1	0.527	15	1146	0.939
117.6	0.490	8.2	0.131	14	999	1.8	7.1	0.239	21	1142	1.3
118.3	0.490	7.1	0.294	9.6	932	1.9	7.1	0.536	15	1066	1.4
119.0	0.559	9.1	0.205	12	1323	1.7	8.1	0.374	18	1513	1.3
119.7	0.490	9.3	0.282	13	1278	2.6	7.1	0.515	20	1461	1.9
120.4	0.490	10	0.270	13	1252	1.7	7.1	0.492	20	1432	1.2
121.1	0.490	8.1	0.485	18	1553	1.4	7.1	0.884	27	1775	1.0
121.8	0.490	8.8	0.442	18	1632	3.3	7.1	0.806	27	1866	2.4
122.5	0.490	8.3	0.422	18	1731	2.3	7.1	0.769	27	1980	1.7
123.2	0.490	11	0.794	21	1887	1.4	7.1	1.4	32	2158	1.0
123.9	0.490	8.6	0.907	18	1736	2.8	7.1	1.7	28	1985	2.0
124.6	0.530	9.8	0.791	27	2065	2.6	7.6	1.4	42	2361	1.9
125.3	0.490	6.8	0.859	26	1963	3.1	7.1	1.6	39	2245	2.3
126.0	0.490	7.9	1.4	20	1938	2.3	7.1	2.5	31	2216	1.6
126.7	0.956	9.2	1.5	25	2014	2.9	14	2.8	38	2302	2.1
127.4	0.532	9.8	1.5	26	2143	2.4	7.7	2.7	40	2451	1.7
128.1	1.3	10	1.3	26	2152	2.3	19	2.4	40	2461	1.6
128.8	1.7	6.2	1.3	25	2100	2.3	25	2.4	39	2401	1.7
129.5	2.1	7.9	1.6	28	2147	3.2	31	3.0	44	2455	2.3
130.2	1.7	7.2	1.7	27	2052	2.9	25	3.0	42	2347	2.1
130.9	2.3	8.9	1.7	27	2131	2.8	33	3.1	41	2437	2.0
131.6	2.7	8.5	1.7	23	2065	3.0	38	3.2	35	2361	2.2
132.3	2.7	9.7	1.4	26	2166	2.8	39	2.6	39	2477	2.0
133.0	3.5	9.8	1.5	25	2131	4.1	50	2.7	38	2436	3.0
133.7	4.1	11	1.5	31	2037	4.2	59	2.7	47	2329	3.1
134.4	4.1	11	1.3	25	1949	3.6	59	2.4	38	2229	2.6
135.1	3.2	7.8	0.977	23	1850	3.1	46	1.8	36	2116	2.3
135.8	4.1	7.0	1.5	23	1744	4.1	59	2.6	35	1994	3.0
136.5	4.3	7.7	1.1	25	1868	4.5	63	2.0	38	2136	3.3
137.2	4.1	6.3	1.1	19	1658	3.8	58	2.1	30	1896	2.7
137.8	3.3	7.2	0.948	16	1474	3.3	47	1.7	25	1686	2.4
138.5	2.9	7.9	1.2	22	1631	2.4	42	2.2	34	1865	1.7
139.2	3.2	8.8	0.800	16	1704	2.9	46	1.5	24	1948	2.1
139.9	2.8	9.4	0.811	13	1534	2.3	41	1.5	20	1754	1.7
140.6	2.4	8.3	0.515	18	1369	4.5	34	0.940	28	1566	3.3
141.3	3.5	7.2	0.863	16	1351	3.5	50	1.6	24	1545	2.5
142.0	2.7	7.4	0.743	14	1396	2.4	39	1.4	22	1596	1.8
142.7	2.2	8.4	0.441	11	1421	2.2	32	0.804	17	1625	1.6
143.4	2.5	6.0	0.666	16	1345	2.8	36	1.2	24	1538	2.0
144.1	2.7	7.0	0.338	15	1173	3.4	39	0.617	22	1342	2.4
144.8	1.7	7.7	249	17	1321	3.4	24	454	26	1511	2.5
145.5	3.0	7.4	0.539	12	1284	1.8	43	0.982	18	1468	1.3
146.2	2.8	7.2	0.380	12	1194	2.7	41	0.692	19	1366	2.0
146.9	2.0	6.9	0.477	12	1229	2.4	29	0.870	18	1405	1.8
147.6	1.5	6.0	0.297	9.2	1183	2.6	22	0.541	14	1352	1.9
148.3	0.960	8.0	0.225	12	1341	3.6	14	0.410	18	1533	2.6
149.0	1.1	7.2	0.364	12	1240	3.0	16	0.663	18	1418	2.2
149.7	0.792	6.3	0.256	11	1089	2.7	11	0.467	17	1246	2.0
150.4	0.677	7.3	0.188	13	1318	2.7	9.8	0.343	20	1507	2.0
151.1	0.748	6.2	0.476	11	1164	2.3	11	0.868	17	1331	1.7
151.8	1.1	6.1	0.316	13	1087	1.4	16	0.576	19	1243	1.0
152.5	0.665	8.3	0.400	13	1292	3.1	9.6	0.730	20	1478	2.2
153.2	1.1	8.4	0.322	13	1304	2.9	16	0.588	20	1491	2.1
153.9	0.490	7.9	0.369	14	1343	1.5	7.1	0.673	21	1536	1.1
154.6	0.490	7.8	0.458	13	1238	1.7	7.1	0.836	20	1415	1.2
155.3	0.816	7.9	0.627	14	1556	3.9	12	1.1	22	1779	2.9
156.0	0.529	10	0.235	14	1404	2.3	7.6	0.429	22	1606	1.7
156.7	0.591	9.0	0.389	14	1393	3.6	8.5	0.710	21	1592	2.6
157.4	0.490	10	0.408	15	1378	3.4	7.1	0.744	23	1576	2.5
158.1	0.678	9.3	0.521	14	1677	2.8	9.8	0.950	22	1918	2.0
158.8	0.906	10.0	0.275	15	1586	3.4	13	0.502	24	1813	2.5
159.5	0.490	9.6	0.768	15	1745	4.0	7.1	1.4	23	1995	2.9
160.2	0.490	9.5	0.649	13	1459	2.1	7.1	1.2	20	1668	1.5
160.9	0.656	8.8	0.363	15	1578	3.0	9.5	0.662	22	1804	2.2
161.6	0.977	9.6	0.409	14	1860	2.3	14	0.745	21	2127	1.7
162.3	1.1	8.3	0.760	14	1541	2.1	15	1.4	22	1762	1.5
163.0	0.875	7.5	0.812	19	1866	3.1	13	1.5	30	2134	2.3
163.7	0.615	9.5	0.494	18	1638	2.7	8.9	0.902	28	1873	2.0
164.3	1.4	7.8	0.600	16	1647	2.4	21	1.1	25	1884	1.8
165.0	1.4	8.4	0.890	15	1824	4.8	20	1.6	23	2086	3.5
165.7	0.732	8.2	0.750	17	1777	4.8	11	1.4	26	2032	3.5
166.4	0.890	9.9	0.685	19	1647	3.2	13	1.2	30	1884	2.3
167.1	1.7	8.7	0.552	18	2053	3.1	24	1.0	27	2347	2.2
167.8	0.801	9.4	0.722	16	1574	3.6	12	1.3	25	1800	2.6
168.5	1.6	8.7	0.690	21	1726	2.1	23	1.3	33	1973	1.6
169.2	1.7	10	0.611	19	1831	5.0	24	1.1	28	2093	3.6



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Sample ID: 010

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
169.9	2.4	7.2	0.518	17	1594	3.6	35	0.944	26	1823	2.6
170.6	1.2	8.4	0.729	18	1717	4.6	17	1.3	28	1963	3.4
171.3	1.9	7.3	0.589	18	1641	3.2	27	1.1	27	1876	2.3
172.0	3.5	7.3	0.414	19	1572	3.1	50	0.756	29	1798	2.3
172.7	2.1	7.7	0.458	16	1475	2.8	30	0.835	25	1686	2.1
173.4	2.5	7.9	0.232	17	1448	3.1	36	0.422	26	1655	2.3
174.1	2.8	7.6	0.217	15	1353	3.3	41	0.395	23	1547	2.4
174.8	1.4	6.3	0.352	17	1361	3.4	20	0.642	26	1557	2.5
175.5	1.9	7.1	0.190	13	1347	2.6	28	0.347	19	1540	1.9
176.2	2.2	8.1	0.159	16	1302	1.6	32	0.291	24	1488	1.2
176.9	1.5	6.3	0.222	12	1053	3.7	22	0.405	18	1204	2.7
177.6	0.803	7.9	0.129	17	1220	1.8	12	0.235	25	1395	1.3
178.3	0.834	6.2	0.310	13	1226	1.8	12	0.566	19	1402	1.3
179.0	0.604	7.2	0.283	9.4	1249	2.2	8.7	0.516	14	1428	1.6
179.7	0.779	9.2	0.245	12	1210	3.5	11	0.446	18	1384	2.5
180.4	0.946	7.1	0.111	9.1	1305	2.1	14	0.203	14	1492	1.5
181.1	0.490	6.0	0.097	7.6	1032	1.5	7.1	0.176	12	1180	1.1
181.8	0.911	7.1	0.341	9.7	1205	1.2	13	0.622	15	1378	0.848
182.5	0.720	7.3	0.247	11	1186	2.8	10	0.450	17	1356	2.1
183.2	0.625	8.7	0.079	9.1	1205	3.2	9.0	0.143	14	1378	2.3
183.9	0.534	6.4	0.109	11	1274	2.6	7.7	0.198	17	1457	1.9
184.6	0.711	5.4	0.079	11	1317	2.5	10	0.143	17	1506	1.9
185.3	1.1	6.4	0.242	10	1026	1.3	15	0.442	15	1174	0.930
186.0	0.559	7.7	0.384	12	1420	3.0	8.1	0.701	19	1624	2.2
186.7	0.490	7.9	0.283	12	1150	2.0	7.1	0.515	19	1315	1.5
187.4	0.490	6.8	0.104	14	1223	2.0	7.1	0.189	22	1398	1.5
188.1	0.490	8.2	0.381	14	1039	1.7	7.1	0.696	22	1188	1.2
188.8	0.643	7.1	0.215	14	1197	3.4	9.3	0.393	21	1369	2.4
189.4	0.527	6.4	0.234	16	1100	2.3	7.6	0.428	25	1257	1.7
190.1	0.490	8.6	0.287	15	1143	2.4	7.1	0.524	24	1307	1.7
190.8	0.570	5.3	0.313	19	1098	2.5	8.2	0.571	29	1256	1.8
191.5	0.490	8.1	0.314	16	1181	3.8	7.1	0.572	24	1350	2.8
192.2	0.490	8.9	0.443	18	1303	2.3	7.1	0.808	28	1490	1.6
192.9	0.490	9.3	0.619	24	1285	4.2	7.1	1.1	36	1469	3.1
193.6	0.490	8.8	0.488	23	1337	2.7	7.1	0.889	35	1529	1.9
194.3	0.535	7.4	0.802	24	1257	3.1	7.7	1.5	36	1438	2.3
195.0	0.490	8.2	0.473	25	1478	3.3	7.1	0.863	38	1691	2.4
195.7	0.490	10	0.734	32	1664	2.4	7.1	1.3	50	1903	1.7
196.4	0.709	9.7	1.2	26	1613	2.9	10	2.2	40	1845	2.1
197.1	0.490	8.5	0.884	31	1968	2.8	7.1	1.6	48	2250	2.0
197.8	0.490	9.4	1.1	35	1883	3.0	7.1	2.0	53	2153	2.2
198.5	0.584	8.7	1.3	40	2056	4.5	8.4	2.3	62	2351	3.3
199.2	0.490	9.7	1.4	42	1917	3.8	7.1	2.5	64	2192	2.8
199.9	0.490	8.2	1.4	31	1862	3.9	7.1	2.5	48	2129	2.8
200.6	0.490	10	1.4	41	2087	3.6	7.1	2.6	63	2387	2.7
201.3	0.490	8.8	1.5	34	2065	2.6	7.1	2.7	51	2362	1.9
202.0	0.490	9.5	1.3	42	2218	2.9	7.1	2.3	64	2536	2.1
202.7	0.490	10	1.8	46	2311	4.2	7.1	3.2	70	2643	3.1
203.4	0.490	12	2.0	47	2328	4.1	7.1	3.6	73	2663	3.0
204.1	0.510	10	2.6	44	2290	3.7	7.4	4.8	67	2619	2.7
204.8	0.658	10	2.4	46	2541	2.8	9.5	4.4	70	2906	2.0
205.5	0.891	11	2.4	44	2511	3.1	13	4.5	67	2872	2.3
206.2	0.942	10	2.5	62	2576	4.0	14	4.6	94	2945	2.9
206.9	0.981	11	2.9	60	2509	4.4	14	5.3	92	2869	3.2
207.6	0.643	12	3.2	53	2619	3.2	9.3	5.9	81	2995	2.3
208.3	1.4	11	3.0	50	2521	3.9	21	5.5	76	2883	2.8
209.0	1.8	10	3.3	56	2673	3.9	26	6.0	86	3057	2.8
209.7	1.5	10	3.7	55	2679	3.3	22	6.8	84	3063	2.4
210.4	1.9	9.4	2.8	58	2377	4.5	27	5.1	88	2718	3.3
211.1	2.6	10	4.1	59	2753	4.9	37	7.6	91	3149	3.6
211.8	2.3	9.3	4.3	55	2668	4.5	33	7.8	84	3050	3.3
212.5	4.7	9.7	3.9	63	2636	4.5	68	7.2	96	3015	3.3
213.2	4.1	9.7	4.5	54	2515	5.0	59	8.1	83	2876	3.6
213.9	4.9	9.5	4.5	59	2416	4.7	70	8.3	90	2763	3.4
214.6	3.9	10	3.9	53	2543	6.4	56	7.2	82	2908	4.7
215.3	4.2	9.7	4.0	55	2487	5.1	60	7.4	84	2844	3.7
215.9	5.2	11	3.6	51	2282	5.9	75	6.5	78	2609	4.3
216.6	4.8	12	4.2	51	2455	5.1	69	7.6	78	2808	3.7
217.3	5.3	9.5	3.5	48	2178	6.4	76	6.4	73	2491	4.7
218.0	5.0	11	3.5	48	2211	5.5	73	6.3	74	2529	4.0
218.7	5.4	9.8	4.1	49	2364	7.4	79	7.5	75	2704	5.4
219.4	5.6	9.8	3.8	47	2193	6.1	81	7.0	73	2508	4.4
220.1	7.7	11	3.8	43	2013	7.1	110	6.9	66	2302	5.1
220.8	6.1	7.8	3.3	48	2062	5.2	87	6.1	73	2358	3.8
221.5	5.6	7.1	3.2	45	1833	5.4	81	5.9	69	2096	3.9
222.2	6.8	9.7	3.6	44	1961	6.3	98	6.6	68	2242	4.6
222.9	6.6	8.9	2.7	33	1710	5.8	95	4.9	51	1955	4.3
223.6	6.7	8.3	2.6	33	1719	5.0	97	4.8	50	1965	3.7
224.3	7.6	6.5	2.3	33	1387	5.5	110	4.2	50	1586	4.0
225.0	6.9	7.3	2.2	32	1417	5.3	100	4.1	50	1620	3.8
225.7	8.4	9.4	2.7	32	1458	6.4	121	4.9	49	1667	4.6



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.4	7.3	8.8	1.4	26	1363	4.8	106	2.6	40	1559	3.5
227.1	5.1	8.7	1.6	26	1306	4.0	73	2.9	39	1493	2.9
227.8	6.0	6.4	1.3	21	1104	3.4	86	2.4	32	1262	2.5
228.5	4.5	6.8	1.5	21	1235	4.8	65	2.8	32	1413	3.5
229.2	5.6	8.4	0.807	21	1090	4.2	81	1.5	33	1246	3.0
229.9	5.3	8.0	0.897	23	1223	2.5	77	1.6	35	1399	1.8
230.6	4.0	6.5	0.630	19	1095	2.7	58	1.1	28	1252	2.0
231.3	5.2	7.7	0.498	18	1058	2.6	75	0.908	28	1210	1.9
232.0	2.1	7.8	0.575	16	935	2.5	31	1.0	25	1069	1.8
232.7	2.8	9.1	0.156	16	971	2.5	40	0.285	24	1110	1.8
233.4	2.5	5.1	0.381	13	936	1.8	37	0.695	19	1071	1.3
234.1	0.884	5.5	0.207	15	909	1.7	13	0.378	23	1040	1.2
234.8	1.9	5.6	0.089	11	967	2.2	27	0.163	18	1106	1.6
235.5	1.2	7.5	0.227	12	1042	1.9	17	0.414	18	1192	1.4
236.2	0.932	6.9	0.100	16	1019	2.6	13	0.182	25	1165	1.9
236.9	0.954	7.7	0.332	14	1079	2.0	14	0.606	21	1233	1.5
237.6	0.785	6.2	0.250	9.2	986	2.5	11	0.457	14	1127	1.8
238.3	1.1	5.9	0.088	9.0	986	1.8	16	0.161	14	1127	1.3
239.0	0.502	6.9	0.159	9.3	996	1.3	7.3	0.290	14	1139	0.958
239.7	1.4	6.3	0.137	9.9	1009	2.7	20	0.250	15	1153	2.0
240.4	0.490	5.7	0.086	9.7	1029	2.3	7.1	0.156	15	1176	1.7
241.1	0.703	7.1	0.174	9.8	1026	1.9	10	0.317	15	1173	1.4
241.7	0.646	7.1	0.079	12	1178	1.9	9.3	0.143	19	1347	1.4
242.4	0.490	6.3	0.258	8.4	1119	2.3	7.1	0.471	13	1279	1.7
243.1	0.633	7.3	0.233	15	1112	1.9	9.1	0.425	23	1271	1.4
243.8	0.591	6.9	0.237	14	974	2.0	8.5	0.433	22	1114	1.5
244.5	0.543	8.8	0.079	10	899	1.6	7.8	0.143	16	1028	1.2
245.2	0.490	11	0.150	16	1024	1.8	7.1	0.274	25	1171	1.3
245.9	0.896	11	0.245	17	1048	2.5	13	0.447	27	1198	1.8
246.6	0.514	8.5	0.188	19	885	2.3	7.4	0.343	29	1012	1.7
247.3	0.490	10	0.234	19	925	2.6	7.1	0.427	28	1058	1.9
248.0	1.2	7.7	0.570	22	946	2.3	18	1.0	34	1082	1.7
248.7	0.490	9.0	0.260	20	923	1.3	7.1	0.475	31	1055	0.959
249.4	0.490	11	0.447	27	942	3.5	7.1	0.815	41	1078	2.6
250.1	0.490	8.5	0.508	31	1001	2.2	7.1	0.926	47	1144	1.6
250.8	0.663	11	0.347	37	1107	3.3	9.6	0.632	56	1266	2.4
251.5	0.490	9.9	0.332	27	996	3.4	7.1	0.605	41	1139	2.5
252.2	0.493	12	0.715	31	1075	3.2	7.1	1.3	47	1229	2.3
252.9	0.526	14	0.461	36	1046	2.7	7.6	0.841	56	1196	2.0
253.6	0.490	12	0.564	40	1106	1.7	7.1	1.0	62	1265	1.3
254.3	0.579	13	0.869	37	1114	2.8	8.4	1.6	57	1274	2.0
255.0	0.490	11	0.806	40	1214	3.0	7.1	1.5	62	1389	2.2
255.7	0.490	14	1.000	34	1333	3.6	7.1	1.8	52	1525	2.6
256.4	0.533	13	1.1	43	1326	2.3	7.7	2.0	67	1516	1.7
257.1	0.490	11	1.0	40	1303	3.1	7.1	1.9	61	1490	2.3
257.8	0.490	11	0.815	34	1295	2.9	7.1	1.5	53	1481	2.1
258.5	0.490	11	0.989	44	1630	4.2	7.1	1.8	68	1864	3.1
259.2	0.490	12	1.1	45	1559	4.3	7.1	2.0	70	1783	3.1
259.9	0.490	11	1.2	54	1627	2.5	7.1	2.1	82	1860	1.8
260.6	0.490	12	1.2	55	1697	3.2	7.1	2.1	84	1941	2.3
261.3	0.490	12	0.982	43	1920	2.0	7.1	1.8	65	2195	1.5
262.0	0.490	13	1.2	49	1901	2.9	7.1	2.2	76	2174	2.2
262.7	0.490	12	1.3	54	1883	3.3	7.1	2.4	83	2153	2.4
263.4	0.630	13	1.1	49	1867	3.1	9.1	2.1	75	2135	2.3
264.1	0.493	13	1.5	58	2180	3.2	7.1	2.7	89	2492	2.3
264.8	0.557	12	1.5	48	2268	2.2	8.0	2.7	73	2593	1.6
265.5	0.635	12	1.8	55	2501	3.2	9.2	3.2	84	2859	2.4
266.2	0.490	13	1.7	50	2365	2.5	7.1	3.0	76	2704	1.8
266.9	0.490	12	2.0	57	2293	3.8	7.1	3.6	88	2622	2.8
267.6	0.733	11	1.7	64	2425	2.7	11	3.0	98	2773	2.0
268.3	0.490	11	2.2	56	2477	2.5	7.1	3.9	86	2832	1.8
268.9	0.855	9.4	2.0	62	2445	3.4	12	3.7	94	2796	2.5
269.6	0.950	11	2.3	59	2248	2.4	14	4.2	91	2571	1.7
270.3	0.708	12	2.0	56	2423	2.2	10	3.6	86	2771	1.6
271.0	0.956	10	2.2	60	2306	3.3	14	4.1	91	2637	2.4
271.7	0.925	11	2.7	58	2402	3.0	13	5.0	89	2746	2.2
272.4	1.5	9.9	2.5	60	2525	3.3	22	4.6	92	2888	2.4
273.1	0.793	11	2.2	59	2371	3.0	11	4.0	90	2712	2.2
273.8	1.6	10	2.2	66	2406	2.9	24	4.1	101	2751	2.1
274.5	1.5	12	2.0	67	2558	3.7	22	3.7	103	2925	2.7
275.2	1.0	9.9	2.2	63	2357	3.3	15	4.1	96	2695	2.4
275.9	1.4	10	1.6	64	2367	2.8	21	3.0	97	2707	2.0
276.6	1.4	9.9	1.7	55	2443	2.9	21	3.1	85	2793	2.1
277.3	1.4	9.5	2.2	56	2380	3.0	21	4.1	86	2721	2.2
278.0	1.5	11	2.0	57	2268	3.0	21	3.7	87	2593	2.2
278.7	1.3	11	2.0	59	2298	2.3	19	3.7	90	2628	1.6
279.4	1.4	12	2.1	54	2070	3.2	20	3.7	83	2367	2.4
280.1	2.9	12	1.6	69	2331	2.6	41	2.9	106	2666	1.9
280.8	2.0	12	2.3	52	2320	2.5	29	4.1	79	2653	1.9
281.5	2.7	11	1.9	63	2226	3.0	39	3.4	97	2546	2.2
282.2	2.4	9.9	1.4	60	2120	3.0	35	2.5	92	2424	2.2



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
282.9	2.3	8.8	1.5	47	1921	1.9	33	2.7	71	2197	1.4
283.6	2.6	8.4	1.5	52	1825	2.3	38	2.8	79	2087	1.7
284.3	1.8	10	1.2	46	1629	2.4	25	2.2	71	1863	1.7
285.0	2.1	8.8	1.6	44	1840	3.2	30	2.8	67	2105	2.4
285.7	1.9	8.7	1.4	43	1562	2.8	27	2.6	65	1786	2.0
286.4	2.0	8.7	1.6	39	1468	2.8	29	3.0	59	1679	2.0
287.1	1.5	7.7	1.3	45	1389	2.9	22	2.3	68	1588	2.1
287.8	2.1	8.9	1.7	41	1504	2.9	30	3.0	63	1719	2.1
288.5	1.6	9.8	1.3	43	1355	2.0	24	2.4	66	1550	1.5
289.2	1.6	11	1.0	38	1298	2.9	24	1.9	58	1485	2.1
289.9	2.8	11	1.3	47	1367	3.4	41	2.3	72	1563	2.5
290.6	2.0	11	1.4	38	1384	2.3	29	2.5	58	1583	1.7
291.3	1.7	11	1.3	35	1290	3.0	24	2.3	53	1476	2.2
292.0	3.4	8.1	0.962	39	1259	3.0	49	1.8	60	1439	2.2
292.7	2.0	8.3	0.817	32	1120	1.8	29	1.5	49	1280	1.3
293.4	1.4	7.3	1.1	38	1339	2.6	21	2.1	58	1531	1.9
294.1	1.6	8.4	0.858	33	968	2.0	23	1.6	51	1107	1.5
294.7	1.3	7.4	0.944	31	1305	3.8	19	1.7	48	1492	2.7
295.4	1.6	9.9	1.2	31	937	3.4	23	2.2	48	1071	2.5
296.1	1.7	9.0	0.848	34	1050	2.5	25	1.5	53	1201	1.8
296.8	2.3	7.2	0.980	33	818	3.2	34	1.8	51	936	2.3
297.5	1.0	7.6	0.796	26	788	2.7	15	1.5	39	901	2.0
298.2	1.4	7.0	0.816	29	706	3.3	21	1.5	44	807	2.4
298.9	1.5	8.6	0.926	28	723	2.6	22	1.7	42	826	1.9
299.6	1.6	9.3	0.627	23	616	2.2	23	1.1	36	704	1.6
300.3	1.3	7.8	0.656	19	566	2.9	19	1.2	29	647	2.1
301.0	1.3	5.3	0.603	21	540	2.9	18	1.1	32	617	2.1
301.7	1.0	7.9	0.712	24	540	2.4	15	1.3	37	617	1.7
302.4	0.490	7.3	0.316	20	563	2.2	7.1	0.576	30	643	1.6
303.1	0.490	6.3	0.656	19	467	3.2	7.1	1.2	29	533	2.4
303.8	0.970	6.6	0.404	17	427	1.9	14	0.737	27	489	1.4
304.5	0.490	7.3	0.285	18	437	4.3	7.1	0.520	28	500	3.1
305.2	0.490	11	0.571	18	468	2.2	7.1	1.0	27	536	1.6
305.9	0.490	8.6	0.386	15	385	2.5	7.1	0.704	22	440	1.8
306.6	0.688	8.2	0.568	12	334	1.9	9.9	1.0	18	381	1.4
307.3	0.661	7.2	0.398	13	389	1.8	9.5	0.725	20	445	1.3
308.0	0.574	6.5	0.336	12	332	2.2	8.3	0.613	18	380	1.6
308.7	0.620	7.2	0.182	17	370	2.2	9.0	0.332	26	423	1.6
309.4	0.490	7.6	0.148	12	318	1.7	7.1	0.270	18	363	1.2
310.1	0.888	8.6	0.177	13	400	1.3	13	0.323	20	457	0.933
310.8	0.490	8.2	0.644	10	357	1.5	7.1	1.2	16	408	1.1
311.5	0.613	6.6	0.381	12	362	1.1	8.8	0.695	18	415	0.802
312.2	0.490	8.0	0.352	12	359	1.9	7.1	0.641	18	410	1.4
312.9	0.490	5.9	0.207	11	311	2.4	7.1	0.377	17	356	1.7
313.6	0.543	7.4	0.239	8.8	330	1.2	7.8	0.436	13	378	0.841
314.3	0.490	13	0.146	13	358	1.1	7.1	0.265	20	410	0.808
315.0	0.654	8.3	0.371	14	317	1.3	9.4	0.677	21	362	0.924
315.7	0.490	6.9	0.154	12	384	1.1	7.1	0.280	19	439	0.782
316.4	0.490	6.3	0.194	13	325	0.775	7.1	0.353	20	371	0.565
317.1	0.490	8.1	0.319	12	318	1.3	7.1	0.581	18	364	0.915
317.8	0.490	8.7	0.397	14	338	1.2	7.1	0.724	21	387	0.861
318.5	0.490	7.9	0.315	14	304	1.3	7.1	0.575	22	347	0.957
319.2	0.490	9.6	0.305	13	297	1.3	7.1	0.557	20	340	0.921
319.9	0.490	6.3	0.437	19	343	1.5	7.1	0.798	29	392	1.1
320.5	0.490	7.1	0.390	15	374	1.4	7.1	0.711	23	427	1.1
321.2	0.490	11	0.548	17	368	1.4	7.1	1.0	26	421	1.0
321.9	0.490	15	0.514	17	303	1.8	7.1	0.938	26	346	1.3
322.6	0.490	8.0	0.345	18	377	1.3	7.1	0.629	28	431	0.981
323.3	0.490	9.5	0.402	23	382	0.537	7.1	0.733	35	437	0.392
324.0	0.490	8.6	0.477	19	330	0.710	7.1	0.871	28	378	0.518
324.7	0.490	7.5	0.484	16	312	1.2	7.1	0.883	25	357	0.854
325.4	0.490	8.5	0.386	19	341	1.5	7.1	0.703	29	390	1.1
326.1	0.490	6.5	0.597	23	325	1.9	7.1	1.1	36	372	1.4
326.8	0.490	8.4	0.734	19	306	1.0	7.1	1.3	30	350	0.730
327.5	0.490	10	0.664	18	380	2.2	7.1	1.2	28	411	1.6
328.2	0.490	11	0.697	26	364	2.1	7.1	1.3	40	439	1.5
328.9	0.589	9.4	0.590	21	354	1.5	8.5	1.1	33	405	1.1
329.6	0.490	9.0	0.500	23	373	2.0	7.1	0.912	36	427	1.5
330.3	0.490	7.5	0.383	22	375	1.8	7.1	0.699	33	429	1.3
331.0	0.490	9.7	0.496	21	359	1.5	7.1	0.905	32	410	1.1
331.7	0.490	7.6	0.613	18	323	1.6	7.1	1.1	28	370	1.2
332.4	0.490	9.1	0.453	18	347	2.2	7.1	0.826	27	397	1.6
333.1	0.490	9.7	0.476	22	342	1.4	7.1	0.868	33	392	1.0
333.8	0.490	7.1	0.791	18	371	1.5	7.1	1.4	28	424	1.1
334.5	0.490	8.3	0.590	21	362	3.0	7.1	1.1	31	414	2.2
335.2	0.490	9.1	0.680	16	381	3.5	7.1	1.2	25	435	2.6
335.9	0.490	7.2	0.775	17	338	2.0	7.1	1.4	27	387	1.5
336.6	0.490	6.6	0.746	18	342	2.1	7.1	1.4	27	391	1.5
337.3	0.490	6.1	0.653	18	319	2.0	7.1	1.2	28	365	1.4
338.0	0.490	10	0.491	19	352	2.5	7.1	0.896	29	403	1.8
338.7	0.490	7.9	0.647	17	293	1.4	7.1	1.2	26	335	0.988



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Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.4	0.490	6.4	0.309	17	372	2.9	7.1	0.564	27	425	2.1
340.1	0.490	6.6	0.614	17	301	2.3	7.1	1.1	26	345	1.7
340.8	0.490	7.2	0.537	16	376	1.5	7.1	0.980	25	430	1.1
341.5	0.490	8.2	0.489	16	320	1.5	7.1	0.892	25	366	1.1
342.2	0.572	7.3	0.554	15	337	1.1	8.3	1.0	22	385	0.826
342.9	0.490	5.7	0.395	14	298	1.7	7.1	0.721	22	340	1.2
343.6	0.490	7.6	0.581	16	370	2.5	7.1	1.1	25	423	1.8
344.3	0.490	7.9	0.319	16	322	2.5	7.1	0.582	25	368	1.8
345.0	0.490	9.3	0.509	14	324	2.6	7.1	0.929	21	371	1.9
345.7	0.490	7.0	0.404	14	367	2.2	7.1	0.738	22	420	1.6
346.4	0.700	8.1	0.409	15	364	1.2	10	0.746	24	416	0.910
347.0	0.490	8.7	0.519	12	299	1.9	7.1	0.947	19	342	1.4
347.7	0.490	8.5	0.433	16	319	1.7	7.1	0.790	25	365	1.3
348.4	0.490	8.0	0.617	18	319	1.9	7.1	1.1	28	365	1.4
349.1	0.490	7.0	0.370	14	305	1.5	7.1	0.674	21	348	1.1
349.8	0.585	8.4	0.193	12	342	1.2	8.4	0.352	19	391	0.904
350.5	0.490	7.1	0.370	13	275	0.908	7.1	0.675	20	314	0.662
351.2	0.490	7.2	0.430	15	272	1.7	7.1	0.784	23	311	1.2
351.9	0.490	8.8	0.604	19	353	1.5	7.1	1.1	28	403	1.1
352.6	0.490	7.8	0.697	15	327	1.2	7.1	1.3	23	374	0.868
353.3	0.490	6.3	0.550	13	282	1.7	7.1	1.0	20	323	1.3
354.0	0.490	10	0.596	17	335	0.950	7.1	1.1	26	383	0.693
354.7	0.490	10	0.329	20	334	1.6	7.1	0.599	31	381	1.1
355.4	0.490	8.3	0.772	22	309	1.2	7.1	1.4	34	353	0.862
356.1	0.490	8.3	0.835	22	354	1.1	7.1	1.5	34	405	0.837
356.8	0.490	9.6	0.781	18	320	1.3	7.1	1.4	28	366	0.963
357.5	0.659	9.6	0.572	21	347	1.3	9.5	1.0	32	397	0.931
358.2	0.490	11	0.436	23	337	0.875	7.1	0.795	35	385	0.638
358.9	0.490	10	0.690	28	308	2.0	7.1	1.3	43	352	1.5
359.6	0.490	11	0.534	30	354	1.4	7.1	0.974	45	405	1.0
360.3	0.490	10	0.883	28	366	1.6	7.1	1.6	43	419	1.2
361.0	0.490	10	1.1	26	296	2.1	7.1	2.0	40	338	1.5
361.7	0.490	10	0.949	26	309	1.3	7.1	1.7	40	354	0.921
362.4	0.490	9.8	0.784	26	285	0.854	7.1	1.4	40	325	0.623
363.1	0.490	9.4	0.753	26	382	1.2	7.1	1.4	41	437	0.881
363.8	0.490	7.9	0.776	32	380	1.7	7.1	1.4	49	435	1.2
364.5	0.490	10	0.956	30	383	1.4	7.1	1.7	45	438	0.991
365.2	0.490	9.4	0.618	30	370	1.0	7.1	1.1	45	423	0.755
365.9	0.490	8.7	0.737	31	366	1.8	7.1	1.3	48	418	1.3
366.6	0.490	8.2	0.631	26	332	1.4	7.1	1.2	40	380	1.0
367.3	0.490	7.6	0.874	28	301	1.4	7.1	1.6	44	344	0.994
368.0	0.490	7.3	0.705	29	356	1.9	7.1	1.3	44	407	1.4
368.7	0.490	10	0.667	24	311	1.2	7.1	1.2	37	356	0.841
369.4	0.490	8.4	0.972	26	433	1.6	7.1	1.8	40	495	1.1
370.1	0.490	8.4	0.631	25	378	0.972	7.1	1.2	38	433	0.709
370.8	0.490	9.3	1.0	23	350	2.4	7.1	1.9	35	400	1.8
371.5	0.523	11	0.781	23	306	2.1	7.6	1.4	35	350	1.5
372.2	0.490	9.0	0.539	19	353	1.7	7.1	0.983	30	404	1.3
372.8	0.490	6.3	0.613	21	358	1.6	7.1	1.1	32	409	1.2
373.5	0.490	7.9	1.0	23	391	3.1	7.1	1.9	35	447	2.3
374.2	0.490	6.1	1.1	22	337	1.2	7.1	1.9	33	386	0.901
374.9	0.490	7.4	0.570	19	320	2.4	7.1	1.0	30	366	1.7
375.6	0.490	6.2	0.802	21	314	2.0	7.1	1.5	32	359	1.5
376.3	0.490	6.5	0.939	25	402	2.3	7.1	1.7	38	460	1.6
377.0	0.490	6.2	0.788	21	329	1.8	7.1	1.4	32	377	1.3
377.7	0.490	7.9	0.605	25	403	2.3	7.1	1.1	38	461	1.7
378.4	0.494	7.1	0.756	17	332	2.5	7.1	1.4	25	379	1.8
379.1	0.490	7.2	0.525	18	346	1.8	7.1	0.957	27	396	1.3
379.8	0.490	5.3	0.633	17	393	1.6	7.1	1.2	26	450	1.2
380.5	0.490	7.8	0.571	17	320	1.8	7.1	1.0	26	365	1.3
381.2	0.490	8.2	0.732	17	343	1.9	7.1	1.3	26	393	1.4
381.9	0.490	8.8	0.445	17	359	2.2	7.1	0.812	27	410	1.6
382.6	0.490	8.0	0.358	15	347	2.3	7.1	0.653	23	396	1.7
383.3	0.573	7.4	0.440	19	368	2.1	8.3	0.802	30	420	1.5
384.0	0.490	6.8	0.373	15	336	0.879	7.1	0.680	22	384	0.641
384.7	0.490	9.0	0.370	14	323	2.8	7.1	0.675	21	369	2.0
385.4	0.490	6.6	0.431	13	334	1.7	7.1	0.787	20	382	1.3
386.1	0.490	6.3	0.282	12	345	0.965	7.1	0.514	19	395	0.704
386.8	0.490	6.0	0.373	13	304	1.3	7.1	0.680	21	347	0.958
387.5	0.490	12	0.215	16	333	1.3	7.1	0.392	25	381	0.978
388.2	0.490	8.0	0.236	13	320	1.5	7.1	0.430	21	366	1.1
388.9	0.490	6.0	0.362	12	294	1.8	7.1	0.660	19	336	1.3
389.6	0.490	6.8	0.190	8.9	308	0.752	7.1	0.347	14	352	0.548
390.3	0.490	6.7	0.136	12	304	1.2	7.1	0.248	19	347	0.878
391.0	0.490	8.2	0.366	14	300	1.6	7.1	0.667	21	344	1.2
391.7	0.490	7.0	0.086	12	320	1.9	7.1	0.158	19	366	1.4
392.4	0.490	5.9	0.327	15	325	1.7	7.1	0.597	23	372	1.2
393.1	0.578	7.0	0.381	11	324	1.2	8.3	0.694	17	371	0.894
393.8	0.490	6.5	0.102	11	327	1.4	7.1	0.186	17	374	1.1
394.5	0.490	8.1	0.182	16	350	1.4	7.1	0.332	25	400	1.0
395.2	0.490	7.0	0.167	13	290	1.2	7.1	0.305	20	332	0.880



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
395.9	0.490	8.1	0.528	19	317	1.2	7.1	0.963	29	363	0.860
396.6	0.490	8.2	0.306	16	333	1.2	7.1	0.559	24	381	0.854
397.3	0.490	8.1	0.503	18	283	0.998	7.1	0.918	27	324	0.728
398.0	0.490	8.5	0.414	16	321	0.922	7.1	0.755	24	367	0.673
398.6	0.490	8.7	0.395	15	284	0.968	7.1	0.720	23	324	0.706
399.3	0.490	7.4	0.527	18	295	1.4	7.1	0.961	27	338	1.0
400.0	0.490	9.8	0.423	22	314	0.719	7.1	0.772	34	359	0.525
400.7	0.490	8.7	0.404	21	334	2.1	7.1	0.737	32	381	1.5
401.4	0.490	9.4	0.505	25	336	1.4	7.1	0.921	38	384	1.1
402.1	0.490	7.4	0.435	26	346	0.739	7.1	0.793	40	396	0.539
402.8	0.490	8.7	0.227	20	256	1.2	7.1	0.415	31	292	0.853
403.5	0.490	10	0.535	23	324	2.4	7.1	0.976	35	370	1.7
404.2	0.490	8.7	0.511	28	325	1.0	7.1	0.932	42	371	0.762
404.9	0.490	10	0.377	24	301	1.9	7.1	0.687	37	344	1.4
405.6	0.490	8.8	0.573	25	302	1.2	7.1	1.0	39	345	0.901
406.3	0.645	8.8	0.832	22	330	1.9	9.3	1.5	33	378	1.4
407.0	0.490	9.1	0.467	25	323	0.780	7.1	0.851	38	369	0.569
407.7	0.490	11	0.799	29	309	0.830	7.1	1.5	45	353	0.606
408.4	0.490	11	0.846	28	257	1.4	7.1	1.5	44	293	1.0
409.1	0.490	9.6	0.485	35	321	0.998	7.1	0.884	54	367	0.728
409.8	0.490	11	0.930	31	320	1.3	7.1	1.7	47	366	0.933
410.5	0.490	10	0.770	32	305	1.2	7.1	1.4	49	349	0.876
411.2	0.490	12	0.710	35	389	1.2	7.1	1.3	54	445	0.911
411.9	0.807	11	0.898	42	394	1.6	12	1.6	64	451	1.2
412.6	0.490	10	0.594	32	336	1.5	7.1	1.1	49	384	1.1
413.3	0.490	7.7	0.682	30	289	1.7	7.1	1.2	47	331	1.2
414.0	0.490	10	0.826	31	276	0.702	7.1	1.5	47	316	0.512
414.7	0.490	11	0.769	34	299	1.5	7.1	1.4	53	342	1.1
415.4	0.490	10	0.829	37	310	1.9	7.1	1.5	56	354	1.4
416.1	0.490	10	0.764	37	343	1.3	7.1	1.4	57	392	0.983
416.8	0.624	10	0.895	40	301	1.3	9.0	1.6	62	344	0.950
417.5	0.490	11	0.722	38	296	1.5	7.1	1.3	59	339	1.1
418.2	0.490	8.5	0.807	36	287	1.7	7.1	1.5	56	329	1.2
418.9	0.625	9.0	0.834	42	330	1.0	9.0	1.5	64	377	0.747
419.6	0.490	9.8	0.713	32	331	1.3	7.1	1.3	49	379	0.929
420.3	0.490	8.6	0.719	32	278	1.1	7.1	1.3	50	317	0.803
421.0	0.490	12	0.921	46	309	2.2	7.1	1.7	71	354	1.6
421.7	0.490	8.3	0.668	35	286	1.4	7.1	1.2	53	327	1.1
422.4	0.490	8.1	1.1	37	301	1.5	7.1	1.9	56	344	1.1
423.1	0.490	8.0	0.790	37	297	1.4	7.1	1.4	57	340	1.0
423.8	0.490	7.7	0.743	37	325	2.0	7.1	1.4	57	371	1.5
424.5	0.490	11	0.753	42	365	1.8	7.1	1.4	64	418	1.3
425.2	0.490	13	0.507	39	338	1.5	7.1	0.925	60	386	1.1
425.8	0.490	7.9	0.513	34	309	1.7	7.1	0.935	51	354	1.3
426.5	0.490	8.4	0.727	34	293	1.8	7.1	1.3	52	336	1.3
427.2	0.490	9.1	1.1	39	315	2.0	7.1	1.9	59	361	1.4
427.9	0.490	7.2	0.819	39	355	2.1	7.1	1.5	60	406	1.5
428.6	0.490	8.8	0.915	33	316	1.9	7.1	1.7	51	361	1.4
429.3	0.490	8.2	0.559	31	312	2.0	7.1	1.0	47	357	1.5
430.0	0.490	8.4	1.4	35	320	1.7	7.1	2.5	54	365	1.2
430.7	0.490	7.6	0.514	33	370	2.9	7.1	0.938	51	423	2.1
431.4	0.490	7.4	0.525	28	271	2.3	7.1	0.957	44	310	1.6
432.1	0.490	7.3	0.812	30	332	1.5	7.1	1.5	46	380	1.1
432.8	0.490	7.6	0.589	31	302	1.6	7.1	1.1	47	345	1.2
433.5	0.490	6.4	0.657	29	337	2.3	7.1	1.2	44	385	1.6
434.2	0.490	7.6	0.993	33	358	2.2	7.1	1.8	51	410	1.6
434.9	0.490	8.4	0.918	28	298	2.2	7.1	1.7	43	341	1.6
435.6	0.490	6.6	0.768	27	303	2.2	7.1	1.4	42	347	1.6
436.3	0.490	6.0	0.560	25	289	1.5	7.1	1.0	38	330	1.1
437.0	0.490	6.5	0.507	22	329	1.9	7.1	0.925	34	376	1.4
437.7	0.490	7.6	0.783	27	355	2.4	7.1	1.4	41	405	1.8
438.4	0.490	7.4	0.987	25	314	1.9	7.1	1.8	38	360	1.4
439.1	0.490	6.1	0.629	22	320	1.9	7.1	1.1	34	366	1.4
439.8	0.490	7.7	0.706	19	341	1.8	7.1	1.3	30	390	1.3
440.5	0.490	6.6	0.664	19	330	1.6	7.1	1.2	28	377	1.1
441.2	0.490	7.2	0.790	20	306	2.2	7.1	1.4	30	350	1.6
441.9	0.490	6.8	0.635	18	293	1.9	7.1	1.2	27	335	1.4
442.6	0.490	5.0	0.821	18	306	2.5	7.1	1.5	28	350	1.8
443.3	0.490	6.6	0.515	15	317	2.0	7.1	0.939	23	363	1.5
444.0	0.490	7.7	0.469	14	325	1.6	7.1	0.856	21	371	1.2
444.7	0.490	6.1	0.400	16	299	1.1	7.1	0.730	25	341	0.782
445.4	0.490	7.8	0.561	14	291	1.3	7.1	1.0	22	333	0.979
446.1	0.490	6.0	0.533	11	281	1.3	7.1	0.971	17	322	0.964
446.8	0.490	8.7	0.691	16	308	1.9	7.1	1.3	25	352	1.4
447.5	0.490	6.7	0.384	15	284	1.7	7.1	0.700	23	324	1.2
448.2	0.490	8.1	0.532	16	312	2.3	7.1	0.971	25	357	1.7
448.9	0.490	7.4	0.306	14	293	1.9	7.1	0.557	22	335	1.4
449.6	0.490	6.4	0.386	11	315	1.6	7.1	0.705	17	360	1.2
450.3	0.490	8.7	0.699	14	317	1.5	7.1	1.3	21	362	1.1
451.0	0.490	7.0	0.512	11	359	1.8	7.1	0.934	17	411	1.3
451.7	0.490	11	0.542	14	309	1.5	7.1	0.988	21	353	1.1



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
452.3	0.490	5.8	0.260	17	306	1.4	7.1	0.474	26	350	1.0
453.0	0.490	6.8	0.312	18	318	1.4	7.1	0.568	28	364	1.0
453.7	0.490	6.6	0.508	16	328	1.4	7.1	0.927	24	375	1.0
454.4	0.610	6.7	0.402	17	297	1.1	8.8	0.733	26	340	0.799
455.1	0.542	6.0	0.436	13	272	2.3	7.8	0.796	20	312	1.7
455.8	0.490	8.5	0.276	14	314	1.4	7.1	0.503	22	359	1.0
456.5	0.490	7.6	0.426	16	310	1.0	7.1	0.778	25	354	0.757
457.2	0.490	8.5	0.460	18	330	1.2	7.1	0.839	28	377	0.885
457.9	0.490	7.2	0.353	17	300	1.4	7.1	0.644	26	343	1.0
458.6	0.490	7.5	0.259	19	298	1.1	7.1	0.473	29	340	0.778
459.3	0.490	10	0.341	20	298	1.8	7.1	0.622	30	341	1.3
460.0	0.490	6.7	0.253	15	265	1.2	7.1	0.462	23	303	0.886
460.7	0.490	8.4	0.486	20	324	1.4	7.1	0.887	30	370	1.0
461.4	0.490	7.8	0.405	23	314	0.860	7.1	0.739	36	359	0.627
462.1	0.490	8.9	0.317	24	289	1.6	7.1	0.579	37	330	1.2
462.8	0.490	8.2	0.618	20	356	1.2	7.1	1.1	30	407	0.872
463.5	0.490	9.0	0.412	24	312	0.870	7.1	0.751	37	357	0.635
464.2	0.490	8.4	0.377	23	285	0.973	7.1	0.687	36	326	0.710
464.9	0.490	10	0.453	26	274	1.3	7.1	0.826	39	313	0.913
465.6	0.490	7.7	0.509	21	284	0.611	7.1	0.929	32	325	0.446
466.3	0.490	9.6	0.449	25	293	1.2	7.1	0.819	39	335	0.864
467.0	0.490	8.3	0.476	22	307	1.2	7.1	0.868	34	351	0.904
467.7	0.490	9.4	0.178	29	332	0.791	7.1	0.325	45	380	0.577
468.4	0.490	9.5	0.493	26	266	1.6	7.1	0.899	41	304	1.2
469.1	0.490	8.3	0.362	26	268	0.933	7.1	0.659	40	306	0.681
469.8	0.490	9.5	0.557	25	345	1.4	7.1	1.0	39	394	1.0
470.5	0.490	8.6	0.627	33	319	1.4	7.1	1.1	50	365	1.0
471.2	0.575	9.0	0.575	32	271	1.4	8.3	1.0	48	310	1.000
471.9	0.490	9.1	0.596	24	259	1.2	7.1	1.1	37	296	0.857
472.6	0.490	8.2	0.516	33	294	0.797	7.1	0.941	50	336	0.581
473.3	0.490	9.3	0.628	30	302	1.3	7.1	1.1	46	345	0.955
474.0	0.490	9.0	0.628	33	335	0.633	7.1	1.1	50	383	0.461
474.7	0.490	8.3	0.354	30	298	1.3	7.1	0.646	45	341	0.949
475.4	0.610	8.0	0.570	33	279	1.5	8.8	1.0	50	319	1.1
476.1	0.490	8.5	0.602	32	278	0.716	7.1	1.1	49	318	0.522
476.8	0.490	8.8	0.591	32	313	0.527	7.1	1.1	50	358	0.384
477.5	0.490	8.9	0.689	37	288	0.791	7.1	1.3	57	330	0.577
478.2	0.490	8.8	0.694	29	254	0.652	7.1	1.3	45	291	0.476
478.8	0.516	7.8	0.640	31	284	1.3	7.4	1.2	48	324	0.921
479.5	0.490	8.0	0.543	33	307	0.919	7.1	0.990	51	352	0.671
480.2	0.490	7.8	0.637	29	341	1.1	7.1	1.2	45	390	0.803
480.9	0.490	9.1	0.267	40	299	1.3	7.1	0.488	61	342	0.931
481.6	0.490	8.4	0.551	30	273	1.0	7.1	1.0	46	313	0.743
482.3	0.490	6.7	0.832	23	258	0.807	7.1	1.5	35	295	0.589
483.0	0.490	8.7	0.823	33	310	1.0	7.1	1.5	51	354	0.738
483.7	0.490	9.0	0.761	30	287	1.7	7.1	1.4	47	328	1.2
484.4	0.490	9.5	0.650	34	293	0.791	7.1	1.2	52	335	0.577
485.1	0.490	8.9	0.796	30	278	0.954	7.1	1.5	45	317	0.696
485.8	0.490	8.5	0.332	29	331	1.7	7.1	0.605	44	378	1.2
486.5	0.669	9.4	0.559	33	387	1.8	9.7	1.0	50	443	1.3
487.2	0.490	9.6	0.718	32	320	1.4	7.1	1.3	49	365	1.0
487.9	0.490	7.5	0.735	85	426	0.820	7.1	1.3	130	487	0.598
488.6	0.490	9.7	0.739	33	296	1.7	7.1	1.3	51	339	1.2
489.3	0.490	7.5	0.697	27	339	1.8	7.1	1.3	41	388	1.3
490.0	0.490	8.8	0.718	27	317	1.4	7.1	1.3	42	362	1.0
490.7	0.490	7.8	0.692	32	289	1.3	7.1	1.3	50	330	0.945
491.4	0.490	7.4	0.529	27	297	1.0	7.1	0.965	41	339	0.758
492.1	0.490	9.6	0.557	24	290	1.0	7.1	1.0	36	332	0.740
492.8	0.490	5.1	0.837	22	330	0.956	7.1	1.5	33	377	0.698
493.5	0.490	7.3	0.553	34	363	1.4	7.1	1.0	53	415	1.0
494.2	0.490	8.2	0.643	28	305	1.1	7.1	1.2	42	349	0.837
494.9	0.490	6.8	0.485	26	321	1.2	7.1	0.885	39	367	0.893
495.6	0.490	7.5	0.545	25	304	1.2	7.1	0.995	39	348	0.888
496.3	0.490	9.0	0.797	24	345	1.2	7.1	1.5	37	394	0.842
497.0	0.490	7.9	0.851	25	302	1.4	7.1	1.6	38	345	1.0
497.7	0.641	8.9	0.578	27	288	2.4	9.3	1.1	42	329	1.7
498.4	0.490	8.0	0.573	24	302	1.0	7.1	1.0	37	346	0.733
499.1	0.502	6.1	0.607	23	275	1.1	7.2	1.1	35	315	0.791
499.8	0.490	8.0	0.462	20	311	1.1	7.1	0.842	31	355	0.820
500.5	0.490	7.3	0.661	19	307	1.6	7.1	1.2	28	351	1.2
501.2	0.490	7.9	0.512	23	310	1.6	7.1	0.934	34	355	1.2
501.9	0.490	8.3	0.513	23	298	2.1	7.1	0.936	35	340	1.5
502.6	0.490	7.2	0.526	21	296	0.918	7.1	0.959	32	339	0.670
503.3	0.490	6.1	0.808	22	347	1.6	7.1	1.5	33	397	1.1
504.0	0.490	8.9	0.539	22	368	1.8	7.1	0.983	34	421	1.3
504.6	0.490	9.7	0.464	23	318	0.900	7.1	0.847	36	364	0.657
505.3	0.490	6.5	0.374	19	313	0.878	7.1	0.682	29	358	0.641
506.0	0.490	6.9	0.495	19	284	1.3	7.1	0.903	29	325	0.930
506.7	0.490	8.6	0.523	20	312	1.5	7.1	0.954	31	357	1.1
507.4	0.490	8.6	0.653	23	267	1.7	7.1	1.2	35	305	1.3
508.1	0.490	8.4	0.404	19	300	1.0	7.1	0.737	30	343	0.761



Minnow Environmental  
Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.8	0.490	6.4	0.530	17	301	1.8	7.1	0.966	26	344	1.3
509.5	0.490	7.4	0.634	19	301	1.7	7.1	1.2	29	344	1.2
510.2	0.490	9.2	0.548	22	318	1.9	7.1	1.000	34	363	1.4
510.9	0.490	8.7	0.426	19	295	0.777	7.1	0.777	29	337	0.567
511.6	0.490	8.2	0.287	20	295	0.638	7.1	0.523	30	337	0.466
512.3	0.490	6.9	0.538	17	257	1.4	7.1	0.982	26	294	1.0
513.0	0.490	8.0	0.378	20	359	1.3	7.1	0.690	31	411	0.957
513.7	0.490	8.3	0.538	23	323	1.4	7.1	0.981	35	370	1.1
514.4	0.490	8.0	0.554	24	274	1.6	7.1	1.0	37	313	1.2
515.1	0.490	7.2	0.369	21	283	1.4	7.1	0.673	32	324	1.0
515.8	0.490	7.7	0.422	22	349	1.1	7.1	0.769	34	399	0.784
516.5	0.490	9.7	0.098	20	313	1.3	7.1	0.178	31	358	0.947
517.2	0.490	7.5	0.423	21	281	1.5	7.1	0.772	32	321	1.1
517.9	0.490	8.7	0.262	22	275	0.835	7.1	0.479	34	314	0.609
518.6	0.490	7.5	0.488	22	282	1.0	7.1	0.890	34	322	0.763
519.3	0.490	8.3	0.334	20	281	1.1	7.1	0.609	30	322	0.785
520.0	0.490	8.0	0.395	22	282	1.7	7.1	0.720	34	323	1.2
520.7	0.552	8.9	0.690	28	320	1.3	8.0	1.3	43	366	0.943
521.4	0.490	7.4	0.429	24	263	1.2	7.1	0.783	37	301	0.851
522.1	0.490	8.5	0.623	19	291	0.897	7.1	1.1	30	333	0.655
522.8	0.490	8.3	0.538	26	275	0.645	7.1	0.980	41	314	0.471
523.5	0.490	8.8	0.600	29	293	1.4	7.1	1.1	44	335	1.0
524.2	0.490	8.1	0.626	24	273	1.3	7.1	1.1	36	313	0.921
524.9	0.490	7.5	0.398	23	269	0.845	7.1	0.726	36	307	0.617
525.6	0.490	7.1	0.605	22	291	1.4	7.1	1.1	33	332	1.0
526.3	0.490	9.5	0.725	24	275	1.0	7.1	1.3	37	315	0.742
527.0	0.490	12	0.745	26	290	1.1	7.1	1.4	39	332	0.785
527.7	0.730	9.1	0.416	27	270	0.834	11	0.758	42	309	0.609
528.4	0.490	9.4	0.533	29	314	1.2	7.1	0.971	45	359	0.867
529.1	0.490	7.2	0.367	23	287	1.9	7.1	0.669	35	328	1.4
529.8	0.490	8.6	0.551	26	308	0.661	7.1	1.0	41	352	0.482
530.5	0.490	8.8	0.572	28	308	1.6	7.1	1.0	43	352	1.1
531.1	0.490	9.4	0.867	27	307	1.7	7.1	1.6	42	351	1.2
531.8	0.490	7.9	0.753	29	280	1.1	7.1	1.4	45	320	0.818
532.5	0.490	7.6	0.672	32	289	1.3	7.1	1.2	49	330	0.957
533.2	0.490	7.6	0.644	27	302	1.9	7.1	1.2	42	345	1.4
533.9	0.490	8.1	0.897	28	274	2.1	7.1	1.6	43	313	1.5
534.6	0.490	8.2	0.743	35	312	1.6	7.1	1.4	54	357	1.2
535.3	0.490	6.8	0.410	26	282	1.0	7.1	0.749	41	323	0.734
536.0	0.490	8.9	0.819	30	324	1.5	7.1	1.5	46	370	1.1
536.7	0.490	9.4	0.808	36	386	1.3	7.1	1.5	56	441	0.929
537.4	0.490	9.3	0.747	31	307	1.7	7.1	1.4	48	351	1.3
538.1	0.490	7.9	0.928	28	317	1.3	7.1	1.7	42	363	0.914
538.8	0.764	7.5	0.830	25	299	1.6	11	1.5	38	342	1.2
539.5	0.490	9.6	0.858	27	316	1.6	7.1	1.6	41	361	1.2
540.2	0.490	7.9	0.953	31	272	1.6	7.1	1.7	48	311	1.2
540.9	0.490	9.1	0.872	36	318	1.5	7.1	1.6	55	364	1.1
541.6	0.490	9.6	0.899	32	326	1.5	7.1	1.6	49	373	1.1
542.3	0.490	6.5	1.4	27	317	1.9	7.1	2.5	42	362	1.4
543.0	0.490	7.4	0.948	31	350	2.1	7.1	1.7	47	401	1.5
543.7	0.490	8.6	1.1	31	291	2.6	7.1	2.0	48	333	1.9
544.4	0.490	9.2	1.2	34	334	2.2	7.1	2.3	52	382	1.6
545.1	0.490	6.8	0.982	28	292	1.8	7.1	1.8	43	334	1.3
545.8	0.490	6.7	1.0	31	273	2.0	7.1	1.9	48	312	1.5
546.5	0.490	9.2	1.7	33	340	1.4	7.1	3.2	50	389	1.1
547.2	0.721	8.7	1.4	39	323	2.2	10	2.5	59	369	1.6
547.9	0.490	7.7	1.2	34	331	2.3	7.1	2.3	52	379	1.7
548.6	0.490	7.4	1.3	30	342	1.8	7.1	2.3	45	391	1.3
549.3	0.490	7.5	1.4	28	320	2.4	7.1	2.5	43	366	1.8
550.0	0.490	8.9	1.0	34	291	1.7	7.1	1.9	53	333	1.2
550.7	0.490	6.7	1.0	28	296	2.3	7.1	1.9	43	339	1.7
551.4	0.490	6.4	1.2	30	289	1.9	7.1	2.2	47	330	1.4
552.1	0.490	8.1	1.0	28	312	2.4	7.1	1.8	43	357	1.8
552.8	0.490	7.3	0.981	28	382	2.6	7.1	1.8	42	437	1.9
553.5	0.490	7.1	0.927	28	306	1.5	7.1	1.7	43	350	1.1
554.2	0.490	7.4	0.753	28	297	1.4	7.1	1.4	43	339	1.0
554.9	0.490	6.8	1.2	28	328	2.4	7.1	2.1	43	375	1.7
555.6	0.490	6.6	0.718	24	289	1.7	7.1	1.3	37	330	1.3
556.3	0.490	6.5	0.875	29	351	1.8	7.1	1.6	44	402	1.3
556.9	0.490	7.6	1.2	25	303	1.5	7.1	2.1	39	346	1.1
557.6	0.490	7.8	0.984	30	333	1.9	7.1	1.8	46	381	1.4
558.3	0.659	7.3	0.770	24	350	2.0	9.5	1.4	36	400	1.5
559.0	0.490	6.9	0.660	25	310	2.2	7.1	1.2	39	355	1.6
559.7	0.490	7.1	0.694	21	284	2.2	7.1	1.3	33	325	1.6
560.4	0.490	7.7	0.688	32	332	2.0	7.1	1.3	48	379	1.5
561.1	0.490	6.5	0.588	27	345	0.806	7.1	1.1	41	395	0.588
561.8	0.490	7.0	0.686	23	293	2.2	7.1	1.3	35	335	1.6
562.5	0.490	7.0	0.579	25	348	2.2	7.1	1.1	39	398	1.6
563.2	0.632	5.9	0.612	25	339	1.4	9.1	1.1	38	387	1.0
563.9	0.490	6.5	0.362	28	304	1.6	7.1	0.660	42	348	1.2
564.6	0.490	8.1	0.454	30	367	1.8	7.1	0.828	45	419	1.3



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Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
565.3	0.490	7.6	0.610	28	310	1.1	7.1	1.1	43	354	0.769
566.0	0.490	8.3	0.583	32	384	2.0	7.1	1.1	48	439	1.4
566.7	0.490	8.5	0.369	31	321	2.0	7.1	0.673	47	367	1.5
567.4	0.490	7.9	0.580	29	303	1.2	7.1	1.1	44	347	0.912
568.1	0.490	9.0	0.563	44	357	1.1	7.1	1.0	67	408	0.785
568.8	0.490	8.5	0.961	36	289	1.5	7.1	1.8	55	330	1.1
569.5	0.490	8.9	1.1	47	350	1.1	7.1	2.0	72	400	0.812
570.2	0.490	13	0.890	53	353	1.2	7.1	1.6	81	404	0.870
570.9	0.490	11	0.904	57	345	0.939	7.1	1.6	87	395	0.685
571.6	0.490	9.2	0.985	49	316	0.863	7.1	1.8	76	361	0.629
572.3	0.490	12	1.1	50	313	1.7	7.1	1.9	77	358	1.3
573.0	0.490	12	0.979	55	335	2.3	7.1	1.8	85	383	1.7
573.7	0.490	15	1.6	71	305	1.5	7.1	2.9	109	349	1.1
574.4	0.490	16	1.1	75	314	0.944	7.1	2.1	115	359	0.689
575.1	0.490	16	1.2	79	408	1.5	7.1	2.2	121	467	1.1
575.8	0.490	17	1.6	73	329	1.8	7.1	2.9	112	376	1.3
576.5	0.490	18	1.9	88	363	1.8	7.1	3.4	135	415	1.3
577.2	0.490	22	2.1	97	356	1.9	7.1	3.8	149	407	1.4
577.9	0.605	17	2.2	90	325	1.6	8.7	4.0	138	372	1.2
578.6	0.490	20	1.9	84	317	1.4	7.1	3.4	128	362	1.0
579.3	0.490	23	2.0	89	333	1.3	7.1	3.7	137	381	0.939
580.0	0.490	20	2.9	117	363	1.7	7.1	5.2	179	415	1.3
580.7	0.490	21	2.3	110	307	1.1	7.1	4.2	169	351	0.830
581.4	0.490	20	2.9	101	359	1.3	7.1	5.3	155	411	0.914
582.1	0.490	21	4.2	121	373	1.7	7.1	7.7	185	426	1.2
582.8	0.490	25	4.3	137	401	2.2	7.1	7.8	210	459	1.6
583.4	0.791	30	7.9	167	372	2.2	11	14	255	426	1.6
584.1	0.490	33	5.0	196	407	0.989	7.1	9.2	300	465	0.721
584.8	0.490	26	5.0	177	311	1.4	7.1	9.1	271	356	1.0
585.5	0.490	38	5.8	202	365	1.5	7.1	11	309	417	1.1
586.2	0.490	41	6.4	237	373	2.3	7.1	12	363	427	1.7
586.9	0.490	45	7.0	254	370	2.0	7.1	13	389	423	1.5
587.6	0.490	46	6.8	260	388	1.8	7.1	12	399	444	1.3
588.3	0.490	45	7.9	238	332	2.0	7.1	14	364	380	1.5
589.0	0.490	46	7.0	223	326	2.3	7.1	13	341	372	1.7
589.7	0.490	46	8.0	233	350	1.7	7.1	15	358	400	1.2
590.4	0.490	42	7.6	230	374	2.7	7.1	14	353	427	1.9
591.1	0.490	46	7.5	212	338	1.8	7.1	14	324	386	1.3
591.8	0.490	44	7.9	215	355	2.9	7.1	14	329	406	2.1
592.5	0.490	45	8.6	218	380	1.4	7.1	16	334	435	0.989
593.2	0.490	43	8.8	228	424	2.8	7.1	16	350	485	2.1
593.9	0.490	43	8.0	219	409	2.8	7.1	15	335	468	2.0
594.6	0.490	48	6.8	247	403	2.9	7.1	12	379	460	2.1
595.3	0.490	48	8.4	215	366	3.3	7.1	15	330	419	2.4
596.0	0.490	61	9.5	284	382	3.2	7.1	17	435	437	2.4
596.7	0.490	54	9.9	260	335	3.4	7.1	18	398	383	2.5
597.4	0.490	57	8.3	273	333	3.4	7.1	15	418	380	2.4
598.1	0.490	67	12	281	393	2.3	7.1	22	430	450	1.7
598.8	0.608	58	6.7	234	372	4.2	8.8	12	358	426	3.0
599.5	0.490	49	8.4	250	409	2.2	7.1	15	382	467	1.6
600.2	0.490	47	6.5	186	392	4.4	7.1	12	285	448	3.2
600.9	0.490	31	4.5	158	394	4.2	7.1	8.3	242	451	3.1
601.6	0.941	25	4.1	125	460	5.0	14	7.4	191	526	3.6
602.3	0.490	22	3.7	117	412	5.6	7.1	6.7	179	471	4.1
603.0	0.490	20	3.2	96	381	4.3	7.1	5.9	147	436	3.1
603.7	0.490	19	3.0	82	380	4.6	7.1	5.5	126	435	3.4
604.4	0.490	14	2.0	77	378	5.4	7.1	3.7	118	432	3.9
605.1	0.490	18	2.1	69	374	4.9	7.1	3.9	105	427	3.6
605.8	0.490	10	2.1	70	379	4.1	7.1	3.8	108	434	3.0
606.5	0.490	14	1.8	73	381	4.3	7.1	3.3	112	436	3.2
607.2	0.490	12	2.0	62	392	4.3	7.1	3.7	96	448	3.1
607.9	0.490	11	1.2	54	322	3.5	7.1	2.2	82	369	2.6
608.6	0.490	9.1	1.6	55	313	4.5	7.1	3.0	84	358	3.3
609.2	0.490	12	1.8	75	344	4.8	7.1	3.3	115	393	3.5
609.9	0.490	14	2.0	90	379	5.3	7.1	3.6	138	434	3.9
610.6	0.490	11	2.0	59	314	5.0	7.1	3.7	90	359	3.7
611.3	0.490	9.7	1.5	53	332	4.6	7.1	2.7	81	380	3.3
612.0	0.490	13	1.2	56	346	4.9	7.1	2.2	86	395	3.6
612.7	0.490	13	1.4	60	310	4.4	7.1	2.6	92	354	3.2
613.4	0.490	12	1.3	57	312	5.3	7.1	2.3	87	357	3.9
614.1	0.490	12	1.2	57	289	5.3	7.1	2.2	88	331	3.9
614.8	0.490	12	1.9	58	298	4.0	7.1	3.4	89	341	2.9
615.5	0.490	11	1.8	57	291	2.7	7.1	3.3	88	332	1.9
616.2	0.490	11	1.6	58	307	4.2	7.1	2.9	88	351	3.1
616.9	0.490	8.6	1.5	55	262	4.4	7.1	2.7	84	300	3.2
617.6	0.490	11	1.5	61	305	3.3	7.1	2.8	94	349	2.4
618.3	0.490	12	1.4	68	282	3.9	7.1	2.5	104	322	2.8
619.0	0.490	9.3	1.7	60	285	3.7	7.1	3.1	92	326	2.7
619.7	0.490	10	1.3	56	260	2.7	7.1	2.4	85	297	2.0
620.4	0.490	10	1.6	61	274	4.4	7.1	2.9	94	313	3.2
621.1	0.490	11	1.8	56	290	2.8	7.1	3.2	86	331	2.0



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.8	0.490	9.7	1.7	62	271	4.2	7.1	3.0	95	309	3.0
622.5	0.490	11	1.6	64	290	2.7	7.1	2.9	98	331	2.0
623.2	0.490	12	1.5	52	243	3.6	7.1	2.8	80	278	2.6
623.9	0.490	12	1.5	65	245	4.1	7.1	2.8	99	280	3.0
624.6	0.490	10	1.2	55	272	3.6	7.1	2.3	84	312	2.6
625.3	0.490	11	1.2	49	275	2.1	7.1	2.1	75	314	1.6
626.0	0.490	9.5	1.3	49	259	4.3	7.1	2.4	75	296	3.1
626.7	0.490	13	1.4	50	289	3.4	7.1	2.5	77	331	2.4
627.4	0.490	9.2	1.3	47	292	2.1	7.1	2.4	72	333	1.5
628.1	0.490	9.2	1.6	52	290	3.9	7.1	3.0	80	331	2.8
628.8	0.490	11	1.9	48	313	3.5	7.1	3.4	73	358	2.6
629.5	0.490	12	1.4	47	270	3.9	7.1	2.6	72	309	2.9
630.2	0.490	9.7	1.3	46	245	2.8	7.1	2.4	71	280	2.0
630.9	0.490	7.9	1.3	42	303	1.5	7.1	2.3	64	346	1.1
631.6	0.490	9.0	1.2	41	294	3.1	7.1	2.2	63	336	2.2
632.3	0.490	8.1	1.3	41	285	3.5	7.1	2.4	63	326	2.5
633.0	0.490	10	0.996	44	272	3.2	7.1	1.8	68	311	2.3
633.7	0.490	8.3	1.3	41	288	2.2	7.1	2.3	63	330	1.6
634.4	0.490	9.4	1.4	44	268	2.4	7.1	2.5	68	307	1.7
635.1	0.490	9.2	0.909	39	303	3.3	7.1	1.7	59	347	2.4
635.7	0.490	9.8	0.932	33	285	2.7	7.1	1.7	51	326	2.0
636.4	0.490	9.2	0.993	46	308	4.1	7.1	1.8	71	352	3.0
637.1	0.490	8.7	0.734	31	286	1.9	7.1	1.3	48	328	1.4
637.8	0.590	9.2	1.1	37	329	3.3	8.5	2.0	56	376	2.4
638.5	0.490	8.6	0.823	31	309	2.0	7.1	1.5	48	353	1.4
639.2	0.490	11	0.846	32	297	2.7	7.1	1.5	49	340	1.9
639.9	0.490	8.4	0.708	31	262	1.9	7.1	1.3	48	299	1.4
640.6	0.490	8.8	0.433	29	307	2.4	7.1	0.790	45	351	1.8
641.3	0.490	7.3	0.581	30	307	2.9	7.1	1.1	46	351	2.1
642.0	0.490	8.5	0.717	27	304	1.7	7.1	1.3	41	348	1.3
642.7	0.490	8.3	0.694	23	332	2.1	7.1	1.3	35	379	1.6
643.4	0.490	9.5	0.624	31	283	2.1	7.1	1.1	48	324	1.5
644.1	0.490	7.0	0.762	26	312	2.1	7.1	1.4	40	356	1.5
644.8	0.490	6.6	0.374	25	282	2.5	7.1	0.683	38	323	1.8
645.5	0.490	9.9	0.412	24	330	1.4	7.1	0.752	37	378	0.989
646.2	0.556	6.9	0.472	25	294	2.2	8.0	0.860	38	336	1.6
646.9	0.490	7.2	0.580	26	300	1.8	7.1	1.1	40	343	1.3
647.6	0.490	6.2	0.385	19	314	1.3	7.1	0.702	30	359	0.974
648.3	0.490	6.5	0.264	20	336	2.3	7.1	0.482	30	384	1.7
649.0	0.490	6.8	0.457	19	337	2.6	7.1	0.833	30	386	1.9
649.7	0.490	7.6	0.292	21	299	1.9	7.1	0.533	31	342	1.4
650.4	0.490	7.3	0.389	17	298	1.7	7.1	0.709	26	341	1.2
651.1	0.490	7.8	0.318	20	330	1.4	7.1	0.580	31	378	1.0
651.8	0.490	7.0	0.306	19	299	1.4	7.1	0.558	30	342	0.996
652.5	0.490	7.1	0.361	20	299	1.2	7.1	0.659	30	342	0.898
653.2	0.490	7.5	0.420	20	320	1.6	7.1	0.766	31	366	1.2
653.9	0.490	7.5	0.425	19	312	1.5	7.1	0.775	29	357	1.1
654.6	0.490	6.9	0.344	19	342	1.5	7.1	0.627	29	391	1.1
655.3	0.490	10	0.145	21	286	1.7	7.1	0.265	32	327	1.2
656.0	0.490	8.0	0.168	20	324	1.5	7.1	0.306	30	371	1.1
656.7	0.490	8.8	0.357	18	339	2.2	7.1	0.651	28	388	1.6
657.4	0.533	7.7	0.370	22	325	1.3	7.7	0.675	33	372	0.951
658.1	0.490	6.8	0.473	24	277	0.880	7.1	0.863	38	317	0.642
658.8	0.490	7.7	0.328	21	316	1.0	7.1	0.598	33	361	0.733
659.5	0.490	8.7	0.252	20	269	0.865	7.1	0.460	31	308	0.631
660.2	0.490	9.0	0.149	23	271	1.5	7.1	0.272	36	310	1.1
660.9	0.490	8.6	0.381	25	347	1.6	7.1	0.695	39	396	1.2
661.6	0.490	7.8	0.481	21	330	1.6	7.1	0.877	32	377	1.2
662.2	0.490	8.7	0.243	20	290	1.9	7.1	0.444	31	331	1.4
662.9	0.490	9.8	0.370	21	293	0.775	7.1	0.675	33	335	0.566
663.6	0.490	9.2	0.089	27	310	2.0	7.1	0.162	42	354	1.4
664.3	0.490	8.0	0.425	21	311	1.6	7.1	0.775	33	356	1.1
665.0	0.490	6.7	0.313	21	329	1.0	7.1	0.572	32	377	0.765
665.7	0.490	8.0	0.456	21	286	1.1	7.1	0.832	32	327	0.775
666.4	0.557	11	0.346	20	296	2.0	8.0	0.632	30	339	1.5
667.1	0.490	9.0	0.310	22	292	1.2	7.1	0.566	34	334	0.874
667.8	0.490	8.5	0.495	27	284	0.921	7.1	0.903	42	324	0.672
668.5	0.490	9.3	0.365	28	300	1.6	7.1	0.666	42	343	1.2
669.2	0.490	9.5	0.504	25	326	1.5	7.1	0.920	39	373	1.1
669.9	0.490	11	0.275	32	336	1.2	7.1	0.502	49	384	0.894
670.6	0.490	10	0.844	29	316	1.9	7.1	1.5	44	361	1.4
671.3	0.490	10	0.525	26	299	1.6	7.1	0.958	39	342	1.1
672.0	0.490	11	0.419	29	301	1.7	7.1	0.764	45	344	1.2
672.7	0.490	9.7	0.320	32	293	1.2	7.1	0.584	50	335	0.846
673.4	0.490	10	0.599	31	306	1.6	7.1	1.1	48	350	1.1
674.1	0.490	10	0.454	34	326	1.5	7.1	0.828	51	372	1.1
674.8	0.490	8.7	0.603	30	327	0.987	7.1	1.1	46	374	0.720
675.5	0.515	12	0.395	32	304	1.6	7.4	0.720	49	348	1.2
676.2	0.490	12	0.509	38	306	1.9	7.1	0.929	58	350	1.4
676.9	0.490	9.4	0.394	32	291	1.9	7.1	0.719	49	332	1.4
677.6	0.490	8.7	0.245	28	294	1.5	7.1	0.447	42	337	1.1



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
678.3	0.490	10	0.536	29	313	1.6	7.1	0.977	45	358	1.2
679.0	0.490	9.8	0.454	33	321	1.4	7.1	0.829	50	367	0.986
679.7	0.490	9.5	0.589	38	318	0.910	7.1	1.1	58	364	0.664
680.4	0.490	9.7	0.461	34	300	1.7	7.1	0.841	52	343	1.2
681.1	0.683	7.6	0.525	35	306	1.9	9.9	0.957	54	350	1.4
681.8	0.490	9.9	0.517	30	377	2.6	7.1	0.943	46	431	1.9
682.5	0.490	8.5	0.361	31	314	1.3	7.1	0.659	47	359	0.915
683.2	0.490	10	0.440	35	338	1.6	7.1	0.803	54	387	1.2
683.9	0.490	11	0.740	30	349	1.3	7.1	1.3	47	399	0.964
684.6	0.490	10.0	0.460	34	322	1.1	7.1	0.839	52	369	0.812
685.3	0.490	11	0.500	35	395	1.4	7.1	0.913	53	452	1.0
686.0	0.490	12	0.685	37	371	3.0	7.1	1.3	57	425	2.2
686.7	0.490	12	0.604	29	334	1.5	7.1	1.1	45	381	1.1
687.4	0.490	11	0.581	38	386	2.3	7.1	1.1	58	442	1.7
688.0	0.490	9.2	0.480	29	291	2.0	7.1	0.876	44	332	1.4
688.7	0.490	9.4	0.753	36	332	2.4	7.1	1.4	55	379	1.7
689.4	0.490	12	0.503	38	381	2.5	7.1	0.917	58	436	1.9
690.1	0.490	12	0.698	34	305	1.2	7.1	1.3	52	349	0.910
690.8	0.490	10	0.540	40	351	1.4	7.1	0.986	61	401	1.0
691.5	0.490	9.6	0.824	40	350	1.7	7.1	1.5	62	401	1.2
692.2	0.490	14	0.609	40	352	2.2	7.1	1.1	61	403	1.6
692.9	0.490	14	0.515	52	353	1.9	7.1	0.940	79	404	1.4
693.6	0.490	11	0.718	44	352	1.7	7.1	1.3	68	403	1.3
694.3	0.490	9.2	0.710	35	316	1.5	7.1	1.3	53	362	1.1
695.0	0.490	11	0.924	46	360	1.5	7.1	1.7	70	412	1.1
695.7	0.490	11	0.977	51	388	1.8	7.1	1.8	78	444	1.3
696.4	0.490	12	0.655	46	330	1.6	7.1	1.2	70	378	1.2
697.1	0.490	9.0	0.560	41	330	1.7	7.1	1.0	62	378	1.3
697.8	0.490	11	0.528	39	359	0.981	7.1	0.962	60	411	0.715
698.5	0.490	13	0.964	44	351	2.0	7.1	1.8	68	402	1.4
699.2	0.490	9.9	0.782	42	316	1.6	7.1	1.4	64	362	1.2
699.9	0.490	11	0.569	46	367	1.3	7.1	1.0	70	419	0.963
700.6	0.490	8.1	0.880	35	382	1.4	7.1	1.6	54	437	1.0
701.3	0.490	11	0.872	40	319	2.1	7.1	1.6	62	365	1.6
702.0	0.490	15	0.804	39	387	1.6	7.1	1.5	60	443	1.1
702.7	0.490	12	0.579	39	371	1.7	7.1	1.1	60	424	1.2
703.4	0.490	14	0.829	44	395	2.2	7.1	1.5	68	451	1.6
704.1	0.490	10	1.4	41	334	2.1	7.1	2.5	63	382	1.5
704.8	0.490	14	0.867	43	384	1.5	7.1	1.6	66	439	1.1
705.5	0.490	11	1.1	40	353	1.5	7.1	2.0	62	404	1.1
706.2	0.490	11	0.766	42	353	2.0	7.1	1.4	64	403	1.5
706.9	0.490	12	0.839	45	348	2.2	7.1	1.5	70	398	1.6
707.6	0.490	11	0.784	35	314	2.1	7.1	1.4	54	360	1.5
708.3	0.490	12	1.0	38	323	1.6	7.1	1.8	58	369	1.2
709.0	0.490	13	0.818	44	372	2.1	7.1	1.5	67	426	1.6
709.7	0.490	12	0.960	46	354	1.8	7.1	1.8	70	405	1.3
710.4	0.490	11	0.742	39	337	1.6	7.1	1.4	60	386	1.1
711.1	0.490	13	1.0	33	363	2.1	7.1	1.8	50	415	1.5
711.8	0.490	11	1.1	40	369	1.9	7.1	2.0	61	422	1.4
712.5	0.490	12	1.1	40	332	2.0	7.1	2.1	61	380	1.5
713.2	0.490	11	0.963	40	305	2.2	7.1	1.8	61	349	1.6
713.9	0.490	9.6	0.737	30	289	2.0	7.1	1.3	46	330	1.4
714.5	0.490	12	0.655	33	347	1.7	7.1	1.2	51	397	1.2
715.2	0.557	12	0.853	37	316	1.0	8.0	1.6	57	361	0.731
715.9	0.490	12	1.0	37	338	1.5	7.1	1.9	57	386	1.1
716.6	0.490	11	0.801	36	344	2.3	7.1	1.5	55	394	1.6
717.3	0.490	9.4	0.849	33	315	1.2	7.1	1.5	51	361	0.851
718.0	0.896	9.8	0.606	27	319	1.6	13	1.1	42	364	1.2
718.7	0.490	12	0.872	35	356	1.5	7.1	1.6	54	407	1.1
719.4	0.490	11	0.292	31	300	1.5	7.1	0.532	47	343	1.1
720.1	0.490	12	0.662	27	294	1.4	7.1	1.2	41	336	1.0
720.8	0.490	11	0.356	29	366	1.5	7.1	0.649	44	418	1.1
721.5	0.490	10	0.504	24	344	1.1	7.1	0.919	37	393	0.820
722.2	0.490	9.9	0.318	28	316	2.0	7.1	0.580	42	361	1.5
722.9	0.490	12	0.384	25	282	2.0	7.1	0.701	38	322	1.5
723.6	0.490	12	0.519	27	295	1.4	7.1	0.947	41	337	0.987
724.3	0.490	10	0.408	26	333	1.2	7.1	0.744	40	381	0.885
725.0	0.490	9.2	0.292	27	294	1.6	7.1	0.532	41	336	1.1
725.7	0.490	8.7	0.481	30	313	2.0	7.1	0.877	45	358	1.5
726.4	0.712	10.0	0.452	32	347	1.5	10	0.824	49	396	1.1
727.1	0.490	9.7	0.381	28	342	0.850	7.1	0.695	43	391	0.620
727.8	0.490	7.4	0.420	27	294	1.4	7.1	0.766	41	337	1.0
728.5	0.490	9.9	0.293	26	303	2.3	7.1	0.535	40	347	1.7
729.2	0.490	11	0.490	27	311	0.893	7.1	0.893	42	355	0.652
729.9	0.490	7.7	0.395	32	332	1.2	7.1	0.720	50	380	0.906
730.6	0.490	9.5	0.344	26	314	1.2	7.1	0.627	40	359	0.908
731.3	0.490	7.8	0.413	26	357	1.2	7.1	0.753	39	409	0.848
732.0	0.490	11	0.255	29	382	3.0	7.1	0.466	45	437	2.2
732.7	0.490	10	0.413	29	313	1.6	7.1	0.754	45	358	1.2
733.4	0.490	11	0.299	30	297	0.952	7.1	0.546	46	339	0.695
734.1	0.490	7.6	0.246	22	275	1.6	7.1	0.448	34	315	1.2



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
734.8	0.490	9.6	0.500	25	349	1.8	7.1	0.913	38	399	1.3
735.5	0.881	11	0.552	32	372	2.9	13	1.0	49	425	2.1
736.2	0.490	11	0.477	24	341	1.4	7.1	0.869	36	390	1.0
736.9	0.490	9.3	0.281	25	279	1.5	7.1	0.512	39	320	1.1
737.6	0.490	8.4	0.489	25	339	1.2	7.1	0.891	38	387	0.899
738.3	0.490	9.4	0.432	21	331	1.6	7.1	0.788	32	379	1.1
739.0	0.490	8.9	0.518	25	323	1.3	7.1	0.945	38	369	0.914
739.7	0.490	10	0.200	22	328	1.8	7.1	0.364	34	375	1.3
740.4	0.490	9.7	0.362	23	303	1.4	7.1	0.660	35	347	1.0
741.0	0.490	8.4	0.524	20	289	0.876	7.1	0.956	30	330	0.639
741.7	0.542	9.3	0.285	22	342	2.0	7.8	0.520	34	391	1.4
742.4	0.610	9.9	0.557	24	379	1.8	8.8	1.0	37	433	1.3
743.1	0.490	8.1	0.293	23	361	1.4	7.1	0.535	35	413	1.0
743.8	0.490	9.1	0.451	22	281	1.4	7.1	0.822	34	321	1.0
744.5	0.490	10	0.215	21	324	1.3	7.1	0.393	32	370	0.978
745.2	0.490	9.5	0.202	19	306	2.2	7.1	0.368	29	350	1.6
745.9	0.490	9.9	0.297	25	297	1.7	7.1	0.541	38	340	1.2
746.6	0.490	12	0.143	19	321	0.635	7.1	0.261	29	367	0.463
747.3	0.490	10	0.363	25	367	1.7	7.1	0.662	38	420	1.3
748.0	0.490	11	0.235	27	306	1.7	7.1	0.428	41	350	1.2
748.7	0.490	10.0	0.194	24	353	1.4	7.1	0.353	37	403	1.0
749.4	0.490	11	0.324	25	293	1.1	7.1	0.590	38	335	0.790
750.1	0.490	8.9	0.458	27	398	1.7	7.1	0.836	41	456	1.3
750.8	0.490	7.9	0.212	25	347	1.6	7.1	0.386	38	397	1.2
751.5	0.490	9.4	0.427	24	371	1.8	7.1	0.779	37	424	1.3
752.2	0.490	7.7	0.361	21	291	1.4	7.1	0.658	32	333	1.0
752.9	0.490	8.9	0.391	21	300	1.6	7.1	0.713	31	343	1.1
753.6	0.490	7.3	0.313	21	313	2.2	7.1	0.572	32	358	1.6
754.3	0.490	9.2	0.495	26	315	1.1	7.1	0.903	40	360	0.806
755.0	0.490	8.0	0.346	23	328	0.823	7.1	0.632	36	375	0.600
755.7	0.490	10	0.328	26	345	1.4	7.1	0.598	40	394	0.990
756.4	0.523	8.4	0.166	24	331	1.7	7.5	0.302	36	378	1.2
757.1	0.490	8.4	0.344	20	315	2.5	7.1	0.628	31	360	1.8
757.8	0.490	11	0.344	22	382	1.0	7.1	0.628	34	437	0.746
758.5	0.490	11	0.634	23	392	1.5	7.1	1.2	36	448	1.1
759.2	0.490	12	0.319	24	318	2.1	7.1	0.582	37	364	1.6
759.9	0.490	7.4	0.291	19	314	1.1	7.1	0.532	29	359	0.829
760.6	0.490	6.8	0.174	23	314	1.5	7.1	0.316	35	359	1.1
761.3	0.490	10	0.363	26	376	1.7	7.1	0.662	40	430	1.3
762.0	0.738	13	0.395	23	365	1.4	11	0.720	35	418	1.0
762.7	0.490	9.2	0.549	26	312	2.2	7.1	1.0	39	357	1.6
763.4	0.490	8.3	0.270	23	316	1.1	7.1	0.492	35	361	0.809
764.1	0.490	8.9	0.634	27	325	1.9	7.1	1.2	42	371	1.4
764.8	0.490	9.4	0.450	24	351	1.5	7.1	0.820	37	402	1.1
765.5	0.490	10.0	0.476	27	314	1.7	7.1	0.869	42	359	1.3
766.2	0.490	9.5	0.555	26	318	2.3	7.1	1.0	40	363	1.7
766.9	0.490	10	0.325	28	350	1.4	7.1	0.592	43	400	1.1
767.5	0.490	10.0	0.311	24	304	1.6	7.1	0.567	36	348	1.2
768.2	0.490	11	0.388	27	357	1.9	7.1	0.707	42	408	1.4
768.9	0.490	10	0.454	27	312	1.3	7.1	0.828	41	357	0.915
769.6	0.490	11	0.402	27	359	2.2	7.1	0.733	42	411	1.6
770.3	0.490	8.4	0.645	26	339	1.9	7.1	1.2	40	387	1.4
771.0	0.490	10	0.562	26	368	1.9	7.1	1.0	40	421	1.4
771.7	0.490	12	0.448	33	381	2.3	7.1	0.818	50	436	1.7
772.4	0.490	11	0.618	30	372	2.5	7.1	1.1	47	425	1.8
773.1	0.490	9.5	0.433	31	359	2.3	7.1	0.790	47	410	1.7
773.8	0.490	12	0.356	27	349	1.0	7.1	0.649	41	399	0.749
774.5	0.490	13	0.534	34	390	1.5	7.1	0.974	52	446	1.1
775.2	0.490	14	0.421	27	329	1.3	7.1	0.768	42	376	0.960
775.9	0.490	9.4	0.261	33	345	1.4	7.1	0.476	51	395	0.989
776.6	0.490	10	0.614	30	311	1.4	7.1	1.1	46	355	1.0
777.3	0.594	10	0.357	26	318	1.5	8.6	0.651	41	364	1.1
778.0	0.490	11	0.418	31	362	1.8	7.1	0.762	48	414	1.3
778.7	0.490	10	0.245	29	349	1.5	7.1	0.447	44	399	1.1
779.4	0.490	12	0.493	25	315	0.917	7.1	0.900	38	360	0.669
780.1	0.490	10	0.432	23	295	1.6	7.1	0.789	35	337	1.2
780.8	0.490	9.0	0.463	27	394	2.3	7.1	0.844	41	450	1.6
781.5	0.490	10	0.378	29	408	2.6	7.1	0.689	44	466	1.9
782.2	0.503	11	0.498	34	362	1.7	7.3	0.909	53	414	1.3
782.9	0.490	12	0.388	30	386	1.9	7.1	0.707	47	441	1.4
783.6	0.490	12	0.495	32	350	1.1	7.1	0.902	49	400	0.770
784.3	0.490	9.9	0.359	30	374	2.4	7.1	0.655	46	427	1.7
785.0	0.490	12	0.440	29	364	1.8	7.1	0.803	44	417	1.3
785.7	0.490	9.7	0.336	27	327	1.9	7.1	0.613	42	373	1.4
786.4	0.490	10	0.380	31	359	2.6	7.1	0.692	47	410	1.9
787.1	0.490	12	0.434	30	357	1.5	7.1	0.791	47	408	1.1
787.8	0.490	12	0.352	31	435	2.2	7.1	0.643	47	497	1.6
788.5	0.490	12	0.079	33	391	1.8	7.1	0.143	50	447	1.3
789.2	0.490	12	0.610	35	422	1.8	7.1	1.1	53	482	1.3
789.9	0.490	10	0.357	31	353	1.9	7.1	0.650	48	403	1.4
790.6	0.490	9.7	0.481	31	392	1.9	7.1	0.878	47	448	1.4



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
791.3	0.490	11	0.555	31	454	2.0	7.1	1.0	48	519	1.4
792.0	0.490	11	0.581	34	433	3.2	7.1	1.1	52	495	2.3
792.7	0.490	9.8	0.409	33	376	1.9	7.1	0.746	50	430	1.4
793.4	0.490	12	0.474	27	387	1.9	7.1	0.864	41	443	1.4
794.0	0.490	13	0.394	34	419	2.8	7.1	0.718	53	479	2.1
794.7	0.490	12	0.485	40	443	2.5	7.1	0.885	61	507	1.8
795.4	0.490	14	0.467	41	386	2.5	7.1	0.851	63	442	1.8
796.1	0.490	11	0.488	34	338	2.4	7.1	0.891	52	387	1.8
796.8	0.594	11	0.535	35	383	1.9	8.6	0.976	54	438	1.4
797.5	0.490	12	0.385	34	380	2.3	7.1	0.702	53	435	1.6
798.2	0.490	12	0.684	39	385	2.7	7.1	1.2	60	441	2.0
798.9	0.490	13	0.563	33	345	1.5	7.1	1.0	51	395	1.1
799.6	0.490	15	0.611	40	404	2.3	7.1	1.1	61	462	1.7
800.3	0.490	13	0.666	34	388	2.3	7.1	1.2	53	443	1.7
801.0	0.490	10	0.358	32	326	2.5	7.1	0.653	49	372	1.9
801.7	0.490	11	0.464	31	326	1.9	7.1	0.846	48	373	1.4
802.4	0.490	11	0.643	38	369	2.2	7.1	1.2	58	422	1.6
803.1	0.490	7.7	0.443	32	316	1.8	7.1	0.808	49	361	1.3
803.8	0.490	9.0	0.601	33	377	1.2	7.1	1.1	50	431	0.909
804.5	0.490	12	0.551	38	336	2.1	7.1	1.0	58	384	1.5
805.2	0.490	12	0.681	42	321	3.0	7.1	1.2	65	367	2.2
805.9	0.490	11	0.716	35	306	1.7	7.1	1.3	54	349	1.2
806.6	0.490	10.0	0.431	34	323	1.3	7.1	0.786	52	369	0.935
807.3	0.490	11	0.545	35	337	1.6	7.1	0.994	54	385	1.1
808.0	0.490	11	0.344	29	320	1.8	7.1	0.627	45	366	1.3
808.7	0.490	9.9	0.541	34	338	2.0	7.1	0.987	52	387	1.5
809.4	0.490	9.9	0.452	36	324	1.0	7.1	0.824	55	370	0.735
810.1	0.490	8.0	0.333	33	332	1.2	7.1	0.608	50	380	0.893
810.8	0.490	8.7	0.315	29	357	2.4	7.1	0.574	44	409	1.8
811.5	0.490	10	0.457	33	394	2.1	7.1	0.833	50	450	1.6
812.2	0.490	11	0.216	29	343	2.6	7.1	0.393	45	392	1.9
812.9	0.490	10	0.408	33	350	2.1	7.1	0.743	50	401	1.5
813.6	0.490	8.2	0.489	28	324	2.5	7.1	0.893	43	370	1.8
814.3	0.490	9.2	0.550	33	324	2.4	7.1	1.0	50	370	1.7
815.0	0.490	9.2	0.195	32	355	2.0	7.1	0.356	48	406	1.5
815.7	0.610	11	0.557	42	318	2.6	8.8	1.0	65	363	1.9
816.4	0.490	9.7	0.504	29	358	2.7	7.1	0.919	44	409	2.0
817.1	0.490	8.3	0.457	31	317	2.1	7.1	0.833	48	362	1.6
817.8	0.490	12	0.325	31	331	1.5	7.1	0.594	48	378	1.1
818.5	0.490	9.6	0.269	28	314	1.6	7.1	0.491	43	359	1.1
819.2	0.490	10	0.209	27	289	2.1	7.1	0.380	41	330	1.6
819.8	0.490	9.0	0.299	30	343	1.5	7.1	0.545	46	392	1.1
820.5	0.490	9.7	0.419	28	342	1.6	7.1	0.765	43	392	1.2
821.2	0.490	8.9	0.592	34	324	1.4	7.1	1.1	52	371	0.998
821.9	0.490	9.9	0.327	31	322	2.1	7.1	0.597	47	368	1.6
822.6	0.490	11	0.457	37	331	1.0	7.1	0.833	57	378	0.743
823.3	0.490	8.6	0.370	26	316	1.9	7.1	0.674	40	362	1.4
824.0	0.490	7.8	0.175	30	362	1.6	7.1	0.319	45	414	1.1
824.7	0.490	7.7	0.429	29	330	1.6	7.1	0.782	45	377	1.2
825.4	0.490	9.8	0.429	32	290	1.4	7.1	0.782	50	332	1.0
826.1	0.490	8.5	0.373	27	314	1.7	7.1	0.680	41	359	1.2
826.8	0.490	8.3	0.717	27	340	1.7	7.1	1.3	41	389	1.3
827.5	0.490	8.2	0.343	26	335	1.5	7.1	0.625	40	384	1.1
828.2	0.515	8.8	0.465	30	365	1.7	7.4	0.847	46	418	1.2
828.9	0.490	8.5	0.347	28	373	2.5	7.1	0.633	43	426	1.9
829.6	0.490	7.8	0.342	29	342	1.6	7.1	0.623	45	391	1.2
830.3	0.490	8.4	0.437	26	403	1.0	7.1	0.797	39	460	0.745
831.0	0.490	8.9	0.630	24	334	1.7	7.1	1.1	37	382	1.3
831.7	0.490	8.3	0.315	26	330	2.0	7.1	0.575	39	377	1.5
832.4	0.490	7.8	0.317	26	371	0.806	7.1	0.578	40	425	0.588
833.1	0.490	8.1	0.415	29	390	2.3	7.1	0.758	44	446	1.7
833.8	0.490	6.8	0.386	22	372	1.8	7.1	0.703	34	425	1.3
834.5	0.490	8.7	0.305	24	316	1.3	7.1	0.556	37	361	0.920
835.2	0.490	11	0.430	29	402	1.8	7.1	0.784	45	460	1.3
835.9	0.490	8.3	0.369	31	345	1.6	7.1	0.672	48	394	1.2
836.6	0.490	8.5	0.311	21	351	1.0	7.1	0.567	32	401	0.741
837.3	0.490	7.6	0.533	25	404	1.5	7.1	0.972	38	462	1.1
838.0	0.490	8.2	0.367	27	329	1.0	7.1	0.670	41	376	0.730
838.7	0.490	10	0.232	31	390	1.7	7.1	0.423	47	446	1.2
839.4	0.490	8.9	0.510	27	374	1.6	7.1	0.930	41	428	1.1
840.1	0.490	7.5	0.441	26	411	1.9	7.1	0.805	40	470	1.4
840.8	0.490	10	0.247	27	416	0.699	7.1	0.451	41	475	0.510
841.5	0.490	11	0.450	34	466	2.3	7.1	0.821	52	533	1.7
842.2	0.490	9.9	0.364	34	438	1.5	7.1	0.664	52	501	1.1
842.9	0.490	9.1	0.388	28	376	1.5	7.1	0.708	43	430	1.1
843.6	0.490	9.4	0.579	27	441	1.6	7.1	1.1	41	504	1.2
844.3	0.490	8.1	0.400	30	412	2.1	7.1	0.729	46	471	1.5
845.0	0.490	10	0.354	38	395	2.2	7.1	0.646	58	452	1.6
845.7	0.490	9.8	0.630	32	405	1.4	7.1	1.1	49	464	1.0
846.4	0.490	9.4	0.299	30	400	1.7	7.1	0.545	46	457	1.2
847.0	0.515	10	0.416	36	422	1.5	7.4	0.758	54	483	1.1



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
847.7	0.490	12	0.584	40	411	2.7	7.1	1.1	61	469	2.0
848.4	0.490	10	0.386	34	372	2.5	7.1	0.704	52	425	1.8
849.1	0.490	14	0.356	35	376	3.1	7.1	0.648	54	430	2.2
849.8	0.490	12	0.582	36	440	2.2	7.1	1.1	56	503	1.6
850.5	0.490	12	0.553	32	406	3.9	7.1	1.0	48	464	2.8
851.2	0.490	14	0.754	41	409	3.4	7.1	1.4	63	468	2.5
851.9	0.504	12	0.545	38	406	2.7	7.3	0.994	59	464	2.0
852.6	0.490	13	0.439	44	435	2.7	7.1	0.800	67	498	2.0
853.3	0.490	13	0.516	40	391	2.6	7.1	0.941	62	447	1.9
854.0	0.490	13	0.454	42	486	3.4	7.1	0.827	65	555	2.5
854.7	0.490	15	0.969	53	483	4.3	7.1	1.8	81	552	3.2
855.4	0.490	13	0.636	41	384	2.8	7.1	1.2	63	439	2.1
856.1	0.490	14	0.413	41	388	3.4	7.1	0.754	63	444	2.5
856.8	0.490	10	0.632	42	369	2.7	7.1	1.2	64	422	2.0
857.5	0.490	17	0.700	45	393	3.5	7.1	1.3	69	450	2.6
858.2	0.657	15	0.789	47	378	2.9	9.5	1.4	72	432	2.1
858.9	0.490	17	0.704	50	410	3.8	7.1	1.3	77	469	2.8
859.6	0.490	16	0.547	50	340	2.3	7.1	0.997	76	389	1.7
860.3	0.490	15	0.555	48	326	1.8	7.1	1.0	74	373	1.3
861.0	0.490	16	0.752	52	367	2.3	7.1	1.4	80	420	1.7
861.7	0.490	16	0.589	50	327	3.5	7.1	1.1	76	374	2.5
862.4	0.490	15	0.769	53	351	2.3	7.1	1.4	81	401	1.6
863.1	0.490	14	0.814	46	304	2.1	7.1	1.5	71	348	1.5
863.8	0.490	14	0.493	45	282	1.4	7.1	0.899	69	322	1.0
864.5	0.490	17	0.764	43	300	2.5	7.1	1.4	65	343	1.8
865.2	0.490	17	0.881	69	358	2.9	7.1	1.6	106	409	2.1
865.9	0.490	15	0.956	54	320	2.1	7.1	1.7	82	366	1.5
866.6	0.490	15	1.0	49	352	1.9	7.1	1.8	75	402	1.4
867.3	0.653	16	1.1	59	309	2.1	9.4	1.9	90	353	1.6
868.0	0.490	16	0.971	66	342	1.8	7.1	1.8	102	391	1.3
868.7	0.490	16	0.429	59	319	2.6	7.1	0.783	91	365	1.9
869.4	0.490	14	0.778	56	348	2.1	7.1	1.4	85	398	1.5
870.1	0.490	15	0.679	51	324	2.1	7.1	1.2	78	371	1.5
870.8	0.490	14	1.1	65	402	2.7	7.1	2.0	99	459	2.0
871.5	0.490	13	0.951	60	315	1.9	7.1	1.7	92	360	1.4
872.2	0.490	16	1.0	70	348	1.7	7.1	1.9	108	398	1.3
872.8	0.490	13	1.2	62	339	1.1	7.1	2.2	95	388	0.831
873.5	0.490	14	1.1	55	351	2.5	7.1	1.9	85	401	1.8
874.2	0.490	16	0.941	65	373	1.3	7.1	1.7	99	427	0.949
874.9	0.490	14	0.937	58	339	2.8	7.1	1.7	88	387	2.1
875.6	0.490	14	1.2	60	335	1.1	7.1	2.2	91	383	0.835
876.3	0.490	14	1.3	65	372	1.9	7.1	2.3	99	425	1.4
877.0	0.490	13	1.4	63	392	2.2	7.1	2.5	96	448	1.6
877.7	0.490	16	0.874	61	354	2.9	7.1	1.6	94	405	2.1
878.4	0.490	12	1.0	53	278	2.1	7.1	1.9	81	318	1.5
879.1	0.490	14	0.946	54	366	2.8	7.1	1.7	83	419	2.1
879.8	0.490	13	1.4	54	288	2.0	7.1	2.5	82	329	1.5
880.5	0.490	18	0.949	59	328	2.4	7.1	1.7	91	376	1.7
881.2	0.490	19	1.0	63	300	2.3	7.1	1.9	97	343	1.7
881.9	0.490	15	1.1	61	337	2.1	7.1	2.1	93	385	1.5
882.6	0.490	14	1.2	57	302	2.1	7.1	2.3	88	346	1.5
883.3	0.490	11	1.1	55	342	1.0	7.1	2.1	84	391	0.736
884.0	0.490	15	1.6	63	348	2.5	7.1	3.0	97	398	1.8
884.7	0.490	15	1.1	61	298	0.852	7.1	2.0	93	341	0.621
885.4	0.490	11	1.2	54	307	1.8	7.1	2.2	84	351	1.3
886.1	0.490	11	0.991	62	307	1.6	7.1	1.8	94	350	1.1
886.8	0.490	13	0.933	53	316	2.7	7.1	1.7	82	361	2.0
887.5	0.490	12	1.2	60	270	2.2	7.1	2.2	91	309	1.6
888.2	0.490	13	1.0	56	276	2.6	7.1	1.9	86	315	1.9
888.9	0.490	13	1.1	60	328	1.3	7.1	1.9	92	375	0.961
889.6	0.490	14	1.4	58	327	2.9	7.1	2.6	89	374	2.1
890.3	0.490	14	1.3	60	332	3.2	7.1	2.3	91	380	2.3
891.0	0.490	12	1.1	58	330	1.7	7.1	2.0	89	377	1.2
891.7	0.490	13	1.1	65	323	1.6	7.1	1.9	99	369	1.2
892.4	0.490	11	0.962	58	287	1.5	7.1	1.8	88	328	1.1
893.1	0.490	12	1.4	60	339	2.4	7.1	2.5	92	387	1.8
893.8	0.490	14	1.3	64	347	1.7	7.1	2.4	99	397	1.2
894.5	0.490	12	0.992	52	315	2.2	7.1	1.8	80	360	1.6
895.2	0.490	11	0.976	62	316	1.9	7.1	1.8	95	361	1.4
895.9	0.490	9.8	0.880	55	299	1.3	7.1	1.6	84	342	0.956
896.6	0.490	11	1.0	62	315	2.3	7.1	1.9	95	360	1.7
897.3	0.490	10	0.762	46	328	1.7	7.1	1.4	71	376	1.3
898.0	0.490	11	1.1	59	292	2.5	7.1	1.9	91	334	1.8
898.7	0.490	8.8	0.863	42	265	1.9	7.1	1.6	65	303	1.4
899.3	0.490	8.0	0.901	47	347	1.7	7.1	1.6	72	396	1.3
900.0	0.490	9.6	1.1	47	322	2.0	7.1	2.0	72	368	1.5
900.7	0.490	13	0.900	47	285	2.0	7.1	1.6	72	326	1.5
901.4	0.490	12	0.766	54	316	2.9	7.1	1.4	82	361	2.1
902.1	0.490	9.7	1.0	48	314	1.8	7.1	1.9	73	359	1.3
902.8	0.490	10	0.830	44	310	2.4	7.1	1.5	67	355	1.7
903.5	0.490	7.8	0.782	42	319	2.2	7.1	1.4	65	365	1.6



Minnow Environmental  
Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
904.2	0.490	10	0.628	49	304	2.1	7.1	1.1	75	348	1.5
904.9	0.490	9.8	0.729	48	331	2.6	7.1	1.3	74	378	1.9
905.6	0.490	9.0	0.854	52	286	2.0	7.1	1.6	80	327	1.5
906.3	0.490	8.2	0.703	41	367	2.1	7.1	1.3	64	419	1.5
907.0	0.490	11	0.603	44	411	2.2	7.1	1.1	68	470	1.6
907.7	0.490	9.7	1.0	50	354	3.3	7.1	1.8	77	405	2.4
908.4	0.490	9.3	0.741	39	305	2.3	7.1	1.4	60	348	1.7
909.1	0.490	9.4	0.441	41	325	2.3	7.1	0.804	63	372	1.7
909.8	0.490	9.1	0.436	37	384	2.9	7.1	0.795	57	439	2.1
910.5	0.490	9.4	1.1	42	371	3.1	7.1	2.0	64	424	2.3
911.2	0.490	7.8	0.290	38	330	2.7	7.1	0.529	58	377	2.0
911.9	0.490	8.2	0.476	38	347	2.5	7.1	0.868	58	397	1.8
912.6	0.490	7.8	0.588	32	337	2.2	7.1	1.1	49	385	1.6
913.3	0.490	6.9	0.447	35	328	2.1	7.1	0.816	53	375	1.5
914.0	0.490	8.9	0.456	37	414	1.9	7.1	0.832	56	473	1.4
914.7	0.490	7.7	0.303	32	296	2.3	7.1	0.553	48	338	1.6
915.4	0.490	6.4	0.350	37	322	2.0	7.1	0.639	56	368	1.5
916.1	0.490	6.8	0.510	36	376	1.6	7.1	0.931	55	430	1.2
916.8	0.490	7.6	0.586	38	376	2.9	7.1	1.1	58	430	2.1
917.5	0.490	7.7	0.567	38	358	2.8	7.1	1.0	59	409	2.1
918.2	0.490	6.5	0.267	27	329	1.5	7.1	0.488	41	376	1.1
918.9	0.490	8.0	0.417	28	291	1.5	7.1	0.761	43	333	1.1
919.6	0.490	7.3	0.282	26	386	2.5	7.1	0.514	40	442	1.8
920.3	0.490	8.0	0.728	29	408	2.9	7.1	1.3	45	467	2.1
921.0	0.490	9.4	0.469	26	323	2.6	7.1	0.855	40	370	1.9
921.7	0.490	7.1	0.273	31	328	2.9	7.1	0.498	48	375	2.1
922.4	0.490	7.2	0.079	26	374	1.9	7.1	0.143	40	428	1.4
923.1	0.490	8.8	0.315	32	430	2.0	7.1	0.574	48	492	1.5
923.8	0.490	9.0	0.209	34	430	2.6	7.1	0.380	53	492	1.9
924.5	0.490	11	0.190	26	326	1.8	7.1	0.347	40	373	1.3
925.1	0.490	9.6	0.353	32	311	2.5	7.1	0.644	49	355	1.8
925.8	0.490	6.4	0.504	23	327	1.2	7.1	0.920	35	374	0.889
926.5	0.490	7.9	0.171	23	342	2.0	7.1	0.312	35	391	1.5
927.2	0.490	8.3	0.448	31	371	2.0	7.1	0.817	48	424	1.5
927.9	0.490	7.0	0.642	26	343	1.9	7.1	1.2	40	392	1.4
928.6	0.490	8.2	0.419	26	333	2.4	7.1	0.764	39	381	1.7
929.3	0.490	7.3	0.333	24	301	1.0	7.1	0.607	37	344	0.741
930.0	0.490	7.9	0.644	26	365	1.6	7.1	1.2	39	418	1.2
930.7	0.490	9.0	0.467	28	372	1.4	7.1	0.852	42	426	1.0
931.4	0.490	7.6	0.371	22	314	1.3	7.1	0.678	34	359	0.940
932.1	0.490	8.8	0.560	31	351	1.7	7.1	1.0	47	401	1.2
932.8	0.490	7.4	0.449	26	403	1.6	7.1	0.819	40	460	1.2
933.5	0.490	7.4	0.693	30	363	1.5	7.1	1.3	45	415	1.1
934.2	0.490	8.5	0.673	30	337	1.6	7.1	1.2	46	385	1.2
934.9	0.490	7.6	0.343	29	323	1.9	7.1	0.626	44	370	1.4
935.6	0.490	8.0	0.381	25	314	1.3	7.1	0.694	38	359	0.944
936.3	0.490	8.2	0.826	25	355	1.2	7.1	1.5	38	405	0.897
937.0	0.490	9.9	0.346	36	356	1.0	7.1	0.631	56	407	0.750
937.7	0.490	10	0.480	29	353	2.3	7.1	0.875	45	404	1.7
938.4	0.490	6.2	0.379	31	351	1.9	7.1	0.691	47	401	1.4
939.1	0.490	9.2	0.609	31	385	1.4	7.1	1.1	48	440	0.992
939.8	0.490	9.1	0.398	28	328	1.6	7.1	0.727	43	375	1.2
940.5	0.490	9.8	0.578	36	367	1.2	7.1	1.1	54	420	0.874
941.2	0.490	11	0.456	41	391	0.914	7.1	0.831	62	447	0.667
941.9	0.490	8.3	0.373	33	317	0.925	7.1	0.681	51	363	0.675
942.6	0.490	6.5	0.487	34	268	1.4	7.1	0.888	52	306	1.1
943.3	0.490	7.4	0.397	32	368	2.1	7.1	0.723	49	420	1.5
944.0	0.490	7.5	0.535	35	334	1.6	7.1	0.976	54	382	1.1
944.7	0.490	10.0	0.708	41	341	2.1	7.1	1.3	63	390	1.5
945.4	0.490	9.5	0.763	40	350	1.6	7.1	1.4	61	400	1.1
946.1	0.490	10	0.497	38	297	1.0	7.1	0.907	58	340	0.742
946.8	0.490	12	0.815	40	347	1.9	7.1	1.5	62	396	1.4
947.5	0.490	11	0.598	47	349	1.9	7.1	1.1	71	399	1.4
948.2	0.490	11	0.362	36	338	1.2	7.1	0.660	55	386	0.868
948.9	0.490	8.6	0.895	55	410	1.3	7.1	1.6	85	469	0.948
949.6	0.490	11	0.488	42	441	0.851	7.1	0.889	64	504	0.621
950.3	0.490	9.7	0.672	45	389	1.8	7.1	1.2	69	445	1.3
951.0	0.490	11	0.753	47	323	1.4	7.1	1.4	72	370	1.0
951.6	0.490	9.0	0.412	40	336	0.827	7.1	0.752	61	384	0.603
952.3	0.490	13	0.571	44	353	1.4	7.1	1.0	68	403	1.0
953.0	0.490	10	0.822	47	336	1.4	7.1	1.5	72	384	1.0
953.7	0.490	9.4	0.658	47	332	1.4	7.1	1.2	73	379	1.0
954.4	0.490	9.9	0.879	46	316	1.2	7.1	1.6	70	361	0.854
955.1	0.490	13	0.731	58	358	1.1	7.1	1.3	88	409	0.817
955.8	0.490	11	0.506	53	418	1.7	7.1	0.923	81	478	1.2
956.5	0.490	10	0.738	46	340	1.6	7.1	1.3	71	389	1.2
957.2	0.490	13	0.652	61	403	1.6	7.1	1.2	93	461	1.2
957.9	0.490	11	0.866	58	380	0.694	7.1	1.6	89	434	0.506
958.6	0.490	11	0.602	66	377	1.6	7.1	1.1	101	431	1.1
959.3	0.490	9.2	0.778	55	382	0.868	7.1	1.4	84	437	0.633
960.0	0.595	13	0.814	53	394	1.6	8.6	1.5	81	451	1.2



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.7	0.490	13	0.931	62	359	1.2	7.1	1.7	95	411	0.858
961.4	0.603	11	1.0	72	423	1.9	8.7	1.9	111	484	1.4
962.1	0.490	11	0.864	69	437	2.0	7.1	1.6	106	500	1.4
962.8	0.556	11	0.594	57	358	1.4	8.0	1.1	87	409	1.0
963.5	0.490	12	0.774	64	420	1.9	7.1	1.4	97	480	1.4
964.2	0.490	11	0.564	60	380	1.7	7.1	1.0	92	434	1.3
964.9	0.539	11	0.631	68	413	1.3	7.8	1.2	104	473	0.921
965.6	0.613	12	1.1	69	427	1.6	8.8	2.0	105	488	1.2
966.3	0.490	11	0.850	66	411	1.3	7.1	1.5	101	470	0.946
967.0	0.490	13	0.929	70	442	2.4	7.1	1.7	107	506	1.7
967.7	0.490	11	0.787	70	410	2.1	7.1	1.4	107	469	1.6
968.4	0.490	14	0.867	71	545	2.0	7.1	1.6	109	623	1.5
969.1	0.490	11	1.0	55	394	1.6	7.1	1.9	85	451	1.2
969.8	0.490	11	1.0	72	436	1.1	7.1	1.9	111	499	0.832
970.5	0.490	13	1.2	79	421	1.8	7.1	2.2	121	482	1.3
971.2	0.490	17	0.991	68	438	1.4	7.1	1.8	104	501	1.1
971.9	0.490	12	0.866	86	431	2.0	7.1	1.6	132	492	1.5
972.6	0.490	11	1.1	73	403	1.3	7.1	2.0	112	461	0.942
973.3	0.490	15	0.730	73	495	1.5	7.1	1.3	112	566	1.1
974.0	0.832	12	1.3	71	398	2.0	12	2.4	109	455	1.5
974.7	0.490	14	1.0	69	393	1.5	7.1	1.9	106	449	1.1
975.4	0.521	11	1.1	79	473	1.9	7.5	2.0	121	540	1.4
976.1	0.490	14	0.980	76	514	2.2	7.1	1.8	116	588	1.6
976.8	0.490	15	1.1	74	465	2.5	7.1	2.0	113	532	1.8
977.5	0.490	14	1.1	90	484	2.1	7.1	2.1	138	554	1.5
978.1	0.582	15	1.1	75	490	1.5	8.4	2.1	115	560	1.1
978.8	0.490	11	1.1	80	509	2.3	7.1	2.1	123	582	1.7
979.5	0.490	13	1.6	69	438	1.4	7.1	2.9	105	501	1.0
980.2	0.490	13	1.2	97	538	2.7	7.1	2.3	149	616	2.0
980.9	0.490	13	0.994	79	516	1.9	7.1	1.8	121	590	1.4
981.6	0.490	12	0.903	78	517	2.5	7.1	1.6	120	591	1.8
982.3	0.490	13	1.4	83	511	3.1	7.1	2.6	128	585	2.3
983.0	0.490	15	1.6	70	504	2.6	7.1	2.9	108	576	1.9
983.7	0.490	15	1.6	100	537	2.2	7.1	2.9	154	614	1.6
984.4	0.490	13	1.1	80	487	2.7	7.1	2.0	122	557	2.0
985.1	0.490	12	1.0	85	504	2.1	7.1	1.9	131	577	1.6
985.8	0.490	13	1.1	81	563	2.3	7.1	2.0	125	644	1.7
986.5	0.490	12	1.3	73	457	2.0	7.1	2.3	112	522	1.4
987.2	0.490	15	1.6	92	499	2.4	7.1	2.9	140	571	1.8
987.9	0.490	12	0.911	83	446	2.7	7.1	1.7	127	510	2.0
988.6	0.490	12	1.7	90	412	2.3	7.1	3.1	138	471	1.6
989.3	0.884	12	1.6	81	485	2.5	13	2.9	124	554	1.8
990.0	0.697	15	0.930	89	503	3.8	10	1.7	136	576	2.8
990.7	0.490	14	1.2	90	391	2.8	7.1	2.2	138	447	2.0
991.4	0.490	11	1.2	74	431	2.3	7.1	2.2	114	493	1.7
992.1	0.501	11	1.1	85	398	2.3	7.2	2.1	130	455	1.7
992.8	0.490	13	1.4	76	453	1.8	7.1	2.5	117	518	1.3
993.5	0.490	15	1.4	82	419	2.5	7.1	2.5	126	480	1.8
994.2	0.490	10	1.3	83	371	1.6	7.1	2.4	127	424	1.1
994.9	0.490	12	1.3	82	470	2.3	7.1	2.4	126	538	1.7
995.6	0.490	8.4	1.1	60	349	1.1	7.1	2.0	92	399	0.782
996.3	0.490	11	1.4	78	426	1.6	7.1	2.6	120	488	1.1
997.0	0.490	13	1.6	101	474	2.4	7.1	2.9	155	542	1.8
997.7	0.750	12	1.7	82	435	1.6	11	3.1	125	497	1.2
998.4	0.490	11	1.0	79	394	2.2	7.1	1.8	120	450	1.6
999.1	0.490	13	1.3	77	477	1.3	7.1	2.3	118	546	0.971
999.8	0.490	14	1.7	80	465	3.0	7.1	3.1	123	531	2.2
1000.5	0.676	14	1.4	110	428	2.1	9.8	2.6	169	490	1.5
1001.2	0.490	14	1.8	101	451	2.8	7.1	3.3	155	516	2.1
1001.9	0.490	12	1.6	80	420	1.9	7.1	3.0	123	480	1.4
1002.6	0.607	11	1.5	79	442	1.9	8.8	2.8	120	506	1.4
1003.3	0.490	15	1.7	99	497	2.1	7.1	3.2	151	568	1.5
1004.0	0.691	14	1.5	95	379	2.0	10.0	2.8	145	433	1.5
1004.7	0.531	14	1.3	90	404	2.7	7.7	2.4	138	462	2.0
1005.3	0.490	13	1.8	95	431	0.847	7.1	3.2	145	493	0.618
1006.0	0.490	12	1.5	85	462	1.2	7.1	2.8	130	528	0.875
1006.7	0.627	13	1.8	92	495	1.5	9.1	3.3	141	566	1.1
1007.4	0.490	13	1.8	91	389	1.7	7.1	3.2	140	445	1.2
1008.1	0.490	14	1.7	103	447	2.6	7.1	3.1	157	511	1.9
1008.8	0.490	11	1.8	90	471	1.1	7.1	3.2	138	539	0.769
1009.5	0.664	11	1.6	101	488	3.4	9.6	2.8	155	558	2.5
1010.2	0.924	14	2.4	105	497	2.4	13	4.3	161	568	1.8
1010.9	0.490	14	1.2	99	400	1.9	7.1	2.2	152	457	1.4
1011.6	0.490	13	1.6	97	415	2.4	7.1	2.9	149	475	1.7
1012.3	0.490	12	1.8	84	412	2.3	7.1	3.2	129	471	1.7
1013.0	0.490	13	1.4	93	469	2.3	7.1	2.6	142	536	1.6
1013.7	0.490	15	1.6	114	433	2.6	7.1	2.9	174	495	1.9
1014.4	0.490	12	1.9	89	355	1.6	7.1	3.4	137	406	1.2
1015.1	0.490	13	1.6	84	330	2.5	7.1	2.9	129	378	1.8
1015.8	0.490	15	1.7	97	392	1.8	7.1	3.1	148	448	1.3
1016.5	0.490	13	1.9	98	411	2.4	7.1	3.4	150	470	1.8



Minnow Environmental  
Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1017.2	0.490	13	1.9	105	376	2.2	7.1	3.5	161	430	1.6
1017.9	0.490	13	2.0	121	413	1.5	7.1	3.6	185	472	1.1
1018.6	0.490	12	1.5	91	378	2.1	7.1	2.7	139	432	1.6
1019.3	0.490	14	1.4	98	369	1.6	7.1	2.6	150	422	1.2
1020.0	0.490	14	2.2	96	334	2.6	7.1	4.0	148	382	1.9
1020.7	0.511	14	1.8	99	295	1.9	7.4	3.2	151	338	1.4
1021.4	0.490	12	1.5	88	271	1.8	7.1	2.7	134	310	1.3
1022.1	0.490	12	2.0	98	356	2.5	7.1	3.7	150	407	1.8
1022.8	0.490	10	2.0	88	317	1.9	7.1	3.7	135	363	1.4
1023.5	0.490	14	1.9	107	320	2.4	7.1	3.5	164	366	1.7
1024.2	0.490	12	1.3	104	312	2.2	7.1	2.4	159	356	1.6
1024.9	0.490	10	1.4	89	347	3.4	7.1	2.5	136	397	2.5
1025.6	0.490	15	1.5	95	277	1.8	7.1	2.7	145	316	1.3
1026.3	1.1	12	2.1	90	291	2.6	16	3.8	138	333	1.9
1027.0	0.490	13	1.6	105	338	3.0	7.1	2.9	161	386	2.2
1027.7	0.490	11	1.3	91	297	3.1	7.1	2.5	140	339	2.2
1028.4	0.490	11	1.6	100	351	2.3	7.1	2.9	153	401	1.7
1029.1	0.490	13	1.6	93	285	3.5	7.1	2.9	142	325	2.6
1029.8	0.490	13	1.6	113	313	2.3	7.1	3.0	173	358	1.7
1030.5	0.615	11	1.6	96	299	2.4	8.9	2.9	148	341	1.8
1031.2	0.532	13	1.5	96	295	2.0	7.7	2.8	147	337	1.5
1031.8	0.490	13	1.4	89	287	3.2	7.1	2.6	136	329	2.4
1032.5	0.490	11	1.5	79	294	3.1	7.1	2.7	120	336	2.2
1033.2	0.615	12	2.2	100	344	4.0	8.9	4.0	154	393	2.9
1033.9	0.490	13	1.7	105	322	4.1	7.1	3.2	161	368	3.0
1034.6	0.490	14	1.6	99	301	3.0	7.1	2.9	152	344	2.2
1035.3	0.490	9.6	1.7	86	314	2.6	7.1	3.2	132	359	1.9
1036.0	0.490	12	1.5	98	310	3.3	7.1	2.7	151	355	2.4
1036.7	0.490	12	2.3	90	328	3.8	7.1	4.3	139	375	2.7
1037.4	0.490	13	1.4	103	292	3.0	7.1	2.5	158	334	2.2
1038.1	0.490	9.3	1.3	85	274	2.3	7.1	2.5	131	313	1.7
1038.8	0.490	10	1.3	87	322	4.7	7.1	2.3	134	368	3.5
1039.5	0.490	11	1.6	93	314	3.5	7.1	3.0	143	359	2.5
1040.2	0.490	12	1.7	97	305	4.8	7.1	3.1	148	349	3.5
1040.9	0.490	11	1.5	97	299	3.1	7.1	2.8	148	342	2.3
1041.6	0.490	11	1.6	77	259	3.3	7.1	3.0	118	297	2.4
1042.3	0.490	14	1.5	99	346	5.1	7.1	2.7	152	396	3.7
1043.0	0.490	10	1.4	101	308	4.3	7.1	2.6	155	352	3.1
1043.7	0.490	11	1.8	100	313	3.5	7.1	3.2	153	358	2.6
1044.4	0.490	8.9	1.2	89	239	3.5	7.1	2.1	136	274	2.6
1045.1	0.490	8.7	1.7	98	308	4.4	7.1	3.2	150	352	3.2
1045.8	0.490	11	1.3	90	302	3.9	7.1	2.3	138	345	2.8
1046.5	0.669	12	1.7	100	366	4.9	9.7	3.2	153	418	3.6
1047.2	0.825	13	1.5	96	297	3.5	12	2.7	146	339	2.5
1047.9	0.490	11	1.6	104	337	5.0	7.1	2.9	159	385	3.7
1048.6	0.490	9.0	1.3	91	305	2.9	7.1	2.4	140	349	2.1
1049.3	0.490	12	1.5	92	315	4.1	7.1	2.7	140	360	3.0
1050.0	0.804	12	1.3	97	329	3.7	12	2.3	149	377	2.7
1050.7	0.490	13	1.6	107	294	4.6	7.1	2.9	164	336	3.4
1051.4	0.490	12	1.5	91	289	2.6	7.1	2.7	139	330	1.9
1052.1	0.490	12	1.2	84	291	3.0	7.1	2.2	129	333	2.2
1052.8	0.636	14	1.6	89	321	4.4	9.2	2.9	136	367	3.2
1053.5	0.490	13	1.3	101	304	4.0	7.1	2.3	155	348	2.9
1054.2	0.490	11	1.5	100	293	2.4	7.1	2.8	153	335	1.7
1054.9	0.593	9.3	2.0	107	339	1.8	8.6	3.6	164	388	1.3
1055.6	0.490	10	1.3	99	294	2.8	7.1	2.5	152	336	2.0
1056.3	0.818	13	1.7	105	339	3.1	12	3.2	161	388	2.3
1057.0	0.490	12	1.3	112	331	3.5	7.1	2.4	172	379	2.6
1057.7	0.490	11	1.5	99	315	3.2	7.1	2.8	152	360	2.4
1058.3	0.490	9.4	1.3	88	293	2.9	7.1	2.4	135	335	2.1
1059.0	0.490	11	1.3	86	267	3.0	7.1	2.3	132	306	2.2
1059.7	0.490	13	1.4	85	298	3.2	7.1	2.6	131	341	2.3
1060.4	0.490	10	1.7	102	301	3.2	7.1	3.1	156	345	2.3
1061.1	0.490	12	1.3	90	283	3.1	7.1	2.4	138	324	2.3
1061.8	0.490	12	1.7	89	330	3.3	7.1	3.1	137	377	2.4
1062.5	0.490	11	1.2	91	334	3.3	7.1	2.3	139	382	2.4
1063.2	0.490	13	1.7	100	272	2.0	7.1	3.0	153	312	1.4
1063.9	0.490	13	1.4	93	298	4.0	7.1	2.6	143	341	2.9
1064.6	0.490	11	1.6	91	316	2.9	7.1	3.0	140	361	2.1
1065.3	0.490	8.7	1.0	69	265	1.8	7.1	1.9	106	304	1.3
1066.0	0.490	12	1.5	85	297	3.1	7.1	2.7	131	340	2.3
1066.7	0.543	12	1.7	101	355	3.7	7.8	3.1	155	406	2.7
1067.4	0.490	11	1.3	76	251	2.2	7.1	2.3	116	287	1.6
1068.1	0.490	11	1.1	77	261	2.0	7.1	2.1	118	299	1.4
1068.8	0.490	12	1.4	85	321	1.8	7.1	2.6	131	367	1.3
1069.5	0.490	13	1.0	90	313	2.7	7.1	1.9	139	357	2.0
1070.2	0.600	12	1.1	91	291	2.0	8.7	2.0	140	333	1.4
1070.9	0.490	12	1.2	92	302	2.8	7.1	2.1	141	345	2.0
1071.6	0.490	10	1.4	98	326	2.4	7.1	2.5	150	372	1.7
1072.3	0.490	10	1.7	89	329	3.6	7.1	3.0	137	377	2.6
1073.0	0.490	12	1.5	91	375	3.3	7.1	2.7	140	428	2.4



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.7	0.490	11	1.1	84	336	3.1	7.1	2.1	129	384	2.3
1074.4	0.490	11	1.1	82	311	2.4	7.1	2.1	126	356	1.7
1075.1	0.490	13	1.1	78	321	1.9	7.1	1.9	120	367	1.4
1075.8	0.490	11	1.5	84	350	3.7	7.1	2.7	128	400	2.7
1076.5	0.490	15	1.2	79	345	3.7	7.1	2.3	121	394	2.7
1077.2	0.490	13	0.933	94	350	3.3	7.1	1.7	144	401	2.4
1077.9	0.543	9.9	1.1	85	315	3.1	7.8	2.0	130	360	2.3
1078.6	0.490	9.7	0.943	66	304	2.1	7.1	1.7	101	348	1.5
1079.3	0.490	11	1.1	88	338	3.5	7.1	2.0	135	387	2.5
1080.0	1.1	13	1.5	103	418	2.9	15	2.7	159	478	2.1
1080.7	0.689	11	1.0	73	342	3.4	10.0	1.9	112	391	2.5
1081.4	0.490	8.8	0.930	73	311	2.5	7.1	1.7	112	356	1.8
1082.1	0.490	8.3	1.1	65	348	2.9	7.1	2.0	100	398	2.2
1082.8	0.490	12	1.3	67	385	3.2	7.1	2.3	103	441	2.4
1083.5	0.490	12	1.1	76	327	3.8	7.1	2.0	116	374	2.8
1084.2	0.490	9.1	1.1	85	335	3.8	7.1	2.0	130	383	2.8
1084.9	0.528	8.5	0.771	61	304	1.7	7.6	1.4	93	347	1.3
1085.5	0.490	9.9	0.986	65	315	3.3	7.1	1.8	100	361	2.4
1086.2	0.490	13	0.975	71	359	5.4	7.1	1.8	109	410	3.9
1086.9	0.615	9.7	1.1	67	305	3.8	8.9	2.0	102	349	2.8
1087.6	0.490	9.5	1.2	62	298	3.1	7.1	2.1	96	341	2.3
1088.3	0.490	9.0	1.6	59	325	3.4	7.1	2.9	90	372	2.5
1089.0	0.560	11	1.8	61	328	3.4	8.1	3.2	93	375	2.5
1089.7	1.2	14	0.956	62	347	5.4	17	1.7	95	396	4.0
1090.4	0.490	9.7	1.1	64	291	4.2	7.1	2.0	97	332	3.1
1091.1	0.490	9.5	0.981	61	339	3.5	7.1	1.8	94	388	2.6
1091.8	0.490	8.3	0.992	54	291	4.3	7.1	1.8	83	333	3.1
1092.5	0.490	10	1.2	64	367	5.3	7.1	2.2	98	420	3.9
1093.2	0.887	12	0.753	69	338	7.5	13	1.4	106	386	5.4
1093.9	0.490	10	0.927	69	348	5.6	7.1	1.7	106	398	4.1
1094.6	0.490	10	0.882	62	303	6.5	7.1	1.6	95	346	4.7
1095.3	0.490	9.5	0.859	66	335	8.0	7.1	1.6	101	384	5.8
1096.0	0.490	11	1.1	69	370	6.8	7.1	1.9	105	423	4.9
1096.7	0.490	10	0.625	70	350	6.7	7.1	1.1	108	400	4.9
1097.4	0.490	7.7	0.604	55	294	6.3	7.1	1.1	85	336	4.6
1098.1	0.490	10	0.785	56	339	6.4	7.1	1.4	85	388	4.7
1098.8	0.490	7.7	0.656	62	355	4.3	7.1	1.2	94	406	3.1
1099.5	0.490	9.7	0.722	69	326	6.1	7.1	1.3	106	372	4.5
1100.2	0.490	7.7	0.388	65	295	3.4	7.1	0.707	99	338	2.5
1100.9	0.490	8.1	0.353	58	333	4.1	7.1	0.643	88	381	3.0
1101.6	0.490	8.8	0.302	50	319	4.4	7.1	0.551	76	364	3.2
1102.3	0.490	11	0.618	62	390	3.9	7.1	1.1	95	445	2.9
1103.0	0.490	8.1	0.391	73	394	3.1	7.1	0.714	112	451	2.2
1103.7	0.490	11	0.705	60	348	3.5	7.1	1.3	92	398	2.5
1104.4	0.490	8.1	0.652	61	325	3.1	7.1	1.2	93	372	2.3
1105.1	0.490	7.1	0.469	46	319	2.5	7.1	0.856	71	365	1.8
1105.8	0.646	10.0	0.543	54	373	2.4	9.3	0.990	82	426	1.8
1106.5	0.515	9.6	0.511	60	340	3.5	7.4	0.932	92	389	2.6
1107.2	0.518	11	0.886	59	368	2.7	7.5	1.6	91	420	2.0
1107.9	0.490	9.7	0.643	52	317	2.1	7.1	1.2	80	362	1.5
1108.6	0.490	9.0	0.446	48	387	2.1	7.1	0.814	73	443	1.5
1109.3	0.490	9.9	0.464	57	369	2.8	7.1	0.847	87	422	2.0
1110.0	0.490	8.1	0.332	58	316	2.1	7.1	0.606	89	361	1.5
1110.7	0.490	8.5	0.304	55	325	1.8	7.1	0.555	85	371	1.3
1111.4	0.490	7.7	0.487	50	363	1.6	7.1	0.889	77	415	1.2
1112.0	0.490	9.2	0.355	46	347	2.6	7.1	0.647	71	397	1.9
1112.7	0.490	9.5	0.388	62	383	1.2	7.1	0.708	95	438	0.867
1113.4	0.490	9.3	0.219	61	386	1.6	7.1	0.400	93	442	1.2
1114.1	0.490	11	0.430	57	388	1.7	7.1	0.784	87	443	1.2
1114.8	0.490	8.8	0.390	47	386	1.3	7.1	0.711	72	441	0.970
1115.5	0.490	11	0.342	49	405	2.2	7.1	0.624	76	463	1.6
1116.2	0.490	13	0.464	53	356	2.0	7.1	0.847	82	407	1.4
1116.9	0.925	11	0.281	51	313	1.5	13	0.512	78	358	1.1
1117.6	0.490	7.3	0.317	55	356	1.2	7.1	0.579	84	407	0.884
1118.3	0.490	8.8	0.508	50	373	1.6	7.1	0.926	77	427	1.2
1119.0	0.490	10	0.270	47	343	2.5	7.1	0.493	72	392	1.8
1119.7	0.490	11	0.452	51	352	2.1	7.1	0.824	78	403	1.5
1120.4	0.490	8.5	0.216	55	344	1.7	7.1	0.393	84	393	1.2
1121.1	0.490	8.6	0.414	45	329	1.7	7.1	0.754	70	376	1.2
1121.8	0.507	7.1	0.287	43	344	2.5	7.3	0.523	66	393	1.8
1122.5	0.490	10	0.324	44	356	1.5	7.1	0.591	67	407	1.1
1123.2	0.490	8.9	0.507	46	342	1.9	7.1	0.925	70	391	1.4
1123.9	0.605	10	0.178	50	301	1.5	8.7	0.324	77	345	1.1
1124.6	0.490	8.6	0.251	44	305	0.931	7.1	0.458	67	349	0.679
1125.3	0.490	8.0	0.392	51	377	1.6	7.1	0.715	78	432	1.2
1126.0	0.490	12	0.218	57	369	1.6	7.1	0.398	87	422	1.2
1126.7	0.490	12	0.404	56	353	1.4	7.1	0.738	86	404	1.0
1127.4	0.490	10	0.495	46	369	1.6	7.1	0.902	71	422	1.1
1128.1	0.490	11	0.241	46	322	1.4	7.1	0.439	70	369	1.0
1128.8	0.490	11	0.511	47	334	1.6	7.1	0.932	72	382	1.2
1129.5	0.490	11	0.563	56	347	2.1	7.1	1.0	85	397	1.5



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Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1130.2	0.490	10	0.296	46	347	2.3	7.1	0.540	70	397	1.7
1130.9	0.490	10	0.284	53	320	1.4	7.1	0.517	81	366	0.993
1131.6	0.490	9.5	0.540	47	345	1.7	7.1	0.985	72	395	1.2
1132.3	0.490	12	0.577	51	360	2.0	7.1	1.1	78	411	1.4
1133.0	0.490	11	0.428	51	329	1.6	7.1	0.781	78	376	1.2
1133.7	0.490	11	0.523	48	299	2.2	7.1	0.955	73	342	1.6
1134.4	0.490	11	0.566	47	312	2.2	7.1	1.0	72	357	1.6
1135.1	0.566	9.7	0.434	50	401	2.4	8.2	0.792	77	459	1.8
1135.8	0.490	9.5	0.424	45	347	1.5	7.1	0.773	69	397	1.1
1136.5	0.490	11	0.218	52	368	1.7	7.1	0.397	79	421	1.3
1137.2	0.490	10	0.417	41	297	1.5	7.1	0.760	62	340	1.1
1137.9	0.490	9.5	0.437	49	320	2.3	7.1	0.796	75	366	1.7
1138.5	0.795	11	0.476	45	396	2.2	11	0.867	69	453	1.6
1139.2	0.490	13	0.386	48	395	1.3	7.1	0.704	74	452	0.961
1139.9	0.490	12	0.491	54	343	2.4	7.1	0.895	82	392	1.8
1140.6	0.889	12	0.464	46	322	2.2	13	0.846	70	369	1.6
1141.3	0.490	10	0.345	42	332	1.6	7.1	0.629	64	379	1.2
1142.0	0.490	12	0.491	41	317	1.1	7.1	0.896	63	362	0.799
1142.7	0.490	13	0.369	51	328	1.5	7.1	0.672	78	376	1.1
1143.4	0.602	13	0.528	50	344	1.7	8.7	0.964	76	393	1.2
1144.1	0.490	11	0.484	47	320	1.4	7.1	0.882	71	366	1.0
1144.8	0.490	9.9	0.247	44	327	2.1	7.1	0.450	67	374	1.5
1145.5	0.490	12	0.541	49	346	2.5	7.1	0.986	76	396	1.8
1146.2	0.490	14	0.481	47	313	0.559	7.1	0.878	72	358	0.408
1146.9	0.490	13	0.509	41	313	1.0	7.1	0.929	62	358	0.766
1147.6	0.490	11	0.439	41	276	2.0	7.1	0.800	62	316	1.4
1148.3	0.490	14	0.552	40	345	1.4	7.1	1.0	61	394	1.0
1149.0	0.739	17	0.469	46	375	2.3	11	0.855	71	429	1.7
1149.7	0.490	14	0.328	42	342	2.5	7.1	0.598	64	391	1.8
1150.4	0.551	13	0.511	42	340	2.7	8.0	0.933	64	388	2.0
1151.1	0.490	12	0.399	38	290	1.8	7.1	0.728	58	331	1.3
1151.8	0.701	16	0.625	46	332	2.5	10	1.1	71	380	1.8
1152.5	0.490	15	0.588	37	329	1.7	7.1	1.1	57	376	1.2
1153.2	0.490	15	0.509	39	310	1.6	7.1	0.929	60	355	1.2
1153.9	0.490	15	0.530	40	323	1.7	7.1	0.967	61	369	1.3
1154.6	0.490	16	0.300	39	319	1.5	7.1	0.547	59	364	1.1
1155.3	0.490	15	0.591	38	313	2.1	7.1	1.1	58	358	1.5
1156.0	0.490	17	0.593	45	323	1.5	7.1	1.1	68	370	1.1
1156.7	0.490	16	0.411	39	348	1.7	7.1	0.749	60	398	1.3
1157.4	0.865	18	0.387	43	364	1.7	12	0.706	66	416	1.3
1158.1	0.549	16	0.381	31	306	1.4	7.9	0.696	47	350	1.0
1158.8	0.841	19	0.595	42	411	2.8	12	1.1	65	471	2.0
1159.5	0.490	16	0.637	40	357	0.883	7.1	1.2	61	408	0.644
1160.2	0.490	18	0.310	28	285	1.8	7.1	0.565	43	326	1.3
1160.9	0.490	17	0.688	36	298	1.3	7.1	1.3	55	340	0.961
1161.6	0.490	16	0.475	35	365	1.7	7.1	0.867	54	417	1.3
1162.3	0.490	16	0.425	37	346	1.0	7.1	0.775	57	396	0.760
1163.0	0.490	18	0.552	37	342	1.8	7.1	1.0	57	392	1.3
1163.7	0.763	21	0.607	29	305	2.1	11	1.1	45	349	1.5
1164.3	0.490	20	0.632	39	371	2.8	7.1	1.2	60	425	2.1
1165.0	0.569	22	0.686	34	356	2.6	8.2	1.3	52	407	1.9
1165.7	0.490	20	0.602	35	373	2.5	7.1	1.1	54	427	1.8
1166.4	0.580	22	0.551	34	333	1.7	8.4	1.0	52	381	1.2
1167.1	0.490	20	0.335	30	296	2.1	7.1	0.610	46	338	1.5
1167.8	0.490	21	0.418	32	357	1.9	7.1	0.763	49	409	1.4
1168.5	0.490	19	0.569	32	344	1.5	7.1	1.0	48	394	1.1
1169.2	0.584	19	0.619	31	346	1.8	8.4	1.1	48	396	1.3
1169.9	0.490	23	0.545	31	322	1.7	7.1	0.994	48	369	1.2
1170.6	0.490	16	0.435	24	298	1.9	7.1	0.794	37	340	1.4
1171.3	0.790	18	0.503	28	351	2.3	11	0.917	44	402	1.7
1172.0	0.789	22	0.651	29	341	2.6	11	1.2	45	390	1.9
1172.7	0.490	19	0.551	36	341	1.7	7.1	1.0	54	390	1.2
1173.4	0.490	20	0.708	33	344	2.2	7.1	1.3	51	394	1.6
1174.1	0.490	17	0.508	26	324	1.7	7.1	0.926	40	370	1.2
1174.8	0.706	21	0.564	25	323	2.4	10	1.0	38	369	1.8
1175.5	0.812	23	0.560	26	333	2.0	12	1.0	41	381	1.5
1176.2	0.490	23	1.1	31	371	3.0	7.1	1.9	47	424	2.2
1176.9	0.490	22	0.509	32	356	2.3	7.1	0.927	49	407	1.7
1177.6	0.490	19	0.442	24	347	1.2	7.1	0.806	37	397	0.899
1178.3	0.622	20	0.582	25	406	1.7	9.0	1.1	39	464	1.2
1179.0	0.532	22	0.894	27	322	2.2	7.7	1.6	41	368	1.6
1179.7	0.490	25	0.982	32	356	1.5	7.1	1.8	49	407	1.1
1180.4	0.490	22	0.667	28	338	1.5	7.1	1.2	42	387	1.1
1181.1	0.490	22	0.623	26	329	2.0	7.1	1.1	40	377	1.4
1181.8	0.490	25	0.430	28	366	2.8	7.1	0.784	44	418	2.0
1182.5	0.839	26	0.832	25	358	2.0	12	1.5	38	410	1.5
1183.2	0.780	22	0.497	26	345	1.5	11	0.906	39	395	1.1
1183.9	0.537	24	0.693	28	363	1.8	7.7	1.3	44	415	1.3
1184.6	0.490	23	0.947	25	363	1.9	7.1	1.7	38	415	1.4
1185.3	0.612	23	0.775	23	377	2.0	8.8	1.4	35	431	1.5
1186.0	0.584	25	0.488	26	314	2.5	8.4	0.889	40	359	1.8



Minnow Environmental Sample ID: 010											
Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1186.7	0.490	25	1.0	26	367	2.8	7.1	1.8	41	419	2.0
1187.4	0.490	24	0.922	22	401	2.1	7.1	1.7	33	458	1.5
1188.1	0.490	27	0.941	23	361	2.8	7.1	1.7	36	413	2.1
1188.8	0.490	25	1.0	24	372	2.0	7.1	1.8	37	426	1.4
1189.5	0.490	25	0.682	27	389	2.4	7.1	1.2	41	445	1.8
1190.2	0.625	29	0.730	28	395	3.3	9.0	1.3	43	452	2.4
1190.8	0.490	29	0.618	24	361	3.6	7.1	1.1	37	413	2.6
1191.5	0.490	27	1.2	22	403	1.9	7.1	2.2	34	461	1.4
1192.2	0.564	27	0.907	22	393	2.8	8.1	1.7	34	449	2.0
1192.9	0.629	27	1.0	25	388	2.2	9.1	1.8	38	444	1.6
1193.6	0.490	25	0.640	23	361	2.4	7.1	1.2	36	412	1.8
1194.3	1.4	26	0.902	26	377	1.7	20	1.6	39	432	1.2
1195.0	0.490	27	0.866	22	390	3.0	7.1	1.6	33	446	2.2
1195.7	0.952	27	0.984	21	420	2.7	14	1.8	32	481	2.0
1196.4	0.490	27	0.927	23	404	2.5	7.1	1.7	36	461	1.8
1197.1	0.490	25	1.0	23	349	2.2	7.1	1.8	35	399	1.6
1197.8	0.562	25	0.575	21	403	2.8	8.1	1.0	33	461	2.0
1198.5	0.490	28	0.924	20	404	2.6	7.1	1.7	31	462	1.9
1199.2	0.511	28	0.639	27	471	2.2	7.4	1.2	42	538	1.6
1199.9	0.490	29	0.666	23	404	2.7	7.1	1.2	35	461	2.0
1200.6	0.490	24	0.723	26	398	2.0	7.1	1.3	39	455	1.5
1201.3	0.490	24	0.953	21	390	2.3	7.1	1.7	33	446	1.7
1202.0	0.490	24	0.961	19	445	3.2	7.1	1.8	30	508	2.3
1202.7	0.490	32	1.1	21	393	2.4	7.1	2.0	32	450	1.7
1203.4	0.490	26	0.750	23	406	1.9	7.1	1.4	35	464	1.4
1204.1	0.680	27	0.949	21	363	2.7	9.8	1.7	32	415	2.0
1204.8	0.490	27	0.589	24	438	1.9	7.1	1.1	37	500	1.4
1205.5	0.528	28	0.810	23	420	2.7	7.6	1.5	36	480	1.9
1206.2	0.490	31	0.924	23	404	2.8	7.1	1.7	35	462	2.0
1206.9	0.490	28	0.640	21	387	2.1	7.1	1.2	32	443	1.5
1207.6	0.695	25	0.771	18	404	2.4	10	1.4	28	462	1.7
1208.3	0.490	26	0.797	22	410	2.5	7.1	1.5	34	469	1.8
1209.0	0.490	29	1.2	22	401	2.6	7.1	2.1	33	459	1.9
1209.7	0.490	30	1.0	21	414	2.1	7.1	1.9	32	474	1.5
1210.4	0.547	25	0.738	21	399	2.1	7.9	1.3	32	456	1.5
1211.1	0.490	26	0.840	22	412	3.2	7.1	1.5	33	471	2.3
1211.8	0.712	28	0.831	22	470	3.6	10	1.5	34	537	2.6
1212.5	0.490	31	1.1	16	383	2.6	7.1	2.0	24	438	1.9
1213.2	0.490	30	1.1	20	414	2.9	7.1	2.0	31	473	2.1
1213.9	0.490	30	0.756	22	416	2.3	7.1	1.4	34	476	1.7
1214.6	0.673	27	0.977	25	387	1.7	9.7	1.8	38	443	1.2
1215.3	0.490	27	0.697	20	438	2.6	7.1	1.3	31	501	1.9
1216.0	0.490	30	0.658	27	422	2.8	7.1	1.2	42	483	2.0
1216.6	0.694	31	0.767	27	434	1.8	10	1.4	41	496	1.3
1217.3	0.490	29	1.0	23	401	2.1	7.1	1.9	36	459	1.6
1218.0	0.490	30	0.671	18	383	2.5	7.1	1.2	28	438	1.9
1218.7	0.490	30	1.3	25	408	1.8	7.1	2.4	38	466	1.3
1219.4	0.978	27	0.956	23	385	0.999	14	1.7	36	441	0.729
1220.1	0.688	28	0.908	22	419	2.2	9.9	1.7	34	479	1.6
1220.8	0.546	27	1.1	21	413	2.7	7.9	1.9	33	473	2.0
1221.5	0.490	31	0.876	22	436	2.5	7.1	1.6	33	498	1.8
1222.2	0.490	29	0.631	21	421	1.8	7.1	1.2	32	481	1.3
1222.9	0.500	29	0.743	24	405	1.9	7.2	1.4	37	463	1.4
1223.6	0.490	26	0.865	23	411	2.2	7.1	1.6	36	470	1.6
1224.3	0.490	28	0.909	21	459	2.4	7.1	1.7	31	525	1.7
1225.0	0.490	27	0.989	23	377	1.8	7.1	1.8	36	431	1.3
1225.7	0.490	28	0.763	24	442	2.4	7.1	1.4	37	506	1.8
1226.4	0.490	27	1.0	25	429	3.0	7.1	1.9	38	491	2.2
1227.1	0.490	25	0.699	22	398	1.9	7.1	1.3	33	455	1.4
1227.8	0.607	25	0.892	21	379	1.9	8.8	1.6	33	434	1.4
1228.5	0.490	29	1.1	23	403	2.5	7.1	2.0	36	461	1.8
1229.2	0.490	28	0.924	25	435	2.7	7.1	1.7	38	498	2.0
1229.9	0.490	26	1.0	25	383	2.0	7.1	1.9	38	438	1.5
1230.6	0.490	28	0.825	22	427	2.4	7.1	1.5	33	488	1.7
1231.3	0.490	24	0.840	22	386	2.6	7.1	1.5	34	442	1.9
1232.0	0.828	34	1.2	24	397	1.8	12	2.1	37	454	1.3
1232.7	0.611	45	1.4	25	396	2.1	8.8	2.5	38	453	1.5
1233.4	0.490	49	1.8	27	442	2.3	7.1	3.2	42	505	1.7
1234.1	0.757	28	1.5	23	421	2.2	11	2.7	36	481	1.6
1234.8	0.490	31	1.8	22	403	2.5	7.1	3.2	33	461	1.8
1235.5	0.688	33	1.3	23	425	2.6	9.9	2.3	36	486	1.9
1236.2	0.490	31	0.711	22	423	2.2	7.1	1.3	34	484	1.6
1236.9	0.576	26	0.904	22	442	2.7	8.3	1.6	34	506	2.0
1237.6	0.490	24	0.586	21	382	1.5	7.1	1.1	31	437	1.1
1238.3	0.490	29	1.2	23	459	2.5	7.1	2.1	35	525	1.8
1239.0	0.599	26	0.787	24	395	3.0	8.6	1.4	37	452	2.2
1239.7	0.517	30	0.937	23	421	1.9	7.5	1.7	35	481	1.4
1240.4	0.668	29	0.935	29	442	2.6	9.6	1.7	44	505	1.9
1241.1	0.490	28	0.700	25	394	1.6	7.1	1.3	38	450	1.2
1241.8	0.673	25	0.848	20	403	1.4	9.7	1.5	31	461	1.0
1242.4	0.490	30	0.723	26	441	2.3	7.1	1.3	40	504	1.7



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1243.1	0.490	28	0.637	22	400	1.3	7.1	1.2	34	458	0.929
1243.8	0.513	22	0.704	21	398	1.8	7.4	1.3	32	455	1.3
1244.5	0.490	26	0.731	22	406	1.6	7.1	1.3	34	465	1.2
1245.2	0.490	29	0.924	26	392	2.4	7.1	1.7	39	449	1.8
1245.9	0.592	29	0.864	24	392	2.4	8.5	1.6	37	449	1.8
1246.6	0.627	25	0.879	20	413	2.2	9.1	1.6	31	472	1.6
1247.3	0.830	24	0.988	22	407	1.5	12	1.8	34	465	1.1
1248.0	1.0	23	0.742	24	393	2.3	15	1.4	36	449	1.7
1248.7	0.614	27	0.516	21	424	2.4	8.9	0.942	32	484	1.8
1249.4	0.490	26	0.654	24	401	1.7	7.1	1.2	37	458	1.2
1250.1	0.490	28	0.828	20	423	2.8	7.1	1.5	31	484	2.0
1250.8	0.490	26	0.864	23	393	3.0	7.1	1.6	35	449	2.2
1251.5	1.0	30	0.891	23	431	2.8	15	1.6	35	492	2.1
1252.2	0.490	27	0.716	19	375	1.3	7.1	1.3	29	429	0.933
1252.9	0.490	25	0.405	26	373	2.1	7.1	0.739	40	426	1.5
1253.6	0.490	23	0.634	23	368	2.1	7.1	1.2	36	421	1.5
1254.3	0.790	21	0.629	27	425	1.8	11	1.1	42	486	1.3
1255.0	0.785	28	0.770	23	432	1.9	11	1.4	36	494	1.4
1255.7	0.605	23	1.1	24	399	1.9	8.7	2.0	37	456	1.4
1256.4	0.989	27	1.1	26	390	2.6	14	2.0	39	447	1.9
1257.1	0.519	19	0.733	23	381	2.3	7.5	1.3	35	436	1.7
1257.8	0.490	26	0.402	26	436	2.0	7.1	0.733	40	498	1.5
1258.5	0.490	26	0.704	23	431	1.2	7.1	1.3	35	493	0.887
1259.2	0.490	24	0.902	25	377	2.2	7.1	1.6	39	431	1.6
1259.9	0.490	24	0.611	24	434	1.9	7.1	1.1	37	497	1.4
1260.6	0.490	25	0.620	24	390	1.9	7.1	1.1	37	446	1.4
1261.3	0.626	24	0.439	21	402	1.8	9.0	0.801	32	460	1.3
1262.0	0.490	25	0.703	26	370	1.8	7.1	1.3	40	423	1.3
1262.7	0.490	30	0.819	28	386	2.2	7.1	1.5	43	442	1.6
1263.4	0.671	25	0.681	27	380	2.1	9.7	1.2	42	435	1.5
1264.1	0.795	21	0.946	25	400	2.5	11	1.7	39	458	1.8
1264.8	0.490	27	0.647	23	411	2.0	7.1	1.2	36	469	1.4
1265.5	0.490	26	0.836	28	387	2.5	7.1	1.5	43	443	1.8
1266.2	0.490	24	0.858	26	365	2.2	7.1	1.6	40	417	1.6
1266.9	0.490	23	0.575	25	379	1.6	7.1	1.0	38	434	1.2
1267.6	1.2	24	0.736	25	378	1.6	17	1.3	38	432	1.2
1268.3	0.490	25	0.727	30	384	2.4	7.1	1.3	46	439	1.7
1268.9	0.520	29	0.493	29	421	1.7	7.5	0.898	45	481	1.2
1269.6	0.490	22	0.732	21	358	2.1	7.1	1.3	33	409	1.5
1270.3	0.715	23	0.703	29	411	2.7	10	1.3	45	470	2.0
1271.0	0.692	20	0.722	24	452	1.9	10.0	1.3	37	517	1.4
1271.7	0.490	26	0.713	27	405	2.3	7.1	1.3	41	463	1.7
1272.4	0.490	26	0.570	25	344	2.3	7.1	1.0	38	393	1.7
1273.1	0.490	24	0.830	28	369	2.3	7.1	1.5	43	422	1.7
1273.8	0.834	19	0.720	24	368	1.7	12	1.3	37	421	1.3
1274.5	0.490	21	0.966	23	407	2.7	7.1	1.8	35	465	1.9
1275.2	0.490	23	0.903	28	361	2.6	7.1	1.6	43	412	1.9
1275.9	0.490	26	0.642	27	362	1.9	7.1	1.2	41	414	1.4
1276.6	0.490	21	0.453	29	386	2.5	7.1	0.826	44	442	1.8
1277.3	0.490	21	0.533	27	383	2.9	7.1	0.972	42	438	2.1
1278.0	0.490	23	0.491	27	392	1.6	7.1	0.896	42	448	1.2
1278.7	0.490	25	0.573	27	371	2.3	7.1	1.0	41	425	1.7
1279.4	0.498	22	0.503	27	341	1.6	7.2	0.917	41	390	1.2
1280.1	0.490	20	0.897	30	410	2.0	7.1	1.6	45	469	1.4
1280.8	0.490	18	0.953	32	414	2.2	7.1	1.7	50	473	1.6
1281.5	0.868	21	0.904	29	404	2.1	13	1.6	45	462	1.5
1282.2	0.490	23	0.656	28	359	1.5	7.1	1.2	44	410	1.1
1282.9	0.490	20	0.699	31	394	1.4	7.1	1.3	48	451	1.0
1283.6	0.533	18	0.662	24	370	3.0	7.7	1.2	36	424	2.2
1284.3	0.490	20	0.787	25	392	2.6	7.1	1.4	39	449	1.9
1285.0	0.490	22	0.769	29	357	1.8	7.1	1.4	45	408	1.3
1285.7	0.490	22	0.543	29	367	3.4	7.1	0.990	45	420	2.5
1286.4	0.706	19	0.623	29	389	2.0	10	1.1	44	445	1.4
1287.1	0.671	18	0.498	21	327	1.7	9.7	0.909	33	374	1.3
1287.8	0.634	22	0.741	29	398	2.1	9.2	1.4	44	455	1.5
1288.5	0.659	24	0.747	30	375	2.0	9.5	1.4	47	429	1.4
1289.2	0.490	21	0.569	30	353	1.8	7.1	1.0	46	404	1.3
1289.9	0.490	19	0.467	30	378	2.1	7.1	0.852	46	433	1.5
1290.6	0.490	16	0.510	26	366	2.4	7.1	0.930	41	419	1.7
1291.3	0.536	18	0.800	29	407	2.0	7.7	1.5	44	465	1.5
1292.0	0.490	23	0.681	33	407	1.7	7.1	1.2	50	465	1.3
1292.7	0.490	20	0.522	30	349	1.3	7.1	0.953	47	399	0.921
1293.4	0.513	19	0.456	34	360	1.9	7.4	0.832	53	411	1.4
1294.1	0.490	16	0.552	29	374	1.2	7.1	1.0	45	427	0.866
1294.8	0.490	25	0.908	30	366	2.7	7.1	1.7	46	418	2.0
1295.4	0.490	23	0.692	30	353	2.3	7.1	1.3	46	403	1.7
1296.1	0.490	25	0.867	35	374	2.1	7.1	1.6	54	428	1.6
1296.8	1.3	17	0.569	30	348	1.8	19	1.0	46	398	1.3
1297.5	0.490	19	0.667	28	355	1.6	7.1	1.2	43	406	1.2
1298.2	0.490	22	0.584	31	396	3.4	7.1	1.1	48	453	2.5
1298.9	0.993	22	0.682	33	354	2.3	14	1.2	51	405	1.7



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
1299.6	0.655	21	0.443	28	350	2.0	9.5	0.808	43	400	1.4
1300.3	0.490	19	0.620	32	367	2.3	7.1	1.1	49	420	1.7
1301.0	0.682	19	0.628	35	379	2.2	9.8	1.1	54	434	1.6
1301.7	0.490	23	0.665	31	335	2.8	7.1	1.2	48	383	2.0
1302.4	0.617	21	0.742	30	322	1.7	8.9	1.4	46	369	1.2
1303.1	0.490	17	0.324	27	342	2.7	7.1	0.591	42	391	2.0
1303.8	0.564	18	0.603	28	350	1.9	8.1	1.1	43	400	1.4
1304.5	0.768	22	0.754	35	352	0.727	11	1.4	54	403	0.530
1305.2	0.576	23	0.757	35	328	1.9	8.3	1.4	54	375	1.4
1305.9	0.828	23	0.703	36	351	2.1	12	1.3	56	402	1.5
1306.6	0.769	19	0.510	33	367	2.4	11	0.930	51	420	1.7
1307.3	0.625	19	0.771	29	395	2.2	9.0	1.4	44	451	1.6
1308.0	0.490	21	0.642	36	383	1.9	7.1	1.2	55	438	1.4
1308.7	0.490	22	0.367	37	336	1.8	7.1	0.670	57	384	1.3
1309.4	0.490	23	0.582	38	313	1.4	7.1	1.1	58	358	1.0
1310.1	0.737	19	0.664	34	363	2.3	11	1.2	53	415	1.7
1310.8	0.756	21	0.782	34	362	2.7	11	1.4	53	414	2.0
1311.5	0.490	19	0.367	40	381	2.2	7.1	0.668	61	435	1.6
1312.2	0.711	19	0.890	38	318	1.7	10	1.6	58	363	1.3
1312.9	0.490	18	0.463	35	357	2.3	7.1	0.844	54	408	1.6
1313.6	0.613	17	0.389	31	365	2.3	8.9	0.710	47	417	1.7
1314.3	0.490	24	0.683	38	348	2.4	7.1	1.2	58	398	1.8
1315.0	0.490	22	0.517	38	329	3.4	7.1	0.943	58	376	2.5
1315.7	1.1	21	0.656	40	338	2.1	15	1.2	61	387	1.5
1316.4	0.490	16	0.706	37	321	1.8	7.1	1.3	57	367	1.3
1317.1	0.490	21	0.726	34	359	2.1	7.1	1.3	52	411	1.6
1317.8	0.490	26	0.909	42	394	2.5	7.1	1.7	64	451	1.8
1318.5	0.785	26	0.796	36	338	1.7	11	1.5	56	387	1.3
1319.2	0.490	18	0.477	44	351	2.2	7.1	0.870	68	401	1.6
1319.9	0.490	20	0.708	42	350	3.1	7.1	1.3	65	400	2.2
1320.6	0.490	20	0.989	32	342	1.9	7.1	1.8	48	391	1.4
1321.3	0.490	23	0.639	39	380	2.5	7.1	1.2	59	435	1.8
1321.9	0.490	23	0.481	46	347	3.2	7.1	0.877	70	396	2.4
1322.6	0.745	23	1.0	43	363	1.4	11	1.9	65	415	1.0
1323.3	0.490	19	0.538	34	352	2.5	7.1	0.981	52	402	1.8
1324.0	0.490	20	0.621	44	345	2.0	7.1	1.1	67	394	1.5
1324.7	1.1	19	0.742	37	354	3.0	16	1.4	56	405	2.2
1325.4	0.490	21	0.444	47	356	2.5	7.1	0.811	71	407	1.8
1326.1	0.490	19	0.516	39	369	2.8	7.1	0.942	61	422	2.1
1326.8	0.490	18	0.615	38	323	2.3	7.1	1.1	58	369	1.7
1327.5	0.520	19	0.524	43	332	2.9	7.5	0.956	66	380	2.1
1328.2	0.490	17	0.426	45	385	2.6	7.1	0.777	68	440	1.9
1328.9	0.490	20	0.662	39	340	2.8	7.1	1.2	60	389	2.0
1329.6	0.490	17	0.396	44	347	3.4	7.1	0.722	68	397	2.5
1330.3	0.551	16	0.664	36	320	2.5	8.0	1.2	55	366	1.8
1331.0	0.824	18	0.481	43	336	2.8	12	0.877	66	384	2.1
1331.7	0.490	18	0.559	46	347	3.1	7.1	1.0	71	396	2.2
1332.4	0.490	19	0.475	45	333	2.6	7.1	0.866	69	380	1.9
1333.1	0.490	16	0.768	35	318	2.0	7.1	1.4	54	364	1.4
1333.8	0.490	19	0.438	43	373	3.0	7.1	0.798	66	427	2.2
1334.5	0.490	22	0.683	54	378	2.8	7.1	1.2	83	432	2.1
1335.2	0.490	20	0.802	42	322	2.5	7.1	1.5	64	368	1.8
1335.9	0.490	19	0.686	43	335	2.6	7.1	1.3	67	383	1.9
1336.6	0.531	16	0.563	36	345	3.1	7.7	1.0	56	394	2.3
1337.3	0.613	20	0.650	42	360	2.3	8.9	1.2	64	411	1.7
1338.0	0.490	18	0.636	51	362	2.6	7.1	1.2	78	414	1.9
1338.7	0.490	20	0.554	43	289	2.2	7.1	1.0	66	330	1.6
1339.4	0.490	17	0.550	48	334	1.9	7.1	1.0	73	381	1.4
1340.1	0.490	14	0.765	45	346	2.3	7.1	1.4	70	396	1.7
1340.8	0.490	15	0.489	43	396	2.7	7.1	0.891	66	452	1.9
1341.5	0.548	20	0.520	44	289	1.4	7.9	0.949	67	331	1.0
1342.2	0.490	15	0.471	46	331	2.6	7.1	0.858	70	379	1.9
1342.9	0.518	15	0.460	39	365	2.0	7.5	0.839	60	417	1.4
1343.6	0.624	14	0.690	37	297	2.1	9.0	1.3	57	340	1.5
1344.3	0.490	18	0.736	40	378	2.0	7.1	1.3	61	432	1.5
1345.0	0.494	19	0.867	45	348	1.5	7.1	1.6	68	398	1.1
1345.7	0.790	15	0.294	37	356	1.8	11	0.536	56	407	1.3
1346.4	0.497	18	0.742	43	334	2.4	7.2	1.4	66	382	1.8
1347.1	0.490	18	0.500	47	332	2.7	7.1	0.912	73	379	2.0
1347.7	0.490	19	0.745	46	363	2.1	7.1	1.4	71	415	1.5
1348.4	0.587	16	0.451	50	337	1.4	8.5	0.823	76	386	1.0
1349.1	0.490	14	0.605	42	312	1.2	7.1	1.1	64	356	0.863
1349.8	0.490	17	0.594	43	329	1.6	7.1	1.1	65	376	1.2
1350.5	0.490	16	0.530	49	337	1.4	7.1	0.967	75	385	1.0
1351.2	0.490	15	0.591	50	317	3.1	7.1	1.1	77	363	2.3
1351.9	0.490	17	0.366	48	320	1.9	7.1	0.668	73	366	1.4
1352.6	0.490	16	0.491	49	287	2.3	7.1	0.896	75	328	1.7
1353.3	0.490	17	0.564	47	373	2.5	7.1	1.0	72	426	1.8
1354.0	0.490	18	0.556	40	338	2.4	7.1	1.0	62	386	1.7
1354.7	0.490	17	0.445	44	319	1.6	7.1	0.812	68	365	1.2
1355.4	0.610	14	0.448	45	353	2.7	8.8	0.817	70	403	2.0



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1356.1	0.490	14	0.570	45	312	2.4	7.1	1.0	69	356	1.7
1356.8	0.627	17	0.482	45	368	2.2	9.1	0.879	68	421	1.6
1357.5	0.490	15	0.470	47	349	2.5	7.1	0.858	72	400	1.8
1358.2	0.490	18	0.380	49	340	2.1	7.1	0.693	75	389	1.5
1358.9	0.733	16	0.480	56	341	3.4	11	0.876	86	390	2.5
1359.6	0.490	15	0.568	42	316	2.5	7.1	1.0	64	362	1.8
1360.3	0.490	18	0.773	47	377	2.2	7.1	1.4	72	431	1.6
1361.0	0.490	16	0.768	53	319	1.9	7.1	1.4	82	364	1.4
1361.7	0.490	19	0.555	58	341	2.2	7.1	1.0	88	390	1.6
1362.4	0.490	16	0.644	45	328	2.4	7.1	1.2	69	375	1.8
1363.1	0.490	13	0.441	44	348	2.1	7.1	0.805	67	398	1.6
1363.8	0.490	20	0.549	48	358	3.9	7.1	1.0	74	409	2.8
1364.5	0.514	18	0.902	64	378	3.1	7.4	1.6	98	432	2.3
1365.2	0.490	15	0.621	48	309	3.1	7.1	1.1	74	354	2.3
1365.9	0.902	14	0.505	48	373	2.6	13	0.921	74	427	1.9
1366.6	0.693	14	0.575	40	395	2.5	10	1.0	61	452	1.8
1367.3	0.490	18	0.605	47	358	2.8	7.1	1.1	72	409	2.0
1368.0	0.490	20	0.662	58	363	2.1	7.1	1.2	89	415	1.5
1368.7	0.618	18	0.516	54	307	2.1	8.9	0.940	82	351	1.5
1369.4	0.633	13	0.465	50	320	3.9	9.1	0.848	76	366	2.8
1370.1	0.490	16	0.478	47	378	2.9	7.1	0.872	72	432	2.1
1370.8	0.490	15	0.645	49	378	1.9	7.1	1.2	74	432	1.4
1371.5	0.820	18	0.479	58	351	3.4	12	0.873	88	402	2.5
1372.2	0.490	15	0.831	51	317	3.0	7.1	1.5	77	363	2.2
1372.9	0.490	13	0.405	49	298	1.8	7.1	0.738	75	340	1.3
1373.6	0.490	18	0.635	47	368	2.9	7.1	1.2	72	420	2.1
1374.2	0.490	14	0.762	47	316	2.4	7.1	1.4	73	362	1.8
1374.9	0.490	18	0.450	64	342	3.1	7.1	0.821	98	391	2.3
1375.6	0.490	17	0.934	53	347	2.5	7.1	1.7	82	397	1.8
1376.3	0.490	13	0.395	50	344	2.1	7.1	0.720	77	393	1.5
1377.0	0.683	17	0.608	53	362	2.6	9.9	1.1	82	414	1.9
1377.7	0.490	15	0.544	60	308	2.8	7.1	0.991	92	352	2.1
1378.4	0.490	15	0.492	55	352	2.5	7.1	0.897	84	402	1.8
1379.1	0.490	15	0.433	61	329	2.9	7.1	0.790	93	376	2.2
1379.8	0.490	15	0.587	53	395	1.5	7.1	1.1	81	452	1.1
1380.5	0.636	17	0.442	54	395	2.9	9.2	0.806	82	451	2.1
1381.2	0.490	16	0.478	57	309	2.6	7.1	0.872	87	354	1.9
1381.9	0.490	14	0.544	57	320	2.2	7.1	0.991	87	366	1.6
1382.6	0.490	17	0.745	56	369	2.1	7.1	1.4	86	422	1.5
1383.3	0.490	17	0.733	52	406	3.1	7.1	1.3	80	465	2.2
1384.0	0.490	16	0.850	58	359	1.9	7.1	1.5	89	411	1.4
1384.7	0.490	17	0.607	59	355	3.1	7.1	1.1	90	406	2.3
1385.4	0.490	16	0.612	68	318	2.4	7.1	1.1	104	363	1.7
1386.1	0.490	12	0.536	53	329	3.0	7.1	0.977	81	376	2.2
1386.8	0.490	16	0.507	50	310	2.8	7.1	0.925	76	355	2.0
1387.5	0.490	18	0.904	58	374	3.3	7.1	1.6	89	427	2.4
1388.2	0.490	16	0.406	66	324	3.0	7.1	0.741	101	371	2.2
1388.9	0.490	14	0.863	57	318	2.5	7.1	1.6	88	364	1.8
1389.6	0.490	15	0.588	61	346	2.1	7.1	1.1	93	396	1.5
1390.3	0.490	14	0.556	61	338	2.4	7.1	1.0	94	386	1.7
1391.0	0.559	18	0.795	64	343	2.6	8.1	1.5	97	392	1.9
1391.7	0.490	18	0.750	79	342	3.0	7.1	1.4	121	391	2.2
1392.4	0.490	15	0.842	64	346	2.5	7.1	1.5	97	396	1.8
1393.1	0.490	14	0.690	61	306	2.0	7.1	1.3	94	350	1.5
1393.8	0.490	12	0.350	57	321	3.1	7.1	0.638	88	368	2.3
1394.5	0.490	17	0.615	63	339	2.9	7.1	1.1	97	388	2.1
1395.2	0.490	16	0.733	63	313	3.1	7.1	1.3	96	358	2.3
1395.9	0.490	15	0.932	55	320	1.8	7.1	1.7	85	366	1.3
1396.6	0.490	15	0.731	57	350	3.2	7.1	1.3	87	401	2.3
1397.3	0.490	17	0.856	68	395	2.2	7.1	1.6	104	451	1.6
1398.0	0.490	16	0.910	63	302	2.3	7.1	1.7	97	345	1.7
1398.7	0.490	15	0.609	82	396	1.6	7.1	1.1	126	452	1.1
1399.4	0.490	14	0.755	67	390	2.7	7.1	1.4	102	446	1.9
1400.1	0.490	15	0.631	56	346	3.0	7.1	1.2	86	396	2.2
1400.7	0.490	18	0.772	65	323	3.7	7.1	1.4	100	369	2.7
1401.4	0.490	13	0.760	76	323	3.3	7.1	1.4	116	369	2.4
1402.1	0.490	13	0.777	81	354	2.1	7.1	1.4	124	405	1.6
1402.8	0.490	13	0.691	60	320	3.2	7.1	1.3	92	366	2.3
1403.5	0.490	14	0.951	67	346	3.0	7.1	1.7	103	396	2.2
1404.2	0.490	17	1.2	73	340	2.2	7.1	2.2	112	388	1.6
1404.9	0.490	16	0.676	82	354	3.1	7.1	1.2	126	404	2.3
1405.6	0.490	14	0.938	75	353	2.6	7.1	1.7	115	404	1.9
1406.3	0.490	17	0.751	67	322	3.3	7.1	1.4	103	368	2.4
1407.0	0.518	16	1.0	71	358	2.5	7.5	1.9	108	409	1.8
1407.7	0.863	18	0.800	77	350	1.9	12	1.5	118	400	1.4
1408.4	0.490	18	1.0	87	314	2.9	7.1	1.8	133	359	2.1
1409.1	0.490	12	0.950	67	330	1.9	7.1	1.7	103	378	1.4
1409.8	0.490	14	0.792	72	314	3.1	7.1	1.4	110	360	2.2
1410.5	0.629	15	0.918	79	381	2.9	9.1	1.7	121	435	2.1
1411.2	0.490	15	0.955	80	319	3.7	7.1	1.7	122	365	2.7
1411.9	0.490	16	0.790	77	307	3.2	7.1	1.4	118	351	2.3



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1412.6	0.547	15	1.2	79	356	2.1	7.9	2.1	121	407	1.5
1413.3	0.490	13	1.2	76	341	2.0	7.1	2.2	116	390	1.5
1414.0	0.490	14	1.0	85	338	2.4	7.1	1.9	130	387	1.8
1414.7	0.559	16	0.878	73	300	2.2	8.1	1.6	112	343	1.6
1415.4	0.490	15	1.1	79	328	2.3	7.1	1.9	121	375	1.7
1416.1	0.490	13	0.729	72	311	4.1	7.1	1.3	110	355	3.0
1416.8	0.490	17	0.913	71	311	2.3	7.1	1.7	109	356	1.7
1417.5	0.490	14	1.2	81	284	2.5	7.1	2.3	123	325	1.8
1418.2	0.490	15	1.3	88	334	2.4	7.1	2.5	135	382	1.8
1418.9	0.490	16	0.962	83	315	2.6	7.1	1.8	127	361	1.9
1419.6	0.490	14	0.969	83	428	2.7	7.1	1.8	128	490	2.0
1420.3	0.490	14	1.3	78	323	2.5	7.1	2.4	119	369	1.8
1421.0	0.490	16	1.2	85	361	3.7	7.1	2.2	130	412	2.7
1421.7	0.490	13	1.0	84	318	3.1	7.1	1.8	129	364	2.3
1422.4	0.490	9.9	0.900	64	265	2.3	7.1	1.6	98	304	1.7
1423.1	0.490	12	1.2	82	299	3.3	7.1	2.2	126	342	2.4
1423.8	0.490	11	0.974	75	343	3.2	7.1	1.8	114	393	2.3
1424.5	0.490	14	1.1	85	321	3.7	7.1	1.9	131	367	2.7
1425.2	0.490	13	0.907	84	305	2.4	7.1	1.7	129	349	1.7
1425.9	0.490	13	0.722	84	325	2.7	7.1	1.3	128	371	2.0
1426.6	0.490	12	1.1	80	323	2.7	7.1	2.0	123	369	1.9
1427.2	0.490	14	1.7	84	303	3.5	7.1	3.1	129	346	2.5
1427.9	0.490	16	0.998	91	330	2.8	7.1	1.8	139	377	2.0
1428.6	0.490	13	0.979	83	302	2.9	7.1	1.8	128	345	2.1
1429.3	0.490	12	0.718	78	294	2.0	7.1	1.3	120	336	1.5
1430.0	0.490	11	1.2	75	365	2.8	7.1	2.2	115	417	2.0
1430.7	0.490	13	1.2	90	349	2.1	7.1	2.2	138	399	1.5
1431.4	0.490	13	1.1	83	283	4.0	7.1	2.1	127	324	2.9
1432.1	0.490	12	1.2	80	288	2.9	7.1	2.2	123	330	2.1
1432.8	0.490	12	1.1	78	289	3.2	7.1	2.1	120	331	2.3
1433.5	0.675	16	1.4	87	346	2.6	9.7	2.6	134	396	1.9
1434.2	0.712	15	1.3	83	307	3.0	10	2.4	127	352	2.2
1434.9	0.490	14	1.3	94	283	4.3	7.1	2.3	144	323	3.1
1435.6	0.490	12	1.0	81	271	2.4	7.1	1.9	124	310	1.7
1436.3	0.490	12	1.5	84	312	3.8	7.1	2.8	129	357	2.8
1437.0	0.490	12	1.1	102	332	3.4	7.1	2.0	156	380	2.5
1437.7	0.490	14	1.3	84	309	3.1	7.1	2.4	129	353	2.2
1438.4	0.490	14	1.3	102	320	3.9	7.1	2.4	156	366	2.8
1439.1	0.490	12	1.4	70	266	3.8	7.1	2.5	107	305	2.8
1439.8	0.490	13	1.6	93	307	3.6	7.1	2.9	142	351	2.6
1440.5	0.490	15	1.4	93	291	3.2	7.1	2.6	142	333	2.4
1441.2	0.490	13	1.3	92	260	2.6	7.1	2.4	142	298	1.9
1441.9	0.675	13	1.3	99	306	3.6	9.7	2.4	152	350	2.6
1442.6	0.694	14	1.6	90	349	2.9	10	3.0	137	399	2.1
1443.3	0.619	14	1.9	93	360	3.3	8.9	3.4	143	411	2.4
1444.0	0.490	14	1.9	113	308	3.4	7.1	3.4	172	352	2.5
1444.7	0.490	13	1.4	100	280	3.1	7.1	2.5	154	320	2.3
1445.4	0.490	13	1.4	107	313	3.3	7.1	2.5	164	358	2.4
1446.1	0.490	11	1.4	87	279	2.5	7.1	2.5	133	319	1.8
1446.8	0.490	14	1.7	97	305	2.8	7.1	3.1	148	349	2.0
1447.5	0.490	13	1.8	120	316	3.6	7.1	3.2	184	361	2.6
1448.2	0.490	14	1.9	112	297	2.4	7.1	3.6	171	340	1.7
1448.9	0.490	13	1.5	100	277	1.9	7.1	2.8	153	317	1.4
1449.6	0.777	14	0.988	96	361	1.7	11	1.8	147	413	1.2
1450.3	0.490	14	1.7	115	343	4.4	7.1	3.1	176	392	3.2
1451.0	0.490	13	1.5	110	297	3.5	7.1	2.7	169	339	2.5
1451.7	0.490	14	1.7	111	297	2.1	7.1	3.0	170	340	1.5
1452.4	0.490	12	2.0	96	304	2.7	7.1	3.7	148	347	2.0
1453.1	0.490	12	1.5	100	311	2.8	7.1	2.7	153	356	2.1
1453.8	0.490	14	1.7	97	304	2.6	7.1	3.2	149	347	1.9
1454.4	0.490	17	1.6	99	331	2.9	7.1	2.9	151	378	2.1
1455.1	0.490	15	1.9	105	348	1.8	7.1	3.5	161	398	1.3
1455.8	0.490	12	1.8	93	298	2.4	7.1	3.3	143	340	1.7
1456.5	0.490	15	2.0	111	349	4.3	7.1	3.7	169	399	3.1
1457.2	0.490	16	1.8	107	376	2.8	7.1	3.3	163	430	2.0
1457.9	0.490	14	1.8	104	262	2.1	7.1	3.3	159	300	1.6
1458.6	0.608	13	1.6	108	289	1.5	8.8	3.0	166	330	1.1
1459.3	0.490	12	1.8	108	341	2.8	7.1	3.2	166	390	2.1
1460.0	0.490	15	2.3	125	319	2.8	7.1	4.2	191	365	2.0
1460.7	0.490	16	1.7	120	337	3.0	7.1	3.1	183	385	2.2
1461.4	0.490	14	1.0	102	308	2.8	7.1	1.9	156	352	2.1
1462.1	0.490	12	2.0	104	290	2.0	7.1	3.6	160	331	1.5
1462.8	0.490	13	2.0	104	301	2.2	7.1	3.7	160	344	1.6
1463.5	0.490	15	2.3	128	342	1.9	7.1	4.3	196	392	1.4
1464.2	0.530	13	1.5	109	327	2.4	7.6	2.8	167	374	1.7
1464.9	0.506	14	1.8	119	319	1.5	7.3	3.3	182	365	1.1
1465.6	0.490	14	1.4	99	327	1.9	7.1	2.6	152	374	1.4
1466.3	0.490	16	2.2	102	320	3.0	7.1	4.0	156	366	2.2
1467.0	0.490	15	2.3	119	376	2.9	7.1	4.2	183	430	2.1
1467.7	0.490	15	1.9	117	309	1.6	7.1	3.5	179	353	1.1
1468.4	0.490	15	1.7	115	301	2.7	7.1	3.2	176	345	2.0



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Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1469.1	0.512	12	1.7	115	345	3.1	7.4	3.1	177	395	2.3
1469.8	0.490	15	1.7	115	368	1.7	7.1	3.2	177	421	1.3
1470.5	0.490	15	1.9	126	340	2.6	7.1	3.5	192	389	1.9
1471.2	0.490	15	1.4	123	337	3.0	7.1	2.6	188	386	2.2
1471.9	0.490	15	1.6	124	321	1.7	7.1	2.9	190	367	1.2
1472.6	0.523	14	1.7	107	345	2.0	7.5	3.0	164	395	1.4
1473.3	0.546	15	1.9	113	333	2.2	7.9	3.5	173	381	1.6
1474.0	0.490	17	1.8	122	333	2.5	7.1	3.3	188	380	1.8
1474.7	0.490	14	1.9	119	320	2.6	7.1	3.5	182	366	1.9
1475.4	0.490	16	1.8	107	378	1.6	7.1	3.3	164	432	1.1
1476.1	0.490	13	1.8	102	316	1.8	7.1	3.2	156	361	1.3
1476.8	0.490	16	2.0	110	351	3.1	7.1	3.7	169	401	2.3
1477.5	0.621	13	2.0	122	306	2.2	9.0	3.6	187	350	1.6
1478.2	0.530	14	1.9	124	319	2.2	7.6	3.5	190	364	1.6
1478.9	0.490	16	1.7	99	304	1.8	7.1	3.2	151	347	1.3
1479.6	0.673	15	1.7	102	330	2.0	9.7	3.1	156	378	1.5
1480.3	0.490	16	1.6	110	355	1.8	7.1	2.9	168	406	1.3
1480.9	0.490	15	1.8	110	372	2.9	7.1	3.2	168	425	2.1
1481.6	0.490	14	1.9	111	347	2.4	7.1	3.5	170	397	1.7
1482.3	0.490	17	1.7	102	363	2.9	7.1	3.2	156	415	2.1
1483.0	0.490	13	1.6	111	323	1.8	7.1	2.9	170	370	1.3
1483.7	0.490	16	1.7	111	358	2.3	7.1	3.1	170	410	1.7
1484.4	0.490	15	1.6	100	275	2.0	7.1	2.9	153	315	1.4
1485.1	0.490	15	1.5	121	352	1.6	7.1	2.8	186	403	1.2
1485.8	0.886	15	1.6	119	370	2.6	13	2.9	182	424	1.9
1486.5	0.490	15	2.3	103	382	2.8	7.1	4.2	158	437	2.1
1487.2	0.490	18	2.0	100	333	3.5	7.1	3.6	153	380	2.6
1487.9	0.490	17	1.9	114	323	2.5	7.1	3.4	175	370	1.9
1488.6	0.636	15	1.6	103	387	2.6	9.2	2.9	158	443	1.9
1489.3	0.490	17	1.7	102	332	1.9	7.1	3.1	157	380	1.4
1490.0	0.490	15	2.1	108	389	2.7	7.1	3.7	165	445	1.9
1490.7	0.490	17	2.1	118	371	1.0	7.1	3.9	181	425	0.753
1491.4	0.490	15	1.9	121	331	1.6	7.1	3.5	186	378	1.2
1492.1	0.541	17	1.9	95	386	2.2	7.8	3.4	146	442	1.6
1492.8	0.490	14	1.9	112	381	2.2	7.1	3.5	172	435	1.6
1493.5	0.490	18	1.8	115	395	3.1	7.1	3.3	176	452	2.3
1494.2	0.490	18	1.9	117	359	2.4	7.1	3.5	180	411	1.8
1494.9	1.0	14	1.6	112	396	1.8	15	2.9	172	453	1.3
1495.6	0.851	14	1.8	108	362	2.5	12	3.2	166	414	1.8
1496.3	0.490	18	1.8	102	396	3.3	7.1	3.4	157	453	2.4
1497.0	0.932	16	1.6	117	415	1.9	13	2.9	180	475	1.4
1497.7	0.490	19	1.7	108	339	1.7	7.1	3.0	165	388	1.3
1498.4	0.490	14	1.4	95	368	2.8	7.1	2.6	145	420	2.0
1499.1	0.495	15	2.0	104	399	2.0	7.1	3.7	160	457	1.4
1499.8	0.490	13	1.2	85	359	2.1	7.1	2.1	131	410	1.6
1500.5	0.490	19	1.7	109	420	1.9	7.1	3.1	167	480	1.4
1501.2	0.490	16	1.9	103	481	2.6	7.1	3.5	159	550	1.9
1501.9	0.490	13	1.1	81	353	2.6	7.1	2.1	124	404	1.9
1502.6	0.624	17	1.7	104	404	2.7	9.0	3.0	159	462	1.9
1503.3	0.490	16	1.8	102	385	2.4	7.1	3.3	156	441	1.8
1504.0	0.944	17	1.7	108	371	2.0	14	3.1	166	425	1.4
1504.7	0.490	12	1.9	100	381	1.8	7.1	3.4	154	436	1.3
1505.4	0.490	15	1.9	92	430	1.6	7.1	3.5	141	492	1.2
1506.1	0.490	14	1.6	102	414	1.8	7.1	2.9	156	474	1.3
1506.8	0.523	17	2.3	110	448	3.4	7.5	4.2	168	512	2.5
1507.4	0.490	16	1.5	109	403	2.3	7.1	2.8	168	461	1.7
1508.1	0.490	18	1.8	112	458	2.5	7.1	3.2	172	523	1.8
1508.8	0.507	16	2.0	103	431	2.0	7.3	3.6	158	493	1.5
1509.5	0.982	16	1.1	103	449	2.2	14	2.0	157	514	1.6
1510.2	0.490	17	1.7	114	473	1.8	7.1	3.2	175	541	1.3
1510.9	0.490	16	2.0	106	447	1.9	7.1	3.7	163	511	1.4
1511.6	0.490	14	1.5	86	361	1.7	7.1	2.7	132	413	1.3
1512.3	0.490	15	1.6	105	467	1.9	7.1	3.0	161	534	1.4
1513.0	0.490	17	1.9	101	505	2.2	7.1	3.5	155	577	1.6
1513.7	0.490	15	1.5	110	463	2.0	7.1	2.8	169	529	1.5
1514.4	0.777	17	1.8	98	440	1.4	11	3.3	151	504	1.0
1515.1	0.638	15	1.4	103	408	1.9	9.2	2.5	158	467	1.4
1515.8	0.650	17	1.6	93	463	1.4	9.4	2.9	142	530	1.0
1516.5	0.490	14	1.4	93	474	1.5	7.1	2.5	142	542	1.1
1517.2	0.490	13	1.4	95	382	1.8	7.1	2.5	146	437	1.3
1517.9	0.490	17	1.4	102	414	1.8	7.1	2.6	156	473	1.3
1518.6	0.490	15	1.3	99	415	2.0	7.1	2.3	152	475	1.5
1519.3	0.490	16	1.3	87	466	1.6	7.1	2.3	133	533	1.2
1520.0	0.605	17	1.5	100	498	2.3	8.7	2.7	153	570	1.7
1520.7	0.490	15	1.2	97	443	1.6	7.1	2.2	148	507	1.2
1521.4	0.490	14	1.4	94	423	2.7	7.1	2.6	143	483	2.0
1522.1	0.490	15	1.5	95	458	1.4	7.1	2.7	145	523	1.0
1522.8	0.490	16	1.5	91	556	2.2	7.1	2.8	139	635	1.6
1523.5	0.490	15	1.4	89	405	2.0	7.1	2.6	137	463	1.5
1524.2	0.490	17	1.2	97	395	2.2	7.1	2.3	149	451	1.6
1524.9	0.514	14	1.4	97	416	1.7	7.4	2.6	148	476	1.2



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Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1525.6	0.490	14	1.4	82	441	2.1	7.1	2.5	125	504	1.5
1526.3	0.497	15	1.1	93	433	2.4	7.2	2.1	142	495	1.8
1527.0	0.490	19	1.5	89	434	1.6	7.1	2.8	137	497	1.2
1527.7	0.490	16	0.915	99	412	1.4	7.1	1.7	152	472	1.0
1528.4	0.614	14	1.2	90	406	1.4	8.9	2.3	139	465	1.0
1529.1	0.490	12	1.0	76	359	1.2	7.1	1.9	116	411	0.875
1529.8	0.606	14	1.4	83	472	2.1	8.8	2.6	127	539	1.5
1530.5	0.490	14	0.907	93	384	1.8	7.1	1.7	143	439	1.3
1531.2	0.567	14	0.705	83	342	1.6	8.2	1.3	127	391	1.1
1531.9	0.490	12	1.5	79	393	2.3	7.1	2.7	121	449	1.7
1532.6	0.490	12	1.3	73	381	1.3	7.1	2.3	112	436	0.914
1533.2	0.490	12	1.5	93	457	2.4	7.1	2.7	143	523	1.8
1533.9	0.490	14	1.1	87	358	1.7	7.1	2.0	133	410	1.2
1534.6	0.490	11	0.721	86	413	1.5	7.1	1.3	132	473	1.1
1535.3	0.646	13	0.972	76	425	1.2	9.3	1.8	116	486	0.905
1536.0	0.490	12	1.2	71	393	1.1	7.1	2.2	109	449	0.821
1536.7	0.490	13	1.2	81	428	1.6	7.1	2.3	124	489	1.2
1537.4	0.490	12	1.1	81	398	1.1	7.1	2.0	124	455	0.829
1538.1	0.490	15	0.927	77	455	1.9	7.1	1.7	118	520	1.4
1538.8	0.491	12	1.0	83	381	1.3	7.1	1.9	127	436	0.968
1539.5	0.736	12	1.1	79	493	1.1	11	2.1	122	564	0.810
1540.2	0.490	15	1.0	103	423	2.4	7.1	1.8	158	484	1.8
1540.9	0.490	16	1.1	90	401	2.0	7.1	1.9	138	459	1.4
1541.6	0.490	11	1.1	75	372	1.5	7.1	2.0	115	426	1.1
1542.3	0.490	13	0.977	66	359	1.9	7.1	1.8	102	410	1.4
1543.0	0.490	9.9	1.0	80	439	2.3	7.1	1.9	123	502	1.7
1543.7	0.490	14	0.879	88	449	2.2	7.1	1.6	135	513	1.6
1544.4	0.490	12	1.0	81	393	1.4	7.1	1.9	123	449	1.1
1545.1	0.490	13	0.967	70	370	1.6	7.1	1.8	108	424	1.2
1545.8	0.803	12	1.1	80	442	1.5	12	2.0	123	506	1.1
1546.5	0.490	11	0.805	81	349	1.3	7.1	1.5	124	399	0.984
1547.2	0.490	13	1.2	79	328	1.8	7.1	2.1	121	375	1.3
1547.9	0.490	12	1.4	69	410	1.3	7.1	2.6	106	469	0.956
1548.6	0.490	10	0.665	77	352	1.2	7.1	1.2	118	402	0.909
1549.3	0.490	10	0.721	87	441	1.7	7.1	1.3	133	504	1.2
1550.0	0.490	12	1.1	78	404	1.7	7.1	1.9	120	462	1.3
1550.7	0.490	14	0.887	82	398	1.1	7.1	1.6	125	455	0.815
1551.4	0.490	11	0.736	76	390	1.1	7.1	1.3	116	446	0.778
1552.1	0.490	11	0.343	65	354	1.6	7.1	0.626	99	404	1.2
1552.8	0.490	12	0.772	68	381	1.6	7.1	1.4	104	436	1.2
1553.5	0.490	11	1.3	76	443	1.2	7.1	2.3	117	507	0.881
1554.2	0.490	13	0.614	67	348	1.5	7.1	1.1	103	398	1.1
1554.9	0.490	10	0.948	67	333	1.8	7.1	1.7	102	381	1.3
1555.6	0.490	13	0.798	68	366	0.914	7.1	1.5	104	419	0.667
1556.3	0.557	13	0.584	71	446	2.7	8.0	1.1	108	510	2.0
1557.0	0.490	14	0.998	62	354	1.3	7.1	1.8	96	405	0.969
1557.7	0.490	12	0.830	63	337	1.8	7.1	1.5	97	385	1.3
1558.4	0.490	12	0.871	61	389	2.5	7.1	1.6	93	444	1.8
1559.1	0.490	13	0.661	65	407	1.6	7.1	1.2	99	465	1.1
1559.7	0.490	15	1.3	69	435	1.5	7.1	2.3	105	497	1.1
1560.4	0.490	13	0.813	61	383	1.3	7.1	1.5	94	438	0.976
1561.1	0.490	9.8	0.588	61	389	1.1	7.1	1.1	93	445	0.792
1561.8	0.490	11	0.901	59	393	1.7	7.1	1.6	90	449	1.3
1562.5	0.490	14	1.0	66	422	2.0	7.1	1.9	101	483	1.5
1563.2	0.490	14	0.978	69	359	1.6	7.1	1.8	105	411	1.1
1563.9	0.764	12	0.848	69	357	1.7	11	1.5	106	408	1.3
1564.6	0.490	11	0.647	61	342	1.4	7.1	1.2	93	391	1.1
1565.3	0.490	12	0.528	62	355	1.9	7.1	0.964	96	406	1.4
1566.0	0.490	12	0.553	68	352	1.7	7.1	1.0	104	402	1.2
1566.7	0.490	14	0.981	64	339	1.5	7.1	1.8	98	388	1.1
1567.4	0.490	14	0.656	70	344	1.8	7.1	1.2	108	394	1.3
1568.1	0.490	10	0.642	57	314	1.3	7.1	1.2	87	359	0.923
1568.8	0.490	12	0.621	53	353	1.0	7.1	1.1	82	403	0.741
1569.5	0.490	13	0.530	56	410	1.7	7.1	0.967	86	469	1.2
1570.2	0.585	12	0.663	59	332	1.7	8.4	1.2	91	380	1.3
1570.9	0.490	12	0.644	54	360	1.1	7.1	1.2	83	411	0.811
1571.6	0.490	11	0.621	46	316	1.2	7.1	1.1	70	362	0.885
1572.3	0.490	11	0.734	47	350	2.4	7.1	1.3	73	400	1.7
1573.0	0.490	12	0.772	51	348	1.7	7.1	1.4	78	397	1.3
1573.7	0.490	12	0.554	50	375	2.0	7.1	1.0	77	428	1.4
1574.4	0.490	12	0.584	52	334	0.956	7.1	1.1	80	382	0.698
1575.1	0.490	11	0.647	48	314	1.8	7.1	1.2	74	359	1.3
1575.8	0.548	11	0.685	48	337	0.887	7.9	1.2	73	386	0.647
1576.5	0.636	13	0.813	58	405	2.5	9.2	1.5	90	464	1.8
1577.2	0.490	10	0.919	45	309	0.821	7.1	1.7	69	353	0.599
1577.9	0.490	12	0.726	46	378	1.4	7.1	1.3	70	432	1.0
1578.6	0.490	10	0.501	45	364	1.8	7.1	0.913	68	416	1.3
1579.3	0.490	13	0.810	49	378	1.4	7.1	1.5	75	432	0.999
1580.0	0.490	13	0.687	53	381	1.1	7.1	1.3	82	436	0.794
1580.7	0.490	9.3	0.692	51	363	1.1	7.1	1.3	78	415	0.775
1581.4	0.490	8.9	0.749	37	322	1.3	7.1	1.4	57	368	0.963



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Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1582.1	0.490	10	0.769	40	354	1.7	7.1	1.4	61	405	1.2
1582.8	0.490	11	0.852	48	390	1.5	7.1	1.6	73	446	1.1
1583.5	0.490	11	0.659	43	312	1.9	7.1	1.2	66	357	1.4
1584.2	0.490	8.8	0.157	38	298	1.1	7.1	0.286	58	341	0.827
1584.9	0.490	10	0.615	38	346	1.3	7.1	1.1	58	395	0.967
1585.5	0.490	10	0.584	39	338	1.1	7.1	1.1	60	387	0.774
1586.2	0.490	10	0.452	47	360	1.9	7.1	0.824	72	412	1.4
1586.9	0.490	12	0.663	44	352	1.9	7.1	1.2	68	403	1.4
1587.6	0.490	9.0	0.660	39	306	1.2	7.1	1.2	60	349	0.874
1588.3	0.490	9.1	0.561	32	351	2.1	7.1	1.0	49	401	1.6
1589.0	0.490	7.6	0.461	35	350	1.1	7.1	0.842	54	400	0.784
1589.7	0.490	9.7	0.719	46	343	1.6	7.1	1.3	70	392	1.1
1590.4	0.490	9.4	0.370	45	396	1.8	7.1	0.675	70	453	1.3
1591.1	0.490	7.4	0.489	38	353	1.9	7.1	0.891	58	403	1.4
1591.8	0.490	7.4	0.630	34	351	1.9	7.1	1.1	52	402	1.4
1592.5	0.490	9.1	0.350	37	381	2.1	7.1	0.638	57	436	1.6
1593.2	0.490	9.2	0.357	34	308	1.6	7.1	0.650	52	353	1.2
1593.9	0.490	8.2	0.395	41	357	1.7	7.1	0.720	63	409	1.2
1594.6	0.490	9.2	0.418	41	367	1.5	7.1	0.762	62	420	1.1
1595.3	0.490	11	0.430	30	354	1.3	7.1	0.784	45	404	0.913
1596.0	0.490	10	0.329	33	365	2.4	7.1	0.600	51	417	1.7
1596.7	0.490	9.3	0.399	38	300	1.9	7.1	0.727	58	342	1.4
1597.4	0.490	11	0.310	35	361	1.3	7.1	0.565	54	413	0.935
1598.1	0.490	7.7	0.537	34	317	2.0	7.1	0.979	51	362	1.4
1598.8	0.490	8.4	0.726	30	324	1.4	7.1	1.3	46	371	1.1
1599.5	0.490	11	0.417	32	405	2.1	7.1	0.761	49	463	1.5
1600.2	0.490	7.8	0.630	39	348	1.6	7.1	1.1	61	398	1.2
1600.9	0.490	8.1	0.462	30	320	1.7	7.1	0.843	45	366	1.3
1601.6	0.490	7.6	0.506	36	341	1.7	7.1	0.924	56	390	1.2
1602.3	0.490	7.9	0.513	29	355	2.1	7.1	0.935	45	406	1.5
1603.0	0.490	8.3	0.432	34	350	2.1	7.1	0.787	53	400	1.5
1603.7	0.490	8.2	0.306	36	329	1.8	7.1	0.558	55	376	1.3
1604.4	0.490	7.5	0.284	30	338	1.8	7.1	0.518	46	386	1.3
1605.1	0.490	8.0	0.385	31	315	2.1	7.1	0.702	48	361	1.5
1605.8	0.490	8.6	0.575	34	420	2.4	7.1	1.0	52	480	1.7
1606.5	0.490	8.4	0.355	36	405	2.2	7.1	0.647	55	463	1.6
1607.2	0.490	9.8	0.481	37	323	2.6	7.1	0.878	56	369	1.9
1607.9	0.490	8.0	0.498	32	326	1.8	7.1	0.908	49	373	1.3
1608.6	0.490	8.9	0.428	33	369	2.0	7.1	0.781	50	422	1.5
1609.3	0.490	8.3	0.348	36	308	1.8	7.1	0.635	55	352	1.3
1610.0	0.490	9.4	0.727	34	340	2.6	7.1	1.3	52	388	1.9
1610.7	0.490	7.8	0.354	30	313	2.8	7.1	0.645	46	358	2.0
1611.4	0.490	7.5	0.482	30	348	1.4	7.1	0.878	46	398	1.0
1612.0	0.493	7.6	0.577	32	336	1.6	7.1	1.1	48	385	1.2
1612.7	0.490	9.3	0.669	33	392	2.5	7.1	1.2	51	448	1.8
1613.4	0.490	9.3	0.819	40	385	3.8	7.1	1.5	61	440	2.7
1614.1	0.490	8.7	0.349	33	330	2.1	7.1	0.636	51	378	1.5
1614.8	0.490	7.6	0.381	31	322	1.9	7.1	0.695	48	368	1.4
1615.5	0.545	8.5	0.747	31	341	2.1	7.9	1.4	48	390	1.5
1616.2	0.490	8.1	0.568	39	353	2.5	7.1	1.0	60	404	1.8
1616.9	0.490	8.9	0.422	34	343	2.4	7.1	0.769	52	392	1.8
1617.6	0.490	8.7	0.345	30	340	2.7	7.1	0.630	46	389	2.0
1618.3	0.490	9.4	0.328	27	354	2.0	7.1	0.599	42	405	1.4
1619.0	0.490	8.7	0.292	33	387	2.0	7.1	0.533	51	442	1.4
1619.7	0.490	13	0.491	38	404	3.1	7.1	0.895	58	462	2.3
1620.4	0.490	9.9	0.273	35	347	1.8	7.1	0.498	53	397	1.3
1621.1	0.490	7.6	0.486	32	317	1.9	7.1	0.887	49	362	1.4
1621.8	0.490	7.7	0.323	31	371	2.5	7.1	0.589	48	424	1.8
1622.5	0.490	7.5	0.484	33	356	2.5	7.1	0.883	51	407	1.8
1623.2	0.490	9.7	0.437	33	344	1.3	7.1	0.796	51	394	0.948
1623.9	0.490	7.3	0.563	33	288	1.6	7.1	1.0	50	329	1.2
1624.6	0.490	9.0	0.384	31	354	2.5	7.1	0.701	47	405	1.8
1625.3	0.490	7.3	0.443	29	325	1.4	7.1	0.807	45	372	1.0
1626.0	0.490	7.8	0.377	29	378	3.0	7.1	0.687	44	433	2.2
1626.7	0.490	11	0.510	38	335	1.5	7.1	0.930	58	383	1.1
1627.4	0.490	11	0.530	39	383	2.2	7.1	0.966	60	438	1.6
1628.1	0.490	9.5	0.742	33	320	2.9	7.1	1.4	51	366	2.1
1628.8	0.490	12	0.596	39	341	2.5	7.1	1.1	60	390	1.8
1629.5	0.490	12	0.757	39	372	2.1	7.1	1.4	60	425	1.5
1630.2	0.490	11	0.552	44	346	2.8	7.1	1.0	67	396	2.0
1630.9	0.490	9.8	0.222	41	353	2.3	7.1	0.405	63	404	1.7
1631.6	0.490	10	0.555	39	305	2.6	7.1	1.0	61	349	1.9
1632.3	0.490	9.8	0.613	40	344	2.5	7.1	1.1	61	394	1.8
1633.0	0.490	9.4	0.493	41	389	2.1	7.1	0.899	63	445	1.5
1633.7	0.490	13	0.617	44	326	2.2	7.1	1.1	67	373	1.6
1634.4	0.490	9.3	0.446	38	313	1.9	7.1	0.813	58	358	1.4
1635.1	0.490	9.6	0.738	44	319	1.9	7.1	1.3	67	365	1.4
1635.8	0.490	9.4	0.819	45	305	2.4	7.1	1.5	68	349	1.8
1636.5	0.490	9.8	0.790	43	287	2.4	7.1	1.4	66	328	1.8
1637.2	0.490	7.5	0.702	40	316	1.0	7.1	1.3	62	362	0.743
1637.9	0.490	8.3	0.725	48	321	2.5	7.1	1.3	74	367	1.9



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1638.5	0.490	12	0.750	50	428	2.8	7.1	1.4	77	490	2.0
1639.2	0.490	10	0.479	46	292	2.3	7.1	0.873	71	334	1.7
1639.9	0.490	8.9	0.883	45	296	1.6	7.1	1.6	70	338	1.2
1640.6	0.490	9.0	0.590	47	343	2.5	7.1	1.1	72	392	1.8
1641.3	0.490	8.1	0.596	44	289	1.7	7.1	1.1	67	330	1.3
1642.0	0.490	10	0.715	45	322	2.8	7.1	1.3	69	369	2.1
1642.7	0.490	11	1.7	46	344	2.5	7.1	3.1	71	394	1.8
1643.4	0.490	12	0.695	52	371	2.7	7.1	1.3	80	424	1.9
1644.1	0.490	10	0.499	53	294	1.6	7.1	0.910	81	336	1.2
1644.8	0.490	11	0.901	50	359	2.5	7.1	1.6	77	410	1.8
1645.5	0.490	11	0.731	44	323	2.3	7.1	1.3	68	369	1.7
1646.2	0.490	10	0.753	41	333	1.7	7.1	1.4	62	381	1.3
1646.9	0.490	11	0.567	43	352	2.4	7.1	1.0	66	402	1.7
1647.6	0.490	10	0.495	45	284	3.3	7.1	0.903	69	325	2.4
1648.3	0.490	10	0.672	51	349	2.1	7.1	1.2	78	399	1.5
1649.0	0.490	12	0.478	51	346	2.3	7.1	0.871	78	396	1.7
1649.7	0.490	12	0.965	59	375	3.4	7.1	1.8	90	429	2.5
1650.4	0.490	10	0.966	61	320	2.7	7.1	1.8	93	366	2.0
1651.1	0.490	11	0.797	47	314	2.5	7.1	1.5	72	359	1.8
1651.8	0.490	9.8	0.813	45	324	1.2	7.1	1.5	69	370	0.904
1652.5	0.490	9.7	0.914	50	336	3.2	7.1	1.7	77	384	2.4
1653.2	0.490	11	0.947	60	321	1.4	7.1	1.7	92	367	0.985
1653.9	0.490	11	0.736	58	333	2.7	7.1	1.3	88	380	2.0
1654.6	0.490	10	0.663	53	312	2.9	7.1	1.2	81	356	2.1
1655.3	0.490	10	1.0	45	323	2.7	7.1	1.9	69	370	1.9
1656.0	0.490	11	1.1	61	351	2.6	7.1	1.9	93	402	1.9
1656.7	0.490	10	0.990	59	298	2.5	7.1	1.8	90	341	1.8
1657.4	0.490	11	0.731	55	321	1.9	7.1	1.3	84	367	1.4
1658.1	0.490	9.3	1.0	46	302	2.2	7.1	1.9	71	345	1.6
1658.8	0.490	11	1.4	62	384	3.4	7.1	2.5	94	439	2.5
1659.5	0.561	11	0.992	60	307	2.0	8.1	1.8	92	351	1.5
1660.2	0.490	11	1.2	61	297	2.2	7.1	2.1	93	340	1.6
1660.9	0.490	11	0.989	58	321	1.2	7.1	1.8	89	367	0.841
1661.6	0.490	10	0.798	66	350	2.2	7.1	1.5	101	401	1.6
1662.3	0.490	11	1.2	51	324	2.2	7.1	2.1	78	370	1.6
1663.0	0.490	13	0.851	69	340	2.7	7.1	1.6	106	389	2.0
1663.7	0.490	10	1.2	61	295	1.8	7.1	2.3	94	337	1.3
1664.4	0.490	13	1.1	59	296	2.4	7.1	1.9	91	338	1.7
1665.0	0.490	11	0.805	63	316	2.1	7.1	1.5	97	362	1.5
1665.7	0.490	12	1.0	64	339	2.6	7.1	1.9	98	388	1.9
1666.4	0.490	12	1.2	69	327	2.2	7.1	2.1	106	374	1.6
1667.1	0.490	11	0.959	64	304	2.3	7.1	1.7	99	347	1.7
1667.8	0.490	10	1.0	60	352	1.3	7.1	1.9	91	402	0.973
1668.5	0.490	12	1.4	76	343	2.6	7.1	2.6	117	392	1.9
1669.2	0.490	11	1.3	66	341	1.6	7.1	2.3	101	390	1.2
1669.9	0.490	13	0.866	64	303	3.1	7.1	1.6	99	346	2.3
1670.6	0.490	11	0.835	66	324	2.4	7.1	1.5	101	371	1.8
1671.3	0.490	11	1.1	66	391	2.3	7.1	2.1	101	447	1.7
1672.0	0.490	10	1.2	61	296	1.3	7.1	2.2	94	339	0.962
1672.7	0.490	11	1.1	69	318	2.0	7.1	2.0	106	364	1.4
1673.4	0.490	13	1.2	66	307	2.0	7.1	2.2	101	351	1.5
1674.1	0.490	12	0.781	60	283	2.1	7.1	1.4	92	324	1.5
1674.8	0.490	11	1.0	70	325	1.7	7.1	1.8	107	371	1.2
1675.5	0.490	11	1.8	65	401	2.5	7.1	3.3	99	458	1.8
1676.2	0.490	15	1.2	80	339	3.1	7.1	2.2	122	388	2.3
1676.9	0.516	11	1.2	70	331	3.0	7.4	2.1	107	379	2.2
1677.6	0.490	12	0.988	61	305	2.8	7.1	1.8	94	348	2.0
1678.3	0.490	13	1.2	71	325	2.5	7.1	2.3	109	371	1.8
1679.0	0.490	14	1.5	75	359	2.2	7.1	2.7	116	410	1.6
1679.7	0.490	11	0.928	69	292	2.0	7.1	1.7	106	334	1.4
1680.4	0.490	11	1.3	78	366	1.8	7.1	2.4	119	419	1.3
1681.1	0.490	11	1.4	75	324	2.2	7.1	2.5	114	371	1.6
1681.8	0.490	9.3	1.1	66	331	2.9	7.1	2.0	101	379	2.1
1682.5	0.490	11	1.1	68	303	2.6	7.1	2.0	104	347	1.9
1683.2	0.490	11	1.1	90	320	1.9	7.1	1.9	138	366	1.4
1683.9	0.490	12	1.3	77	430	2.3	7.1	2.4	119	491	1.6
1684.6	0.490	8.4	1.4	67	329	2.1	7.1	2.6	102	376	1.5
1685.3	0.490	12	1.2	69	316	1.9	7.1	2.3	106	362	1.4
1686.0	0.490	12	0.992	75	339	2.2	7.1	1.8	116	388	1.6
1686.7	0.490	12	1.1	84	339	2.3	7.1	2.1	128	388	1.7
1687.4	0.490	11	1.1	85	352	2.7	7.1	2.0	130	402	2.0
1688.1	0.490	8.4	1.3	66	287	1.0	7.1	2.4	101	328	0.738
1688.8	0.490	12	1.6	73	303	1.7	7.1	2.9	112	347	1.3
1689.5	0.490	12	0.869	76	289	2.9	7.1	1.6	116	331	2.1
1690.2	0.490	11	1.0	75	309	1.6	7.1	1.9	115	354	1.1
1690.9	0.490	11	1.1	65	324	2.0	7.1	2.0	99	371	1.5
1691.5	0.490	14	1.1	79	321	1.7	7.1	1.9	121	367	1.2
1692.2	0.490	14	1.3	90	350	0.815	7.1	2.4	137	400	0.594
1692.9	0.490	13	0.821	82	296	2.6	7.1	1.5	125	338	1.9
1693.6	0.490	10	1.1	84	328	2.1	7.1	2.1	128	375	1.5
1694.3	0.490	12	0.923	91	358	2.5	7.1	1.7	139	409	1.8



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1695.0	0.490	9.1	1.2	71	316	2.7	7.1	2.1	109	361	2.0
1695.7	0.490	13	1.2	78	304	1.9	7.1	2.2	119	347	1.4
1696.4	0.490	11	1.2	70	276	1.8	7.1	2.1	108	315	1.3
1697.1	0.490	16	1.2	78	319	1.9	7.1	2.2	119	365	1.4
1697.8	0.490	11	0.931	74	297	1.4	7.1	1.7	114	340	0.993
1698.5	0.490	15	1.1	71	297	2.0	7.1	2.0	109	340	1.5
1699.2	0.490	12	1.0	76	336	1.3	7.1	1.9	117	385	0.978
1699.9	0.490	14	0.996	81	330	2.9	7.1	1.8	125	377	2.1
1700.6	0.490	11	0.965	81	313	2.0	7.1	1.8	124	358	1.5
1701.3	0.490	11	0.927	72	347	2.5	7.1	1.7	110	396	1.8
1702.0	0.490	13	1.4	81	353	2.2	7.1	2.6	124	403	1.6
1702.7	0.490	13	0.917	95	346	3.1	7.1	1.7	145	395	2.3
1703.4	0.490	14	1.1	86	324	1.8	7.1	2.1	131	371	1.3
1704.1	0.490	15	0.979	73	297	1.7	7.1	1.8	112	339	1.3
1704.8	0.490	13	1.1	75	317	1.9	7.1	2.0	116	362	1.4
1705.5	0.490	13	0.978	87	323	1.7	7.1	1.8	133	369	1.2
1706.2	0.490	15	1.5	87	344	2.1	7.1	2.8	134	393	1.5
1706.9	0.490	16	1.4	77	331	1.1	7.1	2.5	118	378	0.771
1707.6	0.490	14	1.4	96	332	2.7	7.1	2.6	148	380	2.0
1708.3	0.490	14	1.2	73	312	2.0	7.1	2.2	111	357	1.5
1709.0	0.490	15	1.2	81	355	2.4	7.1	2.2	124	405	1.7
1709.7	0.490	14	1.4	86	373	2.3	7.1	2.5	131	427	1.6
1710.4	0.490	12	1.3	84	352	2.5	7.1	2.3	129	403	1.8
1711.1	0.490	10	1.0	72	369	1.9	7.1	1.9	110	422	1.4
1711.8	0.490	16	1.5	88	372	2.1	7.1	2.8	134	426	1.5
1712.5	0.490	14	0.996	89	345	2.1	7.1	1.8	137	395	1.6
1713.2	0.490	13	1.4	83	315	2.0	7.1	2.5	127	360	1.5
1713.9	0.490	12	1.6	85	328	2.7	7.1	2.8	130	375	2.0
1714.6	0.632	12	1.2	78	351	2.1	9.1	2.1	120	401	1.5
1715.3	0.490	13	1.1	81	333	2.3	7.1	1.9	125	381	1.7
1716.0	0.490	15	1.1	87	361	2.8	7.1	1.9	134	413	2.0
1716.7	0.490	11	1.4	97	365	2.5	7.1	2.6	149	418	1.8
1717.3	0.490	13	0.860	80	356	2.0	7.1	1.6	122	407	1.5
1718.0	0.490	11	1.2	84	324	2.3	7.1	2.2	128	371	1.7
1718.7	0.490	13	1.5	83	369	2.2	7.1	2.8	127	423	1.6
1719.4	0.490	13	1.1	89	338	2.4	7.1	2.1	136	387	1.7
1720.1	0.490	12	0.966	90	384	1.6	7.1	1.8	138	439	1.2
1720.8	0.490	12	1.0	74	371	1.5	7.1	1.9	113	424	1.1
1721.5	0.500	15	1.2	92	408	2.3	7.2	2.1	141	467	1.7
1722.2	0.490	13	0.984	87	340	1.9	7.1	1.8	134	389	1.4
1722.9	0.490	12	0.803	91	337	1.7	7.1	1.5	139	385	1.2
1723.6	0.490	8.5	0.906	80	287	1.6	7.1	1.7	122	328	1.1
1724.3	0.490	11	1.1	79	295	1.9	7.1	2.0	122	337	1.4
1725.0	0.490	12	1.1	80	352	2.4	7.1	2.0	122	403	1.7
1725.7	0.490	14	0.985	84	296	2.6	7.1	1.8	128	339	1.9
1726.4	0.490	12	1.1	93	360	1.6	7.1	2.1	143	412	1.2
1727.1	0.490	12	0.781	86	337	1.7	7.1	1.4	132	385	1.2
1727.8	0.490	14	0.773	85	342	2.9	7.1	1.4	130	391	2.1
1728.5	0.490	14	0.967	78	334	2.8	7.1	1.8	119	382	2.1
1729.2	0.490	14	0.979	91	336	2.6	7.1	1.8	139	385	1.9
1729.9	0.490	13	0.874	83	357	1.8	7.1	1.6	127	408	1.3
1730.6	0.490	13	0.949	80	352	2.7	7.1	1.7	122	403	2.0
1731.3	0.490	13	0.675	74	343	2.1	7.1	1.2	113	392	1.6
1732.0	0.490	13	0.913	86	373	2.6	7.1	1.7	132	426	1.9
1732.7	0.490	12	0.901	83	352	3.0	7.1	1.6	127	403	2.2
1733.4	0.490	12	0.946	80	308	1.6	7.1	1.7	123	352	1.2
1734.1	0.490	8.6	0.877	77	325	2.2	7.1	1.6	118	372	1.6
1734.8	0.490	12	0.636	82	367	2.6	7.1	1.2	125	419	1.9
1735.5	0.490	12	0.888	77	353	2.5	7.1	1.6	118	403	1.8
1736.2	0.490	11	0.696	84	332	3.1	7.1	1.3	129	380	2.3
1736.9	0.490	14	0.992	79	373	2.1	7.1	1.8	121	426	1.6
1737.6	0.490	9.7	0.625	75	342	1.8	7.1	1.1	115	391	1.3
1738.3	0.490	11	0.924	72	329	2.1	7.1	1.7	110	377	1.5
1739.0	0.490	12	0.823	81	332	2.5	7.1	1.5	124	379	1.8
1739.7	0.490	12	0.671	74	298	2.5	7.1	1.2	114	341	1.8
1740.4	0.490	13	1.0	72	322	1.8	7.1	1.9	110	368	1.3
1741.1	0.490	11	0.832	75	376	1.8	7.1	1.5	115	431	1.3
1741.8	0.490	11	0.655	79	364	3.6	7.1	1.2	121	416	2.7
1742.5	0.490	14	0.790	78	387	2.5	7.1	1.4	120	442	1.8
1743.2	0.490	13	0.724	74	373	2.7	7.1	1.3	113	427	2.0
1743.9	0.490	9.5	0.639	69	301	1.8	7.1	1.2	106	345	1.3
1744.5	0.490	12	1.0	76	372	3.3	7.1	1.8	117	425	2.4
1745.2	0.490	13	0.838	78	390	3.3	7.1	1.5	119	445	2.4
1745.9	0.490	12	0.687	82	367	3.1	7.1	1.3	125	420	2.2
1746.6	0.490	12	0.798	72	352	3.2	7.1	1.5	110	403	2.3
1747.3	0.490	9.9	0.807	63	308	3.7	7.1	1.5	96	352	2.7
1748.0	0.490	11	0.613	66	370	2.6	7.1	1.1	101	423	1.9
1748.7	0.490	14	0.480	73	338	4.1	7.1	0.875	111	386	3.0
1749.4	0.490	12	0.720	74	363	2.7	7.1	1.3	113	415	1.9
1750.1	0.490	11	0.682	66	335	2.2	7.1	1.2	102	383	1.6
1750.8	0.490	11	0.891	66	370	2.1	7.1	1.6	101	423	1.5



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1751.5	0.490	12	0.936	74	365	3.2	7.1	1.7	114	418	2.3
1752.2	0.490	12	1.1	68	335	2.9	7.1	1.9	104	383	2.1
1752.9	0.490	9.9	0.600	68	330	3.9	7.1	1.1	104	378	2.8
1753.6	0.490	11	0.459	68	364	3.8	7.1	0.837	104	416	2.8
1754.3	0.490	13	0.998	58	376	3.2	7.1	1.8	89	430	2.3
1755.0	0.490	11	0.899	69	437	4.2	7.1	1.6	106	500	3.1
1755.7	0.490	12	0.662	66	351	4.7	7.1	1.2	102	402	3.4
1756.4	0.490	15	0.688	63	418	4.8	7.1	1.3	96	478	3.5
1757.1	0.490	8.9	0.717	64	389	4.5	7.1	1.3	98	445	3.3
1757.8	0.490	9.3	0.718	59	435	3.7	7.1	1.3	90	497	2.7
1758.5	0.490	12	0.608	60	423	5.3	7.1	1.1	93	484	3.9
1759.2	0.490	11	0.699	60	452	3.5	7.1	1.3	92	516	2.6
1759.9	0.490	11	0.667	59	387	4.5	7.1	1.2	90	443	3.3
1760.6	0.490	9.8	0.600	53	437	3.7	7.1	1.1	81	500	2.7
1761.3	0.490	9.0	0.797	52	441	4.6	7.1	1.5	79	504	3.4
1762.0	0.490	12	0.622	58	401	5.3	7.1	1.1	88	459	3.9
1762.7	0.490	9.7	0.509	55	364	4.3	7.1	0.929	85	417	3.1
1763.4	0.490	8.9	0.591	56	412	3.3	7.1	1.1	86	471	2.4
1764.1	0.490	9.4	0.714	55	432	3.1	7.1	1.3	84	494	2.3
1764.8	0.490	10	0.655	53	477	5.6	7.1	1.2	81	546	4.1
1765.5	0.490	11	0.698	62	480	4.5	7.1	1.3	96	549	3.3
1766.2	0.490	11	0.475	55	492	4.0	7.1	0.866	85	563	2.9
1766.9	0.490	9.4	0.691	46	398	2.1	7.1	1.3	71	455	1.6
1767.6	0.490	10	0.649	47	434	4.5	7.1	1.2	72	496	3.3
1768.3	0.490	11	0.795	53	537	6.1	7.1	1.4	81	614	4.4
1769.0	0.490	9.6	0.566	55	484	4.9	7.1	1.0	84	553	3.5
1769.7	0.490	10	0.512	60	503	5.4	7.1	0.933	93	575	3.9
1770.4	0.490	9.2	0.489	51	538	4.7	7.1	0.892	77	615	3.4
1771.0	0.490	8.8	0.633	45	465	4.1	7.1	1.2	69	532	3.0
1771.7	0.490	12	0.591	50	505	4.3	7.1	1.1	77	578	3.1
1772.4	0.490	11	0.608	51	485	5.1	7.1	1.1	79	555	3.8
1773.1	0.490	9.4	0.581	45	492	3.4	7.1	1.1	68	562	2.5
1773.8	0.490	8.9	0.603	43	502	4.9	7.1	1.1	66	574	3.6
1774.5	0.490	10.0	0.467	45	528	3.8	7.1	0.851	68	604	2.8
1775.2	0.490	11	0.556	51	537	4.0	7.1	1.0	79	614	2.9
1775.9	0.490	11	0.694	49	538	4.7	7.1	1.3	75	615	3.4
1776.6	0.490	9.0	0.375	46	496	2.6	7.1	0.683	71	567	1.9
1777.3	0.490	9.7	0.538	39	499	3.6	7.1	0.982	59	571	2.6
1778.0	0.490	11	0.660	49	511	4.3	7.1	1.2	74	585	3.2
1778.7	0.490	11	0.569	42	476	4.4	7.1	1.0	65	545	3.2
1779.4	0.490	10	0.369	44	436	4.0	7.1	0.673	67	498	2.9
1780.1	0.490	8.5	0.419	40	478	3.7	7.1	0.763	62	546	2.7
1780.8	0.490	9.9	0.532	36	467	4.0	7.1	0.970	56	534	2.9
1781.5	0.490	9.0	0.571	43	442	3.7	7.1	1.0	65	506	2.7
1782.2	0.490	9.7	0.339	48	457	2.8	7.1	0.619	73	523	2.0
1782.9	0.490	8.2	0.399	41	467	3.6	7.1	0.727	63	534	2.6
1783.6	0.490	8.9	0.293	36	426	2.5	7.1	0.534	55	487	1.8
1784.3	0.490	9.6	0.535	36	473	2.6	7.1	0.976	56	541	1.9
1785.0	0.490	9.9	0.270	36	464	3.3	7.1	0.492	55	530	2.4
1785.7	0.490	9.3	0.326	35	431	3.9	7.1	0.595	53	493	2.9
1786.4	0.490	8.0	0.465	37	457	2.5	7.1	0.848	56	522	1.8
1787.1	0.490	9.8	0.426	32	495	2.3	7.1	0.777	50	566	1.7
1787.8	0.490	11	0.430	34	525	3.8	7.1	0.784	53	601	2.7
1788.5	0.490	9.8	0.398	34	472	3.3	7.1	0.726	53	540	2.4
1789.2	0.490	9.2	0.552	37	451	3.3	7.1	1.0	57	515	2.4
1789.9	0.490	8.1	0.282	32	415	2.8	7.1	0.514	48	475	2.0
1790.6	0.490	8.9	0.443	36	463	2.7	7.1	0.808	55	530	1.9
1791.3	0.654	8.6	0.483	35	537	3.2	9.4	0.880	54	614	2.4
1792.0	0.490	9.0	0.390	39	463	2.2	7.1	0.711	60	530	1.6
1792.7	0.490	9.7	0.307	31	427	2.9	7.1	0.561	48	489	2.1
1793.4	0.490	8.3	0.449	28	443	2.1	7.1	0.818	43	506	1.5
1794.1	0.490	8.8	0.578	32	428	2.8	7.1	1.1	48	490	2.0
1794.8	0.490	9.9	0.378	27	395	2.9	7.1	0.689	41	452	2.1
1795.5	0.490	10	0.369	32	397	3.0	7.1	0.674	49	454	2.2
1796.2	0.490	11	0.467	38	468	2.0	7.1	0.852	58	535	1.5
1796.8	0.490	11	0.481	31	421	2.4	7.1	0.876	48	481	1.8
1797.5	0.490	11	0.536	37	472	2.2	7.1	0.977	57	540	1.6
1798.2	0.490	16	1.1	46	406	2.8	7.1	2.0	71	465	2.0
1798.9	0.490	17	1.2	47	439	1.6	7.1	2.1	72	502	1.2
1799.6	0.490	16	0.825	43	348	1.6	7.1	1.5	65	397	1.1
1800.3	0.490	17	0.664	44	399	2.6	7.1	1.2	68	457	1.9
1801.0	0.490	20	1.1	48	343	1.6	7.1	2.0	73	392	1.2
1801.7	0.490	28	1.2	68	344	1.7	7.1	2.2	104	394	1.2
1802.4	0.490	25	1.3	59	358	1.5	7.1	2.5	91	409	1.1
1803.1	0.490	29	1.8	61	378	2.0	7.1	3.2	94	433	1.5
1803.8	0.490	26	1.8	60	336	1.9	7.1	3.3	92	385	1.4
1804.5	0.490	32	2.2	95	350	1.7	7.1	4.1	146	400	1.2
1805.2	0.490	44	2.7	98	334	1.9	7.1	4.9	150	382	1.4
1805.9	0.490	41	2.6	96	353	2.0	7.1	4.7	148	404	1.4
1806.6	0.490	37	2.5	92	278	1.1	7.1	4.6	140	318	0.796
1807.3	0.490	44	2.6	106	345	2.2	7.1	4.7	162	395	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1808.0	0.490	47	2.8	125	322	0.881	7.1	5.2	192	368	0.643
1808.7	0.490	61	3.2	147	304	1.8	7.1	5.8	225	348	1.3
1809.4	0.490	55	3.5	143	268	2.2	7.1	6.4	220	307	1.6
1810.1	0.490	59	3.5	153	265	1.1	7.1	6.5	234	303	0.834
1810.8	0.490	67	3.9	162	292	1.8	7.1	7.1	248	334	1.3
1811.5	0.490	82	3.9	175	241	1.1	7.1	7.1	269	276	0.795
1812.2	0.490	66	3.6	174	266	0.871	7.1	6.5	267	304	0.636
1812.9	0.490	64	3.4	145	244	1.4	7.1	6.3	222	279	1.0
1813.6	0.490	63	4.1	159	224	1.1	7.1	7.5	243	256	0.790
1814.3	0.490	79	4.7	168	205	1.1	7.1	8.6	258	235	0.800
1815.0	0.490	80	3.8	203	275	1.5	7.1	7.0	311	315	1.1
1815.7	0.490	92	4.5	203	216	0.939	7.1	8.2	312	247	0.685
1816.4	0.490	72	4.5	202	205	1.4	7.1	8.1	310	234	1.0
1817.1	0.748	75	4.8	204	207	1.1	11	8.8	312	237	0.775
1817.8	0.496	92	4.6	226	209	0.625	7.2	8.5	346	239	0.456
1818.5	0.490	92	4.7	238	200	1.6	7.1	8.6	364	229	1.2
1819.2	0.490	99	4.8	250	170	0.973	7.1	8.8	383	194	0.710
1819.9	0.490	91	4.9	241	158	0.335	7.1	8.9	370	181	0.244
1820.6	0.563	102	6.1	252	149	0.923	8.1	11	386	171	0.673
1821.3	0.490	111	6.2	301	149	0.837	7.1	11	462	170	0.611
1822.0	0.490	118	5.6	274	132	0.719	7.1	10	420	151	0.524
1822.6	0.490	111	5.9	287	147	0.837	7.1	11	440	168	0.611
1823.3	0.551	103	5.7	259	136	1.1	8.0	10	397	156	0.839
1824.0	0.490	127	6.9	277	138	0.556	7.1	13	425	157	0.406
1824.7	1.0	113	6.7	288	119	0.539	15	12	441	136	0.394
1825.4	0.500	121	6.4	307	118	0.900	7.2	12	470	134	0.656
1826.1	0.490	127	7.2	322	127	0.569	7.1	13	493	145	0.415
1826.8	0.712	114	6.1	291	108	0.758	10	11	446	124	0.553
1827.5	0.640	128	7.2	305	126	0.262	9.2	13	467	144	0.192
1828.2	0.637	161	7.2	324	100	0.664	9.2	13	497	115	0.485
1828.9	0.645	134	6.6	327	95	0.442	9.3	12	501	109	0.322
1829.6	0.490	124	7.0	331	85	0.089	7.1	13	507	97	0.065
1830.3	0.490	146	8.0	351	83	0.634	7.1	15	538	95	0.463
1831.0	0.490	160	9.0	370	70	0.090	7.1	16	567	80	0.065
1831.7	0.815	163	8.4	374	69	0.270	12	15	573	79	0.197
1832.4	0.490	160	7.8	392	65	0.182	7.1	14	601	74	0.133
1833.1	0.490	147	8.4	382	67	0.260	7.1	15	586	76	0.190
1833.8	0.591	152	9.0	371	55	0.528	8.5	16	569	62	0.385
1834.5	0.490	169	9.8	390	56	0.385	7.1	18	598	64	0.281
1835.2	0.490	188	8.6	424	57	0.182	7.1	16	649	65	0.133
1835.9	0.490	159	8.8	384	48	0.084	7.1	16	589	55	0.061
1836.6	0.490	165	10	377	44	0.253	7.1	19	577	50	0.184
1837.3	0.632	160	9.7	378	36	0.160	9.1	18	580	41	0.116
1838.0	0.490	196	10	440	36	0.375	7.1	19	674	41	0.274
1838.7	0.490	191	9.9	434	28	0.085	7.1	18	666	32	0.062
1839.4	0.549	187	10	446	33	0.007	7.9	19	684	37	0.005
1840.1	0.490	161	10.0	370	29	0.007	7.1	18	568	33	0.005
1840.8	1.2	184	12	408	31	0.007	17	22	625	35	0.005
1841.5	1.1	218	11	455	29	0.383	16	19	698	33	0.279
1842.2	0.490	183	9.8	449	26	0.007	7.1	18	689	29	0.005
1842.9	0.926	176	10	390	26	0.085	13	19	598	30	0.062
1843.6	0.490	180	11	398	28	0.007	7.1	20	609	32	0.005
1844.3	0.596	209	14	470	30	0.193	8.6	25	720	34	0.141
1845.0	0.512	217	8.7	469	28	0.368	7.4	16	719	32	0.269
1845.7	0.605	194	11	428	26	0.089	8.7	19	656	29	0.065
1846.4	0.826	172	9.7	430	27	0.090	12	18	660	30	0.066
1847.1	1.3	194	12	413	28	0.087	18	22	634	32	0.064
1847.8	0.490	191	13	459	31	0.180	7.1	23	703	35	0.132
1848.5	1.3	219	12	468	31	0.194	18	22	717	35	0.142
1849.1	0.739	184	10	396	31	0.262	11	18	607	35	0.191
1849.8	0.490	170	12	436	26	0.182	7.1	22	669	30	0.133
1850.5	0.490	202	11	442	30	0.386	7.1	21	677	34	0.281
1851.2	0.490	208	11	426	28	0.185	7.1	20	652	32	0.135
1851.9	0.490	222	11	479	29	0.477	7.1	19	734	33	0.348
1852.6	0.490	160	8.9	373	24	0.152	7.1	16	572	27	0.111
1853.3	0.490	194	12	403	27	0.345	7.1	21	617	31	0.252
1854.0	0.490	232	12	460	31	0.198	7.1	22	705	35	0.144
1854.7	0.748	226	11	507	30	0.007	11	20	777	35	0.005
1855.4	0.793	208	10	419	26	0.263	11	18	643	30	0.192
1856.1	0.657	212	11	444	27	0.089	9.5	20	680	31	0.065
1856.8	0.490	188	9.2	385	29	0.174	7.1	17	590	33	0.127
1857.5	1.1	241	12	482	33	0.200	16	22	738	38	0.146
1858.2	0.490	244	11	472	30	0.194	7.1	20	723	34	0.142
1858.9	0.490	207	10	440	29	0.090	7.1	19	675	33	0.066
1859.6	0.490	188	10	416	29	0.265	7.1	18	637	33	0.194
1860.3	1.1	213	11	435	31	0.007	16	21	667	36	0.005
1861.0	0.539	217	12	449	29	0.096	7.8	23	688	34	0.070
1861.7	0.490	235	12	457	31	0.098	7.1	22	701	36	0.071
1862.4	0.490	223	12	455	29	0.176	7.1	21	698	33	0.129
1863.1	0.490	215	11	408	30	0.089	7.1	20	625	34	0.065
1863.8	0.585	216	12	411	30	0.261	8.4	22	629	34	0.190



Minnow Environmental  
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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1864.5	0.734	241	12	432	28	0.279	11	21	662	33	0.203
1865.2	0.490	235	11	432	29	0.091	7.1	20	663	33	0.066
1865.9	0.490	206	11	421	29	0.088	7.1	21	646	33	0.065
1866.6	0.490	215	11	369	28	0.172	7.1	20	566	32	0.126
1867.3	0.716	259	13	429	33	0.097	10	23	658	38	0.071
1868.0	0.850	269	13	457	33	0.301	12	23	700	37	0.219
1868.7	0.787	232	12	472	29	0.278	11	22	724	34	0.203
1869.4	0.681	211	12	389	31	0.172	9.8	22	596	35	0.126
1870.1	0.765	231	12	413	30	0.089	11	22	633	35	0.065
1870.8	0.773	216	11	404	31	0.090	11	21	619	36	0.066
1871.5	0.490	232	11	429	29	0.174	7.1	20	658	33	0.127
1872.2	0.655	256	11	419	31	0.249	9.5	21	642	35	0.182
1872.9	0.697	216	12	368	30	0.164	10	21	565	34	0.120
1873.6	0.490	238	12	417	33	0.179	7.1	22	639	38	0.131
1874.3	0.490	255	13	419	36	0.007	7.1	24	642	41	0.005
1875.0	0.490	266	11	396	30	0.084	7.1	20	606	35	0.061
1875.7	0.490	239	11	399	30	0.007	7.1	20	611	34	0.005
1876.3	0.490	219	11	339	32	0.251	7.1	20	520	36	0.183
1877.0	0.863	270	14	396	35	0.094	12	26	607	41	0.069
1877.7	0.490	261	13	406	36	0.304	7.1	23	622	41	0.222
1878.4	0.533	258	11	424	35	0.095	7.7	20	650	40	0.069
1879.1	0.694	241	12	380	35	0.087	10	23	583	40	0.064
1879.8	1.1	232	11	337	31	0.424	16	20	517	36	0.309
1880.5	0.490	258	12	359	36	0.261	7.1	22	550	41	0.190
1881.2	0.937	290	12	368	33	0.091	14	22	564	38	0.066
1881.9	0.941	250	9.9	368	34	0.174	14	18	564	38	0.127
1882.6	0.490	247	12	347	33	0.007	7.1	22	532	37	0.005
1883.3	0.490	250	12	339	33	0.329	7.1	22	520	38	0.240
1884.0	0.604	266	12	339	36	0.082	8.7	22	520	41	0.060
1884.7	0.490	277	11	362	32	0.087	7.1	21	555	37	0.064
1885.4	0.490	264	11	351	32	0.258	7.1	19	538	37	0.188
1886.1	0.654	261	10	327	36	0.178	9.4	19	501	41	0.130
1886.8	0.608	262	11	313	36	0.249	8.8	21	480	41	0.182
1887.5	1.1	264	11	327	35	0.088	15	21	501	40	0.064
1888.2	0.878	286	12	368	38	0.096	13	22	564	44	0.070
1888.9	0.877	299	11	339	36	0.090	13	19	520	41	0.066
1889.6	0.578	251	12	329	35	0.007	8.3	21	505	40	0.005
1890.3	0.812	281	11	341	36	0.179	12	19	523	41	0.130
1891.0	0.627	284	11	336	36	0.186	9.1	21	515	42	0.136
1891.7	0.490	279	11	350	35	0.466	7.1	19	536	40	0.340
1892.4	0.490	238	9.7	296	33	0.081	7.1	18	453	37	0.059
1893.1	0.490	263	10	314	35	0.007	7.1	19	481	40	0.005
1893.8	0.821	262	10	337	36	0.363	12	19	516	41	0.265
1894.5	0.490	288	10	328	35	0.183	7.1	18	503	40	0.134
1895.2	0.588	285	10	362	35	0.095	8.5	18	555	40	0.069
1895.9	0.490	259	10	333	35	0.269	7.1	18	511	40	0.196
1896.6	0.853	272	10	358	35	0.007	12	19	548	40	0.005
1897.3	0.490	288	11	344	37	0.089	7.1	19	528	43	0.065
1898.0	0.618	262	9.5	328	32	0.007	8.9	17	502	37	0.005
1898.7	0.521	254	8.9	354	34	0.007	7.5	16	543	39	0.005
1899.4	0.893	247	9.5	311	33	0.007	13	17	476	37	0.005
1900.1	0.674	274	9.8	330	37	0.091	9.7	18	506	42	0.067
1900.8	0.490	279	10	359	38	0.197	7.1	19	549	44	0.143
1901.5	0.490	283	9.5	308	30	0.007	7.1	17	473	35	0.005
1902.2	0.490	229	7.5	300	29	0.081	7.1	14	460	33	0.059
1902.8	0.834	226	8.8	268	30	0.081	12	16	410	34	0.059
1903.5	0.490	268	8.6	308	35	0.090	7.1	16	472	40	0.066
1904.2	0.490	286	10	338	34	0.290	7.1	19	518	39	0.211
1904.9	0.629	292	9.8	317	38	0.374	9.1	18	485	43	0.273
1905.6	0.490	266	8.4	316	34	0.285	7.1	15	485	39	0.208
1906.3	0.490	245	8.1	306	31	0.261	7.1	15	469	35	0.190
1907.0	1.2	272	10	319	33	0.007	18	19	489	38	0.005
1907.7	0.490	289	8.3	295	31	0.095	7.1	15	452	36	0.069
1908.4	0.490	263	7.8	319	32	0.186	7.1	14	489	36	0.136
1909.1	0.490	246	8.4	290	33	0.007	7.1	15	444	38	0.005
1909.8	0.490	244	8.0	264	34	0.185	7.1	15	405	39	0.135
1910.5	0.888	254	9.5	287	34	0.276	13	17	441	38	0.202
1911.2	0.490	292	7.8	307	32	0.095	7.1	14	471	37	0.069
1911.9	0.490	245	7.9	282	31	0.184	7.1	14	432	36	0.135
1912.6	0.665	270	7.0	281	33	0.364	9.6	13	431	37	0.265
1913.3	0.490	235	7.9	279	35	0.094	7.1	14	427	40	0.068
1914.0	0.490	244	9.6	290	32	0.007	7.1	18	444	37	0.005
1914.7	0.490	265	7.7	276	31	0.007	7.1	14	423	35	0.005
1915.4	0.490	237	7.0	249	32	0.087	7.1	13	381	36	0.063
1916.1	0.490	203	5.8	207	27	0.221	7.1	11	318	31	0.161
1916.8	0.490	271	7.4	263	34	0.185	7.1	14	403	38	0.135
1917.5	0.490	257	7.1	251	32	0.268	7.1	13	385	36	0.196
1918.2	0.490	254	7.2	266	31	0.367	7.1	13	408	36	0.268
1918.9	0.490	236	7.1	253	35	0.276	7.1	13	387	40	0.201
1919.6	0.654	239	7.0	239	31	0.248	9.4	13	366	36	0.181
1920.3	0.490	261	6.7	247	34	0.007	7.1	12	379	39	0.005



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Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1921.0	0.906	272	6.9	268	32	0.007	13	13	411	37	0.005
1921.7	0.490	254	7.0	287	28	0.177	7.1	13	439	32	0.129
1922.4	0.546	210	6.7	253	31	0.080	7.9	12	387	35	0.059
1923.1	0.490	255	6.8	268	29	0.342	7.1	12	410	34	0.250
1923.8	0.553	252	7.2	276	38	0.089	8.0	13	423	44	0.065
1924.5	0.893	245	7.4	289	32	0.092	13	13	443	37	0.067
1925.2	0.490	262	6.0	284	32	0.089	7.1	11	435	37	0.065
1925.9	0.490	234	6.8	247	29	0.083	7.1	12	379	33	0.061
1926.6	0.512	233	6.6	222	25	0.166	7.4	12	339	29	0.121
1927.3	0.490	250	6.5	283	30	0.093	7.1	12	433	34	0.068
1928.0	0.823	252	6.3	295	29	0.090	12	11	453	33	0.066
1928.7	0.490	247	6.1	281	27	0.084	7.1	11	430	31	0.061
1929.3	0.490	229	6.2	270	27	0.171	7.1	11	415	31	0.125
1930.0	0.490	251	5.6	281	30	0.279	7.1	10	431	34	0.204
1930.7	0.826	267	6.8	322	31	0.097	12	12	494	35	0.070
1931.4	0.490	233	6.2	281	26	0.245	7.1	11	431	29	0.179
1932.1	0.490	269	6.7	317	29	0.091	7.1	12	486	33	0.066
1932.8	0.490	230	5.6	270	26	0.352	7.1	10	414	29	0.256
1933.5	0.585	234	5.7	272	26	0.007	8.4	10	417	30	0.005
1934.2	0.490	244	6.4	307	28	0.287	7.1	12	470	32	0.209
1934.9	0.490	243	6.5	265	27	0.264	7.1	12	406	30	0.193
1935.6	0.490	220	6.6	277	25	0.183	7.1	12	424	29	0.133
1936.3	1.1	216	5.2	256	27	0.089	16	9.5	392	31	0.065
1937.0	0.545	230	6.4	257	26	0.443	7.9	12	394	29	0.324
1937.7	0.490	218	5.7	289	25	0.186	7.1	10	443	29	0.135
1938.4	0.513	203	4.9	237	24	0.091	7.4	8.9	363	28	0.067
1939.1	1.3	196	5.7	241	25	0.177	19	10	369	28	0.129
1939.8	0.490	188	5.3	212	25	0.174	7.1	9.6	325	29	0.127
1940.5	0.911	204	5.6	255	25	0.189	13	10	390	29	0.138
1941.2	0.490	210	5.4	242	24	0.188	7.1	9.8	371	27	0.137
1941.9	0.490	183	5.3	226	24	0.007	7.1	9.7	347	28	0.005
1942.6	0.594	190	5.6	227	23	0.007	8.6	10	348	27	0.005
1943.3	0.490	175	6.2	199	24	0.007	7.1	11	305	27	0.005
1944.0	0.490	194	6.2	233	22	0.281	7.1	11	357	25	0.205
1944.7	0.634	193	6.2	229	24	0.188	9.2	11	352	28	0.137
1945.4	0.490	192	5.2	219	24	0.272	7.1	9.6	336	28	0.199
1946.1	0.757	166	6.2	190	23	0.007	11	11	292	26	0.005
1946.8	0.490	173	5.5	204	23	0.007	7.1	10	312	27	0.005
1947.5	0.490	169	6.5	187	21	0.084	7.1	12	286	24	0.061
1948.2	0.490	172	5.8	192	24	0.178	7.1	11	294	27	0.130
1948.9	0.978	157	5.3	173	20	0.258	14	9.7	264	23	0.188
1949.6	0.490	150	5.6	167	22	0.084	7.1	10	255	25	0.061
1950.3	0.539	153	6.2	163	23	0.007	7.8	11	250	27	0.005
1951.0	0.490	160	5.5	176	21	0.007	7.1	10	270	24	0.005
1951.7	0.490	174	6.6	175	24	0.096	7.1	12	268	28	0.070
1952.4	1.2	154	6.2	159	23	0.093	17	11	243	26	0.068
1953.1	0.490	134	6.5	153	23	0.083	7.1	12	235	26	0.061
1953.8	0.490	165	7.5	159	23	0.092	7.1	14	244	26	0.067
1954.5	1.0	149	6.3	150	22	0.267	15	12	230	25	0.195
1955.2	0.490	152	6.9	178	24	0.090	7.1	13	273	28	0.066
1955.9	0.490	156	7.4	166	25	0.178	7.1	14	254	29	0.130
1956.5	0.490	178	8.0	151	25	0.007	7.1	15	231	28	0.005
1957.2	0.924	209	8.0	174	22	0.287	13	15	267	25	0.210
1957.9	0.490	207	9.3	180	26	0.188	7.1	17	275	30	0.137
1958.6	0.490	174	8.8	171	22	0.079	7.1	16	262	26	0.058
1959.3	0.490	170	8.4	167	24	0.079	7.1	15	256	27	0.058
1960.0	0.756	180	9.5	173	24	0.083	11	17	265	27	0.060
1960.7	0.601	193	11	223	24	0.088	8.7	20	342	28	0.065
1961.4	0.490	184	12	206	24	0.083	7.1	23	316	27	0.061
1962.1	0.931	176	12	202	24	0.007	13	21	309	28	0.005
1962.8	0.490	172	13	226	23	0.173	7.1	23	346	27	0.126
1963.5	0.823	196	13	229	26	0.007	12	23	351	30	0.005
1964.2	0.490	194	12	245	25	0.007	7.1	22	375	29	0.005
1964.9	0.580	233	16	278	28	0.007	8.4	29	426	32	0.005
1965.6	0.490	190	14	249	24	0.083	7.1	25	381	27	0.061
1966.3	0.504	216	15	250	27	0.181	7.3	27	384	31	0.132
1967.0	0.490	209	15	256	24	0.007	7.1	27	392	28	0.005
1967.7	0.490	225	15	319	25	0.478	7.1	28	488	28	0.349
1968.4	0.490	212	16	297	28	0.188	7.1	29	454	32	0.137
1969.1	0.522	225	16	318	26	0.658	7.5	28	488	30	0.480
1969.8	0.591	218	18	294	28	0.263	8.5	33	450	32	0.192
1970.5	0.582	269	19	381	26	0.379	8.4	35	584	30	0.276
1971.2	0.608	276	20	396	27	0.197	8.8	37	606	31	0.144
1971.9	0.700	254	16	362	24	0.088	10	30	554	28	0.064
1972.6	0.857	245	17	336	26	0.535	12	31	514	29	0.390
1973.3	0.613	263	18	365	24	0.083	8.8	33	559	28	0.061
1974.0	0.490	274	19	382	25	0.089	7.1	35	586	28	0.065
1974.7	0.641	269	19	380	28	0.263	9.3	34	583	32	0.192
1975.4	0.490	266	17	359	28	0.420	7.1	31	550	32	0.306
1976.1	0.490	276	18	385	33	0.249	7.1	33	591	38	0.181
1976.8	0.695	260	17	354	24	0.163	10	32	542	28	0.119



Minnow Environmental  
Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1977.5	0.490	318	20	413	29	0.457	7.1	36	633	34	0.334
1978.2	0.490	287	16	377	24	0.081	7.1	29	578	27	0.059
1978.9	0.534	297	19	421	28	0.173	7.7	35	646	32	0.126
1979.6	0.490	290	20	405	32	0.441	7.1	36	620	36	0.322
1980.3	0.490	306	18	451	31	0.285	7.1	34	691	35	0.208
1981.0	0.490	253	16	387	25	0.163	7.1	30	594	29	0.119
1981.7	0.606	242	16	407	27	0.498	8.7	29	624	31	0.363
1982.3	0.490	238	18	398	30	0.169	7.1	32	611	35	0.123
1983.0	0.490	261	20	424	32	0.286	7.1	36	650	37	0.209
1983.7	0.490	241	18	382	29	0.510	7.1	34	586	34	0.372
1984.4	0.490	215	16	375	29	0.420	7.1	29	575	34	0.306
1985.1	0.490	212	18	416	33	0.089	7.1	32	637	38	0.065
1985.8	0.490	224	20	424	36	0.094	7.1	37	649	41	0.069
1986.5	0.490	222	17	417	36	0.284	7.1	31	639	41	0.207
1987.2	0.490	219	18	431	35	0.093	7.1	34	661	40	0.068
1987.9	0.772	211	18	390	32	0.456	11	32	598	37	0.333
1988.6	0.490	210	15	426	37	0.275	7.1	28	653	42	0.201
1989.3	0.490	200	16	363	37	0.351	7.1	28	556	42	0.256
1990.0	0.490	223	16	359	37	0.093	7.1	30	550	42	0.068
1990.7	0.490	222	16	389	34	0.275	7.1	29	596	39	0.201
1991.4	0.653	215	16	378	39	0.178	9.4	29	579	44	0.130
1992.1	0.681	220	15	383	38	0.345	9.8	27	588	44	0.252
1992.8	0.793	187	14	358	39	0.329	11	26	549	44	0.240
1993.5	0.490	209	17	409	39	0.268	7.1	31	626	45	0.195
1994.2	0.490	214	17	423	42	0.091	7.1	30	648	48	0.066
1994.9	1.5	220	15	415	44	0.182	21	28	635	51	0.133
1995.6	0.490	198	14	363	40	0.335	7.1	26	557	46	0.244
1996.3	1.3	208	16	398	44	0.182	19	29	610	51	0.133
1997.0	1.1	217	15	398	41	0.458	16	28	610	47	0.334
1997.7	0.505	210	14	446	43	0.007	7.3	26	683	49	0.005
1998.4	0.490	192	12	363	40	0.085	7.1	22	556	45	0.062
1999.1	0.490	189	15	384	42	0.359	7.1	27	588	48	0.262
1999.8	0.490	208	14	391	42	0.357	7.1	25	599	48	0.260
2000.5	0.490	210	13	407	46	0.100	7.1	23	624	53	0.073
2001.2	0.490	210	13	410	43	0.270	7.1	24	628	49	0.197
2001.9	0.741	198	11	393	45	0.262	11	20	602	51	0.191
2002.6	0.490	193	11	390	40	0.085	7.1	21	598	46	0.062
2003.3	0.577	226	14	451	48	0.376	8.3	26	692	55	0.274
2004.0	0.490	222	14	479	49	0.281	7.1	25	735	56	0.205
2004.7	0.490	202	12	454	42	0.608	7.1	22	696	48	0.444
2005.4	1.0	189	13	428	43	0.524	15	23	656	49	0.383
2006.1	0.671	194	11	390	39	0.340	9.7	20	598	45	0.248
2006.8	0.629	214	13	464	44	0.186	9.1	23	712	51	0.136
2007.5	0.713	217	12	451	40	0.180	10	23	691	46	0.131
2008.2	0.696	197	12	445	42	0.264	10	23	682	48	0.193
2008.8	0.584	174	11	371	40	0.400	8.4	20	568	45	0.292
2009.5	0.985	196	14	433	42	0.520	14	25	664	48	0.380
2010.2	0.490	224	16	472	41	0.007	7.1	29	724	47	0.005
2010.9	0.766	200	14	425	38	0.090	11	25	652	43	0.065
2011.6	0.538	197	14	431	38	0.007	7.8	25	660	44	0.005
2012.3	0.563	193	16	436	41	0.182	8.1	29	668	47	0.133
2013.0	0.581	180	17	404	38	0.172	8.4	32	620	44	0.126
2013.7	0.581	200	17	432	39	0.094	8.4	31	663	44	0.068
2014.4	0.666	193	16	427	36	0.007	9.6	29	655	42	0.005
2015.1	0.765	167	16	394	35	0.084	11	30	604	40	0.061
2015.8	0.490	182	16	370	34	0.007	7.1	30	568	39	0.005
2016.5	0.667	182	18	393	39	0.273	9.6	33	602	44	0.199
2017.2	0.490	190	18	424	35	0.188	7.1	33	650	40	0.137
2017.9	0.490	174	19	411	32	0.343	7.1	34	630	37	0.250
2018.6	0.490	161	18	367	29	0.240	7.1	33	562	33	0.175
2019.3	1.1	173	20	375	31	0.326	16	37	575	35	0.238
2020.0	0.578	184	22	406	32	0.257	8.3	41	622	37	0.188
2020.7	0.490	190	22	434	31	0.271	7.1	41	666	36	0.198
2021.4	0.490	173	20	405	30	0.414	7.1	36	621	34	0.302
2022.1	0.907	174	21	376	28	0.007	13	39	576	33	0.005
2022.8	0.490	171	23	379	31	0.089	7.1	42	580	36	0.065
2023.5	0.622	180	25	401	31	0.184	9.0	45	615	35	0.134
2024.2	0.595	184	25	421	29	0.176	8.6	45	646	34	0.129
2024.9	0.490	164	23	395	28	0.081	7.1	41	606	32	0.059
2025.6	0.526	161	25	386	28	0.085	7.6	46	592	32	0.062
2026.3	0.490	178	26	391	31	0.279	7.1	48	599	35	0.203
2027.0	1.0	177	26	400	28	0.179	15	47	613	32	0.131
2027.7	0.490	189	25	406	30	0.182	7.1	45	622	35	0.133
2028.4	0.582	155	24	368	27	0.173	8.4	43	565	30	0.126
2029.1	0.749	155	25	354	26	0.007	11	45	542	30	0.005
2029.8	0.490	180	27	411	29	0.094	7.1	50	629	33	0.069
2030.5	0.788	180	25	403	25	0.261	11	46	617	28	0.190
2031.2	0.490	167	24	397	23	0.415	7.1	43	608	26	0.303
2031.9	0.490	151	24	362	24	0.007	7.1	43	555	28	0.005
2032.6	0.490	165	25	372	25	0.087	7.1	46	570	28	0.064
2033.3	0.490	171	28	410	29	0.094	7.1	52	629	33	0.069



Minnow Environmental  
Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2034.0	0.490	180	24	408	25	0.466	7.1	44	626	29	0.340
2034.7	0.490	166	23	399	25	0.084	7.1	42	612	28	0.061
2035.3	0.604	156	27	374	27	0.359	8.7	48	573	31	0.262
2036.0	0.537	157	26	355	25	0.174	7.8	47	543	29	0.127
2036.7	0.490	183	28	398	24	0.093	7.1	51	609	28	0.068
2037.4	0.763	181	26	424	26	0.007	11	47	650	30	0.005
2038.1	0.962	158	26	366	25	0.178	14	48	560	28	0.130
2038.8	0.490	169	27	349	27	0.176	7.1	49	536	31	0.128
2039.5	0.757	165	27	346	25	0.083	11	49	531	29	0.060
2040.2	0.490	185	29	451	26	0.007	7.1	53	690	29	0.005
2040.9	0.490	179	27	399	25	0.261	7.1	49	611	28	0.190
2041.6	0.529	155	25	385	26	0.171	7.6	46	590	30	0.125
2042.3	0.490	157	27	339	24	0.328	7.1	50	520	27	0.239
2043.0	0.490	178	29	376	25	0.245	7.1	53	576	29	0.179
2043.7	0.584	171	30	429	27	0.094	8.4	55	658	31	0.069
2044.4	0.490	178	31	416	27	0.371	7.1	57	638	31	0.271
2045.1	0.693	156	28	370	25	0.175	10	51	567	29	0.128
2045.8	0.963	158	29	370	27	0.254	14	53	567	31	0.185
2046.5	0.730	181	28	403	27	0.007	11	51	618	31	0.005
2047.2	0.508	180	30	400	25	0.182	7.3	54	614	28	0.133
2047.9	0.490	161	25	336	24	0.007	7.1	46	515	27	0.005
2048.6	0.490	164	27	351	26	0.248	7.1	49	538	30	0.181
2049.3	0.695	159	30	373	28	0.175	10	55	572	32	0.128
2050.0	0.867	191	30	387	29	0.007	13	55	593	33	0.005
2050.7	0.907	187	27	373	26	0.377	13	49	572	29	0.275
2051.4	0.631	178	28	353	25	0.866	9.1	52	541	29	0.632
2052.1	0.495	170	27	359	27	0.445	7.1	50	550	31	0.325
2052.8	0.542	168	29	361	27	0.264	7.8	53	553	31	0.193
2053.5	0.646	187	26	345	26	0.265	9.3	47	529	30	0.193
2054.2	0.490	172	26	369	25	0.007	7.1	48	566	28	0.005
2054.9	0.602	169	24	347	26	0.089	8.7	44	532	30	0.065
2055.6	0.490	161	23	320	25	0.007	7.1	42	490	28	0.005
2056.3	0.490	177	25	346	27	0.181	7.1	46	531	30	0.132
2057.0	0.851	197	25	366	26	0.093	12	45	562	30	0.068
2057.7	0.490	179	25	362	25	0.085	7.1	45	555	28	0.062
2058.4	0.741	151	22	334	26	0.087	11	41	512	30	0.063
2059.1	0.592	170	22	303	27	0.175	8.5	40	464	30	0.128
2059.8	0.490	185	25	397	30	0.007	7.1	45	609	34	0.005
2060.5	0.502	177	25	357	25	0.007	7.3	45	547	29	0.005
2061.1	0.490	179	22	339	23	0.086	7.1	40	520	27	0.063
2061.8	0.490	186	24	336	27	0.175	7.1	45	515	30	0.128
2062.5	1.1	171	23	328	27	0.090	17	41	503	31	0.066
2063.2	0.875	195	27	386	28	0.193	13	49	592	32	0.141
2063.9	0.671	195	23	366	28	0.199	9.7	42	561	32	0.145
2064.6	0.490	192	23	345	27	0.188	7.1	42	529	31	0.137
2065.3	0.490	163	23	320	26	0.091	7.1	42	490	30	0.066
2066.0	0.490	177	25	347	28	0.275	7.1	46	532	32	0.201
2066.7	0.490	199	24	375	28	0.185	7.1	44	574	32	0.135
2067.4	0.490	195	23	373	25	0.091	7.1	43	572	28	0.066
2068.1	0.490	181	21	332	26	0.007	7.1	38	508	29	0.005
2068.8	0.490	168	21	326	28	0.089	7.1	39	499	32	0.065
2069.5	0.493	215	26	396	30	0.197	7.1	47	607	34	0.144
2070.2	0.714	201	25	374	27	0.007	10	45	573	31	0.005
2070.9	0.574	179	23	357	26	0.092	8.3	43	547	30	0.067
2071.6	0.490	166	22	344	26	0.088	7.1	40	527	30	0.064
2072.3	0.490	180	20	307	27	0.169	7.1	36	470	31	0.123
2073.0	0.490	193	24	352	28	0.094	7.1	44	540	32	0.069
2073.7	0.517	191	23	400	28	0.103	7.5	41	614	32	0.075
2074.4	0.531	179	21	345	25	0.477	7.7	37	529	29	0.348
2075.1	0.490	157	22	328	27	0.088	7.1	40	503	31	0.064
2075.8	0.628	185	22	356	27	0.092	9.1	41	545	31	0.067
2076.5	0.613	198	23	353	29	0.099	8.8	41	542	33	0.072
2077.2	0.490	189	19	388	26	0.007	7.1	35	595	30	0.005
2077.9	0.490	162	19	345	26	0.007	7.1	35	528	29	0.005
2078.6	0.526	160	18	300	25	0.085	7.6	33	460	28	0.062
2079.3	0.490	188	22	335	28	0.183	7.1	41	513	32	0.134
2080.0	0.538	208	20	388	28	0.007	7.8	36	595	32	0.005
2080.7	0.878	175	17	320	23	0.258	13	32	490	26	0.188
2081.4	0.490	162	19	311	25	0.164	7.1	34	477	28	0.120
2082.1	0.784	178	20	350	27	0.007	11	36	537	30	0.005
2082.8	0.806	200	21	370	27	0.381	12	39	567	31	0.278
2083.5	0.739	183	18	375	25	0.174	11	33	575	28	0.127
2084.2	0.490	174	20	384	26	0.092	7.1	36	588	30	0.067
2084.9	0.490	167	20	327	24	0.083	7.1	36	502	27	0.060
2085.6	0.490	179	19	328	28	0.262	7.1	35	502	32	0.191
2086.3	0.490	198	20	386	27	0.282	7.1	36	592	31	0.206
2086.9	0.490	183	18	335	27	0.180	7.1	33	513	31	0.131
2087.6	0.490	165	19	358	26	0.083	7.1	34	548	30	0.061
2088.3	0.490	158	18	325	25	0.081	7.1	34	499	29	0.059
2089.0	0.500	187	20	361	32	0.179	7.2	36	554	37	0.131
2089.7	0.897	195	20	375	26	0.186	13	36	575	29	0.135



Minnow Environmental  
Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2090.4	0.607	204	18	339	26	0.180	8.8	34	519	30	0.131
2091.1	0.634	174	18	373	28	0.007	9.2	32	572	32	0.005
2091.8	0.534	174	18	328	27	0.347	7.7	33	503	31	0.253
2092.5	0.594	183	19	340	28	0.007	8.6	35	521	32	0.005
2093.2	0.490	197	20	362	26	0.182	7.1	36	555	30	0.133
2093.9	0.490	187	17	344	25	0.007	7.1	31	527	28	0.005
2094.6	0.490	162	17	329	26	0.344	7.1	31	505	30	0.251
2095.3	1.1	179	18	309	26	0.259	16	32	473	30	0.189
2096.0	0.490	178	17	343	28	0.269	7.1	31	525	32	0.196
2096.7	0.490	189	17	337	24	0.007	7.1	30	517	27	0.005
2097.4	0.490	188	16	360	26	0.273	7.1	29	552	30	0.199
2098.1	0.490	175	16	296	25	0.169	7.1	29	453	28	0.123
2098.8	0.490	187	15	320	26	0.089	7.1	28	491	30	0.065
2099.5	1.1	207	18	329	26	0.287	16	32	503	30	0.210
2100.2	0.615	184	14	323	24	0.083	8.9	26	495	28	0.061
2100.9	0.490	178	14	319	24	0.265	7.1	26	489	27	0.193
2101.6	0.523	170	14	294	25	0.255	7.5	26	450	29	0.186
2102.3	0.490	180	15	306	28	0.183	7.1	28	469	32	0.133
2103.0	0.490	204	14	310	25	0.256	7.1	25	474	29	0.187
2103.7	0.644	199	14	303	25	0.176	9.3	25	465	28	0.128
2104.4	0.511	171	13	292	25	0.166	7.4	24	447	29	0.121
2105.1	0.615	171	12	258	22	0.007	8.9	21	396	25	0.005
2105.8	0.592	208	16	302	30	0.095	8.5	29	463	34	0.070
2106.5	0.558	197	12	299	25	0.007	8.1	22	458	28	0.005
2107.2	0.490	193	12	283	28	0.093	7.1	21	433	32	0.068
2107.9	0.490	194	12	277	27	0.189	7.1	21	425	31	0.138
2108.6	0.636	176	11	255	26	0.086	9.2	21	391	30	0.063
2109.3	0.490	205	11	273	27	0.007	7.1	20	418	31	0.005
2110.0	0.979	210	10	258	25	0.090	14	19	395	28	0.066
2110.7	0.511	196	11	252	25	0.275	7.4	19	386	29	0.201
2111.4	0.802	170	9.6	224	24	0.166	12	17	343	28	0.121
2112.1	0.490	186	10	228	27	0.452	7.1	19	349	31	0.330
2112.7	0.521	210	11	243	26	0.186	7.5	19	373	30	0.136
2113.4	0.490	197	9.7	237	25	0.460	7.1	18	363	29	0.335
2114.1	0.596	188	10.0	238	25	0.007	8.6	18	365	29	0.005
2114.8	0.490	195	10	203	26	0.081	7.1	18	311	29	0.059
2115.5	0.603	196	8.6	227	27	0.089	8.7	16	348	31	0.065
2116.2	0.715	221	8.7	226	27	0.090	10	16	347	31	0.065
2116.9	0.490	206	9.0	219	25	0.184	7.1	16	336	29	0.134
2117.6	0.947	207	7.1	228	25	0.175	14	13	349	28	0.128
2118.3	0.662	195	7.7	190	27	0.180	9.6	14	291	31	0.132
2119.0	0.490	225	7.5	220	28	0.302	7.1	14	337	32	0.221
2119.7	0.490	223	7.4	201	24	0.093	7.1	13	309	28	0.068
2120.4	0.528	213	5.7	203	27	0.094	7.6	10	311	31	0.068
2121.1	0.490	213	7.3	218	27	0.280	7.1	13	334	31	0.204
2121.8	0.662	198	6.0	165	23	0.007	9.6	11	253	26	0.005
2122.5	0.804	223	6.3	191	24	0.007	12	11	292	27	0.005
2123.2	0.490	234	6.4	218	25	0.287	7.1	12	334	28	0.209
2123.9	0.490	226	6.2	193	25	0.259	7.1	11	295	29	0.189
2124.6	0.490	207	6.0	179	24	0.173	7.1	11	274	27	0.126
2125.3	0.490	209	6.6	183	24	0.087	7.1	12	281	28	0.063
2126.0	0.730	243	6.5	216	25	0.099	11	12	331	29	0.072
2126.7	0.490	239	6.0	214	26	0.007	7.1	11	328	29	0.005
2127.4	0.909	209	4.8	188	25	0.421	13	8.8	288	29	0.308
2128.1	0.490	217	5.1	170	24	0.167	7.1	9.3	260	28	0.122
2128.8	0.797	251	4.9	179	25	0.093	12	8.9	275	28	0.068
2129.5	0.742	247	4.4	183	26	0.007	11	8.0	281	29	0.005
2130.2	0.703	228	5.5	186	24	0.267	10	10	285	27	0.195
2130.9	0.647	214	5.9	190	24	0.176	9.3	11	291	28	0.129
2131.6	0.490	224	7.1	181	25	0.262	7.1	13	277	28	0.191
2132.3	0.757	259	7.2	202	27	0.384	11	13	309	30	0.280
2133.0	0.490	228	7.0	196	26	0.093	7.1	13	301	29	0.068
2133.7	0.718	226	7.2	195	24	0.273	10	13	298	28	0.199
2134.4	1.2	214	7.5	186	25	0.357	17	14	285	29	0.261
2135.1	0.490	206	8.3	179	23	0.007	7.1	15	275	26	0.005
2135.8	0.679	237	8.9	206	25	0.092	9.8	16	316	29	0.067
2136.5	0.695	226	9.2	212	24	0.176	10	17	324	27	0.128
2137.2	0.490	211	10	213	23	0.263	7.1	19	326	26	0.192
2137.9	0.601	216	11	204	24	0.178	8.7	21	312	28	0.130
2138.5	0.538	195	11	200	26	0.174	7.8	19	306	30	0.127
2139.2	0.646	221	13	214	24	0.265	9.3	23	327	27	0.193
2139.9	0.654	222	11	204	21	0.007	9.4	19	312	24	0.005
2140.6	0.490	225	12	209	25	0.007	7.1	22	321	28	0.005
2141.3	0.690	183	12	211	23	0.262	10.0	22	323	26	0.191
2142.0	0.852	207	16	219	25	0.007	12	29	335	28	0.005
2142.7	0.490	224	13	234	22	0.388	7.1	24	359	25	0.283
2143.4	0.521	183	12	197	20	0.169	7.5	21	302	23	0.123
2144.1	0.510	204	15	206	23	0.091	7.4	27	315	26	0.066
2144.8	0.945	171	15	202	23	0.007	14	28	310	26	0.005
2145.5	0.490	175	16	209	25	0.281	7.1	29	320	29	0.205
2146.2	0.490	194	17	215	23	0.280	7.1	30	330	26	0.204



Minnow Environmental Sample ID: 010											
Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2146.9	0.720	173	15	230	21	0.084	10	27	353	25	0.061
2147.6	0.897	177	18	220	22	0.175	13	32	337	25	0.128
2148.3	0.490	158	17	204	24	0.085	7.1	30	312	28	0.062
2149.0	0.790	176	19	230	27	0.092	11	35	353	30	0.067
2149.7	0.490	168	19	242	26	0.376	7.1	36	370	29	0.274
2150.4	0.731	173	19	233	24	0.007	11	34	358	28	0.005
2151.1	0.674	155	19	210	23	0.170	9.7	34	322	26	0.124
2151.8	0.490	175	20	213	23	0.256	7.1	37	327	26	0.187
2152.5	0.623	155	20	191	23	0.341	9.0	37	293	26	0.249
2153.2	0.815	165	20	238	23	0.089	12	36	364	26	0.065
2153.9	0.490	150	19	206	22	0.423	7.1	35	316	25	0.308
2154.6	0.534	143	19	208	27	0.173	7.7	35	319	31	0.126
2155.3	0.490	162	18	204	27	0.182	7.1	33	313	31	0.133
2156.0	0.514	165	17	226	27	0.184	7.4	31	346	31	0.134
2156.7	0.530	158	18	209	25	0.085	7.7	34	321	28	0.062
2157.4	0.811	147	16	198	25	0.083	12	29	304	29	0.061
2158.1	0.598	161	18	194	27	0.177	8.6	32	298	31	0.129
2158.8	0.555	170	17	200	29	0.452	8.0	31	306	33	0.329
2159.5	0.881	179	15	212	26	0.085	13	27	324	29	0.062
2160.2	0.490	154	16	214	29	0.007	7.1	28	327	34	0.005
2160.9	0.670	150	15	202	27	0.254	9.7	28	309	31	0.186
2161.6	0.490	159	16	219	30	0.007	7.1	29	335	34	0.005
2162.3	0.727	177	16	207	28	0.257	10	29	317	32	0.188
2163.0	0.554	177	14	219	26	0.270	8.0	25	336	30	0.197
2163.7	0.490	158	13	209	26	0.086	7.1	24	321	30	0.062
2164.4	1.0	163	14	194	27	0.083	14	26	298	31	0.061
2165.0	0.946	155	12	207	27	0.007	14	23	317	31	0.005
2165.7	0.559	182	13	211	27	0.007	8.1	23	323	30	0.005
2166.4	1.0	182	13	204	26	0.354	15	23	313	30	0.258
2167.1	0.490	158	11	201	28	0.092	7.1	21	309	32	0.067
2167.8	0.580	150	11	185	27	0.258	8.4	21	284	31	0.188
2168.5	0.490	170	12	202	29	0.178	7.1	23	309	33	0.130
2169.2	0.613	185	12	213	25	0.182	8.9	22	327	29	0.133
2169.9	0.490	183	11	221	25	0.007	7.1	20	339	29	0.005
2170.6	0.790	172	11	213	27	0.086	11	21	327	30	0.063
2171.3	0.490	190	11	219	27	0.090	7.1	20	336	31	0.065
2172.0	0.950	194	12	230	31	0.197	14	22	352	35	0.143
2172.7	1.1	184	12	210	26	0.089	15	22	322	30	0.065
2173.4	0.490	198	12	216	27	0.093	7.1	22	331	31	0.068
2174.1	0.490	174	9.7	181	25	0.082	7.1	18	278	29	0.060
2174.8	0.497	173	10	186	27	0.161	7.2	19	286	31	0.118
2175.5	0.490	208	11	209	32	0.091	7.1	21	320	37	0.066
2176.2	0.609	200	11	199	26	0.007	8.8	20	304	30	0.005
2176.9	0.882	178	11	203	29	0.007	13	20	311	33	0.005
2177.6	0.547	199	11	190	29	0.267	7.9	21	291	33	0.194
2178.3	0.695	186	10	176	28	0.352	10	19	270	32	0.257
2179.0	0.658	199	10	185	28	0.089	9.5	19	283	32	0.065
2179.7	0.490	199	8.9	188	30	0.170	7.1	16	288	34	0.124
2180.4	0.490	215	8.4	174	28	0.007	7.1	15	266	32	0.005
2181.1	0.490	199	7.6	158	28	0.007	7.1	14	243	32	0.005
2181.8	0.554	202	8.0	133	25	0.082	8.0	15	204	29	0.059
2182.5	0.506	196	7.0	135	23	0.007	7.3	13	206	27	0.005
2183.2	0.490	202	6.2	128	24	0.007	7.1	11	197	28	0.005
2183.9	0.490	223	5.5	149	26	0.007	7.1	10	229	30	0.005
2184.6	0.490	213	5.9	133	26	0.007	7.1	11	204	30	0.005
2185.3	1.1	228	6.3	137	29	0.352	16	11	209	33	0.257
2186.0	0.590	234	5.6	136	28	0.087	8.5	10	209	33	0.063
2186.7	0.490	233	5.2	137	25	0.082	7.1	9.5	209	29	0.059
2187.4	0.490	232	5.1	132	26	0.083	7.1	9.4	203	30	0.061
2188.1	0.490	215	4.5	118	26	0.007	7.1	8.2	181	30	0.005
2188.8	0.490	233	4.8	119	28	0.178	7.1	8.8	182	32	0.130
2189.5	0.583	233	4.7	129	27	0.094	8.4	8.5	197	31	0.069
2190.2	0.490	243	3.8	112	28	0.007	7.1	6.9	171	32	0.005
2190.9	0.554	205	3.8	101	26	0.007	8.0	7.0	155	29	0.005
2191.5	0.663	240	3.9	100	29	0.007	9.6	7.1	153	33	0.005
2192.2	0.490	253	3.2	108	29	0.093	7.1	5.8	165	33	0.068
2192.9	0.490	245	3.2	103	25	0.086	7.1	5.8	157	28	0.063
2193.6	0.490	240	2.7	89	25	0.081	7.1	5.0	137	29	0.059
2194.3	0.490	242	3.2	80	25	0.087	7.1	5.8	122	29	0.064
2195.0	0.490	252	3.1	89	27	0.090	7.1	5.7	136	31	0.066
2195.7	0.490	266	3.5	95	28	0.090	7.1	6.4	146	32	0.066
2196.4	0.684	251	2.4	114	27	0.086	9.9	4.4	175	31	0.063
2197.1	0.490	264	3.0	88	26	0.007	7.1	5.5	135	30	0.005
2197.8	0.515	248	2.6	81	28	0.007	7.4	4.8	124	32	0.005
2198.5	0.490	241	2.9	83	28	0.087	7.1	5.3	128	32	0.064
2199.2	0.624	244	3.0	77	25	0.085	9.0	5.5	118	29	0.062
2199.9	0.711	251	2.3	83	26	0.089	10	4.3	127	30	0.065
2200.6	0.695	230	2.7	92	28	0.007	10	4.8	142	32	0.005
2201.3	0.507	236	3.1	87	29	0.007	7.3	5.6	133	33	0.005
2202.0	0.511	267	3.1	102	30	0.091	7.4	5.7	156	34	0.066
2202.7	0.490	247	3.2	89	25	0.176	7.1	5.8	137	29	0.129



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2203.4	0.490	245	3.2	101	27	0.179	7.1	5.8	155	31	0.131
2204.1	0.490	262	4.1	101	27	0.007	7.1	7.5	155	30	0.005
2204.8	1.0	225	4.0	111	28	0.269	15	7.4	169	32	0.197
2205.5	0.847	267	5.0	122	27	0.280	12	9.2	186	31	0.205
2206.2	0.910	241	4.9	119	28	0.007	13	8.9	182	32	0.005
2206.9	0.490	211	4.8	118	25	0.087	7.1	8.8	181	29	0.063
2207.6	0.833	226	5.6	128	25	0.091	12	10	196	28	0.066
2208.3	0.490	237	7.1	122	25	0.007	7.1	13	186	29	0.005
2209.0	0.512	232	7.6	119	25	0.276	7.4	14	182	29	0.201
2209.7	0.490	222	7.4	128	25	0.090	7.1	13	197	28	0.066
2210.4	0.490	216	7.3	123	23	0.085	7.1	13	188	27	0.062
2211.1	0.628	213	8.4	135	25	0.007	9.1	15	207	28	0.005
2211.8	0.863	236	8.6	126	27	0.089	12	16	192	31	0.065
2212.5	1.0	213	10	140	25	0.007	15	19	214	29	0.005
2213.2	0.631	225	11	160	25	0.007	9.1	21	245	29	0.005
2213.9	0.622	204	11	142	23	0.007	9.0	20	218	27	0.005
2214.6	0.522	187	10	143	22	0.233	7.5	19	220	25	0.170
2215.3	0.710	206	14	146	24	0.089	10	25	224	28	0.065
2216.0	0.654	213	12	161	24	0.089	9.4	22	246	28	0.065
2216.7	0.490	183	12	167	22	0.007	7.1	22	256	26	0.005
2217.3	0.490	178	13	169	21	0.007	7.1	24	259	24	0.005
2218.0	0.490	189	14	184	23	0.007	7.1	25	282	27	0.005
2218.7	0.912	197	15	194	23	0.189	13	27	298	26	0.138
2219.4	0.490	195	14	176	21	0.260	7.1	26	270	24	0.190
2220.1	0.932	187	15	182	22	0.090	13	28	280	25	0.066
2220.8	1.1	162	16	176	21	0.084	16	30	269	24	0.061
2221.5	0.574	175	18	186	23	0.007	8.3	33	285	26	0.005
2222.2	0.490	195	19	220	24	0.174	7.1	35	337	28	0.127
2222.9	0.752	184	20	192	22	0.088	11	37	294	25	0.064
2223.6	0.490	169	20	190	21	0.085	7.1	37	291	25	0.062
2224.3	0.490	167	22	184	24	0.088	7.1	40	282	27	0.064
2225.0	0.535	169	23	176	24	0.086	7.7	41	270	27	0.063
2225.7	1.1	182	25	185	24	0.091	16	46	283	27	0.066
2226.4	0.490	157	22	170	22	0.084	7.1	41	261	26	0.062
2227.1	0.675	156	23	163	21	0.085	9.7	42	250	24	0.062
2227.8	0.818	165	24	167	24	0.007	12	44	257	27	0.005
2228.5	0.864	157	26	174	24	0.449	12	48	267	28	0.327
2229.2	0.578	164	25	232	24	0.282	8.3	45	356	28	0.206
2229.9	0.490	158	23	181	153	0.007	7.1	41	277	175	0.005
2230.6	0.503	154	21	167	25	0.271	7.3	38	256	28	0.198
2231.3	0.665	170	25	186	25	0.181	9.6	46	285	29	0.132
2232.0	0.490	161	24	185	25	0.007	7.1	44	283	28	0.005
2232.7	0.490	172	24	182	25	0.007	7.1	44	279	29	0.005
2233.4	0.490	154	22	184	25	0.264	7.1	41	282	28	0.193
2234.1	0.490	161	23	171	28	0.389	7.1	42	262	32	0.284
2234.8	0.906	151	22	177	25	0.266	13	41	271	28	0.194
2235.5	0.490	164	21	173	27	0.351	7.1	38	265	31	0.256
2236.2	0.753	165	19	181	24	0.088	11	35	277	28	0.064
2236.9	0.669	160	18	145	26	0.183	9.7	32	222	29	0.133
2237.6	0.513	149	17	143	26	0.166	7.4	31	219	30	0.121
2238.3	0.508	163	16	155	27	0.457	7.3	30	238	31	0.333
2239.0	0.620	164	16	149	26	0.007	9.0	30	229	30	0.005
2239.7	0.728	164	14	160	28	0.007	11	26	246	32	0.005
2240.4	0.490	157	14	156	28	0.089	7.1	26	239	32	0.065
2241.1	0.595	154	15	149	28	0.176	8.6	28	229	32	0.129
2241.8	0.667	175	14	143	26	0.007	9.6	25	218	30	0.005
2242.5	0.601	179	14	141	24	0.447	8.7	25	216	28	0.326
2243.2	0.490	146	12	148	26	0.168	7.1	22	226	30	0.122
2243.8	0.490	154	13	158	27	0.161	7.1	24	242	30	0.118
2244.5	0.530	161	12	157	26	0.078	7.7	23	241	30	0.057
2245.2	0.953	185	13	181	30	0.467	14	24	277	34	0.341
2245.9	0.939	176	13	192	28	0.091	14	24	294	32	0.066
2246.6	0.672	160	12	164	26	0.317	9.7	23	251	30	0.232
2247.3	0.555	162	13	186	30	0.082	8.0	24	285	34	0.060
2248.0	0.593	182	14	224	31	0.176	8.6	26	343	36	0.128
2248.7	0.490	196	13	193	27	0.167	7.1	23	296	31	0.122
2249.4	0.668	197	12	206	28	0.339	9.6	23	316	32	0.247
2250.1	0.630	189	12	201	28	0.258	9.1	22	308	32	0.188
2250.8	0.523	181	12	190	28	0.007	7.5	22	291	32	0.005
2251.5	0.772	194	12	187	31	0.182	11	22	286	35	0.133
2252.2	0.490	202	12	188	28	0.007	7.1	22	288	32	0.005
2252.9	0.613	194	10	147	26	0.167	8.9	19	225	30	0.122
2253.6	0.752	177	11	170	28	0.166	11	21	260	32	0.121
2254.3	1.2	224	12	155	27	0.092	18	23	238	31	0.067
2255.0	0.490	184	11	153	29	0.007	7.1	20	234	33	0.005
2255.7	0.490	206	12	163	28	0.085	7.1	22	250	32	0.062
2256.4	0.490	212	13	155	29	0.007	7.1	23	237	34	0.005
2257.1	0.773	193	11	131	28	0.007	11	20	201	32	0.005
2257.8	0.694	195	11	145	30	0.175	10	20	222	34	0.128
2258.5	0.490	234	11	159	28	0.088	7.1	20	244	32	0.064
2259.2	0.490	230	10	148	27	0.007	7.1	18	227	31	0.005



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2259.9	0.490	231	9.3	134	27	0.261	7.1	17	205	31	0.191
2260.6	0.490	215	9.3	127	30	0.007	7.1	17	195	34	0.005
2261.3	0.699	215	9.3	142	28	0.088	10	17	218	32	0.064
2262.0	0.806	243	9.9	155	29	0.007	12	18	237	33	0.005
2262.7	0.490	266	8.9	139	29	0.171	7.1	16	214	33	0.125
2263.4	0.490	196	8.5	122	25	0.007	7.1	15	187	29	0.005
2264.1	0.490	228	9.1	141	28	0.177	7.1	17	216	32	0.129
2264.8	0.643	250	9.5	144	29	0.264	9.3	17	220	33	0.192
2265.5	0.490	243	8.9	144	27	0.089	7.1	16	220	31	0.065
2266.2	0.490	226	8.1	152	27	0.087	7.1	15	232	30	0.064
2266.9	0.490	225	8.8	145	28	0.007	7.1	16	222	32	0.005
2267.6	0.490	220	9.1	144	30	0.079	7.1	17	220	34	0.058
2268.3	0.490	247	8.7	159	26	0.007	7.1	16	243	29	0.005
2269.0	0.591	293	9.0	139	27	0.087	8.5	16	214	31	0.063
2269.7	0.490	228	8.0	138	27	0.007	7.1	15	211	31	0.005
2270.3	0.725	249	8.2	144	30	0.171	10	15	221	34	0.125
2271.0	0.913	263	7.6	134	30	0.088	13	14	205	34	0.065
2271.7	0.490	247	7.1	135	28	0.173	7.1	13	208	32	0.126
2272.4	0.786	265	6.3	135	30	0.007	11	12	207	35	0.005
2273.1	0.490	262	7.4	120	29	0.007	7.1	13	184	33	0.005
2273.8	0.490	248	5.4	106	31	0.339	7.1	9.8	162	35	0.247
2274.5	0.507	274	5.3	102	30	0.007	7.3	9.6	156	34	0.005
2275.2	0.547	255	5.5	92	27	0.007	7.9	9.9	141	31	0.005
2275.9	0.499	294	6.0	100	29	0.007	7.2	11	153	33	0.005
2276.6	0.490	269	4.8	86	29	0.007	7.1	8.8	132	33	0.005
2277.3	0.492	251	4.6	75	26	0.176	7.1	8.4	114	30	0.129
2278.0	0.490	292	5.0	77	28	0.007	7.1	9.0	118	32	0.005
2278.7	0.490	298	5.0	86	30	0.093	7.1	9.2	131	34	0.068
2279.4	0.665	282	4.7	75	27	0.007	9.6	8.6	116	31	0.005
2280.1	0.490	284	4.8	70	28	0.178	7.1	8.7	107	32	0.130
2280.8	0.558	264	4.1	59	26	0.332	8.1	7.5	90	30	0.242
2281.5	0.809	273	4.3	57	29	0.007	12	7.9	88	33	0.005
2282.2	0.490	270	4.0	73	27	0.007	7.1	7.4	113	31	0.005
2282.9	0.490	279	4.6	61	25	0.077	7.1	8.3	94	28	0.056
2283.6	0.495	274	4.9	67	26	0.007	7.1	8.9	103	29	0.005
2284.3	0.490	276	6.7	78	28	0.007	7.1	12	120	32	0.005
2285.0	0.622	287	6.8	80	29	0.084	9.0	12	123	33	0.061
2285.7	0.490	251	6.4	88	23	0.007	7.1	12	135	26	0.005
2286.4	0.490	253	6.8	96	27	0.263	7.1	12	148	31	0.192
2287.1	0.490	257	6.8	90	26	0.007	7.1	12	137	30	0.005
2287.8	0.490	254	6.9	102	27	0.178	7.1	13	156	31	0.130
2288.5	0.906	243	6.4	96	24	0.007	13	12	147	27	0.005
2289.2	0.638	231	5.5	95	25	0.174	9.2	10	145	28	0.127
2289.9	0.747	219	5.5	94	24	0.087	11	10.0	144	27	0.064
2290.6	0.490	199	5.4	91	24	0.174	7.1	9.8	139	27	0.127
2291.3	0.625	219	6.5	98	24	0.085	9.0	12	150	27	0.062
2292.0	0.490	224	5.6	107	25	0.087	7.1	10	164	29	0.063
2292.7	0.581	212	5.2	110	22	0.007	8.4	9.5	168	25	0.005
2293.4	0.631	192	5.7	104	21	0.172	9.1	10	160	24	0.126
2294.1	0.509	192	4.9	98	23	0.082	7.3	8.9	151	27	0.060
2294.8	0.534	186	5.6	111	25	0.260	7.7	10	171	28	0.190
2295.5	0.628	189	5.6	108	22	0.257	9.1	10	166	25	0.188
2296.2	0.490	185	5.2	107	22	0.007	7.1	9.5	164	25	0.005
2296.8	0.547	169	5.8	98	22	0.080	7.9	11	150	25	0.059
2297.5	0.792	177	6.4	115	24	0.081	11	12	176	27	0.059
2298.2	0.645	187	7.1	123	25	0.087	9.3	13	188	29	0.064
2298.9	0.490	184	6.4	106	23	0.088	7.1	12	162	27	0.064
2299.6	0.490	172	7.3	120	25	0.180	7.1	13	183	29	0.131
2300.3	0.581	161	7.1	108	24	0.172	8.4	13	165	27	0.126
2301.0	0.490	173	8.3	95	24	0.348	7.1	15	145	27	0.254
2301.7	0.490	164	8.9	90	23	0.177	7.1	16	138	26	0.129
2302.4	0.490	181	9.2	85	27	0.552	7.1	17	130	31	0.403
2303.1	0.645	162	9.9	78	26	0.265	9.3	18	119	30	0.193
2303.8	0.490	176	11	75	24	0.171	7.1	19	115	27	0.125
2304.5	0.490	184	11	70	25	0.089	7.1	20	108	29	0.065
2305.2	0.746	177	10	67	28	0.264	11	19	102	32	0.193
2305.9	0.994	192	10	63	24	0.082	14	19	96	27	0.060
2306.6	0.490	159	10	66	25	0.164	7.1	18	101	29	0.120
2307.3	0.790	158	10	51	27	0.007	11	19	79	30	0.005
2308.0	0.535	171	14	52	28	0.086	7.7	25	80	32	0.063
2308.7	0.490	170	12	46	28	0.088	7.1	21	70	32	0.064
2309.4	0.490	172	12	40	28	0.177	7.1	22	61	32	0.129
2310.1	1.1	158	14	35	29	0.007	16	25	54	33	0.005
2310.8	0.587	172	13	34	27	0.174	8.5	24	52	31	0.127
2311.5	0.490	166	12	27	26	0.082	7.1	21	42	30	0.060
2312.2	0.779	190	12	30	30	0.007	11	22	46	34	0.005
2312.9	0.490	161	11	30	29	0.348	7.1	21	47	33	0.254
2313.6	0.515	163	11	22	25	0.007	7.4	20	33	29	0.005
2314.3	0.669	167	12	27	28	0.007	9.7	21	42	32	0.005
2315.0	0.490	171	12	27	32	0.284	7.1	22	41	37	0.207
2315.7	0.490	174	12	37	30	0.089	7.1	22	56	34	0.065



Minnow Environmental  
Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2316.4	0.490	150	11	25	29	0.165	7.1	20	39	33	0.120
2317.1	0.691	162	11	24	29	0.087	10.0	19	37	33	0.063
2317.8	0.490	185	11	24	27	0.007	7.1	20	37	31	0.005
2318.5	0.490	172	10	31	32	0.278	7.1	19	48	36	0.203
2319.2	0.594	182	10.0	33	28	0.162	8.6	18	51	32	0.118
2319.9	0.490	178	10	31	29	0.333	7.1	18	48	33	0.243
2320.6	0.797	175	10	32	31	0.248	12	19	50	35	0.181
2321.3	0.822	180	11	36	28	0.256	12	20	56	33	0.187
2322.0	0.490	198	9.8	43	28	0.172	7.1	18	66	32	0.125
2322.6	0.817	179	10	42	26	0.007	12	18	64	30	0.005
2323.3	0.562	185	10.0	44	30	0.083	8.1	18	67	34	0.060
2324.0	0.915	186	8.9	44	28	0.007	13	16	67	33	0.005
2324.7	0.490	196	9.1	50	30	0.350	7.1	17	77	35	0.256
2325.4	0.552	198	10	56	28	0.246	8.0	19	85	32	0.180
2326.1	0.490	194	8.6	58	28	0.163	7.1	16	89	32	0.119
2326.8	0.490	189	7.6	57	26	0.078	7.1	14	87	30	0.057
2327.5	0.584	218	10	66	30	0.347	8.4	19	101	34	0.253
2328.2	0.490	233	10	58	30	0.007	7.1	19	88	34	0.005
2328.9	0.490	223	8.5	67	28	0.087	7.1	15	103	33	0.064
2329.6	0.490	200	8.6	57	28	0.079	7.1	16	87	32	0.058
2330.3	0.902	220	9.1	58	26	0.158	13	17	89	30	0.115
2331.0	0.490	259	8.6	77	29	0.007	7.1	16	118	33	0.005
2331.7	0.714	243	7.9	61	27	0.007	10	14	93	30	0.005
2332.4	0.490	259	8.5	66	26	0.258	7.1	15	101	30	0.188
2333.1	0.490	194	7.8	50	25	0.076	7.1	14	77	28	0.055
2333.8	0.490	224	8.0	63	30	0.332	7.1	15	96	34	0.242
2334.5	0.490	235	7.3	60	27	0.080	7.1	13	92	31	0.059
2335.2	0.647	261	7.5	75	28	0.007	9.3	14	115	32	0.005
2335.9	0.490	222	7.5	77	26	0.167	7.1	14	118	30	0.122
2336.6	0.490	238	7.9	66	27	0.007	7.1	14	101	31	0.005
2337.3	0.680	246	8.5	68	28	0.085	9.8	15	105	32	0.062
2338.0	0.490	271	7.1	55	30	0.007	7.1	13	85	34	0.005
2338.7	0.490	240	7.6	63	27	0.007	7.1	14	97	31	0.005
2339.4	0.504	222	7.4	45	27	0.081	7.3	13	69	31	0.059
2340.1	0.490	229	8.1	51	30	0.084	7.1	15	78	34	0.062
2340.8	0.529	253	7.3	51	27	0.085	7.6	13	78	31	0.062
2341.5	0.827	262	8.4	54	24	0.257	12	15	83	27	0.188
2342.2	0.490	274	9.2	60	26	0.466	7.1	17	92	30	0.340
2342.9	0.611	241	8.3	56	26	0.007	8.8	15	86	30	0.005
2343.6	0.490	228	8.5	50	25	0.312	7.1	15	77	28	0.228
2344.3	1.0	257	9.4	52	28	0.090	15	17	80	32	0.065
2345.0	0.492	252	10	49	26	0.265	7.1	19	75	30	0.193
2345.7	0.490	232	8.0	57	26	0.007	7.1	15	87	30	0.005
2346.4	0.524	210	8.5	50	24	0.077	7.6	16	76	27	0.056
2347.1	0.490	241	9.0	58	27	0.253	7.1	16	89	31	0.184
2347.8	0.490	271	9.7	63	25	0.178	7.1	18	96	29	0.130
2348.5	1.2	230	8.8	60	25	0.085	18	16	93	28	0.062
2349.1	0.490	255	9.0	65	28	0.262	7.1	16	100	32	0.191
2349.8	0.490	214	8.5	61	25	0.080	7.1	16	93	29	0.058
2350.5	0.618	244	8.7	75	28	0.007	8.9	16	114	32	0.005
2351.2	0.615	232	10	78	28	0.007	8.9	19	120	32	0.005
2351.9	0.490	249	9.4	93	28	0.007	7.1	17	143	31	0.005
2352.6	0.490	211	9.0	90	26	0.163	7.1	16	138	29	0.119
2353.3	0.490	220	9.5	93	25	0.085	7.1	17	142	29	0.062
2354.0	0.890	226	9.9	110	28	0.091	13	18	169	31	0.067
2354.7	0.490	242	11	115	27	0.087	7.1	20	176	31	0.063
2355.4	0.896	218	9.3	109	25	0.165	13	17	167	28	0.121
2356.1	0.754	197	9.9	108	26	0.007	11	18	166	30	0.005
2356.8	0.547	178	9.2	109	24	0.244	7.9	17	168	28	0.178
2357.5	0.662	214	11	111	25	0.181	9.6	20	170	29	0.132
2358.2	0.789	204	12	115	27	0.186	11	21	176	31	0.135
2358.9	0.553	205	9.9	113	27	0.179	8.0	18	174	31	0.131
2359.6	0.490	177	9.0	96	24	0.337	7.1	16	147	27	0.246
2360.3	1.0	200	11	108	28	0.189	15	21	166	32	0.138
2361.0	0.490	191	12	99	27	0.267	7.1	23	151	31	0.195
2361.7	0.874	193	11	101	25	0.171	13	20	155	28	0.125
2362.4	0.694	186	12	93	26	0.175	10	22	143	29	0.128
2363.1	0.651	171	13	96	28	0.178	9.4	24	147	32	0.130
2363.8	1.1	185	12	85	28	0.353	16	21	131	32	0.257
2364.5	0.937	178	13	94	31	0.194	14	23	144	35	0.142
2365.2	0.490	176	13	95	28	0.007	7.1	23	145	32	0.005
2365.9	0.490	176	12	87	29	0.441	7.1	21	134	33	0.322
2366.6	0.887	176	12	83	28	0.164	13	23	128	32	0.120
2367.3	0.771	167	12	79	25	0.079	11	22	122	28	0.058
2368.0	0.787	183	12	77	28	0.261	11	22	118	32	0.190
2368.7	0.522	179	11	74	27	0.254	7.5	19	114	30	0.186
2369.4	0.490	166	10	77	27	0.166	7.1	19	118	31	0.121
2370.1	0.810	160	10	64	28	0.007	12	19	99	32	0.005
2370.8	0.836	185	12	88	31	0.184	12	22	136	35	0.134
2371.5	0.637	176	10	86	29	0.261	9.2	19	131	34	0.191
2372.2	0.490	183	9.8	77	32	0.388	7.1	18	118	36	0.283



Minnow Environmental Sample ID: 010											
Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2372.9	0.490	177	11	75	29	0.084	7.1	19	115	34	0.061
2373.6	0.805	172	11	78	29	0.167	12	19	120	33	0.122
2374.3	1.1	189	11	88	31	0.180	16	21	135	36	0.131
2375.0	0.770	183	9.4	84	31	0.341	11	17	128	35	0.248
2375.6	0.765	170	9.1	77	26	0.158	11	17	117	30	0.116
2376.3	0.728	170	8.4	74	30	0.484	11	15	114	35	0.353
2377.0	0.601	186	10	78	31	0.081	8.7	18	120	36	0.059
2377.7	0.874	218	9.2	81	34	0.007	13	17	125	39	0.005
2378.4	0.490	207	8.9	83	35	0.352	7.1	16	127	40	0.257
2379.1	0.578	199	8.6	75	28	0.158	8.3	16	114	32	0.115
2379.8	0.490	200	8.9	72	30	0.085	7.1	16	110	34	0.062
2380.5	1.3	217	10	69	36	0.090	19	19	106	41	0.066
2381.2	0.788	210	8.7	67	32	0.523	11	16	102	36	0.382
2381.9	0.753	214	9.2	70	32	0.088	11	17	108	36	0.064
2382.6	0.831	198	8.4	76	30	0.326	12	15	116	35	0.238
2383.3	0.565	208	9.4	76	33	0.083	8.2	17	116	38	0.061
2384.0	0.945	230	9.7	94	35	0.092	14	18	144	40	0.067
2384.7	0.581	243	9.5	93	32	0.007	8.4	17	142	37	0.005
2385.4	0.809	240	9.4	88	31	0.007	12	17	134	36	0.005
2386.1	0.659	215	8.6	72	32	0.250	9.5	16	111	36	0.183
2386.8	0.932	235	8.3	74	31	0.085	13	15	113	35	0.062
2387.5	0.490	255	8.4	86	34	0.267	7.1	15	132	39	0.195
2388.2	1.2	256	9.0	92	30	0.282	17	16	141	34	0.206
2388.9	0.786	225	8.1	95	29	0.086	11	15	146	34	0.063
2389.6	0.490	236	8.5	92	29	0.342	7.1	16	140	33	0.249
2390.3	0.756	245	8.6	94	31	0.268	11	16	144	35	0.195
2391.0	0.988	266	9.4	99	34	0.274	14	17	152	39	0.200
2391.7	0.867	238	8.9	85	29	0.007	13	16	130	33	0.005
2392.4	0.921	243	7.8	90	31	0.089	13	14	139	36	0.065
2393.1	0.826	207	6.9	70	27	0.229	12	13	108	31	0.167
2393.8	1.1	254	8.4	93	30	0.262	17	15	143	34	0.191
2394.5	0.980	249	7.7	96	30	0.181	14	14	148	35	0.132
2395.2	0.976	230	6.6	107	27	0.343	14	12	164	31	0.250
2395.9	0.652	221	7.7	90	29	0.007	9.4	14	138	34	0.005
2396.6	0.966	226	8.2	99	30	0.179	14	15	152	35	0.130
2397.3	1.6	231	7.6	85	29	0.164	23	14	130	33	0.120
2398.0	1.2	253	8.7	97	29	0.445	18	16	149	33	0.325
2398.7	0.956	230	8.2	101	30	0.266	14	15	155	35	0.194
2399.4	0.928	208	7.4	89	30	0.081	13	14	136	34	0.059
2400.1	1.4	222	8.6	91	31	0.243	21	16	139	35	0.177
2400.8	1.2	254	10	95	31	0.081	18	19	145	35	0.059
2401.5	1.6	229	9.7	98	28	0.007	23	18	150	32	0.005
2402.1	1.2	203	9.6	102	34	0.180	17	17	156	39	0.132
2402.8	1.6	199	10	76	29	0.164	23	19	117	34	0.120
2403.5	1.1	204	12	83	34	0.516	16	21	126	39	0.377
2404.2	1.2	209	11	88	33	0.087	17	20	134	38	0.063
2404.9	1.1	199	11	76	33	0.081	15	21	117	38	0.059
2405.6	1.6	199	11	76	41	0.165	23	20	116	46	0.120
2406.3	1.4	195	13	65	48	0.156	21	24	100	54	0.114
2407.0	1.1	204	11	64	51	0.161	16	20	98	59	0.117
2407.7	2.1	232	12	73	69	0.180	31	22	112	79	0.131
2408.4	1.5	223	13	61	73	0.007	22	23	93	83	0.005
2409.1	2.3	229	12	58	88	0.007	33	22	89	101	0.005
2409.8	2.3	227	11	56	94	0.349	33	20	86	108	0.254
2410.5	2.4	235	11	54	116	0.338	34	20	83	132	0.247
2411.2	20	272	11	71	114	0.819	284	21	108	130	0.597
2411.9	1.9	261	11	42	126	0.167	28	20	65	144	0.122
2412.6	2.6	249	14	43	143	0.007	38	25	66	163	0.005
2413.3	1.8	261	12	38	152	0.510	25	21	58	174	0.372
2414.0	1.7	259	11	30	152	0.007	24	20	45	174	0.005
2414.7	2.4	285	11	36	150	0.339	34	20	55	172	0.247
2415.4	2.4	258	11	32	152	0.248	35	21	49	173	0.181
2416.1	2.2	277	12	33	163	0.522	32	21	51	186	0.381
2416.8	2.8	272	12	25	181	0.007	41	21	38	207	0.005
2417.5	2.5	307	13	22	176	0.174	35	24	33	202	0.127
2418.2	2.6	284	11	24	186	0.007	38	21	37	213	0.005
2418.9	2.2	293	11	19	173	0.520	32	21	29	198	0.380
2419.6	1.9	282	13	14	184	0.256	28	23	22	210	0.187
2420.3	2.4	310	13	17	184	0.088	35	24	26	210	0.064
2421.0	2.5	320	12	14	189	0.344	36	21	21	216	0.251
2421.7	3.5	304	13	13	206	0.350	51	23	20	235	0.255
2422.4	3.0	309	13	14	196	0.173	44	23	21	224	0.126
2423.1	3.5	305	14	13	196	0.256	51	26	20	225	0.187
2423.8	3.7	293	12	12	211	0.083	54	23	18	242	0.061
2424.5	2.9	346	12	14	189	0.087	42	22	21	216	0.063
2425.2	2.3	323	12	9.2	187	0.257	33	23	14	214	0.187
2425.9	3.0	332	13	8.8	200	0.175	43	23	14	228	0.127
2426.6	3.4	319	12	14	192	0.342	50	21	22	219	0.249
2427.3	3.1	323	12	11	201	0.347	44	21	16	230	0.253
2427.9	3.0	347	10	11	220	0.007	44	19	17	251	0.005
2428.6	4.8	341	11	9.5	207	0.445	70	20	15	236	0.324



Minnow Environmental  
Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2429.3	3.1	327	9.2	8.9	198	0.085	45	17	14	226	0.062
2430.0	2.6	342	9.3	5.4	208	0.085	38	17	8.3	237	0.062
2430.7	2.5	362	8.1	6.5	216	0.183	36	15	10.0	247	0.134
2431.4	2.5	380	9.3	5.8	225	0.007	36	17	8.9	257	0.005
2432.1	2.2	352	7.5	7.0	227	0.437	32	14	11	260	0.319
2432.8	2.3	335	8.4	5.4	225	0.247	34	15	8.3	258	0.180
2433.5	2.5	368	8.2	5.3	251	0.171	36	15	8.1	287	0.125
2434.2	1.9	401	7.8	5.0	252	0.085	28	14	7.7	288	0.062
2434.9	1.6	448	7.7	6.6	244	0.084	23	14	10	279	0.061
2435.6	1.7	411	6.6	3.5	244	0.083	24	12	5.4	279	0.060
2436.3	1.5	382	6.7	5.6	227	0.236	22	12	8.5	259	0.172
2437.0	1.7	380	6.0	5.8	272	0.157	24	11	8.9	311	0.115
2437.7	0.750	448	6.3	2.1	232	0.077	11	11	3.2	265	0.056
2438.4	0.938	467	5.8	3.1	229	0.082	14	11	4.8	261	0.060
2439.1	1.4	420	6.1	4.7	229	0.315	20	11	7.2	262	0.230
2439.8	0.939	458	6.3	3.7	256	0.082	14	12	5.7	293	0.060
2440.5	1.4	461	5.9	4.7	252	0.330	20	11	7.2	288	0.241
2441.2	1.3	468	6.5	3.6	246	0.085	18	12	5.5	282	0.062
2441.9	0.961	500	5.7	4.7	235	0.007	14	10	7.2	269	0.005
2442.6	1.1	477	6.7	3.6	233	0.172	16	12	5.6	266	0.126
2443.3	0.966	519	6.0	4.6	252	0.089	14	11	7.1	289	0.065
2444.0	1.3	507	5.5	4.7	269	0.267	18	10	7.2	308	0.195
2444.7	0.894	522	5.9	3.6	251	0.175	13	11	5.5	287	0.127
2445.4	0.709	463	5.2	5.1	222	0.007	10	9.4	7.9	254	0.005
2446.1	0.876	474	6.0	3.7	258	0.085	13	11	5.7	295	0.062
2446.8	0.670	501	6.7	3.6	258	0.007	9.7	12	5.5	295	0.005
2447.5	0.641	532	5.8	6.0	233	0.263	9.2	11	9.1	267	0.192
2448.2	0.732	513	6.1	4.8	280	0.346	11	11	7.4	320	0.252
2448.9	0.490	450	5.4	2.9	208	0.153	7.1	9.8	4.5	238	0.112
2449.6	1.2	467	5.6	3.3	200	0.320	17	10	5.0	229	0.233
2450.3	1.1	463	6.2	4.6	219	0.168	15	11	7.0	251	0.123
2451.0	0.992	460	6.1	3.5	214	0.082	14	11	5.4	245	0.060
2451.7	0.490	490	6.5	4.3	225	0.087	7.1	12	6.6	257	0.064
2452.4	0.490	467	6.5	5.0	230	0.175	7.1	12	7.7	262	0.128
2453.1	0.674	493	6.3	3.7	215	0.342	9.7	12	5.7	246	0.249
2453.7	0.555	494	6.4	5.2	209	0.542	8.0	12	7.9	239	0.396
2454.4	1.3	516	6.7	6.0	215	0.382	19	12	9.2	246	0.279
2455.1	0.796	475	6.9	5.7	198	0.087	11	13	8.8	227	0.064
2455.8	0.627	479	6.9	5.4	195	0.085	9.0	13	8.2	222	0.062
2456.5	1.1	481	7.8	5.9	196	0.181	16	14	9.1	224	0.132
2457.2	0.591	524	7.5	4.8	193	0.288	8.5	14	7.4	220	0.210
2457.9	0.548	469	7.6	5.8	175	0.267	7.9	14	8.9	200	0.195
2458.6	1.2	454	7.3	5.5	174	0.087	17	13	8.5	199	0.064
2459.3	0.898	424	6.9	6.1	171	0.082	13	13	9.4	196	0.060
2460.0	0.650	465	6.9	6.3	169	0.088	9.4	13	9.6	193	0.064
2460.7	0.495	536	7.0	7.7	170	0.177	7.1	13	12	195	0.129
2461.4	1.2	481	7.3	7.7	152	0.173	18	13	12	173	0.126
2462.1	0.553	446	8.3	7.1	152	0.089	8.0	15	11	174	0.065
2462.8	0.535	435	6.9	5.1	144	0.174	7.7	13	7.8	164	0.127
2463.5	0.587	447	6.5	6.6	137	0.261	8.5	12	10	156	0.191
2464.2	0.733	477	6.4	5.8	145	0.279	11	12	8.9	165	0.203
2464.9	0.523	443	6.0	5.5	124	0.084	7.5	11	8.5	142	0.061
2465.6	0.819	406	4.9	6.7	124	0.170	12	8.9	10	142	0.124
2466.3	0.735	419	6.1	4.8	119	0.007	11	11	7.4	136	0.005
2467.0	1.0	452	5.8	6.3	128	0.186	15	11	9.7	147	0.135
2467.7	0.490	455	4.8	4.9	117	0.184	7.1	8.8	7.5	134	0.134
2468.4	0.490	417	4.6	6.0	126	0.091	7.1	8.4	9.2	144	0.066
2469.1	0.601	420	4.5	3.2	113	0.088	8.7	8.1	4.8	129	0.065
2469.8	0.490	401	4.1	5.6	116	0.261	7.1	7.5	8.5	133	0.191
2470.5	0.490	439	3.9	4.3	118	0.262	7.1	7.2	6.6	134	0.191
2471.2	0.490	416	3.4	3.4	113	0.085	7.1	6.2	5.2	129	0.062
2471.9	0.918	364	3.3	2.6	105	0.161	13	6.0	4.0	120	0.117
2472.6	0.490	381	3.9	3.2	100	0.007	7.1	7.1	4.9	114	0.005
2473.3	0.490	383	3.5	2.6	102	0.360	7.1	6.3	3.9	117	0.263
2474.0	0.490	438	3.2	3.3	108	0.295	7.1	5.8	5.1	123	0.215
2474.7	0.490	384	3.5	3.2	110	0.522	7.1	6.4	4.9	126	0.380
2475.4	0.490	382	2.6	3.2	97	0.258	7.1	4.8	4.8	111	0.188
2476.1	0.580	341	3.2	3.9	105	0.172	8.4	5.9	5.9	120	0.125
2476.8	0.836	344	2.7	3.2	99	0.173	12	5.0	4.9	113	0.126
2477.5	0.733	353	2.7	2.6	94	0.259	11	4.9	4.0	108	0.189
2478.2	0.490	358	3.2	4.3	95	0.359	7.1	5.8	6.5	109	0.262
2478.9	0.679	308	3.3	3.1	88	0.160	9.8	6.1	4.7	101	0.117
2479.6	1.1	347	3.5	5.1	90	0.178	15	6.4	7.8	103	0.130
2480.3	0.576	358	2.8	2.9	88	0.429	8.3	5.2	4.5	100	0.313
2480.9	0.648	349	2.7	5.2	90	0.177	9.4	4.9	7.9	102	0.129
2481.6	0.562	322	3.1	3.9	84	0.083	8.1	5.6	5.9	96	0.060
2482.3	0.490	333	3.1	3.4	84	0.257	7.1	5.6	5.2	96	0.187
2483.0	0.803	313	2.6	3.3	89	0.444	12	4.8	5.0	101	0.324
2483.7	0.635	338	2.5	3.7	81	0.007	9.2	4.6	5.6	93	0.005
2484.4	0.490	340	3.0	5.7	80	0.007	7.1	5.4	8.7	91	0.005
2485.1	0.843	289	3.0	3.7	82	0.248	12	5.5	5.7	93	0.181



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2485.8	0.658	324	3.0	3.2	86	0.007	9.5	5.6	4.9	99	0.005
2486.5	0.554	327	2.6	4.0	88	0.412	8.0	4.7	6.2	101	0.301
2487.2	0.490	313	3.1	4.3	75	0.235	7.1	5.7	6.5	86	0.171
2487.9	0.783	288	3.0	3.0	76	0.153	11	5.5	4.6	86	0.112
2488.6	0.593	287	3.2	3.1	75	0.007	8.6	5.8	4.7	86	0.005
2489.3	0.877	262	2.5	3.2	74	0.076	13	4.6	5.0	85	0.056
2490.0	0.708	259	2.7	4.0	68	0.156	10	5.0	6.2	78	0.114
2490.7	0.877	262	3.2	2.4	68	0.162	13	5.8	3.7	78	0.118
2491.4	1.1	263	3.9	7.4	74	0.257	16	7.0	11	84	0.188
2492.1	0.658	243	3.6	5.3	68	0.233	9.5	6.5	8.1	78	0.170
2492.8	1.3	217	4.1	5.2	66	0.007	19	7.4	8.0	75	0.005
2493.5	1.3	252	4.3	3.3	62	0.169	18	7.9	5.1	71	0.123
2494.2	1.0	263	4.2	5.2	67	0.181	15	7.7	7.9	77	0.132
2494.9	1.0	227	3.8	5.5	60	0.081	15	6.9	8.4	69	0.059
2495.6	0.526	205	4.1	4.4	59	0.007	7.6	7.6	6.7	68	0.005
2496.3	0.857	215	4.2	6.4	65	0.079	12	7.6	9.8	75	0.057
2497.0	0.869	231	4.1	5.7	58	0.341	13	7.5	8.7	66	0.249
2497.7	1.4	228	3.9	6.3	58	0.258	21	7.0	9.7	66	0.188
2498.4	1.1	199	3.6	4.4	56	0.079	16	6.6	6.7	64	0.058
2499.1	1.4	210	3.9	5.7	63	0.343	21	7.1	8.8	71	0.250
2499.8	1.9	217	3.8	5.6	61	0.088	27	7.0	8.5	70	0.064
2500.5	1.7	227	3.1	5.2	59	0.177	24	5.6	8.0	68	0.129
2501.2	1.4	211	3.4	5.5	56	0.085	20	6.1	8.4	63	0.062
2501.9	1.8	187	3.1	4.8	55	0.081	26	5.7	7.3	62	0.059
2502.6	1.7	188	3.7	4.8	56	0.080	24	6.7	7.4	65	0.058
2503.3	1.8	212	3.1	4.8	58	0.271	25	5.7	7.4	66	0.198
2504.0	2.0	201	3.7	6.3	58	0.273	29	6.8	9.7	66	0.199
2504.7	1.7	195	3.5	5.4	60	0.254	25	6.5	8.3	69	0.185
2505.4	2.0	191	3.2	6.0	59	0.175	29	5.8	9.1	67	0.128
2506.1	2.2	195	3.9	3.7	62	0.354	32	7.1	5.7	71	0.258
2506.7	1.6	211	4.6	4.9	60	0.268	23	8.5	7.5	68	0.196
2507.4	2.2	244	4.1	6.6	61	0.007	32	7.5	10	70	0.005
2508.1	2.3	210	5.6	5.8	63	0.254	33	10	8.8	72	0.185
2508.8	3.2	194	6.7	6.2	66	0.163	46	12	9.5	75	0.119
2509.5	4.1	215	8.7	6.3	75	0.269	60	16	9.7	86	0.196
2510.2	4.2	239	12	5.2	85	0.089	61	22	8.0	98	0.065
2510.9	5.8	251	12	7.0	91	0.177	84	21	11	104	0.129
2511.6	5.7	214	13	6.2	96	0.079	82	23	9.4	110	0.057
2512.3	5.1	228	16	4.3	108	0.160	74	28	6.5	124	0.117
2513.0	6.2	251	20	5.6	136	0.175	89	36	8.6	156	0.128
2513.7	7.9	276	21	6.2	126	0.086	114	38	9.5	144	0.063
2514.4	7.3	273	21	6.7	127	0.252	105	38	10	146	0.184
2515.1	7.5	275	23	6.3	146	0.784	108	42	9.6	167	0.572
2515.8	6.0	262	24	7.5	163	0.180	86	43	11	186	0.131
2516.5	7.3	310	27	7.5	169	0.626	105	48	12	193	0.457
2517.2	9.7	313	26	9.9	167	0.087	141	47	15	191	0.064
2517.9	8.7	291	26	5.6	180	0.409	126	47	8.5	206	0.299
2518.6	7.9	318	27	6.0	183	0.086	114	50	9.2	210	0.063
2519.3	8.8	333	30	6.3	229	0.709	127	55	9.6	262	0.517
2520.0	8.8	348	31	7.9	207	0.537	127	57	12	237	0.392
2520.7	7.8	308	25	8.6	191	0.330	113	46	13	219	0.241
2521.4	6.0	318	30	5.8	201	0.439	87	54	9.0	229	0.320
2522.1	5.8	323	25	8.0	224	0.366	84	46	12	256	0.267
2522.8	5.1	300	26	5.1	211	0.349	74	47	7.8	241	0.255
2523.5	7.8	320	24	5.9	208	0.167	112	44	9.1	238	0.122
2524.2	5.8	327	25	4.7	235	0.171	84	46	7.2	268	0.125
2524.9	6.8	319	26	5.8	211	0.442	98	48	8.8	242	0.322
2525.6	6.9	296	25	5.3	214	0.082	99	46	8.1	244	0.060
2526.3	6.9	361	28	4.7	251	0.289	100	51	7.2	287	0.211
2527.0	5.3	368	25	5.9	227	0.667	77	46	9.1	260	0.486
2527.7	6.4	310	25	8.1	214	0.007	93	45	12	245	0.005
2528.4	5.7	334	24	5.1	238	0.179	82	44	7.9	272	0.131
2529.1	6.9	299	23	7.6	228	0.516	100	41	12	261	0.376
2529.8	6.1	332	28	9.3	249	0.431	88	52	14	285	0.314
2530.5	5.4	341	22	9.1	213	0.254	79	41	14	244	0.185
2531.2	4.1	320	22	11	239	0.007	58	40	17	274	0.005
2531.9	3.7	325	19	9.7	219	0.427	54	35	15	251	0.312
2532.6	3.7	381	22	7.8	270	0.285	53	40	12	308	0.208
2533.3	3.6	331	21	5.6	236	0.806	52	39	8.6	270	0.588
2533.9	3.5	348	19	9.0	201	0.168	50	35	14	230	0.123
2534.6	3.8	322	17	12	232	0.393	55	31	18	265	0.287
2535.3	4.0	354	17	8.7	215	0.080	58	31	13	246	0.059
2536.0	3.2	364	17	8.0	240	0.180	47	31	12	274	0.131
2536.7	3.2	398	18	7.6	242	0.275	46	32	12	277	0.201
2537.4	2.3	335	15	7.5	223	0.084	33	28	12	256	0.061
2538.1	2.8	345	17	6.8	207	0.249	40	31	10	237	0.182
2538.8	2.3	321	16	7.2	217	0.440	34	29	11	248	0.321
2539.5	2.3	332	14	3.8	215	0.091	34	26	5.8	246	0.067
2540.2	2.8	349	16	6.9	216	0.086	40	29	11	247	0.063
2540.9	2.9	352	16	5.4	241	0.367	41	29	8.2	275	0.268
2541.6	1.7	343	13	6.2	223	0.007	24	24	9.5	255	0.005



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Sample ID: 010

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2542.3	1.6	325	15	6.5	237	0.525	22	27	10	271	0.383
2543.0	1.1	326	15	6.3	230	0.083	17	27	9.6	263	0.061
2543.7	1.4	344	14	6.3	205	0.007	20	25	9.6	234	0.005
2544.4	1.1	313	11	6.1	192	0.162	16	21	9.3	219	0.118
2545.1	1.1	317	12	4.6	207	0.265	16	22	7.0	237	0.193
2545.8	1.1	312	12	4.0	214	0.174	16	22	6.2	245	0.127
2546.5	1.2	353	11	7.0	206	0.431	18	20	11	235	0.314
2547.2	0.490	347	11	4.8	210	0.280	7.1	21	7.4	240	0.204
2547.9	0.951	345	11	4.2	220	0.373	14	20	6.4	251	0.272
2548.6	0.490	304	10	3.1	191	0.171	7.1	18	4.8	219	0.125
2549.3	1.3	323	12	3.8	212	0.278	19	21	5.8	243	0.203
2550.0	1.4	345	10	4.5	191	0.088	20	19	6.8	219	0.064
2550.7	1.1	332	10	5.6	187	0.280	15	18	8.6	214	0.204
2551.4	0.805	307	10	4.2	185	0.356	12	19	6.5	211	0.260
2552.1	0.490	298	11	4.1	181	0.085	7.1	19	6.3	208	0.062
2552.8	0.713	318	10	4.9	175	0.362	10	18	7.5	200	0.264
2553.5	0.490	326	9.7	4.5	171	0.266	7.1	18	6.8	196	0.194
2554.2	0.972	339	9.1	4.5	176	0.285	14	17	6.9	202	0.208
2554.9	0.490	301	8.3	3.6	172	0.087	7.1	15	5.5	197	0.064
2555.6	1.0	319	8.2	5.0	164	0.335	15	15	7.7	188	0.244
2556.3	0.490	331	7.7	4.4	151	0.438	7.1	14	6.7	173	0.320
2557.0	0.676	351	6.8	3.4	161	0.370	9.8	12	5.2	184	0.270
2557.7	0.490	339	6.7	3.2	155	0.090	7.1	12	4.9	178	0.066
2558.4	0.523	323	7.2	3.2	145	0.187	7.6	13	4.9	165	0.137
2559.1	0.490	347	6.0	6.8	159	0.475	7.1	11	10	182	0.346
2559.7	0.617	339	6.7	5.6	150	0.643	8.9	12	8.6	172	0.469
2560.4	0.490	328	5.7	2.6	143	0.007	7.1	10	3.9	163	0.005
2561.1	0.490	316	5.6	2.6	136	0.085	7.1	10	3.9	155	0.062
2561.8	0.490	305	4.9	4.0	136	0.159	7.1	8.9	6.2	155	0.116
2562.5	0.490	299	5.0	3.0	113	0.080	7.1	9.1	4.5	129	0.058
2563.2	0.508	300	4.8	3.1	110	0.331	7.3	8.8	4.8	126	0.241
2563.9	0.490	348	4.6	5.1	121	0.553	7.1	8.4	7.9	139	0.403
2564.6	0.695	294	4.5	3.2	110	0.081	10	8.2	5.0	126	0.059
2565.3	0.490	315	4.2	3.1	109	0.007	7.1	7.6	4.7	125	0.005
2566.0	0.490	331	4.2	3.5	112	0.182	7.1	7.7	5.3	128	0.133
2566.7	0.748	317	3.9	3.6	107	0.176	11	7.2	5.5	122	0.128
2567.4	0.490	298	3.6	2.1	96	0.155	7.1	6.5	3.2	110	0.113
2568.1	0.490	278	4.6	3.2	96	0.312	7.1	8.3	4.9	110	0.228
2568.8	0.490	302	4.3	4.2	96	0.247	7.1	7.9	6.4	110	0.180
2569.5	0.490	293	5.1	3.3	89	0.338	7.1	9.4	5.1	102	0.247
2570.2	0.490	303	5.5	2.6	102	0.361	7.1	10	3.9	117	0.263
2570.9	0.639	305	4.8	4.3	94	0.568	9.2	8.7	6.6	108	0.414
2571.6	0.542	288	5.6	1.9	90	0.080	7.8	10	2.9	103	0.058
2572.3	0.615	300	4.9	4.0	90	0.083	8.9	8.9	6.1	103	0.061
2573.0	0.490	306	4.8	3.9	87	0.692	7.1	8.8	5.9	99	0.505
2573.7	0.539	301	5.5	2.1	83	0.007	7.8	10.0	3.3	95	0.005
2574.4	0.851	246	5.1	3.1	79	0.250	12	9.3	4.7	90	0.182
2575.1	0.808	256	5.2	3.0	80	0.167	12	9.5	4.5	91	0.122
2575.8	0.490	234	5.5	2.9	84	0.082	7.1	10	4.5	96	0.060
2576.5	0.624	282	5.7	3.7	82	0.085	9.0	10	5.7	94	0.062
2577.2	0.490	242	4.7	2.5	71	0.498	7.1	8.5	3.8	81	0.363
2577.9	0.490	241	5.7	1.2	72	0.162	7.1	10	1.9	82	0.118
2578.6	0.898	237	5.8	3.0	78	0.264	13	11	4.6	90	0.192
2579.3	0.543	237	6.2	3.6	79	0.264	7.8	11	5.5	91	0.193
2580.0	0.653	248	5.8	3.6	82	0.268	9.4	11	5.6	94	0.195
2580.7	0.839	247	5.8	4.4	79	0.261	12	11	6.7	90	0.190
2581.4	0.490	231	5.0	2.5	76	0.233	7.1	9.0	3.9	87	0.170
2582.1	0.938	239	6.1	3.7	85	0.260	14	11	5.6	97	0.190
2582.8	0.876	260	6.5	3.0	87	0.343	13	12	4.6	99	0.250
2583.5	0.923	260	5.9	4.4	79	0.256	13	11	6.8	91	0.187
2584.2	0.904	245	6.9	3.0	77	0.167	13	13	4.5	89	0.122
2584.9	1.3	219	6.3	4.1	79	0.081	18	12	6.3	91	0.059
2585.6	1.8	216	6.6	3.9	82	0.252	26	12	6.0	94	0.184
2586.3	1.9	269	7.7	2.2	86	0.287	27	14	3.4	99	0.209
2586.9	2.1	248	6.3	4.5	83	0.266	30	11	6.8	95	0.194
2587.6	2.4	228	6.7	3.1	90	0.616	35	12	4.8	102	0.449
2588.3	2.3	212	7.1	3.7	83	0.247	34	13	5.7	95	0.181
2589.0	2.4	230	6.6	5.9	96	0.175	35	12	9.0	109	0.128
2589.7	2.1	252	6.9	4.4	100	0.089	30	13	6.8	114	0.065
2590.4	2.5	223	6.4	2.9	81	0.082	36	12	4.5	93	0.060
2591.1	1.8	213	6.3	2.8	92	0.501	26	12	4.3	106	0.366
2591.8	2.0	208	6.7	2.9	99	0.007	30	12	4.4	113	0.005
2592.5	2.1	227	6.5	3.2	96	0.174	30	12	4.9	110	0.127
2593.2	2.1	234	5.9	3.5	94	0.182	31	11	5.3	107	0.133
2593.9	1.6	221	6.3	2.8	98	0.360	23	12	4.3	112	0.262
2594.6	1.1	196	6.2	3.5	95	0.162	15	11	5.4	109	0.119
2595.3	1.3	220	6.2	2.9	91	0.551	19	11	4.4	105	0.402
2596.0	1.2	228	6.9	3.0	100	0.263	17	13	4.6	115	0.192
2596.7	1.8	225	6.0	3.2	100	0.087	25	11	4.9	114	0.063
2597.4	1.8	221	6.3	1.9	97	0.007	26	12	2.9	111	0.005
2598.1	1.6	208	6.1	2.6	107	0.082	23	11	3.9	123	0.060



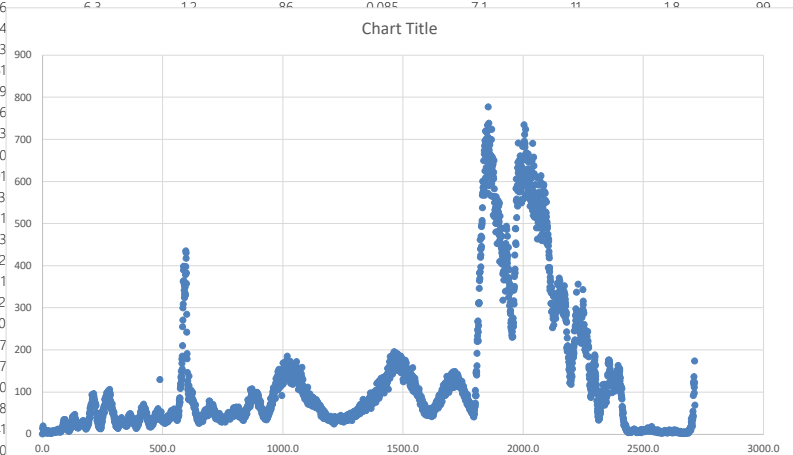
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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2598.8	1.5	193	5.9	3.6	100	0.151	21	11	5.5	114	0.110
2599.5	2.2	243	6.8	3.2	106	0.084	31	12	5.0	121	0.062
2600.2	1.1	249	7.0	3.6	121	0.088	16	13	5.6	139	0.064
2600.9	1.3	211	8.3	2.6	101	0.164	19	15	3.9	116	0.120
2601.6	1.2	208	7.5	3.7	99	0.319	18	14	5.6	113	0.232
2602.3	1.1	232	8.4	2.2	102	0.084	15	15	3.3	116	0.061
2603.0	0.496	225	8.0	2.3	100	0.485	7.2	15	3.5	114	0.354
2603.7	1.3	234	7.6	3.3	96	0.433	19	14	5.0	110	0.316
2604.4	0.982	239	8.0	3.4	90	0.259	14	15	5.2	103	0.189
2605.1	1.2	225	7.5	3.9	92	0.087	17	14	6.1	105	0.064
2605.8	1.7	278	8.7	3.7	93	0.091	25	16	5.7	107	0.066
2606.5	1.6	254	7.0	6.3	87	0.007	23	13	9.6	99	0.005
2607.2	0.792	222	7.4	3.6	82	0.164	11	13	5.5	94	0.120
2607.9	1.0	242	8.0	6.1	90	0.250	15	15	9.4	103	0.182
2608.6	1.5	216	7.5	3.6	86	0.080	21	14	5.6	98	0.058
2609.3	1.8	250	8.2	4.3	88	0.091	26	15	6.5	100	0.066
2610.0	1.3	247	8.0	2.7	77	0.088	18	15	4.1	89	0.065
2610.7	1.6	238	7.7	4.5	88	0.007	22	14	6.9	101	0.005
2611.4	1.7	217	8.2	3.0	79	0.245	25	15	4.6	90	0.179
2612.1	2.0	233	7.4	3.5	87	0.007	28	13	5.4	100	0.005
2612.7	1.5	254	8.6	4.6	88	0.264	21	16	7.0	101	0.193
2613.4	2.3	251	7.6	3.2	85	0.089	33	14	4.9	97	0.065
2614.1	2.1	247	9.0	2.7	86	0.007	30	16	4.2	99	0.005
2614.8	2.3	235	10	4.2	85	0.168	34	18	6.5	97	0.122
2615.5	2.4	251	10	4.9	94	0.344	34	19	7.5	107	0.251
2616.2	2.9	279	11	3.9	100	0.179	41	20	6.0	115	0.131
2616.9	2.2	261	11	4.9	90	0.263	31	20	7.5	103	0.192
2617.6	3.3	269	12	5.6	109	0.376	48	22	8.6	125	0.274
2618.3	3.5	241	13	3.6	105	0.170	51	23	5.5	120	0.124
2619.0	3.1	280	13	5.6	109	0.261	45	25	8.5	124	0.191
2619.7	3.0	261	11	2.0	96	0.162	43	19	3.0	110	0.118
2620.4	2.4	287	13	5.2	107	0.355	35	24	7.9	123	0.259
2621.1	3.0	238	11	4.2	105	0.081	44	21	6.5	120	0.059
2621.8	3.1	270	12	3.0	105	0.167	45	22	4.5	120	0.122
2622.5	3.4	300	14	4.6	126	0.380	50	26	7.1	144	0.277
2623.2	3.4	281	11	3.2	102	0.082	49	21	4.8	116	0.060
2623.9	3.3	270	13	2.9	120	0.175	48	24	4.4	137	0.128
2624.6	2.9	302	11	4.2	126	0.331	41	21	6.4	144	0.241
2625.3	4.1	296	15	3.3	141	0.171	59	27	5.0	161	0.125
2626.0	3.9	355	14	3.8	133	0.180	56	26	5.8	152	0.131
2626.7	2.6	323	13	4.8	147	0.442	38	23	7.4	168	0.322
2627.4	3.7	325	13	2.7	146	0.258	53	24	4.1	167	0.188
2628.1	4.2	341	13	2.4	162	0.085	61	23	3.8	185	0.062
2628.8	3.1	345	15	4.9	178	0.644	45	27	7.5	204	0.470
2629.5	2.5	327	14	6.6	150	0.166	36	25	10	172	0.121
2630.2	2.4	311	13	2.8	155	0.241	34	24	4.4	177	0.176
2630.9	2.1	317	14	5.4	178	0.007	30	25	8.3	204	0.005
2631.6	2.1	307	14	4.4	166	0.247	31	26	6.7	190	0.180
2632.3	2.0	322	15	4.6	157	0.161	29	27	7.1	180	0.118
2633.0	1.9	359	13	5.4	153	0.359	28	24	8.2	175	0.262
2633.7	1.7	344	14	4.0	171	0.087	24	25	6.2	196	0.063
2634.4	1.9	292	12	4.2	157	0.484	28	21	6.4	179	0.353
2635.1	1.7	320	12	3.6	163	0.084	25	22	5.5	187	0.062
2635.8	1.9	338	12	4.8	164	0.264	27	22	7.3	187	0.192
2636.5	1.3	335	12	3.0	160	0.086	19	21	4.5	183	0.063
2637.2	1.6	322	11	3.1	178	0.353	23	20	4.8	204	0.257
2637.9	0.659	329	9.7	3.5	144	0.007	9.5	18	5.4	165	0.005
2638.6	1.3	333	10	3.4	148	0.177	18	19	5.2	170	0.129
2639.2	0.625	348	10	5.7	160	0.092	9.0	19	8.7	183	0.067
2639.9	0.853	343	8.8	4.0	143	0.007	12	16	6.1	164	0.005
2640.6	0.734	313	9.2	3.4	140	0.007	11	17	5.2	160	0.005
2641.3	0.490	304	8.9	3.3	136	0.085	7.1	16	5.0	155	0.062
2642.0	0.926	314	8.5	3.4	139	0.429	13	16	5.2	159	0.313
2642.7	0.490	314	8.4	2.5	134	0.444	7.1	15	3.9	153	0.324
2643.4	0.715	362	8.6	3.1	127	0.181	10	16	4.7	146	0.132
2644.1	0.855	306	6.5	3.5	125	0.266	12	12	5.4	142	0.194
2644.8	0.490	320	7.3	3.3	132	0.007	7.1	13	5.1	151	0.005
2645.5	0.591	346	7.6	1.7	126	0.288	8.5	14	2.6	144	0.210
2646.2	0.522	318	7.2	2.3	125	0.187	7.5	13	3.5	143	0.136
2646.9	0.674	327	6.3	3.5	111	0.184	9.7	11	5.4	127	0.134
2647.6	0.490	273	5.5	3.1	116	0.080	7.1	10	4.7	133	0.059
2648.3	0.490	336	7.2	2.7	125	0.367	7.1	13	4.2	143	0.268
2649.0	0.500	299	7.0	2.8	120	0.179	7.2	13	4.3	137	0.131
2649.7	0.490	330	5.7	2.3	98	0.256	7.1	10	3.6	113	0.187
2650.4	0.490	309	5.4	2.4	109	0.260	7.1	9.9	3.6	125	0.190
2651.1	0.490	296	5.9	3.0	113	0.087	7.1	11	4.6	129	0.063
2651.8	0.490	302	5.3	4.3	113	0.425	7.1	9.7	6.5	129	0.310
2652.5	0.490	318	5.3	2.1	104	0.170	7.1	9.6	3.2	119	0.124
2653.2	0.490	339	5.2	4.0	109	0.269	7.1	9.5	6.2	125	0.196
2653.9	0.490	297	5.2	2.3	99	0.439	7.1	9.6	3.5	113	0.320
2654.6	0.490	325	5.3	3.4	113	0.007	7.1	9.7	5.1	130	0.005



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
2655.3	0.490	314	4.6	1.6	103	0.361	7.1	8.5	2.4	118	0.263
2656.0	0.629	352	4.5	2.6	95	0.258	9.1	8.2	3.9	109	0.188
2656.7	0.490	320	3.8	3.0	96	0.176	7.1	6.9	4.6	110	0.128
2657.4	0.490	312	3.6	3.4	91	0.087	7.1	6.5	5.3	104	0.063
2658.1	0.490	323	3.7	1.8	99	0.266	7.1	6.7	2.8	113	0.194
2658.8	0.578	318	3.7	1.9	92	0.171	8.3	6.8	2.9	105	0.125
2659.5	0.490	300	3.6	2.3	82	0.082	7.1	6.5	3.5	94	0.060
2660.2	0.490	305	3.4	1.3	86	0.089	7.1	6.1	2.0	98	0.065
2660.9	0.490	301	3.6	1.3	83	0.085	7.1	6.5	2.0	95	0.062
2661.6	0.490	288	3.5	1.6	80	0.167	7.1	6.4	2.4	91	0.122
2662.3	0.490	322	3.3	2.1	85	0.087	7.1	6.1	3.3	97	0.063
2663.0	0.490	349	3.1	1.0	82	0.094	7.1	5.6	1.6	94	0.069
2663.7	0.765	304	3.0	1.4	74	0.168	11	5.4	2.1	85	0.123
2664.4	0.815	282	2.9	2.9	79	0.084	12	5.4	4.4	90	0.061
2665.0	0.490	309	3.5	2.0	81	0.007	7.1	6.3	3.0	93	0.005
2665.7	0.490	303	3.1	2.4	74	0.085	7.1	5.7	3.8	84	0.062
2666.4	0.490	321	3.1	3.2	83	0.007	7.1	5.7	4.8	95	0.005
2667.1	0.490	279	3.3	1.7	80	0.007	7.1	5.9	2.5	92	0.005
2667.8	0.490	284	3.0	2.2	73	0.078	7.1	5.5	3.4	83	0.057
2668.5	0.490	303	3.6	2.8	80	0.262	7.1	6.6	4.4	92	0.191
2669.2	0.810	294	3.0	1.6	72	0.252	12	5.4	2.4	83	0.184
2669.9	0.490	313	3.3	2.2	78	0.085	7.1	6.0	3.4	89	0.062
2670.6	0.575	269	3.6	3.1	75	0.007	8.3	6.6	4.8	86	0.005
2671.3	0.490	275	4.0	1.8	73	0.007	7.1	7.3	2.8	83	0.005
2672.0	0.490	289	4.4	2.2	78	0.172	7.1	8.1	3.4	89	0.126
2672.7	0.490	322	5.2	1.6	81	0.085	7.1	9.5	2.5	93	0.062
2673.4	0.490	281	4.2	2.4	76	0.077	7.1	7.6	3.7	87	0.056
2674.1	0.490	267	5.3	2.9	78	0.252	7.1	9.7	4.4	89	0.184
2674.8	0.497	299	6.1	1.8	87	0.088	7.2	11	2.8	99	0.065
2675.5	0.490	315	5.9	2.1	89	0.170	7.1	11	3.2	102	0.124
2676.2	0.490	286	6.3	1.2	86	0.085	7.1	11	1.8	99	0.062
2676.9	0.490	264									0.059
2677.6	0.490	283									0.064
2678.3	0.490	261									0.223
2679.0	0.490	299									0.005
2679.7	0.490	296									0.253
2680.4	0.490	263									0.005
2681.1	0.490	270									0.305
2681.8	0.490	291									0.005
2682.5	0.490	313									0.261
2683.2	0.490	321									0.064
2683.9	0.490	283									0.186
2684.6	0.490	312									0.122
2685.3	0.490	321									0.193
2686.0	0.490	312									0.183
2686.7	0.490	310									0.197
2687.4	0.490	267									0.118
2688.1	0.490	297									0.125
2688.8	0.490	300									0.065
2689.5	0.490	338									0.200
2690.2	0.490	341									0.267
2690.9	0.490	280									0.341
2691.6	0.490	298	9.0	7.9	116	0.320	7.1	16	12	132	0.233
2692.2	0.490	340	7.0	6.6	98	1.1	7.1	13	10	112	0.779
2692.9	0.490	305	6.5	6.1	84	0.532	7.1	12	9.3	96	0.388
2693.6	0.490	359	6.3	7.0	82	0.563	7.1	12	11	94	0.411
2694.3	0.490	324	6.1	7.9	81	1.5	7.1	11	12	93	1.1
2695.0	0.490	384	6.6	8.9	77	0.950	7.1	12	14	88	0.693
2695.7	0.490	374	6.5	9.6	74	0.180	7.1	12	15	85	0.131
2696.4	0.490	358	6.1	8.8	71	0.695	7.1	11	14	81	0.507
2697.1	0.494	365	5.7	5.9	63	0.534	7.1	10	9.1	72	0.389
2697.8	0.490	290	5.9	11	58	0.476	7.1	11	17	66	0.347
2698.5	0.539	356	6.6	9.3	65	1.4	7.8	12	14	74	1.0
2699.2	0.490	444	6.7	13	62	0.964	7.1	12	19	71	0.703
2699.9	0.490	418	6.5	24	66	1.3	7.1	12	37	76	0.943
2700.6	0.490	397	8.1	19	59	2.0	7.1	15	30	67	1.5
2701.3	0.490	342	8.6	17	59	0.887	7.1	16	27	67	0.647
2702.0	0.490	478	10	17	78	2.0	7.1	18	26	90	1.5
2702.7	0.490	418	10	15	70	1.4	7.1	19	23	80	1.0
2703.4	0.490	341	8.6	12	65	1.9	7.1	16	19	75	1.4
2704.1	0.490	395	8.9	27	58	4.7	7.1	16	41	67	3.4
2704.8	0.490	397	12	24	61	1.5	7.1	22	37	69	1.1
2705.5	0.490	477	12	22	59	2.1	7.1	21	34	67	1.5
2706.2	0.490	429	11	35	59	2.9	7.1	20	54	67	2.1
2706.9	0.490	405	10	30	56	1.9	7.1	19	46	64	1.4
2707.6	0.490	453	10	28	67	1.9	7.1	19	42	76	1.4
2708.3	0.490	474	16	60	65	4.3	7.1	29	92	75	3.2
2709.0	0.490	539	19	80	55	5.3	7.1	35	122	63	3.9
2709.7	0.490	503	15	81	68	6.5	7.1	27	124	77	4.8
2710.4	0.490	1021	25	77	61	4.8	7.1	45	118	70	3.5
2711.1	0.490	635	21	89	63	2.0	7.1	39	137	72	1.4





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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
2711.8	0.490	592	21	73	63	6.2	7.1	37	112	72	4.5
2712.5	0.964	496	23	64	47	3.9	14	41	98	54	2.8
2713.2	0.490	689	27	113	55	2.7	7.1	50	174	63	2.0
2713.9	0.866	798	22	80	58	8.5	12	41	123	66	6.2
2714.6	0.490	580	18	45	54	2.2	7.1	32	69	62	1.6



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Sample ID: 011

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
0.3	3.6	128	3.4	16	600	4.4	52	6.2	25	687	3.2
1.0	9.3	123	2.8	58	696	0.007	134	5.0	89	796	0.005
1.7	3.2	80	7.0	24	567	0.007	46	13	37	648	0.005
2.4	0.490	69	5.3	30	1059	0.007	7.1	9.7	46	1211	0.005
3.1	0.490	74	3.0	44	577	0.007	7.1	5.5	67	660	0.005
3.8	0.490	113	2.2	0.534	740	2.8	7.1	3.9	0.818	847	2.0
4.5	0.490	71	4.1	0.534	536	0.007	7.1	7.5	0.818	613	0.005
5.2	1.9	108	5.5	12	2061	7.1	27	10	18	2356	5.2
5.9	3.4	70	3.0	2.5	477	2.2	49	5.5	3.8	546	1.6
6.6	3.3	78	1.5	2.4	845	3.2	48	2.8	3.7	966	2.3
7.3	5.2	125	0.912	4.4	615	2.4	75	1.7	6.7	703	1.7
8.0	0.490	71	2.5	11	753	1.1	7.1	4.5	16	861	0.832
8.7	0.490	60	2.6	24	729	0.007	7.1	4.8	37	833	0.005
9.4	3.7	57	2.1	0.534	820	4.3	53	3.8	0.818	938	3.2
10.1	0.490	60	3.0	4.6	698	3.7	7.1	5.5	7.1	798	2.7
10.8	0.490	70	1.9	6.3	774	2.4	7.1	3.5	9.6	885	1.7
11.5	0.726	53	1.9	11	595	2.1	10	3.5	16	680	1.5
12.2	0.490	53	1.4	11	620	3.3	7.1	2.5	17	709	2.4
12.9	2.2	36	1.6	0.549	670	1.8	32	3.0	0.841	766	1.3
13.6	0.490	38	1.8	5.5	477	1.0	7.1	3.3	8.4	546	0.754
14.3	2.9	67	1.7	0.623	625	2.0	42	3.1	0.955	714	1.5
15.0	0.617	52	1.4	8.9	585	1.8	8.9	2.6	14	669	1.3
15.7	0.490	62	0.959	15	695	1.7	7.1	1.7	23	795	1.3
16.4	0.536	60	1.4	15	870	2.0	7.7	2.6	23	994	1.5
17.1	0.490	78	0.944	6.9	704	2.6	7.1	1.7	11	806	1.9
17.8	3.3	82	0.189	5.6	808	2.4	48	0.344	8.5	924	1.8
18.5	2.6	79	0.189	8.9	788	1.2	38	0.344	14	901	0.887
19.2	3.3	60	0.591	4.7	883	3.0	47	1.1	7.1	1010	2.2
19.9	0.884	55	0.442	7.8	685	1.3	13	0.806	12	783	0.982
20.6	1.6	81	0.284	0.534	606	1.1	23	0.518	0.818	693	0.818
21.3	2.1	81	0.917	9.3	770	1.7	31	1.7	14	880	1.3
22.0	1.6	139	1.2	12	780	2.0	23	2.1	19	892	1.5
22.7	1.0	113	0.743	9.0	1222	2.6	15	1.4	14	1397	1.9
23.4	3.3	106	0.724	8.1	960	3.0	48	1.3	12	1097	2.2
24.1	1.5	94	0.126	7.6	1057	0.814	22	0.230	12	1208	0.594
24.8	0.490	71	1.4	5.8	629	2.2	7.1	2.6	9.0	720	1.6
25.5	1.1	84	0.883	7.8	787	1.3	15	1.6	12	900	0.915
26.1	2.1	90	0.884	6.0	694	0.007	30	1.6	9.2	794	0.005
26.8	0.490	124	0.925	8.5	723	2.5	7.1	1.7	13	827	1.8
27.5	1.4	111	0.640	10	811	0.378	21	1.2	16	927	0.276
28.2	0.974	146	0.376	15	805	2.0	14	0.685	22	921	1.4
28.9	0.754	141	0.982	6.6	858	1.5	11	1.8	10	982	1.1
29.6	0.689	166	0.602	11	875	3.5	9.9	1.1	17	1001	2.6
30.3	0.490	154	0.439	4.5	733	1.5	7.1	0.800	6.8	838	1.1
31.0	0.606	136	0.079	7.0	898	2.6	8.7	0.143	11	1027	1.9
31.7	2.2	172	0.242	7.8	984	0.900	32	0.441	12	1125	0.656
32.4	0.490	92	1.1	9.7	811	1.1	7.1	2.1	15	927	0.827
33.1	0.490	105	0.554	5.8	944	2.3	7.1	1.0	8.9	1079	1.7
33.8	0.527	118	0.143	5.7	505	2.2	7.6	0.261	8.8	577	1.6
34.5	0.562	130	0.399	9.2	828	2.0	8.1	0.728	14	947	1.5
35.2	1.2	117	0.079	8.5	723	1.6	18	0.143	13	827	1.2
35.9	0.957	103	0.707	14	705	2.3	14	1.3	21	806	1.6
36.6	2.9	191	0.397	9.7	820	1.6	42	0.724	15	937	1.2
37.3	0.490	82	1.2	0.534	911	1.7	7.1	2.2	0.818	1042	1.2
38.0	1.3	140	0.501	5.0	1074	1.3	19	0.913	7.6	1228	0.972
38.7	1.7	141	0.079	6.9	795	2.9	25	0.143	11	910	2.1
39.4	0.490	125	0.558	5.1	751	1.8	7.1	1.0	7.9	859	1.3
40.1	1.0	108	0.700	8.0	838	2.3	15	1.3	12	959	1.7
40.8	0.490	123	0.444	9.4	1386	2.2	7.1	0.809	14	1585	1.6
41.5	1.3	89	0.079	4.5	809	1.2	19	0.143	6.9	925	0.907
42.2	0.490	45	0.117	4.1	575	1.3	7.1	0.213	6.3	657	0.960
42.9	1.5	85	0.809	2.2	795	1.0	22	1.5	3.4	909	0.758
43.6	0.490	92	0.524	3.8	785	1.1	7.1	0.956	5.9	897	0.799
44.3	0.490	82	0.664	5.1	767	1.1	7.1	1.2	7.9	877	0.770
45.0	1.0	90	0.079	6.4	874	1.2	15	0.143	9.8	1000	0.880
45.7	0.490	71	0.609	3.4	815	1.3	7.1	1.1	5.2	932	0.943
46.4	2.6	109	0.356	4.3	1096	1.1	38	0.649	6.6	1253	0.790
47.1	0.490	53	0.079	3.5	982	1.3	7.1	0.143	5.4	1123	0.982
47.8	0.490	64	0.228	2.3	1019	2.1	7.1	0.415	3.6	1165	1.5
48.5	0.744	49	0.234	4.4	1035	0.951	11	0.426	6.8	1183	0.694
49.2	0.868	45	0.290	0.739	661	0.808	13	0.528	1.1	756	0.590
49.9	0.490	85	0.329	9.5	860	2.7	7.1	0.601	14	983	2.0
50.6	0.490	82	0.424	2.7	860	1.4	7.1	0.774	4.2	983	1.0
51.3	0.490	61	0.079	8.2	920	0.911	7.1	0.143	13	1052	0.665
52.0	0.914	57	0.514	2.8	1090	1.1	13	0.937	4.3	1247	0.783
52.7	0.664	52	0.104	5.4	913	2.4	9.6	0.190	8.2	1044	1.7
53.3	0.490	47	1.2	4.6	966	2.2	7.1	2.1	7.0	1104	1.6
54.0	1.7	57	0.525	1.0	1116	2.5	24	0.958	1.6	1276	1.8
54.7	1.0	52	0.303	1.6	749	1.5	15	0.553	2.5	857	1.1
55.4	0.490	63	0.812	5.6	843	2.1	7.1	1.5	8.6	964	1.5
56.1	0.637	107	0.527	5.0	990	3.8	9.2	0.961	7.7	1132	2.8



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
56.8	0.949	73	0.366	6.5	1073	1.8	14	0.668	10.0	1228	1.3
57.5	1.6	58	0.460	2.0	924	1.5	23	0.839	3.0	1057	1.1
58.2	0.538	63	0.130	2.0	640	1.4	7.8	0.238	3.1	732	1.0
58.9	1.6	52	0.079	0.534	1008	0.602	23	0.143	0.818	1153	0.439
59.6	0.627	53	0.377	2.1	969	2.0	9.1	0.688	3.2	1108	1.5
60.3	1.2	44	0.079	2.7	939	1.4	18	0.143	4.1	1074	1.0
61.0	0.490	44	0.079	6.5	932	0.417	7.1	0.143	10.0	1066	0.304
61.7	0.490	60	0.165	4.1	866	2.4	7.1	0.301	6.2	990	1.8
62.4	0.490	77	0.123	4.6	1000	1.9	7.1	0.225	7.1	1144	1.4
63.1	0.767	53	0.079	2.4	971	2.5	11	0.143	3.8	1110	1.8
63.8	0.490	60	0.513	3.7	953	2.6	7.1	0.935	5.7	1090	1.9
64.5	1.0	35	0.079	1.1	836	1.4	15	0.143	1.7	955	1.0
65.2	0.490	61	0.079	3.1	932	1.7	7.1	0.143	4.8	1066	1.2
65.9	0.490	70	0.102	4.3	1020	1.3	7.1	0.185	6.6	1166	0.975
66.6	0.804	79	0.226	0.534	1047	1.1	12	0.413	0.818	1197	0.822
67.3	0.512	55	0.124	6.2	877	1.3	7.4	0.226	9.5	1003	0.957
68.0	0.490	64	0.198	2.4	742	1.6	7.1	0.360	3.7	849	1.2
68.7	0.490	66	0.308	4.5	1050	3.0	7.1	0.561	6.9	1200	2.2
69.4	0.490	60	0.160	3.7	890	1.1	7.1	0.292	5.7	1018	0.833
70.1	1.5	60	0.079	3.8	844	1.3	22	0.143	5.9	965	0.983
70.8	0.490	48	0.081	2.8	955	1.8	7.1	0.147	4.3	1092	1.3
71.5	1.2	71	0.079	3.5	944	1.2	17	0.143	5.3	1079	0.880
72.2	1.3	64	0.217	2.6	815	1.6	19	0.395	4.0	932	1.2
72.9	1.6	68	0.079	4.8	898	1.3	23	0.143	7.4	1027	0.970
73.6	0.993	58	0.179	4.9	912	1.6	14	0.326	7.5	1043	1.2
74.3	0.665	64	0.079	2.4	954	1.8	9.6	0.143	3.6	1090	1.3
75.0	0.774	47	0.120	3.0	851	1.4	11	0.219	4.5	973	1.0
75.7	0.490	67	0.079	1.1	967	1.6	7.1	0.143	1.7	1106	1.2
76.4	0.926	56	0.400	1.7	1125	2.3	13	0.730	2.7	1287	1.7
77.1	0.519	52	0.312	1.5	1032	1.3	7.5	0.569	2.3	1180	0.971
77.8	0.490	42	0.079	0.690	749	1.1	7.1	0.143	1.1	856	0.805
78.5	0.490	45	0.289	2.4	944	2.2	7.1	0.528	3.8	1080	1.6
79.1	0.490	56	0.082	1.6	1087	1.9	7.1	0.150	2.5	1244	1.4
79.8	0.490	57	0.215	1.4	925	1.4	7.1	0.392	2.1	1058	0.990
80.5	0.569	60	0.220	1.2	889	1.5	8.2	0.401	1.8	1017	1.1
81.2	0.490	49	0.288	3.1	946	1.5	7.1	0.525	4.7	1082	1.1
81.9	1.1	52	0.342	5.9	1040	2.8	15	0.624	9.1	1189	2.0
82.6	0.490	49	0.583	2.1	1085	2.4	7.1	1.1	3.2	1241	1.7
83.3	0.490	49	0.286	1.6	1035	2.4	7.1	0.522	2.4	1183	1.8
84.0	0.773	46	0.521	3.6	1044	1.6	11	0.951	5.5	1194	1.1
84.7	0.490	49	0.290	0.534	1043	2.2	7.1	0.529	0.818	1192	1.6
85.4	0.494	47	0.250	2.5	1188	2.8	7.1	0.457	3.8	1358	2.0
86.1	0.490	45	0.178	2.7	1060	2.4	7.1	0.324	4.1	1212	1.7
86.8	0.642	47	0.486	3.0	1001	1.5	9.3	0.886	4.6	1145	1.1
87.5	0.490	49	0.186	4.2	1132	1.2	7.1	0.339	6.5	1294	0.903
88.2	0.626	40	0.190	3.4	1043	1.0	9.0	0.347	5.2	1192	0.756
88.9	0.691	38	0.324	4.3	1178	1.4	10.0	0.591	6.5	1347	1.0
89.6	0.726	39	0.118	4.7	1105	1.9	10	0.215	7.2	1264	1.4
90.3	1.1	35	0.218	2.3	1134	1.9	16	0.397	3.6	1297	1.4
91.0	1.2	36	0.471	2.6	1166	2.7	17	0.858	4.0	1334	2.0
91.7	1.5	35	0.431	2.7	1209	1.9	22	0.786	4.1	1382	1.4
92.4	0.778	36	0.398	2.5	1167	1.5	11	0.725	3.8	1334	1.1
93.1	0.490	37	0.301	4.2	1223	2.3	7.1	0.550	6.5	1398	1.7
93.8	0.490	33	0.329	2.2	1066	1.4	7.1	0.600	3.3	1219	1.0
94.5	1.1	34	0.256	2.8	1246	2.0	16	0.467	4.4	1425	1.5
95.2	0.992	38	0.453	2.8	1510	2.6	14	0.827	4.3	1727	1.9
95.9	0.717	38	0.504	3.7	1363	2.0	10	0.920	5.7	1558	1.5
96.6	1.4	37	0.397	3.5	1225	1.8	20	0.724	5.4	1401	1.3
97.3	1.8	43	0.335	4.5	1551	2.4	26	0.612	6.8	1774	1.8
98.0	1.3	39	0.413	2.7	1040	1.2	19	0.754	4.1	1189	0.904
98.7	1.2	37	0.383	1.7	1100	2.8	18	0.699	2.6	1257	2.0
99.4	0.780	48	0.572	3.4	1565	2.0	11	1.0	5.2	1790	1.5
100.1	0.996	26	0.479	4.5	1453	2.4	14	0.873	7.0	1662	1.8
100.8	1.0	32	0.608	4.1	1538	1.8	14	1.1	6.3	1759	1.3
101.5	1.1	36	0.235	4.1	1379	2.0	17	0.429	6.3	1577	1.5
102.2	0.630	24	0.413	1.9	1263	1.5	9.1	0.753	2.9	1444	1.1
102.9	0.803	26	0.916	3.1	1607	2.5	12	1.7	4.8	1838	1.8
103.6	0.686	25	0.575	3.7	1415	1.8	9.9	1.0	5.7	1618	1.3
104.3	1.1	27	0.465	3.1	1364	2.7	15	0.849	4.7	1560	2.0
104.9	1.2	30	0.530	3.5	1333	1.7	18	0.966	5.3	1524	1.2
105.6	0.878	31	0.794	3.2	1324	1.9	13	1.4	4.8	1514	1.4
106.3	0.812	20	0.475	4.7	1267	2.0	12	0.867	7.2	1448	1.5
107.0	1.7	24	0.466	3.4	1722	3.4	25	0.850	5.2	1969	2.5
107.7	2.5	32	0.619	3.9	1919	2.9	35	1.1	6.0	2195	2.1
108.4	2.2	27	0.534	5.3	1609	3.6	32	0.974	8.1	1840	2.6
109.1	1.4	24	0.415	5.4	1352	2.5	21	0.757	8.2	1546	1.8
109.8	1.6	24	0.567	4.2	1421	2.7	23	1.0	6.5	1624	1.9
110.5	2.6	29	0.460	5.0	1482	1.7	38	0.839	7.6	1695	1.2
111.2	3.1	20	0.669	4.5	1800	3.0	45	1.2	6.8	2059	2.2
111.9	2.8	31	0.445	5.3	1475	2.1	41	0.812	8.1	1686	1.6
112.6	2.8	26	0.537	3.8	1310	1.8	40	0.980	5.8	1498	1.3



Minnow Environmental  
Sample ID: 011

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.3	1.3	29	0.633	5.5	1453	3.8	19	1.2	8.4	1662	2.8
114.0	2.4	20	0.418	3.2	1105	1.4	34	0.761	5.0	1263	1.0
114.7	2.7	22	0.568	3.7	1559	4.4	39	1.0	5.7	1782	3.2
115.4	2.2	24	0.682	4.0	1627	2.3	31	1.2	6.2	1861	1.7
116.1	2.0	21	0.492	3.4	1499	2.9	29	0.898	5.2	1715	2.1
116.8	1.9	20	0.643	5.4	1494	2.8	27	1.2	8.2	1709	2.0
117.5	1.8	17	0.492	3.7	1207	2.5	26	0.897	5.7	1380	1.9
118.2	1.2	17	0.347	4.6	1413	2.7	18	0.634	7.0	1615	2.0
118.9	1.4	18	0.433	6.1	1347	2.1	19	0.789	9.4	1541	1.5
119.6	1.7	16	0.489	4.3	1365	3.3	25	0.892	6.6	1561	2.4
120.3	2.2	17	0.378	4.5	1343	2.4	32	0.689	6.8	1536	1.8
121.0	1.6	15	0.566	5.3	1235	2.0	22	1.0	8.2	1412	1.5
121.7	1.3	15	0.360	5.2	1234	2.3	19	0.656	8.0	1412	1.7
122.4	1.5	14	0.412	3.7	1235	1.9	21	0.751	5.7	1412	1.4
123.1	1.5	15	0.244	4.3	1330	2.5	22	0.446	6.6	1521	1.8
123.8	1.9	17	0.424	6.0	1292	3.4	28	0.773	9.2	1477	2.5
124.5	1.7	13	0.183	4.7	1230	2.4	24	0.334	7.2	1407	1.8
125.2	1.3	14	0.567	4.2	1464	2.8	19	1.0	6.4	1674	2.0
125.9	1.5	12	0.387	4.1	1238	2.9	22	0.706	6.3	1416	2.1
126.6	1.0	13	0.306	4.7	1249	2.4	15	0.559	7.3	1428	1.8
127.3	1.2	11	0.164	4.3	1156	2.4	18	0.300	6.6	1322	1.7
128.0	1.5	14	0.417	4.8	1368	3.0	22	0.761	7.4	1564	2.2
128.7	1.6	14	0.394	3.8	1198	2.4	23	0.719	5.8	1369	1.7
129.4	1.9	13	0.331	5.4	1272	3.4	27	0.604	8.3	1455	2.5
130.1	1.5	13	0.249	3.6	1282	1.7	22	0.455	5.5	1466	1.2
130.8	2.0	10	0.475	3.5	1188	2.6	28	0.866	5.3	1358	1.9
131.4	1.4	11	0.262	5.2	1113	2.8	20	0.477	7.9	1273	2.0
132.1	1.0	11	0.426	5.1	1141	2.3	15	0.777	7.8	1305	1.7
132.8	0.967	13	0.251	6.4	1290	2.0	14	0.458	9.9	1475	1.4
133.5	0.854	11	0.235	5.3	1370	2.1	12	0.428	8.1	1566	1.5
134.2	0.490	13	0.217	5.7	1232	1.7	7.1	0.396	8.8	1409	1.3
134.9	0.948	12	0.335	4.9	1072	2.0	14	0.610	7.5	1226	1.5
135.6	0.932	11	0.191	5.8	1148	1.8	13	0.349	8.9	1313	1.3
136.3	0.491	11	0.610	6.0	1278	2.4	7.1	1.1	9.1	1461	1.7
137.0	0.746	12	0.400	6.1	1161	1.8	11	0.730	9.4	1327	1.3
137.7	0.661	14	0.408	5.5	1164	1.4	9.5	0.744	8.5	1331	1.1
138.4	0.993	14	0.258	5.8	1420	2.5	14	0.471	8.9	1624	1.8
139.1	0.942	9.9	0.420	6.1	1346	3.1	14	0.766	9.4	1539	2.3
139.8	1.1	12	0.387	4.7	1099	2.3	16	0.706	7.2	1257	1.7
140.5	0.661	13	0.379	5.7	1385	3.5	9.5	0.691	8.8	1583	2.6
141.2	0.916	11	0.390	6.4	1234	1.3	13	0.712	9.8	1411	0.953
141.9	0.785	13	0.362	6.8	1279	2.3	11	0.661	10	1462	1.7
142.6	0.925	11	0.279	6.9	1225	2.6	13	0.510	11	1401	1.9
143.3	0.737	12	0.443	7.2	1344	1.8	11	0.808	11	1537	1.3
144.0	1.0	10	0.436	6.7	1469	2.6	15	0.795	10	1679	1.9
144.7	0.963	12	0.406	6.4	1391	2.7	14	0.741	9.8	1591	2.0
145.4	0.579	12	0.391	7.2	1273	2.2	8.4	0.712	11	1456	1.6
146.1	0.740	13	0.669	5.3	1392	3.0	11	1.2	8.1	1592	2.2
146.8	1.0	9.7	0.612	6.6	1412	2.4	15	1.1	10	1615	1.7
147.5	0.778	10	0.649	10	1414	1.8	11	1.2	16	1617	1.3
148.2	0.937	11	0.810	7.4	1584	3.3	14	1.5	11	1812	2.4
148.9	1.1	13	0.721	8.4	1455	3.7	15	1.3	13	1663	2.7
149.6	1.0	13	0.680	9.4	1680	2.3	15	1.2	14	1921	1.6
150.3	1.1	13	0.740	9.8	1819	1.6	16	1.3	15	2080	1.2
151.0	1.2	13	0.766	8.6	1538	2.8	18	1.4	13	1759	2.1
151.7	0.567	12	0.626	9.2	1669	2.5	8.2	1.1	14	1908	1.8
152.4	0.490	12	0.779	11	1508	3.1	7.1	1.4	17	1725	2.3
153.1	0.854	10	1.1	8.3	1696	2.4	12	1.9	13	1939	1.7
153.8	0.490	12	1.1	11	1868	3.4	7.1	2.0	17	2137	2.5
154.5	1.0	12	1.2	11	1972	2.0	15	2.3	17	2255	1.4
155.2	1.2	11	1.2	11	1870	3.2	17	2.2	16	2138	2.3
155.9	1.3	11	1.3	13	1852	2.5	19	2.4	20	2118	1.8
156.6	0.897	13	1.2	11	1844	3.5	13	2.3	17	2109	2.6
157.3	1.1	14	0.972	16	1883	2.4	16	1.8	25	2153	1.7
157.9	1.3	11	1.3	16	2079	4.1	19	2.4	24	2377	3.0
158.6	1.8	11	1.5	15	1923	2.9	26	2.8	24	2199	2.1
159.3	1.4	12	1.5	14	1987	2.8	20	2.8	21	2272	2.1
160.0	2.2	13	1.3	14	2214	3.4	31	2.4	21	2531	2.5
160.7	1.1	12	1.4	11	1871	2.7	16	2.5	17	2140	2.0
161.4	0.950	12	1.7	13	1688	2.7	14	3.0	20	1931	2.0
162.1	0.703	12	1.6	16	1943	3.1	10	2.9	25	2222	2.3
162.8	1.6	9.8	1.8	14	1994	3.5	23	3.3	21	2280	2.5
163.5	1.9	13	1.9	13	1941	3.6	27	3.4	19	2220	2.6
164.2	1.3	12	1.4	16	1893	3.7	19	2.6	25	2165	2.7
164.9	1.4	10	1.1	14	2003	2.6	20	2.0	22	2291	1.9
165.6	1.6	12	1.8	14	1971	2.9	23	3.4	22	2254	2.1
166.3	1.4	11	2.0	17	2206	3.9	21	3.6	27	2523	2.8
167.0	1.8	12	2.0	18	2112	4.1	26	3.7	27	2415	3.0
167.7	2.0	12	1.8	17	2192	3.6	29	3.3	26	2506	2.6
168.4	2.3	10	2.3	19	2111	4.0	33	4.2	28	2414	2.9
169.1	2.1	13	2.4	18	1948	3.8	30	4.4	27	2227	2.8



Minnow Environmental  
Sample ID: 011

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
169.8	2.5	11	1.9	16	2087	4.0	35	3.4	24	2387	2.9
170.5	2.3	13	2.6	17	2027	3.8	33	4.8	26	2318	2.8
171.2	1.9	11	2.1	17	1811	3.7	27	3.9	27	2070	2.7
171.9	2.0	9.7	2.1	16	2099	4.5	29	3.8	25	2400	3.3
172.6	3.1	12	2.1	14	1920	4.6	45	3.8	22	2196	3.4
173.3	4.4	11	2.5	16	1892	4.8	64	4.5	25	2163	3.5
174.0	4.5	10	2.3	16	1895	5.1	65	4.3	25	2167	3.8
174.7	5.2	9.3	2.6	18	1658	4.1	75	4.7	28	1896	3.0
175.4	4.8	11	2.2	15	1812	3.9	70	4.0	23	2072	2.9
176.1	6.7	11	2.4	18	1728	5.1	97	4.4	28	1976	3.7
176.8	6.9	12	2.3	16	1992	5.1	99	4.1	24	2278	3.7
177.5	7.0	9.9	2.1	14	1674	4.7	101	3.9	22	1914	3.4
178.2	6.6	13	2.0	17	1853	4.4	95	3.6	25	2119	3.2
178.9	7.0	11	2.2	15	1597	4.3	101	3.9	22	1826	3.1
179.6	7.6	11	1.8	17	1728	4.8	110	3.2	26	1976	3.5
180.3	6.8	12	2.1	16	1656	5.2	97	3.9	24	1894	3.8
181.0	6.0	10	1.6	13	1582	5.5	87	3.0	20	1809	4.0
181.7	6.6	11	1.6	16	1527	6.0	96	2.9	24	1747	4.4
182.4	6.6	12	1.7	16	1515	4.6	95	3.1	24	1733	3.4
183.1	7.5	12	1.8	14	1488	4.4	109	3.3	22	1701	3.2
183.7	5.5	11	1.7	17	1528	4.9	79	3.1	26	1748	3.6
184.4	5.3	9.8	1.9	11	1169	4.6	77	3.4	17	1337	3.3
185.1	6.1	13	2.0	14	1479	5.2	88	3.6	21	1692	3.8
185.8	6.4	11	1.9	13	1258	5.4	92	3.5	20	1439	3.9
186.5	6.4	12	1.5	14	1264	6.6	93	2.7	22	1445	4.8
187.2	6.2	14	1.6	14	1412	4.9	89	2.9	22	1615	3.6
187.9	5.5	13	1.4	15	1155	4.7	79	2.5	23	1321	3.4
188.6	5.4	13	1.2	13	1231	5.8	77	2.2	20	1408	4.3
189.3	5.5	12	1.2	14	994	5.2	79	2.1	22	1137	3.8
190.0	4.2	12	1.4	14	977	4.4	61	2.5	21	1117	3.2
190.7	4.3	9.6	1.2	11	1042	5.8	62	2.2	17	1191	4.2
191.4	4.1	11	1.7	16	1069	5.3	59	3.2	24	1223	3.8
192.1	4.3	13	1.3	16	1146	4.6	62	2.3	24	1311	3.4
192.8	3.7	9.1	1.6	17	1069	5.4	53	2.9	26	1223	3.9
193.5	4.1	12	1.3	13	1095	4.5	60	2.3	20	1252	3.3
194.2	4.1	11	1.1	13	1027	3.2	59	2.0	20	1174	2.3
194.9	3.8	9.8	1.3	15	1111	5.1	55	2.4	23	1271	3.7
195.6	2.3	10	1.4	17	975	4.9	33	2.6	26	1115	3.6
196.3	3.4	11	1.0	11	1029	5.2	49	1.8	17	1176	3.8
197.0	2.2	9.0	1.3	14	1103	4.5	31	2.4	21	1261	3.3
197.7	2.5	12	1.1	17	1189	5.0	36	2.0	26	1359	3.6
198.4	3.0	11	1.3	18	1133	5.5	43	2.4	27	1296	4.0
199.1	1.8	11	1.7	18	1204	4.9	27	3.1	28	1377	3.6
199.8	2.5	10	1.2	14	1225	5.2	36	2.1	21	1401	3.8
200.5	2.6	12	1.3	20	1288	5.7	37	2.3	31	1473	4.2
201.2	2.3	11	1.3	14	1223	4.9	34	2.4	22	1398	3.6
201.9	0.945	10	1.0	18	1140	5.4	14	1.9	28	1303	3.9
202.6	1.1	9.6	1.1	22	1314	6.1	16	2.0	34	1503	4.5
203.3	1.7	9.3	1.2	23	1274	6.1	25	2.1	35	1457	4.4
204.0	1.3	11	0.816	15	1258	6.2	19	1.5	23	1438	4.5
204.7	1.5	13	0.955	16	1380	7.9	22	1.7	25	1578	5.8
205.4	1.6	11	1.4	18	1356	6.4	23	2.5	28	1551	4.7
206.1	0.683	11	1.4	13	1311	7.8	9.9	2.6	21	1499	5.7
206.8	0.899	10	0.686	17	1361	11	13	1.3	27	1556	7.8
207.5	0.850	11	1.4	19	1462	9.1	12	2.5	29	1672	6.6
208.2	0.974	9.8	0.949	19	1340	10	14	1.7	29	1532	7.6
208.9	0.997	12	1.1	20	1445	9.2	14	2.0	30	1652	6.7
209.6	1.1	11	1.1	18	1572	9.2	16	1.9	27	1798	6.7
210.2	0.995	10	1.3	19	1619	9.9	14	2.4	29	1852	7.2
210.9	0.490	9.5	0.921	19	1380	8.9	7.1	1.7	29	1579	6.5
211.6	0.976	12	1.2	20	1525	7.3	14	2.1	30	1743	5.3
212.3	1.0	9.4	1.2	16	1230	7.3	15	2.1	25	1406	5.3
213.0	0.684	8.1	1.1	20	1441	11	9.9	2.1	31	1647	8.1
213.7	1.6	11	1.1	19	1471	9.8	23	2.0	29	1682	7.2
214.4	0.501	9.5	0.734	19	1420	8.1	7.2	1.3	29	1624	5.9
215.1	0.896	11	1.1	18	1425	8.9	13	1.9	28	1629	6.5
215.8	0.880	11	0.880	19	1580	8.2	13	1.6	29	1807	6.0
216.5	0.756	8.1	0.729	14	1305	7.6	11	1.3	22	1493	5.5
217.2	0.661	8.5	0.894	18	1334	9.5	9.5	1.6	28	1525	6.9
217.9	1.6	10	1.1	19	1488	9.9	23	2.0	29	1701	7.2
218.6	0.579	10	0.911	16	1332	8.6	8.4	1.7	25	1523	6.3
219.3	0.998	9.9	0.952	20	1287	10.0	14	1.7	31	1471	7.3
220.0	1.1	8.8	1.1	15	1364	9.3	16	2.0	24	1559	6.8
220.7	0.547	8.9	0.843	17	1160	9.9	7.9	1.5	26	1326	7.3
221.4	0.998	10	1.1	16	1209	10	14	2.1	25	1382	7.4
222.1	0.490	9.2	0.754	18	1009	10	7.1	1.4	28	1154	7.3
222.8	0.490	11	1.1	14	1104	10	7.1	2.0	22	1263	7.6
223.5	0.531	8.8	0.897	13	1020	8.7	7.7	1.6	21	1166	6.3
224.2	0.571	9.1	0.501	11	832	9.4	8.2	0.913	16	952	6.8
224.9	0.560	10	1.1	12	944	8.6	8.1	2.0	19	1080	6.3
225.6	0.751	9.3	0.451	12	807	7.9	11	0.823	18	922	5.7



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Sample ID: 011

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.3	0.490	9.4	0.748	11	816	7.5	7.1	1.4	18	934	5.5
227.0	0.490	10	0.761	12	905	8.9	7.1	1.4	18	1035	6.5
227.7	0.922	9.7	0.595	9.2	802	7.2	13	1.1	14	917	5.3
228.4	0.490	10	0.617	11	797	6.9	7.1	1.1	17	912	5.0
229.1	0.848	9.6	0.507	8.0	722	6.6	12	0.925	12	826	4.8
229.8	0.792	9.9	0.582	8.5	727	6.3	11	1.1	13	831	4.6
230.5	0.591	10	0.624	11	725	5.9	8.5	1.1	16	829	4.3
231.2	0.692	9.7	0.547	7.5	687	5.3	10.0	0.997	11	786	3.8
231.9	0.490	7.9	0.533	10	536	4.7	7.1	0.972	16	613	3.4
232.6	1.0	9.9	0.601	10	617	5.2	15	1.1	16	706	3.8
233.3	0.529	9.0	0.342	9.8	540	4.8	7.6	0.624	15	618	3.5
234.0	0.490	8.5	0.407	10	622	5.9	7.1	0.743	16	711	4.3
234.7	0.490	8.9	0.525	7.4	520	4.5	7.1	0.957	11	594	3.3
235.4	0.490	9.7	0.514	8.5	493	4.3	7.1	0.937	13	564	3.1
236.0	0.490	8.2	0.537	7.5	513	3.8	7.1	0.979	12	587	2.7
236.7	0.716	9.8	0.504	9.1	514	4.2	10	0.919	14	588	3.0
237.4	0.490	12	0.307	9.3	465	2.9	7.1	0.561	14	532	2.1
238.1	0.490	8.5	0.362	10	363	3.5	7.1	0.659	16	415	2.6
238.8	0.821	8.7	0.394	6.7	404	3.4	12	0.719	10	462	2.5
239.5	0.728	9.3	0.340	9.2	416	3.3	11	0.620	14	476	2.4
240.2	0.490	9.0	0.326	10.0	365	2.3	7.1	0.594	15	417	1.7
240.9	0.929	7.8	0.378	9.7	364	2.1	13	0.690	15	417	1.5
241.6	0.490	10	0.616	8.7	436	3.0	7.1	1.1	13	499	2.2
242.3	0.490	9.6	0.333	10	357	2.6	7.1	0.606	15	408	1.9
243.0	0.513	11	0.663	11	382	2.5	7.4	1.2	16	437	1.8
243.7	0.490	9.4	0.226	12	358	2.0	7.1	0.412	18	409	1.5
244.4	0.490	9.4	0.508	14	309	2.2	7.1	0.927	22	354	1.6
245.1	0.490	10	0.278	11	373	2.4	7.1	0.506	17	427	1.8
245.8	0.490	11	0.536	11	321	2.4	7.1	0.977	17	367	1.7
246.5	0.490	10	0.304	10	321	1.5	7.1	0.554	16	367	1.1
247.2	0.490	9.7	0.508	15	281	1.8	7.1	0.926	23	321	1.3
247.9	0.490	8.5	0.420	14	294	1.7	7.1	0.765	21	336	1.3
248.6	0.490	10	0.633	15	295	1.7	7.1	1.2	23	338	1.3
249.3	0.490	9.9	0.603	15	285	2.3	7.1	1.1	23	326	1.7
250.0	0.490	8.1	0.460	14	347	1.3	7.1	0.839	22	396	0.924
250.7	0.490	10	0.448	15	295	1.7	7.1	0.816	22	337	1.2
251.4	0.490	9.5	0.710	16	305	1.5	7.1	1.3	25	348	1.1
252.1	0.490	9.6	0.741	20	311	1.2	7.1	1.4	31	356	0.887
252.8	0.490	11	0.569	17	303	0.985	7.1	1.0	25	346	0.719
253.5	0.490	9.5	0.703	17	315	1.1	7.1	1.3	27	361	0.800
254.2	0.490	9.1	0.709	18	313	1.6	7.1	1.3	27	358	1.1
254.9	0.515	9.2	0.890	17	311	1.2	7.4	1.6	26	356	0.876
255.6	0.630	9.1	0.715	17	291	0.614	9.1	1.3	26	333	0.448
256.3	0.490	11	0.678	16	303	0.615	7.1	1.2	25	347	0.449
257.0	0.490	8.9	0.838	20	313	1.5	7.1	1.5	30	358	1.1
257.7	0.490	12	0.588	15	324	1.1	7.1	1.1	23	371	0.811
258.4	0.490	8.9	0.759	17	269	1.5	7.1	1.4	26	307	1.1
259.1	0.499	8.6	0.620	16	262	0.829	7.2	1.1	25	300	0.605
259.8	0.490	11	0.673	16	320	1.4	7.1	1.2	25	366	1.1
260.5	0.490	9.5	0.843	16	258	1.2	7.1	1.5	25	295	0.887
261.2	0.490	7.4	0.654	17	238	1.4	7.1	1.2	27	272	0.993
261.9	0.548	8.5	0.680	19	242	1.4	7.9	1.2	29	277	0.997
262.5	0.490	11	0.696	15	286	0.792	7.1	1.3	23	327	0.578
263.2	0.490	9.2	0.727	15	264	1.3	7.1	1.3	23	302	0.965
263.9	0.490	10	0.479	16	273	1.3	7.1	0.874	25	312	0.936
264.6	0.490	11	0.702	16	270	1.4	7.1	1.3	25	309	0.999
265.3	0.490	8.2	1.1	18	287	1.1	7.1	2.0	28	329	0.776
266.0	0.490	9.2	0.726	17	276	1.4	7.1	1.3	26	316	1.0
266.7	0.490	7.6	0.602	18	257	1.0	7.1	1.1	28	294	0.751
267.4	0.490	7.7	0.577	14	270	0.701	7.1	1.1	22	309	0.511
268.1	0.490	8.8	0.780	14	317	0.795	7.1	1.4	21	363	0.580
268.8	0.565	8.9	0.698	13	287	0.427	8.2	1.3	20	328	0.312
269.5	0.490	10	1.1	15	320	1.1	7.1	2.0	23	365	0.774
270.2	0.490	12	0.959	11	313	1.2	7.1	1.7	17	358	0.895
270.9	0.614	8.6	0.487	14	322	1.0	8.9	0.889	21	369	0.748
271.6	0.490	7.9	0.469	15	292	1.8	7.1	0.856	23	334	1.3
272.3	0.490	7.9	0.596	9.4	313	0.988	7.1	1.1	14	358	0.721
273.0	0.490	8.6	0.488	11	266	0.329	7.1	0.890	17	304	0.240
273.7	0.490	7.9	0.689	10	302	1.9	7.1	1.3	16	345	1.4
274.4	0.490	9.2	0.708	9.9	278	1.2	7.1	1.3	15	318	0.888
275.1	0.490	8.3	0.869	9.2	300	1.5	7.1	1.6	14	343	1.1
275.8	0.490	8.8	0.744	11	289	2.0	7.1	1.4	17	330	1.5
276.5	0.490	7.7	0.721	11	348	1.5	7.1	1.3	17	398	1.1
277.2	0.490	8.2	0.721	8.3	272	1.9	7.1	1.3	13	311	1.4
277.9	0.490	9.1	0.535	10	344	2.4	7.1	0.976	16	393	1.7
278.6	0.490	7.5	0.617	8.6	309	2.2	7.1	1.1	13	353	1.6
279.3	0.490	10	0.398	6.3	334	1.5	7.1	0.725	9.6	381	1.1
280.0	0.490	11	0.456	9.4	297	1.1	7.1	0.831	14	340	0.834
280.7	0.649	10	0.537	7.3	308	2.0	9.4	0.979	11	352	1.4
281.4	0.490	7.6	0.511	5.7	284	1.5	7.1	0.933	8.7	324	1.1
282.1	0.490	10	0.386	7.5	307	1.0	7.1	0.704	11	351	0.753



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
282.8	0.490	8.7	0.694	5.8	309	1.7	7.1	1.3	8.9	353	1.3
283.5	0.490	7.6	0.530	4.8	316	1.2	7.1	0.967	7.3	362	0.884
284.2	0.490	9.1	0.282	6.2	277	1.6	7.1	0.514	9.5	317	1.2
284.9	0.490	10	0.511	8.6	320	1.5	7.1	0.933	13	366	1.1
285.6	0.490	10.0	0.408	9.0	288	1.2	7.1	0.744	14	329	0.868
286.3	0.490	8.3	0.353	9.3	292	1.2	7.1	0.644	14	334	0.862
287.0	0.490	9.1	0.310	5.2	275	0.963	7.1	0.565	8.0	315	0.702
287.7	0.490	8.3	0.466	7.3	308	0.743	7.1	0.849	11	352	0.542
288.4	0.490	7.8	0.569	5.2	321	0.896	7.1	1.0	8.0	367	0.654
289.0	0.658	11	0.582	5.1	295	1.2	9.5	1.1	7.8	338	0.870
289.7	0.490	7.9	0.320	7.0	287	1.5	7.1	0.584	11	329	1.1
290.4	0.490	11	0.281	7.0	263	1.2	7.1	0.512	11	300	0.889
291.1	0.490	9.8	0.553	5.8	268	2.0	7.1	1.0	8.9	306	1.4
291.8	0.490	8.8	0.377	7.3	273	1.5	7.1	0.687	11	312	1.1
292.5	0.490	10	0.520	7.5	283	1.3	7.1	0.948	11	324	0.974
293.2	0.490	11	0.228	6.2	288	1.2	7.1	0.416	9.4	330	0.849
293.9	0.490	8.9	0.393	8.9	283	1.2	7.1	0.716	14	324	0.880
294.6	0.596	8.8	0.453	7.7	298	1.5	8.6	0.825	12	341	1.1
295.3	0.490	12	0.434	9.0	276	1.4	7.1	0.792	14	316	1.0
296.0	0.490	8.7	0.448	8.8	341	0.598	7.1	0.816	13	390	0.436
296.7	0.490	9.7	0.436	8.8	234	0.999	7.1	0.794	13	268	0.729
297.4	0.490	11	0.435	10.0	253	1.4	7.1	0.793	15	289	1.0
298.1	0.701	11	0.271	9.9	291	0.683	10	0.494	15	333	0.498
298.8	0.752	11	0.638	11	258	0.873	11	1.2	17	295	0.637
299.5	0.490	9.8	0.342	9.9	251	1.4	7.1	0.624	15	287	1.0
300.2	0.490	10	0.732	11	270	0.292	7.1	1.3	16	308	0.213
300.9	0.490	12	0.667	9.1	276	0.828	7.1	1.2	14	316	0.604
301.6	0.490	11	0.645	10.0	222	0.711	7.1	1.2	15	253	0.519
302.3	0.835	11	0.511	11	258	1.2	12	0.933	17	295	0.889
303.0	0.490	12	0.561	15	284	1.3	7.1	1.0	23	324	0.971
303.7	0.490	11	0.490	15	268	1.4	7.1	0.894	23	306	1.0
304.4	0.490	12	0.465	12	224	1.3	7.1	0.847	18	256	0.955
305.1	0.490	11	0.578	13	267	0.967	7.1	1.1	21	306	0.706
305.8	0.490	13	0.766	12	249	0.940	7.1	1.4	19	285	0.686
306.5	0.490	11	0.653	12	253	1.2	7.1	1.2	18	290	0.855
307.2	0.490	12	0.563	12	214	0.579	7.1	1.0	18	245	0.422
307.9	0.490	12	0.604	14	242	0.950	7.1	1.1	22	277	0.693
308.6	0.490	11	0.751	13	231	1.4	7.1	1.4	20	264	1.0
309.3	0.490	9.3	0.644	14	281	1.2	7.1	1.2	21	321	0.857
310.0	0.490	12	0.584	14	313	1.5	7.1	1.1	22	358	1.1
310.7	0.490	12	0.713	15	289	1.2	7.1	1.3	23	330	0.895
311.4	0.490	9.3	0.781	20	227	1.0	7.1	1.4	30	259	0.756
312.1	0.490	11	0.665	13	218	0.604	7.1	1.2	20	249	0.441
312.8	0.490	12	0.971	18	275	0.943	7.1	1.8	27	315	0.688
313.5	0.490	12	0.733	19	276	0.938	7.1	1.3	28	315	0.685
314.2	0.490	11	1.0	16	235	1.3	7.1	1.9	25	269	0.927
314.8	0.490	10	1.3	16	232	1.0	7.1	2.3	25	265	0.764
315.5	0.490	11	1.1	18	261	0.947	7.1	2.0	27	299	0.691
316.2	0.548	12	0.956	20	255	1.7	7.9	1.7	30	291	1.3
316.9	0.490	12	0.847	16	233	1.0	7.1	1.5	25	267	0.752
317.6	0.490	12	1.1	17	286	1.4	7.1	1.9	26	327	1.0
318.3	0.712	9.7	0.926	16	241	0.769	10	1.7	24	275	0.561
319.0	0.490	11	1.2	19	268	1.3	7.1	2.1	29	306	0.933
319.7	0.522	11	1.2	17	236	0.954	7.5	2.2	26	270	0.696
320.4	0.490	12	1.1	18	263	1.1	7.1	2.0	27	301	0.790
321.1	0.592	12	1.1	17	242	0.718	8.5	2.0	26	277	0.524
321.8	0.490	11	0.844	19	258	1.1	7.1	1.5	29	296	0.824
322.5	0.490	8.9	1.3	19	215	1.2	7.1	2.3	30	246	0.889
323.2	0.696	12	0.831	20	282	0.897	10	1.5	30	323	0.654
323.9	0.490	9.3	1.0	18	253	0.626	7.1	1.8	27	290	0.457
324.6	0.490	11	1.5	18	229	1.2	7.1	2.8	28	261	0.891
325.3	0.490	10	1.4	21	261	1.1	7.1	2.5	32	299	0.817
326.0	0.490	11	0.989	16	277	0.718	7.1	1.8	25	316	0.524
326.7	0.596	10	1.1	18	235	1.4	8.6	2.0	28	268	1.1
327.4	0.490	10	0.907	19	225	1.4	7.1	1.7	29	257	0.999
328.1	0.680	12	1.0	23	238	1.4	9.8	1.9	35	272	1.0
328.8	0.490	12	1.3	19	295	1.4	7.1	2.3	29	337	1.0
329.5	0.490	13	1.5	24	242	1.3	7.1	2.7	37	276	0.946
330.2	0.574	7.3	1.1	17	223	0.957	8.3	2.0	26	255	0.698
330.9	0.490	9.6	1.5	19	261	0.696	7.1	2.7	29	299	0.507
331.6	0.490	12	1.3	22	272	1.2	7.1	2.5	34	311	0.888
332.3	0.490	11	1.5	22	247	1.2	7.1	2.8	33	283	0.865
333.0	0.490	9.6	1.2	20	273	0.781	7.1	2.1	30	312	0.570
333.7	0.490	10	1.5	20	275	0.422	7.1	2.7	30	314	0.308
334.4	0.490	10	1.3	19	280	1.0	7.1	2.4	29	320	0.731
335.1	0.490	8.4	1.1	18	277	1.1	7.1	1.9	28	316	0.768
335.8	0.490	9.8	1.3	18	238	0.588	7.1	2.4	28	272	0.429
336.5	0.490	9.8	1.5	17	264	0.698	7.1	2.8	25	302	0.510
337.2	0.490	10	1.2	18	245	0.951	7.1	2.1	28	280	0.693
337.9	0.490	10	1.4	13	230	1.2	7.1	2.6	20	263	0.862
338.6	0.490	9.1	1.6	16	241	0.961	7.1	2.8	24	276	0.701



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.3	0.490	11	1.4	18	278	0.980	7.1	2.6	28	317	0.715
340.0	0.490	8.7	1.2	21	290	1.5	7.1	2.2	32	331	1.1
340.6	0.490	10	1.4	16	276	2.0	7.1	2.5	24	316	1.5
341.3	5.8	9.1	1.2	45	259	1.2	84	2.1	69	297	0.909
342.0	0.490	34	1.7	16	283	1.3	7.1	3.1	25	324	0.944
342.7	0.490	9.8	1.4	19	289	1.2	7.1	2.5	29	331	0.893
343.4	0.490	9.8	1.2	20	272	1.5	7.1	2.2	30	311	1.1
344.1	0.490	7.8	1.3	15	253	1.1	7.1	2.3	23	289	0.833
344.8	0.490	11	1.1	15	282	1.3	7.1	2.1	23	322	0.976
345.5	0.490	9.4	1.3	16	294	1.7	7.1	2.4	24	336	1.3
346.2	0.490	9.4	1.6	18	298	1.6	7.1	2.9	27	341	1.2
346.9	0.490	8.3	1.5	16	268	1.2	7.1	2.7	25	306	0.905
347.6	0.490	10	0.833	16	289	1.7	7.1	1.5	24	330	1.3
348.3	0.490	12	1.4	15	329	1.9	7.1	2.5	23	376	1.4
349.0	0.490	9.9	1.1	15	305	2.8	7.1	2.0	24	349	2.0
349.7	0.490	11	1.4	13	260	1.7	7.1	2.5	20	298	1.2
350.4	0.490	8.3	1.2	14	316	2.0	7.1	2.1	21	362	1.4
351.1	0.490	9.4	1.3	12	290	2.2	7.1	2.3	19	332	1.6
351.8	0.490	9.1	1.2	11	280	2.1	7.1	2.2	17	321	1.6
352.5	0.490	10	0.848	13	307	1.7	7.1	1.5	19	351	1.3
353.2	0.490	8.6	0.769	11	298	2.2	7.1	1.4	17	340	1.6
353.9	0.490	9.1	0.979	11	279	1.5	7.1	1.8	18	319	1.1
354.6	0.490	11	0.783	9.6	314	1.6	7.1	1.4	15	359	1.2
355.3	0.490	8.1	1.0	10	263	1.9	7.1	1.8	15	301	1.4
356.0	0.490	9.1	0.971	9.2	293	1.8	7.1	1.8	14	335	1.3
356.7	0.490	10.0	0.729	11	258	1.2	7.1	1.3	16	295	0.850
357.4	0.490	8.1	1.1	14	290	2.0	7.1	1.9	22	331	1.4
358.1	0.490	9.6	0.901	11	277	1.5	7.1	1.6	17	317	1.1
358.8	0.490	8.2	0.746	9.8	278	1.8	7.1	1.4	15	318	1.3
359.5	0.490	9.5	0.988	8.5	282	1.9	7.1	1.8	13	323	1.4
360.2	0.490	11	1.2	12	319	1.0	7.1	2.1	18	364	0.761
360.9	0.490	7.4	1.0	9.9	273	1.7	7.1	1.9	15	313	1.2
361.6	0.490	7.7	1.3	10	260	2.0	7.1	2.3	16	298	1.4
362.3	0.774	11	0.840	9.9	302	1.7	11	1.5	15	345	1.2
363.0	0.490	10.0	0.700	12	294	2.1	7.1	1.3	19	336	1.5
363.7	0.490	10	1.2	11	289	1.6	7.1	2.1	16	330	1.2
364.4	0.490	11	1.1	14	296	2.0	7.1	1.9	22	339	1.5
365.1	0.490	9.6	1.4	12	335	1.5	7.1	2.6	19	384	1.1
365.8	0.490	11	1.2	10	248	1.8	7.1	2.1	16	284	1.3
366.5	0.490	10	1.0	12	216	2.0	7.1	1.9	19	247	1.5
367.2	0.490	9.2	1.1	10	251	1.5	7.1	2.1	16	287	1.1
367.8	0.490	7.5	1.2	12	218	0.834	7.1	2.1	19	249	0.609
368.5	0.490	12	1.5	17	285	2.1	7.1	2.8	25	326	1.5
369.2	0.490	8.7	1.3	14	238	2.1	7.1	2.3	21	273	1.5
369.9	0.490	9.6	1.4	14	274	0.978	7.1	2.6	22	314	0.713
370.6	0.490	11	1.6	16	263	1.4	7.1	2.9	24	301	1.0
371.3	0.490	10	1.0	14	258	1.5	7.1	1.9	22	295	1.1
372.0	0.490	10	1.6	15	266	1.7	7.1	2.9	23	304	1.3
372.7	0.490	12	1.7	14	245	1.8	7.1	3.0	22	280	1.3
373.4	0.490	11	1.4	17	260	1.9	7.1	2.6	27	297	1.4
374.1	0.490	9.3	1.5	16	286	2.5	7.1	2.7	24	328	1.8
374.8	0.490	9.4	1.7	17	252	0.680	7.1	3.1	26	289	0.496
375.5	0.490	12	1.8	18	270	1.0	7.1	3.2	27	309	0.738
376.2	0.490	11	1.8	21	267	1.3	7.1	3.3	32	305	0.942
376.9	0.490	10	1.3	17	244	1.1	7.1	2.4	27	279	0.835
377.6	0.490	9.2	1.2	15	226	1.0	7.1	2.3	23	259	0.749
378.3	0.490	11	1.1	17	276	1.2	7.1	2.0	26	316	0.908
379.0	0.490	10	1.6	17	196	0.714	7.1	2.9	26	224	0.521
379.7	0.490	9.1	1.6	18	274	1.4	7.1	3.0	28	313	1.0
380.4	0.490	12	1.5	17	248	1.4	7.1	2.8	27	283	1.0
381.1	0.490	10	1.5	18	234	1.1	7.1	2.7	27	267	0.782
381.8	0.490	9.8	1.3	14	287	2.1	7.1	2.3	21	328	1.5
382.5	0.490	11	1.7	19	238	1.8	7.1	3.0	29	272	1.3
383.2	0.490	11	1.8	18	258	2.0	7.1	3.2	28	296	1.5
383.9	0.490	12	1.2	15	214	1.0	7.1	2.3	23	245	0.760
384.6	0.490	8.5	1.6	20	292	1.4	7.1	2.9	31	334	0.998
385.3	0.490	12	1.4	15	229	0.588	7.1	2.6	23	262	0.429
386.0	0.490	10	1.3	20	271	1.4	7.1	2.4	31	310	1.0
386.7	0.490	8.9	1.4	18	240	1.4	7.1	2.5	27	275	1.0
387.4	0.490	10	1.3	18	222	1.2	7.1	2.4	27	254	0.872
388.1	0.490	9.9	1.5	18	264	1.2	7.1	2.8	27	302	0.909
388.8	0.490	9.0	1.2	17	216	0.725	7.1	2.2	26	247	0.529
389.5	0.490	9.3	1.2	19	256	1.2	7.1	2.2	28	293	0.859
390.2	0.490	10	1.1	16	240	1.7	7.1	2.0	25	275	1.3
390.9	0.490	9.5	1.4	18	245	1.1	7.1	2.5	27	280	0.769
391.6	0.490	11	1.3	17	218	1.3	7.1	2.3	26	249	0.932
392.3	0.490	12	1.5	19	278	2.0	7.1	2.7	29	318	1.4
393.0	0.490	11	1.4	18	243	1.4	7.1	2.6	27	277	1.0
393.6	0.490	10	1.3	20	280	1.6	7.1	2.3	31	320	1.2
394.3	0.490	9.5	1.2	19	279	1.4	7.1	2.2	29	320	1.0
395.0	0.490	11	1.4	18	275	1.7	7.1	2.6	27	315	1.2



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
395.7	0.705	11	0.965	19	266	1.1	10	1.8	30	304	0.797
396.4	0.518	9.7	1.5	17	246	0.864	7.5	2.7	26	282	0.630
397.1	0.490	11	1.3	12	250	2.4	7.1	2.3	18	286	1.8
397.8	0.490	10	1.0	14	242	1.3	7.1	1.9	22	277	0.931
398.5	0.490	9.2	1.3	16	250	1.7	7.1	2.4	24	286	1.2
399.2	0.490	11	1.3	16	288	1.0	7.1	2.4	24	330	0.745
399.9	0.490	9.1	1.2	17	261	0.859	7.1	2.2	26	299	0.626
400.6	0.580	10	1.1	13	272	2.0	8.4	2.1	20	311	1.5
401.3	0.490	12	1.2	17	261	1.9	7.1	2.2	26	298	1.4
402.0	0.490	11	1.6	17	334	2.4	7.1	3.0	27	382	1.8
402.7	0.490	11	0.956	15	244	1.1	7.1	1.7	23	279	0.774
403.4	0.490	10	1.3	15	255	1.6	7.1	2.3	23	291	1.1
404.1	0.490	9.9	1.2	13	273	1.4	7.1	2.2	20	312	0.985
404.8	0.490	10	1.2	14	253	1.4	7.1	2.2	21	290	1.1
405.5	0.490	11	0.982	16	283	1.2	7.1	1.8	25	324	0.847
406.2	0.490	9.1	1.1	13	271	1.6	7.1	2.0	20	310	1.2
406.9	0.490	7.5	1.0	13	300	2.4	7.1	1.9	20	343	1.7
407.6	0.490	10	1.4	13	268	1.4	7.1	2.6	20	307	1.0
408.3	0.490	9.5	1.2	17	253	1.7	7.1	2.1	26	289	1.3
409.0	0.699	12	1.2	16	292	1.7	10	2.3	25	334	1.3
409.7	0.490	10	1.3	16	270	2.0	7.1	2.3	24	309	1.5
410.4	0.490	9.2	0.994	11	251	1.4	7.1	1.8	16	287	1.0
411.1	0.490	11	1.0	8.6	285	1.2	7.1	1.9	13	326	0.886
411.8	0.490	11	1.1	9.8	282	1.7	7.1	2.0	15	322	1.2
412.5	0.490	10	0.825	11	267	1.5	7.1	1.5	16	305	1.1
413.2	0.490	10.0	0.969	12	304	1.8	7.1	1.8	18	347	1.3
413.9	0.490	9.9	1.1	14	311	1.5	7.1	2.1	22	356	1.1
414.6	0.490	9.6	0.886	11	283	1.0	7.1	1.6	16	324	0.761
415.3	0.490	9.3	0.862	10	307	1.4	7.1	1.6	15	351	0.995
416.0	0.490	11	1.0	13	278	1.5	7.1	1.9	19	318	1.1
416.7	0.490	9.4	0.744	12	280	1.6	7.1	1.4	19	320	1.1
417.4	0.490	9.8	0.764	13	266	1.9	7.1	1.4	20	304	1.4
418.1	0.490	9.2	1.0	10.0	234	1.1	7.1	1.9	15	268	0.794
418.8	0.490	10	0.767	15	278	1.1	7.1	1.4	23	318	0.805
419.4	0.490	9.5	0.830	14	256	2.0	7.1	1.5	22	292	1.4
420.1	0.490	9.0	0.908	12	286	1.5	7.1	1.7	19	327	1.1
420.8	0.490	9.8	0.629	13	272	1.6	7.1	1.1	20	311	1.2
421.5	0.490	10	0.834	13	317	1.4	7.1	1.5	20	362	1.1
422.2	0.490	12	0.771	13	258	1.4	7.1	1.4	20	295	1.0
422.9	0.490	11	0.913	16	266	1.6	7.1	1.7	24	304	1.2
423.6	0.490	11	0.483	11	262	0.947	7.1	0.882	18	300	0.691
424.3	0.490	10.0	0.769	15	247	0.909	7.1	1.4	24	282	0.663
425.0	0.490	11	0.524	12	241	1.2	7.1	0.956	19	276	0.912
425.7	0.490	10	0.970	12	231	0.946	7.1	1.8	19	264	0.690
426.4	0.490	10	1.2	14	283	1.0	7.1	2.2	22	324	0.741
427.1	0.722	8.6	0.939	14	261	1.1	10	1.7	21	299	0.822
427.8	0.490	11	0.946	19	280	1.2	7.1	1.7	29	321	0.857
428.5	0.490	11	0.831	16	257	1.2	7.1	1.5	24	294	0.855
429.2	0.490	12	1.1	14	267	1.6	7.1	2.0	22	305	1.2
429.9	0.490	12	0.676	18	242	1.8	7.1	1.2	28	277	1.3
430.6	0.490	11	0.910	15	252	1.6	7.1	1.7	24	288	1.1
431.3	0.490	11	0.899	18	265	1.6	7.1	1.6	28	303	1.1
432.0	0.510	11	0.827	20	269	1.5	7.4	1.5	31	308	1.1
432.7	0.490	12	0.606	14	243	1.6	7.1	1.1	22	278	1.2
433.4	0.490	10	0.614	16	267	1.4	7.1	1.1	25	306	1.0
434.1	0.490	9.8	0.969	13	229	1.3	7.1	1.8	20	262	0.922
434.8	0.490	11	1.0	14	272	0.774	7.1	1.9	22	311	0.565
435.5	0.490	9.8	0.812	15	215	1.0	7.1	1.5	23	246	0.742
436.2	0.913	12	0.805	16	271	0.865	13	1.5	25	310	0.631
436.9	0.490	11	1.0	17	252	1.0	7.1	1.9	26	289	0.763
437.6	0.490	11	0.653	20	255	2.0	7.1	1.2	31	292	1.4
438.3	0.490	13	0.913	18	292	1.1	7.1	1.7	28	334	0.823
439.0	0.490	11	0.961	19	270	0.695	7.1	1.8	30	309	0.507
439.7	0.490	8.4	0.808	15	224	1.7	7.1	1.5	23	256	1.2
440.4	0.490	11	1.0	20	246	1.6	7.1	1.8	31	281	1.2
441.1	0.490	12	1.1	18	254	1.1	7.1	1.9	27	290	0.807
441.8	0.490	13	0.938	19	263	1.4	7.1	1.7	29	301	1.0
442.5	0.500	13	1.2	19	243	1.1	7.2	2.2	29	278	0.806
443.2	0.490	8.8	1.1	19	275	1.6	7.1	2.0	29	315	1.2
443.9	0.490	9.8	0.990	18	242	1.9	7.1	1.8	27	277	1.4
444.6	0.490	8.7	1.2	21	240	1.6	7.1	2.3	32	275	1.1
445.3	0.490	9.4	1.2	21	241	1.5	7.1	2.2	33	276	1.1
445.9	0.490	9.0	0.982	20	269	1.5	7.1	1.8	31	308	1.1
446.6	0.709	11	0.807	22	268	1.5	10	1.5	34	306	1.1
447.3	0.490	10	0.925	18	261	0.573	7.1	1.7	28	299	0.418
448.0	0.490	12	1.0	18	244	1.1	7.1	1.8	28	279	0.811
448.7	0.490	10	0.857	20	246	0.411	7.1	1.6	30	281	0.300
449.4	0.520	10	1.3	17	262	1.4	7.5	2.4	27	299	1.0
450.1	0.490	11	0.908	22	293	1.4	7.1	1.7	34	335	1.000
450.8	0.490	11	0.982	20	265	1.5	7.1	1.8	30	303	1.1
451.5	0.490	11	1.3	16	238	1.3	7.1	2.3	25	272	0.936



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
452.2	0.490	12	1.5	18	255	1.5	7.1	2.7	27	291	1.1
452.9	0.490	10	0.835	18	219	0.755	7.1	1.5	27	250	0.551
453.6	0.490	8.7	0.886	21	256	1.4	7.1	1.6	32	292	1.0
454.3	0.490	11	0.914	17	224	1.1	7.1	1.7	25	256	0.784
455.0	0.490	9.6	0.929	23	252	2.1	7.1	1.7	36	288	1.5
455.7	0.490	10	0.992	18	238	1.3	7.1	1.8	27	272	0.918
456.4	0.635	12	1.1	20	256	1.3	9.2	2.1	30	292	0.970
457.1	0.490	11	0.643	18	259	0.731	7.1	1.2	27	296	0.533
457.8	0.490	8.2	0.758	18	221	1.1	7.1	1.4	28	253	0.793
458.5	0.490	9.0	1.2	22	257	2.1	7.1	2.2	33	294	1.5
459.2	0.490	11	1.4	21	250	1.1	7.1	2.5	32	286	0.835
459.9	0.490	9.2	0.835	19	226	0.462	7.1	1.5	29	258	0.337
460.6	0.490	9.8	1.1	19	288	0.881	7.1	2.0	29	330	0.643
461.3	0.490	10	1.1	21	269	1.6	7.1	1.9	32	308	1.2
462.0	0.490	11	1.1	18	263	1.5	7.1	2.0	28	300	1.1
462.7	0.490	11	1.2	15	274	0.735	7.1	2.2	23	313	0.536
463.4	0.490	8.6	1.1	13	211	1.4	7.1	2.0	20	241	0.996
464.1	0.490	12	1.2	19	261	1.5	7.1	2.1	28	299	1.1
464.8	0.490	10	0.937	17	300	1.7	7.1	1.7	26	343	1.2
465.5	0.490	11	1.0	20	265	1.3	7.1	1.9	31	302	0.970
466.2	0.534	9.1	1.1	16	232	1.9	7.7	1.9	25	265	1.4
466.9	0.490	10	0.922	17	275	1.7	7.1	1.7	27	315	1.2
467.6	0.490	8.8	1.2	15	240	1.6	7.1	2.2	23	275	1.2
468.3	0.490	12	1.1	21	306	2.7	7.1	2.0	32	350	2.0
469.0	0.490	9.4	1.4	18	306	1.6	7.1	2.6	28	350	1.2
469.7	0.490	11	1.1	18	286	1.8	7.1	1.9	27	327	1.3
470.4	0.490	11	1.2	19	261	1.7	7.1	2.3	29	299	1.2
471.1	0.490	11	1.1	17	253	1.2	7.1	2.0	26	289	0.898
471.8	0.490	9.0	1.4	15	276	1.3	7.1	2.5	23	315	0.930
472.5	0.490	10	0.980	19	258	1.5	7.1	1.8	29	295	1.1
473.1	0.490	9.6	0.894	16	243	1.3	7.1	1.6	24	278	0.965
473.8	0.497	10	0.883	17	233	1.5	7.2	1.6	26	267	1.1
474.5	0.490	10	1.1	15	271	1.1	7.1	2.0	24	310	0.826
475.2	0.585	12	1.1	14	235	1.4	8.4	2.0	22	269	1.0
475.9	0.490	9.9	0.840	18	310	0.992	7.1	1.5	27	355	0.724
476.6	0.490	11	0.788	14	273	1.5	7.1	1.4	21	312	1.1
477.3	0.490	11	0.753	16	272	1.7	7.1	1.4	25	312	1.2
478.0	0.729	11	0.808	21	311	1.6	11	1.5	32	355	1.2
478.7	0.490	11	0.804	17	273	1.0	7.1	1.5	27	312	0.743
479.4	0.638	11	0.863	20	274	1.3	9.2	1.6	30	313	0.973
480.1	0.490	8.0	0.892	14	296	1.7	7.1	1.6	22	339	1.2
480.8	0.490	11	0.656	16	285	1.4	7.1	1.2	24	326	1.1
481.5	0.490	12	0.994	19	267	1.1	7.1	1.8	29	306	0.820
482.2	0.490	12	1.1	18	257	1.1	7.1	2.0	28	294	0.836
482.9	0.490	12	0.807	18	267	1.7	7.1	1.5	28	306	1.2
483.6	0.776	12	1.0	13	245	1.2	11	1.9	20	280	0.883
484.3	0.490	11	0.866	18	254	1.3	7.1	1.6	28	290	0.956
485.0	0.490	12	0.994	22	285	0.965	7.1	1.8	34	326	0.704
485.7	0.490	11	0.917	18	263	1.4	7.1	1.7	27	301	1.1
486.4	0.490	11	1.3	18	287	1.5	7.1	2.4	28	328	1.1
487.1	0.630	13	1.0	22	255	1.7	9.1	1.8	34	291	1.2
487.8	0.490	13	0.631	17	284	0.648	7.1	1.1	26	324	0.473
488.5	0.490	12	0.654	18	306	0.894	7.1	1.2	28	350	0.652
489.2	0.490	12	1.2	18	254	1.0	7.1	2.1	27	290	0.730
489.9	0.490	12	1.1	22	273	1.4	7.1	2.0	33	312	1.0
490.6	0.490	11	0.923	21	255	1.000	7.1	1.7	32	292	0.729
491.3	0.490	11	0.994	19	261	1.6	7.1	1.8	29	298	1.2
492.0	0.490	9.5	0.841	25	265	1.4	7.1	1.5	38	303	1.0
492.7	0.490	11	1.2	20	280	1.3	7.1	2.1	31	320	0.963
493.4	0.490	11	0.802	18	254	0.886	7.1	1.5	27	290	0.647
494.1	0.490	11	0.908	22	275	1.1	7.1	1.7	33	314	0.819
494.8	0.490	10	1.2	20	247	1.6	7.1	2.1	31	282	1.1
495.5	0.490	11	1.2	20	252	0.835	7.1	2.1	30	288	0.609
496.2	0.490	13	0.953	20	277	0.702	7.1	1.7	31	317	0.512
496.9	0.490	12	0.764	21	282	1.5	7.1	1.4	32	323	1.1
497.6	0.490	11	0.909	21	258	1.6	7.1	1.7	32	295	1.2
498.3	0.504	12	0.963	22	324	1.3	7.3	1.8	34	370	0.948
499.0	0.490	12	0.891	22	265	0.924	7.1	1.6	34	303	0.674
499.6	0.490	11	0.869	24	250	0.837	7.1	1.6	36	286	0.611
500.3	0.490	12	1.2	25	292	0.834	7.1	2.2	38	334	0.609
501.0	0.490	10	1.0	22	250	1.1	7.1	1.8	33	286	0.820
501.7	0.490	10	0.835	21	268	1.5	7.1	1.5	33	307	1.1
502.4	0.661	12	1.0	25	303	1.2	9.5	1.9	38	347	0.878
503.1	0.513	11	0.981	24	302	0.376	7.4	1.8	37	345	0.274
503.8	0.490	11	1.1	23	283	0.755	7.1	2.0	35	324	0.550
504.5	0.635	12	0.900	22	272	1.5	9.2	1.6	34	311	1.1
505.2	0.490	11	0.901	21	299	1.4	7.1	1.6	32	342	1.0
505.9	0.490	11	1.1	19	264	0.975	7.1	2.1	29	302	0.711
506.6	0.490	10	0.805	24	273	1.9	7.1	1.5	36	313	1.4
507.3	0.490	12	1.3	25	310	1.3	7.1	2.3	38	355	0.931
508.0	0.490	13	1.2	27	281	0.917	7.1	2.1	41	321	0.669



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.7	0.490	11	1.0	24	285	1.5	7.1	1.9	37	325	1.1
509.4	0.490	13	0.897	24	248	1.1	7.1	1.6	37	283	0.813
510.1	0.490	11	1.1	18	234	0.568	7.1	2.0	27	268	0.414
510.8	0.490	12	0.874	27	277	1.1	7.1	1.6	41	317	0.796
511.5	0.490	9.6	0.803	18	242	1.4	7.1	1.5	27	276	0.997
512.2	0.490	9.9	1.1	27	294	1.6	7.1	1.9	42	336	1.1
512.9	0.490	11	0.949	26	270	1.3	7.1	1.7	40	309	0.955
513.6	0.490	12	1.2	21	259	1.2	7.1	2.1	33	296	0.851
514.3	0.490	11	0.958	22	306	2.2	7.1	1.7	33	350	1.6
515.0	0.490	11	0.749	24	294	1.4	7.1	1.4	36	336	1.0
515.7	0.490	9.9	1.0	25	314	1.3	7.1	1.8	38	360	0.917
516.4	0.490	11	0.966	26	278	1.2	7.1	1.8	40	318	0.842
517.1	0.490	13	0.837	31	314	1.5	7.1	1.5	48	359	1.1
517.8	0.490	10.0	0.715	21	285	1.2	7.1	1.3	32	326	0.850
518.5	0.490	11	0.697	29	282	0.633	7.1	1.3	44	322	0.462
519.2	0.490	11	0.810	25	269	0.735	7.1	1.5	38	308	0.536
519.9	0.504	11	0.938	23	281	0.933	7.3	1.7	35	321	0.681
520.6	0.490	12	0.792	29	276	0.699	7.1	1.4	44	316	0.510
521.3	0.490	13	0.721	29	277	1.6	7.1	1.3	44	317	1.2
522.0	0.490	10	0.769	25	259	1.1	7.1	1.4	38	296	0.828
522.7	0.490	11	0.860	24	269	1.2	7.1	1.6	37	307	0.840
523.4	0.490	9.6	1.1	29	313	1.1	7.1	2.0	45	358	0.785
524.1	0.490	11	0.610	24	267	0.671	7.1	1.1	37	306	0.490
524.8	0.490	9.6	0.630	28	317	0.833	7.1	1.1	43	363	0.608
525.4	0.490	10	1.1	27	260	1.5	7.1	2.0	42	298	1.1
526.1	0.490	14	0.982	23	267	0.833	7.1	1.8	35	305	0.608
526.8	0.490	9.6	0.750	28	290	0.757	7.1	1.4	42	332	0.552
527.5	0.490	11	0.612	25	307	0.963	7.1	1.1	39	351	0.702
528.2	0.490	12	0.867	29	288	0.806	7.1	1.6	45	330	0.588
528.9	0.490	11	0.910	27	267	1.3	7.1	1.7	41	305	0.920
529.6	0.671	13	0.720	30	308	1.4	9.7	1.3	46	352	1.0
530.3	0.588	13	1.0	27	293	1.1	8.5	1.9	42	335	0.838
531.0	0.490	12	1.1	27	291	0.879	7.1	1.9	42	333	0.641
531.7	0.490	13	0.909	27	303	1.3	7.1	1.7	42	346	0.981
532.4	0.490	11	1.1	27	297	1.0	7.1	2.0	41	339	0.753
533.1	0.490	11	0.777	31	277	1.0	7.1	1.4	48	317	0.735
533.8	0.632	12	1.3	28	289	1.9	9.1	2.4	44	331	1.4
534.5	0.490	12	1.000	29	292	1.5	7.1	1.8	44	334	1.1
535.2	0.557	14	0.858	26	299	1.7	8.0	1.6	40	342	1.2
535.9	0.490	12	1.4	31	273	0.698	7.1	2.5	47	312	0.509
536.6	0.733	11	1.0	26	271	1.7	11	1.8	40	309	1.2
537.3	0.490	10	0.911	28	280	1.5	7.1	1.7	43	320	1.1
538.0	0.490	9.7	1.1	29	274	1.8	7.1	1.9	44	314	1.3
538.7	0.490	11	0.728	28	277	1.2	7.1	1.3	43	317	0.908
539.4	0.490	11	0.899	27	284	1.8	7.1	1.6	42	325	1.3
540.1	0.490	11	1.1	20	286	1.3	7.1	2.0	31	328	0.942
540.8	0.490	13	0.876	23	312	1.2	7.1	1.6	35	357	0.870
541.5	0.490	12	1.5	26	315	1.5	7.1	2.7	40	360	1.1
542.2	0.490	11	1.1	26	300	1.4	7.1	2.0	41	344	1.0
542.9	0.490	10	1.2	25	256	1.3	7.1	2.2	38	293	0.965
543.6	0.490	12	0.964	25	266	1.4	7.1	1.8	39	304	1.0
544.3	0.490	13	0.860	21	310	0.665	7.1	1.6	31	355	0.485
545.0	0.490	10	0.853	27	279	1.5	7.1	1.6	41	319	1.1
545.7	0.490	12	0.793	29	312	1.1	7.1	1.4	45	357	0.827
546.4	0.490	10	1.1	23	237	1.5	7.1	1.9	36	272	1.1
547.1	0.490	11	0.984	26	281	1.2	7.1	1.8	40	322	0.899
547.8	0.490	8.7	1.1	28	283	1.3	7.1	2.1	43	323	0.977
548.5	0.490	12	0.641	29	297	1.7	7.1	1.2	45	339	1.2
549.2	0.490	12	1.3	24	272	0.926	7.1	2.4	37	311	0.676
549.9	0.490	12	1.3	29	290	0.872	7.1	2.3	44	332	0.636
550.6	0.490	10	0.716	20	260	1.4	7.1	1.3	30	297	1.1
551.2	0.490	9.8	0.789	20	291	0.984	7.1	1.4	31	332	0.718
551.9	0.545	12	1.2	26	297	1.5	7.9	2.2	40	340	1.1
552.6	0.490	15	1.1	21	279	1.8	7.1	2.0	32	319	1.3
553.3	0.490	11	0.759	24	272	1.3	7.1	1.4	36	311	0.957
554.0	0.490	13	1.2	22	254	2.0	7.1	2.2	34	291	1.4
554.7	0.490	11	1.3	21	289	1.3	7.1	2.4	32	331	0.978
555.4	0.490	11	0.834	21	276	2.0	7.1	1.5	33	316	1.5
556.1	0.490	11	1.2	19	252	0.343	7.1	2.2	29	288	0.250
556.8	0.490	11	0.882	21	283	1.4	7.1	1.6	32	324	0.993
557.5	0.490	13	0.971	19	268	1.5	7.1	1.8	29	307	1.1
558.2	0.490	15	1.1	21	300	1.0	7.1	2.0	32	344	0.762
558.9	0.490	11	0.684	25	286	1.4	7.1	1.2	38	327	0.995
559.6	0.490	10	1.1	19	268	1.4	7.1	2.0	29	307	0.992
560.3	0.490	12	0.597	26	303	1.9	7.1	1.1	40	347	1.4
561.0	0.490	12	1.3	25	304	1.1	7.1	2.3	38	348	0.776
561.7	0.490	9.8	1.0	18	230	1.6	7.1	1.9	28	263	1.2
562.4	0.490	12	0.707	25	300	1.4	7.1	1.3	38	344	0.996
563.1	0.490	9.6	1.3	20	251	1.1	7.1	2.4	31	286	0.796
563.8	0.618	11	1.2	22	295	0.842	8.9	2.3	34	337	0.614
564.5	0.490	13	0.980	21	316	1.0	7.1	1.8	33	361	0.742



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
565.2	0.490	13	1.0	18	275	0.835	7.1	1.8	28	315	0.609
565.9	0.612	9.6	1.0	19	255	1.0	8.8	1.9	30	291	0.744
566.6	0.546	12	0.963	23	270	1.5	7.9	1.8	36	309	1.1
567.3	0.490	10	1.1	21	282	1.5	7.1	1.9	32	322	1.1
568.0	0.490	12	0.874	21	284	1.1	7.1	1.6	32	324	0.788
568.7	0.490	12	1.2	21	283	1.2	7.1	2.2	32	324	0.840
569.4	0.490	14	1.2	19	305	1.3	7.1	2.2	30	349	0.980
570.1	0.490	15	1.2	24	297	1.4	7.1	2.3	36	340	1.0
570.8	0.490	12	0.656	21	303	1.4	7.1	1.2	32	346	1.1
571.5	0.490	10	1.1	23	279	0.880	7.1	2.1	35	319	0.642
572.2	0.490	13	1.2	24	273	1.6	7.1	2.3	37	312	1.2
572.9	0.490	11	1.0	20	294	1.3	7.1	1.9	31	336	0.924
573.6	0.490	9.5	1.2	19	246	1.1	7.1	2.2	29	281	0.824
574.3	0.598	13	1.2	25	294	1.5	8.6	2.2	38	336	1.1
575.0	0.490	12	1.2	25	288	1.8	7.1	2.1	38	329	1.3
575.7	0.490	13	1.4	27	276	1.6	7.1	2.6	41	316	1.2
576.4	0.490	12	1.1	25	252	1.4	7.1	2.1	38	288	1.0
577.1	0.490	13	1.7	25	301	1.6	7.1	3.1	39	344	1.1
577.7	0.490	12	1.3	22	247	1.4	7.1	2.4	34	282	1.000
578.4	0.490	12	1.1	26	310	1.4	7.1	2.1	40	354	0.987
579.1	0.490	12	1.6	23	254	1.1	7.1	2.9	35	291	0.830
579.8	0.490	11	0.955	31	306	1.5	7.1	1.7	47	350	1.1
580.5	0.490	13	1.5	28	282	1.3	7.1	2.7	44	323	0.942
581.2	0.490	11	1.0	28	257	0.950	7.1	1.9	43	294	0.693
581.9	0.765	13	1.1	25	313	1.9	11	2.0	39	358	1.4
582.6	0.490	11	1.1	22	245	1.0	7.1	2.1	34	280	0.761
583.3	0.490	13	1.3	31	297	1.1	7.1	2.4	47	339	0.811
584.0	0.490	10	1.0	24	256	0.477	7.1	1.9	37	293	0.348
584.7	0.490	11	1.2	23	280	1.7	7.1	2.2	35	321	1.3
585.4	0.490	15	1.1	28	319	1.1	7.1	2.0	42	365	0.822
586.1	0.490	13	1.4	29	281	1.3	7.1	2.5	44	321	0.935
586.8	0.490	12	1.3	26	280	1.2	7.1	2.4	40	320	0.876
587.5	0.490	12	0.956	27	259	1.2	7.1	1.7	42	297	0.902
588.2	0.490	12	1.1	26	286	0.942	7.1	2.1	41	328	0.687
588.9	0.490	11	1.3	28	290	1.4	7.1	2.4	43	332	1.0
589.6	0.490	12	1.2	34	279	0.878	7.1	2.2	53	320	0.641
590.3	0.490	9.7	1.1	24	238	1.1	7.1	2.0	37	273	0.819
591.0	0.490	14	1.3	27	284	1.1	7.1	2.4	42	325	0.806
591.7	0.490	12	1.1	30	267	1.1	7.1	2.0	47	305	0.771
592.4	0.490	11	1.0	31	276	1.4	7.1	1.9	48	315	1.0
593.1	0.490	13	1.2	31	269	1.5	7.1	2.1	47	308	1.1
593.8	0.490	11	0.934	32	278	2.1	7.1	1.7	49	317	1.5
594.5	0.577	11	1.1	22	246	1.0	8.3	2.0	34	281	0.766
595.2	0.490	11	1.0	28	282	0.896	7.1	1.8	43	322	0.653
595.9	0.490	13	1.2	26	265	0.602	7.1	2.3	40	304	0.439
596.6	0.490	13	1.1	26	246	0.911	7.1	2.0	39	281	0.664
597.3	0.490	12	1.6	34	309	0.813	7.1	3.0	52	354	0.593
598.0	0.490	12	1.5	28	264	1.3	7.1	2.7	43	302	0.940
598.7	0.490	10	1.4	24	239	1.1	7.1	2.5	37	273	0.829
599.4	0.490	12	1.3	27	278	1.8	7.1	2.4	41	318	1.3
600.1	0.490	12	1.3	29	306	1.3	7.1	2.4	44	350	0.924
600.8	0.490	14	1.5	27	284	1.6	7.1	2.7	41	324	1.2
601.5	0.490	12	1.6	34	310	1.2	7.1	2.9	52	354	0.858
602.2	0.490	11	1.2	27	278	2.0	7.1	2.2	41	318	1.5
602.9	0.568	12	1.3	28	269	0.688	8.2	2.3	43	307	0.502
603.5	0.490	8.6	1.3	26	251	1.5	7.1	2.4	40	287	1.1
604.2	0.490	13	1.2	30	277	1.6	7.1	2.2	47	317	1.2
604.9	0.490	11	1.0	31	297	1.2	7.1	1.9	47	340	0.907
605.6	0.490	12	1.1	28	249	1.2	7.1	1.9	43	285	0.881
606.3	0.490	13	1.2	25	261	1.1	7.1	2.1	38	298	0.807
607.0	0.490	13	1.2	33	286	1.2	7.1	2.1	50	327	0.840
607.7	0.543	11	1.4	29	274	0.993	7.8	2.6	44	313	0.725
608.4	0.490	13	1.3	28	278	1.2	7.1	2.4	43	318	0.891
609.1	0.490	11	1.5	28	271	1.3	7.1	2.8	43	310	0.921
609.8	0.490	13	1.3	27	266	1.2	7.1	2.3	41	304	0.845
610.5	0.490	10	1.2	29	283	1.8	7.1	2.2	45	324	1.3
611.2	0.490	12	1.4	30	269	1.0	7.1	2.6	46	308	0.741
611.9	0.490	11	1.3	31	293	0.562	7.1	2.4	48	335	0.410
612.6	0.490	13	1.6	31	301	1.1	7.1	2.9	48	344	0.837
613.3	0.490	12	1.3	27	281	0.907	7.1	2.4	41	321	0.662
614.0	0.490	10	1.4	29	257	2.1	7.1	2.6	44	293	1.6
614.7	0.490	11	1.2	30	269	1.3	7.1	2.2	47	307	0.959
615.4	0.490	13	1.5	29	260	1.2	7.1	2.8	45	297	0.861
616.1	0.490	11	1.0	30	268	0.870	7.1	1.9	47	307	0.635
616.8	0.490	14	1.4	28	290	1.8	7.1	2.5	43	332	1.3
617.5	0.490	12	1.5	25	249	1.4	7.1	2.7	38	285	1.0
618.2	0.490	13	1.5	30	293	1.5	7.1	2.7	45	335	1.1
618.9	0.490	12	1.5	24	254	0.928	7.1	2.7	37	291	0.677
619.6	0.490	11	1.1	26	276	1.2	7.1	2.0	40	315	0.899
620.3	0.490	12	1.3	23	268	0.836	7.1	2.4	36	307	0.610
621.0	0.490	11	1.2	24	263	1.8	7.1	2.2	36	301	1.3



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.7	0.490	12	1.2	23	284	1.5	7.1	2.3	35	324	1.1
622.4	0.490	9.4	1.1	24	279	1.4	7.1	2.0	36	319	1.0
623.1	0.490	10.0	1.4	27	248	1.6	7.1	2.5	42	283	1.1
623.8	0.498	11	1.7	24	259	0.548	7.2	3.0	37	297	0.400
624.5	0.490	11	1.3	23	301	1.7	7.1	2.4	35	344	1.2
625.2	0.490	12	1.4	23	266	1.0	7.1	2.5	36	304	0.750
625.9	0.490	9.9	1.3	18	266	1.3	7.1	2.4	27	304	0.947
626.6	0.523	9.1	1.5	26	264	1.1	7.6	2.8	40	302	0.773
627.3	0.490	11	1.4	26	274	2.1	7.1	2.6	40	313	1.5
628.0	0.490	9.6	1.5	22	278	0.693	7.1	2.7	34	318	0.506
628.7	0.490	13	1.3	22	337	2.3	7.1	2.3	34	386	1.7
629.4	0.490	12	1.6	24	267	1.7	7.1	3.0	37	306	1.2
630.1	0.490	9.7	1.3	25	285	1.2	7.1	2.3	38	326	0.874
630.7	0.490	12	1.1	22	281	1.4	7.1	2.0	34	321	1.0
631.4	0.490	14	1.6	22	321	1.9	7.1	3.0	34	367	1.4
632.1	0.490	11	0.983	19	255	1.5	7.1	1.8	29	291	1.1
632.8	0.490	10	1.3	23	284	1.5	7.1	2.3	35	325	1.1
633.5	0.490	12	1.5	24	325	1.1	7.1	2.6	37	371	0.818
634.2	0.527	13	0.929	24	270	1.6	7.6	1.7	37	308	1.2
634.9	0.490	12	1.4	27	301	1.5	7.1	2.6	41	344	1.1
635.6	0.490	12	1.5	24	299	1.1	7.1	2.8	36	341	0.807
636.3	0.490	11	1.2	24	275	1.0	7.1	2.3	37	315	0.754
637.0	0.490	10	1.3	18	262	0.769	7.1	2.3	28	300	0.561
637.7	0.490	10	1.2	21	263	2.3	7.1	2.1	33	301	1.7
638.4	0.490	9.7	1.3	22	286	1.6	7.1	2.3	33	327	1.1
639.1	0.504	12	1.2	20	274	1.6	7.3	2.1	31	313	1.2
639.8	0.490	10	0.969	23	252	1.8	7.1	1.8	35	288	1.3
640.5	0.490	10	1.1	19	245	1.3	7.1	2.0	29	280	0.944
641.2	0.490	11	1.1	19	278	1.6	7.1	2.1	28	318	1.2
641.9	0.490	12	1.0	21	287	1.6	7.1	1.8	32	328	1.2
642.6	0.490	12	1.2	19	268	1.3	7.1	2.2	29	307	0.923
643.3	0.490	13	1.5	18	282	1.9	7.1	2.7	28	323	1.4
644.0	0.490	12	1.2	21	288	1.7	7.1	2.1	33	330	1.3
644.7	0.581	13	1.2	21	266	1.4	8.4	2.1	32	304	1.0
645.4	0.490	11	1.1	21	273	0.943	7.1	2.0	33	313	0.688
646.1	0.490	11	0.978	18	276	1.3	7.1	1.8	28	315	0.980
646.8	0.490	11	1.4	20	258	1.8	7.1	2.5	31	295	1.3
647.5	0.490	9.8	1.2	23	276	2.0	7.1	2.1	35	316	1.4
648.2	0.490	11	1.5	21	286	0.817	7.1	2.7	32	327	0.596
648.9	0.490	13	1.2	23	290	0.815	7.1	2.3	35	331	0.595
649.6	0.572	12	1.3	17	290	1.8	8.3	2.3	26	331	1.3
650.3	0.490	12	0.916	18	264	1.1	7.1	1.7	28	302	0.830
651.0	0.490	12	1.2	19	268	1.4	7.1	2.2	29	306	1.0
651.7	0.490	12	1.2	22	288	1.4	7.1	2.3	33	329	0.987
652.4	0.490	12	1.1	24	256	1.5	7.1	2.0	36	293	1.1
653.1	0.682	11	0.637	22	263	0.702	9.8	1.2	34	301	0.513
653.8	0.593	11	1.1	20	242	1.2	8.6	2.0	31	276	0.854
654.5	0.499	10.0	0.769	22	265	1.7	7.2	1.4	33	303	1.3
655.2	0.507	11	0.885	19	253	1.9	7.3	1.6	29	289	1.4
655.9	0.490	13	0.995	21	274	1.9	7.1	1.8	32	313	1.4
656.5	0.490	11	0.822	23	264	1.1	7.1	1.5	36	301	0.796
657.2	0.490	11	1.1	22	276	1.2	7.1	1.9	34	315	0.867
657.9	0.490	12	0.933	22	251	1.1	7.1	1.7	33	287	0.787
658.6	0.490	11	0.916	22	279	1.4	7.1	1.7	33	319	1.1
659.3	0.490	10	0.968	21	254	2.0	7.1	1.8	32	291	1.5
660.0	0.490	12	1.1	25	259	0.902	7.1	2.1	39	297	0.658
660.7	0.498	11	0.932	22	252	1.5	7.2	1.7	34	288	1.1
661.4	0.490	12	1.5	25	239	1.2	7.1	2.7	38	273	0.879
662.1	0.490	9.6	1.1	24	254	1.6	7.1	2.0	36	290	1.2
662.8	0.490	11	1.3	25	260	1.8	7.1	2.3	38	298	1.3
663.5	0.490	12	1.4	26	304	1.3	7.1	2.5	40	348	0.971
664.2	0.490	11	1.1	25	257	0.968	7.1	2.1	38	294	0.706
664.9	0.490	9.3	1.3	25	244	1.2	7.1	2.3	38	279	0.876
665.6	0.490	8.4	1.0	21	256	1.1	7.1	1.8	33	293	0.826
666.3	0.490	12	1.1	27	274	0.891	7.1	2.1	41	314	0.650
667.0	0.490	11	1.3	28	240	1.4	7.1	2.4	42	275	1.0
667.7	0.490	11	1.2	31	309	2.2	7.1	2.1	47	354	1.6
668.4	0.490	9.0	1.2	24	233	1.5	7.1	2.2	37	266	1.1
669.1	0.695	11	1.2	23	260	1.8	10	2.1	36	297	1.3
669.8	0.490	12	1.5	26	257	1.6	7.1	2.7	40	294	1.2
670.5	0.490	11	1.3	24	248	1.1	7.1	2.4	37	283	0.829
671.2	0.490	10	1.2	20	227	1.3	7.1	2.1	31	260	0.963
671.9	0.529	10.0	1.2	23	244	1.2	7.6	2.1	36	279	0.900
672.6	0.490	11	1.1	23	265	1.1	7.1	2.1	35	303	0.835
673.3	0.490	11	1.2	29	285	1.7	7.1	2.2	45	326	1.2
674.0	0.518	11	1.1	27	281	1.2	7.5	2.0	41	322	0.904
674.7	0.490	11	0.920	24	242	1.9	7.1	1.7	36	276	1.4
675.4	0.490	12	1.2	28	247	1.6	7.1	2.2	42	283	1.2
676.1	0.490	11	1.1	28	265	1.4	7.1	1.9	42	303	1.0
676.8	0.490	13	1.3	26	271	0.829	7.1	2.5	40	310	0.605
677.5	0.490	13	0.930	27	258	1.3	7.1	1.7	41	295	0.940



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
678.2	0.490	10.0	0.953	27	228	0.816	7.1	1.7	42	261	0.596
678.9	0.640	11	1.1	24	273	1.4	9.2	2.0	37	312	1.0
679.6	0.490	9.9	0.959	22	250	0.869	7.1	1.7	34	286	0.634
680.3	0.490	10	1.2	26	250	1.2	7.1	2.2	40	286	0.876
681.0	0.490	11	1.0	28	272	1.1	7.1	1.9	42	311	0.793
681.7	0.546	12	1.1	27	253	1.2	7.9	1.9	42	289	0.862
682.4	0.490	12	0.829	31	274	1.4	7.1	1.5	47	313	1.0
683.1	0.490	12	1.1	29	254	1.7	7.1	2.0	45	290	1.2
683.7	0.490	9.8	1.2	30	275	1.4	7.1	2.2	46	315	1.0
684.4	0.490	9.5	1.4	30	256	0.926	7.1	2.6	46	293	0.675
685.1	0.550	11	1.2	23	228	0.917	7.9	2.2	35	261	0.669
685.8	0.490	12	1.4	27	299	0.549	7.1	2.5	41	342	0.400
686.5	0.490	11	1.4	27	279	1.5	7.1	2.6	41	319	1.1
687.2	0.490	11	1.2	29	279	1.6	7.1	2.1	45	319	1.1
687.9	0.490	10	1.3	29	247	1.2	7.1	2.4	45	283	0.847
688.6	0.490	12	1.2	25	261	1.9	7.1	2.2	38	299	1.4
689.3	0.660	11	1.3	22	265	1.2	9.5	2.3	33	303	0.873
690.0	0.490	10	1.5	22	279	1.8	7.1	2.7	34	319	1.3
690.7	0.490	10	1.5	22	279	1.7	7.1	2.7	34	319	1.3
691.4	0.490	11	1.1	25	258	1.6	7.1	1.9	39	295	1.2
692.1	0.552	11	1.1	24	260	1.4	8.0	2.0	37	297	1.0
692.8	0.490	10	1.5	20	242	1.5	7.1	2.7	30	277	1.1
693.5	0.490	9.6	1.3	23	247	1.7	7.1	2.4	35	282	1.3
694.2	0.490	11	1.6	20	265	1.8	7.1	2.8	31	303	1.3
694.9	0.490	8.4	1.4	21	265	2.2	7.1	2.6	32	303	1.6
695.6	0.490	11	1.1	21	276	1.2	7.1	2.1	32	316	0.909
696.3	0.490	8.5	1.3	23	251	1.3	7.1	2.3	35	286	0.956
697.0	0.490	10	1.0	17	244	1.6	7.1	1.9	26	279	1.2
697.7	0.665	10	1.0	23	303	2.1	9.6	1.9	35	347	1.5
698.4	0.695	12	1.3	21	300	1.2	10	2.4	32	343	0.848
699.1	0.490	11	1.2	17	281	2.1	7.1	2.3	26	321	1.6
699.8	0.490	9.8	1.1	18	242	2.1	7.1	2.0	27	276	1.6
700.5	0.490	11	1.1	23	273	1.8	7.1	2.0	35	313	1.3
701.2	0.490	11	1.1	17	267	1.3	7.1	2.0	26	305	0.919
701.9	0.490	11	0.961	15	285	1.7	7.1	1.8	23	326	1.3
702.6	0.749	11	1.2	18	273	1.6	11	2.2	28	312	1.2
703.3	0.827	11	0.943	17	276	1.2	12	1.7	26	316	0.881
704.0	0.490	13	1.1	20	241	1.9	7.1	2.1	31	275	1.4
704.7	0.490	10	0.819	20	245	1.3	7.1	1.5	30	280	0.926
705.4	0.490	8.9	0.550	19	293	1.1	7.1	1.0	29	335	0.816
706.1	0.490	12	0.863	19	270	1.5	7.1	1.6	29	309	1.1
706.8	0.490	11	0.658	18	236	1.3	7.1	1.2	27	270	0.937
707.5	0.490	10	0.660	18	265	1.8	7.1	1.2	28	303	1.3
708.2	0.490	12	0.788	20	268	1.2	7.1	1.4	31	307	0.849
708.9	0.490	9.3	0.839	15	267	1.5	7.1	1.5	23	305	1.1
709.6	0.490	12	0.863	20	285	1.0	7.1	1.6	31	325	0.730
710.2	0.490	12	0.987	20	255	1.8	7.1	1.8	30	292	1.3
710.9	0.490	10	0.946	20	257	1.1	7.1	1.7	31	294	0.798
711.6	0.490	12	0.742	23	275	2.1	7.1	1.4	36	314	1.5
712.3	0.490	11	0.772	23	269	1.3	7.1	1.4	36	308	0.984
713.0	0.490	12	1.1	22	230	1.6	7.1	2.1	33	263	1.2
713.7	0.650	11	0.819	22	263	1.3	9.4	1.5	34	300	0.926
714.4	0.663	11	0.931	26	293	0.804	9.6	1.7	40	335	0.586
715.1	0.490	12	0.919	21	221	1.1	7.1	1.7	33	253	0.789
715.8	0.569	10	0.856	25	266	1.5	8.2	1.6	38	305	1.1
716.5	0.490	10	0.690	20	215	0.847	7.1	1.3	30	246	0.618
717.2	0.490	11	0.999	23	249	1.4	7.1	1.8	36	285	1.0
717.9	0.490	11	0.744	24	257	1.7	7.1	1.4	36	293	1.2
718.6	0.527	12	1.1	24	246	1.3	7.6	2.1	36	281	0.920
719.3	0.490	11	0.892	23	253	1.4	7.1	1.6	35	289	1.0
720.0	0.500	11	0.646	23	242	0.827	7.2	1.2	35	277	0.604
720.7	0.490	11	0.874	25	261	0.719	7.1	1.6	38	298	0.525
721.4	0.617	11	0.970	24	234	1.3	8.9	1.8	36	268	0.942
722.1	0.556	13	0.815	23	289	0.924	8.0	1.5	35	331	0.675
722.8	0.490	11	0.770	21	228	1.5	7.1	1.4	33	261	1.1
723.5	0.490	11	1.1	28	227	1.1	7.1	2.0	42	259	0.784
724.2	0.490	12	0.892	23	256	1.4	7.1	1.6	35	293	1.0
724.9	0.490	12	1.1	21	248	1.6	7.1	2.0	32	283	1.2
725.6	0.599	11	0.882	24	257	0.635	8.6	1.6	37	294	0.463
726.3	0.490	12	0.809	28	257	1.2	7.1	1.5	44	294	0.870
727.0	0.490	12	1.2	24	257	0.565	7.1	2.2	37	294	0.412
727.7	0.490	11	1.1	22	274	1.6	7.1	2.0	33	313	1.1
728.4	0.490	11	0.538	20	258	1.2	7.1	0.982	31	295	0.865
729.1	0.490	9.1	1.2	23	279	1.7	7.1	2.1	36	319	1.3
729.8	0.490	12	1.1	22	260	1.2	7.1	2.0	34	297	0.849
730.5	0.490	13	1.0	23	267	1.0	7.1	1.9	36	305	0.753
731.2	0.490	13	0.951	22	247	0.669	7.1	1.7	34	282	0.488
731.9	0.490	11	0.970	22	265	0.498	7.1	1.8	34	303	0.363
732.6	0.490	11	0.784	28	266	1.3	7.1	1.4	42	304	0.914
733.3	0.490	10	0.790	23	258	1.3	7.1	1.4	36	295	0.957
734.0	0.490	9.4	0.954	23	233	0.813	7.1	1.7	35	266	0.593



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
734.7	9.4	12	0.803	30	268	0.693	135	1.5	47	306	0.506
735.3	0.490	12	0.998	100	278	1.8	7.1	1.8	154	318	1.3
736.0	0.490	11	11	26	266	1.0	7.1	20	39	305	0.762
736.7	0.576	12	0.822	22	256	0.765	8.3	1.5	34	293	0.558
737.4	0.490	9.6	1.1	21	268	1.1	7.1	2.0	32	306	0.816
738.1	0.490	14	0.911	27	242	0.863	7.1	1.7	41	276	0.630
738.8	0.490	11	1.2	26	296	1.1	7.1	2.3	40	338	0.817
739.5	0.490	11	0.903	26	230	1.3	7.1	1.6	41	264	0.925
740.2	0.490	12	1.0	21	245	0.797	7.1	1.9	33	280	0.582
740.9	0.490	11	1.0	22	257	1.5	7.1	1.8	33	293	1.1
741.6	0.490	13	1.1	23	229	1.1	7.1	2.1	35	262	0.777
742.3	0.490	10	0.751	22	239	0.611	7.1	1.4	33	274	0.446
743.0	0.490	11	0.918	21	268	2.5	7.1	1.7	32	307	1.9
743.7	0.490	13	1.1	20	257	0.922	7.1	2.1	31	293	0.673
744.4	0.490	12	0.658	26	260	0.724	7.1	1.2	40	298	0.528
745.1	0.490	11	1.0	23	260	0.971	7.1	1.8	36	298	0.708
745.8	0.490	12	0.797	24	251	1.4	7.1	1.5	36	287	0.990
746.5	0.490	11	0.723	31	264	0.778	7.1	1.3	47	302	0.567
747.2	0.523	9.1	0.591	21	225	1.4	7.5	1.1	32	257	1.0
747.9	0.490	9.4	0.805	30	257	0.691	7.1	1.5	46	293	0.504
748.6	0.490	9.8	0.983	22	263	1.5	7.1	1.8	34	301	1.1
749.3	0.490	11	0.864	21	248	0.749	7.1	1.6	32	283	0.546
750.0	0.490	12	0.764	24	228	1.1	7.1	1.4	38	261	0.823
750.7	0.490	9.6	0.951	22	247	1.7	7.1	1.7	34	283	1.3
751.4	0.490	9.8	1.0	31	248	1.2	7.1	1.8	47	284	0.910
752.1	0.490	9.2	0.918	21	237	0.845	7.1	1.7	33	271	0.616
752.8	0.490	13	0.974	24	264	1.5	7.1	1.8	37	302	1.1
753.5	0.490	12	1.1	22	256	1.8	7.1	2.0	34	293	1.3
754.2	0.490	11	1.0	28	293	2.0	7.1	1.9	42	336	1.5
754.9	0.490	11	1.1	21	256	0.639	7.1	2.0	33	293	0.466
755.6	0.490	8.6	0.814	21	250	1.8	7.1	1.5	32	286	1.3
756.3	0.490	10.0	0.940	22	240	1.3	7.1	1.7	34	275	0.946
757.0	0.490	10	1.0	22	257	1.9	7.1	1.8	34	294	1.4
757.7	0.490	10	1.1	21	260	1.1	7.1	1.9	32	297	0.774
758.4	0.490	11	0.880	22	261	1.8	7.1	1.6	33	299	1.3
759.1	0.490	9.4	1.4	19	256	0.889	7.1	2.5	29	293	0.649
759.8	0.490	9.6	0.717	21	249	1.1	7.1	1.3	32	285	0.770
760.5	0.490	8.7	0.925	19	309	2.0	7.1	1.7	29	354	1.5
761.2	0.490	12	1.0	21	273	1.5	7.1	1.9	33	312	1.1
761.8	0.490	9.7	1.2	19	284	0.716	7.1	2.2	29	325	0.522
762.5	0.490	12	0.975	23	274	1.1	7.1	1.8	36	313	0.770
763.2	0.490	11	0.742	20	251	1.2	7.1	1.4	31	287	0.844
763.9	0.490	8.4	0.999	19	269	1.2	7.1	1.8	29	308	0.840
764.6	0.490	9.5	0.777	15	262	1.3	7.1	1.4	24	299	0.970
765.3	0.490	9.5	1.1	16	306	1.8	7.1	1.9	25	350	1.3
766.0	0.490	10	0.666	21	297	1.8	7.1	1.2	32	340	1.3
766.7	0.490	11	0.781	15	244	1.2	7.1	1.4	23	279	0.883
767.4	0.490	11	0.665	17	254	1.2	7.1	1.2	26	290	0.870
768.1	0.490	9.5	0.996	16	245	1.4	7.1	1.8	24	281	1.1
768.8	0.490	12	0.912	21	268	1.4	7.1	1.7	32	307	1.0
769.5	0.490	12	0.606	16	256	0.988	7.1	1.1	25	293	0.721
770.2	0.490	11	0.579	18	277	1.4	7.1	1.1	27	317	1.0
770.9	0.490	9.4	0.817	19	274	0.861	7.1	1.5	30	313	0.628
771.6	0.490	8.0	1.0	16	249	1.0	7.1	1.9	24	284	0.754
772.3	0.490	11	0.865	17	269	0.637	7.1	1.6	27	308	0.465
773.0	0.490	9.8	0.812	12	257	1.4	7.1	1.5	19	293	1.0
773.7	0.490	12	1.0	17	253	1.0	7.1	1.9	26	289	0.752
774.4	0.501	11	0.957	17	286	1.2	7.2	1.7	26	327	0.874
775.1	0.518	9.6	0.779	15	257	1.0	7.5	1.4	23	294	0.755
775.8	0.490	10	0.457	21	292	1.7	7.1	0.834	33	334	1.2
776.5	0.490	9.6	0.552	20	278	1.8	7.1	1.0	30	317	1.3
777.2	0.490	10	0.664	13	263	1.0	7.1	1.2	21	301	0.753
777.9	0.490	13	0.741	17	288	1.2	7.1	1.4	26	330	0.897
778.6	0.490	12	0.888	17	338	1.4	7.1	1.6	26	386	1.0
779.3	0.490	12	0.538	18	257	1.7	7.1	0.982	27	294	1.2
780.0	0.490	10	0.751	19	227	0.294	7.1	1.4	28	259	0.215
780.7	0.490	11	0.853	17	263	0.526	7.1	1.6	26	301	0.384
781.4	0.490	11	0.570	18	254	1.1	7.1	1.0	28	290	0.769
782.1	0.490	12	0.871	17	250	0.770	7.1	1.6	26	285	0.562
782.8	0.490	12	0.563	18	255	1.4	7.1	1.0	27	291	1.0
783.5	0.594	12	0.451	19	261	0.449	8.6	0.823	30	298	0.328
784.2	0.584	11	0.781	22	261	1.1	8.4	1.4	33	299	0.775
784.9	0.490	10	0.630	23	251	1.2	7.1	1.1	35	287	0.851
785.6	0.490	9.4	0.848	20	241	1.3	7.1	1.5	31	275	0.935
786.3	0.490	10	0.838	21	260	1.4	7.1	1.5	32	297	0.991
787.0	0.490	9.9	0.909	22	225	0.739	7.1	1.7	34	257	0.539
787.7	0.759	11	0.617	24	286	1.3	11	1.1	36	327	0.932
788.4	0.490	11	1.1	26	291	0.986	7.1	2.1	40	333	0.719
789.0	0.517	12	1.2	31	291	1.3	7.5	2.2	48	333	0.972
789.7	0.490	11	0.710	30	268	0.435	7.1	1.3	46	306	0.317
790.4	0.490	13	1.2	35	292	1.1	7.1	2.1	54	334	0.836



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
791.1	0.490	11	0.825	28	234	0.581	7.1	1.5	43	267	0.424
791.8	0.490	11	0.927	30	308	1.2	7.1	1.7	46	352	0.847
792.5	0.623	12	0.921	31	265	0.868	9.0	1.7	48	303	0.633
793.2	0.490	12	1.1	34	266	1.3	7.1	2.1	51	304	0.945
793.9	0.490	9.8	0.820	31	246	0.991	7.1	1.5	48	281	0.723
794.6	0.490	10	1.1	31	233	0.998	7.1	2.0	47	266	0.728
795.3	0.535	12	1.4	34	291	0.978	7.7	2.6	52	333	0.713
796.0	0.490	12	1.1	31	242	0.931	7.1	2.1	48	277	0.679
796.7	0.490	12	1.2	33	273	1.1	7.1	2.1	51	312	0.773
797.4	0.511	11	1.6	35	274	1.3	7.4	2.9	54	313	0.962
798.1	0.490	11	1.5	34	257	1.1	7.1	2.7	52	294	0.788
798.8	0.490	13	1.3	36	289	1.2	7.1	2.4	55	330	0.863
799.5	0.490	12	1.5	30	285	0.971	7.1	2.8	46	326	0.708
800.2	0.631	12	1.5	40	253	0.438	9.1	2.8	61	289	0.320
800.9	0.490	12	1.1	33	308	0.758	7.1	2.0	51	352	0.553
801.6	0.490	12	1.3	30	251	0.433	7.1	2.4	47	287	0.316
802.3	0.490	10.0	1.3	35	252	1.3	7.1	2.4	53	288	0.932
803.0	0.490	10	1.3	35	284	1.8	7.1	2.3	53	325	1.3
803.7	0.510	12	1.7	33	282	1.1	7.4	3.0	50	323	0.822
804.4	0.542	12	1.4	36	318	1.5	7.8	2.6	56	364	1.1
805.1	0.490	9.7	1.5	34	263	0.746	7.1	2.7	52	300	0.545
805.8	0.490	12	1.6	36	302	1.2	7.1	2.9	56	346	0.890
806.5	0.543	11	1.2	33	281	0.988	7.8	2.2	50	322	0.720
807.2	0.490	12	1.2	32	260	0.731	7.1	2.3	48	297	0.533
807.9	0.490	14	1.3	32	279	1.4	7.1	2.5	49	319	1.0
808.6	0.490	12	1.5	40	294	1.2	7.1	2.7	61	337	0.844
809.3	0.490	12	1.5	34	266	1.7	7.1	2.8	52	304	1.2
810.0	0.490	9.6	1.4	29	270	1.1	7.1	2.6	44	309	0.835
810.7	0.490	11	1.2	27	254	0.729	7.1	2.2	42	290	0.532
811.4	0.513	9.4	1.2	31	246	1.4	7.4	2.2	47	281	0.996
812.1	0.490	11	1.4	37	322	0.953	7.1	2.5	57	369	0.695
812.8	0.490	9.8	1.1	29	274	1.1	7.1	1.9	45	314	0.771
813.5	0.490	10	1.4	26	278	1.4	7.1	2.6	39	317	1.0
814.2	0.555	10.0	1.3	26	278	1.0	8.0	2.4	40	317	0.737
814.9	0.548	11	1.5	27	279	0.997	7.9	2.7	42	320	0.728
815.5	0.497	12	1.2	28	327	1.6	7.2	2.1	42	374	1.1
816.2	0.490	10	1.2	25	263	1.0	7.1	2.2	39	300	0.750
816.9	0.490	9.6	2.2	28	325	0.928	7.1	4.1	43	371	0.677
817.6	0.490	10	2.1	23	298	1.9	7.1	3.9	35	341	1.4
818.3	0.490	12	1.5	20	321	1.4	7.1	2.8	31	367	1.0
819.0	0.490	10	1.5	29	302	1.8	7.1	2.8	44	345	1.3
819.7	0.490	12	1.8	26	330	1.1	7.1	3.3	40	377	0.817
820.4	0.490	9.9	1.6	25	323	0.960	7.1	2.9	39	370	0.701
821.1	0.490	10	1.4	27	312	2.0	7.1	2.6	42	357	1.5
821.8	0.490	11	1.2	21	319	1.1	7.1	2.2	32	364	0.781
822.5	0.490	10.0	1.4	23	327	2.2	7.1	2.5	36	374	1.6
823.2	0.490	11	1.2	17	320	1.1	7.1	2.2	27	366	0.780
823.9	0.490	9.9	0.920	19	312	2.0	7.1	1.7	29	356	1.5
824.6	0.490	8.9	1.2	16	302	1.6	7.1	2.2	25	345	1.2
825.3	0.490	13	0.897	18	336	2.0	7.1	1.6	28	384	1.5
826.0	0.490	9.5	0.889	17	348	0.820	7.1	1.6	26	398	0.599
826.7	0.490	11	0.716	19	310	1.4	7.1	1.3	29	355	1.0
827.4	0.490	11	0.719	20	334	1.7	7.1	1.3	30	382	1.3
828.1	0.490	11	0.881	19	335	1.6	7.1	1.6	29	383	1.2
828.8	0.490	13	0.811	20	329	1.5	7.1	1.5	30	376	1.1
829.5	0.490	8.2	0.472	19	331	1.7	7.1	0.861	29	379	1.2
830.2	0.490	11	0.671	15	360	1.9	7.1	1.2	24	412	1.4
830.9	0.490	11	1.0	19	321	1.5	7.1	1.9	30	367	1.1
831.6	0.490	11	0.763	21	395	2.3	7.1	1.4	33	452	1.7
832.3	0.490	11	0.723	18	318	1.7	7.1	1.3	28	364	1.2
833.0	0.490	11	0.788	18	356	1.5	7.1	1.4	28	407	1.1
833.7	0.490	10.0	0.610	19	378	1.6	7.1	1.1	29	432	1.1
834.4	0.490	13	0.586	16	373	1.7	7.1	1.1	25	427	1.2
835.1	0.490	10.0	0.671	17	355	1.1	7.1	1.2	27	406	0.819
835.8	0.490	9.4	0.533	16	371	1.5	7.1	0.973	25	425	1.1
836.5	0.490	9.7	0.317	13	323	1.0	7.1	0.578	21	370	0.739
837.2	0.490	11	0.720	13	373	2.1	7.1	1.3	21	427	1.5
837.9	0.692	11	0.786	16	353	1.8	10.0	1.4	25	404	1.3
838.6	0.490	13	0.599	18	394	2.3	7.1	1.1	27	451	1.7
839.3	0.490	11	0.463	15	367	1.3	7.1	0.844	23	419	0.945
840.0	0.490	11	0.533	16	404	1.6	7.1	0.972	25	462	1.2
840.7	0.490	12	0.497	13	364	1.8	7.1	0.906	19	417	1.3
841.4	0.490	12	0.654	12	361	1.3	7.1	1.2	18	412	0.982
842.0	0.490	13	0.431	14	387	1.4	7.1	0.787	21	442	1.0
842.7	0.490	13	0.378	18	408	1.4	7.1	0.690	28	466	1.0
843.4	0.490	12	0.806	17	455	1.3	7.1	1.5	26	520	0.965
844.1	0.490	9.6	0.450	15	397	0.988	7.1	0.821	24	454	0.721
844.8	0.542	14	64	165	425	1.7	7.8	117	253	486	1.2
845.5	3.7	11	0.585	19	392	1.8	54	1.1	28	448	1.3
846.2	0.490	14	13	21	380	1.3	7.1	25	32	435	0.942
846.9	0.490	11	0.702	15	357	0.912	7.1	1.3	23	408	0.665



Minnow Environmental  
Sample ID: 011

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
847.6	0.508	12	0.499	20	405	1.3	7.3	0.910	30	463	0.925
848.3	0.490	13	0.671	19	422	1.7	7.1	1.2	29	483	1.2
849.0	0.490	13	0.517	23	409	1.8	7.1	0.943	36	468	1.3
849.7	0.490	12	0.433	19	326	0.994	7.1	0.790	29	373	0.725
850.4	0.490	12	0.483	24	418	1.1	7.1	0.881	36	478	0.810
851.1	0.988	11	0.843	20	401	1.4	14	1.5	31	458	1.0
851.8	0.490	12	0.468	23	426	1.7	7.1	0.853	35	488	1.2
852.5	0.490	13	0.599	22	381	1.1	7.1	1.1	33	436	0.797
853.2	0.490	13	0.641	22	368	2.3	7.1	1.2	34	420	1.7
853.9	0.490	9.9	0.436	20	421	2.8	7.1	0.795	31	482	2.1
854.6	0.538	12	0.708	23	356	1.1	7.8	1.3	35	407	0.783
855.3	0.490	13	0.661	25	374	1.1	7.1	1.2	39	428	0.807
856.0	0.490	13	0.281	22	363	1.7	7.1	0.513	34	415	1.2
856.7	0.933	15	0.448	26	443	1.1	13	0.817	39	507	0.788
857.4	0.490	10	0.589	25	390	1.1	7.1	1.1	39	446	0.812
858.1	0.490	12	0.681	22	392	1.3	7.1	1.2	34	448	0.920
858.8	0.490	11	0.557	23	378	2.3	7.1	1.0	35	432	1.7
859.5	0.490	12	0.675	21	326	1.1	7.1	1.2	32	373	0.838
860.2	0.490	12	0.440	22	355	1.4	7.1	0.802	34	406	1.1
860.9	0.490	15	0.710	30	430	1.9	7.1	1.3	45	491	1.4
861.6	0.490	13	0.635	26	410	1.4	7.1	1.2	39	469	1.0
862.3	0.490	12	0.719	30	433	2.0	7.1	1.3	46	496	1.4
863.0	0.490	14	0.497	25	400	1.4	7.1	0.907	39	457	1.0
863.7	0.490	12	0.772	24	391	1.4	7.1	1.4	36	447	0.996
864.4	0.490	14	0.562	26	394	1.6	7.1	1.0	40	450	1.2
865.1	0.490	13	0.712	31	408	1.4	7.1	1.3	47	467	1.0
865.8	0.490	13	0.579	28	387	1.4	7.1	1.1	42	443	0.995
866.5	0.490	13	0.975	32	458	2.3	7.1	1.8	50	524	1.7
867.2	0.490	12	0.756	35	394	1.3	7.1	1.4	54	450	0.975
867.8	0.490	16	0.626	30	382	1.6	7.1	1.1	47	437	1.2
868.5	0.490	14	0.736	36	386	1.7	7.1	1.3	55	442	1.3
869.2	0.680	13	0.586	30	409	1.9	9.8	1.1	46	467	1.4
869.9	0.490	13	0.484	29	387	1.4	7.1	0.882	44	443	1.0
870.6	0.587	13	0.685	31	389	1.9	8.5	1.2	47	445	1.4
871.3	0.490	16	0.960	32	439	1.5	7.1	1.8	50	502	1.1
872.0	0.490	14	0.935	33	434	1.4	7.1	1.7	51	496	1.0
872.7	0.490	13	0.797	33	464	2.4	7.1	1.5	51	531	1.8
873.4	0.490	14	0.870	31	367	1.0	7.1	1.6	47	419	0.736
874.1	0.490	15	0.573	38	450	2.9	7.1	1.0	58	514	2.1
874.8	0.490	14	0.731	42	417	1.4	7.1	1.3	65	477	0.988
875.5	0.490	12	0.975	34	372	1.9	7.1	1.8	51	425	1.4
876.2	0.490	16	0.650	35	420	1.6	7.1	1.2	53	480	1.1
876.9	0.490	14	0.981	35	457	2.0	7.1	1.8	54	522	1.5
877.6	0.490	17	0.741	33	390	1.3	7.1	1.4	50	446	0.984
878.3	0.490	16	0.994	39	493	2.7	7.1	1.8	59	564	2.0
879.0	0.490	14	0.734	32	408	2.0	7.1	1.3	50	466	1.5
879.7	0.632	15	1.1	35	460	1.7	9.1	1.9	54	526	1.2
880.4	0.490	16	0.844	34	445	1.5	7.1	1.5	51	509	1.1
881.1	0.490	18	0.884	40	469	1.9	7.1	1.6	61	536	1.4
881.8	0.490	15	1.4	37	512	1.8	7.1	2.6	57	586	1.3
882.5	0.490	14	0.923	41	490	2.4	7.1	1.7	63	560	1.8
883.2	0.490	14	0.923	38	469	1.7	7.1	1.7	59	536	1.3
883.9	0.744	17	0.907	43	471	1.1	11	1.7	66	539	0.782
884.6	0.490	14	0.708	40	451	2.4	7.1	1.3	62	516	1.7
885.3	0.490	17	1.2	44	492	1.9	7.1	2.2	67	563	1.4
886.0	0.490	15	0.708	42	452	2.1	7.1	1.3	64	517	1.6
886.7	0.490	15	1.0	42	519	1.8	7.1	1.9	64	593	1.3
887.4	0.490	15	0.920	47	522	1.8	7.1	1.7	71	597	1.3
888.1	0.490	16	1.1	46	558	1.7	7.1	2.0	71	638	1.2
888.8	0.490	17	0.955	50	596	2.1	7.1	1.7	76	681	1.5
889.5	0.490	12	1.1	51	530	2.0	7.1	2.0	78	606	1.5
890.2	0.551	14	1.2	42	454	2.1	8.0	2.2	64	519	1.5
890.9	0.490	12	1.3	50	593	3.6	7.1	2.4	77	678	2.7
891.6	0.490	18	1.5	51	535	2.6	7.1	2.8	78	611	1.9
892.3	0.490	15	1.1	48	467	3.2	7.1	2.0	74	534	2.3
893.0	0.490	14	1.1	42	487	1.8	7.1	2.1	64	557	1.3
893.7	0.490	13	1.1	38	481	3.0	7.1	2.0	58	551	2.2
894.3	0.490	17	1.5	44	517	2.5	7.1	2.8	68	592	1.8
895.0	0.490	17	1.3	50	506	1.5	7.1	2.4	76	579	1.1
895.7	0.490	18	1.4	52	556	2.0	7.1	2.5	80	636	1.5
896.4	0.490	16	1.7	43	515	2.1	7.1	3.2	66	589	1.5
897.1	0.490	14	1.9	43	480	2.2	7.1	3.4	66	548	1.6
897.8	0.490	17	1.8	55	509	2.4	7.1	3.3	84	582	1.7
898.5	0.490	16	1.8	60	491	1.7	7.1	3.3	92	562	1.3
899.2	0.490	16	1.4	51	472	2.3	7.1	2.6	78	540	1.7
899.9	0.490	17	1.6	46	505	2.2	7.1	2.9	71	577	1.6
900.6	0.490	14	1.3	44	448	3.2	7.1	2.4	68	513	2.3
901.3	0.490	18	1.8	52	510	3.5	7.1	3.3	80	583	2.5
902.0	0.652	16	1.6	56	509	2.5	9.4	3.0	86	582	1.8
902.7	0.490	18	1.6	51	565	2.9	7.1	2.9	78	646	2.1
903.4	0.490	15	1.7	48	421	2.5	7.1	3.1	74	481	1.8



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Sample ID: 011

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
904.1	0.490	19	1.6	48	524	2.3	7.1	2.9	74	599	1.7
904.8	0.615	15	1.2	49	447	2.5	8.9	2.3	75	511	1.8
905.5	0.490	15	1.6	59	463	1.8	7.1	2.9	90	530	1.3
906.2	0.490	16	1.9	54	483	1.7	7.1	3.4	82	552	1.2
906.9	0.490	14	1.4	43	403	2.4	7.1	2.5	66	461	1.7
907.6	0.490	19	1.8	47	425	2.8	7.1	3.3	72	486	2.0
908.3	0.533	19	2.0	55	435	2.5	7.7	3.7	84	497	1.8
909.0	0.581	16	1.5	54	414	2.6	8.4	2.8	82	474	1.9
909.7	0.490	17	1.6	44	383	1.7	7.1	3.0	68	438	1.3
910.4	0.490	17	1.8	47	394	2.0	7.1	3.2	72	450	1.5
911.1	0.490	15	1.8	51	376	2.1	7.1	3.4	79	430	1.6
911.8	0.490	15	1.5	49	349	2.1	7.1	2.7	76	399	1.5
912.5	0.490	18	1.9	45	400	2.0	7.1	3.5	69	458	1.5
913.2	0.892	17	1.6	46	371	2.0	13	2.9	70	424	1.5
913.9	0.490	19	1.6	48	387	1.3	7.1	2.9	74	442	0.977
914.6	0.490	18	2.1	54	390	1.5	7.1	3.9	83	446	1.1
915.3	0.490	16	1.9	50	377	1.8	7.1	3.4	76	431	1.3
916.0	0.490	15	1.8	41	381	1.5	7.1	3.3	63	436	1.1
916.7	0.490	17	1.9	44	298	1.8	7.1	3.4	67	341	1.3
917.4	0.490	19	2.0	48	366	2.6	7.1	3.6	73	419	1.9
918.1	0.490	15	1.6	46	334	2.2	7.1	2.9	71	381	1.6
918.8	0.490	17	1.6	46	354	1.7	7.1	3.0	71	404	1.3
919.5	0.490	15	1.8	52	351	1.9	7.1	3.2	79	402	1.4
920.2	0.490	16	1.5	41	344	2.2	7.1	2.8	62	393	1.6
920.9	0.490	15	1.6	53	332	1.5	7.1	2.9	81	380	1.1
921.5	0.490	15	2.0	52	382	1.5	7.1	3.6	80	437	1.1
922.2	0.490	17	1.9	44	290	1.7	7.1	3.5	67	332	1.2
922.9	0.490	15	1.7	49	372	1.6	7.1	3.1	75	425	1.1
923.6	0.490	18	1.4	45	318	1.7	7.1	2.5	69	363	1.2
924.3	0.490	18	1.2	45	314	2.1	7.1	2.1	69	359	1.6
925.0	0.490	17	2.0	52	317	1.8	7.1	3.6	80	362	1.3
925.7	0.490	14	1.7	44	270	1.5	7.1	3.1	68	309	1.1
926.4	0.490	15	1.5	51	336	1.7	7.1	2.8	78	385	1.3
927.1	0.490	15	1.9	42	276	1.4	7.1	3.5	65	316	1.0
927.8	0.490	17	1.6	49	292	1.9	7.1	3.0	76	334	1.4
928.5	0.490	18	2.1	47	309	2.1	7.1	3.8	72	353	1.6
929.2	0.490	17	1.6	44	298	1.7	7.1	3.0	68	341	1.2
929.9	0.490	15	1.5	53	307	0.917	7.1	2.8	81	351	0.669
930.6	0.490	15	2.1	55	307	2.0	7.1	3.9	85	351	1.4
931.3	0.490	18	1.5	49	321	1.6	7.1	2.7	75	367	1.2
932.0	0.490	14	2.0	41	265	1.8	7.1	3.7	63	303	1.3
932.7	0.490	16	1.8	48	339	1.6	7.1	3.2	74	388	1.2
933.4	0.641	14	1.4	40	240	1.6	9.3	2.6	62	275	1.2
934.1	0.544	16	1.9	48	279	1.6	7.9	3.4	74	319	1.2
934.8	0.524	14	1.5	43	299	1.5	7.6	2.8	67	342	1.1
935.5	0.490	20	1.9	53	323	1.6	7.1	3.5	81	369	1.1
936.2	0.490	15	1.8	46	263	1.9	7.1	3.4	70	301	1.4
936.9	0.670	16	2.0	50	309	1.5	9.7	3.6	76	353	1.1
937.6	0.490	15	2.3	50	296	1.5	7.1	4.2	76	338	1.1
938.3	1.0	16	1.7	42	346	2.4	14	3.1	64	395	1.7
939.0	0.490	19	1.6	43	279	2.0	7.1	2.9	66	319	1.4
939.7	0.490	17	2.1	43	305	2.0	7.1	3.8	67	349	1.5
940.4	0.490	17	1.4	37	265	1.9	7.1	2.5	56	303	1.4
941.1	0.490	16	2.2	45	313	1.2	7.1	4.1	68	357	0.907
941.8	0.490	16	1.6	44	272	1.4	7.1	3.0	68	311	1.0
942.5	0.490	16	2.2	38	319	2.3	7.1	3.9	58	365	1.7
943.2	0.490	16	1.4	39	276	1.4	7.1	2.6	60	316	0.995
943.9	0.584	19	1.9	39	295	1.1	8.4	3.5	60	338	0.775
944.6	0.490	16	1.5	33	291	0.770	7.1	2.7	51	333	0.562
945.3	0.907	14	1.1	36	329	1.2	13	1.9	56	377	0.854
946.0	0.490	15	1.6	37	371	2.0	7.1	2.9	56	424	1.5
946.7	0.490	14	1.4	37	280	1.9	7.1	2.6	56	320	1.4
947.4	0.490	16	1.3	37	317	1.7	7.1	2.3	57	362	1.3
948.0	0.490	19	1.5	34	306	2.5	7.1	2.8	52	350	1.8
948.7	0.490	17	1.4	30	287	1.5	7.1	2.6	46	328	1.1
949.4	0.602	17	1.5	36	390	1.1	8.7	2.8	55	446	0.804
950.1	1.5	16	1.4	34	325	2.2	22	2.6	52	371	1.6
950.8	0.490	16	1.0	26	332	1.2	7.1	1.8	40	380	0.887
951.5	0.490	14	1.1	26	319	1.0	7.1	1.9	40	364	0.730
952.2	0.581	15	1.1	25	340	1.1	8.4	1.9	38	389	0.771
952.9	0.490	17	1.4	23	343	2.4	7.1	2.5	35	393	1.8
953.6	0.600	19	0.902	25	315	1.8	8.7	1.6	38	360	1.3
954.3	0.490	18	0.787	28	328	1.8	7.1	1.4	43	375	1.3
955.0	0.490	17	0.955	27	406	2.0	7.1	1.7	42	464	1.4
955.7	0.490	15	0.910	24	295	1.9	7.1	1.7	37	337	1.4
956.4	0.527	17	0.832	25	364	1.6	7.6	1.5	38	416	1.2
957.1	0.490	17	0.838	29	335	0.925	7.1	1.5	45	383	0.675
957.8	0.615	19	0.787	31	361	2.1	8.9	1.4	48	413	1.6
958.5	0.490	14	0.598	25	351	1.5	7.1	1.1	38	402	1.1
959.2	0.490	14	0.582	22	415	1.2	7.1	1.1	34	474	0.901
959.9	1.1	20	0.822	23	362	2.2	16	1.5	36	414	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.6	0.490	15	1.3	30	367	1.1	7.1	2.3	45	419	0.768
961.3	0.490	18	0.798	26	386	1.4	7.1	1.5	40	441	1.0
962.0	0.490	16	0.805	34	326	1.8	7.1	1.5	52	373	1.3
962.7	0.529	17	0.596	27	386	1.6	7.6	1.1	42	441	1.1
963.4	0.490	17	1.0	28	372	1.8	7.1	1.9	43	426	1.3
964.1	0.490	16	0.962	31	387	1.6	7.1	1.8	47	442	1.2
964.8	0.600	17	0.985	29	373	1.9	8.7	1.8	45	427	1.4
965.5	0.490	16	0.705	31	446	2.7	7.1	1.3	48	510	2.0
966.2	0.490	22	0.888	30	465	1.3	7.1	1.6	47	531	0.956
966.9	0.490	19	1.0	36	456	2.0	7.1	1.8	55	521	1.5
967.6	0.926	20	1.0	35	416	1.3	13	1.9	53	475	0.925
968.3	0.490	16	1.0	37	378	1.9	7.1	1.9	57	432	1.4
969.0	0.586	18	0.783	34	402	1.5	8.5	1.4	51	459	1.1
969.7	0.490	18	1.0	29	416	2.4	7.1	1.9	44	475	1.7
970.4	0.490	20	1.1	32	353	1.7	7.1	1.9	49	404	1.2
971.1	0.490	17	1.2	43	392	1.8	7.1	2.1	66	449	1.3
971.8	0.490	18	1.3	34	355	1.8	7.1	2.3	53	406	1.3
972.5	0.680	15	0.911	31	422	2.2	9.8	1.7	48	482	1.6
973.2	0.490	20	1.7	37	443	1.8	7.1	3.0	56	506	1.3
973.9	0.659	17	1.3	39	420	1.9	9.5	2.4	61	480	1.4
974.6	0.490	19	1.2	40	404	1.8	7.1	2.2	62	462	1.3
975.2	0.490	18	1.1	38	379	1.9	7.1	2.0	58	433	1.4
975.9	0.490	13	1.3	36	412	2.5	7.1	2.3	56	472	1.9
976.6	0.490	15	1.0	31	394	2.4	7.1	1.9	48	450	1.7
977.3	0.490	20	1.4	43	432	3.2	7.1	2.6	65	494	2.3
978.0	0.490	18	1.5	47	415	2.0	7.1	2.8	72	474	1.4
978.7	0.490	17	1.4	40	442	2.1	7.1	2.5	62	506	1.5
979.4	0.490	17	1.2	40	487	2.6	7.1	2.2	61	556	1.9
980.1	0.490	20	1.2	47	418	2.0	7.1	2.1	71	478	1.5
980.8	0.490	19	1.5	43	429	2.6	7.1	2.8	66	490	1.9
981.5	0.490	16	1.1	49	453	1.7	7.1	2.0	75	519	1.2
982.2	0.593	16	1.4	44	410	1.5	8.6	2.5	68	469	1.1
982.9	0.490	15	1.7	40	415	2.6	7.1	3.0	62	475	1.9
983.6	0.490	19	1.9	48	442	1.7	7.1	3.4	73	506	1.3
984.3	0.490	18	1.2	38	360	2.0	7.1	2.2	58	411	1.5
985.0	0.490	14	1.8	44	409	2.7	7.1	3.2	67	467	1.9
985.7	0.490	14	1.8	43	405	3.4	7.1	3.4	66	463	2.5
986.4	0.490	19	1.9	49	447	2.8	7.1	3.4	75	511	2.0
987.1	0.490	16	1.7	47	393	3.0	7.1	3.1	72	449	2.2
987.8	0.490	21	1.6	52	372	2.0	7.1	3.0	80	425	1.5
988.5	0.490	15	1.7	40	323	2.0	7.1	3.0	61	370	1.4
989.2	0.490	15	1.8	40	372	1.9	7.1	3.4	61	425	1.4
989.9	0.490	17	1.7	42	400	1.7	7.1	3.1	65	458	1.2
990.6	0.490	17	2.0	47	334	2.8	7.1	3.7	73	382	2.1
991.3	0.490	18	1.4	50	385	2.6	7.1	2.6	76	440	1.9
992.0	0.490	16	1.5	46	335	2.4	7.1	2.8	70	383	1.8
992.7	0.490	15	1.8	48	331	2.3	7.1	3.3	74	379	1.7
993.4	0.490	20	2.0	47	339	2.2	7.1	3.7	71	387	1.6
994.1	0.490	18	2.0	47	304	1.7	7.1	3.7	72	348	1.2
994.8	0.490	19	1.7	48	348	2.4	7.1	3.1	74	398	1.7
995.5	0.490	17	1.5	51	378	1.9	7.1	2.7	78	432	1.4
996.2	0.490	15	1.5	41	309	1.9	7.1	2.8	62	353	1.4
996.9	0.490	17	1.8	51	348	1.8	7.1	3.2	78	398	1.3
997.6	0.490	17	1.6	45	340	2.3	7.1	3.0	69	389	1.7
998.3	0.490	19	1.5	45	323	1.6	7.1	2.7	69	370	1.2
999.0	0.490	16	1.9	42	328	1.8	7.1	3.5	65	375	1.3
999.7	0.490	17	1.5	46	332	2.0	7.1	2.7	71	380	1.5
1000.4	0.490	18	1.8	46	342	1.9	7.1	3.4	71	391	1.4
1001.1	0.490	16	1.5	44	298	1.2	7.1	2.8	68	340	0.881
1001.7	0.490	16	1.7	51	328	1.1	7.1	3.1	77	375	0.791
1002.4	0.490	13	1.9	39	283	1.9	7.1	3.5	59	324	1.4
1003.1	0.490	16	1.6	41	366	0.988	7.1	3.0	63	419	0.721
1003.8	0.490	16	1.3	44	286	2.1	7.1	2.3	68	327	1.5
1004.5	0.490	15	1.4	46	292	1.6	7.1	2.5	70	333	1.2
1005.2	0.490	15	1.6	38	353	2.1	7.1	3.0	59	404	1.5
1005.9	0.490	16	1.8	38	300	1.8	7.1	3.3	59	343	1.3
1006.6	0.490	17	1.7	43	317	2.4	7.1	3.1	66	363	1.7
1007.3	0.490	16	1.4	41	296	1.9	7.1	2.5	62	339	1.4
1008.0	0.490	13	1.3	31	268	1.4	7.1	2.3	48	306	1.0
1008.7	0.490	13	1.5	33	272	0.792	7.1	2.7	50	311	0.578
1009.4	0.490	14	1.2	37	342	1.6	7.1	2.2	57	392	1.2
1010.1	0.490	16	1.5	37	290	1.4	7.1	2.8	57	332	0.996
1010.8	0.490	14	1.2	33	266	1.3	7.1	2.1	50	304	0.948
1011.5	0.490	11	1.2	36	330	1.6	7.1	2.1	55	377	1.2
1012.2	0.490	11	1.1	26	261	2.3	7.1	2.0	40	299	1.7
1012.9	0.490	14	1.1	35	387	1.7	7.1	2.0	53	443	1.2
1013.6	0.490	13	1.0	32	286	2.5	7.1	1.9	49	328	1.8
1014.3	0.506	14	0.883	33	287	2.0	7.3	1.6	51	328	1.4
1015.0	0.490	12	0.970	29	261	1.3	7.1	1.8	45	298	0.980
1015.7	0.602	13	0.723	32	346	2.1	8.7	1.3	50	396	1.5
1016.4	0.490	14	0.689	24	310	1.7	7.1	1.3	37	355	1.2



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1017.1	0.490	15	0.855	29	309	1.5	7.1	1.6	45	353	1.1
1017.8	0.611	13	1.0	29	335	1.9	8.8	1.8	45	383	1.4
1018.5	0.490	14	0.738	26	259	2.4	7.1	1.3	40	296	1.8
1019.2	0.490	12	1.1	27	307	1.5	7.1	1.9	41	351	1.1
1019.9	0.490	12	0.731	29	296	1.4	7.1	1.3	44	338	1.1
1020.6	0.490	11	0.841	27	306	1.7	7.1	1.5	42	350	1.2
1021.3	0.490	12	0.840	23	278	1.3	7.1	1.5	35	318	0.966
1022.0	0.490	11	0.674	24	324	1.9	7.1	1.2	36	371	1.4
1022.7	0.490	13	1.2	22	352	1.7	7.1	2.2	34	402	1.2
1023.4	0.490	13	0.747	23	335	2.3	7.1	1.4	35	383	1.7
1024.1	0.490	14	0.728	24	309	0.583	7.1	1.3	37	354	0.426
1024.8	0.490	12	0.662	21	338	2.3	7.1	1.2	32	387	1.7
1025.5	0.490	11	0.473	21	342	1.8	7.1	0.863	32	392	1.3
1026.2	0.490	11	0.666	19	285	1.5	7.1	1.2	29	326	1.1
1026.9	0.490	11	0.422	22	338	1.4	7.1	0.769	33	387	1.0
1027.6	0.490	11	0.501	22	298	1.8	7.1	0.915	33	340	1.3
1028.2	0.490	12	0.637	18	281	1.2	7.1	1.2	27	322	0.860
1028.9	0.490	11	0.495	20	340	1.7	7.1	0.903	31	389	1.3
1029.6	0.490	11	0.528	21	338	1.7	7.1	0.964	32	386	1.2
1030.3	0.490	10	0.515	18	325	1.7	7.1	0.940	28	371	1.2
1031.0	0.490	9.7	0.766	20	353	1.6	7.1	1.4	31	404	1.2
1031.7	0.536	11	0.498	20	272	1.5	7.7	0.909	30	311	1.1
1032.4	0.490	10.0	0.430	20	349	1.5	7.1	0.785	30	399	1.1
1033.1	0.490	11	0.544	20	354	1.9	7.1	0.992	31	405	1.4
1033.8	0.490	11	0.573	17	306	1.6	7.1	1.0	27	350	1.1
1034.5	0.490	11	0.263	20	372	1.4	7.1	0.480	31	425	1.0
1035.2	0.490	9.6	0.564	19	346	2.1	7.1	1.0	29	396	1.5
1035.9	0.490	12	0.507	18	347	1.9	7.1	0.925	27	397	1.4
1036.6	0.490	12	0.393	17	315	1.9	7.1	0.716	25	360	1.4
1037.3	0.490	12	0.612	19	366	1.9	7.1	1.1	29	419	1.4
1038.0	0.490	11	0.495	16	341	1.5	7.1	0.903	24	390	1.1
1038.7	0.490	11	0.438	14	332	2.4	7.1	0.798	22	379	1.7
1039.4	0.490	11	0.434	16	345	2.2	7.1	0.791	25	394	1.6
1040.1	0.490	11	0.568	15	344	0.984	7.1	1.0	23	394	0.718
1040.8	0.853	11	0.350	17	361	2.7	12	0.637	25	412	2.0
1041.5	0.490	14	0.226	13	340	2.2	7.1	0.412	21	388	1.6
1042.2	0.490	9.3	0.308	14	325	1.3	7.1	0.562	21	371	0.980
1042.9	0.490	9.0	0.531	12	362	1.7	7.1	0.968	18	413	1.2
1043.6	0.490	11	0.400	16	366	1.4	7.1	0.729	24	419	1.0
1044.3	0.490	10	0.396	16	365	2.1	7.1	0.721	25	418	1.5
1045.0	0.490	13	0.471	15	331	1.9	7.1	0.858	23	379	1.4
1045.7	0.490	10	0.463	21	342	1.8	7.1	0.844	32	391	1.3
1046.4	0.640	11	0.467	15	372	2.1	9.2	0.852	23	425	1.6
1047.1	0.490	12	0.398	18	355	2.4	7.1	0.725	28	406	1.7
1047.8	0.490	12	0.473	17	344	2.0	7.1	0.862	26	393	1.5
1048.5	0.490	11	0.400	19	373	3.3	7.1	0.729	30	427	2.4
1049.2	0.490	9.8	0.503	21	397	1.6	7.1	0.918	32	453	1.1
1049.9	0.490	10	0.468	17	343	1.7	7.1	0.854	25	392	1.3
1050.6	0.490	13	0.483	20	360	3.1	7.1	0.881	30	412	2.3
1051.3	0.490	12	0.582	18	360	2.2	7.1	1.1	28	411	1.6
1052.0	0.490	12	0.378	15	352	1.1	7.1	0.689	24	403	0.807
1052.7	0.490	11	0.437	19	387	1.7	7.1	0.797	29	442	1.2
1053.4	0.490	12	0.582	22	364	1.2	7.1	1.1	34	416	0.907
1054.0	0.490	12	0.554	20	329	1.7	7.1	1.0	31	376	1.3
1054.7	0.490	12	0.470	20	354	3.1	7.1	0.857	31	405	2.3
1055.4	0.490	12	0.657	22	348	1.7	7.1	1.2	34	398	1.3
1056.1	0.490	13	0.801	22	365	2.4	7.1	1.5	33	417	1.8
1056.8	0.490	12	0.636	26	388	0.841	7.1	1.2	40	444	0.613
1057.5	0.606	13	0.613	26	388	2.2	8.8	1.1	40	443	1.6
1058.2	0.490	13	0.736	23	388	1.6	7.1	1.3	36	444	1.2
1058.9	0.490	13	0.420	22	356	2.3	7.1	0.766	34	407	1.7
1059.6	0.490	12	0.564	25	372	1.9	7.1	1.0	38	425	1.4
1060.3	0.490	15	0.475	26	314	3.1	7.1	0.866	39	359	2.3
1061.0	0.490	12	0.457	29	426	2.0	7.1	0.834	45	488	1.5
1061.7	0.490	13	0.436	28	319	1.7	7.1	0.794	42	365	1.2
1062.4	0.490	12	0.663	27	342	1.8	7.1	1.2	42	391	1.3
1063.1	0.490	11	0.727	29	343	0.868	7.1	1.3	44	392	0.633
1063.8	0.490	12	0.736	24	306	1.1	7.1	1.3	37	350	0.792
1064.5	0.490	16	0.668	39	370	2.3	7.1	1.2	60	423	1.7
1065.2	0.490	15	0.649	28	328	1.9	7.1	1.2	44	375	1.4
1065.9	0.490	12	0.553	29	339	1.5	7.1	1.0	44	388	1.1
1066.6	0.490	11	0.689	35	431	1.8	7.1	1.3	53	492	1.3
1067.3	0.490	14	0.419	37	451	2.2	7.1	0.764	56	516	1.6
1068.0	0.490	15	0.657	30	352	1.3	7.1	1.2	47	403	0.969
1068.7	0.490	15	0.956	36	384	0.901	7.1	1.7	54	439	0.657
1069.4	0.490	13	0.728	39	363	2.4	7.1	1.3	59	415	1.7
1070.1	0.490	14	0.640	32	369	2.5	7.1	1.2	49	422	1.8
1070.8	0.616	16	0.426	40	434	2.8	8.9	0.777	61	497	2.0
1071.5	0.490	13	0.547	31	405	2.7	7.1	0.997	48	463	1.9
1072.2	0.490	13	0.986	37	393	2.2	7.1	1.8	57	450	1.6
1072.9	0.678	14	0.972	32	388	2.0	9.8	1.8	49	444	1.4



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.6	0.606	16	0.782	44	444	1.5	8.7	1.4	67	508	1.1
1074.3	0.641	16	0.858	37	408	2.7	9.3	1.6	57	467	2.0
1075.0	0.768	16	1.1	44	443	2.1	11	2.0	68	506	1.5
1075.7	0.490	14	1.0	40	382	1.8	7.1	1.9	62	437	1.3
1076.4	0.490	16	1.0	44	465	2.4	7.1	1.9	67	532	1.7
1077.1	0.512	15	1.1	50	490	2.9	7.4	2.0	77	560	2.1
1077.8	0.490	17	1.2	41	435	3.3	7.1	2.3	62	498	2.4
1078.5	0.490	14	1.2	46	424	2.3	7.1	2.2	71	484	1.7
1079.2	0.490	15	1.3	43	431	2.7	7.1	2.3	66	493	2.0
1079.9	0.490	15	1.0	44	427	3.1	7.1	1.9	67	488	2.3
1080.5	0.554	16	1.4	50	439	2.5	8.0	2.5	77	502	1.8
1081.2	0.490	16	1.1	51	470	2.7	7.1	2.0	79	537	2.0
1081.9	0.490	18	1.4	44	439	3.1	7.1	2.5	67	502	2.3
1082.6	0.490	17	1.4	48	478	3.2	7.1	2.5	74	546	2.3
1083.3	0.490	16	1.4	49	440	3.9	7.1	2.6	75	503	2.9
1084.0	0.490	17	2.2	52	499	4.2	7.1	4.0	80	570	3.1
1084.7	0.490	18	2.0	50	410	3.4	7.1	3.7	77	469	2.5
1085.4	0.490	19	2.4	53	508	3.2	7.1	4.4	81	581	2.3
1086.1	0.510	17	2.0	50	426	3.1	7.4	3.6	77	487	2.3
1086.8	0.490	16	2.2	60	435	3.6	7.1	3.9	92	497	2.6
1087.5	0.490	16	2.4	51	434	4.3	7.1	4.3	79	497	3.2
1088.2	0.490	18	2.8	54	412	3.8	7.1	5.1	83	471	2.7
1088.9	0.490	18	3.2	62	456	4.9	7.1	5.8	95	522	3.6
1089.6	0.490	15	2.6	53	369	3.7	7.1	4.7	81	422	2.7
1090.3	0.490	18	2.5	60	419	4.7	7.1	4.6	92	479	3.4
1091.0	0.490	21	2.4	57	367	3.3	7.1	4.3	87	419	2.4
1091.7	0.490	18	2.5	50	321	2.6	7.1	4.6	77	367	1.9
1092.4	0.501	19	2.8	61	474	4.8	7.2	5.1	94	542	3.5
1093.1	0.490	18	2.6	52	354	4.0	7.1	4.7	79	404	2.9
1093.8	0.490	17	2.8	52	339	4.0	7.1	5.2	80	387	2.9
1094.5	0.490	20	2.7	47	308	2.8	7.1	4.9	72	352	2.0
1095.2	0.490	18	3.1	52	370	4.7	7.1	5.6	79	423	3.4
1095.9	0.490	22	2.7	55	426	5.1	7.1	5.0	84	487	3.7
1096.6	0.490	20	2.7	57	292	3.9	7.1	5.0	87	334	2.8
1097.3	0.490	19	2.4	53	279	3.6	7.1	4.3	81	318	2.6
1098.0	0.490	19	2.4	47	345	3.3	7.1	4.4	72	394	2.4
1098.7	0.490	15	2.1	46	256	2.7	7.1	3.9	71	293	1.9
1099.4	0.490	17	2.4	48	349	2.7	7.1	4.4	73	399	1.9
1100.1	0.795	18	2.1	48	273	4.1	11	3.9	73	312	3.0
1100.8	0.490	19	2.0	52	296	2.7	7.1	3.6	79	338	2.0
1101.5	0.750	17	2.2	49	283	2.1	11	3.9	75	324	1.5
1102.2	0.662	21	1.9	51	335	2.7	9.6	3.5	78	383	2.0
1102.9	0.629	19	1.9	55	326	2.6	9.1	3.4	84	373	1.9
1103.6	0.490	19	1.9	51	266	3.1	7.1	3.5	78	304	2.2
1104.3	0.490	15	1.6	39	226	2.5	7.1	3.0	59	259	1.8
1105.0	0.699	20	1.5	52	319	2.1	10	2.7	80	365	1.6
1105.7	0.490	19	2.0	48	274	3.6	7.1	3.7	73	313	2.6
1106.3	0.882	15	1.8	45	286	3.2	13	3.2	69	327	2.3
1107.0	0.490	20	1.5	45	310	2.6	7.1	2.8	68	354	1.9
1107.7	0.490	18	1.3	38	315	2.6	7.1	2.5	58	361	1.9
1108.4	0.646	18	1.6	46	334	3.2	9.3	3.0	70	381	2.4
1109.1	0.490	17	1.5	39	266	2.9	7.1	2.8	60	304	2.1
1109.8	0.555	16	1.4	46	264	3.1	8.0	2.6	71	302	2.3
1110.5	0.490	15	1.2	39	260	2.1	7.1	2.3	59	298	1.5
1111.2	0.531	14	1.5	42	297	2.7	7.7	2.7	64	339	2.0
1111.9	0.490	18	1.5	40	293	3.4	7.1	2.7	62	335	2.5
1112.6	0.490	16	1.4	40	258	1.7	7.1	2.5	61	295	1.2
1113.3	0.490	19	1.1	40	268	1.8	7.1	2.0	62	306	1.3
1114.0	0.506	16	1.6	33	273	2.5	7.3	2.8	51	312	1.8
1114.7	0.490	17	1.3	36	313	3.5	7.1	2.4	56	358	2.5
1115.4	0.544	17	1.2	41	301	2.7	7.9	2.2	63	344	2.0
1116.1	0.490	14	1.4	34	266	1.9	7.1	2.6	52	304	1.4
1116.8	0.490	15	1.2	32	345	3.8	7.1	2.3	49	395	2.8
1117.5	0.490	9.7	0.790	26	215	1.6	7.1	1.4	39	245	1.1
1118.2	0.536	14	1.0	30	261	2.2	7.7	1.9	46	298	1.6
1118.9	0.674	14	1.1	24	276	2.5	9.7	2.0	37	316	1.9
1119.6	0.905	16	0.918	29	296	4.2	13	1.7	44	338	3.0
1120.3	0.616	12	1.2	27	293	2.0	8.9	2.1	41	335	1.4
1121.0	0.490	14	0.931	28	283	2.6	7.1	1.7	43	324	1.9
1121.7	0.490	12	0.821	28	289	2.2	7.1	1.5	42	330	1.6
1122.4	0.685	16	0.776	27	343	3.4	9.9	1.4	41	393	2.5
1123.1	0.490	15	0.751	26	345	3.9	7.1	1.4	40	395	2.9
1123.8	0.490	11	0.824	17	281	2.3	7.1	1.5	26	321	1.7
1124.5	0.490	10	0.764	18	285	3.7	7.1	1.4	28	326	2.7
1125.2	0.562	12	1.1	18	335	2.9	8.1	2.1	27	384	2.1
1125.9	0.556	13	0.718	22	313	2.3	8.0	1.3	33	358	1.6
1126.6	0.490	11	0.796	22	327	3.5	7.1	1.5	34	373	2.6
1127.3	0.490	13	0.691	22	347	2.5	7.1	1.3	33	397	1.9
1128.0	0.490	9.5	0.591	23	328	3.6	7.1	1.1	36	375	2.6
1128.7	0.490	9.6	0.792	19	331	2.8	7.1	1.4	29	379	2.0
1129.4	0.490	12	0.552	20	313	3.4	7.1	1.0	31	358	2.5



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Sample ID: 011

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1130.1	0.490	13	0.453	19	338	3.5	7.1	0.826	30	386	2.5
1130.8	0.494	11	0.577	20	304	2.4	7.1	1.1	30	347	1.7
1131.5	0.580	11	0.440	20	375	3.3	8.4	0.802	30	429	2.4
1132.1	0.499	11	0.522	19	359	1.8	7.2	0.952	29	410	1.3
1132.8	0.490	9.7	0.533	15	310	2.4	7.1	0.973	23	354	1.8
1133.5	0.490	11	0.531	18	327	2.2	7.1	0.969	27	374	1.6
1134.2	0.490	10	0.565	13	306	1.9	7.1	1.0	20	350	1.4
1134.9	0.490	10	0.558	18	382	2.2	7.1	1.0	27	437	1.6
1135.6	0.521	12	0.434	16	304	2.5	7.5	0.791	24	348	1.8
1136.3	0.490	12	0.584	17	330	3.2	7.1	1.1	25	377	2.3
1137.0	0.490	8.8	0.693	16	305	2.7	7.1	1.3	25	348	2.0
1137.7	0.490	11	0.422	16	354	1.9	7.1	0.770	25	405	1.4
1138.4	0.490	11	0.741	18	361	3.0	7.1	1.4	28	413	2.2
1139.1	0.528	11	0.639	16	331	2.8	7.6	1.2	25	378	2.1
1139.8	0.547	11	0.700	15	344	3.0	7.9	1.3	23	394	2.2
1140.5	0.490	10	0.516	15	304	2.4	7.1	0.941	22	348	1.7
1141.2	0.544	9.7	0.339	15	359	1.9	7.8	0.618	22	411	1.4
1141.9	0.626	11	0.690	14	313	2.6	9.0	1.3	22	358	1.9
1142.6	0.490	10	0.478	14	316	2.1	7.1	0.871	21	362	1.5
1143.3	1.2	12	0.552	17	389	3.3	17	1.0	26	445	2.4
1144.0	0.490	11	0.337	15	361	1.7	7.1	0.615	23	413	1.2
1144.7	0.490	12	0.838	17	334	2.7	7.1	1.5	26	382	2.0
1145.4	0.490	11	0.710	16	350	3.5	7.1	1.3	25	400	2.6
1146.1	0.490	11	0.475	17	370	3.3	7.1	0.866	26	423	2.4
1146.8	0.592	12	0.654	13	307	2.7	8.6	1.2	20	351	2.0
1147.5	0.490	11	0.812	14	332	2.2	7.1	1.5	21	379	1.6
1148.2	0.490	11	0.412	14	300	1.8	7.1	0.752	21	343	1.3
1148.9	0.562	11	0.698	15	358	2.9	8.1	1.3	23	409	2.1
1149.6	0.490	11	0.704	17	369	2.1	7.1	1.3	26	422	1.5
1150.3	0.490	12	0.670	13	332	2.2	7.1	1.2	20	380	1.6
1151.0	0.490	9.3	0.465	16	373	2.6	7.1	0.848	24	426	1.9
1151.7	0.490	10	0.558	12	329	2.4	7.1	1.0	19	376	1.7
1152.4	0.490	12	0.632	13	351	3.0	7.1	1.2	20	402	2.2
1153.1	0.490	13	0.838	21	365	2.0	7.1	1.5	32	417	1.5
1153.8	0.490	11	0.563	14	316	3.2	7.1	1.0	22	361	2.3
1154.5	0.490	10	0.749	16	299	2.5	7.1	1.4	24	342	1.8
1155.2	0.663	11	0.868	17	362	3.3	9.6	1.6	26	414	2.4
1155.9	0.490	12	0.751	15	318	3.6	7.1	1.4	22	363	2.6
1156.6	0.526	11	0.701	18	365	4.3	7.6	1.3	28	417	3.1
1157.3	0.628	11	0.775	15	387	2.8	9.1	1.4	24	443	2.0
1158.0	0.490	12	0.961	15	303	3.6	7.1	1.8	24	347	2.6
1158.7	0.490	11	0.988	16	332	4.9	7.1	1.8	25	380	3.6
1159.3	0.490	12	1.0	18	383	4.0	7.1	1.8	28	438	2.9
1160.0	0.490	11	0.741	15	313	3.5	7.1	1.4	23	358	2.5
1160.7	0.490	13	1.1	14	317	3.2	7.1	2.0	22	362	2.4
1161.4	0.827	11	1.1	17	324	3.8	12	2.0	25	371	2.8
1162.1	0.490	12	1.3	14	371	3.5	7.1	2.4	21	424	2.5
1162.8	0.845	11	0.836	19	356	4.3	12	1.5	28	408	3.1
1163.5	0.490	9.3	1.2	17	313	3.3	7.1	2.1	26	358	2.4
1164.2	0.490	13	1.6	17	332	3.7	7.1	2.9	27	380	2.7
1164.9	0.500	11	1.1	17	381	3.5	7.2	1.9	26	436	2.6
1165.6	0.490	15	1.3	21	345	4.2	7.1	2.4	33	394	3.1
1166.3	0.490	14	1.5	14	352	2.4	7.1	2.8	21	403	1.7
1167.0	0.490	13	1.6	21	385	4.7	7.1	2.9	33	440	3.4
1167.7	0.490	13	1.6	16	367	4.0	7.1	2.8	25	420	2.9
1168.4	0.490	14	1.7	20	344	4.3	7.1	3.1	31	394	3.1
1169.1	0.490	14	1.4	18	303	3.1	7.1	2.6	28	346	2.2
1169.8	0.757	15	1.6	23	301	3.8	11	3.0	35	344	2.8
1170.5	0.490	13	1.7	20	336	4.1	7.1	3.2	31	385	3.0
1171.2	0.490	14	1.9	22	311	3.9	7.1	3.6	34	356	2.8
1171.9	0.744	14	1.6	18	295	2.6	11	3.0	27	337	1.9
1172.6	0.490	12	1.6	18	320	3.1	7.1	2.9	27	365	2.3
1173.3	0.547	12	1.3	21	285	2.5	7.9	2.3	32	326	1.8
1174.0	0.898	14	1.1	22	314	2.5	13	2.0	34	359	1.8
1174.7	0.490	13	0.989	17	284	3.2	7.1	1.8	26	325	2.3
1175.4	0.504	13	1.5	17	320	3.3	7.3	2.8	26	366	2.4
1176.1	0.490	13	1.1	22	299	3.3	7.1	2.0	33	342	2.4
1176.8	0.490	12	1.0	24	295	4.0	7.1	1.9	37	338	2.9
1177.5	0.490	15	1.4	22	312	3.3	7.1	2.5	34	356	2.4
1178.2	0.490	13	1.4	20	331	2.9	7.1	2.5	31	378	2.1
1178.9	0.490	15	1.2	25	308	3.0	7.1	2.3	38	352	2.2
1179.6	0.490	15	1.5	23	324	2.6	7.1	2.8	35	370	1.9
1180.3	0.490	13	1.1	25	293	2.6	7.1	2.0	38	336	1.9
1181.0	0.490	12	1.1	20	248	2.6	7.1	2.0	31	284	1.9
1181.7	0.714	14	1.1	27	309	3.6	10	2.0	42	353	2.6
1182.4	0.766	15	1.3	32	333	2.3	11	2.4	49	381	1.7
1183.1	0.490	11	1.1	27	275	1.9	7.1	2.0	42	315	1.4
1183.8	0.490	15	1.0	27	257	3.3	7.1	1.9	41	294	2.4
1184.5	0.490	12	1.5	27	289	3.8	7.1	2.7	42	330	2.8
1185.1	0.490	11	1.2	19	255	2.7	7.1	2.1	29	292	2.0
1185.8	0.490	12	1.1	27	266	2.9	7.1	2.0	42	304	2.1



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Sample ID: 011

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1186.5	0.490	14	1.0	26	313	4.2	7.1	1.8	41	358	3.1
1187.2	0.490	13	1.2	25	261	2.7	7.1	2.2	38	299	2.0
1187.9	0.490	13	1.2	31	301	3.1	7.1	2.1	47	344	2.2
1188.6	0.490	13	1.1	29	274	3.6	7.1	2.0	44	313	2.6
1189.3	0.516	13	1.3	32	305	3.5	7.5	2.5	49	349	2.6
1190.0	0.490	13	1.1	36	375	3.7	7.1	2.0	55	429	2.7
1190.7	0.490	14	1.1	29	353	4.3	7.1	2.0	44	404	3.1
1191.4	0.490	13	0.910	28	314	3.6	7.1	1.7	43	359	2.6
1192.1	0.490	13	0.985	30	332	2.7	7.1	1.8	46	380	2.0
1192.8	0.490	14	0.811	30	323	3.3	7.1	1.5	46	370	2.4
1193.5	0.594	15	1.7	32	308	3.8	8.6	3.2	49	353	2.8
1194.2	0.490	15	0.958	33	300	3.8	7.1	1.7	50	342	2.8
1194.9	0.490	14	1.2	34	329	3.9	7.1	2.1	51	376	2.8
1195.6	0.509	14	1.3	35	286	3.1	7.3	2.3	54	327	2.3
1196.3	0.970	15	0.946	34	357	4.1	14	1.7	52	408	3.0
1197.0	0.490	16	0.984	38	356	4.9	7.1	1.8	58	407	3.6
1197.7	0.490	16	0.909	41	316	4.5	7.1	1.7	62	361	3.3
1198.4	0.490	16	1.3	35	320	4.8	7.1	2.4	54	366	3.5
1199.1	0.490	12	1.2	37	343	4.5	7.1	2.2	56	392	3.3
1199.8	0.492	13	1.1	35	269	3.4	7.1	1.9	54	307	2.5
1200.5	0.490	11	1.1	34	347	3.3	7.1	2.1	53	397	2.4
1201.2	0.490	14	1.1	36	299	3.7	7.1	2.1	56	342	2.7
1201.9	0.490	15	1.2	38	397	6.3	7.1	2.2	58	454	4.6
1202.6	0.548	15	0.905	38	332	4.9	7.9	1.7	58	380	3.6
1203.3	0.565	15	1.3	40	393	4.9	8.2	2.3	61	450	3.6
1204.0	0.490	15	1.4	35	329	4.0	7.1	2.6	54	377	2.9
1204.7	0.490	14	1.4	40	368	4.8	7.1	2.5	61	421	3.5
1205.4	0.637	13	1.3	40	344	5.8	9.2	2.3	61	393	4.2
1206.1	0.599	17	1.3	39	330	4.4	8.7	2.4	60	378	3.2
1206.8	0.490	14	1.0	36	306	4.0	7.1	1.9	55	350	2.9
1207.5	0.490	13	0.789	39	331	4.1	7.1	1.4	60	378	3.0
1208.2	0.490	17	1.8	40	353	5.8	7.1	3.2	62	404	4.2
1208.9	0.490	15	0.946	44	356	6.7	7.1	1.7	68	407	4.9
1209.6	0.621	14	1.1	39	332	5.6	9.0	1.9	60	380	4.1
1210.3	0.786	15	1.3	41	337	6.2	11	2.4	62	385	4.5
1210.9	0.490	16	1.2	41	324	7.7	7.1	2.2	63	370	5.6
1211.6	0.490	14	1.3	44	347	5.0	7.1	2.4	67	397	3.7
1212.3	0.490	14	1.6	48	332	4.1	7.1	2.8	74	380	3.0
1213.0	0.536	14	1.1	41	339	5.2	7.7	2.0	63	388	3.8
1213.7	0.490	14	1.4	46	333	5.3	7.1	2.5	71	381	3.9
1214.4	0.605	14	1.2	40	356	5.7	8.7	2.1	61	408	4.1
1215.1	1.2	13	1.2	43	317	5.9	17	2.2	66	363	4.3
1215.8	0.490	15	1.3	40	319	5.3	7.1	2.3	61	365	3.9
1216.5	0.490	12	1.3	44	395	5.4	7.1	2.3	68	452	3.9
1217.2	0.490	14	1.4	44	331	5.8	7.1	2.6	68	378	4.2
1217.9	0.490	15	1.4	42	362	7.2	7.1	2.6	64	414	5.3
1218.6	0.490	14	1.4	43	325	6.2	7.1	2.5	66	372	4.5
1219.3	0.490	13	1.3	40	284	6.0	7.1	2.3	62	325	4.4
1220.0	0.598	18	1.2	44	322	6.6	8.6	2.3	67	368	4.8
1220.7	0.490	15	1.6	47	391	7.3	7.1	3.0	73	448	5.3
1221.4	0.788	19	1.4	47	335	7.9	11	2.6	72	383	5.7
1222.1	0.490	14	1.4	39	315	6.6	7.1	2.5	60	360	4.8
1222.8	0.490	15	1.1	46	277	6.1	7.1	2.1	70	316	4.4
1223.5	0.551	17	1.3	50	333	7.7	8.0	2.4	77	381	5.6
1224.2	0.490	17	1.7	57	337	7.3	7.1	3.1	87	385	5.3
1224.9	0.490	17	1.6	44	328	5.8	7.1	2.9	67	375	4.2
1225.6	0.490	17	1.4	52	373	5.3	7.1	2.5	80	426	3.9
1226.3	0.490	16	1.6	47	308	7.3	7.1	3.0	73	352	5.3
1227.0	0.490	15	1.5	49	328	6.1	7.1	2.7	75	375	4.4
1227.7	0.490	16	1.4	47	323	5.3	7.1	2.6	72	370	3.9
1228.4	0.490	15	1.8	45	271	6.8	7.1	3.3	69	310	5.0
1229.1	0.490	17	1.7	56	310	8.3	7.1	3.2	86	354	6.1
1229.8	0.490	15	1.5	52	301	7.2	7.1	2.6	80	345	5.3
1230.5	0.490	15	2.1	55	339	7.1	7.1	3.9	85	388	5.2
1231.2	0.490	18	2.3	47	329	7.2	7.1	4.1	72	377	5.3
1231.9	0.490	19	1.8	56	338	9.1	7.1	3.2	86	387	6.7
1232.6	0.490	17	1.8	54	334	6.9	7.1	3.2	83	382	5.1
1233.3	0.490	16	1.8	52	292	7.4	7.1	3.2	79	334	5.4
1234.0	0.490	15	2.3	56	323	6.2	7.1	4.1	86	369	4.5
1234.7	0.490	18	2.4	57	305	7.5	7.1	4.5	87	349	5.5
1235.4	0.702	16	2.0	54	261	6.9	10	3.7	83	298	5.0
1236.1	0.490	15	1.8	54	267	6.3	7.1	3.2	82	306	4.6
1236.8	0.490	17	1.8	56	352	8.1	7.1	3.3	86	402	5.9
1237.4	0.490	18	2.6	53	303	7.5	7.1	4.7	81	346	5.5
1238.1	0.725	17	2.3	57	274	7.1	10	4.2	88	313	5.2
1238.8	0.490	19	2.2	59	282	7.9	7.1	4.1	91	323	5.7
1239.5	0.490	19	2.5	58	276	8.6	7.1	4.6	88	315	6.2
1240.2	0.490	17	1.9	55	290	6.4	7.1	3.5	84	331	4.7
1240.9	0.743	18	2.4	62	325	9.9	11	4.4	94	371	7.2
1241.6	0.872	16	2.0	69	314	7.0	13	3.7	106	359	5.1
1242.3	1.1	17	1.6	59	303	6.3	16	3.0	91	347	4.6



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Sample ID: 011

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1243.0	0.490	17	2.2	61	351	9.1	7.1	4.0	93	402	6.7
1243.7	0.778	16	2.0	61	299	7.7	11	3.6	94	341	5.6
1244.4	0.490	16	1.8	57	297	5.8	7.1	3.4	87	339	4.2
1245.1	0.642	20	2.0	70	304	8.9	9.3	3.7	108	348	6.5
1245.8	0.551	18	2.0	63	297	6.5	7.9	3.6	96	339	4.8
1246.5	0.490	17	2.1	70	297	7.7	7.1	3.9	108	339	5.6
1247.2	0.490	14	1.7	58	303	6.7	7.1	3.2	89	347	4.9
1247.9	0.591	17	2.1	52	309	6.6	8.5	3.8	80	353	4.8
1248.6	0.490	17	2.0	57	271	7.9	7.1	3.6	88	310	5.7
1249.3	0.490	17	1.9	60	284	5.8	7.1	3.4	92	325	4.2
1250.0	0.490	18	1.8	61	270	6.5	7.1	3.2	93	309	4.7
1250.7	0.490	17	1.4	57	331	8.0	7.1	2.6	88	379	5.8
1251.4	0.603	17	1.9	61	299	8.6	8.7	3.4	93	342	6.3
1252.1	0.490	16	1.5	57	270	7.5	7.1	2.8	87	309	5.5
1252.8	0.490	16	1.8	51	260	7.0	7.1	3.3	79	297	5.1
1253.5	0.490	14	1.8	55	306	10.0	7.1	3.3	84	350	7.3
1254.2	0.678	16	2.2	53	278	7.9	9.8	4.1	80	318	5.8
1254.9	0.490	18	1.9	53	316	10	7.1	3.4	82	362	7.4
1255.6	0.490	16	1.6	57	287	7.1	7.1	2.8	88	328	5.2
1256.3	0.656	14	1.5	46	267	8.5	9.5	2.8	71	305	6.2
1257.0	0.490	16	1.9	46	281	9.0	7.1	3.5	70	321	6.6
1257.7	0.490	15	1.5	49	295	13	7.1	2.8	75	337	9.6
1258.4	0.749	17	2.1	48	303	11	11	3.8	74	346	7.9
1259.1	0.490	17	1.5	51	334	12	7.1	2.8	79	382	8.4
1259.8	0.490	12	1.7	45	296	12	7.1	3.1	68	339	8.9
1260.5	0.490	16	1.8	42	275	11	7.1	3.2	64	314	8.3
1261.2	0.678	15	1.7	46	332	14	9.8	3.2	70	380	10
1261.9	0.636	16	1.6	45	313	14	9.2	3.0	70	358	10.0
1262.6	0.610	12	1.3	37	257	13	8.8	2.3	57	294	9.2
1263.2	0.490	14	1.1	34	252	9.9	7.1	2.0	53	288	7.2
1263.9	0.490	15	0.709	34	298	10	7.1	1.3	53	341	7.6
1264.6	0.490	13	1.4	34	301	12	7.1	2.6	53	345	8.7
1265.3	0.490	15	0.925	36	264	12	7.1	1.7	54	302	8.5
1266.0	0.531	13	1.3	36	330	9.4	7.7	2.4	54	378	6.8
1266.7	0.791	14	1.2	34	298	11	11	2.2	52	340	8.2
1267.4	0.490	16	1.3	35	303	8.1	7.1	2.4	53	347	5.9
1268.1	0.490	14	1.1	31	304	10	7.1	2.1	48	348	7.4
1268.8	0.490	12	1.3	33	339	9.3	7.1	2.4	51	387	6.8
1269.5	0.490	12	1.2	33	368	11	7.1	2.1	51	421	8.0
1270.2	0.490	15	1.1	33	344	9.4	7.1	2.0	50	394	6.8
1270.9	0.537	13	1.3	33	370	10	7.8	2.4	51	423	7.6
1271.6	0.490	13	1.1	28	283	6.8	7.1	2.1	44	324	5.0
1272.3	0.490	12	1.3	34	368	11	7.1	2.3	52	421	8.3
1273.0	0.490	11	0.835	27	409	9.8	7.1	1.5	42	468	7.1
1273.7	0.798	13	0.952	27	341	11	12	1.7	41	390	8.3
1274.4	0.518	10	0.862	25	362	12	7.5	1.6	38	414	8.8
1275.1	0.490	12	0.746	22	324	8.5	7.1	1.4	34	371	6.2
1275.8	0.490	8.9	0.960	24	310	7.7	7.1	1.8	37	354	5.6
1276.5	0.490	12	0.679	21	398	8.8	7.1	1.2	32	455	6.4
1277.2	0.538	13	1.0	21	368	9.1	7.8	1.9	33	421	6.7
1277.9	0.525	13	1.0	23	353	10	7.6	1.9	36	404	7.6
1278.6	0.490	11	0.513	16	297	8.0	7.1	0.935	24	339	5.8
1279.3	0.490	11	0.720	23	346	6.9	7.1	1.3	35	396	5.1
1280.0	0.490	11	0.845	22	430	8.5	7.1	1.5	34	492	6.2
1280.7	0.490	11	0.890	21	360	8.2	7.1	1.6	33	412	6.0
1281.4	0.490	12	0.799	18	366	9.6	7.1	1.5	28	419	7.0
1282.1	0.490	12	0.525	25	380	9.7	7.1	0.957	39	435	7.1
1282.8	0.490	11	0.893	20	350	7.0	7.1	1.6	31	400	5.1
1283.5	0.490	11	0.853	20	366	6.8	7.1	1.6	30	419	4.9
1284.2	0.490	12	0.905	22	355	6.7	7.1	1.7	33	406	4.9
1284.9	0.490	9.6	1.1	23	347	7.1	7.1	2.0	35	397	5.2
1285.6	0.490	11	0.789	15	330	5.2	7.1	1.4	23	378	3.8
1286.3	0.490	9.6	0.864	21	369	5.1	7.1	1.6	32	422	3.8
1287.0	0.490	11	0.957	18	337	7.0	7.1	1.7	28	386	5.1
1287.7	0.787	9.4	0.838	22	348	10	11	1.5	33	398	7.4
1288.4	0.490	10	0.704	23	296	6.8	7.1	1.3	35	339	5.0
1289.1	0.497	9.2	1.0	22	314	6.5	7.2	1.8	33	359	4.7
1289.7	0.490	12	1.0	25	339	5.6	7.1	1.8	38	388	4.1
1290.4	0.490	10	0.909	19	336	6.2	7.1	1.7	29	384	4.5
1291.1	0.529	11	1.2	25	304	5.2	7.6	2.2	38	348	3.8
1291.8	0.490	14	1.0	27	367	8.4	7.1	1.8	41	420	6.1
1292.5	0.524	11	1.0	26	315	3.9	7.6	1.8	40	360	2.9
1293.2	0.490	11	1.1	30	325	7.5	7.1	2.0	46	371	5.5
1293.9	0.605	11	1.3	26	275	4.7	8.7	2.3	39	314	3.4
1294.6	0.490	9.4	1.1	24	312	6.2	7.1	2.0	37	357	4.5
1295.3	0.682	11	1.3	29	357	7.2	9.8	2.3	45	408	5.3
1296.0	0.490	12	1.3	28	287	5.9	7.1	2.3	43	328	4.3
1296.7	0.490	14	1.0	32	279	6.3	7.1	1.9	50	319	4.6
1297.4	0.490	11	1.3	32	318	6.8	7.1	2.3	49	363	4.9
1298.1	0.490	9.6	1.4	35	279	7.8	7.1	2.6	53	319	5.7
1298.8	0.490	12	1.3	38	310	6.5	7.1	2.4	58	355	4.8



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1299.5	0.659	13	1.1	40	361	7.7	9.5	2.1	62	413	5.6
1300.2	0.545	13	1.3	41	330	7.9	7.9	2.5	63	377	5.8
1300.9	0.490	11	1.0	31	271	5.6	7.1	1.9	47	310	4.1
1301.6	0.490	12	1.7	34	296	5.6	7.1	3.1	53	338	4.1
1302.3	0.490	12	1.3	33	263	5.7	7.1	2.4	50	301	4.1
1303.0	0.490	11	1.3	36	278	6.4	7.1	2.4	55	318	4.7
1303.7	0.490	10	1.2	34	251	5.0	7.1	2.2	52	287	3.7
1304.4	0.490	11	1.1	35	271	6.5	7.1	2.1	54	309	4.7
1305.1	0.490	12	1.1	36	267	7.6	7.1	2.1	56	305	5.5
1305.8	0.490	12	1.6	41	271	6.0	7.1	2.9	63	310	4.3
1306.5	0.490	13	1.5	37	261	5.5	7.1	2.8	57	299	4.0
1307.2	0.490	12	1.3	46	256	6.8	7.1	2.4	71	293	5.0
1307.9	0.490	13	2.0	44	275	6.1	7.1	3.6	68	314	4.4
1308.6	0.490	16	1.5	36	274	6.7	7.1	2.8	55	313	4.9
1309.3	0.510	14	1.3	46	246	6.3	7.4	2.4	71	281	4.6
1310.0	0.544	12	1.4	43	259	6.6	7.8	2.5	66	296	4.8
1310.7	0.490	13	1.5	39	287	7.0	7.1	2.7	60	328	5.1
1311.4	0.490	12	1.5	46	253	6.7	7.1	2.7	71	289	4.9
1312.1	0.490	14	1.4	40	243	5.9	7.1	2.6	62	277	4.3
1312.8	0.490	13	1.4	44	251	7.6	7.1	2.6	67	287	5.5
1313.5	0.490	12	1.5	42	242	6.8	7.1	2.8	64	277	5.0
1314.2	0.507	15	1.7	47	268	5.9	7.3	3.0	72	306	4.3
1314.9	0.490	14	1.9	49	295	7.4	7.1	3.5	75	338	5.4
1315.6	0.490	14	1.9	50	278	5.8	7.1	3.5	77	318	4.2
1316.2	0.490	12	1.8	52	272	6.8	7.1	3.3	80	311	4.9
1316.9	0.490	13	1.6	44	245	7.2	7.1	2.9	68	280	5.2
1317.6	0.490	13	1.6	55	286	5.6	7.1	2.9	84	327	4.1
1318.3	0.490	14	1.5	50	305	11	7.1	2.7	77	349	7.9
1319.0	0.543	16	1.8	55	313	9.0	7.8	3.3	84	358	6.6
1319.7	0.490	15	1.7	51	249	7.5	7.1	3.1	78	285	5.4
1320.4	0.753	14	1.7	50	282	6.4	11	3.2	77	323	4.6
1321.1	0.590	15	1.9	55	291	7.6	8.5	3.4	85	333	5.6
1321.8	0.490	16	1.8	54	300	9.3	7.1	3.2	83	343	6.8
1322.5	0.571	16	2.1	51	246	10.0	8.2	3.8	78	282	7.3
1323.2	0.490	15	1.5	52	284	7.7	7.1	2.8	79	324	5.6
1323.9	0.490	14	2.0	59	278	7.6	7.1	3.7	90	318	5.5
1324.6	0.806	18	1.8	55	291	8.5	12	3.2	84	333	6.2
1325.3	0.490	15	1.9	49	260	7.0	7.1	3.4	75	297	5.1
1326.0	0.490	17	1.7	54	287	7.8	7.1	3.2	82	328	5.7
1326.7	0.684	16	1.8	62	287	7.7	9.9	3.2	95	328	5.6
1327.4	0.490	15	1.8	47	232	10	7.1	3.3	72	265	7.3
1328.1	0.490	15	1.7	57	288	9.0	7.1	3.0	88	330	6.6
1328.8	0.490	16	1.9	58	256	7.2	7.1	3.5	89	293	5.2
1329.5	0.490	15	1.8	64	253	7.7	7.1	3.4	97	289	5.6
1330.2	0.599	14	2.1	59	273	11	8.7	3.9	90	312	7.8
1330.9	0.490	15	1.8	60	302	10	7.1	3.2	92	345	7.6
1331.6	0.745	13	1.7	56	289	7.6	11	3.2	86	330	5.6
1332.3	0.490	18	1.8	61	316	11	7.1	3.3	93	362	7.7
1333.0	0.490	18	2.3	66	294	7.0	7.1	4.2	101	336	5.1
1333.7	0.490	17	2.2	56	271	8.4	7.1	4.0	86	310	6.1
1334.4	0.490	16	2.2	57	238	9.0	7.1	4.0	87	273	6.6
1335.1	0.490	16	2.4	69	276	8.8	7.1	4.3	105	315	6.4
1335.8	0.490	14	1.8	64	311	11	7.1	3.3	98	356	8.0
1336.5	0.567	17	2.4	58	258	9.1	8.2	4.4	90	295	6.6
1337.2	0.603	18	1.7	59	273	9.4	8.7	3.1	90	312	6.9
1337.9	0.490	18	1.9	62	303	8.2	7.1	3.5	95	347	6.0
1338.6	0.490	16	2.0	61	284	11	7.1	3.7	93	325	8.1
1339.3	0.490	19	1.6	68	292	14	7.1	2.8	104	334	10
1340.0	0.490	19	1.8	70	280	11	7.1	3.3	107	321	8.2
1340.7	0.517	17	2.3	68	300	10	7.5	4.2	104	343	7.6
1341.4	0.633	16	1.7	61	274	10	9.1	3.1	93	314	7.3
1342.1	0.507	18	2.2	58	272	9.6	7.3	3.9	89	311	7.0
1342.7	1.1	18	2.2	70	274	12	16	4.0	107	313	8.5
1343.4	0.727	16	2.6	67	289	14	11	4.8	103	330	10
1344.1	0.490	18	2.0	62	292	10	7.1	3.6	94	334	7.5
1344.8	0.490	19	1.8	60	259	10	7.1	3.2	91	296	7.6
1345.5	0.810	17	1.9	62	271	13	12	3.5	94	310	9.4
1346.2	0.490	18	2.5	72	274	11	7.1	4.5	110	314	7.9
1346.9	0.501	18	2.2	65	290	12	7.2	4.0	99	331	8.7
1347.6	0.490	17	2.6	68	278	13	7.1	4.8	104	318	9.3
1348.3	0.490	18	2.3	81	303	14	7.1	4.2	124	346	9.9
1349.0	0.490	20	1.9	63	297	12	7.1	3.4	96	339	8.6
1349.7	0.490	21	2.1	62	262	11	7.1	3.9	95	300	8.2
1350.4	0.998	17	1.9	67	281	12	14	3.5	102	321	8.7
1351.1	0.490	19	2.3	64	252	12	7.1	4.1	97	288	8.6
1351.8	0.490	21	3.1	80	317	16	7.1	5.7	123	362	12
1352.5	0.490	21	2.3	72	278	16	7.1	4.1	111	318	11
1353.2	0.843	19	2.4	69	322	19	12	4.3	106	368	14
1353.9	0.490	19	2.6	69	336	17	7.1	4.8	106	384	13
1354.6	0.490	20	2.4	69	313	17	7.1	4.4	106	357	12
1355.3	0.983	20	2.4	70	317	17	14	4.5	108	362	12



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1356.0	0.490	19	2.5	66	300	18	7.1	4.5	100	343	13
1356.7	0.849	19	2.4	76	330	20	12	4.4	117	377	15
1357.4	0.490	17	2.3	62	271	19	7.1	4.3	94	310	14
1358.1	0.510	21	2.9	76	342	23	7.4	5.3	116	391	17
1358.8	0.490	18	2.5	59	272	23	7.1	4.6	90	311	17
1359.5	0.777	24	2.8	69	318	23	11	5.1	106	363	17
1360.2	0.499	21	3.1	74	274	23	7.2	5.6	113	313	17
1360.9	0.490	22	2.6	62	292	25	7.1	4.8	95	334	18
1361.6	0.490	22	2.7	63	344	32	7.1	4.9	97	393	23
1362.3	0.672	20	3.0	70	351	32	9.7	5.5	107	401	24
1363.0	0.678	21	2.4	73	307	34	9.8	4.4	112	352	25
1363.7	0.490	21	2.7	68	293	32	7.1	4.9	104	335	24
1364.4	0.543	19	2.6	67	317	33	7.8	4.7	102	362	24
1365.1	0.891	21	3.1	63	338	40	13	5.6	97	387	29
1365.8	0.490	20	2.6	62	291	35	7.1	4.8	95	333	26
1366.5	0.675	21	3.0	59	276	37	9.7	5.4	90	316	27
1367.2	0.671	20	3.5	64	302	43	9.7	6.4	97	345	32
1367.9	0.490	19	3.2	54	304	40	7.1	5.8	83	348	29
1368.6	0.490	21	2.6	67	297	44	7.1	4.7	103	340	32
1369.2	0.490	22	3.3	57	315	46	7.1	5.9	88	360	34
1369.9	0.530	24	2.7	61	272	39	7.6	5.0	93	311	29
1370.6	0.490	22	3.1	68	359	52	7.1	5.7	104	411	38
1371.3	0.623	22	3.2	62	319	57	9.0	5.8	95	365	42
1372.0	0.907	21	2.9	61	305	54	13	5.3	94	349	40
1372.7	1.1	18	3.3	55	310	54	15	6.0	84	355	40
1373.4	0.619	17	3.1	63	334	56	8.9	5.6	96	382	41
1374.1	0.490	20	2.8	61	304	51	7.1	5.1	93	347	37
1374.8	0.709	21	3.5	65	335	62	10	6.4	99	383	45
1375.5	0.510	18	3.0	49	245	49	7.4	5.5	75	281	36
1376.2	0.769	21	3.0	61	326	71	11	5.6	94	373	52
1376.9	0.490	18	3.2	62	335	75	7.1	5.9	95	383	55
1377.6	0.490	19	2.6	53	262	63	7.1	4.7	81	299	46
1378.3	0.490	19	2.9	53	289	61	7.1	5.2	81	331	44
1379.0	0.759	23	3.3	58	319	72	11	5.9	88	365	53
1379.7	0.490	21	3.4	59	318	67	7.1	6.1	91	363	49
1380.4	0.490	24	2.9	58	392	82	7.1	5.2	89	449	60
1381.1	0.490	20	3.1	65	324	80	7.1	5.7	99	371	58
1381.8	0.490	23	2.9	65	389	79	7.1	5.3	100	445	57
1382.5	0.490	19	3.0	48	277	65	7.1	5.5	73	317	47
1383.2	0.575	21	2.7	56	278	64	8.3	4.9	85	317	47
1383.9	0.490	17	2.7	55	324	81	7.1	4.9	85	370	59
1384.6	0.490	18	3.1	53	349	68	7.1	5.6	81	400	50
1385.3	0.490	19	2.4	59	317	66	7.1	4.4	91	363	48
1386.0	0.490	19	2.7	53	304	61	7.1	4.9	82	348	44
1386.7	0.490	21	2.7	52	296	67	7.1	4.9	80	338	49
1387.4	0.490	18	2.3	52	320	64	7.1	4.1	79	366	47
1388.1	0.490	19	2.8	54	318	61	7.1	5.0	82	364	45
1388.8	0.490	18	2.2	48	301	54	7.1	4.0	73	344	39
1389.5	0.490	21	2.8	64	372	65	7.1	5.2	97	425	47
1390.2	0.490	18	1.7	49	295	51	7.1	3.2	76	337	37
1390.9	0.490	18	2.7	54	302	52	7.1	4.8	82	346	38
1391.6	0.490	19	2.4	56	342	55	7.1	4.4	86	391	40
1392.3	0.508	17	1.9	47	331	54	7.3	3.4	72	379	39
1393.0	0.490	17	2.6	49	309	45	7.1	4.7	75	353	33
1393.7	0.595	17	2.2	55	283	41	8.6	3.9	84	324	30
1394.4	0.490	19	1.9	53	324	37	7.1	3.5	82	371	27
1395.1	0.673	16	1.7	45	290	35	9.7	3.1	69	332	25
1395.7	0.490	18	1.9	47	315	38	7.1	3.5	72	361	27
1396.4	0.599	18	2.1	52	319	35	8.6	3.8	80	365	26
1397.1	0.490	17	2.0	42	288	33	7.1	3.6	65	330	24
1397.8	0.490	22	1.9	46	318	24	7.1	3.5	71	363	18
1398.5	0.490	18	1.5	51	327	26	7.1	2.8	79	374	19
1399.2	1.0	18	1.9	50	334	22	15	3.5	76	382	16
1399.9	0.490	18	1.7	40	287	23	7.1	3.2	61	328	17
1400.6	0.604	15	1.6	40	294	25	8.7	2.9	61	336	18
1401.3	0.614	15	1.5	44	335	21	8.9	2.8	67	383	15
1402.0	0.722	17	1.6	49	327	21	10	2.9	75	374	15
1402.7	0.490	16	2.2	51	350	16	7.1	3.9	78	401	12
1403.4	0.490	15	1.5	44	280	16	7.1	2.7	67	321	12
1404.1	0.490	14	1.6	39	302	14	7.1	3.0	60	345	11
1404.8	0.490	17	0.980	41	305	15	7.1	1.8	63	349	11
1405.5	0.654	18	1.6	38	305	16	9.4	3.0	59	349	11
1406.2	0.769	18	1.7	40	343	15	11	3.1	62	392	11
1406.9	0.752	18	1.6	47	346	15	11	2.9	71	396	11
1407.6	0.787	18	2.0	44	317	21	11	3.6	67	363	15
1408.3	0.606	18	1.6	41	279	18	8.7	2.9	63	319	13
1409.0	0.490	17	1.6	43	286	13	7.1	2.9	66	327	9.2
1409.7	0.490	16	1.4	44	296	13	7.1	2.6	67	339	9.7
1410.4	0.766	19	1.4	46	311	13	11	2.6	70	356	9.4
1411.1	0.686	17	1.7	42	316	12	9.9	3.1	64	361	9.0
1411.8	0.749	19	1.5	42	324	11	11	2.8	64	370	7.8



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Sample ID: 011

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1412.5	0.719	16	1.4	43	345	12	10	2.6	66	394	9.0
1413.2	0.505	16	1.6	43	298	12	7.3	2.9	66	341	9.0
1413.9	0.524	15	1.6	34	267	10	7.6	2.9	53	305	7.4
1414.6	0.555	14	1.2	39	291	8.2	8.0	2.2	59	333	6.0
1415.3	0.611	17	1.3	40	304	6.8	8.8	2.4	62	348	4.9
1416.0	0.605	15	1.3	37	284	6.3	8.7	2.3	57	325	4.6
1416.7	0.608	19	1.1	35	288	8.0	8.8	2.1	54	329	5.9
1417.4	0.561	17	1.2	43	306	5.6	8.1	2.2	66	350	4.1
1418.1	0.490	17	1.3	38	275	6.1	7.1	2.4	58	314	4.4
1418.8	0.665	19	1.4	34	292	5.9	9.6	2.5	53	334	4.3
1419.5	0.618	19	1.4	35	319	5.8	8.9	2.5	54	365	4.2
1420.2	0.490	20	1.2	38	293	5.6	7.1	2.1	58	335	4.1
1420.9	0.596	17	1.4	33	305	5.9	8.6	2.5	51	348	4.3
1421.6	0.490	16	1.6	29	231	5.6	7.1	2.9	44	264	4.1
1422.2	0.868	19	1.4	34	267	6.1	13	2.5	52	305	4.5
1422.9	0.741	19	1.2	42	299	9.7	11	2.3	64	342	7.1
1423.6	0.961	19	1.8	36	277	6.0	14	3.2	55	317	4.4
1424.3	0.508	17	1.0	36	281	4.7	7.3	1.9	55	321	3.4
1425.0	0.490	17	1.2	36	277	6.2	7.1	2.2	55	317	4.5
1425.7	0.956	18	1.3	38	278	6.7	14	2.4	58	317	4.9
1426.4	0.565	20	1.0	34	292	7.7	8.2	1.9	52	333	5.6
1427.1	1.1	21	1.2	40	284	7.6	15	2.1	61	325	5.5
1427.8	0.662	22	1.3	32	275	5.4	9.6	2.4	49	315	3.9
1428.5	0.561	21	1.4	40	364	5.4	8.1	2.5	61	416	3.9
1429.2	0.504	20	1.4	33	279	4.9	7.3	2.5	50	319	3.6
1429.9	0.490	18	1.3	30	268	4.8	7.1	2.3	46	307	3.5
1430.6	0.876	19	1.5	35	308	4.9	13	2.7	53	352	3.5
1431.3	0.886	20	1.4	30	265	5.3	13	2.5	47	303	3.9
1432.0	0.490	16	1.1	28	251	5.1	7.1	2.1	44	287	3.7
1432.7	0.490	20	1.4	31	277	6.0	7.1	2.5	48	317	4.4
1433.4	0.737	23	3.5	32	289	5.6	11	6.3	49	331	4.1
1434.1	0.490	21	1.1	27	217	2.7	7.1	2.0	41	248	1.9
1434.8	1.1	19	1.6	33	319	4.4	16	2.9	50	365	3.2
1435.5	0.490	31	1.8	29	293	4.1	7.1	3.2	44	336	3.0
1436.2	1.4	23	1.4	30	271	4.4	20	2.6	46	310	3.2
1436.9	1.2	20	1.3	32	249	4.9	18	2.4	49	284	3.6
1437.6	0.490	24	1.0	30	267	4.6	7.1	1.9	46	305	3.4
1438.3	0.490	20	1.3	24	269	5.0	7.1	2.3	36	308	3.6
1439.0	0.896	22	1.6	24	268	4.2	13	3.0	37	307	3.1
1439.7	0.490	22	1.4	28	286	4.5	7.1	2.5	44	326	3.3
1440.4	0.682	25	1.6	29	324	7.6	9.9	2.9	44	370	5.5
1441.1	0.664	24	1.5	26	267	4.9	9.6	2.7	40	305	3.6
1441.8	0.860	24	1.3	24	267	6.6	12	2.5	37	305	4.8
1442.5	0.490	24	1.4	29	327	7.0	7.1	2.6	45	374	5.1
1443.2	0.506	21	1.3	23	269	6.5	7.3	2.4	35	307	4.7
1443.9	0.736	22	1.4	24	272	5.0	11	2.5	36	311	3.7
1444.6	0.680	24	1.7	25	269	6.0	9.8	3.1	38	307	4.4
1445.3	0.527	23	1.4	21	259	6.6	7.6	2.6	33	297	4.8
1446.0	0.632	26	1.3	24	323	5.8	9.1	2.5	37	370	4.3
1446.7	0.751	24	1.5	20	307	8.0	11	2.7	30	351	5.8
1447.4	0.905	24	1.5	24	285	5.5	13	2.7	37	326	4.0
1448.1	0.764	22	1.4	24	295	6.4	11	2.6	37	338	4.7
1448.7	0.764	28	1.7	25	278	5.7	11	3.0	39	318	4.2
1449.4	1.2	24	1.5	22	299	7.3	17	2.7	34	342	5.3
1450.1	0.490	28	1.6	25	314	7.6	7.1	2.8	39	358	5.5
1450.8	1.2	22	1.6	24	263	6.4	17	2.9	37	301	4.7
1451.5	0.800	27	1.9	25	290	6.8	12	3.4	38	331	4.9
1452.2	0.490	26	1.6	19	293	4.9	7.1	3.0	29	335	3.6
1452.9	0.490	25	1.7	23	270	6.6	7.1	3.1	36	309	4.9
1453.6	0.662	27	1.6	21	348	5.0	9.6	2.9	31	398	3.6
1454.3	0.644	27	1.5	23	341	5.1	9.3	2.7	36	390	3.7
1455.0	0.591	24	1.4	20	307	6.5	8.5	2.5	31	351	4.7
1455.7	0.490	29	2.0	20	322	6.0	7.1	3.7	31	368	4.4
1456.4	0.975	24	1.8	20	280	5.3	14	3.2	31	320	3.9
1457.1	0.856	30	1.6	21	262	5.4	12	2.9	32	300	3.9
1457.8	0.752	24	1.9	23	255	5.6	11	3.5	35	291	4.1
1458.5	0.974	24	1.2	18	261	5.3	14	2.2	27	299	3.8
1459.2	0.490	27	2.2	21	302	6.2	7.1	4.0	32	345	4.5
1459.9	0.571	29	1.7	20	297	6.7	8.2	3.2	31	339	4.9
1460.6	0.805	25	1.3	16	250	3.8	12	2.4	24	286	2.7
1461.3	0.972	23	1.7	19	277	7.6	14	3.1	30	317	5.5
1462.0	0.490	29	1.4	19	320	5.5	7.1	2.5	30	365	4.0
1462.7	0.686	24	1.8	18	289	5.6	9.9	3.3	27	330	4.1
1463.4	0.490	27	1.4	18	263	6.2	7.1	2.6	27	300	4.5
1464.1	0.663	30	1.7	20	269	4.5	9.6	3.1	31	308	3.3
1464.8	0.493	26	1.3	18	297	3.8	7.1	2.4	28	340	2.8
1465.5	0.490	25	1.2	19	315	5.1	7.1	2.2	29	360	3.7
1466.2	0.552	27	1.3	17	296	5.7	8.0	2.4	25	338	4.2
1466.9	0.989	22	1.6	13	271	3.9	14	3.0	21	310	2.9
1467.6	0.607	24	1.3	19	312	5.4	8.8	2.3	29	356	3.9
1468.3	0.947	31	1.9	19	308	5.8	14	3.4	29	352	4.2



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1469.0	0.759	27	1.4	17	291	4.9	11	2.6	25	332	3.6
1469.7	0.750	26	1.5	17	285	5.7	11	2.7	25	326	4.2
1470.4	0.490	24	1.6	20	272	5.0	7.1	2.8	31	311	3.7
1471.1	1.0	24	1.3	15	295	5.7	15	2.4	22	337	4.1
1471.8	0.631	26	1.2	16	277	4.0	9.1	2.2	25	317	2.9
1472.5	0.943	26	1.3	17	270	3.9	14	2.3	25	309	2.9
1473.2	0.897	27	1.3	19	284	4.5	13	2.4	29	325	3.3
1473.9	0.656	27	1.3	15	295	5.0	9.5	2.4	23	337	3.6
1474.6	0.631	28	1.4	21	318	6.7	9.1	2.5	32	363	4.9
1475.2	0.490	23	1.1	16	275	4.9	7.1	2.1	24	314	3.6
1475.9	0.490	25	1.8	18	261	5.4	7.1	3.2	28	299	4.0
1476.6	0.494	26	1.3	18	307	4.4	7.1	2.4	27	351	3.2
1477.3	1.2	25	1.1	13	273	4.4	18	2.1	21	313	3.2
1478.0	0.706	26	1.5	17	303	4.7	10	2.7	25	347	3.5
1478.7	1.1	27	1.3	17	282	4.0	16	2.4	25	323	2.9
1479.4	0.913	27	1.6	17	320	4.3	13	2.9	27	366	3.1
1480.1	0.751	28	1.2	17	304	4.6	11	2.2	27	347	3.3
1480.8	0.671	27	1.6	17	295	3.9	9.7	3.0	26	338	2.8
1481.5	0.490	27	1.3	16	272	4.4	7.1	2.3	25	312	3.2
1482.2	0.721	28	1.4	18	295	4.8	10	2.6	28	337	3.5
1482.9	0.983	25	1.8	20	350	4.8	14	3.3	31	400	3.5
1483.6	0.490	28	1.7	19	280	2.8	7.1	3.1	30	321	2.0
1484.3	0.596	26	1.4	16	352	3.9	8.6	2.6	25	402	2.8
1485.0	0.490	31	1.1	17	249	4.6	7.1	2.0	26	285	3.4
1485.7	0.490	25	1.5	17	359	4.9	7.1	2.8	26	410	3.6
1486.4	0.943	28	1.3	22	334	3.4	14	2.5	34	382	2.5
1487.1	0.613	26	1.5	23	319	4.4	8.8	2.8	35	365	3.2
1487.8	0.490	31	1.3	16	298	3.8	7.1	2.4	24	340	2.8
1488.5	0.822	25	1.5	18	298	4.6	12	2.7	28	341	3.4
1489.2	0.892	31	1.5	17	286	3.2	13	2.7	27	328	2.3
1489.9	1.3	32	1.3	20	323	4.3	18	2.3	30	369	3.1
1490.6	0.490	30	1.4	18	303	3.3	7.1	2.5	27	347	2.4
1491.3	0.864	28	1.6	17	313	4.4	12	2.8	26	358	3.2
1492.0	0.490	33	1.5	17	319	4.5	7.1	2.7	26	365	3.2
1492.7	0.681	28	1.7	21	344	3.9	9.8	3.0	32	393	2.8
1493.4	0.490	32	1.8	18	331	4.2	7.1	3.3	27	379	3.0
1494.1	0.490	28	1.5	18	291	4.2	7.1	2.8	27	333	3.1
1494.8	1.2	28	1.8	18	336	5.4	17	3.2	27	384	3.9
1495.5	0.490	34	2.0	24	338	4.3	7.1	3.7	37	387	3.1
1496.2	0.773	34	1.7	25	292	4.6	11	3.0	38	334	3.4
1496.9	0.595	31	2.0	21	309	4.3	8.6	3.7	33	354	3.1
1497.6	0.490	31	2.0	17	358	4.2	7.1	3.7	26	410	3.1
1498.3	0.690	47	2.1	18	309	4.8	10.0	3.8	28	353	3.5
1499.0	0.490	30	2.0	21	288	3.8	7.1	3.6	32	329	2.8
1499.7	1.3	44	2.3	23	360	4.0	19	4.2	35	412	2.9
1500.4	0.656	33	2.3	23	356	5.2	9.5	4.2	35	407	3.8
1501.0	0.490	43	2.3	23	355	5.1	7.1	4.2	35	406	3.7
1501.7	0.692	37	1.9	20	334	3.7	10.0	3.5	31	382	2.7
1502.4	0.490	33	1.4	18	305	2.5	7.1	2.6	27	349	1.8
1503.1	0.791	33	2.0	16	340	3.7	11	3.7	25	389	2.7
1503.8	0.490	36	2.8	17	318	3.6	7.1	5.2	26	364	2.6
1504.5	1.5	39	2.6	20	314	3.8	21	4.8	30	359	2.8
1505.2	0.753	39	2.6	22	315	3.5	11	4.8	34	360	2.6
1505.9	0.523	41	3.1	19	307	4.1	7.5	5.6	29	351	3.0
1506.6	0.678	40	2.5	22	336	4.0	9.8	4.6	33	384	2.9
1507.3	0.501	39	2.3	17	278	2.7	7.2	4.3	26	318	1.9
1508.0	0.808	47	2.2	18	318	4.0	12	3.9	27	363	2.9
1508.7	0.490	42	2.5	26	312	4.2	7.1	4.6	39	357	3.1
1509.4	0.490	48	1.9	19	369	5.1	7.1	3.5	29	422	3.7
1510.1	0.490	36	2.3	20	317	4.6	7.1	4.2	31	363	3.4
1510.8	1.1	38	1.7	22	380	3.7	15	3.2	34	435	2.7
1511.5	0.663	33	1.4	21	354	3.0	9.6	2.5	33	405	2.2
1512.2	0.490	33	1.8	20	345	3.5	7.1	3.2	30	394	2.6
1512.9	0.582	31	1.5	24	349	3.9	8.4	2.7	37	400	2.8
1513.6	0.847	26	1.5	19	322	3.7	12	2.7	30	369	2.7
1514.3	0.490	33	1.3	22	315	3.8	7.1	2.4	34	360	2.8
1515.0	0.795	34	1.6	22	338	5.8	11	2.9	33	387	4.2
1515.7	0.490	27	1.4	20	307	3.5	7.1	2.5	30	351	2.6
1516.4	0.490	30	1.5	18	325	3.9	7.1	2.7	27	372	2.8
1517.1	0.490	30	1.9	20	342	4.0	7.1	3.4	31	391	2.9
1517.8	0.995	31	1.2	17	315	4.1	14	2.1	27	360	3.0
1518.5	0.490	34	1.7	20	327	3.9	7.1	3.2	30	374	2.9
1519.2	0.547	32	1.3	17	309	3.7	7.9	2.3	27	354	2.7
1519.9	0.490	31	1.2	20	346	5.0	7.1	2.2	30	396	3.6
1520.6	1.1	28	1.3	17	310	4.8	16	2.3	26	355	3.5
1521.3	0.490	34	1.2	22	343	5.1	7.1	2.2	33	392	3.7
1522.0	0.490	29	1.7	18	344	6.0	7.1	3.1	27	394	4.4
1522.7	0.490	32	1.2	18	295	3.9	7.1	2.2	28	337	2.9
1523.4	0.514	32	1.1	18	377	4.9	7.4	2.0	28	431	3.6
1524.1	0.490	33	1.6	21	363	4.7	7.1	3.0	33	415	3.5
1524.8	0.490	33	1.4	19	310	5.7	7.1	2.6	29	355	4.1



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
1525.5	0.795	34	1.6	19	330	3.0	11	3.0	29	378	2.2
1526.2	0.760	28	1.2	18	346	5.2	11	2.2	27	396	3.8
1526.8	0.490	28	1.4	17	348	5.2	7.1	2.5	25	397	3.8
1527.5	0.667	37	1.7	21	318	4.8	9.6	3.1	32	363	3.5
1528.2	0.609	32	1.2	18	331	5.4	8.8	2.2	28	378	3.9
1528.9	0.702	33	1.5	21	334	3.4	10	2.8	33	382	2.5
1529.6	0.550	31	1.9	19	330	4.7	7.9	3.4	29	377	3.4
1530.3	0.493	35	1.6	21	330	4.5	7.1	2.9	32	378	3.3
1531.0	1.1	39	2.3	22	330	3.5	16	4.2	33	377	2.5
1531.7	0.814	39	1.8	17	307	4.8	12	3.2	26	351	3.5
1532.4	0.677	34	1.8	21	327	4.1	9.8	3.3	33	374	3.0
1533.1	0.490	35	1.8	18	309	4.9	7.1	3.3	28	354	3.6
1533.8	1.3	40	1.9	20	355	4.3	18	3.4	30	406	3.1
1534.5	1.1	42	1.8	21	335	5.5	16	3.4	32	383	4.0
1535.2	0.490	45	1.6	17	322	4.2	7.1	2.9	27	369	3.1
1535.9	0.785	38	1.9	21	341	4.2	11	3.5	32	390	3.0
1536.6	0.625	36	1.6	18	334	4.5	9.0	2.9	28	382	3.3
1537.3	0.569	39	1.7	20	344	4.7	8.2	3.0	30	394	3.4
1538.0	0.675	40	2.0	19	314	5.2	9.7	3.6	29	359	3.8
1538.7	0.670	39	1.9	19	331	5.7	9.7	3.4	29	378	4.2
1539.4	0.927	43	2.0	19	349	4.6	13	3.6	30	400	3.4
1540.1	0.650	38	1.6	17	316	4.4	9.4	2.9	26	362	3.2
1540.8	0.490	46	2.2	20	369	5.7	7.1	4.0	31	422	4.2
1541.5	0.625	42	2.1	22	325	4.7	9.0	3.9	34	371	3.4
1542.2	0.712	40	1.7	20	298	4.1	10	3.0	30	341	3.0
1542.9	0.492	38	2.1	17	330	3.4	7.1	3.9	26	378	2.5
1543.6	0.654	40	1.9	16	332	4.3	9.4	3.4	25	380	3.1
1544.3	0.751	42	2.1	17	313	5.7	11	3.9	26	358	4.2
1545.0	0.490	40	2.2	21	330	5.0	7.1	4.1	32	377	3.6
1545.7	0.490	36	1.8	18	315	5.4	7.1	3.4	28	360	4.0
1546.4	0.537	38	1.7	16	301	5.2	7.8	3.2	24	344	3.8
1547.1	0.603	36	1.7	17	311	4.5	8.7	3.2	27	356	3.3
1547.8	0.626	39	1.7	18	315	5.2	9.0	3.2	27	361	3.8
1548.5	0.751	40	1.9	18	312	3.9	11	3.5	27	357	2.8
1549.2	0.490	37	1.9	16	337	4.8	7.1	3.5	25	385	3.5
1549.9	0.605	35	1.7	14	309	5.6	8.7	3.0	22	353	4.1
1550.6	1.0	38	2.0	18	318	5.3	15	3.6	27	363	3.9
1551.3	0.567	42	2.0	21	335	5.0	8.2	3.6	32	383	3.6
1552.0	0.714	41	1.9	19	331	4.9	10	3.5	29	379	3.6
1552.7	0.826	39	2.2	18	349	5.7	12	4.0	28	399	4.1
1553.3	0.696	34	1.9	15	298	5.1	10	3.5	23	340	3.7
1554.0	0.953	37	1.6	22	349	4.7	14	2.9	34	400	3.4
1554.7	0.922	35	1.8	16	301	4.6	13	3.3	25	345	3.3
1555.4	0.721	35	1.8	20	305	5.0	10	3.4	30	348	3.7
1556.1	0.938	31	1.5	17	303	6.9	14	2.7	27	346	5.0
1556.8	0.701	30	1.4	17	285	3.4	10	2.5	26	326	2.4
1557.5	0.876	38	2.3	20	333	6.0	13	4.2	31	381	4.4
1558.2	0.721	35	1.8	19	335	4.8	10	3.2	29	383	3.5
1558.9	0.578	32	1.8	18	296	5.0	8.3	3.2	27	338	3.7
1559.6	0.490	34	1.7	18	387	7.5	7.1	3.1	27	442	5.5
1560.3	0.490	37	1.7	16	294	5.2	7.1	3.1	25	336	3.8
1561.0	0.802	32	2.1	20	323	5.0	12	3.9	30	369	3.6
1561.7	0.740	34	1.9	17	281	4.2	11	3.4	27	322	3.1
1562.4	0.926	34	1.9	16	294	4.8	13	3.5	24	336	3.5
1563.1	0.518	32	1.5	18	302	4.8	7.5	2.8	27	346	3.5
1563.8	0.794	33	1.8	16	295	4.9	11	3.2	25	338	3.6
1564.5	0.490	33	2.0	22	307	5.4	7.1	3.7	33	351	3.9
1565.2	0.569	34	1.8	19	284	4.5	8.2	3.2	29	325	3.3
1565.9	0.490	28	1.8	17	298	5.8	7.1	3.2	26	341	4.3
1566.6	0.490	30	1.8	21	320	4.7	7.1	3.2	32	365	3.4
1567.3	1.3	32	1.7	16	358	4.8	19	3.1	24	410	3.5
1568.0	0.811	32	1.8	21	313	6.1	12	3.3	32	358	4.4
1568.7	0.490	32	1.7	18	317	4.3	7.1	3.1	27	363	3.1
1569.4	0.596	30	1.6	17	296	4.0	8.6	2.9	26	339	2.9
1570.1	1.0	33	2.1	19	344	5.4	15	3.8	29	394	3.9
1570.8	0.749	33	1.3	18	288	6.0	11	2.3	27	330	4.3
1571.5	0.515	31	1.6	19	309	5.4	7.4	2.8	28	354	3.9
1572.2	0.490	28	1.9	18	313	4.9	7.1	3.4	27	358	3.6
1572.9	0.510	30	1.6	16	267	4.4	7.4	3.0	24	306	3.2
1573.6	0.490	29	1.3	18	290	4.8	7.1	2.4	28	332	3.5
1574.3	0.613	26	1.5	16	302	5.2	8.8	2.7	25	345	3.8
1575.0	0.684	31	1.6	22	315	4.1	9.9	3.0	33	360	3.0
1575.7	1.1	27	1.3	19	276	5.4	16	2.4	29	315	3.9
1576.4	0.793	30	1.7	22	317	4.9	11	3.0	33	362	3.6
1577.1	0.692	28	1.4	19	295	5.8	10.0	2.5	29	337	4.2
1577.8	0.895	32	1.7	16	268	6.1	13	3.2	24	306	4.5
1578.5	0.762	31	1.6	16	283	4.5	11	2.9	24	323	3.3
1579.1	1.3	26	1.5	15	277	6.1	18	2.7	23	317	4.4
1579.8	1.0	27	1.4	18	237	4.5	15	2.6	27	271	3.3
1580.5	1.2	25	1.5	19	320	5.8	17	2.8	29	366	4.2
1581.2	0.490	24	1.9	18	276	4.9	7.1	3.4	27	316	3.6



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1581.9	0.576	27	1.1	22	285	4.5	8.3	1.9	34	326	3.3
1582.6	0.847	26	1.3	20	280	5.8	12	2.4	31	320	4.2
1583.3	0.874	25	1.2	20	252	5.5	13	2.3	30	289	4.0
1584.0	0.784	30	1.1	20	269	6.0	11	2.1	31	307	4.4
1584.7	0.647	27	1.2	19	303	5.1	9.3	2.3	28	346	3.7
1585.4	0.948	27	1.3	17	290	5.2	14	2.3	27	332	3.8
1586.1	0.609	28	1.6	21	311	5.1	8.8	2.9	32	356	3.7
1586.8	1.1	32	1.5	19	292	7.1	16	2.7	29	333	5.2
1587.5	0.588	30	1.8	19	274	6.5	8.5	3.2	29	313	4.8
1588.2	0.727	26	1.4	20	289	4.5	10	2.5	31	331	3.3
1588.9	0.490	26	1.6	23	256	6.0	7.1	3.0	36	293	4.4
1589.6	0.821	24	1.4	16	280	5.2	12	2.6	25	321	3.8
1590.3	0.507	25	1.3	21	315	7.9	7.3	2.4	32	360	5.8
1591.0	0.755	26	1.2	19	267	6.3	11	2.2	29	305	4.6
1591.7	0.972	25	1.4	21	292	4.9	14	2.6	32	333	3.6
1592.4	0.490	25	0.986	21	274	6.0	7.1	1.8	32	314	4.4
1593.1	0.864	29	1.4	22	312	5.8	12	2.6	34	356	4.2
1593.8	0.687	28	1.2	21	310	4.7	9.9	2.2	33	354	3.4
1594.5	0.490	28	1.1	23	293	5.4	7.1	2.1	35	335	3.9
1595.2	1.2	24	1.1	21	252	5.6	17	1.9	33	288	4.1
1595.9	0.666	21	1.2	18	267	5.0	9.6	2.2	27	306	3.6
1596.6	0.908	25	1.2	22	280	6.3	13	2.1	34	321	4.6
1597.3	0.986	26	1.1	21	311	5.5	14	1.9	33	356	4.0
1598.0	0.619	21	1.1	21	264	3.9	8.9	2.0	32	301	2.9
1598.7	0.699	27	1.4	26	302	7.0	10	2.5	40	345	5.1
1599.4	0.490	23	1.3	23	305	6.3	7.1	2.4	35	348	4.6
1600.1	0.506	26	1.2	18	286	6.9	7.3	2.2	27	327	5.0
1600.8	0.490	24	1.1	27	285	5.5	7.1	2.0	41	325	4.0
1601.5	0.490	23	1.3	27	279	7.2	7.1	2.3	42	319	5.3
1602.2	0.763	23	1.0	24	277	3.8	11	1.9	37	317	2.8
1602.9	0.647	20	0.997	24	262	4.9	9.3	1.8	37	300	3.6
1603.6	1.0	23	1.1	26	270	4.6	15	2.1	40	309	3.4
1604.2	1.1	24	1.4	23	271	5.9	16	2.5	36	309	4.3
1604.9	1.5	22	1.1	24	247	5.0	21	1.9	37	282	3.7
1605.6	0.725	20	1.2	26	312	5.4	10	2.2	40	356	4.0
1606.3	0.915	20	1.4	24	314	5.8	13	2.6	37	359	4.2
1607.0	0.490	23	1.1	25	287	6.8	7.1	2.0	38	329	5.0
1607.7	0.988	21	1.3	26	280	5.6	14	2.4	40	320	4.1
1608.4	0.557	23	0.995	25	289	4.9	8.0	1.8	38	330	3.6
1609.1	0.490	20	1.2	24	259	4.7	7.1	2.1	36	296	3.4
1609.8	0.499	18	1.3	24	267	5.0	7.2	2.4	37	305	3.7
1610.5	0.924	23	1.3	27	323	4.2	13	2.4	41	369	3.0
1611.2	0.872	21	1.1	29	262	5.2	13	2.1	44	300	3.8
1611.9	0.611	21	0.873	27	264	5.2	8.8	1.6	42	302	3.8
1612.6	0.490	18	1.2	24	250	4.4	7.1	2.1	37	285	3.2
1613.3	0.490	17	0.970	26	260	4.9	7.1	1.8	40	297	3.6
1614.0	0.490	20	1.0	25	292	4.5	7.1	1.8	38	334	3.3
1614.7	0.865	16	1.3	25	263	4.0	12	2.3	38	301	2.9
1615.4	0.728	24	0.949	28	270	4.2	11	1.7	43	308	3.1
1616.1	0.639	22	1.0	26	263	4.6	9.2	1.8	39	300	3.3
1616.8	0.490	19	1.1	25	244	3.4	7.1	2.0	39	279	2.5
1617.5	1.2	20	1.3	28	272	5.8	17	2.4	43	311	4.2
1618.2	0.490	18	0.718	29	285	4.9	7.1	1.3	44	326	3.6
1618.9	0.886	19	1.1	27	279	4.6	13	2.1	41	319	3.3
1619.6	1.2	22	1.1	28	279	5.0	18	2.0	43	319	3.7
1620.3	1.2	17	0.923	30	257	5.0	18	1.7	47	294	3.7
1621.0	0.490	20	1.0	29	264	4.3	7.1	1.9	44	302	3.2
1621.7	0.490	21	1.1	30	260	3.1	7.1	1.9	46	298	2.3
1622.4	0.493	18	0.940	30	254	5.5	7.1	1.7	46	290	4.0
1623.1	0.490	18	0.892	23	269	4.2	7.1	1.6	36	308	3.1
1623.8	0.490	19	0.932	32	297	4.8	7.1	1.7	49	340	3.5
1624.5	0.490	17	0.847	25	282	4.0	7.1	1.5	39	323	3.0
1625.2	0.591	17	0.770	27	238	3.0	8.5	1.4	42	273	2.2
1625.9	0.833	17	0.761	32	259	4.2	12	1.4	50	296	3.1
1626.6	0.490	17	1.1	32	293	3.4	7.1	2.1	49	335	2.5
1627.3	0.490	17	1.1	29	274	3.7	7.1	2.0	45	313	2.7
1628.0	0.490	18	1.0	29	275	5.2	7.1	1.9	45	314	3.8
1628.7	0.835	18	0.726	28	275	5.2	12	1.3	43	315	3.8
1629.4	0.788	19	0.827	31	286	5.8	11	1.5	47	327	4.2
1630.1	0.583	18	0.876	28	257	4.5	8.4	1.6	43	294	3.3
1630.7	0.507	16	0.739	28	259	3.8	7.3	1.3	43	296	2.8
1631.4	0.490	20	0.952	28	282	4.6	7.1	1.7	43	323	3.4
1632.1	0.490	19	0.801	26	295	4.5	7.1	1.5	40	337	3.3
1632.8	0.820	16	1.0	28	298	4.0	12	1.9	43	341	2.9
1633.5	1.2	18	0.812	31	307	5.5	18	1.5	47	351	4.0
1634.2	0.490	18	0.851	30	274	4.3	7.1	1.6	46	314	3.1
1634.9	0.746	19	0.847	32	312	4.8	11	1.5	50	357	3.5
1635.6	1.1	19	0.830	30	278	4.0	15	1.5	46	317	2.9
1636.3	0.490	18	0.753	28	271	5.1	7.1	1.4	43	310	3.7
1637.0	0.490	20	0.923	32	274	4.2	7.1	1.7	49	314	3.1
1637.7	0.730	20	1.0	31	279	3.3	11	1.9	47	319	2.4



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Sample ID: 011

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1638.4	0.490	18	1.2	25	280	4.8	7.1	2.2	38	320	3.5
1639.1	0.645	18	1.3	31	256	3.9	9.3	2.3	47	293	2.9
1639.8	0.490	17	0.750	28	290	5.3	7.1	1.4	43	332	3.9
1640.5	0.601	18	0.903	29	331	4.3	8.7	1.6	45	379	3.1
1641.2	0.490	18	0.867	33	277	4.5	7.1	1.6	50	316	3.3
1641.9	0.490	17	0.800	32	258	4.2	7.1	1.5	49	294	3.1
1642.6	0.793	17	0.855	30	276	5.1	11	1.6	47	315	3.7
1643.3	0.675	18	1.1	31	293	6.5	9.7	1.9	48	335	4.7
1644.0	0.490	18	1.0	31	295	4.7	7.1	1.9	47	337	3.4
1644.7	0.500	20	0.793	34	296	3.6	7.2	1.4	52	339	2.6
1645.4	0.490	16	0.558	27	310	4.4	7.1	1.0	41	355	3.2
1646.1	0.490	15	0.693	29	254	3.3	7.1	1.3	45	290	2.4
1646.8	0.598	17	0.920	30	298	4.7	8.6	1.7	46	340	3.4
1647.5	0.490	18	0.767	36	307	4.2	7.1	1.4	55	351	3.0
1648.2	0.490	19	0.676	31	327	4.6	7.1	1.2	48	374	3.4
1648.9	0.490	15	1.1	38	307	3.8	7.1	2.0	58	351	2.8
1649.6	0.692	18	1.1	29	292	3.4	10.0	2.0	45	334	2.5
1650.3	0.603	15	0.681	30	316	4.0	8.7	1.2	46	361	2.9
1651.0	0.490	18	0.537	32	341	4.5	7.1	0.980	49	390	3.3
1651.7	0.490	15	0.815	33	273	4.1	7.1	1.5	50	312	3.0
1652.4	0.558	16	1.0	29	338	4.0	8.1	1.9	44	386	2.9
1653.1	0.490	14	0.617	32	288	4.8	7.1	1.1	49	329	3.5
1653.8	0.587	18	0.882	28	309	4.4	8.5	1.6	43	353	3.2
1654.5	0.490	16	0.922	36	327	4.1	7.1	1.7	54	374	3.0
1655.2	0.490	18	0.620	35	313	4.9	7.1	1.1	54	358	3.6
1655.9	0.490	14	0.633	29	306	5.0	7.1	1.2	45	350	3.6
1656.6	0.490	14	0.768	32	323	4.8	7.1	1.4	49	369	3.5
1657.2	0.542	16	0.693	34	273	4.0	7.8	1.3	53	312	2.9
1657.9	0.824	15	0.451	31	317	5.6	12	0.822	47	362	4.1
1658.6	0.490	14	0.653	38	358	5.7	7.1	1.2	58	410	4.1
1659.3	0.640	17	0.767	33	351	6.3	9.2	1.4	51	402	4.6
1660.0	0.608	16	0.813	32	312	8.6	8.8	1.5	50	357	6.3
1660.7	0.753	18	0.878	40	310	10	11	1.6	61	354	7.5
1661.4	0.490	17	0.894	31	318	8.4	7.1	1.6	48	364	6.1
1662.1	0.490	16	0.812	36	292	11	7.1	1.5	55	334	8.2
1662.8	0.591	15	0.822	36	325	12	8.5	1.5	55	372	9.1
1663.5	0.490	17	0.965	36	316	15	7.1	1.8	55	361	11
1664.2	0.626	19	0.867	33	266	13	9.0	1.6	50	305	9.1
1664.9	0.490	17	0.681	36	299	16	7.1	1.2	54	341	11
1665.6	1.2	17	1.0	38	288	16	17	1.9	58	330	12
1666.3	0.490	18	1.4	37	308	21	7.1	2.5	56	352	15
1667.0	0.490	18	1.0	37	333	22	7.1	1.9	57	381	16
1667.7	0.490	16	0.825	30	296	29	7.1	1.5	46	338	21
1668.4	0.796	20	1.2	38	321	26	11	2.3	58	367	19
1669.1	0.490	16	1.1	37	324	30	7.1	1.9	57	371	22
1669.8	0.741	18	1.5	34	324	32	11	2.8	53	371	23
1670.5	0.490	19	1.2	40	337	40	7.1	2.3	61	386	29
1671.2	0.490	18	1.5	46	334	39	7.1	2.8	70	382	29
1671.9	0.490	19	1.3	38	280	32	7.1	2.4	58	321	23
1672.6	0.591	15	1.5	39	292	39	8.5	2.7	60	334	28
1673.3	0.490	13	1.2	31	259	38	7.1	2.2	48	296	28
1674.0	0.545	18	1.5	37	287	38	7.9	2.7	57	328	28
1674.7	0.490	17	1.8	41	306	43	7.1	3.3	62	349	32
1675.4	0.490	17	2.1	42	283	41	7.1	3.9	64	324	30
1676.1	0.490	18	1.9	35	310	44	7.1	3.4	53	354	32
1676.8	0.490	17	1.8	41	302	47	7.1	3.2	62	346	34
1677.5	0.490	17	1.7	45	273	46	7.1	3.0	69	312	34
1678.2	0.490	15	1.8	45	264	39	7.1	3.4	70	302	28
1678.9	0.490	15	1.9	39	289	47	7.1	3.5	60	331	34
1679.6	0.649	17	1.8	40	316	50	9.4	3.2	61	362	37
1680.3	0.490	18	1.8	39	281	52	7.1	3.2	60	321	38
1681.0	0.490	15	2.4	43	297	49	7.1	4.3	66	340	36
1681.7	0.490	17	1.8	41	285	57	7.1	3.2	62	326	42
1682.4	0.752	16	2.1	40	291	51	11	3.9	61	333	37
1683.0	0.490	15	2.3	37	301	48	7.1	4.1	57	344	35
1683.7	0.490	17	2.3	39	274	48	7.1	4.2	60	313	35
1684.4	0.763	16	2.2	44	298	50	11	4.0	67	340	36
1685.1	0.492	15	2.3	45	298	51	7.1	4.2	68	340	37
1685.8	0.490	16	2.2	41	266	43	7.1	4.1	63	305	31
1686.5	0.490	14	2.4	44	283	52	7.1	4.4	67	324	38
1687.2	0.587	18	2.0	52	302	55	8.5	3.7	80	345	40
1687.9	0.490	19	3.1	43	290	50	7.1	5.6	66	331	36
1688.6	0.847	16	2.2	48	301	61	12	4.0	73	344	45
1689.3	0.619	15	1.9	47	322	51	8.9	3.5	71	368	37
1690.0	1.0	16	2.6	51	294	58	14	4.7	78	336	43
1690.7	0.490	16	2.1	45	266	48	7.1	3.8	68	304	35
1691.4	0.490	16	2.0	51	286	48	7.1	3.7	78	327	35
1692.1	0.634	18	1.6	41	264	46	9.1	2.9	63	302	34
1692.8	0.490	15	2.3	41	247	47	7.1	4.3	62	283	34
1693.5	0.547	18	1.9	44	288	55	7.9	3.5	67	329	40
1694.2	0.490	16	2.1	42	242	49	7.1	3.8	64	276	36



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1694.9	0.490	17	2.2	43	283	50	7.1	4.0	66	324	37
1695.6	0.716	14	2.3	47	302	44	10	4.2	71	345	32
1696.3	0.608	18	2.2	54	332	53	8.8	4.0	83	379	39
1697.0	0.600	19	2.5	50	331	53	8.7	4.6	77	379	39
1697.7	0.490	18	2.1	54	297	58	7.1	3.8	82	340	42
1698.4	0.490	16	2.0	39	277	49	7.1	3.7	60	317	35
1699.1	0.744	17	2.6	45	294	52	11	4.7	69	337	38
1699.8	0.490	18	1.9	52	314	54	7.1	3.5	79	359	39
1700.5	0.574	17	2.6	57	298	56	8.3	4.8	87	341	41
1701.2	0.721	20	1.9	49	294	56	10	3.5	76	336	41
1701.9	1.0	18	2.7	46	289	54	15	4.9	70	330	40
1702.6	0.501	21	1.6	51	342	53	7.2	3.0	79	391	39
1703.3	0.490	20	1.9	45	266	56	7.1	3.5	69	304	41
1704.0	0.847	22	1.9	48	297	38	12	3.5	74	340	28
1704.7	0.490	19	2.1	46	289	41	7.1	3.8	71	331	30
1705.4	0.490	19	1.9	45	265	32	7.1	3.5	68	303	24
1706.1	0.490	24	2.1	44	293	33	7.1	3.9	67	336	24
1706.8	1.1	19	2.4	45	277	30	16	4.3	70	317	22
1707.5	0.966	18	2.1	47	306	29	14	3.8	72	349	21
1708.2	0.490	22	1.8	48	285	29	7.1	3.2	73	326	21
1708.8	0.490	20	2.2	53	315	29	7.1	4.1	82	361	21
1709.5	0.490	21	1.9	41	298	26	7.1	3.5	63	341	19
1710.2	0.490	21	1.9	47	295	26	7.1	3.5	73	338	19
1710.9	0.724	20	2.0	42	322	26	10	3.6	65	368	19
1711.6	0.490	21	2.0	42	265	22	7.1	3.6	64	303	16
1712.3	0.589	21	1.5	43	272	22	8.5	2.8	66	311	16
1713.0	0.616	22	1.6	47	305	19	8.9	2.9	72	349	14
1713.7	0.743	17	2.2	45	305	19	11	4.0	68	349	14
1714.4	0.490	20	1.7	38	286	16	7.1	3.1	59	327	12
1715.1	0.490	21	2.0	44	312	17	7.1	3.6	67	356	12
1715.8	0.900	19	2.0	45	282	16	13	3.6	70	322	12
1716.5	1.0	21	1.3	43	298	14	15	2.4	66	341	10
1717.2	0.555	19	1.8	45	268	14	8.0	3.3	69	306	9.9
1717.9	0.490	16	1.6	39	244	10	7.1	2.9	59	279	7.6
1718.6	0.490	20	1.5	53	268	14	7.1	2.7	82	307	10
1719.3	0.742	18	1.9	43	293	15	11	3.4	66	335	11
1720.0	0.490	19	1.4	40	252	14	7.1	2.6	62	288	11
1720.7	0.545	20	2.5	50	301	17	7.9	4.5	77	344	12
1721.4	0.490	17	1.1	39	270	14	7.1	2.0	60	308	10
1722.1	0.490	16	1.5	41	253	13	7.1	2.8	63	290	9.7
1722.8	0.490	15	1.6	37	292	11	7.1	2.9	57	334	7.7
1723.5	0.666	20	1.9	52	316	11	9.6	3.4	80	361	8.0
1724.2	0.490	16	1.7	43	269	11	7.1	3.0	66	308	7.7
1724.9	0.490	20	1.3	38	263	9.5	7.1	2.5	58	301	6.9
1725.6	0.490	19	1.3	32	228	9.4	7.1	2.3	49	260	6.8
1726.3	0.490	18	1.3	35	295	11	7.1	2.4	54	338	7.9
1727.0	0.526	19	1.1	36	268	8.0	7.6	2.0	55	307	5.8
1727.7	0.544	16	1.3	35	267	11	7.9	2.3	54	306	8.3
1728.4	0.784	17	1.5	36	246	9.1	11	2.7	56	282	6.6
1729.1	0.490	17	1.8	43	287	12	7.1	3.2	65	328	8.4
1729.8	0.490	19	1.6	48	313	11	7.1	2.9	73	357	8.0
1730.5	0.490	18	1.3	41	254	7.0	7.1	2.3	63	290	5.1
1731.2	0.539	16	1.2	35	260	8.3	7.8	2.2	54	297	6.0
1731.9	0.644	15	0.932	29	250	6.2	9.3	1.7	44	286	4.5
1732.6	0.581	15	1.1	33	264	9.8	8.4	2.0	51	302	7.1
1733.3	0.490	16	1.3	32	229	6.5	7.1	2.4	49	262	4.7
1734.0	0.490	18	1.6	41	237	6.6	7.1	2.9	63	271	4.8
1734.6	0.871	19	1.2	37	263	9.1	13	2.3	57	301	6.6
1735.3	0.807	16	1.2	37	274	11	12	2.2	57	314	8.2
1736.0	0.490	18	1.2	38	248	7.4	7.1	2.1	58	284	5.4
1736.7	0.490	19	1.3	38	249	8.2	7.1	2.3	59	285	6.0
1737.4	0.615	18	1.6	32	265	7.1	8.9	2.9	49	302	5.2
1738.1	0.490	16	1.3	30	247	6.9	7.1	2.4	47	282	5.0
1738.8	0.490	20	1.4	34	268	5.5	7.1	2.5	52	307	4.0
1739.5	0.570	18	1.1	29	252	6.6	8.2	1.9	45	288	4.8
1740.2	0.490	17	1.4	35	259	5.5	7.1	2.5	53	296	4.0
1740.9	0.490	19	1.0	32	257	7.9	7.1	1.9	49	294	5.8
1741.6	0.727	19	1.1	38	259	7.1	10	2.0	58	296	5.2
1742.3	0.490	16	1.4	29	280	7.8	7.1	2.5	44	320	5.7
1743.0	0.490	17	0.993	30	244	4.9	7.1	1.8	46	279	3.6
1743.7	0.490	16	0.978	33	235	7.9	7.1	1.8	50	269	5.8
1744.4	0.587	16	1.2	31	237	6.6	8.5	2.2	48	271	4.8
1745.1	0.500	14	1.4	32	238	5.3	7.2	2.5	49	272	3.9
1745.8	1.0	14	0.676	29	279	6.4	15	1.2	44	320	4.7
1746.5	0.499	19	1.2	30	289	5.3	7.2	2.2	46	331	3.8
1747.2	0.490	13	1.1	26	265	4.0	7.1	2.1	39	303	2.9
1747.9	0.490	16	1.1	29	316	6.8	7.1	2.0	44	361	4.9
1748.6	0.683	14	1.4	29	266	6.9	9.9	2.5	44	305	5.0
1749.3	0.490	14	1.1	23	271	5.4	7.1	2.1	35	310	3.9
1750.0	0.591	13	1.1	20	255	5.1	8.5	2.1	31	292	3.7
1750.7	0.490	13	0.610	18	266	5.6	7.1	1.1	28	304	4.1



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Sample ID: 011

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1751.4	0.490	12	0.903	18	305	5.9	7.1	1.6	27	349	4.3
1752.1	0.490	12	0.886	17	312	6.0	7.1	1.6	25	357	4.4
1752.8	0.490	10	0.654	17	248	4.9	7.1	1.2	27	284	3.5
1753.5	0.963	12	1.0	18	271	5.9	14	1.8	28	309	4.3
1754.2	0.490	11	0.886	15	307	6.2	7.1	1.6	23	351	4.5
1754.9	0.490	11	0.615	15	283	5.0	7.1	1.1	23	324	3.6
1755.6	0.490	11	0.704	16	310	5.1	7.1	1.3	24	355	3.8
1756.3	0.490	10	0.510	19	328	4.8	7.1	0.931	30	375	3.5
1757.0	0.490	11	0.740	12	316	5.4	7.1	1.3	19	362	3.9
1757.7	0.516	9.1	0.667	14	303	5.2	7.4	1.2	22	347	3.8
1758.4	0.490	10	0.675	15	296	6.3	7.1	1.2	23	338	4.6
1759.1	0.490	11	0.836	13	313	5.8	7.1	1.5	20	358	4.2
1759.8	0.490	8.8	0.716	13	314	6.4	7.1	1.3	19	360	4.7
1760.4	0.512	9.5	0.529	17	325	6.3	7.4	0.964	25	372	4.6
1761.1	0.490	9.4	0.554	13	332	6.8	7.1	1.0	20	379	5.0
1761.8	0.490	11	0.780	13	321	5.9	7.1	1.4	20	367	4.3
1762.5	0.703	9.4	0.844	14	290	5.4	10	1.5	21	332	4.0
1763.2	0.490	11	0.385	13	292	5.1	7.1	0.703	20	333	3.7
1763.9	0.522	9.9	0.900	14	300	6.4	7.5	1.6	21	344	4.6
1764.6	0.490	10	0.565	13	335	6.6	7.1	1.0	19	383	4.8
1765.3	0.514	10	0.601	14	276	7.1	7.4	1.1	21	316	5.2
1766.0	0.490	10	0.729	13	305	6.3	7.1	1.3	20	348	4.6
1766.7	0.531	8.3	0.695	14	347	6.8	7.7	1.3	21	397	5.0
1767.4	0.637	10.0	0.649	13	272	8.8	9.2	1.2	20	311	6.4
1768.1	0.490	11	0.680	15	299	8.1	7.1	1.2	23	342	5.9
1768.8	0.490	9.2	0.476	12	305	6.5	7.1	0.869	19	349	4.7
1769.5	0.490	9.7	0.708	15	308	7.0	7.1	1.3	22	353	5.1
1770.2	1.0	8.2	0.626	14	317	8.4	15	1.1	22	362	6.1
1770.9	0.490	11	0.605	13	288	6.3	7.1	1.1	19	329	4.6
1771.6	0.490	9.8	0.728	10.0	306	6.5	7.1	1.3	15	350	4.8
1772.3	0.672	8.0	0.693	9.9	327	7.4	9.7	1.3	15	374	5.4
1773.0	0.491	9.1	0.257	13	297	7.6	7.1	0.469	20	340	5.5
1773.7	0.490	8.7	0.511	8.5	276	6.4	7.1	0.932	13	316	4.7
1774.4	0.490	10	0.858	14	294	6.3	7.1	1.6	21	336	4.6
1775.1	0.490	8.9	0.654	11	295	8.3	7.1	1.2	17	337	6.0
1775.8	0.490	9.1	0.604	13	291	9.1	7.1	1.1	20	333	6.6
1776.5	0.490	9.6	0.476	8.6	316	10	7.1	0.868	13	361	7.4
1777.2	0.490	10	0.512	13	339	8.6	7.1	0.933	19	388	6.3
1777.9	0.490	11	0.690	12	313	9.1	7.1	1.3	18	358	6.7
1778.6	0.490	9.2	0.708	14	320	8.0	7.1	1.3	21	365	5.8
1779.3	0.503	9.2	0.727	14	295	7.9	7.3	1.3	21	337	5.8
1780.0	0.698	12	0.763	17	343	7.7	10	1.4	25	392	5.6
1780.7	0.490	11	0.601	17	300	9.2	7.1	1.1	26	343	6.7
1781.4	0.746	7.6	0.668	15	324	11	11	1.2	23	371	7.9
1782.1	0.490	8.5	0.609	13	277	8.4	7.1	1.1	20	317	6.1
1782.8	0.490	10	0.814	16	305	11	7.1	1.5	25	349	7.9
1783.5	0.490	10	0.727	19	302	11	7.1	1.3	29	346	7.7
1784.2	0.541	10	0.722	18	283	9.6	7.8	1.3	27	323	7.0
1784.9	0.490	12	0.899	15	299	11	7.1	1.6	23	342	7.9
1785.6	0.490	11	0.431	15	269	8.1	7.1	0.785	23	307	5.9
1786.2	0.490	8.9	0.975	19	295	12	7.1	1.8	30	338	8.5
1786.9	0.490	9.8	0.954	21	274	14	7.1	1.7	32	314	11
1787.6	0.490	11	1.1	22	276	11	7.1	1.9	34	315	8.3
1788.3	0.659	9.7	0.672	21	280	13	9.5	1.2	32	320	9.5
1789.0	0.550	11	0.937	23	286	16	7.9	1.7	35	327	11
1789.7	0.490	11	1.0	19	290	11	7.1	1.9	29	332	8.2
1790.4	0.490	11	0.845	17	246	13	7.1	1.5	27	282	9.6
1791.1	0.490	12	0.869	24	267	14	7.1	1.6	37	305	10
1791.8	0.786	11	0.916	25	271	16	11	1.7	38	310	12
1792.5	0.956	11	1.0	29	294	16	14	1.8	44	336	12
1793.2	0.490	13	1.1	25	260	17	7.1	2.0	38	297	12
1793.9	0.490	12	1.3	24	243	14	7.1	2.4	36	278	10
1794.6	0.490	11	0.972	28	248	12	7.1	1.8	43	284	8.9
1795.3	0.490	13	1.3	29	265	13	7.1	2.4	45	303	9.4
1796.0	0.612	16	1.3	28	264	11	8.8	2.4	44	302	8.0
1796.7	0.539	11	1.4	32	251	11	7.8	2.6	49	287	7.8
1797.4	0.721	14	1.0	33	279	12	10	1.9	51	319	8.6
1798.1	0.555	15	1.5	32	290	9.4	8.0	2.7	49	331	6.9
1798.8	0.675	14	1.8	40	289	11	9.7	3.4	61	330	7.7
1799.5	0.606	16	1.6	37	259	8.9	8.8	2.9	57	296	6.5
1800.2	0.490	14	1.7	39	286	11	7.1	3.1	60	327	7.7
1800.9	0.490	15	1.4	42	277	8.3	7.1	2.6	64	317	6.1
1801.6	0.559	13	2.0	39	304	6.5	8.1	3.7	60	347	4.8
1802.3	0.517	14	2.0	35	296	7.2	7.5	3.6	54	339	5.2
1803.0	0.490	16	1.9	38	297	9.3	7.1	3.4	58	340	6.8
1803.7	0.490	16	1.7	43	265	7.8	7.1	3.1	66	303	5.7
1804.4	0.490	16	1.7	37	284	6.8	7.1	3.0	57	325	5.0
1805.1	0.886	18	1.9	40	287	6.4	13	3.5	61	328	4.7
1805.8	0.490	13	1.6	47	296	7.4	7.1	2.8	71	339	5.4
1806.5	0.490	16	1.5	41	263	5.2	7.1	2.8	62	300	3.8
1807.2	0.490	16	1.8	45	257	6.1	7.1	3.2	69	294	4.5



Minnow Environmental  
Sample ID: 011

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1807.9	0.494	12	2.2	39	256	5.5	7.1	4.0	59	293	4.0
1808.6	0.490	16	1.6	43	279	6.2	7.1	2.9	65	320	4.5
1809.3	0.490	16	2.1	52	273	5.0	7.1	3.8	80	313	3.7
1810.0	0.490	18	1.6	47	267	5.6	7.1	2.9	72	306	4.1
1810.7	0.683	18	2.0	46	286	5.7	9.9	3.7	70	327	4.1
1811.4	0.490	17	2.2	47	279	6.1	7.1	4.0	71	319	4.4
1812.1	0.664	15	2.1	45	238	5.5	9.6	3.8	69	272	4.0
1812.7	0.490	17	2.2	54	278	5.2	7.1	4.1	82	318	3.8
1813.4	0.490	15	2.1	47	263	4.4	7.1	3.8	71	301	3.2
1814.1	0.670	17	2.0	62	271	7.7	9.7	3.7	95	310	5.6
1814.8	0.492	16	1.9	42	294	5.6	7.1	3.4	65	337	4.1
1815.5	0.499	18	2.4	45	302	5.4	7.2	4.4	69	345	4.0
1816.2	0.709	17	2.3	52	268	4.9	10	4.1	79	307	3.5
1816.9	0.561	17	2.1	50	259	4.3	8.1	3.8	77	296	3.2
1817.6	0.490	18	2.6	48	251	5.6	7.1	4.7	73	287	4.1
1818.3	0.490	16	2.5	50	293	7.3	7.1	4.5	77	335	5.3
1819.0	0.490	19	2.1	44	261	7.7	7.1	3.9	68	298	5.6
1819.7	0.802	17	2.3	52	307	7.3	12	4.2	80	351	5.4
1820.4	0.490	17	2.4	49	256	7.7	7.1	4.3	75	293	5.6
1821.1	0.490	14	2.6	39	253	7.0	7.1	4.8	59	289	5.1
1821.8	0.490	16	2.6	56	280	6.6	7.1	4.7	86	320	4.8
1822.5	0.600	18	3.1	51	272	8.4	8.7	5.6	78	311	6.1
1823.2	0.490	17	2.9	44	307	7.8	7.1	5.3	68	351	5.7
1823.9	0.613	18	2.7	45	253	6.5	8.8	4.9	70	290	4.8
1824.6	0.490	16	2.2	45	269	7.0	7.1	3.9	69	308	5.1
1825.3	0.490	14	2.5	49	274	7.7	7.1	4.5	74	314	5.6
1826.0	1.2	18	2.0	57	306	6.8	17	3.7	87	350	5.0
1826.7	0.490	15	1.7	44	281	7.3	7.1	3.1	68	321	5.3
1827.4	0.490	21	2.1	49	329	7.2	7.1	3.8	74	376	5.3
1828.1	0.691	16	2.1	44	324	7.0	10.0	3.8	67	371	5.1
1828.8	0.595	16	1.6	51	317	7.8	8.6	2.9	78	363	5.7
1829.5	0.490	15	2.0	46	297	8.2	7.1	3.6	71	340	6.0
1830.2	0.490	16	1.9	43	269	6.4	7.1	3.4	66	308	4.7
1830.9	0.490	20	1.7	43	324	7.1	7.1	3.1	66	370	5.2
1831.6	0.768	14	1.5	37	288	7.6	11	2.7	56	330	5.5
1832.3	0.490	16	1.7	44	351	9.3	7.1	3.1	68	401	6.8
1833.0	0.490	17	1.5	45	358	6.3	7.1	2.6	69	410	4.6
1833.7	0.490	18	1.1	40	318	7.8	7.1	1.9	61	364	5.7
1834.4	0.539	14	1.7	41	327	7.3	7.8	3.1	63	374	5.3
1835.1	0.490	15	1.4	35	350	7.5	7.1	2.5	54	400	5.4
1835.8	0.490	15	1.6	35	341	8.7	7.1	2.9	54	390	6.3
1836.5	0.490	17	1.2	29	320	7.9	7.1	2.3	45	366	5.8
1837.2	0.490	16	1.1	35	378	9.0	7.1	2.0	54	432	6.5
1837.9	0.490	17	1.3	40	416	6.8	7.1	2.3	61	475	4.9
1838.5	0.490	16	1.6	36	333	7.0	7.1	2.9	55	381	5.1
1839.2	0.490	15	1.4	34	336	6.4	7.1	2.6	52	385	4.7
1839.9	0.623	13	1.1	26	315	6.1	9.0	2.0	40	360	4.4
1840.6	0.611	14	1.3	35	326	5.8	8.8	2.3	54	372	4.2
1841.3	0.490	14	1.3	31	366	5.9	7.1	2.4	47	418	4.3
1842.0	0.490	12	1.2	32	327	4.8	7.1	2.1	50	374	3.5
1842.7	0.490	15	1.1	35	389	5.0	7.1	2.1	53	445	3.6
1843.4	0.522	15	1.0	36	397	6.2	7.5	1.9	55	454	4.6
1844.1	0.490	13	1.1	28	329	4.6	7.1	2.1	43	376	3.4
1844.8	0.504	12	1.2	37	343	4.3	7.3	2.3	57	393	3.1
1845.5	0.624	14	1.2	24	349	5.1	9.0	2.1	37	399	3.7
1846.2	0.490	14	0.928	34	334	4.3	7.1	1.7	52	382	3.2
1846.9	0.490	12	1.1	30	345	3.1	7.1	2.1	46	394	2.2
1847.6	0.490	15	1.1	33	334	3.4	7.1	2.0	51	381	2.5
1848.3	0.908	11	0.911	33	306	4.5	13	1.7	50	350	3.3
1849.0	0.490	13	1.3	27	290	4.3	7.1	2.4	42	332	3.2
1849.7	0.490	13	1.2	32	307	3.8	7.1	2.1	49	352	2.8
1850.4	0.887	12	1.2	31	295	3.1	13	2.3	47	338	2.3
1851.1	0.490	10	1.1	26	287	4.5	7.1	2.0	40	329	3.3
1851.8	0.490	14	0.951	27	311	4.6	7.1	1.7	41	355	3.4
1852.5	0.734	16	0.981	27	300	3.7	11	1.8	42	343	2.7
1853.2	0.507	13	1.0	26	299	3.1	7.3	1.9	40	342	2.3
1853.9	0.637	13	1.0	29	316	4.7	9.2	1.9	45	361	3.4
1854.6	0.736	13	1.2	26	319	4.0	11	2.2	40	364	2.9
1855.3	0.490	14	0.897	23	257	3.8	7.1	1.6	36	294	2.8
1856.0	0.490	15	0.974	24	283	3.1	7.1	1.8	36	324	2.3
1856.7	0.490	12	1.2	27	287	2.7	7.1	2.3	42	328	1.9
1857.4	0.729	10	0.942	22	259	3.7	11	1.7	34	296	2.7
1858.1	0.490	14	1.3	21	301	3.8	7.1	2.4	32	344	2.8
1858.8	0.575	12	0.673	23	274	2.8	8.3	1.2	36	313	2.0
1859.5	0.490	12	0.778	20	291	4.0	7.1	1.4	31	333	2.9
1860.2	0.490	12	0.649	24	300	2.9	7.1	1.2	37	343	2.1
1860.9	0.490	13	0.789	18	291	2.8	7.1	1.4	28	333	2.0
1861.6	0.490	11	0.756	20	260	2.6	7.1	1.4	31	297	1.9
1862.3	0.490	12	0.917	20	262	2.2	7.1	1.7	31	299	1.6
1863.0	0.490	11	0.872	20	287	1.8	7.1	1.6	31	328	1.3
1863.6	0.490	15	1.0	16	299	3.9	7.1	1.9	24	342	2.9



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1864.3	0.490	11	1.2	18	294	3.3	7.1	2.1	28	336	2.4
1865.0	0.490	14	0.877	18	307	3.7	7.1	1.6	28	351	2.7
1865.7	0.490	15	1.2	23	308	3.2	7.1	2.1	35	352	2.3
1866.4	0.490	11	1.3	18	311	3.0	7.1	2.4	27	356	2.2
1867.1	0.490	12	1.3	18	265	2.4	7.1	2.4	28	303	1.8
1867.8	0.490	10	1.2	15	281	2.1	7.1	2.3	23	321	1.5
1868.5	0.490	12	1.1	17	342	3.4	7.1	2.1	26	392	2.5
1869.2	0.490	14	1.2	13	288	3.6	7.1	2.1	19	329	2.6
1869.9	0.490	10	0.805	14	263	3.8	7.1	1.5	22	300	2.7
1870.6	0.490	12	0.459	14	289	1.7	7.1	0.838	22	331	1.2
1871.3	0.490	12	0.733	14	287	3.0	7.1	1.3	22	328	2.2
1872.0	0.490	14	0.757	17	366	2.4	7.1	1.4	26	419	1.8
1872.7	0.490	10	0.813	17	291	3.0	7.1	1.5	25	333	2.2
1873.4	0.490	12	0.887	17	298	2.5	7.1	1.6	26	340	1.8
1874.1	0.490	12	0.787	17	262	3.2	7.1	1.4	26	300	2.3
1874.8	0.490	10	0.707	11	267	2.1	7.1	1.3	17	306	1.5
1875.5	0.490	11	0.757	11	276	3.0	7.1	1.4	17	316	2.2
1876.2	0.538	10.0	0.805	11	261	2.1	7.8	1.5	17	298	1.5
1876.9	0.490	12	0.802	14	258	3.1	7.1	1.5	22	295	2.3
1877.6	0.490	11	0.800	13	244	1.6	7.1	1.5	19	279	1.2
1878.3	0.699	12	0.815	17	302	3.0	10	1.5	26	346	2.2
1879.0	0.490	14	0.745	20	263	2.3	7.1	1.4	30	300	1.7
1879.7	0.490	12	0.701	18	285	1.9	7.1	1.3	28	326	1.4
1880.4	0.490	13	0.889	19	290	2.1	7.1	1.6	29	331	1.5
1881.1	0.547	14	1.5	23	310	2.2	7.9	2.8	36	354	1.6
1881.8	0.668	13	1.5	24	264	1.9	9.6	2.7	38	301	1.4
1882.5	0.490	15	1.6	23	243	2.3	7.1	3.0	35	278	1.7
1883.2	0.569	14	1.4	35	272	2.4	8.2	2.6	53	311	1.8
1883.9	0.490	12	1.4	23	250	2.2	7.1	2.5	35	286	1.6
1884.6	0.490	14	1.9	25	257	2.2	7.1	3.4	39	294	1.6
1885.3	0.490	14	1.5	22	234	2.1	7.1	2.8	33	267	1.5
1886.0	0.490	12	1.6	29	231	3.9	7.1	2.9	44	264	2.8
1886.7	0.490	14	1.8	31	214	3.0	7.1	3.4	47	245	2.2
1887.4	0.490	14	2.0	34	218	2.4	7.1	3.6	51	250	1.8
1888.1	0.498	13	2.2	32	242	2.4	7.2	4.1	49	276	1.7
1888.8	0.490	13	2.2	31	253	3.0	7.1	3.9	47	290	2.2
1889.5	0.490	13	2.6	36	231	2.2	7.1	4.7	55	265	1.6
1890.2	0.490	12	2.2	37	263	2.4	7.1	4.1	56	300	1.7
1890.8	0.490	12	2.2	37	226	3.3	7.1	4.0	56	259	2.4
1891.5	0.490	16	2.6	39	256	3.2	7.1	4.8	61	293	2.4
1892.2	0.513	14	2.8	42	241	3.3	7.4	5.1	65	276	2.4
1892.9	0.531	11	2.6	38	219	2.3	7.7	4.8	58	251	1.6
1893.6	0.490	14	3.0	39	290	2.5	7.1	5.5	60	332	1.8
1894.3	0.490	13	2.9	43	230	3.2	7.1	5.2	65	263	2.3
1895.0	0.490	14	3.2	51	257	4.8	7.1	5.8	78	293	3.5
1895.7	0.490	14	3.6	50	262	4.0	7.1	6.6	77	300	2.9
1896.4	0.518	16	3.2	53	264	3.1	7.5	5.9	82	302	2.3
1897.1	0.490	13	2.4	40	267	3.0	7.1	4.4	61	306	2.2
1897.8	0.576	15	3.6	55	334	5.8	8.3	6.6	84	382	4.3
1898.5	0.490	14	3.9	50	324	4.3	7.1	7.1	77	370	3.2
1899.2	0.490	14	4.3	48	312	4.0	7.1	7.8	73	357	2.9
1899.9	0.490	15	4.4	54	302	4.9	7.1	8.0	83	346	3.6
1900.6	0.490	17	4.2	54	321	3.6	7.1	7.6	83	367	2.6
1901.3	0.490	15	4.2	53	336	5.0	7.1	7.6	82	384	3.6
1902.0	0.490	15	3.9	52	320	5.2	7.1	7.1	80	366	3.8
1902.7	0.490	14	3.9	52	341	5.6	7.1	7.2	80	390	4.1
1903.4	0.490	15	4.4	55	365	4.2	7.1	8.0	84	417	3.1
1904.1	0.490	15	4.1	55	403	4.6	7.1	7.4	85	461	3.4
1904.8	0.490	15	3.1	56	483	4.2	7.1	5.7	86	552	3.1
1905.5	0.490	16	3.6	60	424	6.4	7.1	6.6	92	485	4.7
1906.2	0.490	15	3.4	55	428	5.4	7.1	6.1	85	489	3.9
1906.9	0.490	14	3.3	51	444	3.8	7.1	6.0	78	507	2.8
1907.6	0.490	14	3.3	53	570	3.9	7.1	6.0	82	652	2.9
1908.3	0.490	14	2.5	55	461	5.2	7.1	4.6	84	527	3.8
1909.0	0.908	16	3.4	61	582	5.5	13	6.2	93	666	4.0
1909.7	0.490	15	2.6	52	520	3.7	7.1	4.8	79	594	2.7
1910.4	0.583	13	2.6	55	506	4.5	8.4	4.7	85	578	3.3
1911.1	0.490	14	2.6	46	553	4.5	7.1	4.7	71	632	3.3
1911.8	0.490	13	1.9	48	557	4.0	7.1	3.4	73	637	2.9
1912.5	0.490	16	2.1	47	473	4.2	7.1	3.9	72	541	3.1
1913.2	0.490	14	2.3	52	613	5.0	7.1	4.2	79	701	3.6
1913.9	0.490	13	2.0	47	548	4.3	7.1	3.6	71	627	3.1
1914.6	0.490	14	2.0	49	546	3.8	7.1	3.7	75	624	2.8
1915.3	0.542	11	1.8	40	522	3.8	7.8	3.3	61	597	2.8
1916.0	0.619	15	1.8	40	494	2.2	8.9	3.3	62	565	1.6
1916.6	0.490	14	1.9	42	554	4.7	7.1	3.5	65	634	3.5
1917.3	0.490	13	1.8	41	539	3.0	7.1	3.2	63	617	2.2
1918.0	0.490	13	1.4	38	460	2.3	7.1	2.6	58	526	1.7
1918.7	0.490	15	1.5	41	544	3.4	7.1	2.7	63	622	2.5
1919.4	0.490	12	1.3	38	494	3.2	7.1	2.4	59	565	2.4
1920.1	0.490	14	0.959	32	510	3.2	7.1	1.7	49	583	2.3



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
1920.8	0.490	12	1.1	38	451	2.7	7.1	2.0	58	515	2.0
1921.5	0.490	13	1.1	30	432	2.2	7.1	2.0	46	494	1.6
1922.2	0.490	14	1.0	42	498	5.1	7.1	1.8	64	570	3.7
1922.9	0.562	12	0.750	34	407	1.2	8.1	1.4	52	466	0.906
1923.6	0.490	11	1.1	29	417	2.8	7.1	1.9	45	477	2.0
1924.3	0.490	12	0.903	39	394	1.2	7.1	1.6	59	450	0.866
1925.0	0.490	12	0.723	34	420	1.8	7.1	1.3	52	481	1.3
1925.7	0.490	13	1.2	30	456	2.1	7.1	2.1	47	521	1.6
1926.4	0.490	13	0.807	27	369	2.1	7.1	1.5	42	421	1.6
1927.1	0.526	13	0.712	29	411	2.1	7.6	1.3	45	470	1.5
1927.8	0.490	14	0.832	33	443	3.6	7.1	1.5	50	507	2.6
1928.5	0.490	12	1.1	30	391	1.9	7.1	2.1	46	447	1.4
1929.2	0.490	14	0.751	25	366	1.6	7.1	1.4	39	419	1.2
1929.9	0.490	12	0.618	29	389	2.4	7.1	1.1	44	445	1.7
1930.6	0.490	12	80	26	430	1.5	7.1	146	40	491	1.1
1931.3	0.726	12	0.724	26	363	2.0	10	1.3	41	415	1.4
1932.0	0.761	14	0.626	27	335	2.7	11	1.1	42	384	1.9
1932.7	0.591	12	0.521	27	376	2.0	8.5	0.950	41	431	1.4
1933.4	0.490	12	1.1	24	370	1.2	7.1	2.0	36	423	0.844
1934.1	0.789	12	1.1	24	333	1.3	11	2.0	36	381	0.963
1934.8	0.490	11	0.616	24	346	2.4	7.1	1.1	37	396	1.7
1935.5	0.687	12	0.854	27	322	1.1	9.9	1.6	41	368	0.834
1936.2	0.490	11	0.813	25	322	1.6	7.1	1.5	38	368	1.2
1936.9	0.490	12	0.720	23	356	1.9	7.1	1.3	36	407	1.4
1937.6	0.490	11	0.539	19	345	1.3	7.1	0.983	29	395	0.969
1938.3	0.490	13	0.457	19	309	1.2	7.1	0.833	29	354	0.845
1939.0	0.490	11	0.582	23	383	2.2	7.1	1.1	35	438	1.6
1939.7	0.490	11	0.759	22	331	2.1	7.1	1.4	34	378	1.5
1940.4	0.490	10.0	0.408	16	332	1.6	7.1	0.744	24	379	1.2
1941.1	0.490	11	0.356	16	337	1.3	7.1	0.649	25	386	0.921
1941.8	0.490	11	0.560	16	356	1.9	7.1	1.0	24	407	1.4
1942.4	0.547	13	0.476	18	324	1.8	7.9	0.868	27	370	1.3
1943.1	0.490	13	0.414	14	346	1.6	7.1	0.756	21	396	1.2
1943.8	0.490	11	0.486	16	318	1.7	7.1	0.886	25	364	1.2
1944.5	0.490	12	0.631	18	352	1.6	7.1	1.2	28	403	1.2
1945.2	0.490	11	0.525	16	361	2.2	7.1	0.958	25	413	1.6
1945.9	0.490	12	0.294	12	307	2.3	7.1	0.537	18	351	1.7
1946.6	0.490	11	0.604	12	340	1.8	7.1	1.1	19	389	1.3
1947.3	0.490	11	0.577	16	322	1.5	7.1	1.1	25	368	1.1
1948.0	0.688	13	0.569	15	350	1.7	9.9	1.0	23	400	1.2
1948.7	0.490	13	0.300	12	368	1.3	7.1	0.548	19	421	0.952
1949.4	0.738	11	0.285	10	344	1.8	11	0.519	16	393	1.3
1950.1	0.490	9.8	0.624	9.8	353	2.2	7.1	1.1	15	404	1.6
1950.8	0.490	10	0.289	10	345	1.4	7.1	0.527	16	395	1.1
1951.5	0.490	13	0.171	10	328	1.0	7.1	0.312	15	376	0.756
1952.2	0.506	12	0.336	8.2	349	1.5	7.3	0.612	13	399	1.1
1952.9	0.490	10	0.348	11	339	1.1	7.1	0.634	16	387	0.831
1953.6	0.519	9.2	0.393	8.4	340	1.8	7.5	0.717	13	389	1.3
1954.3	0.579	9.2	0.331	9.9	377	1.5	8.4	0.604	15	431	1.1
1955.0	0.490	10	0.377	9.0	322	1.7	7.1	0.687	14	368	1.3
1955.7	0.490	9.4	0.242	7.2	321	1.3	7.1	0.441	11	367	0.970
1956.4	0.490	9.3	0.244	7.9	296	2.0	7.1	0.445	12	339	1.5
1957.1	0.490	11	0.264	6.4	343	2.1	7.1	0.482	9.9	392	1.5
1957.8	0.490	10	0.307	9.6	309	2.1	7.1	0.560	15	353	1.5
1958.5	0.490	10	0.247	8.1	321	2.3	7.1	0.450	12	367	1.7
1959.2	0.490	11	0.513	8.3	298	1.6	7.1	0.936	13	341	1.2
1959.9	0.490	11	0.452	7.5	302	1.1	7.1	0.825	12	345	0.828
1960.6	0.490	11	0.425	10	333	1.6	7.1	0.775	16	380	1.1
1961.3	0.490	10	0.389	6.9	319	2.4	7.1	0.709	11	365	1.8
1962.0	0.490	11	0.283	8.3	294	1.4	7.1	0.517	13	336	1.0
1962.7	0.490	10	0.289	7.8	301	1.3	7.1	0.527	12	344	0.914
1963.4	0.490	9.0	0.279	7.2	306	1.3	7.1	0.509	11	350	0.956
1964.1	0.490	9.7	0.444	7.9	365	1.3	7.1	0.810	12	418	0.924
1964.8	0.490	12	0.183	6.7	308	1.1	7.1	0.334	10	352	0.810
1965.5	0.490	10	0.433	7.1	313	1.1	7.1	0.789	11	358	0.801
1966.2	0.490	13	0.272	7.6	273	2.1	7.1	0.496	12	312	1.5
1966.9	0.490	9.4	0.380	8.1	289	1.1	7.1	0.693	12	330	0.784
1967.6	0.490	11	0.189	6.7	319	1.2	7.1	0.344	10	365	0.882
1968.3	0.490	12	0.243	7.9	297	1.0	7.1	0.442	12	339	0.765
1968.9	0.490	10	0.436	11	313	1.9	7.1	0.796	17	357	1.4
1969.6	0.490	11	0.419	10	284	1.8	7.1	0.764	15	324	1.3
1970.3	0.491	17	0.610	9.6	282	1.5	7.1	1.1	15	323	1.1
1971.0	0.490	16	1.1	15	283	1.9	7.1	2.0	23	323	1.4
1971.7	0.490	20	1.7	20	291	2.1	7.1	3.1	30	333	1.5
1972.4	0.490	16	1.5	21	251	1.1	7.1	2.8	32	287	0.773
1973.1	0.490	17	1.7	20	301	1.9	7.1	3.0	30	344	1.4
1973.8	0.490	18	1.6	19	264	1.4	7.1	3.0	30	302	1.0
1974.5	0.490	19	1.9	23	294	1.4	7.1	3.4	35	336	1.0
1975.2	0.544	18	1.9	27	276	1.5	7.8	3.5	41	315	1.1
1975.9	0.490	16	1.8	28	252	1.9	7.1	3.4	42	288	1.4
1976.6	0.490	14	1.9	27	259	1.7	7.1	3.5	42	297	1.2



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1977.3	0.490	17	2.1	29	281	2.1	7.1	3.8	45	321	1.5
1978.0	0.490	15	2.1	29	315	2.4	7.1	3.8	45	360	1.8
1978.7	0.531	16	2.0	26	280	1.8	7.7	3.7	40	320	1.3
1979.4	0.490	16	1.7	23	280	2.0	7.1	3.2	36	320	1.5
1980.1	0.490	16	2.1	25	294	2.0	7.1	3.9	38	336	1.4
1980.8	0.490	14	2.2	26	270	1.5	7.1	4.0	39	309	1.1
1981.5	0.490	15	2.2	25	316	2.8	7.1	4.1	38	362	2.1
1982.2	0.490	16	2.6	26	303	2.7	7.1	4.7	40	347	1.9
1982.9	0.490	16	2.0	26	348	1.4	7.1	3.6	40	397	1.0
1983.6	0.490	15	2.6	29	289	2.3	7.1	4.7	44	331	1.7
1984.3	0.490	16	1.9	29	343	1.6	7.1	3.4	45	393	1.2
1985.0	0.490	14	2.6	31	359	1.5	7.1	4.8	48	411	1.1
1985.7	0.579	18	1.9	26	302	2.8	8.4	3.6	40	346	2.0
1986.4	0.490	16	2.4	26	323	2.2	7.1	4.4	39	369	1.6
1987.1	0.490	15	1.9	33	337	1.9	7.1	3.5	50	386	1.4
1987.8	0.490	17	2.4	28	322	2.5	7.1	4.5	44	368	1.8
1988.5	0.490	15	2.1	27	360	2.0	7.1	3.8	42	412	1.4
1989.2	0.490	16	2.1	28	345	2.9	7.1	3.8	43	395	2.1
1989.9	0.490	15	1.8	31	353	1.7	7.1	3.3	48	404	1.2
1990.6	0.490	14	1.9	32	378	2.7	7.1	3.5	49	432	2.0
1991.3	0.490	16	1.9	31	380	2.4	7.1	3.4	47	434	1.8
1992.0	0.490	14	2.2	36	344	2.4	7.1	4.0	55	394	1.7
1992.7	0.490	16	1.9	30	406	2.2	7.1	3.4	45	464	1.6
1993.4	0.490	14	1.8	33	389	2.2	7.1	3.4	50	445	1.6
1994.1	0.490	16	1.9	31	411	2.3	7.1	3.4	48	470	1.7
1994.7	0.490	15	2.1	33	413	1.7	7.1	3.7	50	472	1.2
1995.4	0.490	15	2.0	32	434	2.5	7.1	3.7	50	497	1.8
1996.1	0.490	15	1.6	26	383	2.5	7.1	3.0	39	438	1.8
1996.8	0.490	14	1.9	31	446	2.6	7.1	3.5	47	510	1.9
1997.5	0.490	16	2.0	32	518	3.3	7.1	3.7	50	593	2.4
1998.2	0.490	15	1.8	28	460	3.6	7.1	3.4	43	526	2.6
1998.9	0.490	16	2.2	31	504	4.0	7.1	4.1	47	577	2.9
1999.6	0.490	14	2.1	31	504	4.1	7.1	3.8	48	576	3.0
2000.3	0.490	16	2.2	31	556	4.0	7.1	4.0	47	636	2.9
2001.0	0.490	12	2.1	30	516	2.0	7.1	3.8	46	590	1.4
2001.7	0.511	16	1.8	30	522	2.7	7.4	3.2	46	597	2.0
2002.4	0.490	13	1.8	28	501	3.7	7.1	3.3	43	572	2.7
2003.1	0.490	13	1.5	26	489	2.6	7.1	2.8	40	559	1.9
2003.8	0.490	14	1.9	28	541	3.2	7.1	3.5	42	618	2.3
2004.5	0.636	16	1.3	25	561	3.4	9.2	2.4	38	642	2.5
2005.2	0.490	14	1.3	26	493	3.2	7.1	2.4	40	564	2.3
2005.9	0.815	12	1.2	27	527	2.5	12	2.2	42	603	1.8
2006.6	0.490	15	1.6	26	535	3.6	7.1	3.0	39	612	2.6
2007.3	0.490	14	1.4	26	509	2.7	7.1	2.5	40	583	2.0
2008.0	0.490	15	1.1	26	498	1.0	7.1	2.0	39	569	0.755
2008.7	0.490	15	1.1	21	534	3.3	7.1	1.9	32	610	2.4
2009.4	0.490	15	1.6	26	460	2.4	7.1	2.9	39	526	1.8
2010.1	0.490	14	0.984	22	473	1.6	7.1	1.8	33	540	1.1
2010.8	0.490	14	1.1	19	466	2.2	7.1	1.9	29	533	1.6
2011.5	0.490	15	0.849	22	466	1.2	7.1	1.5	34	533	0.886
2012.2	0.490	13	1.4	19	469	2.5	7.1	2.5	30	537	1.8
2012.9	0.490	14	0.776	17	450	1.9	7.1	1.4	25	515	1.4
2013.6	0.490	14	0.954	16	421	1.4	7.1	1.7	25	481	1.1
2014.3	0.490	14	1.0	17	500	1.1	7.1	1.8	26	572	0.817
2015.0	0.490	13	0.614	21	446	1.1	7.1	1.1	31	510	0.789
2015.7	0.490	13	1.0	20	449	1.5	7.1	1.9	31	514	1.1
2016.4	0.490	10	0.688	20	411	2.1	7.1	1.3	31	470	1.5
2017.1	0.490	14	0.656	19	388	1.9	7.1	1.2	30	444	1.4
2017.8	0.560	15	1.0	18	377	1.2	8.1	1.9	27	431	0.902
2018.5	0.490	15	0.788	17	406	2.4	7.1	1.4	26	465	1.8
2019.2	0.490	12	0.897	16	374	1.5	7.1	1.6	25	428	1.1
2019.9	0.500	10	0.585	18	392	0.823	7.2	1.1	27	449	0.601
2020.5	0.586	12	0.685	17	401	1.7	8.5	1.2	26	458	1.3
2021.2	0.490	13	0.646	14	423	1.8	7.1	1.2	21	483	1.3
2021.9	0.824	14	0.783	18	398	1.9	12	1.4	28	455	1.4
2022.6	0.490	15	0.757	15	357	0.764	7.1	1.4	23	408	0.557
2023.3	0.587	14	0.576	18	386	1.3	8.5	1.1	27	441	0.926
2024.0	0.490	13	0.995	14	341	1.7	7.1	1.8	21	390	1.3
2024.7	0.490	12	0.961	14	373	1.1	7.1	1.8	21	426	0.794
2025.4	0.490	11	0.410	13	393	1.0	7.1	0.748	21	450	0.759
2026.1	0.490	13	0.563	11	382	2.0	7.1	1.0	18	437	1.5
2026.8	0.490	11	0.629	13	369	1.1	7.1	1.1	20	422	0.784
2027.5	0.490	13	0.668	13	400	1.8	7.1	1.2	20	458	1.3
2028.2	0.490	13	0.694	12	336	1.6	7.1	1.3	19	384	1.2
2028.9	0.490	12	0.523	11	325	0.459	7.1	0.954	16	371	0.335
2029.6	0.490	13	0.739	9.9	394	1.5	7.1	1.3	15	451	1.1
2030.3	0.490	12	0.491	10	317	1.4	7.1	0.895	16	362	1.0
2031.0	0.547	13	0.617	9.5	350	1.0	7.9	1.1	15	400	0.735
2031.7	0.490	13	0.624	10	432	1.8	7.1	1.1	15	494	1.3
2032.4	0.490	12	0.482	9.8	329	1.5	7.1	0.879	15	377	1.1
2033.1	0.811	11	0.374	7.3	369	1.5	12	0.682	11	421	1.1



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
2033.8	0.490	12	0.685	8.2	356	1.5	7.1	1.2	13	407	1.1
2034.5	0.490	9.5	0.493	6.1	332	1.2	7.1	0.899	9.4	380	0.894
2035.2	0.490	14	0.216	9.7	446	1.4	7.1	0.394	15	510	1.1
2035.9	0.490	10	0.382	5.9	312	1.4	7.1	0.697	9.1	356	1.0
2036.6	0.490	14	0.495	6.9	382	1.2	7.1	0.903	11	437	0.898
2037.3	0.490	11	0.463	6.2	361	1.6	7.1	0.844	9.4	413	1.2
2038.0	0.707	11	0.405	6.9	363	1.2	10	0.739	11	415	0.863
2038.7	0.490	11	0.399	4.3	353	2.0	7.1	0.728	6.6	404	1.4
2039.4	0.490	9.0	0.356	5.6	299	0.914	7.1	0.649	8.5	342	0.667
2040.1	0.493	9.3	0.372	7.0	356	1.2	7.1	0.678	11	408	0.888
2040.8	0.490	9.3	0.276	5.2	307	1.4	7.1	0.504	8.0	352	1.0
2041.5	0.490	11	0.280	6.7	374	2.2	7.1	0.510	10	428	1.6
2042.2	0.490	8.9	0.207	4.8	321	1.6	7.1	0.378	7.4	367	1.2
2042.9	0.490	10	0.226	6.6	350	1.4	7.1	0.413	10	400	0.996
2043.6	0.614	10.0	0.374	4.7	335	1.1	8.9	0.682	7.2	383	0.819
2044.3	0.490	8.9	0.392	7.2	338	1.1	7.1	0.714	11	386	0.779
2045.0	0.490	8.2	0.414	5.2	328	1.3	7.1	0.754	7.9	375	0.931
2045.6	0.490	8.4	0.506	5.8	366	1.3	7.1	0.923	8.9	419	0.936
2046.3	0.490	8.3	0.272	5.3	342	0.959	7.1	0.495	8.1	392	0.700
2047.0	0.490	8.5	0.425	4.8	311	0.783	7.1	0.775	7.3	356	0.571
2047.7	0.490	11	0.498	4.3	345	2.1	7.1	0.908	6.5	395	1.5
2048.4	0.490	8.0	0.354	7.1	352	1.9	7.1	0.645	11	403	1.4
2049.1	0.547	7.3	0.414	6.2	356	1.5	7.9	0.754	9.6	407	1.1
2049.8	0.490	11	0.476	4.2	345	1.1	7.1	0.868	6.5	395	0.832
2050.5	0.490	9.9	0.468	3.5	346	1.6	7.1	0.853	5.3	396	1.2
2051.2	0.490	8.6	0.375	5.7	340	1.1	7.1	0.684	8.8	388	0.774
2051.9	0.490	8.9	0.428	5.8	284	0.804	7.1	0.780	8.9	325	0.586
2052.6	0.490	8.2	0.412	5.4	290	1.3	7.1	0.751	8.2	332	0.923
2053.3	0.490	9.4	0.671	3.8	385	2.2	7.1	1.2	5.9	440	1.6
2054.0	0.490	9.2	0.630	6.0	321	1.5	7.1	1.1	9.2	367	1.1
2054.7	0.490	9.0	0.654	8.5	343	1.9	7.1	1.2	13	392	1.4
2055.4	0.490	9.4	0.614	5.2	296	1.0	7.1	1.1	7.9	338	0.749
2056.1	0.490	10	0.716	6.3	310	2.2	7.1	1.3	9.7	354	1.6
2056.8	0.490	7.8	0.755	6.0	314	1.8	7.1	1.4	9.1	359	1.3
2057.5	0.490	8.5	0.764	5.6	316	2.5	7.1	1.4	8.6	361	1.8
2058.2	0.490	11	1.2	6.4	317	1.8	7.1	2.2	9.9	363	1.3
2058.9	0.490	9.8	1.3	7.7	302	1.7	7.1	2.3	12	345	1.3
2059.6	0.490	8.7	1.3	4.7	390	1.9	7.1	2.5	7.2	446	1.4
2060.3	0.490	9.4	1.6	6.3	306	1.5	7.1	2.8	9.6	350	1.1
2061.0	0.714	9.3	1.6	8.3	336	1.6	10	2.9	13	385	1.2
2061.7	0.490	9.0	1.6	5.9	269	2.0	7.1	2.9	9.1	307	1.5
2062.4	0.490	9.1	1.4	6.8	276	1.5	7.1	2.5	10	315	1.1
2063.1	0.490	9.7	2.0	5.4	317	2.6	7.1	3.6	8.3	363	1.9
2063.8	0.490	8.7	1.8	6.3	319	1.0	7.1	3.3	9.7	365	0.750
2064.5	0.490	9.1	1.7	6.2	311	2.4	7.1	3.2	9.5	355	1.8
2065.2	0.490	8.1	1.4	7.3	290	1.9	7.1	2.6	11	332	1.4
2065.9	0.490	8.1	1.5	5.5	293	1.3	7.1	2.8	8.4	336	0.947
2066.6	0.490	10	2.5	9.0	312	1.7	7.1	4.5	14	356	1.2
2067.3	0.490	9.3	2.0	6.8	333	1.7	7.1	3.6	10	381	1.2
2068.0	0.490	9.7	1.8	12	282	1.4	7.1	3.3	18	323	1.0
2068.7	0.490	7.6	1.5	10	269	1.9	7.1	2.7	16	308	1.4
2069.4	0.490	8.6	1.8	11	292	2.2	7.1	3.3	17	333	1.6
2070.1	0.490	8.7	1.6	11	300	2.6	7.1	2.9	17	343	1.9
2070.8	0.490	9.5	1.5	13	270	1.4	7.1	2.7	20	309	1.0
2071.5	0.490	9.6	1.5	13	293	1.7	7.1	2.7	19	335	1.2
2072.1	0.490	8.1	1.5	11	268	1.0	7.1	2.7	17	306	0.745
2072.8	0.490	11	1.5	11	280	2.0	7.1	2.7	16	321	1.4
2073.5	0.490	8.6	1.3	12	255	2.1	7.1	2.5	18	291	1.5
2074.2	0.490	9.6	1.5	14	292	1.2	7.1	2.8	22	334	0.911
2074.9	0.490	10	1.2	12	254	2.1	7.1	2.2	19	291	1.6
2075.6	0.490	10	1.6	14	277	0.796	7.1	3.0	21	317	0.580
2076.3	0.526	9.3	1.4	13	275	1.4	7.6	2.6	20	315	0.988
2077.0	0.490	10	2.1	17	286	2.0	7.1	3.8	26	327	1.5
2077.7	0.490	11	1.8	15	273	1.0	7.1	3.4	22	312	0.737
2078.4	0.490	10	1.8	16	280	1.2	7.1	3.2	25	321	0.857
2079.1	0.490	9.9	1.4	15	246	1.4	7.1	2.6	23	282	1.0
2079.8	0.490	8.7	1.6	12	264	1.6	7.1	3.0	19	302	1.2
2080.5	0.490	12	2.1	15	261	1.4	7.1	3.9	23	298	1.0
2081.2	0.490	11	2.0	20	284	1.8	7.1	3.7	31	325	1.3
2081.9	0.554	12	2.1	18	255	1.4	8.0	3.8	28	292	1.0
2082.6	0.894	11	2.2	19	259	1.2	13	4.0	30	297	0.878
2083.3	0.490	12	2.5	19	283	1.0	7.1	4.6	29	323	0.742
2084.0	0.490	15	2.2	21	310	1.4	7.1	4.1	32	355	1.0
2084.7	0.490	12	2.6	21	272	1.0	7.1	4.7	33	311	0.738
2085.4	0.490	12	2.5	20	288	1.0	7.1	4.5	31	329	0.749
2086.1	0.490	10	2.4	18	275	1.4	7.1	4.4	27	315	0.995
2086.8	0.490	11	2.4	20	279	1.2	7.1	4.4	31	319	0.905
2087.5	0.490	9.9	1.8	21	268	1.7	7.1	3.3	32	306	1.2
2088.2	0.490	12	1.5	19	278	1.2	7.1	2.8	29	318	0.864
2088.9	0.490	12	2.2	25	337	2.1	7.1	4.0	38	385	1.5
2089.6	0.490	13	2.0	22	277	1.1	7.1	3.6	34	316	0.836



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2090.3	0.490	12	2.2	25	283	0.976	7.1	3.9	39	324	0.712
2091.0	0.490	16	1.8	22	263	0.866	7.1	3.3	34	300	0.632
2091.7	0.490	13	1.6	22	257	1.5	7.1	3.0	34	294	1.1
2092.4	0.534	13	2.0	23	256	0.647	7.7	3.6	35	293	0.472
2093.1	0.490	13	1.9	20	296	1.5	7.1	3.4	31	339	1.1
2093.8	0.490	15	1.7	21	267	1.2	7.1	3.2	32	306	0.864
2094.5	0.490	13	1.8	19	257	1.3	7.1	3.3	29	294	0.980
2095.2	0.490	14	2.1	20	263	1.3	7.1	3.8	31	301	0.976
2095.9	0.490	13	1.2	17	268	0.826	7.1	2.2	27	307	0.603
2096.6	0.490	12	1.2	17	272	0.667	7.1	2.2	26	311	0.487
2097.3	0.490	15	1.3	23	282	1.3	7.1	2.4	35	322	0.975
2098.0	0.490	15	1.2	20	282	0.932	7.1	2.3	30	322	0.680
2098.7	0.490	13	0.924	12	229	0.856	7.1	1.7	19	262	0.624
2099.3	0.490	12	1.1	18	242	1.8	7.1	2.0	27	277	1.3
2100.0	0.490	11	0.793	15	263	1.0	7.1	1.4	23	301	0.761
2100.7	0.490	12	1.2	18	249	0.802	7.1	2.1	28	285	0.585
2101.4	0.490	13	0.920	15	234	0.893	7.1	1.7	23	267	0.652
2102.1	0.490	13	0.905	12	270	1.1	7.1	1.6	18	309	0.768
2102.8	0.676	10	0.857	16	245	0.511	9.8	1.6	24	280	0.373
2103.5	0.726	12	0.921	15	263	0.990	10	1.7	24	301	0.723
2104.2	0.522	11	0.851	17	240	0.644	7.5	1.6	26	274	0.470
2104.9	0.490	11	0.994	15	243	0.438	7.1	1.8	23	278	0.320
2105.6	1.4	12	0.628	13	235	1.2	20	1.1	21	268	0.887
2106.3	0.490	10	0.750	15	264	0.454	7.1	1.4	23	302	0.332
2107.0	0.490	10	0.905	16	270	0.665	7.1	1.6	24	309	0.485
2107.7	0.606	10	0.783	12	233	0.444	8.7	1.4	19	266	0.324
2108.4	0.490	14	0.599	13	242	1.4	7.1	1.1	19	276	1.0
2109.1	0.818	13	0.571	12	245	0.568	12	1.0	19	280	0.414
2109.8	0.490	12	0.426	12	291	0.244	7.1	0.776	19	333	0.178
2110.5	0.490	12	0.767	14	251	0.481	7.1	1.4	21	287	0.351
2111.2	0.490	11	0.764	12	239	0.651	7.1	1.4	18	274	0.475
2111.9	0.490	9.5	0.398	13	212	0.612	7.1	0.725	19	243	0.447
2112.6	0.490	11	0.487	11	204	0.875	7.1	0.889	16	234	0.639
2113.3	0.601	11	0.281	9.6	235	0.551	8.7	0.513	15	269	0.402
2114.0	0.490	9.7	0.418	9.1	221	0.608	7.1	0.762	14	253	0.444
2114.7	0.490	9.8	0.865	8.7	236	0.982	7.1	1.6	13	270	0.716
2115.4	0.490	11	0.622	8.0	250	0.630	7.1	1.1	12	286	0.460
2116.1	0.490	10	0.557	5.8	218	0.362	7.1	1.0	8.8	249	0.264
2116.8	0.490	13	0.405	8.9	242	0.519	7.1	0.738	14	276	0.379
2117.5	0.698	11	0.335	7.8	225	0.680	10	0.610	12	257	0.496
2118.2	0.490	10	0.487	7.2	238	0.680	7.1	0.889	11	272	0.496
2118.9	0.490	12	0.552	5.7	251	0.707	7.1	1.0	8.8	287	0.516
2119.6	0.490	13	0.474	6.4	256	1.5	7.1	0.864	9.8	292	1.1
2120.3	0.490	12	0.688	8.1	270	1.4	7.1	1.3	12	309	1.0
2121.0	0.608	13	0.461	6.0	278	1.0	8.8	0.840	9.2	318	0.737
2121.7	0.909	12	0.580	5.9	272	1.6	13	1.1	9.1	311	1.2
2122.4	0.490	12	0.675	6.3	263	0.793	7.1	1.2	9.6	301	0.578
2123.1	0.538	12	0.629	6.7	268	1.5	7.8	1.1	10	307	1.1
2123.8	0.490	14	0.770	5.0	261	1.8	7.1	1.4	7.6	299	1.3
2124.5	0.846	12	0.619	4.0	262	2.4	12	1.1	6.1	300	1.8
2125.2	0.490	11	0.766	4.0	240	1.1	7.1	1.4	6.1	274	0.798
2125.8	0.490	11	0.551	4.4	279	1.6	7.1	1.0	6.7	319	1.2
2126.5	0.490	13	0.531	5.7	274	0.954	7.1	0.969	8.8	313	0.696
2127.2	0.517	12	0.509	5.0	291	1.9	7.5	0.929	7.7	333	1.4
2127.9	0.490	11	0.789	2.3	301	1.2	7.1	1.4	3.6	344	0.897
2128.6	0.490	13	0.544	4.2	289	1.3	7.1	0.992	6.5	331	0.951
2129.3	0.490	10	0.479	4.5	295	2.1	7.1	0.874	6.8	338	1.5
2130.0	0.490	10	0.466	5.4	256	2.0	7.1	0.850	8.2	293	1.5
2130.7	0.490	14	0.869	4.5	277	1.1	7.1	1.6	6.9	316	0.811
2131.4	0.490	11	0.703	4.4	264	2.6	7.1	1.3	6.8	301	1.9
2132.1	0.490	12	0.841	3.4	292	1.5	7.1	1.5	5.2	334	1.1
2132.8	0.510	11	0.620	3.8	294	1.5	7.4	1.1	5.8	336	1.1
2133.5	0.490	12	1.2	3.9	251	1.7	7.1	2.1	6.0	287	1.3
2134.2	0.490	11	1.1	4.1	319	2.0	7.1	2.0	6.3	365	1.4
2134.9	0.490	10	0.924	4.7	264	2.0	7.1	1.7	7.1	302	1.5
2135.6	0.490	10	0.944	3.7	297	1.9	7.1	1.7	5.6	339	1.4
2136.3	0.490	11	0.985	4.5	278	1.6	7.1	1.8	6.9	317	1.1
2137.0	0.490	11	1.2	3.7	259	2.1	7.1	2.2	5.6	296	1.5
2137.7	0.490	11	1.3	3.0	239	1.2	7.1	2.3	4.5	274	0.873
2138.4	0.490	12	1.2	6.3	281	1.3	7.1	2.2	9.6	321	0.950
2139.1	0.490	9.2	1.2	2.8	243	1.4	7.1	2.2	4.3	277	1.0
2139.8	0.490	12	1.4	6.4	269	2.1	7.1	2.6	9.9	307	1.6
2140.5	0.490	13	1.7	5.4	251	1.6	7.1	3.1	8.2	287	1.2
2141.2	0.490	11	0.907	5.2	232	1.9	7.1	1.7	7.9	265	1.4
2141.9	0.490	9.8	1.3	3.9	256	1.5	7.1	2.4	5.9	293	1.1
2142.6	0.490	11	1.1	5.9	248	1.7	7.1	1.9	9.0	283	1.2
2143.3	0.490	9.2	1.3	7.4	228	1.6	7.1	2.4	11	261	1.2
2144.0	0.490	8.6	1.1	9.1	237	0.855	7.1	2.0	14	271	0.624
2144.7	0.490	11	1.4	6.3	224	0.825	7.1	2.5	9.6	256	0.602
2145.4	0.490	9.5	1.3	7.8	237	1.2	7.1	2.4	12	270	0.861
2146.1	0.490	10	0.935	8.0	241	0.688	7.1	1.7	12	275	0.502



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
2146.8	0.490	9.7	1.0	7.3	215	1.1	7.1	1.9	11	246	0.777
2147.5	0.490	10	1.4	7.0	232	1.3	7.1	2.5	11	265	0.968
2148.2	0.490	8.0	1.1	7.7	220	1.1	7.1	2.0	12	251	0.790
2148.9	0.490	9.6	0.865	7.2	225	1.2	7.1	1.6	11	257	0.852
2149.6	0.490	11	1.2	6.8	224	1.0	7.1	2.3	10	256	0.751
2150.3	0.490	10	1.3	7.6	229	0.775	7.1	2.4	12	262	0.565
2151.0	0.563	8.7	1.3	8.8	249	1.6	8.1	2.4	13	285	1.2
2151.7	0.490	10	1.4	7.5	195	0.806	7.1	2.6	11	224	0.588
2152.3	0.490	10	1.2	9.6	224	0.890	7.1	2.2	15	257	0.649
2153.0	0.684	10	1.1	8.1	214	1.1	9.9	2.0	12	245	0.829
2153.7	0.490	8.4	0.954	9.7	209	0.864	7.1	1.7	15	239	0.631
2154.4	0.490	10	1.2	11	232	1.7	7.1	2.1	16	266	1.2
2155.1	0.490	8.6	1.5	11	220	0.422	7.1	2.7	17	252	0.308
2155.8	0.490	9.9	1.2	9.2	225	1.0	7.1	2.2	14	257	0.753
2156.5	0.490	8.8	1.2	9.9	236	0.310	7.1	2.3	15	270	0.226
2157.2	0.490	10	1.5	15	253	0.634	7.1	2.7	22	290	0.463
2157.9	0.490	8.9	1.0	12	228	0.630	7.1	1.9	19	261	0.460
2158.6	0.490	9.8	0.979	11	242	1.3	7.1	1.8	17	277	0.948
2159.3	0.490	7.9	1.2	8.6	219	1.4	7.1	2.2	13	251	1.0
2160.0	0.490	11	1.0	10	253	1.6	7.1	1.9	16	290	1.2
2160.7	0.490	9.6	1.1	13	237	0.324	7.1	1.9	20	271	0.236
2161.4	0.490	12	0.877	12	225	1.3	7.1	1.6	18	257	0.943
2162.1	0.490	9.2	0.920	12	247	0.427	7.1	1.7	18	282	0.311
2162.8	0.490	9.6	0.585	8.9	214	0.762	7.1	1.1	14	245	0.556
2163.5	0.490	11	0.938	11	222	0.592	7.1	1.7	16	254	0.432
2164.2	0.490	9.3	0.500	11	229	0.497	7.1	0.911	17	262	0.363
2164.9	0.490	9.5	0.647	12	224	0.712	7.1	1.2	19	256	0.520
2165.6	0.490	12	0.844	14	252	0.958	7.1	1.5	21	288	0.699
2166.3	0.490	11	0.565	9.4	217	0.795	7.1	1.0	14	248	0.580
2167.0	0.490	9.5	0.736	12	228	0.589	7.1	1.3	18	261	0.430
2167.7	0.490	9.6	0.783	11	214	1.0	7.1	1.4	17	245	0.751
2168.4	0.490	9.9	0.562	7.8	220	0.593	7.1	1.0	12	251	0.432
2169.1	0.490	9.0	0.482	11	218	1.0	7.1	0.879	17	249	0.735
2169.8	0.490	9.3	0.360	8.6	240	0.837	7.1	0.657	13	274	0.611
2170.5	0.490	9.9	0.673	12	270	1.1	7.1	1.2	18	309	0.822
2171.2	0.556	11	0.815	12	227	0.832	8.0	1.5	18	260	0.607
2171.9	0.490	8.9	0.323	8.6	227	0.374	7.1	0.589	13	260	0.273
2172.6	0.490	11	0.578	7.0	243	0.507	7.1	1.1	11	278	0.370
2173.3	0.490	8.8	0.414	7.2	256	0.859	7.1	0.755	11	293	0.627
2174.0	0.490	11	0.576	7.6	234	1.0	7.1	1.0	12	268	0.754
2174.7	0.490	9.8	0.662	9.2	225	0.564	7.1	1.2	14	258	0.412
2175.4	0.490	7.8	0.537	8.7	221	1.2	7.1	0.980	13	253	0.896
2176.1	0.490	11	0.724	6.7	250	1.2	7.1	1.3	10	286	0.875
2176.8	0.650	9.9	0.604	7.1	267	0.985	9.4	1.1	11	305	0.719
2177.5	0.640	11	0.587	5.3	235	0.892	9.2	1.1	8.1	269	0.651
2178.1	0.640	9.5	0.573	7.6	263	1.4	9.2	1.0	12	301	0.992
2178.8	0.490	11	0.381	8.2	285	1.8	7.1	0.695	13	326	1.3
2179.5	0.514	10	0.347	7.0	239	1.3	7.4	0.632	11	273	0.966
2180.2	0.521	11	0.674	6.3	239	0.863	7.5	1.2	9.7	273	0.629
2180.9	0.490	11	0.486	5.6	263	1.1	7.1	0.886	8.6	301	0.778
2181.6	0.642	13	0.313	6.2	274	1.3	9.3	0.572	9.5	313	0.924
2182.3	0.490	8.9	0.647	4.0	252	1.6	7.1	1.2	6.1	289	1.2
2183.0	0.889	11	0.553	3.9	256	1.5	13	1.0	6.0	293	1.1
2183.7	0.697	12	0.661	3.4	259	2.3	10	1.2	5.2	297	1.7
2184.4	0.533	11	0.360	5.7	268	1.5	7.7	0.656	8.7	307	1.1
2185.1	0.490	11	0.690	2.9	267	1.5	7.1	1.3	4.4	305	1.1
2185.8	0.598	10	0.840	4.2	271	1.2	8.6	1.5	6.4	310	0.860
2186.5	0.518	10	0.584	4.2	247	1.7	7.5	1.1	6.5	283	1.3
2187.2	0.490	11	0.445	4.8	281	2.7	7.1	0.811	7.4	322	1.9
2187.9	0.490	9.5	0.603	3.4	250	1.5	7.1	1.1	5.3	286	1.1
2188.6	0.490	9.4	0.622	3.2	265	0.945	7.1	1.1	4.9	303	0.690
2189.3	0.490	9.8	0.661	3.1	289	0.501	7.1	1.2	4.7	331	0.366
2190.0	0.490	10	0.521	1.8	287	1.9	7.1	0.950	2.7	329	1.4
2190.7	0.490	9.2	0.609	3.5	289	1.7	7.1	1.1	5.3	331	1.2
2191.4	0.490	10	0.466	3.5	293	1.5	7.1	0.850	5.4	335	1.1
2192.1	0.490	8.6	0.741	1.7	232	1.8	7.1	1.4	2.6	265	1.3
2192.8	0.490	8.7	0.667	3.3	251	1.8	7.1	1.2	5.1	287	1.3
2193.5	0.490	8.0	0.434	4.0	272	1.5	7.1	0.792	6.2	311	1.1
2194.2	0.490	8.8	0.692	2.6	276	2.7	7.1	1.3	4.0	315	1.9
2194.9	0.490	9.2	0.703	1.7	256	1.7	7.1	1.3	2.6	293	1.2
2195.6	0.490	11	1.0	3.3	295	2.2	7.1	1.8	5.1	337	1.6
2196.3	0.490	10	0.863	3.2	295	2.6	7.1	1.6	4.8	337	1.9
2197.0	0.490	8.8	0.559	1.9	240	1.8	7.1	1.0	3.0	275	1.3
2197.7	0.490	10	0.899	2.5	258	1.5	7.1	1.6	3.9	295	1.1
2198.4	0.490	11	0.995	3.1	261	2.2	7.1	1.8	4.7	298	1.6
2199.1	0.490	9.4	0.921	1.7	318	2.5	7.1	1.7	2.6	363	1.8
2199.8	0.490	10	1.1	4.2	280	2.4	7.1	2.1	6.4	320	1.7
2200.5	0.490	12	0.938	5.1	289	3.2	7.1	1.7	7.8	331	2.3
2201.2	0.490	11	1.1	4.1	269	1.7	7.1	2.0	6.3	307	1.3
2201.9	0.490	9.4	1.4	3.6	289	2.9	7.1	2.6	5.5	330	2.1
2202.6	0.490	8.0	0.989	4.8	261	2.0	7.1	1.8	7.3	299	1.4



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2203.3	0.884	11	1.4	8.5	314	2.7	13	2.5	13	359	1.9
2204.0	0.490	10	1.2	5.9	242	2.5	7.1	2.1	9.0	276	1.8
2204.6	0.490	9.7	1.5	7.6	250	1.1	7.1	2.7	12	285	0.807
2205.3	0.490	11	1.4	9.8	308	3.4	7.1	2.6	15	352	2.5
2206.0	0.490	10	1.3	5.9	265	1.7	7.1	2.4	9.0	303	1.3
2206.7	0.490	12	1.7	11	253	1.6	7.1	3.0	17	289	1.2
2207.4	0.490	11	0.954	7.7	225	1.6	7.1	1.7	12	257	1.1
2208.1	0.490	11	0.831	8.2	248	1.4	7.1	1.5	13	284	0.989
2208.8	0.490	10	1.1	6.2	247	1.6	7.1	2.1	9.5	282	1.2
2209.5	0.490	11	1.1	10	215	1.3	7.1	2.1	16	246	0.948
2210.2	0.588	7.9	1.2	11	238	1.6	8.5	2.3	16	272	1.2
2210.9	0.490	11	1.5	10	229	0.929	7.1	2.7	15	262	0.678
2211.6	0.490	9.5	1.1	9.5	203	1.3	7.1	2.0	15	232	0.965
2212.3	0.490	8.3	1.5	11	260	2.0	7.1	2.7	17	297	1.5
2213.0	0.490	10	1.1	9.0	266	1.1	7.1	2.0	14	304	0.781
2213.7	0.490	9.7	1.3	13	237	0.841	7.1	2.4	20	271	0.614
2214.4	0.490	8.6	1.6	11	238	1.4	7.1	2.9	16	273	0.990
2215.1	0.490	9.2	1.5	12	233	1.6	7.1	2.7	18	266	1.2
2215.8	0.490	11	1.3	12	206	1.1	7.1	2.3	19	235	0.838
2216.5	0.490	12	1.2	12	217	1.5	7.1	2.2	19	248	1.1
2217.2	0.490	9.9	1.2	16	232	0.898	7.1	2.1	24	266	0.655
2217.9	0.490	8.4	0.953	11	213	0.767	7.1	1.7	17	243	0.559
2218.6	0.490	7.6	1.1	11	219	1.5	7.1	1.9	17	250	1.1
2219.3	0.706	11	0.752	13	229	0.534	10	1.4	20	262	0.389
2220.0	0.490	9.7	1.2	14	225	0.644	7.1	2.3	21	257	0.470
2220.7	0.490	7.7	0.936	12	223	0.932	7.1	1.7	18	255	0.680
2221.4	0.490	9.8	0.909	11	231	0.905	7.1	1.7	18	265	0.660
2222.1	0.490	11	1.1	12	241	1.7	7.1	2.0	18	276	1.3
2222.8	0.490	9.6	0.926	13	205	1.2	7.1	1.7	19	235	0.843
2223.5	0.533	10	1.3	15	217	0.767	7.7	2.4	23	248	0.560
2224.2	0.490	8.4	1.3	8.9	220	0.613	7.1	2.4	14	252	0.447
2224.9	0.490	8.6	1.2	13	231	0.534	7.1	2.2	19	265	0.390
2225.6	0.490	8.9	0.745	13	241	1.1	7.1	1.4	20	275	0.774
2226.3	0.490	10	0.911	10	225	0.825	7.1	1.7	16	257	0.602
2227.0	0.490	8.0	0.808	11	209	0.713	7.1	1.5	17	239	0.520
2227.7	0.490	9.9	0.721	10	236	0.741	7.1	1.3	15	270	0.540
2228.4	0.490	8.1	1.1	12	221	1.3	7.1	2.0	19	253	0.979
2229.1	0.490	9.7	0.970	7.9	206	0.659	7.1	1.8	12	235	0.481
2229.8	0.490	9.8	1.0	10	251	0.943	7.1	1.9	16	287	0.688
2230.5	0.490	12	0.672	11	227	0.919	7.1	1.2	17	260	0.671
2231.1	0.490	9.0	0.479	8.4	232	0.883	7.1	0.874	13	265	0.644
2231.8	0.490	8.0	0.729	9.9	266	1.2	7.1	1.3	15	304	0.860
2232.5	0.490	12	0.959	9.1	232	0.686	7.1	1.7	14	265	0.501
2233.2	0.490	10	0.463	9.1	240	0.223	7.1	0.844	14	274	0.162
2233.9	0.490	9.8	0.344	7.7	220	0.747	7.1	0.627	12	252	0.545
2234.6	0.490	9.3	0.593	9.0	206	1.4	7.1	1.1	14	235	0.989
2235.3	0.490	8.3	0.551	7.9	213	0.678	7.1	1.0	12	244	0.494
2236.0	0.666	10	0.664	5.3	252	1.2	9.6	1.2	8.1	288	0.884
2236.7	0.576	9.6	0.415	10.0	229	0.861	8.3	0.757	15	262	0.628
2237.4	0.490	11	0.398	5.5	214	1.3	7.1	0.725	8.4	245	0.970
2238.1	0.490	9.2	0.481	8.3	249	1.3	7.1	0.878	13	285	0.954
2238.8	0.490	8.9	0.461	7.3	287	1.7	7.1	0.841	11	329	1.2
2239.5	0.490	12	0.379	8.1	249	1.3	7.1	0.690	12	285	0.980
2240.2	0.490	10	0.414	7.1	225	1.1	7.1	0.756	11	257	0.767
2240.9	0.490	11	0.948	6.3	266	0.976	7.1	1.7	9.7	304	0.712
2241.6	0.490	8.8	0.576	6.5	256	1.9	7.1	1.1	9.9	293	1.4
2242.3	0.913	12	0.903	5.2	268	1.9	13	1.6	8.0	306	1.4
2243.0	0.490	10	0.712	4.6	235	1.4	7.1	1.3	7.1	269	1.0
2243.7	0.490	11	0.589	2.2	242	1.8	7.1	1.1	3.3	277	1.3
2244.4	0.490	10	0.549	4.3	266	1.2	7.1	1.0	6.6	304	0.846
2245.1	0.490	9.0	0.859	3.1	247	1.1	7.1	1.6	4.8	283	0.812
2245.8	0.490	11	0.619	4.4	284	1.6	7.1	1.1	6.7	325	1.2
2246.5	0.490	10	0.806	6.7	252	1.9	7.1	1.5	10	288	1.4
2247.2	0.490	9.4	0.796	4.6	250	1.8	7.1	1.5	7.1	286	1.3
2247.9	0.490	9.9	0.589	2.1	216	1.7	7.1	1.1	3.2	247	1.3
2248.6	0.490	9.9	0.807	6.4	274	1.5	7.1	1.5	9.8	314	1.1
2249.3	0.490	10	0.943	3.2	248	1.5	7.1	1.7	4.9	284	1.1
2250.0	0.490	11	0.904	3.8	258	2.1	7.1	1.6	5.8	296	1.5
2250.7	0.490	9.7	1.1	3.9	261	3.2	7.1	1.9	6.0	298	2.3
2251.4	0.490	9.6	0.864	3.2	256	3.7	7.1	1.6	4.8	293	2.7
2252.1	0.490	11	1.2	2.7	274	2.7	7.1	2.2	4.1	313	2.0
2252.8	0.490	11	1.3	3.7	292	1.1	7.1	2.4	5.6	334	0.815
2253.5	0.490	8.5	0.886	2.6	244	2.3	7.1	1.6	4.0	278	1.7
2254.2	0.504	9.9	1.1	3.3	252	1.7	7.3	2.1	5.1	288	1.2
2254.9	0.490	9.4	0.897	3.8	246	1.8	7.1	1.6	5.9	281	1.3
2255.6	0.490	9.7	0.930	3.4	280	1.9	7.1	1.7	5.2	320	1.4
2256.3	0.490	9.7	1.1	1.9	257	1.4	7.1	2.0	2.9	294	1.0
2256.9	0.490	9.4	1.0	3.3	247	1.4	7.1	1.9	5.1	283	1.0
2257.6	0.490	10	1.1	3.3	304	2.7	7.1	2.1	5.0	347	1.9
2258.3	0.490	8.7	0.956	2.7	245	2.1	7.1	1.7	4.1	280	1.5
2259.0	0.605	9.2	1.2	3.0	264	2.5	8.7	2.3	4.5	301	1.8



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2259.7	0.490	11	1.0	3.3	252	2.5	7.1	1.9	5.1	288	1.8
2260.4	0.490	11	1.3	2.7	255	2.2	7.1	2.3	4.1	292	1.6
2261.1	0.490	9.1	1.5	3.1	247	1.5	7.1	2.7	4.8	282	1.1
2261.8	0.490	8.1	1.3	5.3	289	2.0	7.1	2.4	8.1	331	1.5
2262.5	0.568	7.9	1.5	4.1	246	2.1	8.2	2.7	6.2	281	1.5
2263.2	0.490	9.0	1.1	5.6	263	2.4	7.1	2.1	8.6	301	1.8
2263.9	0.490	9.8	1.5	5.8	239	2.3	7.1	2.8	8.9	273	1.6
2264.6	0.725	9.8	1.5	3.2	264	1.7	10	2.8	5.0	302	1.3
2265.3	0.490	12	1.6	5.4	262	1.1	7.1	3.0	8.3	299	0.824
2266.0	0.490	11	2.3	5.0	281	2.3	7.1	4.1	7.6	321	1.6
2266.7	0.490	10	1.9	5.9	267	3.2	7.1	3.4	9.0	305	2.3
2267.4	0.490	11	1.9	5.6	239	1.7	7.1	3.5	8.7	273	1.2
2268.1	0.490	7.9	1.9	8.2	254	1.9	7.1	3.5	13	290	1.4
2268.8	0.490	7.2	1.9	6.6	279	2.0	7.1	3.4	10	319	1.5
2269.5	0.508	8.3	2.0	4.7	231	2.3	7.3	3.6	7.1	264	1.7
2270.2	0.490	10	1.7	7.6	254	2.2	7.1	3.0	12	290	1.6
2270.9	0.525	9.0	2.1	5.9	237	1.7	7.6	3.9	9.0	271	1.3
2271.6	0.490	10	2.3	9.1	256	1.7	7.1	4.2	14	293	1.2
2272.3	0.490	10	2.5	9.1	230	1.8	7.1	4.5	14	263	1.3
2273.0	0.501	8.1	2.2	9.5	242	1.3	7.2	4.0	15	277	0.979
2273.7	0.490	10	2.3	10	257	2.4	7.1	4.3	16	294	1.7
2274.4	0.490	8.6	2.0	10	254	1.3	7.1	3.7	16	291	0.961
2275.1	0.490	8.9	2.3	11	224	1.9	7.1	4.2	17	256	1.4
2275.8	0.490	9.7	1.7	12	272	0.883	7.1	3.0	19	311	0.644
2276.5	0.490	9.8	1.4	11	252	1.1	7.1	2.6	17	288	0.814
2277.2	0.490	12	1.8	12	237	0.891	7.1	3.3	19	271	0.650
2277.9	0.490	10	1.7	12	248	1.4	7.1	3.0	19	284	0.999
2278.6	0.937	9.2	1.9	11	304	1.7	14	3.5	17	348	1.2
2279.3	0.490	11	1.3	12	267	1.9	7.1	2.4	19	305	1.4
2280.0	0.490	9.9	1.5	11	223	1.5	7.1	2.7	17	255	1.1
2280.7	0.490	8.5	1.7	16	285	1.2	7.1	3.0	24	326	0.877
2281.4	0.553	8.8	1.8	13	297	1.2	8.0	3.3	20	339	0.891
2282.1	0.490	11	1.8	14	249	1.2	7.1	3.3	21	285	0.903
2282.8	0.490	9.4	1.5	16	285	1.1	7.1	2.7	24	326	0.836
2283.4	0.490	11	1.7	17	279	0.938	7.1	3.1	26	319	0.684
2284.1	0.490	8.7	1.4	15	254	0.900	7.1	2.5	22	291	0.657
2284.8	0.490	9.8	1.7	18	281	1.6	7.1	3.0	28	321	1.2
2285.5	0.490	11	1.9	17	295	0.817	7.1	3.4	26	337	0.596
2286.2	0.490	9.0	1.5	17	270	0.318	7.1	2.8	27	309	0.232
2286.9	0.586	9.6	1.6	17	221	0.532	8.5	2.8	26	252	0.388
2287.6	0.490	9.6	1.2	20	260	1.3	7.1	2.1	31	297	0.967
2288.3	0.490	9.3	1.1	22	232	1.0	7.1	2.1	33	265	0.741
2289.0	0.490	8.8	1.1	18	261	0.603	7.1	2.1	27	298	0.440
2289.7	0.490	10	0.852	18	259	0.836	7.1	1.6	28	296	0.610
2290.4	0.490	9.0	1.1	18	228	1.9	7.1	1.9	28	261	1.4
2291.1	0.490	9.7	0.667	17	243	0.840	7.1	1.2	27	278	0.613
2291.8	0.490	8.6	1.1	18	264	1.2	7.1	2.1	28	302	0.892
2292.5	0.490	8.6	1.2	19	240	0.709	7.1	2.2	29	274	0.518
2293.2	0.490	11	0.784	20	279	1.4	7.1	1.4	30	319	1.0
2293.9	0.490	9.0	0.942	19	259	1.0	7.1	1.7	29	296	0.741
2294.6	0.490	9.8	0.931	22	241	0.823	7.1	1.7	33	275	0.600
2295.3	0.490	12	1.4	22	254	0.680	7.1	2.5	34	291	0.496
2296.0	0.513	11	0.979	19	252	1.1	7.4	1.8	29	288	0.771
2296.7	0.490	11	0.895	18	241	0.913	7.1	1.6	28	275	0.666
2297.4	0.490	9.7	0.650	18	247	0.742	7.1	1.2	28	282	0.541
2298.1	1.1	9.7	0.723	16	258	0.957	15	1.3	24	295	0.698
2298.8	0.490	11	0.925	13	260	1.0	7.1	1.7	20	297	0.746
2299.5	0.490	11	1.0	19	246	0.314	7.1	1.8	28	282	0.229
2300.2	0.490	11	1.1	18	258	0.933	7.1	2.0	27	295	0.681
2300.9	0.490	9.7	0.779	15	256	1.0	7.1	1.4	24	293	0.739
2301.6	0.490	9.8	0.704	16	240	1.1	7.1	1.3	24	275	0.804
2302.3	0.799	12	0.701	18	276	0.514	12	1.3	28	315	0.375
2303.0	0.490	10	0.830	16	245	0.733	7.1	1.5	24	280	0.535
2303.7	0.490	9.8	0.909	13	251	0.401	7.1	1.7	19	287	0.292
2304.4	0.490	10.0	1.2	17	220	0.956	7.1	2.1	25	252	0.697
2305.1	0.490	12	0.917	13	249	0.709	7.1	1.7	20	285	0.517
2305.8	0.490	11	1.2	16	253	1.3	7.1	2.2	25	289	0.937
2306.5	0.490	11	1.4	14	223	0.776	7.1	2.5	21	255	0.566
2307.2	0.590	9.6	1.2	14	214	0.686	8.5	2.2	22	244	0.500
2307.9	0.562	11	1.3	14	243	0.826	8.1	2.4	21	278	0.603
2308.6	0.490	11	1.6	11	244	1.0	7.1	2.9	17	280	0.741
2309.2	0.490	12	1.5	14	242	1.5	7.1	2.8	21	277	1.1
2309.9	0.490	9.6	1.6	14	235	1.2	7.1	2.9	21	268	0.848
2310.6	0.738	10	1.6	12	233	2.1	11	2.9	18	266	1.5
2311.3	0.698	9.8	2.2	15	266	1.2	10	3.9	23	305	0.849
2312.0	1.2	11	2.2	13	253	0.708	17	3.9	20	290	0.517
2312.7	0.535	9.3	2.0	14	250	2.0	7.7	3.6	21	286	1.4
2313.4	0.574	11	1.7	13	229	1.3	8.3	3.2	19	262	0.975
2314.1	0.490	9.8	1.6	13	251	2.3	7.1	2.9	21	287	1.7
2314.8	0.490	12	2.1	14	256	2.1	7.1	3.9	21	293	1.5
2315.5	0.490	13	1.9	12	265	1.2	7.1	3.4	19	304	0.858



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2316.2	0.490	9.7	1.7	11	238	1.6	7.1	3.2	17	272	1.2
2316.9	0.490	11	2.2	15	255	2.1	7.1	4.0	22	292	1.5
2317.6	0.490	9.5	1.8	10	252	1.1	7.1	3.2	16	289	0.833
2318.3	0.490	9.5	2.1	14	252	1.6	7.1	3.8	22	288	1.2
2319.0	0.490	10	1.7	9.1	233	1.6	7.1	3.2	14	266	1.2
2319.7	0.490	9.6	1.6	10.0	238	2.7	7.1	2.9	15	273	2.0
2320.4	0.490	10	1.7	12	267	2.2	7.1	3.0	19	305	1.6
2321.1	0.490	8.6	1.7	8.6	252	1.9	7.1	3.2	13	289	1.4
2321.8	0.490	9.7	1.2	7.2	248	1.6	7.1	2.2	11	283	1.1
2322.5	0.490	9.2	1.8	10	264	1.2	7.1	3.2	16	302	0.875
2323.2	0.761	12	1.2	11	242	1.6	11	2.3	17	277	1.2
2323.9	0.490	10	0.889	7.8	269	2.1	7.1	1.6	12	307	1.5
2324.6	0.490	11	1.1	12	274	1.7	7.1	2.0	18	313	1.2
2325.3	0.715	12	1.3	8.4	265	1.7	10	2.4	13	303	1.2
2326.0	0.490	11	1.3	8.3	279	1.6	7.1	2.3	13	319	1.1
2326.7	0.490	11	1.1	8.2	252	1.7	7.1	1.9	13	288	1.3
2327.4	0.490	9.0	0.716	8.0	256	1.8	7.1	1.3	12	292	1.3
2328.1	0.490	8.7	0.555	4.6	264	1.1	7.1	1.0	7.0	302	0.822
2328.8	0.490	11	0.812	8.6	242	1.5	7.1	1.5	13	277	1.1
2329.5	0.625	10	0.660	6.2	258	1.2	9.0	1.2	9.4	295	0.909
2330.2	0.522	11	0.653	6.0	240	2.1	7.5	1.2	9.1	274	1.5
2330.9	0.543	9.8	0.792	5.1	259	1.7	7.8	1.4	7.8	297	1.2
2331.6	0.490	11	0.713	6.7	253	1.5	7.1	1.3	10	290	1.1
2332.3	0.490	11	0.710	7.0	267	1.1	7.1	1.3	11	305	0.787
2333.0	0.490	8.9	0.586	6.1	251	1.5	7.1	1.1	9.4	287	1.1
2333.7	0.692	11	0.807	7.9	257	1.7	10.0	1.5	12	294	1.2
2334.4	0.490	11	0.485	6.9	249	1.6	7.1	0.885	11	285	1.2
2335.0	0.490	11	0.606	4.4	246	1.2	7.1	1.1	6.7	282	0.865
2335.7	0.490	13	0.416	5.9	279	1.1	7.1	0.758	9.0	320	0.811
2336.4	0.490	11	0.618	4.9	276	1.4	7.1	1.1	7.5	316	1.0
2337.1	0.490	12	0.504	3.8	258	1.2	7.1	0.919	5.8	295	0.843
2337.8	0.633	9.6	0.550	5.2	278	1.5	9.1	1.0	8.0	318	1.1
2338.5	0.490	7.2	0.621	6.2	288	2.3	7.1	1.1	9.5	329	1.7
2339.2	0.490	10	0.548	4.8	259	1.4	7.1	1.0	7.4	296	1.1
2339.9	0.644	8.8	0.598	5.1	266	1.4	9.3	1.1	7.9	304	0.997
2340.6	0.490	10	0.612	4.4	238	1.5	7.1	1.1	6.8	272	1.1
2341.3	0.936	9.1	0.620	4.5	281	1.0	14	1.1	6.9	321	0.766
2342.0	0.490	11	0.633	5.1	256	2.4	7.1	1.2	7.8	293	1.7
2342.7	0.490	11	0.676	9.9	258	2.4	7.1	1.2	15	295	1.7
2343.4	0.490	9.8	0.825	4.0	267	1.8	7.1	1.5	6.2	305	1.3
2344.1	0.490	7.9	0.592	5.2	234	1.5	7.1	1.1	7.9	267	1.1
2344.8	0.490	8.5	0.873	5.1	254	1.9	7.1	1.6	7.8	291	1.4
2345.5	0.490	11	0.614	5.5	273	1.2	7.1	1.1	8.5	313	0.878
2346.2	0.490	10	0.574	5.4	266	1.5	7.1	1.0	8.3	304	1.1
2346.9	0.490	8.3	0.454	5.6	269	0.758	7.1	0.827	8.6	308	0.553
2347.6	0.490	9.7	0.916	6.1	247	1.8	7.1	1.7	9.3	282	1.3
2348.3	0.490	10	0.971	7.0	302	1.8	7.1	1.8	11	345	1.3
2349.0	0.490	11	0.723	8.4	267	1.6	7.1	1.3	13	306	1.2
2349.7	0.490	12	1.1	8.8	262	2.2	7.1	2.1	14	300	1.6
2350.4	0.490	12	0.751	7.0	266	2.2	7.1	1.4	11	304	1.6
2351.1	0.490	11	0.859	9.8	297	1.7	7.1	1.6	15	339	1.2
2351.8	0.490	12	1.3	12	305	1.4	7.1	2.3	18	349	1.0
2352.5	0.490	9.5	0.767	9.7	264	1.9	7.1	1.4	15	302	1.4
2353.2	0.490	11	1.2	12	273	1.6	7.1	2.2	19	312	1.2
2353.9	0.490	8.2	1.2	11	267	0.832	7.1	2.2	17	305	0.607
2354.6	0.490	11	0.854	13	283	1.6	7.1	1.6	20	323	1.2
2355.3	0.490	12	1.1	14	285	1.5	7.1	2.0	22	326	1.1
2356.0	0.490	10	0.813	17	297	2.1	7.1	1.5	25	340	1.5
2356.7	0.490	11	1.1	18	283	1.5	7.1	1.9	28	324	1.1
2357.4	0.490	9.5	1.2	17	333	1.3	7.1	2.3	26	381	0.984
2358.1	0.490	11	1.2	17	311	1.3	7.1	2.2	25	356	0.976
2358.8	0.490	12	1.1	17	296	2.2	7.1	2.1	26	339	1.6
2359.5	0.490	10	1.1	18	285	1.2	7.1	2.0	28	326	0.853
2360.2	0.490	10	1.2	18	293	1.0	7.1	2.2	28	335	0.731
2360.9	0.490	11	1.4	14	274	1.1	7.1	2.5	22	313	0.778
2361.5	0.490	11	1.3	19	298	1.2	7.1	2.3	29	340	0.857
2362.2	0.490	9.1	1.2	20	284	1.2	7.1	2.1	31	325	0.851
2362.9	0.490	9.6	1.3	19	287	0.794	7.1	2.4	30	328	0.579
2363.6	0.490	9.4	1.4	15	260	1.3	7.1	2.6	24	298	0.968
2364.3	0.521	11	1.5	20	321	1.4	7.5	2.7	31	367	1.0
2365.0	0.490	8.8	1.2	17	277	1.0	7.1	2.2	25	317	0.730
2365.7	0.490	12	0.985	23	272	1.1	7.1	1.8	36	311	0.796
2366.4	0.490	9.0	1.3	18	223	0.999	7.1	2.4	27	254	0.729
2367.1	0.490	9.8	0.945	18	281	0.212	7.1	1.7	28	322	0.155
2367.8	0.490	10	1.2	23	262	1.4	7.1	2.2	35	299	1.0
2368.5	0.490	12	1.2	19	287	0.804	7.1	2.2	30	328	0.586
2369.2	0.490	9.5	0.729	18	263	1.2	7.1	1.3	27	301	0.909
2369.9	0.490	11	1.3	20	266	0.942	7.1	2.4	30	305	0.687
2370.6	0.490	12	1.2	20	267	1.4	7.1	2.2	31	306	0.997
2371.3	0.490	12	1.1	22	308	0.597	7.1	2.0	34	352	0.436
2372.0	0.490	12	1.0	21	260	0.224	7.1	1.9	32	297	0.164



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2372.7	0.490	10	1.2	20	302	1.1	7.1	2.3	30	345	0.833
2373.4	0.490	11	0.537	20	262	0.924	7.1	0.980	30	299	0.674
2374.1	0.490	12	0.714	17	286	1.0	7.1	1.3	26	327	0.741
2374.8	0.490	13	0.708	17	287	0.555	7.1	1.3	26	328	0.405
2375.5	0.490	12	0.689	23	282	0.976	7.1	1.3	36	323	0.712
2376.2	0.490	9.0	0.817	20	279	0.389	7.1	1.5	30	319	0.284
2376.9	0.598	12	0.970	22	260	0.879	8.6	1.8	34	298	0.641
2377.6	0.490	8.9	1.1	18	254	1.3	7.1	2.0	28	291	0.920
2378.3	0.490	11	0.835	20	260	0.631	7.1	1.5	31	298	0.460
2379.0	0.490	11	0.878	25	270	1.3	7.1	1.6	38	309	0.944
2379.7	0.490	9.4	0.663	19	275	0.547	7.1	1.2	29	314	0.399
2380.4	0.490	12	0.957	18	285	0.722	7.1	1.7	27	326	0.527
2381.1	0.755	10	0.974	21	287	1.1	11	1.8	32	329	0.767
2381.8	0.766	11	1.0	20	254	0.639	11	1.8	31	290	0.466
2382.5	0.490	9.0	0.614	20	253	1.1	7.1	1.1	30	290	0.789
2383.2	0.490	9.7	0.916	18	270	0.726	7.1	1.7	27	309	0.530
2383.9	0.490	11	0.790	19	274	0.786	7.1	1.4	30	313	0.574
2384.6	0.834	9.6	0.815	19	247	0.599	12	1.5	29	283	0.437
2385.3	0.490	13	0.986	19	243	0.744	7.1	1.8	29	278	0.543
2386.0	0.490	11	0.937	20	258	0.725	7.1	1.7	31	295	0.529
2386.7	0.490	11	0.819	16	265	1.3	7.1	1.5	24	303	0.932
2387.4	0.490	10	0.926	17	257	2.0	7.1	1.7	26	294	1.5
2388.0	0.490	12	0.666	19	277	0.978	7.1	1.2	29	317	0.713
2388.7	0.490	9.1	0.864	18	251	1.3	7.1	1.6	27	286	0.980
2389.4	0.490	11	0.710	17	232	0.979	7.1	1.3	26	265	0.714
2390.1	0.490	9.7	0.860	15	241	0.700	7.1	1.6	23	275	0.511
2390.8	0.490	11	0.821	17	240	1.6	7.1	1.5	25	274	1.1
2391.5	0.490	11	0.666	16	240	1.6	7.1	1.2	24	274	1.1
2392.2	0.490	14	0.903	14	257	0.775	7.1	1.6	21	294	0.565
2392.9	0.490	10	0.727	11	227	1.1	7.1	1.3	17	260	0.804
2393.6	0.490	8.8	0.914	14	258	0.850	7.1	1.7	21	295	0.620
2394.3	0.490	13	0.601	12	225	1.3	7.1	1.1	19	257	0.966
2395.0	0.490	10	0.770	10	218	0.680	7.1	1.4	16	249	0.496
2395.7	0.490	10	0.516	17	238	1.2	7.1	0.940	25	273	0.865
2396.4	0.490	12	0.630	10	237	0.862	7.1	1.1	16	271	0.629
2397.1	0.490	12	0.715	11	244	1.3	7.1	1.3	17	279	0.978
2397.8	0.490	12	0.553	12	250	1.4	7.1	1.0	19	286	0.995
2398.5	0.490	12	0.881	9.2	247	1.3	7.1	1.6	14	283	0.948
2399.2	0.490	10	0.776	7.9	287	0.603	7.1	1.4	12	328	0.440
2399.9	0.490	12	0.490	9.8	241	1.1	7.1	0.893	15	276	0.819
2400.6	0.490	12	0.845	7.7	256	1.0	7.1	1.5	12	292	0.750
2401.3	0.490	12	0.763	7.0	255	1.1	7.1	1.4	11	292	0.768
2402.0	0.490	11	0.477	8.4	252	1.4	7.1	0.870	13	288	1.0
2402.7	0.490	11	0.753	6.6	260	1.2	7.1	1.4	10	298	0.910
2403.4	0.895	10	0.490	5.8	256	0.966	13	0.893	8.9	293	0.705
2404.1	0.490	11	0.190	4.6	255	1.7	7.1	0.346	7.1	292	1.3
2404.8	0.490	10	0.324	6.1	253	0.866	7.1	0.592	9.4	289	0.632
2405.5	0.490	13	0.438	7.0	248	1.2	7.1	0.799	11	283	0.855
2406.2	0.490	11	0.672	6.3	270	0.846	7.1	1.2	9.6	309	0.617
2406.9	0.490	10	0.333	5.9	233	1.4	7.1	0.608	9.0	267	0.996
2407.6	0.522	9.5	0.490	5.5	269	2.0	7.5	0.894	8.4	308	1.5
2408.3	0.490	10	0.628	7.3	276	1.7	7.1	1.1	11	316	1.2
2409.0	0.490	11	0.374	6.5	293	1.7	7.1	0.683	9.9	335	1.3
2409.7	0.490	10.0	0.581	7.7	236	1.9	7.1	1.1	12	269	1.4
2410.4	0.490	9.9	0.694	7.6	251	1.1	7.1	1.3	12	287	0.839
2411.1	0.490	9.6	0.617	6.7	248	1.3	7.1	1.1	10	284	0.921
2411.8	0.490	10	0.529	11	269	0.632	7.1	0.965	16	307	0.461
2412.5	0.490	10	0.599	8.4	241	1.7	7.1	1.1	13	275	1.2
2413.2	0.490	11	0.482	6.4	284	1.4	7.1	0.880	9.8	325	1.0
2413.8	0.577	9.2	0.545	6.6	248	2.0	8.3	0.994	10	284	1.5
2414.5	0.528	11	0.356	6.8	250	1.7	7.6	0.649	10	286	1.3
2415.2	0.490	12	0.694	7.3	283	2.0	7.1	1.3	11	324	1.5
2415.9	0.490	9.6	0.519	6.4	292	1.3	7.1	0.946	9.8	334	0.982
2416.6	0.490	10.0	0.363	7.5	250	2.0	7.1	0.661	11	286	1.4
2417.3	0.490	8.4	0.999	9.4	247	1.9	7.1	1.8	14	283	1.4
2418.0	0.490	11	0.850	8.1	257	1.9	7.1	1.5	12	294	1.4
2418.7	0.490	9.5	0.578	7.8	246	2.3	7.1	1.1	12	282	1.7
2419.4	0.490	10.0	0.655	11	249	1.9	7.1	1.2	17	285	1.4
2420.1	0.490	11	1.1	11	288	1.7	7.1	1.9	17	330	1.3
2420.8	0.490	9.8	1.0	11	266	3.3	7.1	1.8	16	304	2.4
2421.5	0.490	8.6	1.0	13	259	1.5	7.1	1.9	19	296	1.1
2422.2	0.490	11	1.0	11	270	3.2	7.1	1.8	16	308	2.4
2422.9	0.490	11	1.0	16	272	0.753	7.1	1.9	25	310	0.549
2423.6	0.490	9.0	0.978	12	257	1.7	7.1	1.8	18	294	1.3
2424.3	0.687	12	1.1	14	255	2.7	9.9	1.9	21	292	2.0
2425.0	0.490	11	1.1	15	262	1.6	7.1	2.0	24	300	1.2
2425.7	0.490	11	1.1	14	245	1.9	7.1	2.1	21	280	1.4
2426.4	0.634	9.6	1.3	16	254	1.1	9.2	2.3	25	290	0.769
2427.1	0.490	9.4	1.4	13	276	2.5	7.1	2.5	21	316	1.8
2427.8	0.490	8.6	1.2	16	330	2.2	7.1	2.2	25	377	1.6
2428.5	0.490	10.0	1.5	15	230	1.6	7.1	2.7	23	263	1.2



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2429.2	0.490	11	1.4	18	256	2.2	7.1	2.5	28	293	1.6
2429.9	0.826	11	1.8	17	273	1.6	12	3.3	26	312	1.2
2430.6	0.650	8.2	1.3	16	208	1.2	9.4	2.3	25	238	0.859
2431.3	0.545	11	1.2	14	260	1.6	7.9	2.2	21	297	1.1
2432.0	0.490	10	1.4	21	231	0.634	7.1	2.6	33	264	0.463
2432.7	0.807	13	1.1	18	252	1.6	12	2.0	28	288	1.1
2433.4	0.490	12	1.1	18	262	0.980	7.1	1.9	27	300	0.715
2434.1	0.490	12	1.2	19	267	2.2	7.1	2.1	28	305	1.6
2434.8	0.490	11	1.1	21	290	2.0	7.1	2.0	32	332	1.4
2435.5	0.490	11	1.3	19	212	2.1	7.1	2.3	30	242	1.5
2436.2	0.490	11	1.2	18	215	1.5	7.1	2.3	27	246	1.1
2436.9	0.490	9.8	1.3	16	221	1.6	7.1	2.3	25	252	1.2
2437.6	0.490	13	1.4	21	229	1.2	7.1	2.5	33	262	0.876
2438.3	0.553	11	1.0	17	235	1.4	8.0	1.8	27	269	0.998
2439.0	0.490	9.3	1.5	17	233	0.919	7.1	2.7	26	266	0.671
2439.6	0.490	9.7	1.2	18	233	0.971	7.1	2.3	28	267	0.709
2440.3	0.490	9.4	1.2	18	254	0.719	7.1	2.2	28	291	0.525
2441.0	0.632	12	1.3	20	232	0.580	9.1	2.4	30	266	0.423
2441.7	0.490	11	1.0	20	216	1.1	7.1	1.9	31	247	0.804
2442.4	0.537	11	1.3	19	214	0.994	7.7	2.3	29	245	0.726
2443.1	0.573	8.2	0.858	16	244	0.736	8.3	1.6	25	279	0.537
2443.8	0.490	12	1.3	20	245	1.3	7.1	2.4	31	280	0.939
2444.5	0.490	13	1.0	21	231	1.6	7.1	1.9	32	264	1.2
2445.2	0.490	11	0.861	18	217	1.5	7.1	1.6	28	248	1.1
2445.9	0.490	11	1.3	17	210	0.609	7.1	2.3	26	241	0.445
2446.6	0.490	11	1.3	21	222	1.5	7.1	2.3	32	254	1.1
2447.3	0.662	11	0.872	21	247	0.879	9.6	1.6	32	283	0.642
2448.0	0.490	12	1.2	23	254	1.4	7.1	2.2	35	291	0.996
2448.7	0.490	10	0.889	19	212	1.2	7.1	1.6	29	242	0.840
2449.4	0.632	11	0.995	19	232	0.766	9.1	1.8	29	265	0.559
2450.1	0.490	11	0.670	16	229	1.0	7.1	1.2	25	262	0.743
2450.8	0.644	10	0.752	17	252	1.1	9.3	1.4	27	289	0.780
2451.5	0.490	11	0.621	17	228	1.1	7.1	1.1	26	260	0.767
2452.2	0.490	13	0.924	18	218	1.9	7.1	1.7	28	250	1.4
2452.9	0.490	10	0.719	16	220	0.653	7.1	1.3	24	252	0.476
2453.6	0.490	9.1	0.737	13	226	1.3	7.1	1.3	19	258	0.979
2454.3	0.490	13	0.896	16	253	1.5	7.1	1.6	25	290	1.1
2455.0	0.490	9.0	0.498	12	199	1.4	7.1	0.908	18	228	1.0
2455.7	0.490	11	0.753	12	247	1.7	7.1	1.4	19	282	1.2
2456.4	0.490	11	0.490	12	254	1.2	7.1	0.893	18	290	0.862
2457.1	0.490	9.7	0.532	10	266	0.956	7.1	0.971	15	304	0.697
2457.8	0.490	13	0.351	9.7	253	0.544	7.1	0.640	15	289	0.397
2458.5	0.490	9.7	0.528	11	256	1.5	7.1	0.964	16	293	1.1
2459.2	0.490	11	0.467	9.4	247	1.1	7.1	0.852	14	282	0.822
2459.9	0.490	9.0	0.360	7.0	244	1.1	7.1	0.656	11	279	0.788
2460.6	0.490	9.7	0.295	6.1	219	0.918	7.1	0.539	9.3	250	0.670
2461.3	0.670	9.3	0.463	7.3	250	0.914	9.7	0.845	11	286	0.667
2462.0	0.490	10	0.369	5.8	244	0.805	7.1	0.673	8.9	279	0.587
2462.7	0.490	9.7	0.289	4.0	236	0.674	7.1	0.526	6.2	270	0.492
2463.4	0.490	8.8	0.550	7.7	264	1.5	7.1	1.0	12	302	1.1
2464.1	0.638	10	0.436	8.0	272	1.7	9.2	0.795	12	311	1.2
2464.8	0.965	9.9	0.418	8.1	265	1.2	14	0.763	12	304	0.890
2465.5	0.490	8.1	0.296	6.4	244	1.0	7.1	0.539	9.9	279	0.737
2466.1	0.624	11	0.241	7.3	254	1.7	9.0	0.440	11	290	1.2
2466.8	0.490	8.5	0.317	8.9	268	1.5	7.1	0.579	14	307	1.1
2467.5	0.490	9.3	0.415	9.7	271	1.5	7.1	0.756	15	310	1.1
2468.2	0.490	11	0.480	8.1	264	1.2	7.1	0.876	12	302	0.845
2468.9	0.490	7.5	0.423	5.9	244	1.2	7.1	0.771	9.1	278	0.853
2469.6	0.490	8.7	0.186	8.2	260	1.3	7.1	0.340	13	297	0.943
2470.3	0.566	6.6	0.755	7.9	269	1.6	8.2	1.4	12	307	1.1
2471.0	0.490	8.5	0.386	7.6	246	1.6	7.1	0.704	12	281	1.2
2471.7	0.490	9.2	0.707	7.3	264	1.7	7.1	1.3	11	302	1.2
2472.4	0.490	7.9	0.461	7.0	237	0.770	7.1	0.840	11	271	0.562
2473.1	0.490	8.8	0.888	7.1	250	2.4	7.1	1.6	11	286	1.7
2473.8	0.490	11	1.1	12	282	2.7	7.1	2.1	19	323	2.0
2474.5	0.517	9.3	0.914	10	270	1.8	7.5	1.7	16	308	1.3
2475.2	0.490	8.6	1.2	11	265	1.0	7.1	2.2	16	303	0.757
2475.9	0.490	10	1.4	9.4	285	3.3	7.1	2.5	14	325	2.4
2476.6	0.490	8.3	1.2	11	274	2.7	7.1	2.2	17	313	2.0
2477.3	0.881	10	1.6	10	289	3.6	13	2.8	16	330	2.7
2478.0	0.490	10.0	1.8	13	278	2.5	7.1	3.2	20	318	1.9
2478.7	0.490	11	1.4	10	255	3.3	7.1	2.6	16	291	2.4
2479.4	0.490	11	1.6	12	241	2.4	7.1	2.8	18	276	1.8
2480.1	0.490	9.9	1.9	14	272	2.6	7.1	3.4	21	311	1.9
2480.8	0.490	11	1.5	9.4	257	1.9	7.1	2.7	14	294	1.4
2481.5	0.490	8.5	1.0	13	246	1.8	7.1	1.9	20	281	1.3
2482.2	0.490	11	1.5	11	269	2.0	7.1	2.7	16	308	1.4
2482.9	0.490	11	1.4	14	253	2.2	7.1	2.5	21	290	1.6
2483.6	0.562	8.4	1.4	13	255	2.1	8.1	2.6	21	291	1.5
2484.3	0.490	13	1.3	17	257	2.1	7.1	2.5	26	294	1.5
2485.0	0.490	11	1.5	23	261	1.6	7.1	2.8	35	299	1.2



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2485.7	0.490	10	1.3	17	254	1.7	7.1	2.3	26	290	1.2
2486.4	0.490	10	1.3	17	239	1.5	7.1	2.4	26	274	1.1
2487.1	0.490	11	1.6	16	255	2.1	7.1	2.9	25	292	1.5
2487.8	0.490	12	2.0	16	248	1.5	7.1	3.6	25	284	1.1
2488.5	0.490	9.1	1.5	21	259	0.949	7.1	2.8	32	296	0.692
2489.2	0.490	10.0	1.0	17	232	0.787	7.1	1.9	27	265	0.574
2489.9	0.490	9.9	1.2	22	289	1.8	7.1	2.2	34	330	1.3
2490.6	0.490	10	1.2	20	223	0.585	7.1	2.3	31	255	0.427
2491.3	0.490	12	1.3	22	226	0.909	7.1	2.3	34	259	0.663
2491.9	0.490	9.5	1.1	28	234	0.855	7.1	2.1	42	268	0.624
2492.6	0.490	11	1.1	26	225	1.4	7.1	2.0	39	257	1.0
2493.3	0.490	9.7	1.4	22	228	0.858	7.1	2.5	34	260	0.626
2494.0	0.490	10	1.4	26	220	1.2	7.1	2.6	41	252	0.841
2494.7	0.490	12	1.3	28	250	0.678	7.1	2.4	43	286	0.495
2495.4	0.490	11	1.1	28	213	1.1	7.1	2.0	43	243	0.809
2496.1	0.490	9.9	2.1	20	230	1.0	7.1	3.8	30	263	0.764
2496.8	0.490	9.4	1.9	22	216	1.1	7.1	3.5	33	247	0.824
2497.5	0.490	11	1.7	26	199	1.9	7.1	3.0	40	227	1.4
2498.2	0.490	9.5	1.7	24	246	1.0	7.1	3.1	37	281	0.758
2498.9	0.490	13	1.9	23	255	1.5	7.1	3.5	35	292	1.1
2499.6	0.490	11	1.7	21	229	1.3	7.1	3.0	33	262	0.970
2500.3	0.490	13	2.2	20	212	1.0	7.1	4.1	31	242	0.736
2501.0	0.490	13	2.2	27	222	1.3	7.1	4.0	41	254	0.981
2501.7	0.490	9.5	2.1	19	210	1.2	7.1	3.8	30	240	0.912
2502.4	0.490	11	2.6	26	234	1.0	7.1	4.7	40	267	0.738
2503.1	0.596	12	2.5	22	215	1.5	8.6	4.6	33	246	1.1
2503.8	0.490	10	2.4	24	204	1.5	7.1	4.4	36	234	1.1
2504.5	0.490	12	2.5	25	233	0.944	7.1	4.6	38	266	0.688
2505.2	0.490	12	2.4	25	226	0.876	7.1	4.5	38	258	0.639
2505.9	0.490	9.3	2.2	23	222	1.8	7.1	3.9	35	254	1.3
2506.6	0.490	11	2.2	24	232	1.4	7.1	4.1	37	266	1.0
2507.3	0.490	9.9	2.6	18	225	1.3	7.1	4.7	27	257	0.934
2508.0	0.639	12	3.0	19	216	0.955	9.2	5.4	29	247	0.697
2508.7	0.490	11	2.5	23	230	0.825	7.1	4.6	35	263	0.602
2509.4	0.490	10	2.4	20	225	2.8	7.1	4.4	30	257	2.1
2510.1	0.490	14	2.7	21	252	2.1	7.1	4.9	33	288	1.5
2510.8	0.490	11	2.2	24	226	1.2	7.1	4.0	37	258	0.902
2511.5	0.490	13	2.3	20	241	2.1	7.1	4.2	31	276	1.5
2512.2	0.490	10.0	2.3	19	218	1.2	7.1	4.3	29	249	0.899
2512.9	0.490	11	1.9	16	227	1.5	7.1	3.4	25	260	1.1
2513.6	0.490	10	2.5	18	246	2.0	7.1	4.5	28	281	1.4
2514.3	0.585	12	2.0	19	206	2.2	8.5	3.7	29	236	1.6
2515.0	0.490	9.8	1.9	18	233	1.5	7.1	3.4	28	267	1.1
2515.7	0.490	11	1.9	18	261	1.2	7.1	3.5	27	299	0.871
2516.4	0.555	9.2	1.8	17	259	1.4	8.0	3.4	27	296	1.0
2517.1	0.490	9.0	1.9	19	252	1.6	7.1	3.4	30	288	1.1
2517.7	0.490	13	1.4	16	247	1.5	7.1	2.6	25	283	1.1
2518.4	0.682	10	1.5	14	251	1.7	9.8	2.7	22	287	1.2
2519.1	0.544	12	1.2	14	243	1.4	7.9	2.2	21	278	1.0
2519.8	0.490	11	1.6	18	241	1.1	7.1	2.8	27	275	0.801
2520.5	0.490	12	1.1	18	262	1.3	7.1	2.0	28	300	0.940
2521.2	0.490	12	1.1	13	244	1.2	7.1	1.9	20	280	0.880
2521.9	0.490	9.8	1.1	13	235	0.751	7.1	2.1	20	269	0.548
2522.6	0.490	11	1.0	11	273	1.7	7.1	1.9	17	312	1.2
2523.3	0.587	9.8	0.758	12	271	1.1	8.5	1.4	18	310	0.787
2524.0	0.490	11	0.906	14	256	1.5	7.1	1.7	22	292	1.1
2524.7	0.490	10	0.955	12	243	1.6	7.1	1.7	18	278	1.2
2525.4	0.490	9.9	1.0	12	292	1.7	7.1	1.9	19	334	1.3
2526.1	0.617	8.6	0.881	10	266	1.4	8.9	1.6	16	305	1.0
2526.8	0.623	11	0.820	12	267	2.5	9.0	1.5	18	305	1.8
2527.5	0.546	9.5	0.594	10	266	1.2	7.9	1.1	16	305	0.880
2528.2	0.490	11	0.550	10.0	259	1.3	7.1	1.0	15	296	0.919
2528.9	0.490	11	0.718	9.5	265	1.3	7.1	1.3	15	303	0.953
2529.6	0.490	11	0.872	8.9	240	1.6	7.1	1.6	14	274	1.2
2530.3	0.797	10	0.855	11	287	2.7	12	1.6	17	329	1.9
2531.0	0.490	11	0.682	9.1	244	1.7	7.1	1.2	14	279	1.2
2531.7	0.553	8.9	0.897	9.1	272	1.9	8.0	1.6	14	311	1.4
2532.4	0.575	11	0.693	11	254	1.5	8.3	1.3	16	290	1.1
2533.1	0.490	9.8	0.577	7.4	244	1.2	7.1	1.1	11	279	0.897
2533.8	0.490	9.3	0.726	12	267	2.5	7.1	1.3	19	305	1.8
2534.5	0.490	9.2	0.727	10	261	1.4	7.1	1.3	15	298	1.0
2535.2	0.490	9.4	0.602	8.8	280	3.5	7.1	1.1	14	321	2.5
2535.9	0.490	9.7	0.917	14	333	2.4	7.1	1.7	21	380	1.8
2536.6	0.490	9.4	1.1	13	297	3.7	7.1	2.0	20	339	2.7
2537.3	0.490	11	1.2	11	250	3.1	7.1	2.2	17	286	2.2
2538.0	0.490	11	1.4	16	291	2.3	7.1	2.5	24	333	1.7
2538.7	0.490	9.6	1.4	14	279	2.8	7.1	2.6	21	319	2.1
2539.4	0.490	9.2	1.5	11	265	3.1	7.1	2.8	17	304	2.2
2540.1	0.490	8.9	1.3	13	252	2.9	7.1	2.3	20	288	2.1
2540.8	0.490	10.0	1.2	14	258	2.3	7.1	2.1	21	295	1.7
2541.5	0.490	10	1.2	14	259	2.3	7.1	2.2	22	296	1.7



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2542.2	0.490	8.8	1.2	15	262	1.8	7.1	2.2	22	300	1.3
2542.9	0.606	11	1.2	14	238	2.3	8.8	2.1	22	273	1.7
2543.5	0.490	12	1.6	18	267	2.3	7.1	2.9	28	305	1.7
2544.2	0.490	12	1.7	20	244	1.7	7.1	3.2	31	279	1.2
2544.9	0.490	11	1.7	19	249	1.8	7.1	3.0	28	285	1.3
2545.6	0.490	11	1.5	20	270	2.2	7.1	2.8	30	309	1.6
2546.3	0.490	11	1.5	20	254	2.0	7.1	2.8	31	291	1.5
2547.0	0.490	10	1.8	21	233	1.6	7.1	3.3	33	266	1.1
2547.7	0.490	11	1.8	24	275	1.8	7.1	3.3	36	314	1.3
2548.4	0.490	10.0	1.4	24	234	1.3	7.1	2.6	36	268	0.949
2549.1	0.490	12	1.9	25	248	1.4	7.1	3.4	38	284	1.0
2549.8	0.490	12	1.6	27	250	1.4	7.1	2.9	41	286	1.0
2550.5	0.506	12	2.0	27	261	1.5	7.3	3.6	42	298	1.1
2551.2	0.490	12	1.7	25	219	1.2	7.1	3.1	38	250	0.868
2551.9	0.490	11	1.7	23	225	0.983	7.1	3.1	36	257	0.717
2552.6	0.682	12	2.0	23	237	1.3	9.9	3.7	36	271	0.982
2553.3	0.871	13	1.8	32	241	0.626	13	3.3	49	275	0.456
2554.0	0.490	12	1.6	28	266	1.2	7.1	2.9	42	304	0.879
2554.7	0.490	12	1.6	28	236	1.7	7.1	2.9	44	270	1.3
2555.4	0.675	12	1.5	28	225	0.818	9.7	2.8	42	258	0.597
2556.1	0.490	12	1.3	26	224	1.2	7.1	2.3	40	257	0.861
2556.8	0.490	12	1.4	29	222	1.2	7.1	2.6	44	254	0.897
2557.5	0.490	11	2.0	26	239	1.1	7.1	3.6	39	274	0.839
2558.2	0.490	12	1.3	23	239	1.2	7.1	2.4	35	273	0.886
2558.9	0.490	12	1.2	24	239	0.925	7.1	2.2	37	273	0.675
2559.6	0.490	14	1.4	29	247	2.2	7.1	2.5	45	282	1.6
2560.3	0.490	13	1.3	27	224	0.876	7.1	2.3	41	256	0.639
2561.0	0.490	12	1.5	30	228	0.755	7.1	2.8	46	261	0.551
2561.7	0.490	12	1.4	26	227	1.0	7.1	2.6	40	260	0.758
2562.4	0.490	12	2.0	28	247	1.2	7.1	3.7	43	283	0.864
2563.1	0.490	12	1.8	25	236	2.5	7.1	3.3	38	270	1.8
2563.8	0.490	14	1.3	25	232	0.906	7.1	2.4	38	266	0.661
2564.5	0.490	13	1.5	25	235	0.609	7.1	2.8	38	269	0.444
2565.2	0.490	14	1.4	22	202	0.790	7.1	2.6	34	231	0.576
2565.9	0.490	10	2.0	23	213	1.7	7.1	3.7	36	244	1.2
2566.6	0.490	13	1.8	22	237	1.2	7.1	3.3	34	271	0.889
2567.3	0.729	14	1.9	26	239	1.4	11	3.5	39	273	1.0
2568.0	0.490	14	1.7	20	238	1.3	7.1	3.1	31	272	0.935
2568.7	0.490	13	1.1	23	245	0.765	7.1	2.0	36	280	0.558
2569.3	0.490	12	1.6	25	229	2.3	7.1	3.0	39	262	1.6
2570.0	0.490	13	1.8	22	247	2.3	7.1	3.2	34	283	1.7
2570.7	0.552	16	2.0	22	240	1.1	8.0	3.7	34	275	0.816
2571.4	0.490	12	1.4	24	226	1.1	7.1	2.5	37	259	0.794
2572.1	0.736	12	1.7	19	221	0.853	11	3.1	29	252	0.623
2572.8	0.588	12	1.4	26	216	1.6	8.5	2.6	40	247	1.1
2573.5	0.601	12	1.4	25	197	0.911	8.7	2.6	38	225	0.664
2574.2	0.490	13	1.8	27	222	1.1	7.1	3.3	41	254	0.836
2574.9	0.490	13	1.7	21	212	0.590	7.1	3.0	32	242	0.431
2575.6	0.490	12	1.5	27	206	0.778	7.1	2.7	42	236	0.567
2576.3	0.490	13	0.949	24	230	1.6	7.1	1.7	37	264	1.1
2577.0	0.490	13	1.5	21	220	0.623	7.1	2.7	32	252	0.455
2577.7	0.490	13	1.5	27	226	0.820	7.1	2.7	41	258	0.599
2578.4	0.510	14	1.3	24	228	0.313	7.4	2.3	37	261	0.228
2579.1	0.490	13	1.3	24	205	1.2	7.1	2.4	37	235	0.891
2579.8	0.490	14	0.796	22	227	1.4	7.1	1.5	34	260	1.0
2580.5	0.490	13	0.868	20	217	0.885	7.1	1.6	31	248	0.646
2581.2	0.490	15	1.2	23	228	1.1	7.1	2.2	35	260	0.837
2581.9	0.490	11	0.955	18	220	0.315	7.1	1.7	28	251	0.230
2582.6	0.490	12	0.981	22	244	0.846	7.1	1.8	33	279	0.617
2583.3	0.490	13	0.907	19	268	1.3	7.1	1.7	30	307	0.977
2584.0	0.490	13	0.809	17	214	0.625	7.1	1.5	26	245	0.456
2584.7	0.490	14	1.0	18	250	1.1	7.1	1.9	27	286	0.803
2585.4	0.606	15	1.0	19	249	1.0	8.7	1.8	29	285	0.735
2586.1	0.490	14	0.800	17	236	0.973	7.1	1.5	26	270	0.710
2586.8	0.490	14	1.2	20	238	0.684	7.1	2.1	30	272	0.499
2587.5	0.490	14	0.799	20	223	0.807	7.1	1.5	31	255	0.589
2588.2	0.490	9.9	0.908	14	181	0.473	7.1	1.7	22	207	0.345
2588.9	0.490	13	1.1	21	233	0.706	7.1	2.1	33	266	0.515
2589.6	0.490	14	0.982	17	233	1.3	7.1	1.8	26	267	0.959
2590.3	0.490	13	0.870	15	240	1.7	7.1	1.6	23	275	1.2
2591.0	0.490	12	0.785	17	219	2.0	7.1	1.4	25	251	1.5
2591.7	0.490	12	0.483	16	257	1.1	7.1	0.880	24	294	0.809
2592.4	0.490	12	0.446	14	248	1.1	7.1	0.814	21	284	0.817
2593.1	0.490	12	0.635	13	274	0.868	7.1	1.2	21	314	0.634
2593.8	0.490	13	0.546	11	287	1.2	7.1	0.995	17	328	0.911
2594.5	0.490	11	0.427	10	228	1.3	7.1	0.779	16	260	0.978
2595.1	0.490	13	0.588	11	224	0.983	7.1	1.1	17	256	0.717
2595.8	0.490	11	0.490	15	250	1.5	7.1	0.893	23	286	1.1
2596.5	0.490	12	0.636	9.2	233	1.4	7.1	1.2	14	266	1.0
2597.2	0.490	12	0.233	8.3	258	1.4	7.1	0.424	13	295	1.0
2597.9	0.490	11	0.463	10	235	1.4	7.1	0.845	16	269	1.0



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2598.6	0.490	14	0.292	8.0	324	1.9	7.1	0.533	12	370	1.4
2599.3	0.761	9.1	0.360	9.8	291	1.9	11	0.656	15	333	1.4
2600.0	0.718	11	0.344	11	266	2.0	10	0.628	17	305	1.5
2600.7	0.810	11	0.374	11	253	1.7	12	0.681	17	289	1.3
2601.4	0.490	12	0.289	9.4	268	0.967	7.1	0.528	14	306	0.705
2602.1	0.490	12	0.288	10	276	1.2	7.1	0.525	15	316	0.841
2602.8	0.619	9.7	0.596	12	276	1.3	8.9	1.1	19	315	0.959
2603.5	0.490	11	0.480	9.5	254	1.6	7.1	0.875	14	291	1.2
2604.2	0.490	12	0.560	12	270	2.0	7.1	1.0	19	309	1.5
2604.9	0.490	9.8	0.416	12	286	1.6	7.1	0.759	19	327	1.1
2605.6	0.490	9.9	0.586	15	273	1.8	7.1	1.1	22	312	1.3
2606.3	0.534	9.1	0.743	12	262	1.9	7.7	1.4	19	300	1.4
2607.0	0.490	11	0.897	13	263	2.4	7.1	1.6	21	300	1.7
2607.7	0.490	9.6	0.899	16	270	2.1	7.1	1.6	25	309	1.6
2608.4	0.490	9.0	0.873	16	260	1.5	7.1	1.6	25	298	1.1
2609.1	0.490	12	0.956	14	306	2.2	7.1	1.7	21	350	1.6
2609.8	0.490	11	0.942	13	270	1.9	7.1	1.7	20	309	1.4
2610.5	0.490	11	1.0	17	257	1.2	7.1	1.8	27	294	0.906
2611.2	0.490	12	0.867	19	279	2.6	7.1	1.6	30	319	1.9
2611.9	0.490	14	0.729	15	273	1.8	7.1	1.3	22	313	1.3
2612.6	0.490	12	1.1	18	269	1.3	7.1	2.0	28	308	0.914
2613.3	0.490	12	0.797	19	264	1.7	7.1	1.5	29	301	1.3
2614.0	0.490	9.9	0.618	17	239	1.5	7.1	1.1	26	273	1.1
2614.7	0.490	13	0.702	17	278	0.928	7.1	1.3	27	318	0.677
2615.4	0.490	12	0.657	17	244	0.798	7.1	1.2	26	279	0.583
2616.1	0.490	12	1.1	21	243	1.1	7.1	2.1	32	278	0.838
2616.8	0.490	10	0.877	26	260	0.968	7.1	1.6	41	297	0.707
2617.5	0.512	12	1.1	21	254	0.842	7.4	2.0	32	291	0.614
2618.2	0.490	11	1.2	18	236	0.980	7.1	2.1	28	270	0.715
2618.9	0.490	11	1.1	19	219	0.832	7.1	2.0	29	250	0.607
2619.6	0.711	13	0.975	25	239	1.4	10	1.8	39	274	1.0
2620.3	0.490	13	0.709	22	240	1.1	7.1	1.3	34	274	0.786
2621.0	0.544	12	1.2	23	234	1.1	7.9	2.1	35	267	0.804
2621.6	0.490	10	0.559	18	240	1.0	7.1	1.0	28	274	0.760
2622.3	0.490	11	0.994	22	229	0.818	7.1	1.8	34	262	0.597
2623.0	0.490	12	1.1	27	227	1.2	7.1	2.1	42	260	0.858
2623.7	0.510	12	0.855	25	235	1.2	7.4	1.6	39	269	0.843
2624.4	0.490	11	0.862	23	250	1.0	7.1	1.6	36	286	0.731
2625.1	0.490	11	1.1	23	225	0.948	7.1	2.1	36	258	0.692
2625.8	0.490	11	1.1	23	247	0.739	7.1	1.9	36	283	0.539
2626.5	0.543	9.5	0.947	23	250	0.898	7.8	1.7	35	286	0.655
2627.2	0.490	10	0.585	19	220	0.991	7.1	1.1	30	251	0.723
2627.9	0.490	9.5	0.862	20	243	0.952	7.1	1.6	31	277	0.694
2628.6	0.490	11	0.704	27	222	0.776	7.1	1.3	41	254	0.566
2629.3	0.490	12	0.801	24	245	1.1	7.1	1.5	37	280	0.789
2630.0	0.490	11	0.968	22	242	0.964	7.1	1.8	33	277	0.703
2630.7	0.490	11	0.800	24	227	0.764	7.1	1.5	37	260	0.558
2631.4	0.490	11	0.593	24	255	1.5	7.1	1.1	37	291	1.1
2632.1	0.490	12	0.807	20	231	0.577	7.1	1.5	31	264	0.421
2632.8	0.712	12	0.808	27	238	1.8	10	1.5	41	272	1.3
2633.5	0.490	13	0.484	29	248	1.9	7.1	0.883	45	284	1.4
2634.2	0.490	11	0.909	26	284	1.1	7.1	1.7	40	325	0.792
2634.9	0.490	11	0.966	25	264	0.972	7.1	1.8	38	302	0.709
2635.6	0.490	10	0.735	24	261	1.0	7.1	1.3	37	299	0.763
2636.3	0.490	14	1.1	26	231	1.2	7.1	2.1	40	264	0.858
2637.0	0.547	10	0.598	20	286	1.5	7.9	1.1	30	327	1.1
2637.7	0.640	13	0.834	24	252	1.4	9.2	1.5	36	288	0.992
2638.4	0.490	11	0.725	26	250	1.7	7.1	1.3	40	286	1.2
2639.1	0.490	14	0.817	24	248	1.7	7.1	1.5	36	284	1.2
2639.8	0.490	12	0.641	23	235	1.5	7.1	1.2	35	269	1.1
2640.5	0.490	10	0.618	24	249	1.1	7.1	1.1	37	284	0.781
2641.2	0.490	10	0.895	26	268	1.2	7.1	1.6	40	306	0.895
2641.9	0.505	12	0.893	27	277	1.2	7.3	1.6	41	317	0.910
2642.6	0.490	10	0.858	28	274	1.4	7.1	1.6	43	313	1.0
2643.3	0.490	11	0.875	21	295	1.9	7.1	1.6	32	337	1.4
2644.0	0.490	9.5	0.489	21	252	1.4	7.1	0.892	32	289	0.998
2644.7	0.490	11	0.645	23	256	1.3	7.1	1.2	36	292	0.970
2645.4	0.508	10	0.805	28	301	2.3	7.3	1.5	43	345	1.7
2646.1	0.490	13	0.936	24	254	2.0	7.1	1.7	36	291	1.5
2646.8	0.490	11	0.747	22	264	1.3	7.1	1.4	34	302	0.949
2647.5	0.746	12	0.934	21	275	1.3	11	1.7	33	315	0.983
2648.1	0.584	12	0.595	20	285	1.6	8.4	1.1	31	325	1.1
2648.8	0.490	11	0.797	20	269	1.1	7.1	1.5	31	308	0.837
2649.5	0.684	13	0.755	21	259	0.954	9.9	1.4	33	296	0.696
2650.2	0.685	11	0.590	21	301	1.6	9.9	1.1	32	344	1.1
2650.9	0.490	12	0.526	22	293	1.5	7.1	0.959	33	335	1.1
2651.6	0.490	9.9	0.577	21	278	1.2	7.1	1.1	32	318	0.894
2652.3	0.490	12	0.519	20	295	0.594	7.1	0.947	31	337	0.433
2653.0	0.490	9.8	0.527	20	274	1.3	7.1	0.962	30	313	0.956
2653.7	0.490	11	0.547	20	286	1.9	7.1	0.997	30	327	1.4
2654.4	0.490	10	0.339	20	293	2.0	7.1	0.619	30	335	1.4



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2655.1	0.490	10	0.302	17	321	1.5	7.1	0.550	27	367	1.1
2655.8	0.654	12	0.355	16	288	1.6	9.4	0.647	25	329	1.2
2656.5	0.594	11	0.495	20	284	0.987	8.6	0.902	30	325	0.720
2657.2	0.490	11	0.308	15	306	2.0	7.1	0.561	22	350	1.5
2657.9	0.769	10	0.483	16	280	1.3	11	0.881	24	320	0.944
2658.6	0.490	11	0.386	14	264	1.3	7.1	0.704	21	302	0.959
2659.3	0.490	8.6	0.266	17	261	1.5	7.1	0.485	26	299	1.1
2660.0	0.546	11	0.150	14	243	2.3	7.9	0.273	22	278	1.7
2660.7	0.583	12	0.572	13	278	1.5	8.4	1.0	20	318	1.1
2661.4	0.642	9.2	0.378	12	296	2.6	9.3	0.690	18	338	1.9
2662.1	0.624	9.8	0.380	13	285	2.0	9.0	0.694	20	326	1.4
2662.8	0.540	10.0	0.208	14	330	1.7	7.8	0.380	22	377	1.2
2663.5	0.490	11	0.577	10	314	1.9	7.1	1.1	16	359	1.4
2664.2	0.490	12	0.110	10	277	1.6	7.1	0.201	16	316	1.1
2664.9	0.762	11	0.470	11	276	1.8	11	0.858	17	316	1.3
2665.6	0.531	10	0.271	13	326	2.6	7.7	0.493	20	373	1.9
2666.3	0.490	9.4	0.205	10	326	2.5	7.1	0.374	16	373	1.8
2667.0	0.490	11	0.370	11	329	2.8	7.1	0.675	17	377	2.0
2667.7	0.490	10	0.480	8.8	320	3.4	7.1	0.875	13	366	2.5
2668.4	0.506	11	0.424	10	393	3.0	7.3	0.774	15	450	2.2
2669.1	0.490	9.5	0.365	14	317	5.0	7.1	0.665	21	363	3.6
2669.8	0.735	9.7	0.307	12	417	5.2	11	0.559	18	477	3.8
2670.5	0.490	10	0.752	17	413	6.4	7.1	1.4	27	472	4.6
2671.2	0.546	11	0.593	13	465	6.1	7.9	1.1	20	532	4.5
2671.9	0.544	11	0.392	11	502	6.9	7.8	0.715	16	574	5.0
2672.6	1.0	10	0.524	14	511	5.3	15	0.956	22	584	3.9
2673.3	0.767	11	0.585	14	602	9.0	11	1.1	21	688	6.6
2673.9	0.714	11	0.563	17	551	7.6	10	1.0	25	630	5.5
2674.6	0.496	11	0.559	18	711	6.9	7.2	1.0	27	813	5.1
2675.3	0.490	13	0.582	16	843	10	7.1	1.1	25	964	7.5
2676.0	0.490	13	0.834	21	908	15	7.1	1.5	32	1038	11
2676.7	0.741	11	0.885	17	856	12	11	1.6	27	979	8.5
2677.4	0.507	11	0.781	18	878	11	7.3	1.4	28	1004	8.1
2678.1	0.490	9.8	1.1	20	1049	13	7.1	2.0	31	1200	9.4
2678.8	1.2	13	1.0	21	1090	14	18	1.9	33	1247	9.9
2679.5	0.998	12	0.982	23	1077	12	14	1.8	35	1232	8.5
2680.2	1.2	12	1.1	22	1196	13	17	2.0	34	1368	9.5
2680.9	0.648	13	1.2	25	1286	13	9.4	2.2	38	1471	9.2
2681.6	0.939	11	1.2	26	1483	12	14	2.2	39	1696	9.0
2682.3	0.819	13	1.3	24	1524	12	12	2.4	37	1743	8.7
2683.0	1.4	14	1.3	30	1562	12	20	2.3	46	1786	9.1
2683.7	0.937	11	1.5	26	1322	9.5	14	2.8	40	1511	6.9
2684.4	0.804	14	1.2	28	1507	10	12	2.2	43	1723	7.3
2685.1	0.662	10	1.5	31	1557	9.5	9.6	2.8	47	1780	6.9
2685.8	0.995	14	1.2	31	1555	8.5	14	2.1	48	1778	6.2
2686.5	1.1	12	1.5	27	1496	7.5	16	2.8	42	1711	5.5
2687.2	0.748	13	1.6	25	1441	7.2	11	2.9	39	1648	5.3
2687.9	0.490	11	1.5	28	1687	9.2	7.1	2.8	44	1930	6.7
2688.6	0.686	14	1.6	29	1594	5.8	9.9	2.8	44	1823	4.2
2689.3	1.1	14	1.7	33	1589	7.6	16	3.1	51	1817	5.6
2690.0	1.1	11	1.7	33	1427	7.4	15	3.1	51	1632	5.4
2690.7	0.490	14	1.5	30	1543	5.6	7.1	2.8	45	1765	4.1
2691.4	0.539	13	1.6	35	1689	5.8	7.8	3.0	53	1932	4.2
2692.1	0.954	13	1.5	34	1662	6.9	14	2.8	53	1900	5.0
2692.8	0.716	14	1.7	34	1387	5.0	10	3.1	52	1586	3.6
2693.5	0.817	14	1.8	36	1449	5.2	12	3.2	55	1657	3.8
2694.2	0.810	13	1.8	31	1384	5.1	12	3.3	47	1583	3.7
2694.9	1.0	12	2.0	27	1203	4.8	15	3.7	42	1376	3.5
2695.6	0.692	13	1.7	36	1371	5.5	10.0	3.2	56	1568	4.0
2696.3	0.490	14	1.3	30	1177	4.3	7.1	2.4	45	1345	3.2
2697.0	0.490	12	2.1	31	1220	6.2	7.1	3.8	47	1395	4.5
2697.7	0.490	12	2.0	28	1189	4.0	7.1	3.7	43	1360	2.9
2698.4	0.490	13	1.8	32	1123	4.6	7.1	3.3	50	1285	3.4
2699.0	0.490	12	1.8	32	1125	6.1	7.1	3.3	48	1287	4.5
2699.7	0.490	14	1.5	36	1017	5.7	7.1	2.7	56	1163	4.2
2700.4	0.490	12	1.1	32	970	4.7	7.1	2.1	50	1110	3.4
2701.1	0.576	11	1.6	37	921	4.3	8.3	2.8	56	1053	3.2
2701.8	0.527	12	1.5	28	1026	5.8	7.6	2.8	44	1173	4.2
2702.5	0.490	13	1.1	29	969	5.8	7.1	2.0	45	1108	4.2
2703.2	0.837	16	1.1	31	888	5.1	12	2.0	48	1015	3.7
2703.9	0.731	13	0.704	32	855	4.3	11	1.3	49	978	3.2
2704.6	0.554	14	1.0	28	886	5.4	8.0	1.9	42	1013	3.9
2705.3	0.768	15	0.962	26	833	5.0	11	1.8	40	952	3.6
2706.0	1.0	16	1.1	24	787	4.3	15	2.0	37	900	3.1
2706.7	0.647	12	0.956	26	758	4.4	9.3	1.7	39	867	3.2
2707.4	0.945	14	0.703	20	758	3.5	14	1.3	31	867	2.5
2708.1	0.490	14	0.684	18	676	4.2	7.1	1.2	27	773	3.0
2708.8	1.2	14	0.871	18	751	3.4	17	1.6	28	859	2.5
2709.5	1.4	14	0.950	21	702	4.4	21	1.7	33	802	3.2
2710.2	1.8	11	0.616	16	643	3.2	26	1.1	24	735	2.3
2710.9	1.7	11	0.754	14	694	4.1	25	1.4	21	794	3.0



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2711.6	2.7	9.6	0.530	14	566	4.2	39	0.966	22	647	3.1
2712.3	3.8	12	0.583	19	724	4.1	55	1.1	29	828	3.0
2713.0	4.0	12	0.628	11	674	4.6	57	1.1	17	771	3.3
2713.7	4.0	10	0.955	17	631	4.8	57	1.7	26	721	3.5
2714.4	5.7	10	1.3	16	705	4.4	82	2.3	25	806	3.2
2715.1	7.8	12	1.4	17	724	4.6	113	2.6	25	828	3.4
2715.8	6.9	12	1.4	17	772	4.8	99	2.6	26	883	3.5
2716.5	7.9	11	1.9	18	735	5.4	114	3.5	27	841	4.0
2717.2	8.3	10	2.2	16	822	5.2	120	3.9	25	940	3.8
2717.9	10	11	1.9	19	876	4.4	148	3.5	29	1002	3.2
2718.6	11	14	2.9	21	955	5.1	153	5.2	31	1092	3.7
2719.3	13	12	2.9	21	1102	6.5	191	5.4	32	1261	4.7
2720.0	13	11	3.2	19	1019	5.8	191	5.9	29	1165	4.2
2720.7	11	11	3.2	19	1055	4.2	165	5.8	29	1206	3.0
2721.4	12	11	3.6	23	1121	5.3	173	6.6	36	1282	3.9
2722.1	12	10	4.2	20	1123	3.0	180	7.7	31	1285	2.2
2722.8	11	13	3.9	24	1107	5.1	152	7.1	37	1266	3.7
2723.5	13	14	5.1	27	1286	4.2	186	9.3	41	1471	3.1
2724.2	11	12	4.5	28	1387	4.2	161	8.1	43	1586	3.1
2724.8	12	13	4.6	32	1584	5.8	179	8.4	48	1811	4.3
2725.5	8.4	11	4.3	27	1414	6.8	121	7.8	41	1617	5.0
2726.2	7.1	12	4.1	29	1370	5.8	102	7.5	45	1566	4.3
2726.9	7.6	13	4.2	30	1507	5.4	109	7.6	46	1723	3.9
2727.6	6.1	13	4.0	30	1554	4.9	88	7.4	45	1777	3.6
2728.3	7.0	14	3.5	34	1510	5.8	100	6.4	52	1727	4.2
2729.0	6.6	13	4.1	32	1671	6.5	95	7.6	50	1910	4.8
2729.7	6.0	14	3.5	33	1556	5.5	87	6.4	51	1779	4.0
2730.4	4.7	11	3.9	25	1447	3.7	67	7.1	38	1654	2.7
2731.1	4.6	12	4.4	31	1693	5.1	66	8.0	47	1936	3.7
2731.8	4.7	16	5.2	33	1659	5.6	68	9.4	50	1898	4.1
2732.5	4.0	14	5.3	28	1848	4.8	57	9.7	43	2113	3.5
2733.2	4.4	14	4.5	36	1710	4.5	63	8.2	54	1955	3.3
2733.9	4.4	14	4.4	33	1672	6.6	64	8.0	50	1911	4.8
2734.6	3.6	14	4.3	34	1654	4.5	52	7.9	53	1891	3.3
2735.3	2.7	13	4.3	41	1912	6.9	38	7.9	62	2187	5.0
2736.0	3.8	13	4.3	39	1864	6.1	54	7.8	60	2132	4.5
2736.7	3.3	11	3.9	37	1814	4.7	48	7.1	56	2074	3.4
2737.4	2.6	12	4.3	44	2052	5.8	38	7.8	67	2347	4.2
2738.1	2.6	14	4.8	45	2229	5.7	38	8.8	69	2548	4.2
2738.8	3.2	14	4.0	41	2036	6.4	47	7.2	62	2329	4.7
2739.5	2.9	13	3.9	45	2324	5.0	42	7.1	69	2658	3.7
2740.2	3.6	12	4.2	41	2091	6.3	52	7.6	62	2392	4.6
2740.9	2.6	12	4.4	46	2281	5.5	38	8.0	71	2609	4.0
2741.6	2.3	14	4.5	42	2114	5.4	33	8.1	64	2417	4.0
2742.3	2.6	14	5.1	38	2184	5.6	37	9.3	58	2497	4.1
2743.0	2.4	14	4.7	41	2417	5.5	35	8.6	62	2764	4.0
2743.7	2.5	14	5.1	46	2376	3.5	36	9.3	71	2717	2.6
2744.4	2.0	17	4.8	44	2458	3.9	29	8.7	68	2811	2.9
2745.1	1.6	12	4.2	42	2272	4.3	23	7.6	64	2598	3.1
2745.8	2.3	15	4.0	53	2712	4.2	33	7.3	81	3101	3.0
2746.5	2.0	14	4.9	40	2277	3.7	29	8.9	62	2604	2.7
2747.2	1.3	15	3.7	37	2336	4.6	19	6.8	57	2671	3.3
2747.9	1.5	14	3.7	40	2382	6.4	21	6.8	61	2724	4.6
2748.6	1.7	16	4.6	40	2603	4.3	24	8.4	61	2977	3.1
2749.3	1.2	14	3.7	43	2341	5.3	18	6.7	67	2677	3.9
2750.0	1.6	12	4.3	44	2236	4.2	23	7.9	68	2557	3.1
2750.7	1.8	14	3.3	41	2242	3.2	26	6.0	63	2564	2.3
2751.3	1.3	15	3.5	43	2366	3.5	19	6.4	66	2705	2.5
2752.0	1.4	15	3.8	43	2256	4.2	21	7.0	66	2579	3.1
2752.7	0.876	17	2.6	45	2244	3.1	13	4.8	69	2566	2.3
2753.4	1.5	15	3.2	40	2347	3.5	21	5.9	61	2683	2.6
2754.1	1.1	15	3.5	36	2212	2.9	16	6.3	56	2529	2.1
2754.8	1.4	15	3.2	37	2244	4.5	21	5.9	57	2566	3.3
2755.5	0.910	12	3.3	38	1787	3.6	13	6.0	59	2044	2.6
2756.2	0.750	15	2.9	37	2204	3.0	11	5.3	56	2520	2.2
2756.9	1.4	14	3.1	36	2132	3.0	21	5.6	55	2438	2.2
2757.6	0.799	14	3.0	43	2108	3.7	12	5.5	66	2411	2.7
2758.3	0.576	17	2.8	38	1915	3.0	8.3	5.0	58	2190	2.2
2759.0	0.698	15	2.5	34	1744	2.9	10	4.5	53	1994	2.1
2759.7	0.774	14	2.4	32	2075	3.6	11	4.3	49	2372	2.6
2760.4	0.928	15	2.2	39	1920	3.4	13	3.9	59	2196	2.5
2761.1	0.614	14	2.6	31	1823	2.9	8.9	4.7	48	2085	2.1
2761.8	0.490	13	2.2	35	1757	3.6	7.1	4.0	54	2009	2.6
2762.5	0.631	14	1.9	30	1600	3.2	9.1	3.5	46	1830	2.3
2763.2	0.893	15	2.0	27	1630	1.9	13	3.6	41	1864	1.4
2763.9	0.502	13	1.8	37	1657	3.6	7.3	3.4	57	1895	2.6
2764.6	0.616	13	1.9	32	1462	2.6	8.9	3.5	50	1672	1.9
2765.3	0.512	17	1.4	28	1593	3.5	7.4	2.6	43	1822	2.5
2766.0	0.561	14	1.8	30	1371	3.2	8.1	3.4	46	1568	2.3
2766.7	0.791	16	1.5	30	1404	3.4	11	2.7	46	1606	2.5
2767.4	0.490	18	1.4	26	1516	2.8	7.1	2.5	40	1734	2.0



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
2768.1	0.522	15	1.2	30	1598	3.2	7.5	2.3	47	1828	2.4
2768.8	0.591	18	1.3	26	1309	3.2	8.5	2.3	39	1496	2.4
2769.5	0.580	16	1.1	31	1328	2.7	8.4	1.9	47	1519	2.0
2770.2	0.490	18	1.5	27	1346	4.1	7.1	2.6	41	1540	3.0
2770.9	0.490	17	1.2	26	1503	3.2	7.1	2.3	40	1718	2.3
2771.6	0.950	18	1.2	27	1279	2.4	14	2.1	41	1462	1.8
2772.3	0.490	18	1.1	25	1295	3.6	7.1	1.9	39	1481	2.6
2773.0	0.665	14	0.817	24	1042	2.8	9.6	1.5	37	1192	2.0
2773.7	0.825	13	0.872	21	1187	2.2	12	1.6	31	1358	1.6
2774.4	0.677	13	0.726	18	1222	2.4	9.8	1.3	28	1397	1.7
2775.1	0.525	13	0.636	20	1049	1.8	7.6	1.2	31	1199	1.3
2775.8	0.490	14	0.676	21	909	2.1	7.1	1.2	31	1039	1.5
2776.5	0.490	14	0.331	21	1067	2.6	7.1	0.604	32	1220	1.9
2777.2	0.683	15	0.498	18	899	2.1	9.9	0.908	28	1028	1.5
2777.8	0.490	16	0.413	17	988	1.8	7.1	0.753	26	1130	1.3
2778.5	0.593	13	0.384	16	963	1.9	8.6	0.700	25	1101	1.4
2779.2	0.490	16	0.461	15	960	1.6	7.1	0.842	22	1098	1.2
2779.9	0.490	13	0.594	14	903	2.3	7.1	1.1	21	1032	1.7
2780.6	0.490	12	0.573	15	868	1.5	7.1	1.0	23	993	1.1
2781.3	0.490	12	0.290	14	926	2.1	7.1	0.528	22	1059	1.6
2782.0	0.490	12	0.366	17	782	2.7	7.1	0.668	26	894	2.0
2782.7	0.490	11	0.367	16	946	2.3	7.1	0.669	24	1082	1.7
2783.4	0.490	13	0.601	11	910	2.0	7.1	1.1	17	1041	1.4
2784.1	0.798	9.4	0.672	8.9	804	1.2	12	1.2	14	919	0.908
2784.8	0.490	11	0.204	11	856	1.6	7.1	0.372	17	979	1.1
2785.5	0.575	13	0.329	9.8	874	2.0	8.3	0.600	15	1000	1.5
2786.2	1.0	11	0.184	11	857	1.6	15	0.336	17	980	1.1
2786.9	0.994	12	0.220	11	921	2.0	14	0.401	17	1053	1.5
2787.6	1.3	14	0.079	12	946	2.7	18	0.143	18	1082	2.0
2788.3	0.857	12	0.438	12	885	1.9	12	0.800	19	1012	1.4
2789.0	1.0	11	0.292	13	934	2.5	14	0.532	19	1068	1.8
2789.7	1.7	11	0.239	9.3	815	1.9	25	0.436	14	932	1.4
2790.4	1.6	10	0.266	12	873	1.4	23	0.484	18	998	0.990
2791.1	1.4	9.6	0.295	12	932	1.8	20	0.539	18	1066	1.3
2791.8	2.0	12	0.144	15	927	2.2	28	0.262	22	1060	1.6
2792.5	2.0	9.5	0.142	15	916	2.1	29	0.258	22	1048	1.5
2793.2	1.7	7.2	0.430	10	791	1.5	24	0.785	16	904	1.1
2793.9	2.1	11	0.184	12	874	1.8	30	0.335	18	1000	1.3
2794.6	1.9	9.1	0.292	12	1047	1.7	28	0.533	18	1198	1.2
2795.3	2.6	9.5	0.406	13	1040	2.2	38	0.740	20	1190	1.6
2796.0	2.3	7.8	0.386	15	1211	2.2	33	0.703	22	1385	1.6
2796.7	2.0	10	0.432	14	1075	2.1	28	0.788	21	1229	1.5
2797.4	2.8	10.0	0.578	17	1210	3.2	40	1.1	26	1383	2.3
2798.1	3.4	11	0.632	17	1078	2.1	49	1.2	25	1233	1.5
2798.8	2.0	12	0.895	17	1215	2.1	29	1.6	26	1389	1.5
2799.5	2.4	11	0.914	20	1238	2.8	35	1.7	31	1416	2.0
2800.2	3.9	9.3	0.994	18	1159	2.7	57	1.8	27	1326	2.0
2800.9	3.4	12	1.3	20	1401	2.8	50	2.4	31	1602	2.0
2801.6	3.0	12	0.886	21	1316	2.1	44	1.6	32	1505	1.5
2802.3	5.0	11	1.2	23	1329	2.1	72	2.1	36	1520	1.6
2803.0	3.7	13	1.1	20	1337	3.0	54	1.9	31	1528	2.2
2803.7	4.6	13	1.1	26	1306	2.3	66	2.0	40	1493	1.7
2804.3	3.5	11	1.4	27	1596	3.5	50	2.5	41	1825	2.5
2805.0	4.1	12	1.3	30	1449	4.0	60	2.4	46	1657	2.9
2805.7	3.3	12	0.975	26	1440	4.0	48	1.8	39	1646	2.9
2806.4	4.2	13	1.0	29	1516	2.9	60	1.8	44	1734	2.1
2807.1	5.4	12	1.5	27	1622	2.9	79	2.7	41	1855	2.2
2807.8	5.0	13	1.5	31	1677	3.8	72	2.8	48	1918	2.8
2808.5	3.7	13	2.0	30	1716	3.3	53	3.7	45	1963	2.4
2809.2	4.6	14	1.8	31	1971	3.4	67	3.3	48	2254	2.5
2809.9	3.0	13	1.7	31	1978	3.4	44	3.1	48	2262	2.4
2810.6	3.1	13	2.3	37	2174	2.7	45	4.3	57	2486	1.9
2811.3	3.2	16	2.5	36	2081	3.0	47	4.5	56	2380	2.2
2812.0	2.7	15	2.0	42	2332	3.8	39	3.7	64	2667	2.8
2812.7	2.7	13	1.5	35	2043	2.3	39	2.7	53	2337	1.7
2813.4	2.7	13	1.8	38	1850	3.0	39	3.3	59	2116	2.2
2814.1	1.6	15	1.9	39	1988	3.6	23	3.5	60	2274	2.7
2814.8	2.9	16	2.3	45	2467	4.1	42	4.2	69	2821	3.0
2815.5	2.3	17	2.0	42	2148	3.8	34	3.7	65	2456	2.8
2816.2	1.2	15	2.1	36	2286	3.6	17	3.8	56	2614	2.6
2816.9	1.4	17	1.6	37	2201	5.1	20	2.9	56	2517	3.7
2817.6	2.3	15	2.1	37	2210	3.9	33	3.8	56	2528	2.9
2818.3	1.1	16	2.5	40	2186	3.3	16	4.5	62	2500	2.4
2819.0	1.1	14	1.9	41	2348	3.8	15	3.4	63	2684	2.8
2819.7	1.2	17	1.8	37	2312	4.2	17	3.2	56	2643	3.1
2820.4	2.0	16	1.9	44	2205	3.5	28	3.5	68	2522	2.5
2821.1	0.490	15	1.6	45	2539	4.6	7.1	2.9	69	2903	3.4
2821.8	0.838	17	1.5	41	2390	3.4	12	2.7	63	2733	2.4
2822.5	1.2	14	1.5	43	2302	2.8	18	2.7	66	2632	2.0
2823.2	0.490	15	1.6	36	2057	2.4	7.1	2.9	55	2352	1.8
2823.9	0.762	13	1.6	36	2096	3.7	11	3.0	55	2396	2.7



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2824.6	1.0	17	1.5	33	2099	4.6	15	2.7	51	2400	3.3
2825.3	0.490	16	1.2	45	1905	3.0	7.1	2.2	68	2179	2.2
2826.0	0.754	17	1.1	49	2164	2.2	11	2.1	75	2474	1.6
2826.7	0.490	17	1.4	33	1870	3.9	7.1	2.5	50	2138	2.8
2827.4	0.490	16	1.2	31	1816	2.8	7.1	2.1	47	2077	2.1
2828.1	0.490	14	1.4	36	1952	4.1	7.1	2.6	54	2232	3.0
2828.8	0.490	17	1.1	37	1883	4.3	7.1	2.0	57	2153	3.1
2829.5	0.490	14	1.0	39	1833	3.4	7.1	1.9	60	2096	2.5
2830.2	0.676	17	1.0	37	2043	3.2	9.8	1.9	57	2336	2.3
2830.8	0.490	16	1.3	34	1833	2.7	7.1	2.3	52	2096	2.0
2831.5	0.490	18	1.2	37	2001	3.4	7.1	2.3	57	2288	2.5
2832.2	0.490	16	1.0	28	1605	2.9	7.1	1.9	43	1835	2.1
2832.9	0.555	16	0.878	35	1587	2.6	8.0	1.6	54	1815	1.9
2833.6	0.490	15	1.0	29	1534	3.1	7.1	1.9	44	1754	2.3
2834.3	1.1	16	0.769	34	1393	2.4	15	1.4	52	1593	1.8
2835.0	0.490	15	0.954	27	1511	2.8	7.1	1.7	41	1728	2.1
2835.7	0.643	16	0.607	27	1566	2.2	9.3	1.1	42	1791	1.6
2836.4	0.490	14	0.800	30	1411	2.9	7.1	1.5	46	1613	2.1
2837.1	0.490	16	0.619	26	1313	2.2	7.1	1.1	40	1502	1.6
2837.8	0.490	15	0.626	28	1419	2.6	7.1	1.1	42	1623	1.9
2838.5	0.752	14	0.455	28	1360	1.9	11	0.829	43	1555	1.4
2839.2	0.490	16	0.331	27	1235	3.3	7.1	0.605	42	1413	2.4
2839.9	0.490	14	0.592	21	1158	2.3	7.1	1.1	32	1324	1.7
2840.6	0.545	14	0.660	21	1275	3.1	7.9	1.2	32	1458	2.3
2841.3	0.490	17	0.540	24	1131	1.9	7.1	0.985	37	1294	1.4
2842.0	0.490	16	0.655	27	1214	3.1	7.1	1.2	41	1388	2.3
2842.7	0.507	17	0.313	24	1188	2.2	7.3	0.570	37	1358	1.6
2843.4	0.490	15	0.263	21	1028	2.3	7.1	0.480	32	1175	1.7
2844.1	0.490	14	0.323	20	1101	1.5	7.1	0.590	30	1259	1.1
2844.8	0.490	17	0.381	21	1185	1.8	7.1	0.695	33	1355	1.3
2845.5	0.490	14	0.332	19	1015	2.3	7.1	0.605	29	1161	1.7
2846.2	0.490	12	0.257	18	998	1.4	7.1	0.468	28	1141	1.0
2846.9	0.859	15	0.310	18	982	3.1	12	0.566	27	1123	2.3
2847.6	0.703	17	0.272	19	908	2.1	10	0.495	29	1039	1.5
2848.3	0.626	16	0.312	21	1037	1.5	9.0	0.568	32	1186	1.1
2849.0	0.490	13	0.136	19	968	1.5	7.1	0.248	29	1107	1.1
2849.7	0.490	14	0.427	16	942	2.7	7.1	0.779	24	1078	1.9
2850.4	0.490	12	0.227	19	852	1.6	7.1	0.415	30	974	1.2
2851.1	0.661	13	0.304	15	926	2.0	9.5	0.555	24	1059	1.4
2851.8	0.802	14	0.148	13	879	1.0	12	0.269	21	1006	0.755
2852.5	0.551	13	0.394	15	892	2.0	8.0	0.719	23	1020	1.5
2853.2	0.911	14	0.309	10	805	1.9	13	0.563	16	920	1.4
2853.9	0.602	13	0.079	14	881	1.9	8.7	0.143	21	1007	1.4
2854.6	0.490	15	0.552	12	911	2.8	7.1	1.0	18	1042	2.1
2855.3	0.848	16	0.213	15	847	1.7	12	0.389	23	968	1.3
2856.0	1.0	15	0.302	12	902	0.907	15	0.550	18	1032	0.662
2856.7	0.653	18	0.374	12	834	1.5	9.4	0.683	19	954	1.1
2857.3	0.899	21	0.427	13	818	1.3	13	0.779	20	935	0.912
2858.0	0.692	29	0.487	14	801	1.3	10.0	0.888	21	915	0.978
2858.7	0.490	28	0.454	14	761	2.0	7.1	0.828	22	871	1.5
2859.4	0.490	29	0.323	12	810	1.4	7.1	0.590	19	926	1.0
2860.1	0.728	34	0.379	9.7	848	2.1	11	0.691	15	970	1.5
2860.8	0.490	31	0.256	11	810	1.9	7.1	0.467	17	926	1.4
2861.5	0.851	28	0.349	10	836	1.1	12	0.636	15	956	0.785
2862.2	0.576	28	0.359	11	734	1.5	8.3	0.655	17	839	1.1
2862.9	0.580	21	0.184	9.9	710	1.4	8.4	0.336	15	812	1.0
2863.6	0.490	23	0.150	9.6	770	1.9	7.1	0.274	15	880	1.4
2864.3	0.490	32	0.079	11	806	2.4	7.1	0.143	17	922	1.8
2865.0	0.642	25	0.226	11	933	1.9	9.3	0.413	18	1067	1.4
2865.7	0.755	24	0.270	8.6	871	1.5	11	0.492	13	995	1.1
2866.4	0.494	23	0.272	11	802	1.9	7.1	0.497	17	917	1.4
2867.1	0.490	28	0.328	9.5	790	1.2	7.1	0.599	14	904	0.850
2867.8	0.937	34	0.507	11	912	2.0	14	0.925	18	1043	1.5
2868.5	0.615	38	0.363	11	848	2.3	8.9	0.662	17	969	1.7
2869.2	0.490	34	0.272	11	861	2.2	7.1	0.497	17	985	1.6
2869.9	0.857	50	0.369	11	828	1.8	12	0.673	17	946	1.3
2870.6	1.1	41	0.278	11	771	1.9	16	0.508	17	882	1.4
2871.3	1.2	45	0.224	10	902	1.2	17	0.408	16	1031	0.885
2872.0	0.730	48	0.465	14	745	2.5	11	0.848	22	852	1.8
2872.7	1.3	65	0.794	9.7	792	1.8	19	1.4	15	906	1.3
2873.4	0.954	61	0.568	13	762	2.1	14	1.0	20	871	1.5
2874.1	0.602	63	0.636	9.6	717	1.7	8.7	1.2	15	820	1.3
2874.8	1.0	65	0.643	11	738	2.1	15	1.2	17	844	1.5
2875.5	0.783	86	0.578	11	867	1.8	11	1.1	17	992	1.3
2876.2	1.9	84	0.615	12	743	2.2	28	1.1	19	849	1.6
2876.9	1.0	74	0.683	13	803	2.5	15	1.2	20	918	1.8
2877.6	1.1	83	0.907	10	769	2.0	16	1.7	16	879	1.5
2878.3	0.772	76	0.644	11	731	2.2	11	1.2	16	836	1.6
2879.0	1.1	76	0.674	11	795	1.7	16	1.2	16	909	1.3
2879.7	0.953	62	0.763	10	768	1.8	14	1.4	16	879	1.3
2880.4	0.888	64	0.562	10	790	2.3	13	1.0	16	903	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2881.1	0.621	62	0.774	12	731	1.6	9.0	1.4	19	836	1.2
2881.8	0.952	68	0.656	12	767	1.9	14	1.2	18	878	1.4
2882.5	0.657	70	0.956	14	878	1.6	9.5	1.7	22	1004	1.2
2883.2	1.2	66	1.1	13	703	2.0	17	2.0	19	803	1.4
2883.9	0.490	71	1.4	12	797	1.8	7.1	2.6	19	911	1.3
2884.5	1.0	79	1.6	14	763	1.8	15	3.0	22	872	1.3
2885.2	0.531	75	1.1	14	764	2.0	7.7	2.1	22	873	1.4
2885.9	0.490	77	1.8	13	742	1.7	7.1	3.2	20	849	1.2
2886.6	1.1	81	2.1	14	732	1.9	16	3.8	21	837	1.4
2887.3	1.3	95	2.0	16	684	2.1	19	3.6	24	782	1.5
2888.0	1.1	119	2.6	13	744	2.9	16	4.7	19	851	2.1
2888.7	1.6	122	1.8	16	822	2.8	22	3.3	24	940	2.1
2889.4	1.3	86	1.3	11	614	1.5	19	2.3	17	702	1.1
2890.1	0.986	90	2.0	79	699	2.2	14	3.7	121	799	1.6
2890.8	1.7	98	1.7	13	842	3.5	25	3.0	20	963	2.5
2891.5	2.2	107	2.1	11	798	2.3	32	3.8	17	913	1.7
2892.2	1.5	114	2.0	14	741	1.2	22	3.6	21	847	0.847
2892.9	0.908	110	2.0	10	791	1.8	13	3.7	16	904	1.3
2893.6	1.4	132	2.0	13	730	2.6	21	3.7	20	835	1.9
2894.3	1.3	143	2.8	13	752	2.1	19	5.1	19	860	1.5
2895.0	1.2	146	2.4	16	701	2.1	18	4.4	24	801	1.5
2895.7	1.3	144	3.0	17	723	2.5	19	5.5	27	826	1.8
2896.4	1.0	206	3.8	12	701	3.2	15	7.0	18	802	2.4
2897.1	2.6	234	4.2	14	715	3.2	38	7.7	22	817	2.3
2897.8	0.943	225	4.0	21	883	2.5	14	7.3	32	1010	1.8
2898.5	1.6	197	4.4	23	642	1.6	23	8.0	36	735	1.2
2899.2	1.8	201	5.0	26	703	1.8	26	9.2	40	803	1.3
2899.9	1.9	275	5.5	30	714	3.5	28	10	46	817	2.6



Minnow Environmental  
Sample ID: 012

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
0.1	0.500	97	6.2	29	280	3.2	7.2	11	44	320	2.4
0.8	0.490	85	3.5	26	317	2.4	7.1	6.4	40	362	1.8
1.5	0.674	96	3.8	24	319	3.3	9.7	6.9	37	365	2.4
2.2	0.490	91	5.5	23	316	2.2	7.1	9.9	35	361	1.6
2.9	0.490	90	3.1	29	346	2.2	7.1	5.6	44	395	1.6
3.6	0.490	96	3.3	32	365	2.6	7.1	6.0	49	418	1.9
4.3	0.490	84	5.5	28	298	2.3	7.1	10.0	42	340	1.7
5.0	0.490	90	3.9	29	351	2.7	7.1	7.1	45	401	1.9
5.7	0.490	85	5.1	26	304	2.5	7.1	9.4	40	348	1.8
6.4	0.490	111	3.9	38	353	2.3	7.1	7.1	59	404	1.7
7.1	0.576	84	3.1	26	358	3.1	8.3	5.7	40	410	2.3
7.8	0.490	81	2.9	25	293	2.7	7.1	5.3	39	335	2.0
8.5	0.694	77	3.7	27	325	2.2	10	6.7	42	371	1.6
9.2	0.490	136	3.2	28	391	3.7	7.1	5.8	43	448	2.7
9.9	0.490	88	2.8	27	345	2.1	7.1	5.2	41	394	1.5
10.6	0.490	88	2.7	26	324	2.3	7.1	5.0	40	371	1.6
11.3	0.490	90	2.7	28	336	2.4	7.1	5.0	43	384	1.7
12.0	0.490	86	5.4	26	360	3.4	7.1	9.9	40	412	2.5
12.7	0.490	81	3.2	28	320	2.4	7.1	5.8	43	366	1.7
13.4	0.490	88	2.6	27	371	2.8	7.1	4.7	42	424	2.1
14.1	0.575	87	2.9	29	319	2.3	8.3	5.3	44	365	1.7
14.8	0.490	78	3.0	30	347	2.6	7.1	5.5	45	397	1.9
15.5	0.490	76	3.2	26	343	3.5	7.1	5.9	40	392	2.6
16.2	0.563	81	3.4	29	351	3.6	8.1	6.2	45	401	2.7
16.9	0.490	97	2.7	29	346	2.3	7.1	4.9	44	395	1.7
17.6	0.490	74	2.3	32	317	3.0	7.1	4.3	48	362	2.2
18.3	0.490	79	3.0	31	319	2.4	7.1	5.5	47	365	1.8
19.0	0.490	82	3.3	28	330	3.3	7.1	6.0	43	378	2.4
19.7	0.490	85	2.8	32	312	2.7	7.1	5.1	49	357	1.9
20.3	0.490	95	2.7	31	340	4.1	7.1	4.9	48	389	3.0
21.0	0.720	86	2.5	31	333	2.0	10	4.5	47	380	1.5
21.7	0.490	80	2.6	27	356	1.7	7.1	4.7	42	407	1.2
22.4	0.490	88	3.8	25	364	3.6	7.1	7.0	39	416	2.6
23.1	0.490	93	2.3	33	342	2.6	7.1	4.3	50	391	1.9
23.8	0.490	92	2.3	31	348	2.0	7.1	4.3	47	398	1.5
24.5	0.490	89	2.0	28	343	2.6	7.1	3.6	43	393	1.9
25.2	0.490	94	2.9	27	339	2.8	7.1	5.3	41	388	2.1
25.9	0.720	96	2.5	31	362	2.9	10	4.5	47	413	2.1
26.6	0.490	83	2.0	31	346	2.0	7.1	3.7	48	396	1.4
27.3	0.490	98	2.2	26	374	2.6	7.1	4.0	41	428	1.9
28.0	0.490	92	2.2	29	355	3.1	7.1	4.1	44	406	2.3
28.7	0.490	98	2.5	32	377	2.3	7.1	4.6	48	432	1.7
29.4	0.490	79	1.8	29	348	2.6	7.1	3.2	45	397	1.9
30.1	0.490	78	1.9	28	337	2.3	7.1	3.4	42	386	1.7
30.8	0.490	73	1.8	29	291	2.5	7.1	3.2	44	333	1.8
31.5	0.490	83	2.2	32	337	3.1	7.1	4.0	49	385	2.2
32.2	0.490	79	2.0	31	333	1.9	7.1	3.7	48	380	1.4
32.9	0.490	80	1.4	31	379	2.6	7.1	2.5	47	433	1.9
33.6	0.490	71	2.4	28	333	2.5	7.1	4.3	43	380	1.8
34.3	0.490	72	1.4	25	316	2.0	7.1	2.5	38	362	1.5
35.0	0.490	90	2.0	34	381	3.7	7.1	3.6	51	436	2.7
35.7	0.490	77	1.7	32	349	2.5	7.1	3.2	49	399	1.8
36.4	0.490	86	1.8	28	322	3.1	7.1	3.4	43	368	2.2
37.1	0.490	64	1.5	27	316	2.3	7.1	2.8	42	361	1.7
37.8	0.490	64	1.5	27	333	2.5	7.1	2.7	42	381	1.8
38.5	0.490	80	1.6	33	362	3.0	7.1	3.0	51	414	2.2
39.2	0.490	74	1.8	32	365	3.4	7.1	3.3	48	417	2.5
39.9	0.490	75	1.7	28	353	2.8	7.1	3.0	43	404	2.1
40.6	0.490	60	1.4	27	284	1.5	7.1	2.5	42	325	1.1
41.3	0.490	68	1.5	26	306	2.3	7.1	2.8	40	349	1.7
42.0	0.490	73	1.3	33	313	2.4	7.1	2.3	50	357	1.8
42.7	0.490	75	1.5	32	345	2.9	7.1	2.7	49	394	2.1
43.4	0.557	66	1.3	31	340	3.1	8.0	2.3	48	389	2.3
44.1	0.490	58	1.3	27	312	2.6	7.1	2.3	42	357	1.9
44.8	0.490	77	1.1	30	319	2.5	7.1	2.1	45	365	1.8
45.5	0.490	77	1.1	28	355	3.0	7.1	2.1	43	406	2.2
46.1	0.490	69	1.0	29	342	2.9	7.1	1.9	45	392	2.1
46.8	0.490	73	1.1	30	317	2.9	7.1	2.0	46	362	2.1
47.5	0.490	69	1.2	31	333	2.9	7.1	2.2	47	380	2.1
48.2	0.490	64	0.973	29	330	2.9	7.1	1.8	44	377	2.1
48.9	0.490	69	0.944	31	346	4.0	7.1	1.7	48	396	2.9
49.6	0.490	64	0.862	29	339	2.9	7.1	1.6	44	387	2.1
50.3	0.490	59	0.983	27	324	3.9	7.1	1.8	41	371	2.9
51.0	0.490	65	0.719	31	321	2.0	7.1	1.3	48	367	1.5
51.7	0.517	75	1.1	32	326	3.5	7.5	2.0	49	373	2.6
52.4	0.490	67	0.745	32	348	2.8	7.1	1.4	50	398	2.0
53.1	0.543	64	0.860	28	313	3.2	7.8	1.6	42	358	2.3
53.8	0.490	61	1.0	26	319	3.1	7.1	1.9	40	365	2.3
54.5	0.490	65	1.0	27	296	3.2	7.1	1.9	41	339	2.3
55.2	0.490	72	0.941	34	324	2.8	7.1	1.7	53	370	2.1
55.9	0.660	68	0.693	31	306	2.7	9.5	1.3	47	350	1.9



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Sample ID: 012

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
56.6	0.490	62	0.813	30	300	3.1	7.1	1.5	46	343	2.3
57.3	0.490	66	0.697	29	319	3.2	7.1	1.3	44	365	2.3
58.0	0.490	67	0.701	34	304	3.6	7.1	1.3	51	348	2.6
58.7	0.711	68	0.801	32	301	3.4	10	1.5	48	345	2.5
59.4	0.490	59	1.0	29	268	2.9	7.1	1.9	45	307	2.1
60.1	0.490	66	0.825	33	297	3.0	7.1	1.5	50	339	2.2
60.8	0.515	64	0.801	27	306	4.3	7.4	1.5	41	350	3.1
61.5	0.594	74	0.734	33	304	3.1	8.6	1.3	50	347	2.2
62.2	0.490	68	1.1	35	300	3.8	7.1	2.0	54	343	2.8
62.9	0.490	63	1.0	28	282	3.6	7.1	1.9	42	323	2.6
63.6	0.490	65	1.1	25	282	4.0	7.1	2.0	39	322	2.9
64.3	0.577	66	0.947	34	280	4.2	8.3	1.7	52	320	3.1
65.0	0.598	70	0.756	31	290	4.9	8.6	1.4	48	331	3.5
65.7	0.490	74	0.779	37	326	4.4	7.1	1.4	57	373	3.2
66.4	0.584	65	0.957	33	276	4.2	8.4	1.7	51	316	3.1
67.1	0.490	64	0.784	32	262	3.7	7.1	1.4	49	299	2.7
67.8	0.490	66	0.685	31	281	2.8	7.1	1.2	47	322	2.1
68.5	0.490	70	0.728	30	282	4.7	7.1	1.3	46	322	3.4
69.2	0.588	61	0.896	35	279	4.9	8.5	1.6	54	319	3.6
69.9	0.490	64	0.776	36	251	3.4	7.1	1.4	55	287	2.5
70.6	0.490	65	0.508	34	254	3.5	7.1	0.927	53	291	2.5
71.3	0.490	68	0.870	32	276	4.9	7.1	1.6	49	315	3.6
71.9	0.492	64	0.748	31	233	3.8	7.1	1.4	48	267	2.8
72.6	0.526	61	0.853	34	276	3.5	7.6	1.6	52	315	2.6
73.3	0.736	60	0.880	30	244	3.7	11	1.6	46	279	2.7
74.0	0.490	57	0.893	31	263	5.1	7.1	1.6	47	300	3.7
74.7	0.490	67	0.815	40	230	4.2	7.1	1.5	62	263	3.1
75.4	0.490	64	0.828	36	232	5.7	7.1	1.5	55	265	4.1
76.1	0.582	57	0.702	34	227	2.7	8.4	1.3	52	259	2.0
76.8	0.490	59	0.597	32	261	4.5	7.1	1.1	50	299	3.3
77.5	0.490	65	0.938	42	270	4.8	7.1	1.7	65	309	3.5
78.2	0.490	66	0.840	36	240	4.1	7.1	1.5	56	274	3.0
78.9	0.580	54	0.751	39	248	4.0	8.4	1.4	61	283	3.0
79.6	0.490	58	0.608	36	218	4.1	7.1	1.1	55	250	3.0
80.3	0.490	57	0.756	37	233	4.5	7.1	1.4	56	266	3.3
81.0	0.770	56	0.796	37	245	4.1	11	1.5	57	280	3.0
81.7	0.592	56	0.920	36	224	4.8	8.5	1.7	55	256	3.5
82.4	0.490	58	0.623	41	228	3.9	7.1	1.1	62	261	2.9
83.1	0.585	48	0.641	35	226	3.3	8.4	1.2	53	258	2.4
83.8	0.490	52	0.740	35	206	5.1	7.1	1.3	54	236	3.7
84.5	0.709	59	0.778	41	243	4.2	10	1.4	63	278	3.0
85.2	0.490	54	0.630	35	193	4.1	7.1	1.1	54	221	3.0
85.9	0.490	62	0.854	41	209	5.4	7.1	1.6	63	239	4.0
86.6	0.524	51	0.832	38	209	3.9	7.6	1.5	58	239	2.8
87.3	0.490	52	0.575	41	232	5.9	7.1	1.0	63	265	4.3
88.0	0.490	55	0.490	40	217	4.0	7.1	0.894	61	248	2.9
88.7	0.490	53	0.458	43	207	4.4	7.1	0.836	66	236	3.2
89.4	0.490	49	0.811	42	224	4.1	7.1	1.5	65	256	3.0
90.1	0.490	50	0.820	42	200	5.5	7.1	1.5	64	229	4.0
90.8	0.524	50	0.581	41	207	3.8	7.6	1.1	63	236	2.8
91.5	0.490	50	0.601	44	196	4.3	7.1	1.1	67	224	3.1
92.2	0.583	47	0.778	41	235	5.2	8.4	1.4	63	269	3.8
92.9	0.490	44	0.672	44	193	5.3	7.1	1.2	68	220	3.9
93.6	0.490	48	0.839	46	195	6.4	7.1	1.5	70	223	4.6
94.3	0.624	47	0.815	38	187	4.6	9.0	1.5	58	214	3.4
95.0	0.490	51	0.634	47	191	4.7	7.1	1.2	73	218	3.4
95.7	0.490	43	0.376	44	220	5.0	7.1	0.686	67	251	3.6
96.4	0.490	41	0.604	42	185	2.8	7.1	1.1	64	211	2.0
97.1	0.613	35	0.546	36	162	5.5	8.8	0.995	55	185	4.0
97.8	0.490	42	0.653	46	193	5.5	7.1	1.2	70	221	4.0
98.4	0.490	45	0.679	45	174	5.1	7.1	1.2	69	199	3.7
99.1	0.490	41	0.693	42	170	4.5	7.1	1.3	65	194	3.3
99.8	0.490	38	0.523	42	169	4.6	7.1	0.953	65	193	3.4
100.5	0.490	34	0.673	43	156	4.3	7.1	1.2	65	179	3.2
101.2	0.490	40	0.667	45	173	5.9	7.1	1.2	69	198	4.3
101.9	0.678	34	0.408	44	166	4.6	9.8	0.743	67	189	3.4
102.6	0.490	36	0.580	41	166	4.7	7.1	1.1	63	190	3.4
103.3	0.490	32	0.934	45	206	5.9	7.1	1.7	69	235	4.3
104.0	0.490	37	0.833	44	171	5.5	7.1	1.5	67	196	4.0
104.7	0.551	31	0.734	44	159	4.0	8.0	1.3	67	181	2.9
105.4	0.955	32	0.824	46	168	5.9	14	1.5	70	192	4.3
106.1	0.605	30	0.920	39	160	6.8	8.7	1.7	60	183	5.0
106.8	0.528	31	0.583	43	157	3.9	7.6	1.1	66	180	2.8
107.5	0.490	32	0.669	49	165	5.1	7.1	1.2	75	188	3.7
108.2	0.764	30	0.592	48	158	6.7	11	1.1	73	180	4.9
108.9	0.596	27	0.724	51	153	6.4	8.6	1.3	78	175	4.7
109.6	0.490	28	0.744	49	161	7.7	7.1	1.4	75	185	5.6
110.3	0.490	27	0.878	49	153	5.0	7.1	1.6	75	175	3.6
111.0	0.490	29	0.700	45	160	5.6	7.1	1.3	68	183	4.1
111.7	0.490	27	0.537	51	148	5.3	7.1	0.979	78	169	3.9
112.4	0.490	24	0.480	45	158	4.0	7.1	0.875	69	180	2.9



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Sample ID: 012

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
113.1	0.741	22	0.852	41	143	4.3	11	1.6	63	164	3.1
113.8	0.490	26	0.841	51	176	5.0	7.1	1.5	79	202	3.7
114.5	0.490	27	0.862	51	161	5.4	7.1	1.6	79	184	3.9
115.2	0.490	28	0.951	52	157	5.1	7.1	1.7	80	180	3.7
115.9	0.490	25	1.2	50	146	5.0	7.1	2.1	76	167	3.6
116.6	0.490	23	0.962	60	135	6.9	7.1	1.8	92	155	5.0
117.3	0.490	23	0.976	59	164	6.7	7.1	1.8	90	188	4.9
118.0	0.490	24	1.1	51	149	5.6	7.1	1.9	77	170	4.1
118.7	0.490	24	0.901	59	162	8.2	7.1	1.6	90	185	6.0
119.4	0.490	21	1.1	58	153	6.3	7.1	2.1	89	175	4.6
120.1	0.490	23	0.991	49	147	6.2	7.1	1.8	75	168	4.5
120.8	0.525	19	0.752	68	142	8.2	7.6	1.4	105	162	6.0
121.5	0.490	23	1.0	61	146	5.8	7.1	1.9	93	166	4.3
122.2	0.564	21	0.897	53	142	6.9	8.1	1.6	81	163	5.1
122.9	0.490	20	0.772	51	149	6.2	7.1	1.4	79	170	4.6
123.6	0.490	20	0.827	53	149	8.4	7.1	1.5	81	171	6.1
124.3	0.490	21	0.989	56	132	6.9	7.1	1.8	85	150	5.0
124.9	0.490	19	1.0	48	143	6.4	7.1	1.8	74	163	4.7
125.6	0.490	19	1.4	63	138	8.2	7.1	2.6	97	157	6.0
126.3	0.490	16	0.660	47	120	5.2	7.1	1.2	71	138	3.8
127.0	0.601	18	1.5	57	138	6.3	8.7	2.8	87	157	4.6
127.7	0.831	21	1.2	65	163	6.5	12	2.1	100	186	4.8
128.4	0.490	19	1.3	53	128	5.9	7.1	2.4	81	147	4.3
129.1	0.490	16	1.3	56	152	6.7	7.1	2.4	86	174	4.9
129.8	0.490	17	1.4	54	153	7.0	7.1	2.6	83	175	5.1
130.5	0.490	18	1.1	54	150	6.7	7.1	2.0	82	171	4.9
131.2	0.490	17	1.0	53	127	7.5	7.1	1.9	81	146	5.5
131.9	0.490	15	1.3	54	135	6.0	7.1	2.3	83	154	4.4
132.6	0.490	17	1.4	54	139	6.9	7.1	2.5	83	159	5.0
133.3	0.490	17	1.6	48	139	6.4	7.1	2.9	74	159	4.7
134.0	0.490	19	1.5	51	129	6.0	7.1	2.7	78	147	4.4
134.7	0.490	17	1.5	54	131	8.0	7.1	2.7	83	149	5.9
135.4	0.490	22	1.4	67	148	6.6	7.1	2.5	103	170	4.8
136.1	0.490	17	1.2	57	151	5.8	7.1	2.2	88	172	4.3
136.8	0.490	18	1.4	60	163	6.9	7.1	2.6	91	186	5.0
137.5	0.490	16	1.3	60	145	8.7	7.1	2.5	91	165	6.3
138.2	0.490	20	7.5	58	135	7.9	7.1	14	89	154	5.8
138.9	0.490	16	1.6	61	146	7.7	7.1	2.9	93	167	5.6
139.6	0.552	19	1.7	64	176	7.0	8.0	3.2	98	201	5.1
140.3	0.490	19	2.0	60	145	7.2	7.1	3.7	92	166	5.3
141.0	0.490	18	1.8	63	146	7.7	7.1	3.2	97	167	5.6
141.7	0.490	17	1.4	61	136	6.4	7.1	2.6	93	156	4.7
142.4	0.490	18	1.9	58	154	7.2	7.1	3.5	89	176	5.3
143.1	0.490	15	1.4	72	149	7.1	7.1	2.5	110	170	5.2
143.8	0.490	18	1.5	65	160	7.9	7.1	2.7	100	183	5.8
144.5	0.490	19	1.7	69	155	7.8	7.1	3.1	105	177	5.7
145.2	0.490	18	2.2	67	152	8.1	7.1	4.0	102	174	5.9
145.9	0.490	19	1.5	58	146	7.2	7.1	2.7	88	166	5.3
146.6	0.490	16	1.9	68	158	7.4	7.1	3.4	104	180	5.4
147.3	0.490	21	1.9	67	160	11	7.1	3.4	103	183	7.7
148.0	0.490	19	2.0	68	159	8.1	7.1	3.6	104	182	5.9
148.7	0.490	16	1.8	70	145	5.2	7.1	3.2	107	165	3.8
149.4	0.498	14	1.9	57	148	6.6	7.2	3.5	87	169	4.8
150.1	0.821	21	2.2	74	153	7.5	12	4.0	113	175	5.4
150.7	0.490	21	2.3	77	161	8.7	7.1	4.2	117	184	6.3
151.4	0.490	19	2.1	74	159	8.1	7.1	3.7	113	182	5.9
152.1	0.490	18	1.7	67	139	6.9	7.1	3.0	102	159	5.0
152.8	0.490	17	2.3	67	153	9.0	7.1	4.2	103	174	6.6
153.5	0.490	18	2.0	70	171	8.5	7.1	3.6	107	195	6.2
154.2	0.588	21	1.9	61	144	7.8	8.5	3.4	93	165	5.7
154.9	0.490	19	2.4	73	151	6.7	7.1	4.4	113	173	4.9
155.6	0.490	19	2.1	68	140	6.4	7.1	3.9	103	160	4.7
156.3	0.490	21	2.7	79	173	10	7.1	4.8	121	198	7.6
157.0	0.490	22	2.3	74	168	9.2	7.1	4.1	114	192	6.7
157.7	0.548	19	2.7	75	159	7.6	7.9	5.0	115	182	5.5
158.4	0.490	18	2.1	68	155	8.9	7.1	3.7	105	177	6.5
159.1	0.490	18	2.3	67	156	8.2	7.1	4.2	102	178	6.0
159.8	0.490	22	2.5	72	162	8.0	7.1	4.6	110	185	5.9
160.5	0.490	22	2.4	76	168	9.7	7.1	4.4	117	193	7.1
161.2	0.514	22	2.6	77	166	8.6	7.4	4.7	117	190	6.3
161.9	0.597	20	2.0	75	138	7.8	8.6	3.6	114	158	5.7
162.6	0.609	17	2.1	71	161	8.5	8.8	3.9	109	184	6.2
163.3	0.490	19	2.4	74	163	7.5	7.1	4.4	113	187	5.5
164.0	0.490	25	2.9	81	191	10.0	7.1	5.4	124	219	7.3
164.7	0.490	19	2.7	78	171	9.2	7.1	5.0	119	195	6.7
165.4	0.490	21	2.2	73	174	8.6	7.1	3.9	112	199	6.3
166.1	0.490	20	2.7	77	177	9.9	7.1	4.9	117	203	7.2
166.8	0.490	20	3.3	74	159	7.0	7.1	6.0	113	182	5.1
167.5	0.490	21	2.4	88	181	9.7	7.1	4.4	135	207	7.1
168.2	0.540	23	2.7	73	153	7.8	7.8	5.0	112	175	5.7
168.9	0.490	19	2.6	64	155	6.8	7.1	4.8	98	177	5.0



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
169.6	0.490	19	2.8	86	175	8.3	7.1	5.1	133	200	6.1
170.3	0.490	19	2.9	80	164	9.8	7.1	5.3	123	188	7.2
171.0	0.490	23	2.3	77	173	9.7	7.1	4.2	119	197	7.1
171.7	0.552	19	2.4	85	177	8.9	8.0	4.4	130	202	6.5
172.4	0.490	18	2.2	77	176	9.1	7.1	3.9	118	202	6.7
173.1	0.490	21	2.7	79	175	9.9	7.1	5.0	121	200	7.3
173.8	0.490	21	2.8	86	189	8.7	7.1	5.2	131	216	6.4
174.5	0.490	18	2.7	96	184	8.1	7.1	4.9	146	211	5.9
175.2	0.490	20	2.8	78	170	6.0	7.1	5.0	120	194	4.4
175.9	0.490	21	3.5	82	196	9.3	7.1	6.4	125	224	6.8
176.6	0.490	19	3.6	88	208	10	7.1	6.6	135	238	7.6
177.2	0.490	19	2.8	83	181	8.8	7.1	5.1	127	207	6.4
177.9	0.490	17	2.7	80	164	7.9	7.1	4.9	123	187	5.8
178.6	0.490	18	3.4	87	177	7.5	7.1	6.1	133	202	5.4
179.3	0.490	20	2.9	82	199	9.0	7.1	5.2	126	228	6.5
180.0	0.490	22	3.9	94	231	11	7.1	7.2	143	264	7.8
180.7	0.490	26	3.6	102	189	10	7.1	6.6	156	216	7.6
181.4	0.547	21	3.3	82	191	10	7.9	6.0	126	219	7.6
182.1	0.490	20	3.5	82	177	7.2	7.1	6.4	126	203	5.3
182.8	0.626	21	3.8	93	220	13	9.0	6.9	142	252	9.4
183.5	0.490	20	3.7	93	208	8.9	7.1	6.7	142	238	6.5
184.2	0.490	21	3.6	89	192	8.2	7.1	6.5	136	220	6.0
184.9	0.490	22	3.1	88	190	7.4	7.1	5.7	134	217	5.4
185.6	0.490	21	3.2	92	192	7.3	7.1	5.9	141	219	5.3
186.3	0.490	19	3.1	85	189	6.3	7.1	5.7	130	216	4.6
187.0	0.490	22	3.1	93	190	8.9	7.1	5.6	142	218	6.5
187.7	0.501	24	3.1	87	184	8.9	7.2	5.7	134	211	6.5
188.4	0.490	18	3.3	90	196	6.7	7.1	6.1	138	224	4.9
189.1	0.490	20	3.6	97	200	6.9	7.1	6.6	148	229	5.0
189.8	0.490	23	3.2	84	203	6.6	7.1	5.9	129	233	4.8
190.5	0.490	20	3.8	101	200	7.2	7.1	7.0	154	229	5.2
191.2	0.490	18	3.6	86	182	8.8	7.1	6.5	131	208	6.4
191.9	0.490	21	3.5	90	191	6.8	7.1	6.5	137	219	5.0
192.6	0.490	20	3.9	88	200	7.6	7.1	7.0	135	228	5.6
193.3	0.490	20	4.1	91	213	9.5	7.1	7.4	139	243	7.0
194.0	0.541	18	3.2	85	184	7.4	7.8	5.8	130	211	5.4
194.7	0.490	25	3.9	92	204	6.8	7.1	7.1	141	234	4.9
195.4	0.490	22	3.4	94	180	7.5	7.1	6.2	144	206	5.5
196.1	0.490	22	3.8	96	232	7.7	7.1	6.9	147	265	5.6
196.8	0.490	24	3.3	91	204	6.8	7.1	6.1	140	233	4.9
197.5	0.490	17	3.2	107	211	8.4	7.1	5.8	164	241	6.1
198.2	0.490	20	4.2	96	202	8.0	7.1	7.6	147	231	5.8
198.9	0.490	19	3.3	93	190	7.2	7.1	6.0	142	217	5.2
199.6	0.490	18	4.2	97	205	5.4	7.1	7.7	149	234	4.0
200.3	0.490	26	3.4	86	194	7.3	7.1	6.3	131	221	5.3
201.0	0.490	21	4.2	98	199	7.6	7.1	7.7	151	228	5.5
201.7	0.490	18	3.6	89	183	6.1	7.1	6.5	136	209	4.5
202.4	0.490	17	4.0	89	210	7.4	7.1	7.2	136	241	5.4
203.1	0.490	20	4.2	89	208	6.7	7.1	7.6	137	237	4.9
203.7	0.490	21	4.3	89	235	8.2	7.1	7.8	137	269	5.9
204.4	0.490	22	3.9	103	187	6.4	7.1	7.0	158	213	4.7
205.1	0.490	20	3.6	94	200	6.5	7.1	6.6	144	229	4.7
205.8	0.504	20	4.2	95	185	7.8	7.3	7.6	146	212	5.7
206.5	0.490	20	4.1	103	233	8.4	7.1	7.4	158	266	6.1
207.2	0.490	19	4.0	102	191	7.2	7.1	7.3	157	218	5.3
207.9	0.490	20	3.8	114	193	6.5	7.1	7.0	175	221	4.7
208.6	0.490	19	4.0	111	203	5.3	7.1	7.2	170	232	3.8
209.3	0.490	21	3.5	85	184	5.1	7.1	6.4	130	210	3.7
210.0	0.490	18	4.0	95	195	6.1	7.1	7.4	145	223	4.5
210.7	0.490	20	3.6	103	196	7.3	7.1	6.5	157	224	5.3
211.4	0.490	20	4.2	100	217	5.8	7.1	7.7	153	248	4.2
212.1	0.490	18	3.7	94	211	6.5	7.1	6.7	144	241	4.7
212.8	0.490	20	4.6	90	194	5.1	7.1	8.5	137	221	3.7
213.5	0.490	19	3.5	98	193	5.6	7.1	6.4	150	220	4.1
214.2	0.490	22	4.1	101	204	6.4	7.1	7.4	154	233	4.6
214.9	0.654	21	4.0	101	228	5.4	9.4	7.3	155	261	3.9
215.6	0.494	19	3.7	89	186	5.5	7.1	6.8	137	212	4.0
216.3	0.490	19	3.5	101	185	5.9	7.1	6.3	155	212	4.3
217.0	0.490	20	3.9	101	220	5.5	7.1	7.1	155	251	4.0
217.7	0.490	18	3.8	104	202	5.9	7.1	6.8	160	231	4.3
218.4	0.490	19	4.5	99	196	5.8	7.1	8.3	152	224	4.3
219.1	0.893	19	3.4	102	191	4.4	13	6.2	156	219	3.2
219.8	0.490	21	3.4	106	200	6.4	7.1	6.2	162	229	4.7
220.5	0.490	20	4.1	100	191	5.8	7.1	7.4	153	218	4.2
221.2	0.490	17	3.9	106	199	5.5	7.1	7.1	163	228	4.0
221.9	0.541	22	2.9	93	190	5.2	7.8	5.3	142	217	3.8
222.6	0.490	19	4.1	93	193	7.6	7.1	7.4	142	220	5.5
223.3	0.490	21	3.9	96	194	6.3	7.1	7.2	146	221	4.6
224.0	0.490	19	3.3	104	188	5.7	7.1	6.0	159	215	4.1
224.7	0.490	19	3.5	113	200	5.4	7.1	6.3	173	228	4.0
225.4	0.490	19	4.0	104	220	6.2	7.1	7.3	159	251	4.5



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.1	0.490	21	4.4	96	188	6.4	7.1	8.0	146	215	4.6
226.8	0.490	19	4.1	103	195	5.4	7.1	7.4	157	223	3.9
227.5	0.490	19	3.9	101	204	5.0	7.1	7.2	155	234	3.7
228.2	0.490	19	3.6	92	190	5.4	7.1	6.5	141	217	3.9
228.9	0.490	19	4.2	92	192	5.1	7.1	7.7	141	220	3.7
229.5	0.490	18	3.9	99	198	5.8	7.1	7.0	152	227	4.3
230.2	0.490	20	3.5	102	197	6.3	7.1	6.4	157	225	4.6
230.9	0.649	19	3.5	92	180	5.8	9.4	6.5	141	205	4.2
231.6	0.490	19	4.0	106	211	6.1	7.1	7.4	163	242	4.4
232.3	0.490	18	3.3	88	229	6.0	7.1	6.0	134	261	4.3
233.0	0.490	18	4.0	96	225	5.4	7.1	7.3	147	257	3.9
233.7	0.490	22	4.3	108	208	8.0	7.1	7.8	166	238	5.9
234.4	0.490	21	2.9	99	215	5.1	7.1	5.2	151	246	3.8
235.1	0.490	18	3.9	115	214	5.0	7.1	7.1	176	245	3.6
235.8	0.490	20	3.1	104	230	5.5	7.1	5.7	160	263	4.0
236.5	0.490	20	3.8	103	232	5.5	7.1	6.9	158	265	4.0
237.2	0.490	18	3.7	105	197	3.8	7.1	6.7	161	226	2.8
237.9	0.490	20	3.5	91	201	4.2	7.1	6.4	140	230	3.1
238.6	0.490	16	3.2	109	224	4.6	7.1	5.9	167	256	3.4
239.3	0.490	17	3.5	93	206	5.4	7.1	6.4	142	235	3.9
240.0	0.490	20	3.4	97	197	3.6	7.1	6.2	148	225	2.6
240.7	0.490	19	3.7	108	241	5.6	7.1	6.8	166	275	4.1
241.4	0.490	16	3.6	98	210	4.0	7.1	6.6	151	240	2.9
242.1	0.490	17	3.4	93	230	5.2	7.1	6.2	143	263	3.8
242.8	0.490	18	3.0	95	213	4.5	7.1	5.5	146	243	3.3
243.5	0.490	20	3.3	96	270	5.1	7.1	5.9	148	308	3.7
244.2	0.490	20	2.8	109	218	5.0	7.1	5.0	166	250	3.7
244.9	0.490	18	3.0	115	234	4.5	7.1	5.5	176	267	3.3
245.6	0.490	15	2.7	107	232	4.4	7.1	4.9	165	265	3.2
246.3	0.490	17	3.8	107	238	6.6	7.1	7.0	165	272	4.8
247.0	0.658	17	3.2	105	213	5.0	9.5	5.8	160	244	3.7
247.7	0.490	16	3.5	103	202	4.1	7.1	6.5	159	231	3.0
248.4	0.490	18	2.5	100	217	4.1	7.1	4.5	154	248	3.0
249.1	0.530	18	3.3	103	232	4.9	7.6	6.0	158	265	3.6
249.8	0.490	17	2.6	103	218	5.2	7.1	4.8	158	249	3.8
250.5	0.490	19	2.6	107	223	6.3	7.1	4.7	164	256	4.6
251.2	0.490	15	2.7	93	225	3.4	7.1	4.8	143	257	2.5
251.9	0.490	16	2.7	101	211	4.2	7.1	4.9	154	241	3.1
252.6	0.490	18	2.9	110	264	3.5	7.1	5.2	168	302	2.6
253.3	0.490	19	2.9	102	225	3.8	7.1	5.3	156	257	2.8
254.0	0.572	19	2.6	97	230	4.7	8.3	4.8	149	263	3.4
254.7	0.490	17	2.5	94	225	6.0	7.1	4.6	144	257	4.4
255.3	0.490	18	2.9	105	242	6.6	7.1	5.2	161	277	4.8
256.0	0.490	17	2.9	94	232	5.0	7.1	5.3	145	265	3.6
256.7	0.490	16	2.3	101	227	4.0	7.1	4.2	155	259	2.9
257.4	0.490	19	2.4	100	245	4.5	7.1	4.4	153	281	3.3
258.1	0.490	20	2.5	102	220	4.4	7.1	4.6	156	252	3.2
258.8	0.490	16	2.7	98	226	3.1	7.1	5.0	150	258	2.3
259.5	0.490	16	2.5	109	266	5.8	7.1	4.5	167	305	4.3
260.2	0.490	18	2.3	111	241	5.6	7.1	4.1	169	276	4.1
260.9	0.490	18	2.6	90	251	4.9	7.1	4.8	137	287	3.6
261.6	0.490	16	2.5	88	217	4.8	7.1	4.5	135	248	3.5
262.3	0.490	16	2.4	99	253	4.4	7.1	4.4	151	289	3.2
263.0	0.490	18	2.5	88	231	4.1	7.1	4.6	135	264	3.0
263.7	0.490	17	1.6	101	226	5.2	7.1	2.9	155	259	3.8
264.4	0.490	15	2.5	85	238	4.0	7.1	4.6	131	272	2.9
265.1	0.490	15	2.8	101	224	4.2	7.1	5.1	155	256	3.1
265.8	0.490	15	2.1	86	215	3.8	7.1	3.9	131	246	2.8
266.5	0.490	15	2.0	85	217	4.3	7.1	3.7	130	248	3.1
267.2	0.490	17	2.4	99	234	4.7	7.1	4.4	151	267	3.5
267.9	0.490	18	2.0	94	219	5.0	7.1	3.6	143	251	3.6
268.6	0.490	16	2.4	89	237	5.0	7.1	4.4	136	271	3.7
269.3	0.584	18	2.3	93	224	3.7	8.4	4.2	143	256	2.7
270.0	0.490	16	2.3	89	223	4.8	7.1	4.2	137	255	3.5
270.7	0.490	14	2.0	80	237	3.3	7.1	3.6	123	271	2.4
271.4	0.490	15	2.2	87	224	4.8	7.1	4.0	133	256	3.5
272.1	0.490	18	1.7	85	210	3.5	7.1	3.1	130	240	2.6
272.8	0.723	16	1.6	86	245	5.7	10	2.9	132	280	4.2
273.5	0.490	19	1.9	85	209	5.0	7.1	3.5	130	238	3.7
274.2	0.490	16	1.6	87	215	3.6	7.1	3.0	134	246	2.6
274.9	0.490	16	1.8	71	215	5.3	7.1	3.4	109	246	3.9
275.6	0.490	14	1.2	83	211	4.3	7.1	2.3	127	241	3.2
276.3	0.490	16	2.1	86	228	3.8	7.1	3.8	131	260	2.8
277.0	0.490	18	1.6	82	247	4.6	7.1	2.8	126	282	3.4
277.7	0.490	15	1.6	79	232	3.3	7.1	3.0	120	265	2.4
278.4	0.490	16	2.0	79	226	3.6	7.1	3.6	121	258	2.6
279.1	0.490	16	1.8	76	202	4.1	7.1	3.3	116	231	3.0
279.8	0.490	18	1.6	96	214	4.1	7.1	2.9	148	245	3.0
280.5	0.490	17	1.5	78	207	3.3	7.1	2.7	120	237	2.4
281.2	0.490	14	1.5	81	215	3.8	7.1	2.8	125	246	2.7
281.8	0.490	17	1.7	74	222	3.8	7.1	3.2	113	254	2.8



Minnow Environmental  
Sample ID: 012

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
282.5	0.490	18	1.9	83	230	5.2	7.1	3.5	127	263	3.8
283.2	0.490	17	1.9	82	220	3.9	7.1	3.4	126	252	2.9
283.9	0.490	15	1.3	75	197	3.3	7.1	2.4	115	225	2.4
284.6	0.490	16	1.6	74	213	3.8	7.1	2.9	113	243	2.8
285.3	0.490	18	1.3	78	231	4.2	7.1	2.4	119	265	3.1
286.0	0.490	17	1.5	86	228	4.6	7.1	2.8	132	261	3.3
286.7	0.490	21	1.7	90	232	4.0	7.1	3.0	138	265	2.9
287.4	0.490	17	1.4	74	227	4.6	7.1	2.5	113	259	3.3
288.1	0.490	15	1.4	79	213	3.2	7.1	2.5	121	243	2.3
288.8	0.490	15	1.5	70	223	4.5	7.1	2.7	108	255	3.3
289.5	0.490	19	1.1	70	221	4.2	7.1	2.1	108	252	3.1
290.2	0.490	18	1.6	63	199	3.8	7.1	2.9	97	228	2.8
290.9	0.522	16	1.2	68	197	4.0	7.5	2.3	104	225	2.9
291.6	0.490	14	1.1	61	209	3.0	7.1	2.0	93	239	2.2
292.3	0.490	16	1.4	73	226	3.7	7.1	2.5	113	259	2.7
293.0	0.490	17	1.4	78	212	4.2	7.1	2.6	120	242	3.1
293.7	0.490	17	1.2	71	200	2.7	7.1	2.1	109	228	2.0
294.4	0.490	15	1.1	65	200	3.2	7.1	1.9	99	229	2.3
295.1	0.507	18	1.1	72	222	4.5	7.3	2.0	110	254	3.3
295.8	0.490	15	1.1	64	242	2.9	7.1	1.9	98	277	2.2
296.5	0.490	17	1.0	64	206	2.4	7.1	1.8	98	236	1.8
297.2	0.490	15	1.1	63	193	3.3	7.1	2.0	96	221	2.4
297.9	0.490	16	1.1	64	199	4.3	7.1	2.0	98	228	3.2
298.6	0.490	14	1.4	61	201	4.2	7.1	2.6	94	230	3.0
299.3	0.490	16	1.1	63	221	3.8	7.1	2.1	97	252	2.8
300.0	0.569	17	1.1	65	199	4.1	8.2	2.0	99	228	3.0
300.7	0.490	16	0.991	63	233	3.0	7.1	1.8	97	267	2.2
301.4	0.490	16	0.605	66	224	3.8	7.1	1.1	102	257	2.7
302.1	0.490	17	0.823	57	211	2.9	7.1	1.5	88	241	2.1
302.8	0.490	17	0.831	62	221	3.1	7.1	1.5	94	253	2.3
303.5	0.490	19	1.2	71	221	3.5	7.1	2.2	109	253	2.5
304.2	0.490	13	0.849	57	203	3.4	7.1	1.5	87	232	2.5
304.9	0.745	18	1.3	56	224	3.8	11	2.4	86	256	2.8
305.6	0.641	15	1.4	53	212	3.5	9.3	2.5	82	243	2.6
306.3	0.729	19	1.3	63	211	3.1	11	2.3	96	242	2.3
307.0	0.490	16	0.877	58	194	3.7	7.1	1.6	89	222	2.7
307.7	0.490	17	1.2	57	196	2.9	7.1	2.1	87	224	2.1
308.3	0.490	17	1.1	54	215	2.9	7.1	2.0	82	245	2.1
309.0	0.490	18	0.973	55	218	3.5	7.1	1.8	84	250	2.6
309.7	0.490	15	1.2	44	196	3.7	7.1	2.2	68	224	2.7
310.4	0.490	16	1.2	54	221	4.1	7.1	2.3	83	253	3.0
311.1	0.724	15	1.1	50	231	2.9	10	2.1	76	264	2.1
311.8	0.490	17	1.0	49	214	4.0	7.1	1.9	76	245	2.9
312.5	0.490	17	0.906	52	209	3.2	7.1	1.7	79	239	2.3
313.2	0.582	16	0.944	55	224	4.0	8.4	1.7	85	256	2.9
313.9	0.490	16	1.2	50	205	3.2	7.1	2.2	77	234	2.3
314.6	0.490	15	1.0	43	219	3.1	7.1	1.8	66	250	2.3
315.3	0.490	15	1.1	46	206	2.8	7.1	2.0	70	235	2.1
316.0	0.490	16	1.4	55	212	4.1	7.1	2.5	84	242	3.0
316.7	0.490	16	1.0	50	218	3.7	7.1	1.9	76	250	2.7
317.4	0.490	15	1.1	47	211	4.7	7.1	2.1	71	241	3.4
318.1	0.490	15	1.0	47	230	3.8	7.1	1.9	72	263	2.8
318.8	0.490	16	1.0	47	204	4.7	7.1	1.8	72	234	3.4
319.5	0.490	19	1.0	50	224	2.8	7.1	1.8	77	256	2.1
320.2	0.490	16	1.0	51	216	4.3	7.1	1.9	78	247	3.1
320.9	0.490	12	0.838	43	221	4.9	7.1	1.5	65	252	3.6
321.6	0.490	20	0.950	43	214	4.0	7.1	1.7	66	245	2.9
322.3	0.490	14	1.0	47	221	3.8	7.1	1.9	72	253	2.8
323.0	0.490	18	0.988	48	208	3.2	7.1	1.8	74	238	2.4
323.7	0.490	16	0.756	44	185	3.5	7.1	1.4	67	212	2.5
324.4	0.490	15	0.929	45	208	3.8	7.1	1.7	69	238	2.8
325.1	0.490	15	1.1	39	216	4.7	7.1	2.1	60	248	3.4
325.8	0.490	17	1.2	46	204	4.2	7.1	2.1	71	233	3.0
326.5	0.490	17	0.947	45	198	2.9	7.1	1.7	68	227	2.1
327.2	0.490	14	0.918	46	212	4.6	7.1	1.7	71	242	3.3
327.9	0.490	14	1.0	43	213	4.4	7.1	1.8	66	243	3.2
328.6	0.564	17	0.877	49	211	3.9	8.1	1.6	74	241	2.9
329.3	0.490	16	0.863	49	235	5.2	7.1	1.6	75	268	3.8
330.0	0.490	15	0.799	46	198	4.6	7.1	1.5	70	227	3.4
330.7	0.490	14	0.910	41	194	3.9	7.1	1.7	63	221	2.8
331.4	0.490	16	1.2	44	218	5.9	7.1	2.2	67	249	4.3
332.1	0.490	18	0.845	43	207	5.5	7.1	1.5	66	236	4.0
332.8	0.490	18	0.996	42	224	3.9	7.1	1.8	65	256	2.8
333.5	0.752	18	1.2	44	204	4.3	11	2.2	68	233	3.1
334.1	0.490	14	0.843	43	194	3.6	7.1	1.5	65	222	2.6
334.8	0.490	13	1.2	44	201	4.2	7.1	2.1	68	230	3.1
335.5	0.490	15	1.2	40	199	5.3	7.1	2.1	61	227	3.9
336.2	0.490	18	0.990	44	213	4.8	7.1	1.8	67	243	3.5
336.9	0.490	15	1.2	57	230	6.1	7.1	2.1	88	263	4.5
337.6	0.595	13	1.2	37	174	3.7	8.6	2.3	57	199	2.7
338.3	0.490	15	1.1	42	194	4.0	7.1	2.1	64	222	2.9



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Sample ID: 012

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.0	0.490	17	0.900	45	203	4.4	7.1	1.6	70	232	3.2
339.7	0.490	15	0.701	48	196	5.5	7.1	1.3	74	224	4.0
340.4	0.554	18	1.5	45	213	8.0	8.0	2.8	68	243	5.8
341.1	0.490	15	1.3	44	229	5.5	7.1	2.4	67	262	4.0
341.8	0.490	11	1.2	38	190	4.9	7.1	2.2	58	217	3.6
342.5	0.490	14	1.1	51	199	6.7	7.1	2.1	78	228	4.9
343.2	0.490	17	1.1	57	195	6.3	7.1	1.9	87	223	4.6
343.9	0.490	15	1.2	46	184	5.3	7.1	2.3	70	211	3.9
344.6	0.490	13	1.1	42	162	5.3	7.1	2.1	65	186	3.9
345.3	0.490	13	1.5	42	208	5.2	7.1	2.8	64	238	3.8
346.0	0.490	14	1.4	49	200	8.1	7.1	2.6	75	229	5.9
346.7	0.490	14	1.1	45	176	5.6	7.1	2.0	69	201	4.1
347.4	0.490	14	0.959	52	192	7.1	7.1	1.7	80	220	5.2
348.1	0.490	16	1.5	51	186	6.4	7.1	2.8	79	212	4.7
348.8	0.490	18	1.5	57	183	7.5	7.1	2.7	88	209	5.5
349.5	0.490	18	1.2	54	174	6.1	7.1	2.1	83	199	4.5
350.2	0.490	15	1.6	47	172	5.4	7.1	2.9	72	197	3.9
350.9	0.490	16	1.6	57	191	7.3	7.1	3.0	87	219	5.3
351.6	0.490	17	2.2	61	192	6.8	7.1	4.0	93	219	5.0
352.3	0.490	18	1.8	59	189	8.5	7.1	3.3	91	216	6.2
353.0	0.490	18	2.3	53	172	6.4	7.1	4.2	82	197	4.7
353.7	0.490	17	1.4	53	183	6.5	7.1	2.6	81	209	4.7
354.4	0.537	17	1.5	64	199	7.0	7.7	2.7	97	227	5.1
355.1	0.490	16	1.9	61	188	7.7	7.1	3.5	94	215	5.6
355.8	0.490	16	1.9	60	181	7.2	7.1	3.5	92	207	5.3
356.5	0.539	17	1.9	66	171	7.1	7.8	3.5	101	196	5.2
357.2	0.490	15	1.8	55	158	6.8	7.1	3.2	84	181	5.0
357.9	0.553	16	1.9	57	184	7.4	8.0	3.5	88	211	5.4
358.6	0.497	18	2.1	62	170	6.7	7.2	3.8	95	195	4.9
359.3	0.490	19	1.8	67	178	6.4	7.1	3.3	103	204	4.7
360.0	0.490	16	2.0	66	150	6.7	7.1	3.6	101	172	4.9
360.6	0.490	17	2.3	52	159	7.7	7.1	4.2	80	182	5.6
361.3	0.490	16	2.0	54	158	7.0	7.1	3.7	83	180	5.1
362.0	0.490	20	1.9	70	172	9.8	7.1	3.4	108	196	7.1
362.7	0.490	18	2.3	59	150	5.5	7.1	4.3	90	172	4.0
363.4	0.490	20	2.7	62	151	6.4	7.1	4.9	95	173	4.7
364.1	0.490	15	1.9	60	142	7.7	7.1	3.5	92	162	5.6
364.8	0.490	15	2.6	59	157	7.4	7.1	4.7	90	180	5.4
365.5	0.490	19	2.2	66	171	7.4	7.1	3.9	102	196	5.4
366.2	0.490	19	2.6	70	143	7.9	7.1	4.7	107	163	5.8
366.9	0.490	19	2.1	75	164	8.2	7.1	3.8	115	187	6.0
367.6	0.507	19	2.3	64	144	8.8	7.3	4.1	98	165	6.4
368.3	0.490	17	2.5	68	147	6.8	7.1	4.6	103	168	5.0
369.0	0.490	18	2.2	65	153	7.1	7.1	4.0	99	175	5.2
369.7	0.490	20	2.4	75	154	7.7	7.1	4.4	116	177	5.6
370.4	0.490	17	2.2	63	148	7.2	7.1	3.9	97	169	5.2
371.1	0.490	20	2.3	74	182	8.7	7.1	4.2	113	208	6.3
371.8	0.490	19	2.8	72	153	5.6	7.1	5.2	110	175	4.1
372.5	0.490	17	2.5	73	153	7.7	7.1	4.5	112	175	5.6
373.2	0.490	20	2.3	75	152	7.8	7.1	4.3	114	174	5.7
373.9	0.490	18	2.6	66	151	5.8	7.1	4.7	102	173	4.3
374.6	0.490	17	2.4	72	152	5.5	7.1	4.3	111	174	4.0
375.3	0.490	19	2.3	69	150	7.2	7.1	4.1	105	171	5.3
376.0	0.490	22	2.2	69	156	6.7	7.1	4.1	106	178	4.9
376.7	0.490	19	2.4	77	156	7.5	7.1	4.3	118	178	5.5
377.4	0.490	18	2.2	66	154	6.4	7.1	4.1	101	176	4.7
378.1	0.490	17	2.3	66	152	6.8	7.1	4.1	101	174	4.9
378.8	0.490	21	2.5	66	156	5.5	7.1	4.5	101	179	4.0
379.5	0.490	17	2.4	64	137	5.8	7.1	4.4	98	156	4.3
380.2	0.490	19	2.0	64	154	7.9	7.1	3.7	99	176	5.8
380.9	0.490	18	2.4	54	155	6.7	7.1	4.5	83	177	4.9
381.6	0.490	17	2.3	61	150	5.7	7.1	4.2	94	171	4.2
382.3	0.490	20	2.0	70	158	5.7	7.1	3.6	107	181	4.2
383.0	0.490	16	1.6	61	154	5.3	7.1	3.0	93	176	3.9
383.7	0.490	16	1.7	59	148	6.9	7.1	3.1	90	169	5.0
384.4	0.490	17	1.7	59	149	6.3	7.1	3.2	90	171	4.6
385.1	0.490	16	1.7	64	151	5.8	7.1	3.1	99	173	4.2
385.8	0.490	18	1.6	65	149	5.9	7.1	2.9	100	170	4.3
386.5	0.490	18	1.6	61	134	6.8	7.1	2.9	94	153	4.9
387.1	0.490	16	1.7	55	140	3.9	7.1	3.1	85	160	2.8
387.8	0.490	16	2.0	58	175	7.4	7.1	3.7	90	200	5.4
388.5	0.490	20	1.8	58	149	6.9	7.1	3.3	89	170	5.0
389.2	0.490	19	1.7	61	160	7.1	7.1	3.2	94	183	5.2
389.9	0.490	17	1.6	52	145	5.9	7.1	2.9	80	166	4.3
390.6	0.490	18	2.0	58	164	5.4	7.1	3.7	89	188	4.0
391.3	0.490	16	1.4	65	152	3.9	7.1	2.6	99	174	2.8
392.0	0.490	18	1.4	50	145	5.9	7.1	2.5	77	166	4.3
392.7	0.528	19	1.4	61	147	5.2	7.6	2.6	94	168	3.8
393.4	0.490	15	1.1	54	133	5.5	7.1	2.0	82	153	4.0
394.1	0.490	17	1.8	60	145	6.8	7.1	3.3	92	165	4.9
394.8	0.490	19	1.3	59	148	5.6	7.1	2.3	90	170	4.1



Minnow Environmental  
Sample ID: 012

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
395.5	0.490	19	1.4	61	151	5.4	7.1	2.6	94	173	3.9
396.2	0.490	17	2.0	61	151	5.5	7.1	3.7	94	173	4.0
396.9	0.490	15	1.5	49	137	4.3	7.1	2.6	75	157	3.1
397.6	0.490	17	1.4	52	162	4.8	7.1	2.6	79	185	3.5
398.3	0.522	19	1.8	53	165	5.1	7.5	3.4	81	189	3.7
399.0	0.490	15	1.2	55	176	4.5	7.1	2.2	84	201	3.3
399.7	0.490	16	1.2	53	155	7.5	7.1	2.3	81	177	5.5
400.4	0.490	15	1.4	48	151	5.6	7.1	2.6	74	173	4.1
401.1	0.490	16	1.6	48	146	4.6	7.1	3.0	74	166	3.3
401.8	0.490	16	1.4	55	146	4.4	7.1	2.5	84	167	3.2
402.5	0.490	16	1.6	49	151	5.4	7.1	2.9	76	173	3.9
403.2	0.490	14	1.5	46	145	5.2	7.1	2.7	71	165	3.8
403.9	0.490	14	1.5	47	139	4.7	7.1	2.8	72	159	3.4
404.6	0.490	17	1.6	48	157	4.9	7.1	2.9	74	180	3.6
405.3	0.490	15	1.3	55	139	4.8	7.1	2.4	85	159	3.5
406.0	0.490	15	1.3	53	148	4.7	7.1	2.4	82	169	3.5
406.7	0.490	15	1.3	47	137	3.4	7.1	2.4	73	157	2.5
407.4	0.531	16	1.5	54	145	4.1	7.7	2.8	83	165	3.0
408.1	0.490	13	1.0	47	162	3.7	7.1	1.9	72	186	2.7
408.8	0.490	16	1.2	43	136	4.7	7.1	2.1	66	156	3.4
409.5	0.490	16	1.2	45	143	4.4	7.1	2.2	69	164	3.2
410.2	0.490	15	1.7	53	152	5.2	7.1	3.1	82	173	3.8
410.9	0.609	14	1.4	43	160	4.7	8.8	2.6	66	182	3.4
411.6	0.490	16	1.7	49	160	4.8	7.1	3.1	75	183	3.5
412.3	0.592	15	0.988	52	160	4.5	8.6	1.8	79	183	3.3
413.0	0.508	14	1.1	44	150	4.7	7.3	2.1	68	171	3.4
413.6	0.490	13	1.0	40	144	4.1	7.1	1.8	61	165	3.0
414.3	0.595	15	1.4	48	158	4.4	8.6	2.6	74	181	3.2
415.0	0.490	14	1.2	45	158	4.8	7.1	2.1	69	180	3.5
415.7	0.490	16	1.3	39	160	4.7	7.1	2.4	61	183	3.5
416.4	0.490	15	1.3	38	147	4.0	7.1	2.3	58	168	2.9
417.1	0.490	13	0.995	42	155	3.7	7.1	1.8	65	177	2.7
417.8	0.490	13	1.4	48	146	4.1	7.1	2.6	74	167	3.0
418.5	0.490	16	0.890	43	145	4.0	7.1	1.6	67	166	2.9
419.2	0.490	13	0.899	45	184	3.7	7.1	1.6	69	210	2.7
419.9	0.490	15	0.906	38	180	5.1	7.1	1.7	59	206	3.7
420.6	0.490	13	0.844	36	171	4.7	7.1	1.5	55	195	3.4
421.3	0.490	12	0.971	34	146	3.0	7.1	1.8	51	167	2.2
422.0	0.490	14	0.810	45	184	5.1	7.1	1.5	69	210	3.7
422.7	0.490	14	1.1	43	170	4.2	7.1	1.9	65	194	3.1
423.4	0.490	13	0.892	37	203	5.1	7.1	1.6	57	233	3.7
424.1	0.490	13	1.1	32	184	5.1	7.1	2.1	49	211	3.7
424.8	0.490	15	0.836	38	168	3.9	7.1	1.5	58	192	2.8
425.5	0.490	15	1.1	36	175	3.8	7.1	2.0	56	200	2.8
426.2	0.490	13	0.904	35	173	4.8	7.1	1.6	54	198	3.5
426.9	0.490	13	0.588	36	170	3.4	7.1	1.1	55	194	2.5
427.6	0.490	14	1.0	39	194	4.2	7.1	1.8	60	222	3.0
428.3	0.490	14	0.939	38	169	3.3	7.1	1.7	58	193	2.4
429.0	0.618	13	0.984	32	204	4.4	8.9	1.8	49	233	3.2
429.7	0.490	13	1.1	30	179	3.0	7.1	2.0	46	205	2.2
430.4	0.490	11	1.2	25	164	2.4	7.1	2.1	39	187	1.8
431.1	0.490	12	0.940	35	206	5.6	7.1	1.7	53	235	4.1
431.8	0.490	14	0.879	36	198	5.0	7.1	1.6	56	226	3.7
432.5	0.490	12	0.722	32	171	4.1	7.1	1.3	49	195	3.0
433.2	0.562	11	1.0	29	182	3.4	8.1	1.8	45	208	2.5
433.9	0.490	12	0.687	34	184	3.9	7.1	1.3	52	211	2.8
434.6	0.490	12	0.887	32	199	4.3	7.1	1.6	50	227	3.1
435.3	0.490	13	0.967	36	216	4.1	7.1	1.8	55	248	3.0
436.0	0.490	14	0.565	29	205	3.7	7.1	1.0	45	235	2.7
436.7	0.490	12	1.0	32	210	3.0	7.1	1.9	48	240	2.2
437.4	0.490	9.2	0.771	29	177	2.8	7.1	1.4	45	203	2.1
438.1	0.490	12	0.701	31	192	4.3	7.1	1.3	47	219	3.1
438.8	0.490	11	0.839	26	197	3.7	7.1	1.5	40	225	2.7
439.5	0.549	9.9	0.652	30	203	3.2	7.9	1.2	46	232	2.4
440.2	0.490	13	0.830	27	200	4.0	7.1	1.5	41	229	2.9
440.8	0.490	13	0.605	25	207	3.1	7.1	1.1	38	236	2.3
441.5	0.857	12	0.663	26	200	3.2	12	1.2	40	229	2.3
442.2	0.490	12	0.753	29	205	4.2	7.1	1.4	44	234	3.0
442.9	0.490	11	0.783	29	206	2.2	7.1	1.4	44	235	1.6
443.6	0.490	11	0.428	26	208	3.3	7.1	0.780	40	238	2.4
444.3	0.490	12	0.919	29	187	3.9	7.1	1.7	44	214	2.8
445.0	0.490	12	0.682	31	234	4.9	7.1	1.2	48	268	3.5
445.7	0.490	11	1.1	30	183	3.5	7.1	1.9	45	209	2.6
446.4	0.490	12	0.770	29	210	4.4	7.1	1.4	45	240	3.2
447.1	0.490	10	1.0	31	222	4.4	7.1	1.9	47	253	3.2
447.8	0.490	13	0.723	29	192	3.8	7.1	1.3	44	220	2.8
448.5	0.490	13	0.558	32	209	3.3	7.1	1.0	48	239	2.4
449.2	0.490	13	1.0	33	235	3.8	7.1	1.9	50	269	2.8
449.9	0.490	11	0.975	32	214	2.0	7.1	1.8	49	245	1.5
450.6	0.490	12	1.3	33	221	3.8	7.1	2.4	51	252	2.8
451.3	0.490	11	0.751	34	198	2.7	7.1	1.4	52	226	2.0



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Sample ID: 012

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
452.0	0.490	12	1.0	30	230	3.6	7.1	1.9	46	263	2.6
452.7	0.490	10	1.3	30	201	3.9	7.1	2.4	46	230	2.8
453.4	0.490	12	1.0	31	218	4.4	7.1	1.8	47	249	3.2
454.1	0.490	14	0.983	31	215	3.7	7.1	1.8	48	246	2.7
454.8	0.490	12	0.622	30	222	3.4	7.1	1.1	46	254	2.5
455.5	0.490	14	1.2	29	211	3.6	7.1	2.1	45	241	2.6
456.2	0.490	9.8	1.3	35	218	4.1	7.1	2.3	53	249	3.0
456.9	0.573	13	1.0	35	204	3.1	8.3	1.9	54	233	2.3
457.6	0.490	11	1.1	36	215	3.4	7.1	2.1	55	246	2.5
458.3	0.490	14	1.1	35	236	4.5	7.1	2.1	54	270	3.3
459.0	0.512	11	1.5	35	221	3.9	7.4	2.7	54	253	2.8
459.7	0.490	11	1.2	32	210	3.4	7.1	2.2	49	240	2.5
460.4	0.490	9.9	1.3	34	245	4.2	7.1	2.4	52	280	3.1
461.1	0.490	11	1.2	34	203	4.0	7.1	2.2	53	233	2.9
461.8	0.490	12	0.897	35	209	3.9	7.1	1.6	54	239	2.9
462.5	0.490	13	0.864	34	194	3.0	7.1	1.6	52	222	2.2
463.2	0.490	13	1.0	33	191	2.8	7.1	1.9	51	218	2.0
463.9	0.490	12	1.2	34	221	4.9	7.1	2.2	52	253	3.6
464.6	0.490	11	1.3	32	193	3.7	7.1	2.3	49	220	2.7
465.3	0.490	11	1.6	38	229	5.2	7.1	2.9	59	261	3.8
466.0	0.693	11	0.666	41	209	3.5	10.0	1.2	63	239	2.5
466.6	0.490	11	1.1	43	207	3.1	7.1	2.1	66	236	2.2
467.3	0.616	12	1.8	37	202	4.1	8.9	3.3	56	232	3.0
468.0	0.490	12	1.1	36	201	4.5	7.1	2.0	55	230	3.3
468.7	0.526	15	1.9	40	197	4.7	7.6	3.5	61	226	3.4
469.4	0.689	11	1.4	38	186	5.3	9.9	2.5	59	213	3.9
470.1	0.686	13	1.5	42	215	3.4	9.9	2.7	64	246	2.5
470.8	0.490	12	1.8	35	213	4.3	7.1	3.2	54	243	3.1
471.5	0.896	13	1.6	39	200	4.4	13	2.9	60	229	3.2
472.2	0.497	12	1.5	38	183	3.8	7.2	2.7	58	209	2.8
472.9	0.813	14	1.9	39	192	4.7	12	3.4	60	219	3.5
473.6	0.490	13	1.7	43	211	5.7	7.1	3.0	65	242	4.2
474.3	0.490	14	1.3	36	194	4.6	7.1	2.4	56	222	3.3
475.0	0.490	15	1.6	38	202	3.9	7.1	2.8	58	230	2.9
475.7	0.591	14	1.5	44	211	5.6	8.5	2.8	67	242	4.1
476.4	0.730	12	1.7	37	188	4.7	11	3.0	57	215	3.5
477.1	0.972	14	2.0	39	181	5.8	14	3.6	60	207	4.3
477.8	0.490	16	1.6	35	167	4.7	7.1	2.9	53	191	3.5
478.5	0.666	14	1.3	42	193	4.6	9.6	2.4	65	221	3.4
479.2	0.490	15	1.6	42	193	6.3	7.1	2.9	65	221	4.6
479.9	1.0	17	1.8	41	178	5.5	14	3.3	62	203	4.0
480.6	0.721	15	1.8	38	195	4.8	10	3.2	58	223	3.5
481.3	0.490	15	1.5	40	168	5.9	7.1	2.7	62	192	4.3
482.0	0.596	17	1.7	38	191	5.9	8.6	3.1	59	219	4.3
482.7	1.1	14	1.8	42	172	5.5	16	3.2	64	197	4.0
483.4	0.490	14	1.6	42	178	5.1	7.1	2.8	64	203	3.7
484.1	1.0	16	1.5	39	182	4.4	15	2.8	60	208	3.2
484.8	0.842	14	1.6	45	186	5.4	12	3.0	68	213	3.9
485.5	0.578	15	1.7	44	175	5.4	8.3	3.0	68	200	3.9
486.2	0.659	15	1.5	36	171	4.9	9.5	2.7	55	195	3.6
486.9	0.836	12	1.2	41	187	6.5	12	2.2	63	214	4.8
487.6	0.490	15	1.4	36	162	5.8	7.1	2.5	54	186	4.2
488.3	0.675	16	1.8	45	179	5.0	9.8	3.3	68	205	3.7
489.0	0.490	15	1.3	44	169	5.7	7.1	2.4	67	194	4.1
489.7	0.490	15	2.0	41	170	5.3	7.1	3.6	63	195	3.9
490.4	0.490	16	1.6	42	179	5.9	7.1	3.0	64	205	4.3
491.1	0.490	15	1.8	48	204	4.8	7.1	3.4	73	233	3.5
491.8	0.490	16	1.7	40	177	5.6	7.1	3.1	62	202	4.1
492.4	0.557	15	1.4	35	161	4.7	8.0	2.5	53	184	3.4
493.1	0.761	13	1.2	32	169	6.9	11	2.3	49	194	5.0
493.8	0.564	15	1.5	36	182	5.2	8.1	2.7	55	208	3.8
494.5	0.638	18	1.5	41	192	6.0	9.2	2.7	63	219	4.4
495.2	0.490	15	1.4	45	177	5.8	7.1	2.5	68	203	4.2
495.9	0.520	14	1.3	42	167	4.4	7.5	2.3	64	191	3.2
496.6	0.490	12	1.3	36	167	5.2	7.1	2.3	55	191	3.8
497.3	0.490	14	1.3	41	169	5.9	7.1	2.4	62	193	4.3
498.0	0.490	17	1.2	43	187	5.8	7.1	2.1	66	213	4.2
498.7	0.490	15	1.9	45	175	5.9	7.1	3.4	69	200	4.3
499.4	0.490	15	1.2	33	166	3.9	7.1	2.3	51	190	2.8
500.1	0.801	14	1.8	40	183	5.4	12	3.2	62	210	3.9
500.8	0.494	15	1.4	41	198	5.4	7.1	2.5	62	226	3.9
501.5	1.0	15	1.5	42	183	5.6	15	2.6	65	209	4.1
502.2	1.2	15	1.5	42	174	5.1	17	2.8	64	199	3.7
502.9	1.0	10	1.6	38	198	4.9	14	3.0	58	227	3.6
503.6	0.490	12	1.3	35	173	3.5	7.1	2.3	53	198	2.6
504.3	0.589	13	1.3	35	231	5.5	8.5	2.3	53	264	4.0
505.0	0.645	14	1.2	40	193	5.0	9.3	2.2	62	221	3.6
505.7	0.715	15	1.2	41	175	4.2	10	2.1	62	200	3.1
506.4	0.666	11	1.1	34	171	4.4	9.6	2.0	52	196	3.2
507.1	0.587	13	1.3	33	184	3.6	8.5	2.5	50	210	2.6
507.8	0.490	13	1.5	38	179	4.7	7.1	2.7	58	205	3.4



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Sample ID: 012

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.5	0.998	13	1.2	40	185	6.1	14	2.2	62	212	4.4
509.2	0.754	12	1.3	38	161	4.2	11	2.3	59	184	3.1
509.9	0.491	15	1.3	40	187	5.3	7.1	2.3	61	214	3.9
510.6	0.490	11	1.5	37	173	5.4	7.1	2.8	57	198	3.9
511.3	0.693	14	1.4	36	174	3.8	10	2.5	55	199	2.8
512.0	0.510	15	1.3	44	185	4.4	7.4	2.3	68	212	3.2
512.7	0.490	12	1.3	35	168	4.5	7.1	2.3	54	193	3.3
513.4	0.490	13	0.972	37	163	5.0	7.1	1.8	57	186	3.6
514.1	0.835	14	1.4	39	181	5.6	12	2.6	59	207	4.1
514.8	0.490	12	1.3	40	172	5.3	7.1	2.3	61	197	3.9
515.5	0.523	12	1.1	39	160	4.9	7.5	2.1	59	183	3.6
516.2	0.490	12	1.4	34	173	4.3	7.1	2.6	53	198	3.2
516.9	0.520	11	1.0	39	158	3.2	7.5	1.9	59	181	2.4
517.6	0.490	14	1.5	34	155	4.9	7.1	2.8	52	178	3.6
518.3	0.625	15	1.1	37	176	6.4	9.0	2.0	57	202	4.7
519.0	0.496	14	1.4	41	182	5.4	7.2	2.6	63	208	3.9
519.6	0.490	9.9	0.961	36	149	4.6	7.1	1.8	56	170	3.3
520.3	0.490	13	1.3	33	175	3.7	7.1	2.4	51	200	2.7
521.0	0.490	14	1.6	41	176	4.5	7.1	3.0	63	201	3.3
521.7	0.668	12	1.1	38	141	5.6	9.6	2.1	59	161	4.1
522.4	0.490	13	1.3	43	167	5.6	7.1	2.3	66	191	4.1
523.1	0.599	12	1.1	37	157	4.9	8.7	2.0	57	179	3.6
523.8	0.490	13	1.3	38	180	5.1	7.1	2.3	59	206	3.7
524.5	0.490	14	1.5	40	182	6.4	7.1	2.7	61	209	4.7
525.2	0.490	13	1.3	44	159	4.3	7.1	2.4	67	182	3.1
525.9	0.567	12	1.2	39	150	4.8	8.2	2.3	60	172	3.5
526.6	0.490	12	1.4	36	172	4.4	7.1	2.5	56	196	3.2
527.3	0.490	13	1.7	38	152	6.0	7.1	3.2	59	174	4.3
528.0	0.773	13	1.1	35	153	4.5	11	1.9	54	174	3.3
528.7	0.490	13	1.1	38	146	4.7	7.1	1.9	58	167	3.4
529.4	0.490	13	1.4	40	153	4.2	7.1	2.5	61	175	3.1
530.1	0.490	13	1.3	39	149	4.9	7.1	2.3	60	170	3.6
530.8	0.490	13	1.7	40	161	4.8	7.1	3.1	61	184	3.5
531.5	0.490	14	1.3	50	167	6.1	7.1	2.3	76	191	4.5
532.2	0.490	12	1.6	38	141	5.4	7.1	2.9	59	162	3.9
532.9	0.490	13	1.6	40	160	4.8	7.1	3.0	62	183	3.5
533.6	0.740	13	1.3	40	166	5.3	11	2.4	62	190	3.8
534.3	0.686	11	0.873	41	152	4.8	9.9	1.6	62	174	3.5
535.0	0.490	16	1.4	42	166	5.5	7.1	2.5	65	190	4.0
535.7	0.490	14	1.1	37	140	3.7	7.1	2.1	57	160	2.7
536.4	0.490	14	0.933	41	137	4.0	7.1	1.7	63	157	2.9
537.1	0.490	9.9	1.1	35	152	4.7	7.1	2.1	53	174	3.4
537.8	0.490	12	1.5	41	150	3.6	7.1	2.7	63	171	2.7
538.5	0.490	11	1.1	43	149	4.3	7.1	1.9	66	170	3.2
539.2	0.490	11	1.2	41	140	4.9	7.1	2.1	64	160	3.6
539.9	0.490	11	1.0	36	158	3.2	7.1	1.8	56	180	2.3
540.6	0.490	9.9	1.5	38	148	4.5	7.1	2.7	58	170	3.3
541.3	0.490	14	1.4	33	134	3.5	7.1	2.5	51	154	2.6
542.0	0.490	13	1.2	40	144	2.6	7.1	2.2	61	164	1.9
542.7	0.490	15	1.2	39	147	3.0	7.1	2.2	60	168	2.2
543.4	0.650	11	1.2	35	151	4.2	9.4	2.2	54	172	3.1
544.1	0.490	13	1.2	38	150	3.5	7.1	2.2	59	171	2.6
544.8	0.490	11	1.3	39	140	3.3	7.1	2.4	60	160	2.4
545.4	0.490	11	1.5	35	143	3.5	7.1	2.7	53	163	2.5
546.1	0.835	12	1.2	40	140	2.9	12	2.1	61	161	2.1
546.8	0.490	13	1.4	41	146	2.9	7.1	2.6	62	166	2.1
547.5	0.567	14	1.3	46	133	4.0	8.2	2.3	71	152	2.9
548.2	0.805	11	1.5	46	153	2.7	12	2.8	71	175	2.0
548.9	0.490	11	1.6	36	157	2.3	7.1	2.9	56	180	1.7
549.6	0.490	11	0.964	34	129	3.0	7.1	1.8	52	147	2.2
550.3	0.987	14	0.805	43	150	3.4	14	1.5	66	171	2.5
551.0	0.552	14	1.5	39	170	4.2	8.0	2.7	60	194	3.0
551.7	0.490	13	1.5	42	145	3.0	7.1	2.7	64	166	2.2
552.4	0.490	12	1.2	40	136	3.4	7.1	2.1	61	156	2.4
553.1	0.490	11	1.4	45	155	2.0	7.1	2.6	68	178	1.5
553.8	0.490	13	1.6	36	147	2.1	7.1	2.8	56	168	1.5
554.5	0.490	12	1.5	39	155	3.4	7.1	2.7	60	178	2.5
555.2	0.569	11	1.1	41	143	2.7	8.2	2.1	63	163	2.0
555.9	0.683	12	1.5	38	161	2.9	9.9	2.8	58	184	2.1
556.6	0.538	13	1.3	36	159	1.5	7.8	2.5	55	182	1.1
557.3	0.633	13	1.7	47	144	2.5	9.1	3.1	72	165	1.8
558.0	0.490	15	1.1	40	137	3.1	7.1	2.1	62	157	2.3
558.7	0.490	12	1.7	48	141	3.0	7.1	3.2	74	161	2.2
559.4	0.790	12	1.3	43	133	2.6	11	2.4	65	152	1.9
560.1	0.563	11	1.5	42	149	2.2	8.1	2.8	64	170	1.6
560.8	0.490	12	1.3	39	140	2.9	7.1	2.5	60	160	2.1
561.5	0.543	13	1.5	40	141	3.2	7.8	2.8	61	162	2.3
562.2	0.490	12	1.2	44	132	2.3	7.1	2.3	68	151	1.7
562.9	0.496	12	1.3	39	136	1.9	7.2	2.5	60	155	1.4
563.6	0.490	8.3	1.2	38	141	2.7	7.1	2.1	59	162	2.0
564.3	0.490	11	1.4	42	143	3.5	7.1	2.5	64	164	2.5



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
565.0	0.490	13	1.2	42	141	2.8	7.1	2.1	64	161	2.0
565.7	0.490	11	0.660	49	144	3.2	7.1	1.2	75	164	2.3
566.4	0.518	11	1.4	38	147	2.8	7.5	2.6	59	168	2.0
567.1	0.490	9.9	1.0	40	113	2.1	7.1	1.9	61	130	1.5
567.8	0.725	12	1.6	43	147	3.4	10	3.0	65	169	2.5
568.5	0.779	13	1.6	47	139	3.2	11	2.9	72	159	2.3
569.2	0.670	12	1.2	44	135	3.7	9.7	2.3	68	155	2.7
569.9	0.492	9.4	1.3	42	128	2.7	7.1	2.3	64	147	2.0
570.6	0.893	13	1.7	38	145	3.2	13	3.0	58	165	2.3
571.3	0.490	11	1.3	41	138	3.2	7.1	2.5	63	158	2.3
571.9	0.581	13	1.5	46	142	3.2	8.4	2.7	70	163	2.3
572.6	0.490	12	1.1	44	124	2.7	7.1	2.0	67	141	2.0
573.3	0.616	12	1.7	41	145	1.9	8.9	3.1	62	165	1.4
574.0	0.490	14	1.5	42	147	3.1	7.1	2.7	64	168	2.3
574.7	0.490	13	1.2	52	127	2.2	7.1	2.2	79	145	1.6
575.4	0.490	12	1.2	41	128	2.1	7.1	2.3	63	147	1.5
576.1	0.490	9.7	1.5	42	124	2.5	7.1	2.7	65	142	1.8
576.8	0.490	12	1.7	44	137	4.0	7.1	3.0	68	156	2.9
577.5	0.491	12	1.1	40	123	1.8	7.1	1.9	61	140	1.3
578.2	0.490	13	1.1	41	115	2.9	7.1	2.1	63	131	2.1
578.9	0.490	12	1.4	36	135	2.4	7.1	2.5	56	154	1.7
579.6	0.490	14	1.5	39	141	2.5	7.1	2.8	60	161	1.9
580.3	0.580	11	1.4	40	133	2.8	8.4	2.6	62	152	2.0
581.0	0.490	12	1.6	41	129	1.5	7.1	3.0	62	148	1.1
581.7	0.490	12	1.5	42	137	2.9	7.1	2.7	64	157	2.1
582.4	0.490	11	1.1	39	121	2.5	7.1	2.0	59	138	1.9
583.1	0.490	13	1.3	41	134	1.7	7.1	2.4	62	154	1.2
583.8	0.650	12	1.4	34	132	2.5	9.4	2.5	53	151	1.8
584.5	0.490	11	1.1	39	130	3.0	7.1	2.1	60	148	2.2
585.2	0.490	12	1.2	43	146	2.1	7.1	2.1	66	167	1.5
585.9	0.490	11	1.2	35	144	2.4	7.1	2.1	53	164	1.7
586.6	0.513	14	1.2	38	141	1.6	7.4	2.1	58	161	1.2
587.3	0.490	12	1.5	36	142	2.5	7.1	2.7	55	162	1.8
588.0	0.490	11	1.1	39	136	2.8	7.1	2.1	60	156	2.1
588.7	0.593	11	1.5	37	134	2.9	8.6	2.7	57	153	2.1
589.4	0.490	11	1.3	33	134	2.0	7.1	2.4	50	153	1.5
590.1	0.490	11	1.4	29	154	2.6	7.1	2.6	44	176	1.9
590.8	0.490	13	0.966	31	155	3.3	7.1	1.8	48	177	2.4
591.5	0.490	15	1.0	37	139	2.3	7.1	1.9	57	159	1.7
592.2	0.490	11	1.3	32	118	2.2	7.1	2.3	49	135	1.6
592.9	0.490	10	0.759	34	144	1.8	7.1	1.4	51	165	1.3
593.6	0.490	9.4	1.1	31	140	1.8	7.1	1.9	47	160	1.3
594.3	0.490	10	1.2	32	147	2.2	7.1	2.2	48	168	1.6
595.0	0.626	12	0.868	42	144	2.2	9.0	1.6	64	165	1.6
595.7	0.602	12	1.5	31	159	1.9	8.7	2.6	47	182	1.4
596.4	0.624	12	1.1	31	127	1.2	9.0	2.1	47	146	0.896
597.1	0.490	13	1.2	34	167	2.7	7.1	2.2	52	191	2.0
597.7	0.490	13	1.4	31	152	2.5	7.1	2.6	47	174	1.8
598.4	0.490	13	1.2	34	155	2.0	7.1	2.1	53	178	1.4
599.1	0.490	9.5	0.800	29	167	2.1	7.1	1.5	44	191	1.5
599.8	0.628	14	1.0	28	171	2.5	9.1	1.9	42	195	1.8
600.5	0.490	13	1.1	29	177	2.6	7.1	2.0	45	202	1.9
601.2	0.490	10	0.989	33	159	2.6	7.1	1.8	50	182	1.9
601.9	0.695	12	1.1	28	149	1.8	10	1.9	42	171	1.3
602.6	0.490	10	0.923	27	165	2.5	7.1	1.7	42	189	1.8
603.3	0.490	9.2	0.828	22	148	2.7	7.1	1.5	34	169	2.0
604.0	0.490	11	1.1	25	189	1.6	7.1	2.0	38	217	1.2
604.7	0.490	13	1.0	30	173	2.2	7.1	1.9	46	198	1.6
605.4	0.490	12	0.811	25	146	2.2	7.1	1.5	38	167	1.6
606.1	0.573	11	1.2	22	174	2.5	8.3	2.2	33	199	1.8
606.8	0.490	14	1.0	29	183	1.9	7.1	1.9	44	210	1.4
607.5	0.490	11	1.0	27	177	2.0	7.1	1.9	41	202	1.4
608.2	0.490	12	0.892	29	173	2.6	7.1	1.6	44	198	1.9
608.9	0.490	11	1.5	24	171	1.9	7.1	2.7	37	196	1.4
609.6	0.490	8.8	1.1	21	181	2.1	7.1	2.0	33	208	1.6
610.3	0.526	10	1.2	25	175	1.9	7.6	2.1	38	200	1.4
611.0	0.490	11	1.3	26	169	2.0	7.1	2.3	40	193	1.5
611.7	0.490	9.5	1.1	30	190	2.8	7.1	1.9	46	217	2.1
612.4	0.490	8.8	0.880	21	180	1.8	7.1	1.6	32	206	1.3
613.1	0.648	9.3	0.987	21	171	2.1	9.4	1.8	32	196	1.5
613.8	0.490	11	1.1	22	161	2.1	7.1	2.0	34	184	1.5
614.5	0.490	11	1.1	23	196	2.2	7.1	2.0	35	224	1.6
615.2	0.490	10	1.0	26	190	1.7	7.1	1.8	40	218	1.2
615.9	0.490	11	0.832	20	173	1.9	7.1	1.5	30	198	1.4
616.6	0.613	11	0.931	24	194	2.4	8.8	1.7	38	221	1.8
617.3	0.490	9.4	0.794	21	159	1.7	7.1	1.4	32	182	1.3
618.0	0.490	11	1.3	24	201	2.6	7.1	2.3	37	230	1.9
618.7	0.490	8.3	1.3	23	198	2.7	7.1	2.4	35	227	1.9
619.4	0.490	8.9	0.864	21	204	1.9	7.1	1.6	31	233	1.4
620.1	0.490	10	1.2	26	196	1.9	7.1	2.1	40	224	1.4
620.8	0.490	11	1.1	24	194	1.7	7.1	2.1	37	222	1.2



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.5	0.490	11	1.0	23	172	1.7	7.1	1.8	36	197	1.2
622.2	0.490	10.0	1.4	32	194	1.6	7.1	2.5	50	222	1.2
622.9	0.490	9.3	1.2	24	202	1.7	7.1	2.3	37	231	1.3
623.6	0.490	11	0.854	23	198	2.3	7.1	1.6	35	227	1.7
624.2	0.490	13	1.0	28	203	1.4	7.1	1.9	43	232	1.0
624.9	0.490	10	1.3	27	216	2.2	7.1	2.4	41	247	1.6
625.6	0.490	8.7	0.933	26	201	1.9	7.1	1.7	40	230	1.4
626.3	0.490	11	1.5	32	239	1.8	7.1	2.7	49	273	1.3
627.0	0.490	10	1.7	26	200	3.2	7.1	3.1	40	228	2.3
627.7	0.490	7.8	1.0	24	186	1.8	7.1	1.9	37	212	1.3
628.4	0.490	9.5	1.5	25	225	1.9	7.1	2.7	39	257	1.4
629.1	0.490	6.8	1.5	28	199	1.5	7.1	2.7	43	228	1.1
629.8	0.490	9.4	1.2	33	223	1.7	7.1	2.1	51	255	1.2
630.5	0.490	11	1.3	27	217	1.9	7.1	2.3	41	248	1.4
631.2	0.581	9.0	1.0	24	203	1.8	8.4	1.9	37	232	1.3
631.9	0.490	9.9	1.5	26	191	1.7	7.1	2.8	39	219	1.3
632.6	0.490	10	1.2	27	239	2.1	7.1	2.2	41	273	1.5
633.3	0.490	8.8	1.4	29	213	2.1	7.1	2.5	44	243	1.6
634.0	0.490	9.5	1.6	26	188	0.954	7.1	3.0	40	215	0.696
634.7	0.490	9.7	1.6	30	205	1.1	7.1	2.9	46	234	0.808
635.4	0.731	7.8	1.1	29	190	1.0	11	2.0	45	217	0.755
636.1	0.490	11	1.1	24	216	1.3	7.1	2.0	37	247	0.962
636.8	0.490	9.5	1.3	26	213	1.5	7.1	2.4	41	243	1.1
637.5	0.490	11	0.943	32	205	1.5	7.1	1.7	49	234	1.1
638.2	0.490	9.1	1.1	28	193	1.0	7.1	2.0	44	221	0.738
638.9	0.490	9.7	1.3	23	196	1.0	7.1	2.3	35	224	0.734
639.6	0.490	10	1.3	28	222	2.0	7.1	2.4	43	254	1.5
640.3	0.490	8.5	1.3	25	184	1.4	7.1	2.4	38	211	0.986
641.0	0.490	8.9	1.1	27	188	1.2	7.1	2.0	41	215	0.906
641.7	0.539	9.1	0.838	27	191	0.983	7.8	1.5	41	219	0.717
642.4	0.490	6.8	1.3	29	211	1.4	7.1	2.4	44	241	1.1
643.1	0.490	10	1.4	28	209	1.1	7.1	2.6	43	239	0.811
643.8	0.490	9.4	1.2	26	200	1.4	7.1	2.2	40	229	1.0
644.5	0.490	8.7	1.4	31	204	1.0	7.1	2.6	47	233	0.735
645.2	0.490	8.0	1.1	29	231	1.3	7.1	2.0	45	264	0.927
645.9	0.490	7.9	1.1	31	240	1.3	7.1	1.9	47	275	0.944
646.6	0.490	11	1.5	29	187	0.833	7.1	2.8	45	213	0.608
647.3	0.490	9.9	1.8	29	241	0.988	7.1	3.2	44	276	0.721
648.0	0.490	9.0	1.3	32	211	1.3	7.1	2.5	49	241	0.922
648.7	0.490	9.7	1.1	27	190	1.4	7.1	2.0	41	218	0.990
649.4	0.490	9.8	1.4	31	209	1.4	7.1	2.5	48	239	1.0
650.1	0.490	11	0.832	29	233	1.6	7.1	1.5	45	267	1.2
650.7	0.490	10.0	1.3	23	203	0.660	7.1	2.3	35	232	0.481
651.4	0.490	9.4	0.956	32	209	1.3	7.1	1.7	49	239	0.924
652.1	0.490	8.0	1.2	24	175	0.855	7.1	2.2	36	200	0.624
652.8	0.490	7.8	1.4	30	227	1.1	7.1	2.5	46	260	0.830
653.5	0.544	11	1.2	24	219	0.992	7.9	2.2	37	250	0.724
654.2	0.490	12	1.1	24	203	1.6	7.1	2.1	37	232	1.1
654.9	0.490	8.3	1.1	24	213	1.5	7.1	2.0	37	244	1.1
655.6	0.490	11	0.928	27	226	1.3	7.1	1.7	42	258	0.966
656.3	0.490	8.1	1.2	31	223	1.3	7.1	2.2	47	255	0.938
657.0	0.490	14	1.1	28	212	2.2	7.1	2.0	43	243	1.6
657.7	0.490	8.4	1.2	33	227	1.3	7.1	2.1	51	260	0.967
658.4	0.490	8.7	0.973	25	225	0.774	7.1	1.8	38	258	0.565
659.1	0.490	8.9	1.1	25	228	0.816	7.1	2.0	38	261	0.595
659.8	0.514	9.5	0.990	29	197	0.848	7.4	1.8	45	225	0.619
660.5	0.490	7.9	1.2	29	232	1.8	7.1	2.2	45	265	1.3
661.2	0.490	9.5	1.1	26	222	1.6	7.1	2.0	40	253	1.2
661.9	0.490	8.3	0.843	23	210	1.3	7.1	1.5	35	240	0.985
662.6	0.490	7.5	1.2	23	207	0.940	7.1	2.1	36	237	0.686
663.3	0.490	7.9	1.1	24	217	1.1	7.1	2.1	36	248	0.833
664.0	0.490	9.5	0.891	27	222	1.9	7.1	1.6	41	254	1.4
664.7	0.490	8.7	0.953	24	200	1.1	7.1	1.7	37	228	0.812
665.4	0.490	8.6	1.1	22	232	0.723	7.1	2.0	33	266	0.528
666.1	0.490	8.8	1.2	25	231	1.6	7.1	2.2	38	265	1.2
666.8	0.490	8.8	1.2	26	204	1.5	7.1	2.3	40	233	1.1
667.5	0.490	11	1.1	27	230	1.7	7.1	2.1	42	263	1.2
668.2	0.490	8.3	0.900	24	221	1.0	7.1	1.6	37	253	0.735
668.9	0.490	8.3	0.980	24	226	2.3	7.1	1.8	38	258	1.7
669.6	0.625	10	1.3	27	265	1.9	9.0	2.4	41	303	1.4
670.3	0.490	11	1.3	22	241	1.8	7.1	2.4	34	276	1.3
671.0	0.588	10	0.805	25	234	1.6	8.5	1.5	38	268	1.1
671.7	0.490	12	1.2	24	212	1.6	7.1	2.2	37	242	1.2
672.4	0.490	6.1	0.843	25	218	0.358	7.1	1.5	38	249	0.261
673.1	0.490	8.5	1.5	22	228	1.1	7.1	2.7	33	261	0.804
673.8	0.496	8.9	0.934	22	213	1.2	7.2	1.7	34	243	0.893
674.5	0.490	8.8	1.0	26	250	1.4	7.1	1.9	40	286	1.0
675.2	0.490	6.2	1.3	25	239	0.930	7.1	2.4	38	274	0.679
675.9	0.490	11	0.873	27	268	1.3	7.1	1.6	42	306	0.924
676.6	0.490	12	2.0	26	248	1.8	7.1	3.7	41	284	1.3
677.2	0.490	10	1.2	21	238	1.2	7.1	2.2	32	272	0.859



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
677.9	0.490	8.5	1.1	21	215	1.2	7.1	2.1	32	246	0.887
678.6	0.490	8.7	0.814	21	276	0.747	7.1	1.5	33	315	0.545
679.3	0.490	7.6	1.4	24	258	0.374	7.1	2.6	36	295	0.273
680.0	0.490	8.8	1.2	22	224	1.5	7.1	2.2	34	256	1.1
680.7	0.490	8.5	1.1	21	239	1.1	7.1	2.0	32	273	0.831
681.4	0.490	9.5	1.1	20	217	1.8	7.1	1.9	31	248	1.3
682.1	0.490	10.0	1.0	22	217	0.844	7.1	1.8	34	249	0.616
682.8	0.490	10	0.970	23	241	0.376	7.1	1.8	36	276	0.274
683.5	0.490	9.1	0.931	23	246	1.4	7.1	1.7	35	281	1.0
684.2	0.490	9.1	0.719	29	227	1.4	7.1	1.3	44	260	0.987
684.9	0.490	8.7	1.3	24	214	1.1	7.1	2.3	37	245	0.782
685.6	0.490	6.2	1.1	22	231	1.0	7.1	1.9	34	264	0.753
686.3	0.490	9.6	1.0	24	244	1.7	7.1	1.8	37	279	1.3
687.0	0.490	8.0	1.2	23	223	1.2	7.1	2.2	36	255	0.900
687.7	0.490	8.0	1.0	22	212	0.906	7.1	1.8	33	242	0.661
688.4	0.498	10.0	1.2	28	243	1.1	7.2	2.1	42	277	0.821
689.1	0.490	7.2	1.0	25	263	1.6	7.1	1.9	38	301	1.2
689.8	0.490	9.8	1.2	24	244	1.0	7.1	2.1	36	279	0.752
690.5	0.490	8.8	1.2	25	265	1.4	7.1	2.1	38	303	1.0
691.2	0.490	9.5	1.0	22	214	0.648	7.1	1.9	33	245	0.473
691.9	0.490	9.8	1.2	30	254	1.2	7.1	2.2	45	291	0.840
692.6	0.490	7.6	1.2	28	230	0.636	7.1	2.2	42	263	0.464
693.3	0.490	7.6	1.2	27	232	0.777	7.1	2.1	42	265	0.567
694.0	0.490	10	1.1	29	253	1.4	7.1	2.0	44	290	1.0
694.7	0.490	7.8	1.2	29	299	0.900	7.1	2.1	44	341	0.656
695.4	0.575	8.3	1.3	28	239	1.0	8.3	2.3	43	274	0.765
696.1	0.490	12	1.3	30	261	1.4	7.1	2.4	46	298	1.0
696.8	0.490	8.8	1.3	27	266	1.4	7.1	2.3	42	304	1.0
697.5	0.490	9.6	1.3	28	230	1.1	7.1	2.4	43	263	0.771
698.2	0.490	9.2	1.2	31	260	1.1	7.1	2.3	47	297	0.801
698.9	0.490	8.4	1.2	30	260	1.5	7.1	2.3	46	298	1.1
699.6	0.490	8.2	1.1	26	249	1.3	7.1	2.0	40	285	0.952
700.3	0.775	10	1.3	25	254	1.2	11	2.4	38	291	0.873
701.0	0.490	11	1.1	29	268	0.891	7.1	2.0	44	306	0.650
701.7	0.490	9.0	0.971	30	260	1.8	7.1	1.8	46	298	1.3
702.4	0.490	10	1.0	28	251	1.7	7.1	1.9	43	287	1.2
703.1	0.490	11	1.3	31	277	1.8	7.1	2.3	48	316	1.3
703.7	0.490	10	1.5	32	241	1.6	7.1	2.7	49	275	1.2
704.4	0.490	10.0	0.927	27	230	0.943	7.1	1.7	42	263	0.688
705.1	0.714	11	1.1	31	267	1.3	10	2.0	48	306	0.946
705.8	0.490	12	1.2	31	257	1.8	7.1	2.2	48	294	1.3
706.5	0.490	11	0.945	31	245	1.3	7.1	1.7	48	281	0.934
707.2	0.490	8.6	0.942	27	221	0.860	7.1	1.7	42	253	0.628
707.9	0.490	11	1.3	33	222	1.5	7.1	2.4	50	254	1.1
708.6	0.490	9.1	1.4	27	217	1.3	7.1	2.6	41	248	0.977
709.3	0.490	9.3	0.980	26	255	1.1	7.1	1.8	40	292	0.832
710.0	0.490	9.6	1.3	30	233	0.697	7.1	2.3	46	266	0.509
710.7	0.490	10	0.974	31	234	1.3	7.1	1.8	47	268	0.969
711.4	0.490	9.7	1.2	37	268	0.901	7.1	2.2	56	306	0.657
712.1	0.490	8.8	1.3	32	267	0.866	7.1	2.4	49	306	0.632
712.8	0.490	8.5	0.970	32	286	0.868	7.1	1.8	49	327	0.633
713.5	0.490	11	1.3	39	240	0.931	7.1	2.3	60	274	0.679
714.2	0.490	10	0.929	35	231	1.3	7.1	1.7	54	264	0.940
714.9	0.490	11	0.739	24	211	0.945	7.1	1.3	37	241	0.690
715.6	0.498	12	1.2	28	268	0.696	7.2	2.2	43	306	0.507
716.3	0.490	14	1.2	34	257	1.7	7.1	2.3	52	294	1.2
717.0	0.490	14	1.2	34	243	1.4	7.1	2.1	52	278	1.1
717.7	0.490	12	0.886	38	257	0.730	7.1	1.6	58	294	0.532
718.4	0.490	9.7	1.1	36	276	0.475	7.1	2.0	54	316	0.346
719.1	0.490	10	0.993	28	259	1.4	7.1	1.8	43	297	1.0
719.8	0.490	13	1.0	32	268	1.9	7.1	1.9	48	306	1.4
720.5	0.930	10	1.0	32	230	1.5	13	1.9	49	263	1.1
721.2	0.490	11	0.933	32	247	1.3	7.1	1.7	49	283	0.944
721.9	0.490	9.6	0.912	26	220	0.666	7.1	1.7	40	252	0.486
722.6	0.490	10	0.840	26	239	1.6	7.1	1.5	41	273	1.2
723.3	0.490	12	1.0	32	327	1.3	7.1	1.9	49	374	0.963
724.0	0.490	8.0	0.717	28	225	1.1	7.1	1.3	43	257	0.804
724.7	0.683	7.8	1.3	31	253	1.2	9.9	2.3	48	290	0.905
725.4	0.715	9.2	0.918	28	260	0.865	10	1.7	43	297	0.631
726.1	0.490	9.0	1.1	30	291	1.7	7.1	2.0	46	333	1.3
726.8	0.490	11	0.864	37	260	0.992	7.1	1.6	56	297	0.724
727.5	0.490	9.1	1.2	27	250	1.2	7.1	2.1	42	286	0.840
728.2	0.490	7.7	0.877	31	250	1.2	7.1	1.6	48	286	0.839
728.9	0.490	10	0.938	28	278	1.3	7.1	1.7	42	318	0.933
729.5	0.490	8.8	0.816	32	257	1.4	7.1	1.5	49	294	1.1
730.2	0.490	11	1.1	33	253	1.2	7.1	1.9	50	289	0.855
730.9	0.490	11	0.801	29	246	1.9	7.1	1.5	44	282	1.4
731.6	0.490	9.4	0.894	31	260	1.2	7.1	1.6	48	297	0.883
732.3	0.490	7.7	1.2	26	256	1.2	7.1	2.2	40	293	0.905
733.0	0.490	8.8	0.848	29	242	1.4	7.1	1.5	44	277	1.0
733.7	0.490	12	1.1	30	215	0.575	7.1	2.1	46	246	0.420



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
734.4	0.490	9.3	1.0	25	225	0.899	7.1	1.9	38	258	0.656
735.1	0.490	8.7	0.942	24	226	0.702	7.1	1.7	37	259	0.512
735.8	0.490	9.8	0.945	29	284	1.3	7.1	1.7	45	325	0.979
736.5	0.490	9.7	0.820	28	339	1.3	7.1	1.5	43	387	0.920
737.2	0.490	11	0.887	34	266	1.6	7.1	1.6	53	304	1.1
737.9	0.490	11	0.984	29	284	1.1	7.1	1.8	45	324	0.821
738.6	0.490	10	1.2	27	281	0.998	7.1	2.2	41	321	0.728
739.3	0.490	9.7	0.712	23	224	1.6	7.1	1.3	35	256	1.2
740.0	0.490	12	0.917	28	287	1.3	7.1	1.7	42	328	0.974
740.7	0.579	10	0.922	29	276	1.4	8.4	1.7	45	316	1.1
741.4	0.490	12	0.704	25	254	1.1	7.1	1.3	38	291	0.813
742.1	0.621	8.9	1.2	29	265	0.751	9.0	2.1	44	303	0.548
742.8	0.490	10	1.1	27	262	1.4	7.1	2.0	41	299	1.0
743.5	0.490	10	1.2	27	284	1.6	7.1	2.2	42	325	1.2
744.2	0.490	9.2	0.918	26	235	0.840	7.1	1.7	40	269	0.613
744.9	0.490	9.5	1.3	30	249	1.2	7.1	2.3	46	285	0.885
745.6	0.490	10	1.1	28	240	1.2	7.1	2.0	42	274	0.865
746.3	0.490	11	1.1	32	277	1.1	7.1	2.0	48	317	0.786
747.0	0.490	11	0.897	28	252	1.3	7.1	1.6	43	288	0.953
747.7	0.490	8.8	0.977	28	254	0.650	7.1	1.8	43	291	0.475
748.4	0.490	7.1	1.1	20	248	1.1	7.1	2.0	31	284	0.798
749.1	0.490	10	1.2	24	271	2.4	7.1	2.3	36	310	1.8
749.8	0.490	11	1.3	29	267	1.1	7.1	2.4	44	305	0.830
750.5	0.490	13	1.2	29	228	1.7	7.1	2.3	44	261	1.2
751.2	0.490	11	1.3	30	241	0.697	7.1	2.4	46	276	0.509
751.9	0.490	11	1.6	27	263	1.7	7.1	3.0	41	301	1.2
752.6	0.490	9.5	1.1	26	262	1.3	7.1	2.0	40	300	0.968
753.3	0.490	11	1.2	27	312	1.1	7.1	2.1	41	356	0.792
754.0	0.490	12	1.2	28	218	0.708	7.1	2.3	43	249	0.516
754.7	0.490	8.9	1.5	32	299	1.6	7.1	2.7	48	342	1.1
755.4	0.573	11	1.3	27	267	2.2	8.3	2.4	42	305	1.6
756.1	0.490	11	1.2	29	224	1.4	7.1	2.1	44	256	0.997
756.7	0.490	9.9	1.0	25	269	1.1	7.1	1.8	39	308	0.772
757.4	0.490	9.8	0.847	29	230	1.5	7.1	1.5	45	263	1.1
758.1	0.490	10	1.1	29	233	1.2	7.1	1.9	44	267	0.882
758.8	0.490	10	1.4	28	253	1.8	7.1	2.6	43	290	1.3
759.5	0.490	11	1.6	29	284	1.0	7.1	2.9	45	324	0.763
760.2	0.490	10	0.884	28	262	0.942	7.1	1.6	43	299	0.687
760.9	0.490	9.4	1.1	25	248	0.787	7.1	2.0	38	283	0.574
761.6	0.490	9.7	0.920	26	252	1.5	7.1	1.7	40	288	1.1
762.3	0.490	11	1.3	24	288	1.2	7.1	2.4	37	330	0.852
763.0	0.490	9.6	1.1	23	280	0.962	7.1	2.1	35	320	0.702
763.7	0.490	9.3	1.4	31	256	1.1	7.1	2.5	48	293	0.809
764.4	0.490	8.5	0.887	25	213	0.367	7.1	1.6	39	243	0.268
765.1	0.511	10	1.3	28	273	1.5	7.4	2.4	42	312	1.1
765.8	0.490	9.7	1.4	21	237	1.3	7.1	2.5	33	271	0.941
766.5	0.512	8.3	1.1	26	251	0.656	7.4	2.1	40	287	0.479
767.2	0.490	8.3	1.4	31	267	1.0	7.1	2.6	47	305	0.754
767.9	0.490	8.3	1.2	25	234	1.3	7.1	2.1	38	267	0.923
768.6	0.490	9.7	1.2	22	263	1.5	7.1	2.2	33	301	1.1
769.3	0.490	9.6	1.0	26	259	2.3	7.1	1.9	40	296	1.7
770.0	0.490	11	1.3	30	256	1.5	7.1	2.4	46	293	1.1
770.7	0.490	10	1.0	25	244	1.5	7.1	1.9	38	279	1.1
771.4	0.490	9.7	1.4	24	244	0.829	7.1	2.5	38	279	0.605
772.1	0.490	8.2	0.950	22	253	1.7	7.1	1.7	33	289	1.3
772.8	0.532	9.8	1.2	27	259	1.3	7.7	2.1	41	296	0.926
773.5	0.490	11	1.2	24	259	1.4	7.1	2.2	36	296	0.989
774.2	0.490	10	1.2	24	210	1.7	7.1	2.2	37	240	1.3
774.9	0.490	9.5	1.2	29	266	0.970	7.1	2.3	44	304	0.708
775.6	0.490	8.8	1.1	28	257	1.6	7.1	2.1	42	294	1.1
776.3	0.490	12	1.0	22	268	1.3	7.1	1.9	34	306	0.947
777.0	0.490	11	1.0	27	230	2.0	7.1	1.9	41	263	1.4
777.7	0.490	9.4	0.883	24	212	1.0	7.1	1.6	37	242	0.737
778.4	0.490	7.9	1.6	27	262	1.6	7.1	2.9	42	300	1.2
779.1	0.509	11	1.3	22	252	1.8	7.3	2.3	34	288	1.3
779.8	0.490	10	1.4	23	272	1.5	7.1	2.6	35	311	1.1
780.5	0.490	11	1.1	26	241	0.846	7.1	2.0	40	275	0.617
781.2	0.490	10.0	1.1	24	243	1.2	7.1	2.1	36	278	0.872
781.9	0.490	9.3	0.869	26	255	1.3	7.1	1.6	40	291	0.970
782.6	0.490	11	1.3	30	281	1.8	7.1	2.3	46	321	1.3
783.2	0.490	10	1.1	28	264	1.6	7.1	1.9	43	302	1.2
783.9	0.490	12	0.934	24	236	0.713	7.1	1.7	37	270	0.520
784.6	0.490	8.2	0.960	24	250	0.878	7.1	1.8	36	286	0.641
785.3	0.490	8.4	1.5	20	234	1.7	7.1	2.7	30	268	1.2
786.0	0.490	10	0.883	22	279	2.0	7.1	1.6	34	319	1.4
786.7	0.490	9.7	1.2	25	277	1.9	7.1	2.2	39	317	1.4
787.4	0.490	9.3	0.960	20	249	1.6	7.1	1.8	31	285	1.2
788.1	0.490	7.8	1.2	19	249	1.2	7.1	2.2	29	284	0.876
788.8	0.490	7.8	1.5	23	250	1.1	7.1	2.7	35	286	0.830
789.5	0.654	12	1.2	24	264	1.2	9.4	2.2	37	302	0.867
790.2	0.490	11	1.3	23	219	1.2	7.1	2.4	35	250	0.849



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
790.9	0.490	9.8	0.846	24	238	1.6	7.1	1.5	36	272	1.2
791.6	0.490	7.4	1.2	21	262	1.6	7.1	2.3	32	300	1.2
792.3	0.490	9.4	1.1	21	292	1.6	7.1	2.0	33	334	1.2
793.0	0.490	10	1.2	21	259	1.7	7.1	2.2	33	296	1.2
793.7	0.490	11	1.2	21	218	1.1	7.1	2.2	32	250	0.777
794.4	0.490	8.6	1.2	28	240	1.3	7.1	2.2	42	275	0.923
795.1	0.490	11	1.5	25	284	1.5	7.1	2.7	38	324	1.1
795.8	0.490	9.1	1.2	25	241	1.2	7.1	2.2	38	276	0.888
796.5	0.490	11	1.5	28	257	1.6	7.1	2.8	43	294	1.1
797.2	0.490	9.1	1.7	25	241	2.3	7.1	3.0	39	275	1.6
797.9	0.490	8.2	1.2	22	247	1.4	7.1	2.2	34	282	1.0
798.6	0.490	9.6	1.3	23	274	1.6	7.1	2.3	35	313	1.1
799.3	0.490	10	1.1	23	295	1.4	7.1	2.0	36	337	1.0
800.0	0.490	9.8	1.5	19	243	1.2	7.1	2.8	30	278	0.842
800.7	0.490	9.4	1.0	26	259	1.7	7.1	1.9	40	296	1.3
801.4	0.490	9.2	0.638	24	243	0.693	7.1	1.2	37	278	0.506
802.1	0.490	7.5	1.1	23	248	2.3	7.1	2.1	36	283	1.7
802.8	0.490	9.4	0.999	23	242	1.0	7.1	1.8	36	276	0.748
803.5	0.490	11	1.4	25	277	1.2	7.1	2.6	39	317	0.861
804.2	0.513	9.4	0.904	22	228	1.5	7.4	1.6	34	260	1.1
804.9	0.490	7.4	0.938	22	228	1.5	7.1	1.7	34	261	1.1
805.6	0.490	9.7	0.841	21	244	1.6	7.1	1.5	32	279	1.2
806.3	0.490	9.3	1.1	19	280	1.8	7.1	2.1	30	320	1.3
807.0	0.490	11	1.1	22	270	1.1	7.1	2.0	34	309	0.768
807.7	0.490	9.0	1.2	22	237	1.3	7.1	2.1	34	271	0.952
808.4	0.490	9.4	1.2	18	235	0.981	7.1	2.1	28	268	0.716
809.1	0.490	11	1.6	21	300	1.6	7.1	2.9	32	343	1.2
809.7	0.513	9.7	1.4	24	293	2.4	7.4	2.5	37	335	1.8
810.4	0.490	10	1.2	21	230	2.0	7.1	2.2	32	263	1.4
811.1	0.490	8.7	1.1	19	237	1.4	7.1	2.0	30	271	1.0
811.8	0.490	11	1.4	22	252	1.7	7.1	2.6	33	288	1.2
812.5	0.490	8.8	1.7	18	263	2.2	7.1	3.1	28	301	1.6
813.2	0.490	10	1.3	22	236	1.6	7.1	2.4	33	270	1.2
813.9	0.490	8.8	1.1	22	260	1.3	7.1	2.0	34	297	0.965
814.6	0.490	9.4	1.1	24	286	1.7	7.1	1.9	36	326	1.3
815.3	0.490	8.9	1.1	23	242	1.3	7.1	2.0	35	276	0.956
816.0	0.490	10	1.4	21	278	1.6	7.1	2.6	33	318	1.2
816.7	0.490	11	1.2	23	269	1.5	7.1	2.1	36	308	1.1
817.4	0.563	9.7	1.6	20	237	1.6	8.1	3.0	30	271	1.2
818.1	0.490	8.4	1.0	20	248	1.2	7.1	1.8	30	284	0.858
818.8	0.490	8.1	1.7	22	290	2.2	7.1	3.1	33	331	1.6
819.5	0.533	9.2	1.4	23	259	2.1	7.7	2.5	36	296	1.5
820.2	0.490	9.4	1.1	20	230	1.7	7.1	1.9	31	263	1.2
820.9	0.490	8.0	1.2	26	250	1.9	7.1	2.2	40	286	1.4
821.6	0.490	8.7	1.7	18	284	1.7	7.1	3.0	28	324	1.2
822.3	0.490	7.9	1.2	22	288	1.3	7.1	2.3	34	329	0.919
823.0	0.490	9.9	1.1	21	265	2.1	7.1	2.0	32	303	1.5
823.7	0.490	9.2	1.2	18	260	1.9	7.1	2.1	28	297	1.4
824.4	0.604	9.5	1.3	19	265	2.0	8.7	2.3	29	303	1.5
825.1	0.490	9.5	1.1	20	256	2.0	7.1	2.1	31	293	1.5
825.8	0.490	9.3	1.1	17	277	2.0	7.1	2.1	26	316	1.4
826.5	0.490	8.7	1.5	23	309	1.4	7.1	2.8	35	353	1.0
827.2	0.634	9.5	0.857	20	259	1.9	9.2	1.6	31	296	1.4
827.9	0.490	6.2	0.992	20	252	1.5	7.1	1.8	30	288	1.1
828.6	0.490	10	1.3	21	305	2.4	7.1	2.3	32	349	1.8
829.3	0.490	11	1.3	18	276	1.7	7.1	2.3	28	315	1.2
830.0	0.490	11	1.4	23	237	1.5	7.1	2.6	35	271	1.1
830.7	0.490	10.0	0.930	23	252	0.905	7.1	1.7	36	288	0.660
831.4	0.490	10	1.3	18	298	1.4	7.1	2.3	28	341	1.0
832.1	0.490	9.2	1.1	18	276	2.0	7.1	2.0	28	316	1.5
832.8	0.490	11	1.0	22	281	1.9	7.1	1.9	34	322	1.4
833.5	0.490	8.7	1.1	19	255	2.0	7.1	2.1	30	291	1.5
834.2	0.490	10	1.1	21	283	1.8	7.1	2.1	32	324	1.3
834.9	0.490	9.6	1.5	19	274	1.2	7.1	2.7	29	314	0.906
835.5	0.490	7.6	0.900	18	230	1.7	7.1	1.6	28	263	1.2
836.2	0.490	9.8	1.2	22	323	1.7	7.1	2.2	34	369	1.2
836.9	0.490	8.7	0.986	18	278	1.5	7.1	1.8	28	318	1.1
837.6	0.490	8.3	0.981	15	261	2.2	7.1	1.8	23	299	1.6
838.3	0.490	8.2	1.1	17	272	1.6	7.1	2.1	26	312	1.2
839.0	0.490	10	1.3	19	306	1.6	7.1	2.4	28	350	1.1
839.7	0.490	11	1.1	18	251	1.8	7.1	2.0	27	287	1.3
840.4	0.490	11	1.1	15	233	2.0	7.1	1.9	24	266	1.4
841.1	0.490	7.7	1.2	18	281	2.0	7.1	2.2	27	321	1.4
841.8	0.490	9.2	1.4	19	325	1.6	7.1	2.6	30	372	1.1
842.5	0.490	10	1.4	23	305	2.2	7.1	2.6	35	348	1.6
843.2	0.490	8.5	0.985	21	267	1.8	7.1	1.8	33	305	1.3
843.9	0.490	9.5	0.987	20	263	1.9	7.1	1.8	31	301	1.4
844.6	0.490	9.4	1.3	14	316	1.0	7.1	2.3	21	362	0.756
845.3	0.490	9.1	1.5	18	253	1.5	7.1	2.7	27	290	1.1
846.0	0.490	8.4	1.6	19	260	2.2	7.1	3.0	28	298	1.6
846.7	0.514	8.9	1.2	22	277	1.8	7.4	2.2	34	317	1.3



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
847.4	0.490	11	1.3	18	263	1.8	7.1	2.4	28	301	1.3
848.1	0.490	7.2	1.2	16	280	1.3	7.1	2.3	24	320	0.956
848.8	0.490	9.3	1.5	20	293	2.8	7.1	2.7	30	335	2.1
849.5	0.490	11	1.4	25	309	2.0	7.1	2.5	39	353	1.5
850.2	0.490	11	1.5	18	324	2.5	7.1	2.6	28	370	1.8
850.9	0.490	12	1.4	18	311	1.6	7.1	2.5	28	356	1.2
851.6	0.490	10	1.4	15	287	2.5	7.1	2.5	24	328	1.8
852.3	0.490	11	1.6	18	303	2.0	7.1	3.0	27	346	1.4
853.0	0.490	11	1.3	17	261	1.5	7.1	2.4	27	298	1.1
853.7	0.490	8.7	1.3	20	251	1.6	7.1	2.4	31	287	1.2
854.4	0.579	10	1.7	23	271	1.6	8.4	3.1	35	310	1.2
855.1	0.490	11	1.4	18	262	1.3	7.1	2.5	27	299	0.929
855.8	0.490	10	1.3	21	331	2.1	7.1	2.3	32	379	1.5
856.5	0.490	11	1.6	19	274	1.3	7.1	2.9	29	313	0.957
857.2	0.541	10	1.2	17	257	1.3	7.8	2.1	26	294	0.983
857.9	0.490	9.0	1.4	20	305	1.3	7.1	2.5	30	349	0.950
858.6	0.490	7.8	1.2	16	297	2.0	7.1	2.2	24	340	1.5
859.3	0.491	9.7	1.2	20	325	2.1	7.1	2.3	31	372	1.5
860.0	0.490	15	1.2	27	271	1.9	7.1	2.2	41	310	1.4
860.7	0.490	11	1.6	23	288	1.2	7.1	3.0	35	330	0.897
861.3	0.490	9.8	1.3	21	300	1.1	7.1	2.4	33	344	0.832
862.0	0.490	8.9	1.5	23	296	1.1	7.1	2.7	35	339	0.808
862.7	0.490	11	1.9	23	272	1.2	7.1	3.4	35	312	0.867
863.4	0.718	9.0	1.1	23	267	1.2	10	2.0	36	305	0.875
864.1	0.490	9.2	1.3	20	301	1.4	7.1	2.3	31	344	1.0
864.8	0.490	12	1.6	21	280	1.0	7.1	2.9	32	320	0.740
865.5	0.490	11	1.1	25	254	1.4	7.1	2.1	38	290	1.0
866.2	0.490	9.7	1.1	25	290	1.5	7.1	2.1	38	331	1.1
866.9	0.490	8.7	1.2	23	236	1.3	7.1	2.2	35	270	0.927
867.6	0.490	9.4	1.6	27	294	1.3	7.1	2.9	42	336	0.933
868.3	0.490	8.2	1.1	20	278	0.946	7.1	2.0	31	318	0.690
869.0	0.490	11	1.0	23	291	1.3	7.1	1.8	36	333	0.935
869.7	0.490	9.8	1.6	28	276	0.975	7.1	3.0	43	316	0.711
870.4	0.490	8.3	1.5	25	301	1.6	7.1	2.8	38	344	1.2
871.1	0.490	9.6	1.2	28	301	1.3	7.1	2.1	42	344	0.943
871.8	0.490	10	1.5	29	286	2.1	7.1	2.8	44	327	1.6
872.5	0.490	10	1.4	25	283	1.5	7.1	2.6	39	324	1.1
873.2	0.645	8.7	1.6	32	256	1.8	9.3	2.8	49	293	1.3
873.9	0.490	9.4	1.5	27	258	1.9	7.1	2.7	41	296	1.4
874.6	0.577	11	1.7	26	283	1.1	8.3	3.2	40	324	0.768
875.3	0.679	8.9	1.7	26	260	2.2	9.8	3.0	39	298	1.6
876.0	0.490	11	1.4	26	259	1.4	7.1	2.6	40	296	1.0
876.7	0.551	11	1.0	29	272	1.2	8.0	1.9	45	311	0.867
877.4	0.490	8.5	0.979	28	295	1.3	7.1	1.8	43	337	0.945
878.1	0.490	11	1.4	28	303	1.4	7.1	2.5	42	347	1.0
878.8	0.490	8.8	1.3	25	234	0.786	7.1	2.4	38	267	0.573
879.5	0.490	10	1.7	30	278	2.1	7.1	3.2	46	317	1.5
880.2	0.490	11	1.5	32	292	2.0	7.1	2.7	48	334	1.4
880.9	0.490	9.1	1.4	23	267	1.1	7.1	2.5	35	305	0.779
881.6	0.490	8.7	1.2	23	256	1.4	7.1	2.3	35	293	1.0
882.3	0.490	12	1.1	27	241	0.878	7.1	2.0	41	275	0.641
883.0	0.960	8.7	1.3	26	276	1.4	14	2.4	40	316	1.0
883.7	0.490	7.9	1.4	25	272	1.6	7.1	2.5	38	312	1.2
884.4	0.490	10	1.3	24	322	1.8	7.1	2.4	38	369	1.3
885.1	0.490	11	1.1	30	292	0.884	7.1	2.1	46	333	0.645
885.8	0.490	9.9	1.2	28	262	2.1	7.1	2.2	42	300	1.5
886.5	0.490	9.4	1.4	27	246	1.0	7.1	2.6	41	281	0.740
887.2	0.490	8.6	1.2	31	301	1.0	7.1	2.3	48	344	0.746
887.8	0.734	8.5	1.5	30	323	1.6	11	2.7	46	369	1.2
888.5	0.490	11	1.5	26	272	1.3	7.1	2.7	39	311	0.944
889.2	0.490	8.3	1.5	30	256	1.3	7.1	2.7	46	293	0.933
889.9	0.583	11	1.9	26	261	0.870	8.4	3.4	40	298	0.635
890.6	0.490	9.9	1.8	27	264	1.4	7.1	3.2	41	302	1.0
891.3	0.490	8.7	1.5	30	258	1.1	7.1	2.7	46	295	0.797
892.0	0.490	11	1.4	29	270	0.894	7.1	2.6	45	308	0.652
892.7	0.490	10	0.955	28	256	0.695	7.1	1.7	43	293	0.507
893.4	0.570	9.6	1.5	36	306	1.0	8.2	2.6	55	350	0.763
894.1	0.490	13	1.7	31	280	0.681	7.1	3.0	47	320	0.497
894.8	0.490	11	1.5	25	287	1.3	7.1	2.8	39	329	0.947
895.5	0.779	10	1.8	30	296	0.746	11	3.4	46	339	0.544
896.2	0.490	10	1.5	25	234	2.0	7.1	2.7	39	268	1.5
896.9	0.490	10	1.2	31	256	1.4	7.1	2.2	48	293	1.0
897.6	0.490	9.1	1.3	26	256	1.6	7.1	2.4	39	293	1.1
898.3	0.490	10	1.5	24	282	1.6	7.1	2.7	37	323	1.1
899.0	0.498	13	1.3	29	296	1.7	7.2	2.5	44	338	1.3
899.7	0.490	11	1.1	26	267	1.8	7.1	1.9	40	306	1.3
900.4	0.490	11	1.1	26	319	0.455	7.1	2.0	40	365	0.332
901.1	0.490	9.9	1.3	23	298	1.1	7.1	2.4	35	341	0.806
901.8	0.490	9.7	1.3	25	298	1.8	7.1	2.4	39	341	1.3
902.5	0.562	9.9	1.2	25	267	1.7	8.1	2.2	39	305	1.2
903.2	0.490	10	1.0	25	282	1.3	7.1	1.9	38	322	0.957



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
903.9	0.490	11	1.5	25	282	1.3	7.1	2.8	39	323	0.965
904.6	0.490	12	1.4	21	293	1.5	7.1	2.6	32	335	1.1
905.3	0.490	12	1.4	24	322	1.6	7.1	2.6	37	368	1.2
906.0	0.490	12	1.2	27	275	1.5	7.1	2.2	41	314	1.1
906.7	0.490	11	1.3	25	289	1.4	7.1	2.4	38	331	1.0
907.4	0.536	9.7	1.3	20	347	1.1	7.7	2.3	30	397	0.789
908.1	0.490	9.9	0.890	22	329	1.2	7.1	1.6	33	377	0.840
908.8	0.586	10	1.8	23	334	1.9	8.5	3.3	35	381	1.4
909.5	0.680	12	1.3	22	298	1.2	9.8	2.4	34	341	0.898
910.2	0.490	12	1.2	24	298	1.1	7.1	2.2	36	341	0.783
910.9	0.531	11	1.4	27	382	0.975	7.7	2.5	41	437	0.711
911.6	0.638	12	1.2	19	329	2.1	9.2	2.1	29	377	1.6
912.3	1.2	10	1.1	25	292	1.3	17	2.0	38	334	0.916
913.0	0.490	9.6	0.873	21	316	1.4	7.1	1.6	32	361	1.1
913.7	0.725	10	1.4	19	337	1.1	10	2.5	30	385	0.817
914.4	0.490	11	1.4	24	459	1.4	7.1	2.5	36	525	1.0
915.0	1.4	11	1.2	25	405	1.5	20	2.3	38	463	1.1
915.7	0.490	9.9	1.5	27	471	1.6	7.1	2.8	42	539	1.2
916.4	0.847	12	1.5	21	483	0.811	12	2.7	33	553	0.592
917.1	1.4	9.6	1.3	24	477	0.726	19	2.3	36	545	0.530
917.8	0.761	9.2	0.919	23	467	1.5	11	1.7	35	534	1.1
918.5	1.3	10	1.4	22	529	1.2	18	2.5	33	605	0.890
919.2	2.0	10	1.2	28	633	1.5	29	2.2	42	724	1.1
919.9	0.618	11	1.3	29	707	0.466	8.9	2.3	45	808	0.340
920.6	1.3	11	1.3	28	714	2.0	19	2.4	43	817	1.5
921.3	1.2	8.7	0.998	23	727	1.4	17	1.8	35	831	1.0
922.0	1.4	10	1.6	30	669	1.3	21	3.0	46	765	0.923
922.7	0.490	9.7	1.4	26	733	1.9	7.1	2.6	39	838	1.4
923.4	1.7	11	1.0	27	684	1.1	24	1.9	42	782	0.791
924.1	1.6	10	1.2	33	843	2.8	23	2.2	50	964	2.0
924.8	0.815	8.9	1.3	30	989	1.7	12	2.3	45	1131	1.2
925.5	1.4	10	1.7	33	980	2.4	20	3.0	51	1121	1.7
926.2	1.7	13	1.5	33	993	2.3	24	2.8	51	1136	1.6
926.9	1.7	9.4	1.3	32	931	1.5	25	2.4	49	1065	1.1
927.6	0.860	12	1.3	34	1072	1.9	12	2.4	53	1226	1.4
928.3	1.1	10	1.7	35	1137	2.1	16	3.2	54	1300	1.6
929.0	1.4	11	1.5	40	1090	1.5	21	2.7	62	1246	1.1
929.7	1.3	12	1.7	35	1178	1.4	19	3.1	54	1347	1.0
930.4	1.8	11	1.5	37	1092	1.5	26	2.7	57	1249	1.1
931.1	1.3	12	1.3	32	1175	1.7	19	2.3	50	1344	1.3
931.8	2.0	11	2.1	36	1242	1.6	29	3.8	55	1421	1.2
932.5	1.1	12	1.7	40	1171	1.2	16	3.0	61	1339	0.903
933.2	1.1	12	1.5	44	1170	2.1	17	2.7	68	1338	1.6
933.9	1.3	8.6	1.6	36	1242	1.9	19	2.9	56	1420	1.4
934.6	1.7	10	1.6	38	1305	1.6	24	2.8	58	1492	1.2
935.3	1.7	11	1.9	45	1381	1.8	25	3.5	69	1580	1.3
936.0	1.2	12	1.5	45	1126	2.3	18	2.7	69	1288	1.7
936.7	0.596	11	1.3	44	1378	2.2	8.6	2.3	67	1576	1.6
937.4	0.683	11	1.3	43	1370	1.2	9.9	2.3	66	1566	0.901
938.1	1.0	11	1.8	43	1534	1.9	15	3.2	66	1754	1.4
938.8	1.1	15	1.4	42	1323	2.0	17	2.5	64	1513	1.5
939.5	1.7	15	1.0	42	1206	1.9	24	1.9	65	1379	1.4
940.2	1.0	12	1.4	44	1210	1.7	15	2.5	67	1384	1.2
940.8	1.5	11	1.5	37	1123	1.3	22	2.7	57	1284	0.965
941.5	1.6	13	1.3	45	1345	0.970	23	2.3	70	1538	0.708
942.2	0.682	11	1.2	49	1388	1.8	9.8	2.1	74	1587	1.3
942.9	1.2	11	1.5	47	1350	1.5	17	2.7	72	1543	1.1
943.6	0.602	10	1.5	45	1254	1.6	8.7	2.8	70	1434	1.2
944.3	1.3	12	1.6	46	1500	1.8	18	2.8	71	1716	1.3
945.0	1.4	12	1.5	47	1358	1.7	21	2.7	72	1553	1.3
945.7	1.2	14	1.6	47	1247	2.0	18	2.9	72	1426	1.5
946.4	0.838	13	1.2	45	1079	1.2	12	2.3	69	1234	0.901
947.1	1.2	11	1.1	36	1164	2.2	17	2.0	55	1331	1.6
947.8	0.953	12	1.8	45	1315	2.0	14	3.3	70	1504	1.4
948.5	1.5	15	1.5	44	1294	1.8	22	2.7	67	1479	1.3
949.2	0.964	15	1.2	49	1403	1.4	14	2.2	75	1604	1.0
949.9	1.5	14	1.2	44	1303	2.1	21	2.2	67	1490	1.5
950.6	1.4	10	1.2	41	1240	2.4	21	2.3	63	1418	1.8
951.3	1.0	13	1.1	40	1310	2.3	15	2.0	62	1499	1.7
952.0	1.1	9.8	1.5	37	1050	2.7	16	2.7	57	1200	2.0
952.7	1.7	11	1.0	45	1190	1.7	24	1.8	69	1361	1.2
953.4	0.557	11	1.1	38	1204	1.9	8.0	2.0	58	1377	1.4
954.1	1.3	10	1.6	39	1214	1.2	18	2.9	59	1388	0.882
954.8	0.920	13	0.943	41	1324	1.5	13	1.7	63	1514	1.1
955.5	0.490	13	1.2	47	1218	2.8	7.1	2.2	72	1393	2.0
956.2	0.490	13	1.1	42	1119	1.5	7.1	2.0	64	1279	1.1
956.9	0.628	11	0.813	45	1341	1.2	9.1	1.5	68	1534	0.912
957.6	0.490	11	1.0	39	1145	2.2	7.1	1.8	60	1310	1.6
958.3	0.490	12	1.3	37	1069	2.1	7.1	2.4	57	1223	1.5
959.0	0.723	12	0.786	44	1185	2.1	10	1.4	67	1355	1.5
959.7	0.513	11	0.904	41	1090	1.9	7.4	1.6	62	1247	1.4



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.4	0.490	10	1.1	33	1047	1.6	7.1	1.9	51	1197	1.2
961.1	0.490	9.8	0.922	28	1092	1.6	7.1	1.7	43	1248	1.1
961.8	0.490	13	0.795	31	883	1.5	7.1	1.5	47	1010	1.1
962.5	0.490	11	0.758	28	895	1.5	7.1	1.4	43	1024	1.1
963.2	0.490	12	0.911	34	1027	1.2	7.1	1.7	52	1174	0.841
963.9	0.490	11	0.914	35	1113	1.2	7.1	1.7	53	1273	0.862
964.6	0.490	11	0.882	27	974	2.2	7.1	1.6	42	1114	1.6
965.3	0.490	10	0.631	31	999	1.5	7.1	1.2	47	1142	1.1
966.0	0.490	11	0.628	28	918	1.5	7.1	1.1	44	1049	1.1
966.6	0.521	8.1	0.747	29	1035	0.860	7.5	1.4	44	1184	0.628
967.3	0.814	12	0.980	33	1119	1.9	12	1.8	50	1280	1.4
968.0	0.490	10.0	0.550	33	986	3.0	7.1	1.0	50	1127	2.2
968.7	0.490	11	0.623	33	1015	1.9	7.1	1.1	50	1160	1.4
969.4	0.490	11	0.694	34	1035	2.3	7.1	1.3	52	1183	1.7
970.1	0.506	11	0.476	29	1092	1.4	7.3	0.867	45	1249	1.0
970.8	0.490	11	0.635	25	1094	1.4	7.1	1.2	38	1251	1.0
971.5	0.490	11	0.807	31	1132	2.0	7.1	1.5	48	1294	1.4
972.2	0.490	12	0.913	31	1074	2.0	7.1	1.7	47	1228	1.5
972.9	0.490	12	0.449	35	1002	1.2	7.1	0.819	54	1146	0.841
973.6	0.490	12	0.494	29	1209	2.0	7.1	0.901	44	1382	1.5
974.3	0.659	12	0.779	32	1154	1.4	9.5	1.4	49	1319	1.0
975.0	0.490	12	0.777	32	1289	2.1	7.1	1.4	49	1474	1.5
975.7	0.490	13	0.691	31	1132	1.4	7.1	1.3	47	1294	1.0
976.4	0.490	12	0.663	31	1154	2.0	7.1	1.2	48	1320	1.4
977.1	0.524	12	0.730	25	1255	2.2	7.6	1.3	38	1435	1.6
977.8	0.562	12	0.621	30	1338	2.0	8.1	1.1	46	1530	1.4
978.5	0.590	10.0	1.0	29	1371	2.4	8.5	1.8	44	1568	1.7
979.2	0.490	12	0.781	29	1093	2.3	7.1	1.4	45	1250	1.7
979.9	0.490	9.4	0.535	26	1193	1.3	7.1	0.976	39	1364	0.944
980.6	0.490	11	0.915	23	1227	1.6	7.1	1.7	35	1403	1.2
981.3	0.674	11	0.614	23	1236	1.9	9.7	1.1	36	1413	1.4
982.0	0.490	14	0.639	27	1186	2.3	7.1	1.2	42	1356	1.7
982.7	0.490	13	0.486	26	1147	2.3	7.1	0.887	40	1311	1.7
983.4	0.490	9.9	0.724	27	1059	0.926	7.1	1.3	42	1211	0.676
984.1	0.649	12	0.613	27	1250	1.8	9.4	1.1	41	1429	1.3
984.8	1.0	10	0.667	25	1294	2.0	15	1.2	38	1479	1.5
985.5	0.490	13	0.529	27	1258	2.3	7.1	0.965	41	1439	1.7
986.2	0.490	10	0.563	28	1203	1.3	7.1	1.0	43	1375	0.955
986.9	0.490	11	0.583	27	1283	1.6	7.1	1.1	41	1467	1.2
987.6	0.490	11	0.734	23	1205	1.8	7.1	1.3	35	1378	1.3
988.3	0.490	14	0.580	28	1339	1.6	7.1	1.1	42	1531	1.2
989.0	0.490	12	0.369	24	1151	1.8	7.1	0.673	37	1316	1.3
989.7	0.490	11	0.724	24	1146	0.834	7.1	1.3	36	1311	0.608
990.4	0.731	10.0	0.664	23	1055	1.7	11	1.2	35	1207	1.2
991.1	1.0	14	0.569	24	1158	1.8	15	1.0	37	1324	1.3
991.8	0.490	12	0.739	23	1221	2.0	7.1	1.3	35	1397	1.5
992.5	0.493	13	0.746	28	1211	1.9	7.1	1.4	42	1385	1.4
993.1	0.588	9.0	0.521	24	1241	1.4	8.5	0.951	37	1419	0.997
993.8	0.629	13	0.277	25	1385	1.5	9.1	0.506	39	1583	1.1
994.5	0.490	11	0.511	24	1193	2.1	7.1	0.932	36	1365	1.5
995.2	0.490	10	0.833	24	1186	0.883	7.1	1.5	36	1356	0.644
995.9	0.490	10	0.419	24	1119	1.8	7.1	0.765	37	1280	1.3
996.6	0.727	13	0.722	23	1322	1.3	10	1.3	36	1512	0.959
997.3	0.490	10	0.889	25	1337	1.9	7.1	1.6	38	1529	1.4
998.0	1.3	9.5	0.694	26	1336	2.7	19	1.3	40	1527	2.0
998.7	0.490	14	0.666	23	1156	1.6	7.1	1.2	36	1322	1.2
999.4	0.750	13	0.494	30	1195	1.5	11	0.901	46	1367	1.1
1000.1	0.490	13	0.748	22	1130	1.6	7.1	1.4	34	1292	1.2
1000.8	1.1	10	0.855	26	1233	1.6	15	1.6	41	1411	1.2
1001.5	0.490	14	0.760	27	1235	1.7	7.1	1.4	42	1412	1.2
1002.2	0.542	281	0.532	25	1288	1.6	7.8	0.971	38	1473	1.2
1002.9	0.613	10	0.908	29	1254	1.5	8.8	1.7	44	1434	1.1
1003.6	1.3	12	0.747	24	1318	0.886	18	1.4	37	1508	0.646
1004.3	2.3	13	1.1	25	1184	2.4	33	2.0	38	1353	1.7
1005.0	1.1	13	1.2	26	1374	2.2	16	2.3	40	1571	1.6
1005.7	0.647	12	0.911	32	1241	1.8	9.3	1.7	49	1419	1.3
1006.4	1.1	13	0.780	25	1332	2.5	16	1.4	38	1523	1.8
1007.1	1.7	10	1.4	27	1230	1.8	24	2.5	41	1407	1.3
1007.8	1.3	14	1.0	23	1357	1.8	19	1.8	36	1552	1.3
1008.5	1.4	14	0.884	29	1152	2.5	20	1.6	45	1317	1.8
1009.2	1.9	12	0.824	34	1351	1.6	27	1.5	51	1545	1.2
1009.9	1.6	13	1.3	28	1262	2.9	24	2.4	43	1443	2.1
1010.6	1.9	16	1.4	27	1196	2.4	27	2.5	42	1368	1.7
1011.3	1.4	13	0.931	28	1407	1.9	20	1.7	43	1609	1.4
1012.0	1.4	16	1.0	29	1211	1.9	21	1.9	45	1385	1.4
1012.7	1.8	13	1.4	26	1179	2.0	26	2.5	40	1348	1.5
1013.4	1.5	14	1.4	28	1154	1.8	21	2.5	43	1319	1.3
1014.1	1.2	16	1.7	29	1245	2.5	17	3.1	44	1424	1.8
1014.8	2.7	15	1.1	33	1202	2.2	40	1.9	50	1375	1.6
1015.5	1.5	13	1.3	34	990	1.3	21	2.4	53	1132	0.913
1016.2	2.0	16	1.5	24	1165	0.893	29	2.7	36	1332	0.652



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Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1016.9	2.2	15	1.1	25	1150	2.2	31	2.0	39	1315	1.6
1017.6	2.1	12	1.3	27	928	1.3	30	2.3	41	1061	0.960
1018.3	1.3	18	1.3	27	947	1.7	19	2.5	42	1083	1.3
1018.9	2.9	12	1.2	29	1135	2.6	41	2.2	44	1298	1.9
1019.6	1.1	13	1.1	27	1007	2.1	16	2.1	41	1151	1.5
1020.3	1.6	15	1.3	31	1224	2.1	23	2.3	47	1400	1.5
1021.0	1.5	18	2.1	31	1032	1.7	21	3.9	47	1180	1.2
1021.7	1.3	16	2.2	31	1228	1.7	19	4.1	48	1404	1.2
1022.4	1.6	15	1.5	28	1112	2.3	24	2.7	43	1272	1.6
1023.1	2.3	14	2.0	29	1108	2.4	33	3.6	45	1267	1.8
1023.8	2.7	14	1.9	26	977	1.6	39	3.5	41	1117	1.2
1024.5	2.2	14	1.6	25	1204	2.6	32	3.0	38	1376	1.9
1025.2	2.5	14	1.7	28	1093	3.1	37	3.0	43	1250	2.3
1025.9	2.1	15	1.3	25	1071	1.7	30	2.3	38	1225	1.3
1026.6	2.1	10	0.938	22	803	1.5	30	1.7	33	918	1.1
1027.3	1.4	13	1.8	25	1106	2.6	20	3.2	39	1265	1.9
1028.0	3.0	17	1.5	30	1205	2.7	43	2.8	46	1378	1.9
1028.7	1.9	17	1.5	25	961	2.6	27	2.8	38	1099	1.9
1029.4	1.8	14	1.4	23	1031	1.4	26	2.5	35	1179	1.0
1030.1	1.9	11	1.2	26	1033	2.2	27	2.1	41	1181	1.6
1030.8	2.8	13	1.7	28	1309	3.0	41	3.1	43	1497	2.2
1031.5	2.3	16	1.3	24	1032	2.3	33	2.4	37	1180	1.7
1032.2	1.7	13	1.5	32	1050	3.0	25	2.7	48	1201	2.2
1032.9	1.2	15	1.3	27	1148	1.9	17	2.4	41	1312	1.4
1033.6	2.0	14	1.7	22	1002	1.6	29	3.0	34	1146	1.1
1034.3	1.7	14	1.5	26	1105	2.8	25	2.7	40	1264	2.0
1035.0	2.1	15	1.6	27	1041	1.3	31	2.9	42	1190	0.933
1035.7	1.6	15	1.6	26	1027	2.2	24	2.9	41	1174	1.6
1036.4	1.5	19	1.3	27	1134	2.9	22	2.5	41	1297	2.1
1037.1	1.7	13	1.6	26	1121	2.0	25	2.9	40	1282	1.5
1037.8	1.5	16	1.3	34	1171	1.4	22	2.4	52	1339	1.0
1038.5	1.3	16	0.933	27	1229	1.5	19	1.7	41	1405	1.1
1039.2	1.5	13	1.2	26	1125	2.5	22	2.2	40	1287	1.8
1039.9	0.907	16	1.4	27	1154	2.7	13	2.5	42	1320	2.0
1040.6	0.894	15	0.767	20	954	1.5	13	1.4	30	1091	1.1
1041.3	0.930	13	0.654	24	1075	1.6	13	1.2	37	1229	1.1
1042.0	0.506	12	1.0	24	1079	2.4	7.3	1.9	37	1234	1.8
1042.7	0.968	13	0.811	22	1015	1.3	14	1.5	34	1160	0.928
1043.4	0.931	14	1.1	24	992	1.3	13	2.0	37	1134	0.943
1044.1	0.898	16	0.943	27	1092	2.0	13	1.7	41	1249	1.5
1044.8	0.524	13	0.730	22	931	1.3	7.6	1.3	34	1065	0.983
1045.4	0.661	14	0.400	24	965	1.6	9.5	0.729	38	1104	1.2
1046.1	0.615	12	0.581	26	858	1.7	8.9	1.1	39	981	1.2
1046.8	0.490	13	0.511	22	985	1.5	7.1	0.931	34	1126	1.1
1047.5	0.858	15	0.964	24	1035	2.0	12	1.8	37	1183	1.4
1048.2	0.738	15	0.891	24	942	1.8	11	1.6	37	1077	1.3
1048.9	1.0	16	0.688	25	884	2.2	15	1.3	39	1011	1.6
1049.6	1.2	14	0.844	20	947	2.3	17	1.5	31	1083	1.7
1050.3	1.2	12	1.2	20	847	1.2	17	2.2	31	969	0.887
1051.0	1.9	12	1.2	24	915	1.1	27	2.1	37	1046	0.809
1051.7	2.0	13	0.807	26	955	1.7	29	1.5	41	1092	1.2
1052.4	0.916	12	0.824	16	828	2.0	13	1.5	25	947	1.4
1053.1	1.8	14	0.750	20	1086	2.0	26	1.4	30	1242	1.4
1053.8	1.3	18	0.942	22	1105	1.9	19	1.7	34	1264	1.4
1054.5	2.1	16	1.5	20	1067	1.9	30	2.7	31	1220	1.4
1055.2	1.5	17	1.4	26	1121	1.9	22	2.5	40	1282	1.4
1055.9	1.9	15	1.1	21	1010	1.9	27	2.0	32	1155	1.4
1056.6	1.3	14	1.1	18	1113	1.8	19	2.0	27	1272	1.3
1057.3	1.9	17	1.1	21	1288	1.3	27	2.1	32	1472	0.953
1058.0	2.3	17	1.1	22	1237	1.9	34	1.9	34	1415	1.4
1058.7	1.6	17	0.922	19	1258	2.2	24	1.7	29	1438	1.6
1059.4	1.4	14	1.0	18	1209	1.8	20	1.8	28	1382	1.3
1060.1	1.9	15	1.4	20	1360	1.3	27	2.6	31	1555	0.972
1060.8	0.842	15	1.0	19	1191	2.0	12	1.8	30	1362	1.5
1061.5	1.4	15	1.0	21	1070	2.0	20	1.9	32	1223	1.5
1062.2	1.6	13	1.1	17	1213	2.6	23	2.1	27	1387	1.9
1062.9	0.730	16	1.1	18	1156	2.1	11	1.9	28	1322	1.5
1063.6	1.6	16	1.1	19	1287	2.6	23	2.1	29	1472	1.9
1064.3	1.3	20	0.939	17	1335	2.4	18	1.7	26	1526	1.8
1065.0	1.2	17	1.4	18	1226	2.9	17	2.5	27	1402	2.1
1065.7	1.3	18	0.856	20	1214	2.2	19	1.6	31	1388	1.6
1066.4	2.2	17	0.900	17	1332	2.5	32	1.6	26	1523	1.8
1067.1	1.7	16	1.1	17	1520	2.2	25	2.0	26	1738	1.6
1067.8	1.3	20	1.4	16	1128	2.5	19	2.5	25	1289	1.8
1068.5	1.5	20	1.3	21	1267	2.3	22	2.4	33	1449	1.7
1069.2	1.6	17	1.0	16	1257	1.6	23	1.9	25	1437	1.2
1069.9	1.5	19	0.971	17	1235	2.5	22	1.8	26	1412	1.8
1070.6	1.5	20	0.830	20	1300	1.9	22	1.5	30	1487	1.4
1071.3	0.859	21	1.1	22	1432	2.1	12	2.1	34	1637	1.5
1071.9	1.3	20	1.5	18	1236	2.6	18	2.8	27	1413	1.9
1072.6	1.3	18	1.5	19	1318	2.4	19	2.7	29	1507	1.8



Minnow Environmental  
Sample ID: 012

Parameter DL (ppm) Length (µm)	7Li 0.490	24Mg 0.362	55Mn 0.079	66Zn 0.534	88Sr 0.003	137Ba 0.007	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.3	1.5	17	1.4	20	1271	2.4	22	2.6	31	1454	1.8
1074.0	1.3	21	1.2	18	1335	2.1	19	2.2	27	1527	1.5
1074.7	1.1	22	1.2	17	1338	1.3	15	2.2	26	1530	0.914
1075.4	1.2	17	1.3	19	1320	2.0	17	2.4	29	1510	1.5
1076.1	2.3	15	1.2	25	1480	2.7	33	2.1	38	1693	2.0
1076.8	1.5	19	1.6	18	1374	2.6	22	3.0	27	1572	1.9
1077.5	1.9	21	1.4	19	1393	1.6	28	2.5	29	1593	1.2
1078.2	1.4	23	1.5	20	1344	2.5	21	2.7	31	1537	1.8
1078.9	2.4	20	1.5	19	1385	2.6	35	2.7	29	1584	1.9
1079.6	1.2	23	1.2	21	1418	2.9	18	2.2	32	1621	2.1
1080.3	1.3	23	1.6	21	1416	2.7	18	3.0	32	1619	2.0
1081.0	1.8	24	1.5	19	1283	2.2	26	2.8	30	1467	1.6
1081.7	1.2	23	1.5	20	1392	2.6	17	2.8	31	1592	1.9
1082.4	1.3	21	1.4	19	1396	2.3	19	2.6	30	1596	1.7
1083.1	1.3	21	1.0	18	1284	2.3	19	1.9	28	1469	1.7
1083.8	0.719	21	1.3	18	1283	2.2	10	2.3	28	1467	1.6
1084.5	0.703	23	1.5	15	1256	1.7	10	2.8	23	1437	1.2
1085.2	0.837	23	1.1	18	1241	1.8	12	2.0	27	1419	1.3
1085.9	0.809	20	1.4	17	1297	2.4	12	2.5	26	1483	1.8
1086.6	0.490	19	1.3	18	1333	2.8	7.1	2.3	27	1524	2.0
1087.3	0.490	24	1.1	18	1303	2.0	7.1	2.1	28	1490	1.5
1088.0	0.490	24	0.874	19	1315	2.1	7.1	1.6	29	1504	1.5
1088.7	0.716	23	1.1	21	1425	1.8	10	1.9	33	1629	1.3
1089.4	0.490	23	1.2	17	1238	1.8	7.1	2.3	25	1416	1.3
1090.1	0.490	18	0.863	14	1169	2.8	7.1	1.6	22	1337	2.0
1090.8	0.490	20	0.890	15	1338	2.7	7.1	1.6	23	1531	2.0
1091.5	0.490	25	0.903	15	1211	3.2	7.1	1.6	23	1385	2.3
1092.2	0.490	29	0.976	14	1113	1.3	7.1	1.8	22	1273	0.939
1092.9	0.490	25	0.722	11	1138	1.5	7.1	1.3	17	1301	1.1
1093.6	0.490	29	0.881	11	1051	2.5	7.1	1.6	16	1202	1.8
1094.3	0.490	38	0.818	15	1178	2.4	7.1	1.5	22	1347	1.8
1095.0	0.490	37	0.694	13	1030	2.4	7.1	1.3	20	1178	1.7
1095.7	0.490	39	0.894	16	1179	2.6	7.1	1.6	25	1348	1.9
1096.4	0.490	39	0.946	12	1080	2.0	7.1	1.7	18	1235	1.5
1097.1	0.490	42	1.2	12	1072	2.2	7.1	2.1	18	1225	1.6
1097.8	0.490	88	0.822	13	1142	1.4	7.1	1.5	19	1306	1.0
1098.4	0.586	80	1.1	11	1041	1.9	8.5	1.9	17	1190	1.4
1099.1	0.490	76	1.3	12	921	1.5	7.1	2.3	18	1054	1.1
1099.8	0.584	75	1.3	12	888	1.9	8.4	2.3	19	1016	1.4
1100.5	0.490	76	1.3	11	926	2.4	7.1	2.4	17	1059	1.7
1101.2	0.490	92	1.1	14	898	2.3	7.1	2.0	21	1026	1.7
1101.9	0.490	105	1.1	17	983	2.8	7.1	2.0	26	1124	2.0
1102.6	0.490	99	1.2	13	943	2.1	7.1	2.2	20	1079	1.5
1103.3	0.490	86	1.2	9.7	873	1.3	7.1	2.2	15	999	0.960
1104.0	0.490	89	1.1	15	839	1.5	7.1	2.1	22	960	1.1
1104.7	0.490	93	1.2	13	907	2.4	7.1	2.2	21	1037	1.7
1105.4	0.490	93	1.2	16	852	1.1	7.1	2.1	25	974	0.810
1106.1	0.490	87	0.945	12	799	1.9	7.1	1.7	19	914	1.4
1106.8	0.495	83	0.995	12	826	1.5	7.1	1.8	18	944	1.1
1107.5	0.490	76	0.830	12	777	1.4	7.1	1.5	18	888	1.0
1108.2	0.490	70	0.694	9.8	752	1.6	7.1	1.3	15	860	1.1
1108.9	0.490	58	0.301	9.9	754	1.2	7.1	0.550	15	863	0.859
1109.6	0.490	46	0.381	8.9	689	1.0	7.1	0.694	14	787	0.749
1110.3	0.490	40	0.409	7.7	672	1.3	7.1	0.747	12	769	0.977
1111.0	0.490	52	0.393	8.2	749	1.3	7.1	0.718	13	856	0.952
1111.7	0.490	39	0.559	9.1	724	1.1	7.1	1.0	14	828	0.775
1112.4	0.742	35	0.475	6.3	746	1.2	11	0.866	9.6	854	0.908
1113.1	0.490	33	0.217	8.0	765	1.4	7.1	0.395	12	875	1.0
1113.8	0.490	28	0.284	5.5	607	1.5	7.1	0.518	8.4	694	1.1
1114.5	0.490	31	0.406	5.0	760	0.643	7.1	0.740	7.6	869	0.469
1115.2	0.490	30	0.313	4.5	711	0.705	7.1	0.572	7.0	813	0.515
1115.9	0.490	28	0.203	6.7	695	1.7	7.1	0.371	10	795	1.3
1116.6	0.490	27	0.378	4.6	570	0.625	7.1	0.690	7.1	652	0.456
1117.3	0.490	32	0.381	3.9	713	0.604	7.1	0.695	5.9	815	0.441
1118.0	0.587	46	0.455	5.4	670	1.1	8.5	0.830	8.3	766	0.786
1118.7	0.490	37	0.211	5.9	692	0.744	7.1	0.385	9.1	791	0.543
1119.4	0.490	37	0.291	5.1	667	1.3	7.1	0.531	7.8	763	0.959
1120.1	0.490	39	0.339	6.0	696	0.858	7.1	0.619	9.2	796	0.626
1120.8	0.541	58	0.580	3.5	628	0.627	7.8	1.1	5.4	718	0.457
1121.5	0.490	93	0.698	7.3	634	0.977	7.1	1.3	11	725	0.713
1122.2	0.490	153	0.924	7.7	600	1.3	7.1	1.7	12	686	0.930
1122.9	0.817	202	1.5	9.0	471	0.629	12	2.7	14	539	0.459
1123.6	0.490	209	1.6	12	618	0.863	7.1	2.9	18	706	0.630
1124.3	0.528	238	1.8	12	620	1.3	7.6	3.2	18	709	0.935
1124.9	0.618	233	1.4	9.2	491	0.378	8.9	2.6	14	562	0.276
1125.6	0.838	350	1.8	12	579	1.1	12	3.3	18	662	0.784
1126.3	1.1	396	2.6	13	444	1.3	15	4.7	20	507	0.929
1127.0	0.615	379	3.3	14	653	0.782	8.9	5.9	21	747	0.570
1127.7	1.7	386	2.7	17	552	1.1	24	4.9	26	631	0.775
1128.4	1.6	399	3.7	22	426	0.867	23	6.8	33	487	0.633
1129.1	2.5	438	5.0	19	393	2.1	36	9.2	28	450	1.5



Minnow Environmental  
Sample ID: 012

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.490	0.362	0.079	0.534	0.003	0.007					
Length (µm)											
1129.8	1.9	575	6.4	101	629	1.2	28	12	154	719	0.853
1130.5	1.7	530	5.2	20	607	0.792	25	9.5	31	694	0.578
1131.2	1.7	592	6.2	15	598	1.3	24	11	23	684	0.968
1131.9	0.681	410	2.8	17	465	0.682	9.8	5.1	27	532	0.497
1132.6	1.1	662	6.4	33	797	1.6	15	12	50	911	1.2
1133.3	2.5	687	6.3	42	515	0.651	36	12	65	589	0.475
1134.0	1.3	559	5.7	27	422	0.007	19	10	41	482	0.005
1134.7	3.9	655	7.3	47	458	0.007	56	13	72	523	0.005



Minnow Environmental  
Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
0.1	2.9	49	2.5	20	344	2.5	41	4.6	31	393	1.8
0.8	3.0	48	2.3	18	352	2.9	43	4.1	28	403	2.1
1.5	2.3	47	2.6	18	315	2.8	34	4.8	27	360	2.1
2.2	2.7	53	1.9	19	367	2.6	39	3.5	29	419	1.9
2.9	2.2	46	2.1	19	311	2.9	32	3.8	30	356	2.1
3.6	3.0	49	1.9	18	346	3.1	43	3.4	28	396	2.2
4.3	2.8	45	2.0	19	313	1.8	41	3.6	29	358	1.3
5.0	3.2	47	1.8	19	328	2.2	46	3.2	29	375	1.6
5.7	2.6	49	2.4	21	346	2.3	37	4.3	32	396	1.7
6.4	2.5	46	1.8	20	353	2.9	37	3.3	31	404	2.1
7.1	2.5	46	2.1	18	323	3.2	37	3.8	28	369	2.3
7.8	2.5	51	2.0	19	318	2.0	36	3.6	29	364	1.5
8.5	2.0	48	1.9	22	331	2.4	29	3.5	34	378	1.8
9.2	2.1	41	1.5	19	310	2.8	31	2.7	29	354	2.0
9.9	1.9	45	2.1	18	305	1.9	28	3.8	28	349	1.4
10.6	2.9	48	2.2	21	354	2.4	42	4.0	32	404	1.8
11.3	2.6	45	1.9	19	329	2.9	38	3.5	30	376	2.1
12.0	2.4	45	2.0	19	316	3.5	34	3.7	30	361	2.5
12.7	2.2	46	2.1	24	370	2.9	32	3.9	37	423	2.1
13.4	2.1	42	1.6	24	287	2.6	30	3.0	37	328	1.9
14.1	2.4	37	1.6	20	277	2.2	35	3.0	31	317	1.6
14.8	2.4	47	2.0	22	336	2.4	34	3.6	34	384	1.7
15.4	2.4	39	1.8	20	317	3.1	34	3.3	30	362	2.2
16.1	2.9	45	1.9	24	346	2.2	42	3.5	36	395	1.6
16.8	2.5	44	1.8	22	329	1.9	37	3.4	34	376	1.4
17.5	2.8	41	1.6	23	282	2.4	40	3.0	35	323	1.8
18.2	2.5	35	1.4	21	274	2.2	36	2.6	32	314	1.6
18.9	2.2	36	2.3	25	301	2.2	31	4.2	38	344	1.6
19.6	2.4	41	2.2	21	323	2.3	34	3.9	32	369	1.7
20.3	3.0	39	1.5	23	329	2.7	44	2.8	35	376	2.0
21.0	3.0	41	1.9	22	291	2.3	43	3.4	34	333	1.7
21.7	2.7	43	2.0	25	288	2.6	39	3.6	38	329	1.9
22.4	2.0	39	1.9	26	308	2.9	28	3.4	39	352	2.1
23.1	2.6	43	1.4	24	304	2.8	38	2.6	37	348	2.0
23.8	2.0	38	1.6	25	334	2.3	29	3.0	39	382	1.7
24.5	2.1	36	1.4	23	289	3.2	30	2.5	35	331	2.3
25.2	1.9	33	1.3	23	282	2.6	28	2.4	36	323	1.9
25.9	2.3	37	1.6	24	338	2.1	33	2.9	37	386	1.5
26.6	3.1	36	1.6	25	321	3.7	44	2.9	38	367	2.7
27.3	2.8	33	1.6	24	292	2.2	41	3.0	37	334	1.6
28.0	2.6	37	1.6	25	294	4.3	37	2.8	39	337	3.1
28.7	2.3	39	1.7	28	300	2.6	33	3.1	44	344	1.9
29.4	2.4	33	1.4	26	303	4.7	35	2.5	40	347	3.4
30.1	1.5	32	1.1	22	269	3.9	22	2.1	34	308	2.8
30.8	2.4	35	1.4	28	340	5.3	35	2.6	43	389	3.8
31.5	2.4	32	1.5	26	273	5.1	34	2.7	40	312	3.7
32.2	2.7	35	1.7	29	296	5.3	39	3.0	45	339	3.9
32.9	2.2	33	1.5	31	297	8.1	31	2.7	47	339	5.9
33.6	2.6	37	1.6	29	272	5.7	37	2.9	44	311	4.2
34.3	2.5	33	2.0	30	302	7.2	36	3.7	46	346	5.3
35.0	1.8	34	1.5	27	283	4.9	25	2.8	41	324	3.6
35.7	1.7	29	1.4	31	308	6.0	25	2.5	47	352	4.4
36.4	2.4	34	1.4	31	290	5.0	35	2.6	47	332	3.6
37.1	2.2	29	1.4	27	249	5.3	31	2.5	41	285	3.9
37.8	1.6	28	1.5	28	224	3.6	23	2.7	43	256	2.6
38.5	2.8	34	1.7	28	254	7.5	41	3.0	43	290	5.4
39.2	1.7	31	1.3	31	241	6.3	24	2.3	47	276	4.6
39.9	2.5	30	1.1	29	274	7.5	36	1.9	44	313	5.4
40.6	2.2	31	1.3	31	270	6.2	32	2.4	47	308	4.5
41.2	1.6	27	1.7	29	233	5.9	24	3.2	44	266	4.3
41.9	1.9	33	1.5	35	248	7.9	27	2.8	53	284	5.8
42.6	2.3	30	1.4	35	278	7.7	33	2.6	54	317	5.6
43.3	2.1	29	1.6	37	256	6.8	30	2.8	57	292	4.9
44.0	1.3	30	1.6	35	263	6.2	19	2.9	53	300	4.5
44.7	2.0	32	1.7	32	253	8.1	28	3.1	48	290	5.9
45.4	2.1	34	1.9	38	258	8.4	31	3.5	59	295	6.1
46.1	1.7	32	1.4	37	284	7.7	25	2.5	57	325	5.6
46.8	1.8	26	1.1	33	230	7.0	27	2.0	51	263	5.1
47.5	2.1	27	1.5	34	251	8.2	30	2.8	52	287	6.0
48.2	1.6	34	2.0	40	273	9.0	23	3.6	61	312	6.5
48.9	1.8	35	1.8	44	309	7.1	25	3.2	68	354	5.2
49.6	1.7	30	1.7	41	254	8.2	24	3.0	63	290	6.0
50.3	2.4	27	1.8	38	252	6.0	35	3.2	59	288	4.4
51.0	1.6	31	1.7	42	247	8.1	24	3.1	64	283	5.9
51.7	1.2	32	1.7	45	276	7.7	17	3.0	69	315	5.6
52.4	1.8	31	1.9	47	245	8.8	26	3.4	72	280	6.4
53.1	2.3	32	2.7	46	285	9.1	33	4.9	71	325	6.6
53.8	1.0	32	1.6	41	238	8.9	15	3.0	62	272	6.5
54.5	2.8	32	2.3	45	270	7.4	41	4.3	69	309	5.4
55.2	1.3	35	1.8	47	244	11	19	3.2	72	279	7.7
55.9	1.5	29	1.7	50	275	7.7	21	3.1	76	315	5.6



Minnow Environmental  
Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
56.6	2.0	27	1.6	43	251	7.0	29	2.9	66	287	5.1
57.3	1.2	27	1.9	42	214	6.5	18	3.5	65	245	4.7
58.0	1.7	27	1.8	50	247	7.5	25	3.3	77	283	5.5
58.7	1.7	28	1.6	44	260	9.1	25	2.9	67	298	6.6
59.4	2.0	27	1.9	54	275	9.1	29	3.4	83	315	6.7
60.1	1.3	25	1.6	44	233	7.9	18	2.9	68	266	5.7
60.8	1.5	30	1.7	45	258	7.2	22	3.1	69	295	5.2
61.5	1.5	26	1.9	46	224	7.1	21	3.5	70	257	5.2
62.2	1.5	28	1.4	52	233	8.4	21	2.6	80	267	6.2
62.9	1.4	27	1.5	48	226	8.7	20	2.7	74	259	6.3
63.6	1.3	24	2.0	44	237	9.2	18	3.6	68	271	6.7
64.3	1.5	27	1.9	51	241	8.9	22	3.5	77	276	6.5
65.0	2.1	25	2.1	46	222	11	31	3.9	71	254	8.0
65.7	1.0	27	1.9	47	214	7.3	15	3.5	71	245	5.3
66.4	1.8	25	1.9	49	242	9.3	27	3.5	75	277	6.8
67.1	0.731	24	2.1	56	209	9.1	11	3.8	87	239	6.6
67.7	1.1	27	2.0	55	229	13	16	3.6	84	262	9.3
68.4	1.8	25	2.1	63	247	10	26	3.8	97	283	7.4
69.1	0.903	22	1.5	39	188	9.1	13	2.7	60	215	6.6
69.8	1.8	24	1.6	56	234	10.0	27	3.0	85	268	7.3
70.5	1.5	28	1.9	55	246	9.9	22	3.4	85	282	7.2
71.2	1.3	28	2.2	62	232	9.9	19	4.1	95	265	7.2
71.9	1.0	26	1.8	57	223	9.1	14	3.4	88	255	6.7
72.6	1.6	27	1.7	56	199	8.6	23	3.1	85	227	6.3
73.3	1.3	29	2.0	58	217	9.3	19	3.6	89	248	6.8
74.0	1.4	25	1.6	53	227	9.1	20	2.9	81	260	6.7
74.7	1.6	31	1.8	51	192	9.3	22	3.2	79	219	6.8
75.4	1.0	23	2.1	57	190	7.0	15	3.8	87	217	5.1
76.1	0.659	24	2.2	56	214	8.9	9.5	4.0	85	244	6.5
76.8	1.1	26	1.9	63	218	9.7	16	3.5	97	250	7.1
77.5	1.1	27	1.7	61	204	9.2	16	3.2	94	233	6.7
78.2	0.857	27	2.4	65	216	8.1	12	4.3	99	247	5.9
78.9	1.2	28	2.3	58	184	7.6	17	4.1	89	211	5.5
79.6	1.3	25	2.3	68	206	10	19	4.2	104	236	7.5
80.3	0.777	26	2.5	65	223	9.3	11	4.6	99	256	6.8
81.0	0.755	24	1.8	67	198	10	11	3.2	103	226	7.3
81.7	1.3	29	2.4	65	208	8.7	19	4.4	100	238	6.4
82.4	0.926	22	2.2	61	194	7.7	13	4.0	94	222	5.6
83.1	1.2	23	2.6	56	201	9.7	17	4.7	86	229	7.1
83.8	0.837	28	2.4	64	194	8.6	12	4.4	97	221	6.3
84.5	1.2	24	2.3	61	196	8.3	17	4.1	93	224	6.1
85.2	1.2	28	2.7	61	217	11	17	4.9	94	249	7.8
85.9	1.3	22	2.7	58	200	7.9	19	4.8	89	229	5.8
86.6	0.607	25	2.4	59	205	9.6	8.8	4.4	91	234	7.0
87.3	0.604	24	2.6	63	214	11	8.7	4.8	96	245	7.8
88.0	0.611	27	2.5	65	186	9.1	8.8	4.6	100	212	6.6
88.7	0.784	25	2.0	60	201	8.6	11	3.7	92	230	6.3
89.4	0.643	25	2.7	66	214	12	9.3	4.9	101	244	8.6
90.1	1.0	25	2.6	62	184	7.6	15	4.7	96	210	5.6
90.8	0.513	24	2.4	59	191	11	7.4	4.4	91	219	8.3
91.5	0.967	25	2.4	73	195	11	14	4.4	112	224	8.0
92.2	1.1	24	2.1	64	204	12	15	3.9	98	233	8.8
92.9	0.722	26	2.5	63	256	11	10	4.6	96	293	7.8
93.5	0.864	27	2.0	61	199	9.9	12	3.7	94	228	7.2
94.2	1.0	25	2.2	61	170	8.7	15	4.0	93	195	6.3
94.9	0.555	26	2.7	64	182	8.9	8.0	4.8	97	209	6.5
95.6	0.542	24	2.6	69	195	9.8	7.8	4.7	105	223	7.2
96.3	0.585	27	2.6	61	203	9.9	8.4	4.8	94	232	7.2
97.0	0.513	23	2.0	66	206	9.3	7.4	3.6	101	236	6.8
97.7	1.4	23	2.8	73	195	10	20	5.1	112	223	7.6
98.4	0.702	26	2.1	69	201	9.8	10	3.8	106	229	7.2
99.1	0.513	24	2.9	70	189	8.2	7.4	5.3	108	216	6.0
99.8	1.1	22	2.4	61	205	8.8	16	4.4	93	234	6.4
100.5	1.4	28	3.0	74	211	8.0	20	5.5	113	241	5.9
101.2	0.975	25	2.6	65	196	9.3	14	4.7	100	224	6.8
101.9	0.845	24	2.6	70	182	7.9	12	4.8	107	208	5.8
102.6	0.513	23	2.6	70	208	8.6	7.4	4.7	108	238	6.2
103.3	1.6	25	2.1	69	190	9.2	23	3.9	105	218	6.7
104.0	0.973	25	2.3	64	187	8.7	14	4.1	99	214	6.3
104.7	0.513	29	2.6	70	194	9.4	7.4	4.8	108	222	6.8
105.4	1.2	26	2.6	63	176	9.4	17	4.7	97	201	6.9
106.1	0.852	23	2.6	70	189	10	12	4.8	107	216	7.3
106.8	1.2	25	2.3	73	186	7.4	17	4.1	112	213	5.4
107.5	0.820	26	2.5	79	194	8.1	12	4.5	122	222	5.9
108.2	0.845	27	2.6	69	186	7.4	12	4.7	106	213	5.4
108.9	0.736	22	2.3	66	188	10.0	11	4.1	101	215	7.3
109.6	0.744	21	2.3	70	170	6.4	11	4.1	108	195	4.6
110.3	0.824	25	2.5	65	185	6.8	12	4.6	100	211	4.9
111.0	0.551	24	2.7	71	176	8.7	8.0	4.9	109	201	6.4
111.7	0.513	25	3.2	69	170	7.6	7.4	5.8	106	195	5.6
112.4	1.1	24	2.5	68	184	7.0	16	4.6	104	210	5.1



Minnow Environmental  
Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.1	0.654	25	2.3	71	170	6.6	9.4	4.2	108	194	4.8
113.8	1.6	25	2.3	66	168	6.3	23	4.3	101	192	4.6
114.5	0.588	26	2.9	64	178	6.8	8.5	5.3	98	204	5.0
115.2	1.2	25	2.6	67	196	6.9	17	4.8	103	224	5.1
115.9	0.513	24	2.5	64	151	6.7	7.4	4.6	98	172	4.9
116.6	1.2	22	2.2	59	180	6.5	18	4.0	91	206	4.7
117.3	0.534	24	2.2	69	182	7.0	7.7	4.1	105	208	5.1
118.0	1.3	25	2.9	67	189	5.8	19	5.2	103	216	4.2
118.7	0.968	28	3.2	70	200	6.5	14	5.8	107	229	4.7
119.3	0.592	25	2.3	63	195	5.7	8.5	4.3	96	223	4.2
120.0	0.697	24	2.3	63	172	6.7	10	4.3	97	197	4.9
120.7	0.993	28	2.6	61	200	6.4	14	4.7	93	229	4.7
121.4	0.513	22	2.5	73	189	5.2	7.4	4.5	111	216	3.8
122.1	1.0	29	2.1	72	207	6.4	14	3.8	110	237	4.6
122.8	0.513	25	2.4	64	200	5.2	7.4	4.3	98	228	3.8
123.5	0.513	23	2.5	64	156	4.1	7.4	4.6	99	179	3.0
124.2	0.543	27	2.4	62	174	5.4	7.8	4.5	95	199	3.9
124.9	0.652	26	2.6	69	195	3.8	9.4	4.7	106	223	2.7
125.6	0.687	25	2.3	57	168	3.9	9.9	4.1	88	192	2.9
126.3	0.614	21	2.3	58	161	4.5	8.9	4.2	89	184	3.3
127.0	0.513	28	2.3	62	185	5.0	7.4	4.1	94	212	3.6
127.7	0.513	27	2.0	66	160	5.3	7.4	3.7	101	183	3.9
128.4	0.971	26	2.1	76	183	5.5	14	3.8	116	209	4.0
129.1	0.513	26	2.4	62	186	5.6	7.4	4.5	95	212	4.0
129.8	0.513	26	2.1	65	157	5.1	7.4	3.8	100	180	3.7
130.5	0.513	25	2.6	69	173	3.8	7.4	4.7	106	197	2.8
131.2	0.513	23	2.3	70	168	5.8	7.4	4.2	108	192	4.2
131.9	1.2	23	2.4	69	167	4.1	17	4.3	106	191	3.0
132.6	0.859	26	2.1	63	170	5.4	12	3.8	96	194	3.9
133.3	0.775	26	2.7	59	169	4.7	11	4.9	90	193	3.4
134.0	0.617	24	2.3	70	160	4.3	8.9	4.2	107	183	3.2
134.7	0.899	21	2.4	71	178	4.8	13	4.4	109	204	3.5
135.4	0.663	24	2.1	57	169	4.7	9.6	3.8	87	193	3.5
136.1	0.625	28	2.0	70	169	6.1	9.0	3.6	107	193	4.5
136.8	0.728	27	1.8	58	156	4.9	11	3.3	88	179	3.6
137.5	0.583	24	2.4	64	146	5.7	8.4	4.3	97	168	4.2
138.2	0.896	22	2.7	62	169	4.4	13	4.9	95	193	3.2
138.9	0.626	23	2.4	72	185	5.2	9.0	4.4	111	211	3.8
139.6	0.870	25	2.0	75	195	5.5	13	3.7	114	223	4.0
140.3	0.513	27	2.3	65	158	3.8	7.4	4.3	99	180	2.8
141.0	0.513	24	2.1	60	157	4.1	7.4	3.9	93	180	3.0
141.7	0.751	24	1.9	59	169	2.1	11	3.4	91	193	1.5
142.4	0.640	22	2.0	57	168	4.6	9.2	3.7	88	192	3.3
143.1	0.890	24	1.9	64	185	5.0	13	3.4	98	211	3.6
143.8	0.513	26	2.2	67	183	4.9	7.4	4.0	103	209	3.6
144.5	0.513	24	2.0	67	162	5.0	7.4	3.6	102	186	3.6
145.2	0.513	25	2.2	67	168	5.9	7.4	3.9	103	192	4.3
145.8	0.513	26	1.9	64	190	4.5	7.4	3.5	98	218	3.3
146.5	0.553	24	1.8	61	163	3.8	8.0	3.3	93	186	2.7
147.2	0.582	26	2.0	67	164	4.9	8.4	3.7	103	188	3.6
147.9	0.513	27	2.2	66	171	5.3	7.4	3.9	101	195	3.9
148.6	0.513	24	2.2	55	160	4.1	7.4	4.0	85	183	3.0
149.3	0.513	25	1.6	64	152	4.2	7.4	2.9	98	174	3.1
150.0	1.3	25	2.0	65	165	4.8	19	3.6	99	189	3.5
150.7	0.571	23	2.0	57	147	3.2	8.2	3.6	88	169	2.3
151.4	0.578	26	2.0	59	163	3.8	8.3	3.6	91	186	2.7
152.1	1.0	24	1.4	57	155	4.5	15	2.6	87	177	3.3
152.8	0.747	30	2.0	53	160	4.8	11	3.7	81	183	3.5
153.5	0.542	25	1.5	60	158	4.2	7.8	2.8	93	181	3.1
154.2	0.513	25	1.8	58	161	3.8	7.4	3.3	88	184	2.7
154.9	0.832	23	2.1	52	166	3.4	12	3.9	80	190	2.5
155.6	0.513	21	1.8	56	183	4.5	7.4	3.3	86	209	3.3
156.3	0.588	24	1.8	61	164	4.2	8.5	3.3	93	187	3.1
157.0	0.513	27	2.0	72	171	4.7	7.4	3.7	110	195	3.5
157.7	0.513	24	1.5	60	146	3.9	7.4	2.7	93	167	2.9
158.4	1.0	24	1.7	66	167	4.0	15	3.1	101	191	2.9
159.1	0.650	21	1.9	51	145	3.9	9.4	3.5	78	166	2.9
159.8	0.647	21	2.2	54	185	4.8	9.3	4.0	83	212	3.5
160.5	0.513	22	1.5	55	156	4.5	7.4	2.8	84	178	3.3
161.2	0.603	23	1.8	63	168	4.3	8.7	3.4	96	192	3.2
161.9	0.513	23	1.8	52	151	4.2	7.4	3.3	80	172	3.1
162.6	0.513	20	1.8	54	124	3.3	7.4	3.2	83	142	2.4
163.3	0.513	24	1.9	60	161	5.0	7.4	3.4	91	184	3.7
164.0	0.513	19	1.6	50	136	4.7	7.4	2.9	76	156	3.4
164.7	0.513	21	1.6	59	157	3.7	7.4	2.9	90	180	2.7
165.4	0.571	22	1.5	56	162	3.8	8.2	2.7	85	186	2.8
166.1	0.659	21	1.5	53	147	3.4	9.5	2.8	81	169	2.5
166.8	0.513	22	1.6	55	151	3.3	7.4	2.9	84	173	2.4
167.5	0.513	22	1.7	52	151	4.4	7.4	3.1	79	173	3.2
168.2	0.513	21	1.7	55	148	4.4	7.4	3.1	85	169	3.2
168.9	0.513	20	1.3	51	142	4.3	7.4	2.4	78	162	3.1



Minnow Environmental  
Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
169.6	0.513	24	1.6	54	158	4.8	7.4	3.0	82	180	3.5
170.3	0.513	22	1.3	50	152	3.9	7.4	2.4	77	173	2.8
170.9	0.513	23	1.5	55	138	4.7	7.4	2.7	84	158	3.4
171.6	0.513	23	1.4	59	158	3.9	7.4	2.5	90	181	2.9
172.3	0.513	25	1.2	60	168	4.1	7.4	2.2	92	192	3.0
173.0	0.513	20	1.5	55	143	4.5	7.4	2.7	84	164	3.3
173.7	0.713	19	1.3	52	147	4.9	10	2.4	80	168	3.6
174.4	0.513	22	1.3	47	145	3.6	7.4	2.4	72	166	2.6
175.1	0.513	20	1.1	51	138	3.1	7.4	2.0	77	158	2.2
175.8	0.565	19	1.5	52	147	4.4	8.2	2.7	79	168	3.2
176.5	0.557	23	1.7	59	160	6.9	8.0	3.2	91	183	5.0
177.2	0.513	21	1.5	50	147	3.4	7.4	2.7	77	168	2.5
177.9	0.591	20	1.3	50	151	7.0	8.5	2.4	77	173	5.1
178.6	0.513	21	1.4	51	157	4.5	7.4	2.6	78	179	3.3
179.3	0.513	19	1.3	43	137	3.6	7.4	2.4	66	157	2.6
180.0	0.513	22	1.7	53	136	4.9	7.4	3.0	81	155	3.5
180.7	0.513	20	1.3	51	169	4.6	7.4	2.4	78	194	3.4
181.4	0.513	19	1.6	46	156	4.6	7.4	2.8	71	178	3.4
182.1	0.513	22	1.4	49	164	4.6	7.4	2.6	75	187	3.4
182.8	0.513	21	1.1	45	155	5.2	7.4	2.0	69	177	3.8
183.5	0.513	21	1.1	46	150	5.0	7.4	2.0	70	171	3.6
184.2	0.513	23	1.6	49	149	3.2	7.4	2.8	75	170	2.3
184.9	0.513	21	1.1	50	155	3.6	7.4	2.0	76	178	2.6
185.6	0.513	20	1.2	42	140	4.4	7.4	2.2	65	161	3.2
186.3	0.513	19	1.1	41	161	5.5	7.4	2.1	63	185	4.0
187.0	1.1	21	1.7	45	143	5.2	16	3.2	70	164	3.8
187.7	0.513	23	1.2	52	159	5.1	7.4	2.2	79	182	3.7
188.4	0.611	21	1.2	41	127	4.4	8.8	2.2	63	146	3.2
189.1	0.513	21	1.6	41	145	6.0	7.4	2.8	64	166	4.4
189.8	0.694	22	1.2	44	171	5.7	10	2.2	68	195	4.2
190.5	0.689	22	1.4	51	170	5.3	9.9	2.6	78	194	3.9
191.2	0.513	22	1.3	48	152	4.3	7.4	2.3	74	174	3.1
191.9	0.513	21	1.2	46	150	4.3	7.4	2.2	70	171	3.2
192.6	0.513	22	1.4	45	151	5.8	7.4	2.5	68	173	4.2
193.3	0.513	22	1.6	46	176	5.3	7.4	2.9	70	202	3.9
194.0	0.513	21	0.949	43	154	4.2	7.4	1.7	65	176	3.0
194.7	0.944	18	1.3	40	150	4.9	14	2.3	61	171	3.5
195.4	0.513	23	1.3	44	170	4.3	7.4	2.4	68	194	3.2
196.1	0.860	22	1.1	44	188	6.3	12	2.1	68	215	4.6
196.7	0.513	24	1.1	40	169	4.6	7.4	2.0	61	194	3.3
197.4	0.513	22	1.3	45	175	4.9	7.4	2.3	69	200	3.6
198.1	0.710	23	1.4	44	169	5.1	10	2.6	67	194	3.7
198.8	0.661	19	1.1	35	149	4.5	9.5	1.9	54	171	3.3
199.5	0.513	24	1.5	41	177	4.7	7.4	2.7	62	203	3.4
200.2	0.513	21	1.2	39	168	5.3	7.4	2.1	60	192	3.9
200.9	0.597	21	1.3	41	160	5.4	8.6	2.4	63	184	4.0
201.6	0.882	23	1.2	39	168	4.6	13	2.2	60	192	3.4
202.3	0.825	23	1.2	45	180	5.0	12	2.2	69	206	3.6
203.0	1.0	22	1.1	38	170	3.7	15	2.1	59	194	2.7
203.7	0.513	21	1.0	38	167	5.7	7.4	1.9	58	191	4.1
204.4	0.620	19	0.924	37	172	4.3	8.9	1.7	56	197	3.2
205.1	0.513	21	0.928	38	186	4.9	7.4	1.7	58	212	3.6
205.8	0.585	21	0.847	36	201	4.7	8.5	1.5	56	230	3.4
206.5	0.513	23	1.1	37	190	4.5	7.4	2.0	56	218	3.3
207.2	0.721	22	0.835	30	176	5.5	10	1.5	46	201	4.0
207.9	0.897	18	0.856	40	188	4.4	13	1.6	61	215	3.2
208.6	0.513	20	1.1	36	189	3.7	7.4	1.9	55	217	2.7
209.3	0.513	20	1.3	30	167	5.0	7.4	2.4	45	191	3.7
210.0	0.537	20	0.833	32	216	3.0	7.7	1.5	49	247	2.2
210.7	0.813	18	1.3	39	217	4.5	12	2.4	60	248	3.3
211.4	0.872	16	0.928	27	200	3.8	13	1.7	41	228	2.8
212.1	0.627	17	0.649	34	192	3.9	9.1	1.2	51	219	2.8
212.8	0.947	23	1.1	35	215	4.7	14	1.9	54	246	3.4
213.5	0.808	18	0.880	31	208	4.0	12	1.6	47	238	3.0
214.2	1.1	21	0.839	35	235	5.4	17	1.5	53	268	4.0
214.9	0.513	15	0.852	28	191	4.0	7.4	1.6	43	218	2.9
215.6	1.1	18	0.716	28	182	3.2	15	1.3	43	208	2.4
216.3	0.513	18	1.3	32	226	5.3	7.4	2.4	50	259	3.8
217.0	0.592	20	1.0	28	181	4.5	8.5	1.8	43	207	3.3
217.7	0.940	19	0.741	32	242	3.6	14	1.4	49	276	2.7
218.4	0.808	18	0.982	26	218	2.8	12	1.8	40	249	2.0
219.1	0.596	16	0.912	25	195	3.9	8.6	1.7	38	223	2.9
219.8	0.881	16	0.894	28	238	6.2	13	1.6	43	272	4.5
220.5	0.834	17	0.776	26	203	2.4	12	1.4	40	232	1.7
221.2	0.812	18	0.864	27	225	4.0	12	1.6	42	257	2.9
221.9	0.781	19	1.0	32	248	4.5	11	1.9	49	283	3.3
222.5	1.3	19	0.608	28	214	3.3	19	1.1	43	244	2.4
223.2	0.815	19	0.745	29	210	2.6	12	1.4	44	240	1.9
223.9	0.748	17	0.740	29	232	3.7	11	1.3	45	265	2.7
224.6	0.900	19	0.816	23	247	2.9	13	1.5	36	283	2.1
225.3	1.3	17	0.846	26	187	3.6	19	1.5	40	214	2.7



Minnow Environmental  
Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.0	0.583	14	0.870	26	218	3.1	8.4	1.6	40	249	2.3
226.7	0.839	17	0.830	26	232	3.7	12	1.5	40	266	2.7
227.4	0.570	18	0.657	29	223	4.4	8.2	1.2	45	255	3.2
228.1	0.899	19	0.943	27	237	2.6	13	1.7	41	271	1.9
228.8	1.3	18	0.887	32	247	3.9	18	1.6	49	282	2.8
229.5	0.568	17	0.946	30	220	3.4	8.2	1.7	45	252	2.5
230.2	1.0	14	1.2	31	221	3.0	15	2.2	48	252	2.2
230.9	0.769	15	0.956	31	212	3.3	11	1.7	47	243	2.4
231.6	0.990	16	0.841	28	222	3.5	14	1.5	43	254	2.6
232.3	0.513	15	0.791	24	199	3.3	7.4	1.4	37	227	2.4
233.0	0.841	16	0.962	33	229	4.1	12	1.8	51	262	3.0
233.7	1.5	17	0.940	35	233	3.3	21	1.7	54	266	2.4
234.4	0.861	16	0.871	32	206	3.0	12	1.6	48	235	2.2
235.1	0.583	14	0.748	32	239	2.9	8.4	1.4	49	273	2.1
235.8	1.1	19	0.891	34	233	4.0	16	1.6	52	267	2.9
236.5	0.918	18	0.854	35	265	4.0	13	1.6	53	303	2.9
237.2	0.568	21	0.619	29	232	2.8	8.2	1.1	45	265	2.0
237.9	0.984	15	0.946	36	207	3.8	14	1.7	55	236	2.8
238.6	0.754	16	0.595	29	198	2.7	11	1.1	44	227	2.0
239.3	0.802	19	1.0	34	251	2.5	12	1.9	52	287	1.8
240.0	0.513	14	0.963	35	201	2.0	7.4	1.8	54	230	1.5
240.7	1.3	17	0.784	39	238	3.9	18	1.4	60	272	2.9
241.4	1.0	14	0.906	30	228	2.9	15	1.7	46	261	2.1
242.1	1.1	16	1.2	33	276	3.6	15	2.1	50	315	2.7
242.8	0.738	17	1.2	36	234	3.0	11	2.1	56	267	2.2
243.5	1.1	17	0.740	34	211	3.0	16	1.3	52	242	2.2
244.2	1.2	17	0.831	37	214	4.0	17	1.5	56	245	2.9
244.9	0.806	16	1.1	32	193	2.7	12	2.1	49	220	2.0
245.6	1.3	20	1.1	35	226	3.1	19	2.1	53	259	2.3
246.3	1.0	17	1.0	34	219	2.8	15	1.9	52	250	2.0
247.0	0.527	17	1.5	37	227	2.6	7.6	2.7	57	259	1.9
247.7	0.513	14	1.3	29	193	2.7	7.4	2.4	44	221	1.9
248.3	1.2	18	1.4	40	232	2.4	17	2.5	62	266	1.7
249.0	0.706	17	1.1	36	191	2.8	10	1.9	55	218	2.0
249.7	1.0	18	1.3	38	209	3.7	15	2.4	59	239	2.7
250.4	0.513	18	1.0	35	206	1.9	7.4	1.9	53	236	1.4
251.1	1.1	19	1.3	36	206	2.9	16	2.3	55	235	2.1
251.8	0.848	18	1.2	46	240	4.1	12	2.3	70	275	3.0
252.5	0.905	18	1.3	48	229	2.1	13	2.4	74	262	1.6
253.2	1.1	17	1.3	45	207	2.6	16	2.3	69	237	1.9
253.9	1.3	18	1.7	44	218	1.9	19	3.1	67	249	1.4
254.6	0.518	18	1.2	42	183	2.0	7.5	2.1	64	209	1.5
255.3	0.857	19	1.7	44	229	2.2	12	3.1	68	262	1.6
256.0	0.716	19	1.5	42	190	2.9	10	2.7	64	218	2.1
256.7	0.513	17	1.3	43	235	3.1	7.4	2.4	66	269	2.2
257.4	0.695	19	1.3	50	209	2.9	10	2.5	76	239	2.1
258.1	0.926	17	1.7	46	197	2.3	13	3.2	71	226	1.7
258.8	0.993	18	1.4	45	197	2.4	14	2.5	69	225	1.7
259.5	0.741	20	1.6	51	194	2.6	11	2.9	79	222	1.9
260.2	1.2	21	1.4	49	187	3.0	18	2.6	75	214	2.2
260.9	1.4	20	1.5	49	191	2.6	21	2.8	76	219	1.9
261.6	1.0	18	1.5	51	175	2.4	15	2.8	78	200	1.8
262.3	0.786	19	1.5	36	161	3.1	11	2.7	55	185	2.3
263.0	1.4	22	1.5	46	179	3.3	20	2.7	70	205	2.4
263.7	0.684	24	1.9	50	181	2.9	9.9	3.5	77	207	2.1
264.4	0.811	27	1.2	52	204	3.2	12	2.2	80	233	2.3
265.1	0.993	21	1.5	44	152	2.0	14	2.8	68	174	1.5
265.8	0.767	22	1.8	47	168	2.7	11	3.3	72	192	2.0
266.5	1.2	23	1.8	55	223	3.3	18	3.2	85	255	2.4
267.2	1.3	24	1.7	53	185	3.0	19	3.0	82	211	2.2
267.9	0.913	20	1.6	58	176	2.5	13	2.9	89	201	1.8
268.6	0.613	23	1.5	53	168	3.7	8.9	2.8	82	192	2.7
269.3	0.772	25	1.5	54	181	3.0	11	2.7	82	207	2.2
270.0	1.7	24	2.2	52	185	1.9	24	4.0	79	212	1.4
270.7	0.559	22	1.5	45	163	1.9	8.1	2.7	69	187	1.4
271.4	0.609	21	1.6	56	174	3.3	8.8	2.9	86	199	2.4
272.1	0.717	20	2.1	48	166	2.8	10	3.9	74	190	2.0
272.8	0.946	27	2.3	59	176	3.2	14	4.3	91	202	2.3
273.5	1.2	22	1.4	51	176	2.2	17	2.6	79	201	1.6
274.1	0.751	22	2.2	57	147	1.8	11	4.0	87	168	1.3
274.8	0.513	22	2.0	52	183	2.4	7.4	3.6	80	210	1.7
275.5	0.513	23	2.3	56	183	3.3	7.4	4.2	86	209	2.4
276.2	0.974	23	2.2	54	168	2.5	14	4.0	83	192	1.8
276.9	0.613	26	2.3	64	171	2.7	8.8	4.1	98	195	2.0
277.6	0.840	26	1.7	60	180	2.0	12	3.2	92	206	1.5
278.3	0.805	23	1.7	59	182	2.4	12	3.2	90	208	1.8
279.0	1.0	22	2.1	64	169	2.0	15	3.9	97	193	1.5
279.7	1.2	24	2.4	58	198	3.0	17	4.4	89	227	2.2
280.4	0.902	26	2.7	63	210	3.0	13	5.0	97	240	2.2
281.1	0.871	24	2.0	58	175	3.0	13	3.7	89	200	2.2
281.8	0.696	23	2.1	61	180	1.9	10	3.9	94	206	1.4



Minnow Environmental  
Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
282.5	0.958	24	2.3	64	174	1.5	14	4.1	97	199	1.1
283.2	0.711	28	2.0	54	189	2.5	10	3.7	83	216	1.8
283.9	1.1	27	1.9	62	181	3.3	15	3.4	95	207	2.4
284.6	0.754	26	2.0	65	159	2.1	11	3.6	100	182	1.5
285.3	0.933	26	2.1	58	193	2.7	13	3.8	88	221	2.0
286.0	0.650	29	2.1	54	182	2.9	9.4	3.8	83	208	2.2
286.7	0.664	33	1.9	58	170	2.5	9.6	3.5	89	195	1.8
287.4	0.938	27	1.1	59	157	2.5	14	2.0	90	179	1.8
288.1	0.681	25	2.4	67	202	2.3	9.8	4.4	103	230	1.7
288.8	0.646	25	1.9	52	154	2.9	9.3	3.4	79	176	2.1
289.5	0.932	29	1.9	61	193	2.5	13	3.5	93	221	1.8
290.2	0.647	25	2.1	57	177	2.4	9.3	3.7	87	203	1.8
290.9	0.743	28	1.9	52	162	1.9	11	3.5	80	186	1.4
291.6	1.3	29	1.7	61	177	3.1	19	3.0	94	202	2.3
292.3	1.1	29	1.7	56	171	2.6	16	3.1	86	196	1.9
293.0	0.801	32	2.3	70	189	2.1	12	4.1	107	216	1.5
293.7	1.2	30	1.6	60	190	2.1	17	2.9	92	217	1.5
294.4	0.867	24	1.9	58	160	3.1	13	3.6	89	183	2.3
295.1	0.777	25	1.8	55	178	3.1	11	3.2	85	204	2.3
295.8	0.949	23	1.5	50	157	2.1	14	2.7	77	180	1.5
296.5	1.1	27	2.3	61	179	2.7	16	4.2	93	205	2.0
297.2	1.2	30	1.8	57	156	3.2	17	3.3	88	178	2.4
297.9	0.719	30	1.7	56	164	3.1	10	3.2	86	188	2.3
298.6	1.1	30	1.6	55	159	1.9	16	2.9	84	182	1.4
299.3	1.0	28	2.0	54	169	1.6	15	3.7	83	193	1.2
299.9	2.1	33	1.5	57	203	2.5	30	2.8	88	232	1.8
300.6	1.2	27	1.6	55	151	2.5	18	2.9	84	173	1.8
301.3	0.513	26	1.8	50	158	1.8	7.4	3.3	77	181	1.3
302.0	1.1	26	1.6	52	157	2.3	16	3.0	79	180	1.7
302.7	0.881	29	1.6	60	189	2.4	13	3.0	91	216	1.7
303.4	0.651	28	1.1	54	177	1.6	9.4	2.0	83	202	1.2
304.1	0.640	30	1.3	65	172	3.1	9.2	2.4	100	196	2.2
304.8	0.628	24	1.8	58	168	2.3	9.1	3.2	88	192	1.7
305.5	0.806	25	1.1	48	156	2.6	12	2.0	73	178	1.9
306.2	1.3	26	1.4	56	172	2.8	19	2.6	86	197	2.0
306.9	0.691	25	1.2	45	166	3.0	10.0	2.3	69	190	2.2
307.6	0.620	23	1.4	46	160	2.5	8.9	2.6	70	183	1.8
308.3	0.735	24	1.2	51	151	1.7	11	2.2	78	173	1.3
309.0	0.841	24	1.2	42	174	2.4	12	2.1	65	199	1.7
309.7	0.732	27	1.1	51	178	2.1	11	2.1	77	204	1.6
310.4	1.5	25	1.4	51	163	1.9	22	2.5	78	186	1.4
311.1	0.708	22	1.0	49	171	2.4	10	1.8	75	196	1.8
311.8	0.549	23	1.4	54	168	2.2	7.9	2.5	82	193	1.6
312.5	1.3	25	1.1	54	156	2.8	19	2.0	83	178	2.0
313.2	0.997	27	1.2	58	180	1.7	14	2.2	89	206	1.2
313.9	0.893	20	0.992	37	139	2.6	13	1.8	56	159	1.9
314.6	1.0	23	1.4	50	168	1.8	15	2.5	77	192	1.3
315.3	1.8	28	1.3	52	179	1.3	25	2.3	80	204	0.963
316.0	1.4	25	1.0	47	190	3.0	20	1.9	72	218	2.2
316.7	1.0	27	0.905	48	159	2.7	15	1.7	73	182	2.0
317.4	0.772	22	1.0	44	160	3.0	11	1.9	68	183	2.2
318.1	1.4	27	0.895	39	156	3.7	21	1.6	60	179	2.7
318.8	1.4	27	0.796	49	168	2.5	20	1.5	74	192	1.8
319.5	0.884	28	0.836	41	150	2.2	13	1.5	62	172	1.6
320.2	1.2	24	1.0	39	143	2.4	18	1.9	60	164	1.8
320.9	0.746	21	0.828	38	162	1.7	11	1.5	58	185	1.2
321.6	0.872	24	0.994	42	171	2.0	13	1.8	64	196	1.5
322.3	1.2	24	0.973	38	164	3.6	17	1.8	58	187	2.7
323.0	1.1	26	0.736	45	156	3.1	16	1.3	70	178	2.2
323.7	0.767	20	0.681	38	142	2.6	11	1.2	59	162	1.9
324.4	0.619	20	0.679	37	140	2.5	8.9	1.2	57	160	1.8
325.1	0.619	20	0.889	38	143	2.7	8.9	1.6	58	163	2.0
325.8	1.7	24	0.507	44	175	3.1	25	0.924	68	200	2.2
326.4	0.811	25	0.661	44	165	2.3	12	1.2	67	189	1.7
327.1	0.852	20	0.800	35	169	3.6	12	1.5	54	194	2.6
327.8	1.5	22	0.790	36	195	2.5	22	1.4	56	223	1.9
328.5	1.2	21	0.880	38	169	3.2	17	1.6	58	194	2.3
329.2	1.0	22	0.700	35	140	3.3	15	1.3	54	160	2.4
329.9	0.696	19	0.588	30	149	3.0	10	1.1	46	171	2.2
330.6	0.513	19	0.568	31	153	4.0	7.4	1.0	47	175	3.0
331.3	0.750	20	0.792	27	157	3.3	11	1.4	41	180	2.4
332.0	0.822	20	0.515	32	172	3.6	12	0.940	49	196	2.6
332.7	0.968	22	0.634	30	160	5.0	14	1.2	46	183	3.6
333.4	0.924	22	0.812	28	164	4.5	13	1.5	43	188	3.3
334.1	0.691	19	0.736	34	174	4.0	10.0	1.3	53	199	2.9
334.8	1.2	17	0.509	24	149	3.9	17	0.929	36	170	2.9
335.5	0.813	19	0.498	27	145	3.6	12	0.908	41	166	2.6
336.2	0.743	16	0.756	27	140	4.0	11	1.4	42	160	2.9
336.9	0.540	20	0.554	29	153	2.0	7.8	1.0	45	175	1.5
337.6	0.821	18	0.853	27	137	2.9	12	1.6	42	157	2.1
338.3	1.5	16	0.372	25	143	3.7	21	0.679	38	163	2.7



Minnow Environmental  
Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.0	0.513	17	1.3	27	160	4.0	7.4	2.4	42	183	2.9
339.7	1.5	15	0.752	30	163	3.2	21	1.4	46	186	2.3
340.4	1.0	19	0.793	32	162	4.9	15	1.4	49	185	3.6
341.1	0.626	17	1.0	24	157	3.7	9.0	1.9	37	179	2.7
341.8	0.513	16	0.784	26	144	3.7	7.4	1.4	40	165	2.7
342.5	0.772	20	0.897	28	154	3.5	11	1.6	42	177	2.6
343.2	1.2	16	0.678	20	131	2.7	17	1.2	30	150	2.0
343.9	0.570	17	0.804	26	144	2.6	8.2	1.5	40	165	1.9
344.6	1.1	19	0.827	25	159	3.2	16	1.5	38	182	2.3
345.3	0.534	19	0.613	25	151	4.0	7.7	1.1	39	173	2.9
346.0	0.513	18	0.889	32	157	3.2	7.4	1.6	49	180	2.3
346.7	0.513	18	0.701	27	165	4.6	7.4	1.3	42	189	3.4
347.4	0.918	18	1.1	22	145	3.8	13	2.0	33	166	2.8
348.1	1.5	14	0.644	23	145	3.6	21	1.2	36	166	2.6
348.8	0.749	18	0.992	21	177	4.5	11	1.8	32	203	3.3
349.5	0.775	17	1.0	35	150	4.6	11	1.8	53	172	3.4
350.2	0.513	15	0.806	25	129	3.9	7.4	1.5	39	148	2.8
350.9	0.513	17	1.3	21	134	3.1	7.4	2.4	32	154	2.3
351.6	0.513	16	0.706	25	143	4.1	7.4	1.3	38	164	3.0
352.3	0.905	16	0.821	30	137	3.5	13	1.5	46	157	2.6
352.9	0.582	16	0.949	24	138	4.3	8.4	1.7	37	158	3.1
353.6	0.513	15	0.938	26	148	3.1	7.4	1.7	40	169	2.3
354.3	0.513	15	0.855	24	152	4.7	7.4	1.6	37	173	3.4
355.0	0.848	17	0.881	25	155	4.5	12	1.6	38	177	3.3
355.7	1.0	18	0.963	27	163	3.7	15	1.8	42	186	2.7
356.4	1.3	19	0.638	26	131	4.6	19	1.2	39	150	3.4
357.1	0.561	14	0.873	27	128	2.6	8.1	1.6	42	147	1.9
357.8	0.836	18	1.0	28	149	4.8	12	1.9	43	170	3.5
358.5	0.670	16	1.0	28	131	3.7	9.7	1.8	43	149	2.7
359.2	1.5	19	1.3	32	140	5.2	21	2.5	48	160	3.8
359.9	0.623	17	0.606	23	128	3.9	9.0	1.1	36	146	2.8
360.6	0.513	14	1.0	28	148	4.4	7.4	1.8	43	169	3.2
361.3	1.1	16	1.0	28	135	5.3	16	1.9	42	155	3.9
362.0	0.940	18	1.1	30	137	4.0	14	1.9	45	157	2.9
362.7	0.978	19	1.5	31	130	4.2	14	2.7	47	149	3.1
363.4	0.648	19	1.2	28	131	4.1	9.3	2.2	42	150	3.0
364.1	0.833	17	1.6	30	126	2.9	12	2.9	46	144	2.1
364.8	0.876	20	1.5	31	138	4.1	13	2.7	48	158	3.0
365.5	0.545	17	1.5	37	130	4.5	7.9	2.7	56	149	3.3
366.2	0.767	20	1.4	32	132	3.3	11	2.6	49	151	2.4
366.9	0.741	19	1.6	42	134	5.4	11	2.9	64	153	3.9
367.6	0.639	16	1.4	33	112	4.8	9.2	2.5	50	128	3.5
368.3	0.721	15	1.6	33	116	3.3	10	3.0	51	133	2.4
369.0	0.808	18	1.7	36	126	6.4	12	3.1	55	144	4.7
369.7	0.936	18	1.4	39	120	4.2	14	2.5	59	138	3.1
370.4	0.742	17	1.7	33	122	5.0	11	3.1	51	140	3.7
371.1	0.832	18	2.0	27	121	5.5	12	3.7	42	139	4.0
371.8	0.917	18	2.0	31	113	4.7	13	3.7	47	129	3.4
372.5	0.513	19	2.3	40	122	6.1	7.4	4.1	61	139	4.4
373.2	0.598	18	2.1	35	105	4.7	8.6	3.8	53	120	3.4
373.9	0.996	17	2.1	40	126	5.3	14	3.9	62	144	3.9
374.6	0.513	19	1.9	32	109	5.8	7.4	3.5	49	125	4.2
375.3	0.900	20	2.2	38	110	4.6	13	4.0	59	126	3.4
376.0	0.753	23	2.4	42	111	4.9	11	4.3	64	127	3.6
376.7	0.513	20	1.9	40	133	5.2	7.4	3.4	61	152	3.8
377.4	0.922	20	2.4	41	149	7.2	13	4.3	62	171	5.2
378.1	0.863	18	2.3	39	110	5.6	12	4.2	59	125	4.1
378.8	0.749	20	2.3	38	143	5.9	11	4.1	58	164	4.3
379.5	0.987	19	2.1	44	107	5.8	14	3.9	67	122	4.2
380.1	0.631	19	2.3	37	118	4.7	9.1	4.2	57	135	3.4
380.8	0.661	18	2.4	39	113	6.5	9.5	4.4	59	130	4.7
381.5	1.3	20	2.3	41	132	6.5	18	4.2	63	150	4.7
382.2	1.1	21	2.7	43	117	6.8	15	4.9	65	134	5.0
382.9	0.513	22	2.5	42	112	6.6	7.4	4.5	64	128	4.8
383.6	0.513	19	2.3	36	94	4.9	7.4	4.2	56	107	3.6
384.3	0.513	17	2.4	36	92	5.9	7.4	4.3	55	105	4.3
385.0	0.754	25	3.0	47	130	8.1	11	5.4	72	149	5.9
385.7	0.737	18	2.6	44	108	7.4	11	4.8	68	124	5.4
386.4	0.705	21	2.4	43	106	5.9	10	4.4	65	122	4.3
387.1	1.6	18	2.7	50	114	6.5	24	4.9	76	130	4.8
387.8	0.752	18	2.8	43	95	6.7	11	5.1	66	109	4.9
388.5	0.756	23	2.5	48	114	7.2	11	4.5	74	130	5.2
389.2	1.1	25	2.9	47	105	7.1	16	5.3	72	120	5.2
389.9	0.850	20	3.1	47	100	7.0	12	5.6	73	115	5.1
390.6	0.517	23	2.5	48	102	6.0	7.5	4.5	74	117	4.4
391.3	0.513	18	2.8	44	113	7.5	7.4	5.1	68	129	5.5
392.0	0.513	20	3.0	49	102	8.7	7.4	5.5	75	117	6.3
392.7	1.1	22	2.6	56	100	7.7	16	4.7	86	114	5.6
393.4	0.513	20	2.7	49	106	8.2	7.4	5.0	75	121	6.0
394.1	0.904	19	3.2	44	88	7.0	13	5.9	68	101	5.1
394.8	0.756	21	3.2	52	91	7.3	11	5.9	79	104	5.3



Minnow Environmental  
Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
395.5	1.1	22	2.7	50	101	7.2	16	5.0	77	116	5.3
396.2	0.513	22	2.8	56	105	6.8	7.4	5.0	86	120	5.0
396.9	0.519	25	2.5	48	94	8.2	7.5	4.6	74	108	6.0
397.6	0.513	20	2.9	53	112	6.5	7.4	5.3	81	128	4.8
398.3	0.520	19	3.0	52	90	8.0	7.5	5.4	80	102	5.8
399.0	0.867	23	2.8	59	100	7.6	13	5.0	91	114	5.6
399.7	0.513	22	2.9	52	98	6.5	7.4	5.3	79	112	4.7
400.4	0.513	20	3.2	61	98	9.2	7.4	5.7	93	112	6.7
401.1	0.809	20	2.8	41	91	8.7	12	5.2	62	104	6.4
401.8	0.513	22	2.8	49	102	7.4	7.4	5.1	75	117	5.4
402.5	0.881	24	3.9	55	106	8.7	13	7.1	84	121	6.4
403.2	0.648	21	2.9	46	93	8.4	9.4	5.3	71	107	6.2
403.9	0.787	21	2.4	55	98	9.0	11	4.4	84	112	6.6
404.6	0.513	18	2.5	42	95	8.1	7.4	4.5	65	109	5.9
405.3	1.2	21	3.3	47	124	10	17	6.0	72	142	7.5
405.9	1.1	24	3.1	48	101	11	16	5.6	73	115	8.0
406.6	0.530	20	2.2	51	84	9.1	7.7	4.0	78	97	6.6
407.3	0.833	22	3.0	47	97	9.6	12	5.4	73	111	7.0
408.0	0.532	19	2.4	41	82	9.1	7.7	4.4	62	94	6.7
408.7	1.1	23	2.9	56	97	9.7	16	5.3	86	111	7.1
409.4	0.513	27	2.9	56	91	11	7.4	5.4	86	104	7.9
410.1	0.567	22	3.0	50	84	8.9	8.2	5.4	76	96	6.5
410.8	0.965	22	2.4	53	105	9.6	14	4.4	81	120	7.0
411.5	0.513	22	2.9	55	91	11	7.4	5.2	85	104	7.9
412.2	0.671	23	2.5	48	95	9.5	9.7	4.5	74	108	6.9
412.9	1.1	23	2.7	56	96	8.6	16	4.9	86	109	6.3
413.6	0.964	20	2.7	62	99	11	14	4.8	95	113	8.4
414.3	0.649	20	3.2	48	87	8.4	9.4	5.8	73	99	6.2
415.0	0.914	20	2.9	48	96	11	13	5.3	73	110	8.1
415.7	0.806	24	2.9	44	92	13	12	5.3	67	106	9.2
416.4	0.902	24	3.1	59	96	12	13	5.7	90	109	9.0
417.1	0.530	20	2.2	51	93	11	7.7	4.0	78	106	8.1
417.8	0.910	23	2.5	49	93	8.7	13	4.5	75	106	6.4
418.5	1.1	19	3.1	48	91	11	16	5.6	74	104	8.1
419.2	1.2	22	2.9	49	89	9.5	17	5.3	75	101	6.9
419.9	0.898	25	2.7	52	89	11	13	4.9	80	102	8.2
420.6	0.685	17	3.1	48	79	8.9	9.9	5.6	74	91	6.5
421.3	0.513	20	2.4	45	98	11	7.4	4.5	69	113	7.8
422.0	1.2	25	2.9	55	98	12	17	5.3	84	112	9.0
422.7	1.4	22	2.3	40	86	9.8	20	4.3	61	99	7.2
423.4	0.541	23	2.6	55	90	12	7.8	4.8	84	103	8.5
424.1	0.743	19	2.6	43	78	8.6	11	4.8	65	89	6.3
424.8	0.513	23	2.6	41	91	9.9	7.4	4.7	63	104	7.2
425.5	1.1	23	3.1	52	100	12	16	5.7	79	115	9.0
426.2	0.526	22	2.6	54	96	12	7.6	4.8	83	110	8.8
426.9	0.656	20	2.7	38	86	11	9.5	5.0	58	99	7.7
427.6	0.916	23	2.4	46	103	12	13	4.4	71	118	8.7
428.3	0.906	22	3.0	48	91	11	13	5.4	74	104	8.1
429.0	0.546	24	2.3	51	103	9.3	7.9	4.3	77	117	6.8
429.7	0.513	21	2.3	46	97	8.5	7.4	4.2	70	110	6.2
430.4	0.742	23	2.2	45	101	9.3	11	4.1	70	116	6.8
431.1	0.575	22	2.0	43	95	10	8.3	3.7	66	109	7.4
431.8	1.0	21	2.3	49	101	10.0	15	4.2	75	116	7.3
432.4	1.3	23	1.7	41	94	9.1	18	3.1	63	108	6.6
433.1	1.1	22	2.1	36	98	8.0	15	3.9	55	112	5.9
433.8	0.802	19	1.8	39	97	9.7	12	3.3	60	110	7.1
434.5	0.900	19	2.1	39	92	8.9	13	3.9	60	106	6.5
435.2	1.0	19	1.7	45	103	12	15	3.2	70	118	8.6
435.9	0.513	20	2.5	45	106	10	7.4	4.6	70	121	7.3
436.6	0.794	20	1.5	43	118	9.7	11	2.8	66	135	7.1
437.3	1.1	21	1.7	38	108	10	17	3.2	59	124	7.6
438.0	0.795	20	1.7	36	118	8.6	11	3.1	56	135	6.3
438.7	0.867	22	2.0	40	104	9.8	13	3.6	61	119	7.2
439.4	1.7	20	1.3	39	121	9.7	24	2.4	60	139	7.0
440.1	0.767	19	1.3	37	98	9.2	11	2.4	57	112	6.7
440.8	0.982	22	1.8	31	102	10	14	3.4	48	117	7.5
441.5	1.5	21	1.3	39	119	10.0	21	2.4	61	136	7.3
442.2	1.2	19	1.3	33	105	8.3	18	2.3	51	120	6.0
442.9	1.2	19	1.4	36	115	7.3	17	2.5	55	132	5.4
443.6	1.1	17	1.4	31	109	9.7	16	2.6	47	125	7.1
444.3	1.2	18	1.5	33	110	8.2	17	2.7	51	126	6.0
445.0	1.1	24	1.2	32	139	9.1	16	2.2	50	159	6.7
445.7	1.0	19	1.3	32	109	8.9	15	2.3	49	125	6.5
446.4	1.2	17	1.5	28	104	6.7	18	2.7	43	119	4.9
447.1	1.0	16	1.3	33	121	9.9	15	2.3	50	138	7.2
447.8	1.1	20	1.1	30	128	8.0	17	1.9	46	146	5.8
448.5	1.4	21	1.4	28	124	8.0	20	2.5	43	141	5.8
449.2	1.5	17	0.930	26	110	7.1	21	1.7	40	126	5.1
449.9	1.1	19	1.2	35	134	8.6	16	2.2	53	153	6.3
450.6	0.973	20	1.2	32	123	8.1	14	2.1	48	141	5.9
451.3	1.1	20	0.924	25	136	8.0	16	1.7	38	156	5.8



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Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
452.0	1.3	18	1.4	33	120	8.5	19	2.6	51	138	6.2
452.7	0.916	19	1.5	27	123	7.3	13	2.7	41	141	5.4
453.4	1.3	18	1.1	28	124	8.7	18	2.0	43	142	6.3
454.1	0.951	16	1.2	23	117	7.6	14	2.1	35	133	5.6
454.8	0.958	16	0.976	24	119	5.4	14	1.8	37	136	3.9
455.5	1.5	18	1.3	23	133	9.4	22	2.3	35	152	6.9
456.2	0.991	17	0.719	26	133	7.9	14	1.3	40	153	5.8
456.9	1.1	17	1.1	28	139	6.4	15	1.9	43	159	4.6
457.6	1.3	16	0.825	25	147	6.7	19	1.5	38	168	4.9
458.3	1.2	17	0.740	21	145	9.4	17	1.3	32	166	6.8
458.9	1.8	17	0.557	23	128	5.7	26	1.0	35	146	4.1
459.6	1.4	17	0.482	26	148	6.7	20	0.879	40	169	4.9
460.3	1.6	16	0.687	19	120	6.8	23	1.3	29	138	4.9
461.0	1.3	19	0.958	25	159	7.4	19	1.7	38	182	5.4
461.7	1.2	15	0.692	24	131	6.3	18	1.3	37	150	4.6
462.4	0.795	15	1.2	28	140	5.9	11	2.2	43	160	4.3
463.1	0.848	17	0.594	20	138	6.9	12	1.1	31	157	5.0
463.8	1.5	16	0.772	20	142	7.0	22	1.4	31	163	5.1
464.5	0.928	18	0.754	29	163	6.3	13	1.4	44	187	4.6
465.2	1.3	15	0.948	23	149	6.3	19	1.7	35	170	4.6
465.9	1.4	17	0.943	21	145	5.7	20	1.7	33	166	4.1
466.6	0.513	17	0.683	20	135	6.4	7.4	1.2	31	155	4.7
467.3	1.4	17	0.794	24	145	4.7	20	1.4	37	166	3.5
468.0	1.5	13	0.714	20	160	4.8	21	1.3	30	183	3.5
468.7	1.3	17	0.782	23	157	5.9	19	1.4	36	179	4.3
469.4	0.513	16	0.755	19	148	6.7	7.4	1.4	29	169	4.9
470.1	1.4	15	0.680	23	152	4.4	20	1.2	35	173	3.2
470.8	1.3	17	0.693	22	180	5.0	18	1.3	33	206	3.6
471.5	0.767	16	0.687	19	167	5.4	11	1.3	29	191	3.9
472.2	0.698	16	0.512	22	140	4.6	10	0.935	34	160	3.3
472.9	1.2	16	0.917	24	166	4.5	18	1.7	37	190	3.3
473.6	0.767	13	0.759	18	159	3.7	11	1.4	28	182	2.7
474.3	1.3	14	0.873	23	177	5.1	18	1.6	35	202	3.7
475.0	0.724	18	1.2	25	168	5.0	10	2.2	38	192	3.6
475.7	0.997	15	0.907	22	157	3.3	14	1.7	34	180	2.4
476.4	0.942	13	0.838	19	157	3.9	14	1.5	29	180	2.8
477.1	1.4	14	0.798	17	140	4.0	20	1.5	26	160	2.9
477.8	0.941	16	0.961	21	183	3.2	14	1.8	32	209	2.3
478.5	1.6	17	0.784	25	171	4.7	23	1.4	38	195	3.4
479.2	1.7	15	0.744	23	148	4.3	25	1.4	35	169	3.1
479.9	1.5	14	0.573	21	165	2.9	21	1.0	33	188	2.1
480.6	1.2	16	0.925	23	174	3.6	18	1.7	35	199	2.6
481.3	1.5	15	0.942	21	217	4.5	22	1.7	33	249	3.3
482.0	1.2	16	0.994	23	181	3.8	18	1.8	35	207	2.8
482.7	0.952	13	0.751	19	172	3.7	14	1.4	29	197	2.7
483.4	0.970	16	0.766	23	181	3.9	14	1.4	35	207	2.9
484.1	1.0	13	0.874	22	169	2.9	15	1.6	33	193	2.1
484.8	1.2	15	1.1	21	202	4.0	17	2.1	32	231	2.9
485.4	1.0	17	0.809	16	156	3.6	14	1.5	25	178	2.6
486.1	0.870	15	0.815	90	166	3.2	13	1.5	138	190	2.3
486.8	0.907	14	0.595	19	155	2.8	13	1.1	29	177	2.1
487.5	0.906	13	0.646	17	156	3.1	13	1.2	26	178	2.2
488.2	0.910	16	0.955	24	183	3.3	13	1.7	36	210	2.4
488.9	0.944	18	0.586	22	153	4.1	14	1.1	34	175	3.0
489.6	1.3	15	1.0	19	170	2.5	18	1.9	30	194	1.8
490.3	1.7	16	0.756	19	205	4.0	24	1.4	29	234	2.9
491.0	1.2	16	0.815	22	215	2.2	18	1.5	34	246	1.6
491.7	1.6	14	0.768	25	176	4.2	23	1.4	38	201	3.1
492.4	1.8	15	1.1	23	192	2.5	26	2.0	35	219	1.8
493.1	1.7	14	1.0	23	210	3.7	24	1.9	36	240	2.7
493.8	1.1	13	0.808	18	131	2.1	16	1.5	28	149	1.5
494.5	0.613	14	0.893	24	190	2.4	8.8	1.6	37	217	1.7
495.2	1.7	15	1.0	24	181	2.7	24	1.9	37	207	2.0
495.9	1.2	17	1.1	23	157	2.7	17	2.0	36	180	2.0
496.6	1.5	15	0.946	26	210	2.3	21	1.7	39	240	1.7
497.3	1.6	14	0.966	21	189	2.7	23	1.8	32	216	2.0
498.0	1.2	15	0.964	25	201	2.5	17	1.8	38	230	1.8
498.7	1.0	16	1.1	20	178	2.2	15	2.0	31	204	1.6
499.4	1.0	15	1.0	22	159	2.6	15	1.9	34	182	1.9
500.1	1.3	12	0.841	22	175	2.4	19	1.5	33	200	1.7
500.8	1.5	15	0.641	20	178	2.2	21	1.2	30	204	1.6
501.5	1.3	17	0.912	26	191	2.2	19	1.7	40	219	1.6
502.2	1.7	17	0.880	25	174	3.1	24	1.6	38	199	2.2
502.9	1.000	13	0.770	22	168	3.0	14	1.4	34	193	2.2
503.6	1.5	15	0.891	26	208	2.1	22	1.6	40	238	1.6
504.3	1.3	15	1.1	23	188	2.3	19	2.1	35	215	1.7
505.0	1.8	16	0.961	23	195	2.3	25	1.8	35	223	1.7
505.7	1.0	16	0.901	24	163	1.9	14	1.6	37	186	1.4
506.4	1.3	13	1.1	29	190	2.1	19	1.9	45	217	1.5
507.1	1.7	15	0.885	21	181	1.9	24	1.6	33	207	1.4
507.8	1.6	16	0.952	25	208	3.2	24	1.7	38	238	2.3



Minnow Environmental  
Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.5	2.0	16	1.1	24	184	2.4	29	2.0	38	211	1.8
509.2	0.935	13	0.814	29	173	3.1	14	1.5	44	197	2.2
509.9	1.1	16	1.3	21	188	2.4	16	2.4	33	215	1.8
510.6	1.0	16	1.1	22	190	2.2	15	2.0	33	217	1.6
511.2	1.2	15	0.928	25	187	1.8	17	1.7	38	214	1.3
511.9	1.5	17	0.869	24	188	2.6	22	1.6	37	214	1.9
512.6	0.977	16	0.693	26	196	1.4	14	1.3	39	225	1.0
513.3	1.7	15	0.724	21	181	2.1	25	1.3	33	207	1.5
514.0	0.706	13	1.1	23	164	1.7	10	2.0	36	187	1.2
514.7	1.4	16	1.2	26	209	2.7	20	2.2	40	239	1.9
515.4	0.923	16	0.810	24	190	2.3	13	1.5	37	217	1.7
516.1	1.2	14	0.875	27	197	1.1	18	1.6	42	225	0.828
516.8	0.840	14	0.965	23	199	2.1	12	1.8	35	228	1.5
517.5	1.8	16	1.1	21	200	2.0	26	1.9	32	228	1.5
518.2	1.4	17	1.0	27	216	2.4	21	1.9	42	247	1.8
518.9	1.4	17	0.798	25	165	2.0	21	1.5	39	188	1.5
519.6	0.977	13	0.611	24	173	2.7	14	1.1	37	198	2.0
520.3	1.3	14	0.812	20	179	1.7	19	1.5	30	205	1.2
521.0	0.899	17	1.2	21	226	2.1	13	2.1	33	259	1.6
521.7	0.787	16	1.3	29	195	2.0	11	2.3	44	223	1.5
522.4	1.2	17	0.760	26	201	2.0	18	1.4	40	230	1.5
523.1	0.984	13	0.665	22	180	2.2	14	1.2	34	206	1.6
523.8	1.4	14	0.671	23	182	2.4	21	1.2	35	208	1.8
524.5	1.0	15	0.566	28	198	1.6	15	1.0	42	227	1.2
525.2	0.634	17	0.754	27	203	2.4	9.1	1.4	41	232	1.7
525.9	1.4	15	0.883	21	173	1.2	21	1.6	32	198	0.861
526.6	1.4	14	0.950	19	183	1.8	20	1.7	29	209	1.3
527.3	1.0	14	0.849	21	175	1.5	15	1.5	33	200	1.1
528.0	1.5	17	0.744	24	207	1.6	22	1.4	36	237	1.2
528.7	1.1	16	1.0	21	209	2.2	16	1.9	32	239	1.6
529.4	1.7	13	0.579	21	198	0.950	24	1.1	32	226	0.693
530.1	1.6	16	0.712	19	190	1.3	23	1.3	30	217	0.960
530.8	1.5	15	0.451	22	213	1.9	21	0.823	33	243	1.4
531.5	0.631	16	0.857	24	217	1.5	9.1	1.6	38	248	1.1
532.2	1.5	14	0.780	21	213	1.5	21	1.4	33	244	1.1
532.9	1.3	14	0.789	23	194	1.6	18	1.4	36	222	1.2
533.6	1.6	14	0.711	15	202	1.5	24	1.3	23	231	1.1
534.3	1.8	17	0.682	23	263	2.8	26	1.2	35	301	2.0
535.0	1.2	15	0.896	22	208	1.5	18	1.6	33	238	1.1
535.7	1.1	14	0.711	17	200	1.5	15	1.3	26	229	1.1
536.4	1.1	14	0.591	17	249	2.2	15	1.1	26	285	1.6
537.1	0.781	14	0.361	15	224	1.9	11	0.657	23	256	1.4
537.7	0.911	13	0.637	18	233	1.6	13	1.2	27	266	1.2
538.4	1.0	13	0.738	21	195	1.8	15	1.3	32	223	1.3
539.1	1.4	12	0.725	18	205	2.1	20	1.3	28	234	1.5
539.8	1.7	13	0.674	15	216	1.6	24	1.2	23	247	1.1
540.5	1.5	12	0.815	19	205	3.0	22	1.5	29	234	2.2
541.2	1.3	14	0.826	22	225	2.4	19	1.5	34	257	1.7
541.9	1.0	14	0.720	17	193	1.7	15	1.3	27	221	1.2
542.6	1.7	14	0.545	19	240	2.0	24	0.993	28	275	1.5
543.3	0.866	15	0.765	15	236	1.1	13	1.4	23	270	0.793
544.0	1.2	14	0.669	15	221	1.1	17	1.2	23	253	0.773
544.7	1.1	13	0.654	16	229	1.3	16	1.2	25	262	0.943
545.4	1.4	14	0.760	19	219	1.9	20	1.4	29	251	1.4
546.1	1.4	14	0.720	18	209	2.6	21	1.3	28	239	1.9
546.8	1.1	13	0.495	17	256	2.3	15	0.902	26	292	1.7
547.5	1.1	14	0.920	15	237	1.5	16	1.7	23	271	1.1
548.2	1.6	13	0.471	17	232	2.0	24	0.859	27	266	1.4
548.9	0.771	13	0.794	15	225	2.7	11	1.4	22	257	1.9
549.6	1.1	11	0.796	11	222	1.3	16	1.5	16	254	0.914
550.3	1.3	12	0.539	12	218	2.4	19	0.984	19	249	1.8
551.0	1.4	14	0.823	15	272	2.2	20	1.5	23	311	1.6
551.7	1.3	12	0.750	14	217	2.6	18	1.4	21	248	1.9
552.4	1.5	14	0.871	15	239	1.9	21	1.6	23	273	1.4
553.1	0.838	13	0.934	14	238	2.9	12	1.7	21	272	2.1
553.8	1.4	11	0.720	14	227	1.8	20	1.3	22	260	1.3
554.5	0.965	12	0.955	16	249	1.3	14	1.7	25	285	0.973
555.2	1.0	12	0.762	16	221	1.7	15	1.4	25	253	1.2
555.9	1.7	11	0.891	14	209	1.5	24	1.6	21	239	1.1
556.6	0.922	11	0.584	13	225	2.0	13	1.1	20	258	1.5
557.3	0.802	13	0.765	14	220	1.6	12	1.4	22	251	1.2
558.0	1.6	11	0.569	14	232	2.3	23	1.0	21	265	1.7
558.7	1.5	13	0.873	14	202	1.7	22	1.6	22	231	1.2
559.4	1.2	9.6	0.941	13	192	1.4	17	1.7	20	220	1.0
560.1	1.6	12	0.835	15	227	1.6	23	1.5	23	260	1.1
560.8	2.0	12	0.865	18	216	1.6	28	1.6	28	247	1.1
561.5	1.7	12	0.898	19	242	2.7	25	1.6	29	276	1.9
562.2	1.9	12	0.721	18	228	2.3	27	1.3	27	261	1.7
562.9	2.4	12	0.822	17	237	1.4	34	1.5	26	271	1.0
563.6	2.0	12	0.408	14	227	1.4	29	0.744	22	260	1.0
564.3	1.8	12	1.3	16	254	2.7	27	2.4	24	291	1.9



Minnow Environmental  
Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
564.9	1.4	13	1.2	17	206	2.2	20	2.2	26	236	1.6
565.6	1.2	11	0.798	12	230	1.7	17	1.5	18	263	1.3
566.3	1.3	10	1.2	13	220	1.9	18	2.2	19	251	1.4
567.0	1.3	13	0.970	16	208	2.1	18	1.8	24	238	1.6
567.7	1.6	11	0.864	17	223	1.3	23	1.6	25	255	0.922
568.4	0.829	16	1.0	16	212	2.9	12	1.8	24	242	2.1
569.1	1.1	9.7	1.1	20	225	2.3	15	2.0	30	257	1.7
569.8	1.6	11	0.911	13	212	2.2	23	1.7	20	243	1.6
570.5	1.4	14	1.2	19	225	1.7	20	2.2	29	257	1.2
571.2	1.3	11	1.3	18	224	1.3	19	2.3	28	256	0.936
571.9	1.8	12	0.814	19	238	1.8	26	1.5	29	273	1.3
572.6	1.4	11	0.854	19	253	1.3	21	1.6	29	289	0.935
573.3	1.0	9.8	1.0	19	254	1.6	15	1.9	30	290	1.2
574.0	0.988	12	1.3	18	218	1.6	14	2.3	28	250	1.1
574.7	1.5	11	1.1	16	208	1.3	21	2.0	25	238	0.980
575.4	1.0	10	1.0	18	230	2.1	14	1.9	28	263	1.5
576.1	1.1	10	0.986	16	223	1.2	16	1.8	24	256	0.892
576.8	1.6	12	1.1	19	259	1.8	23	2.0	30	296	1.3
577.5	1.4	12	1.1	26	243	1.2	21	2.0	39	278	0.858
578.2	1.1	11	1.1	21	228	2.3	15	2.0	33	261	1.7
578.9	0.732	10	1.5	15	202	0.868	11	2.7	23	231	0.634
579.6	1.8	8.8	0.759	19	235	1.4	26	1.4	29	268	1.0
580.3	1.6	13	0.979	20	253	2.0	23	1.8	30	290	1.4
581.0	1.4	12	0.909	22	234	1.6	20	1.7	34	267	1.2
581.7	2.0	14	0.775	17	234	1.4	29	1.4	26	267	1.0
582.4	0.815	11	0.817	20	256	2.4	12	1.5	30	293	1.8
583.1	1.2	10	0.992	15	238	2.0	18	1.8	24	272	1.5
583.8	1.0	12	0.890	21	279	1.8	15	1.6	32	319	1.3
584.5	1.2	14	0.894	28	222	1.3	18	1.6	42	254	0.953
585.2	1.2	12	1.0	24	225	1.4	17	1.9	37	257	1.0
585.9	1.1	10	1.1	20	223	2.2	16	2.0	30	255	1.6
586.6	1.8	9.4	0.937	21	207	1.6	26	1.7	32	237	1.2
587.3	1.7	11	0.874	23	223	1.1	25	1.6	35	256	0.768
588.0	0.820	12	0.705	22	213	1.7	12	1.3	34	244	1.3
588.7	1.2	13	0.850	22	202	1.4	17	1.6	33	231	1.0
589.4	0.786	9.0	0.843	20	198	0.739	11	1.5	31	226	0.539
590.1	1.8	11	0.766	23	271	1.4	27	1.4	35	309	1.0
590.7	0.863	12	1.2	22	265	1.8	12	2.1	34	303	1.3
591.4	1.1	12	0.814	18	193	1.9	15	1.5	28	220	1.4
592.1	1.6	11	0.874	21	208	0.981	23	1.6	32	238	0.716
592.8	1.5	11	0.951	19	232	1.2	21	1.7	29	266	0.880
593.5	1.4	10	0.602	16	194	1.2	20	1.1	24	222	0.909
594.2	2.2	12	1.1	22	251	1.3	31	2.0	33	287	0.932
594.9	0.841	10	1.1	17	212	1.1	12	2.0	26	242	0.834
595.6	2.4	11	0.839	20	232	1.6	35	1.5	30	265	1.1
596.3	1.1	13	0.894	20	229	1.6	16	1.6	30	262	1.2
597.0	1.1	13	0.915	23	252	1.9	16	1.7	35	288	1.4
597.7	1.2	12	0.893	20	201	0.980	17	1.6	30	230	0.715
598.4	1.2	13	0.699	24	200	0.910	18	1.3	37	229	0.664
599.1	0.998	12	0.977	20	269	1.4	14	1.8	30	308	1.0
599.8	1.6	13	0.887	20	275	1.3	23	1.6	30	315	0.925
600.5	1.3	12	0.935	21	229	1.6	19	1.7	32	262	1.2
601.2	0.752	12	0.693	20	220	1.9	11	1.3	30	252	1.4
601.9	0.819	10.0	0.762	23	218	0.513	12	1.4	35	249	0.374
602.6	0.999	11	0.929	18	234	1.1	14	1.7	28	268	0.776
603.3	1.3	11	0.775	16	242	1.1	19	1.4	25	277	0.786
604.0	1.3	12	0.973	21	232	1.5	18	1.8	32	266	1.1
604.7	1.3	13	0.839	20	206	1.0	19	1.5	30	236	0.738
605.4	0.659	12	1.1	18	269	1.1	9.5	2.0	28	308	0.791
606.1	0.885	9.9	0.922	20	238	1.7	13	1.7	30	272	1.2
606.8	1.5	14	0.812	18	284	0.936	21	1.5	28	325	0.683
607.5	1.3	12	0.892	20	221	0.621	18	1.6	31	253	0.453
608.2	1.1	11	0.767	22	251	1.2	16	1.4	33	287	0.904
608.9	1.1	9.7	0.776	19	230	1.6	16	1.4	29	262	1.2
609.6	1.2	11	0.525	15	214	1.2	17	0.957	22	244	0.866
610.3	1.4	12	0.735	19	232	1.5	20	1.3	28	265	1.1
611.0	1.9	13	0.812	17	226	1.0	27	1.5	26	259	0.760
611.7	1.2	11	0.632	18	237	1.7	17	1.2	28	271	1.3
612.4	1.8	11	0.422	21	222	1.1	26	0.770	31	254	0.803
613.1	0.836	8.5	0.626	15	228	1.3	12	1.1	23	261	0.921
613.8	2.2	13	0.773	20	241	1.4	32	1.4	30	276	1.0
614.5	0.870	12	0.604	19	211	1.0	13	1.1	29	241	0.730
615.2	1.1	11	1.2	24	266	1.4	16	2.2	37	304	1.0
615.9	1.0	9.6	0.746	15	214	0.878	15	1.4	23	244	0.641
616.6	1.0	11	0.681	19	234	1.0	15	1.2	29	267	0.746
617.2	1.1	12	0.597	19	229	1.1	16	1.1	29	262	0.787
617.9	0.611	13	0.768	18	219	1.3	8.8	1.4	27	251	0.929
618.6	0.583	12	0.655	20	221	1.0	8.4	1.2	31	252	0.760
619.3	0.703	11	0.762	15	222	1.2	10	1.4	23	254	0.853
620.0	1.5	10	0.681	19	254	1.1	21	1.2	28	291	0.814
620.7	1.2	11	0.625	16	221	0.564	17	1.1	24	253	0.411



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Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.4	1.3	12	0.307	22	240	1.0	19	0.560	33	275	0.759
622.1	0.978	8.3	0.517	18	215	1.1	14	0.943	27	246	0.823
622.8	1.5	10	0.475	14	253	0.775	21	0.866	22	289	0.566
623.5	0.833	12	0.455	14	273	1.4	12	0.830	22	312	1.0
624.2	1.2	11	0.617	18	254	1.3	17	1.1	28	291	0.947
624.9	1.1	11	0.718	17	229	1.5	15	1.3	26	262	1.1
625.6	0.980	10	0.656	15	215	1.2	14	1.2	23	246	0.889
626.3	0.909	11	0.737	18	219	1.2	13	1.3	27	250	0.851
627.0	1.8	12	0.817	20	263	1.2	26	1.5	31	301	0.870
627.7	1.4	10	0.667	18	215	0.912	20	1.2	27	246	0.665
628.4	0.812	10	0.640	16	218	0.721	12	1.2	25	250	0.526
629.1	0.914	8.1	0.702	14	228	0.768	13	1.3	21	261	0.560
629.8	0.755	12	0.494	13	259	1.3	11	0.900	20	297	0.981
630.5	1.2	11	0.655	14	231	0.571	17	1.2	22	264	0.416
631.2	1.5	12	0.908	14	206	0.833	21	1.7	21	235	0.607
631.9	2.0	9.0	0.500	15	220	0.871	28	0.911	22	252	0.635
632.6	0.710	12	0.559	15	234	1.4	10	1.0	24	268	1.1
633.3	1.2	13	0.659	17	244	1.2	18	1.2	26	279	0.854
634.0	1.1	12	0.908	16	222	1.1	17	1.7	25	254	0.811
634.7	0.588	12	0.526	18	245	0.763	8.5	0.959	28	280	0.557
635.4	0.996	12	0.786	20	261	1.3	14	1.4	30	298	0.951
636.1	1.3	11	0.530	13	240	1.0	18	0.966	20	274	0.750
636.8	1.2	12	0.536	15	246	0.808	17	0.977	23	281	0.590
637.5	1.0	12	0.644	16	230	1.1	15	1.2	25	263	0.795
638.2	1.7	10	0.844	19	248	1.3	24	1.5	29	283	0.946
638.9	0.774	8.2	0.731	13	187	1.2	11	1.3	20	214	0.892
639.6	0.862	10	0.584	14	281	1.4	12	1.1	21	321	1.1
640.3	0.548	12	0.541	18	266	0.981	7.9	0.986	27	305	0.716
641.0	0.697	10	0.729	14	208	1.5	10	1.3	21	238	1.1
641.7	1.3	11	0.827	15	213	1.1	18	1.5	23	244	0.793
642.4	0.989	11	0.702	18	264	0.701	14	1.3	27	302	0.512
643.1	1.1	11	0.854	15	266	0.696	16	1.6	23	304	0.508
643.7	1.3	10	0.678	16	259	1.1	18	1.2	24	296	0.787
644.4	1.6	11	0.809	16	252	1.7	24	1.5	25	288	1.3
645.1	1.6	11	0.649	18	255	1.4	23	1.2	27	291	1.0
645.8	0.583	10	0.802	12	220	1.7	8.4	1.5	19	252	1.2
646.5	1.1	11	1.3	13	251	1.2	17	2.3	20	287	0.868
647.2	0.985	12	1.3	21	319	1.4	14	2.3	32	365	0.993
647.9	1.3	11	0.842	14	208	0.770	19	1.5	22	238	0.562
648.6	1.2	10	0.869	19	233	1.4	18	1.6	29	267	1.0
649.3	1.3	9.7	0.725	17	264	0.746	18	1.3	26	302	0.544
650.0	1.0	10	0.691	15	229	0.982	15	1.3	24	262	0.717
650.7	1.2	12	0.876	18	228	1.2	18	1.6	28	260	0.867
651.4	0.618	12	0.486	15	239	0.933	8.9	0.887	22	273	0.681
652.1	0.962	9.1	0.686	14	236	1.3	14	1.3	21	270	0.949
652.8	0.819	8.4	0.767	18	221	0.611	12	1.4	27	252	0.446
653.5	1.2	11	0.842	17	290	1.8	18	1.5	26	332	1.3
654.2	1.1	10	0.456	15	267	2.0	15	0.832	24	306	1.4
654.9	1.4	12	0.676	15	236	1.2	20	1.2	24	270	0.851
655.6	0.621	11	1.1	12	225	1.0	9.0	2.0	19	258	0.746
656.3	0.568	11	0.641	15	227	0.857	8.2	1.2	24	260	0.626
657.0	1.5	12	0.969	19	273	0.945	22	1.8	30	312	0.689
657.7	1.3	11	0.384	17	226	1.1	18	0.700	25	258	0.810
658.4	0.618	12	0.774	16	245	0.678	8.9	1.4	24	280	0.494
659.1	0.902	9.1	0.402	16	209	0.761	13	0.734	25	238	0.555
659.8	0.929	10	0.772	15	258	1.0	13	1.4	22	295	0.760
660.5	1.4	11	0.932	16	244	0.595	20	1.7	25	279	0.434
661.2	1.1	12	0.736	14	211	1.2	17	1.3	22	241	0.867
661.9	0.991	11	0.972	16	219	1.3	14	1.8	24	251	0.978
662.6	0.513	8.9	0.893	14	212	0.880	7.4	1.6	21	242	0.642
663.3	0.870	11	1.1	21	320	1.6	13	2.0	33	366	1.2
664.0	1.0	13	1.1	18	248	0.897	15	2.0	28	283	0.655
664.7	0.513	12	0.858	15	227	1.0	7.4	1.6	23	259	0.749
665.4	0.830	12	1.1	18	229	0.606	12	1.9	27	262	0.442
666.1	1.2	9.0	0.799	17	264	1.5	17	1.5	25	302	1.1
666.8	0.658	14	1.0	20	263	0.684	9.5	1.9	30	301	0.499
667.5	0.809	11	0.820	19	262	1.9	12	1.5	29	300	1.4
668.2	1.3	13	0.870	20	223	1.3	19	1.6	31	255	0.970
668.9	0.993	10	0.984	20	209	0.961	14	1.8	31	240	0.701
669.5	0.513	10	0.684	20	214	1.1	7.4	1.2	31	245	0.768
670.2	1.2	11	1.1	17	230	1.1	17	1.9	26	263	0.786
670.9	0.843	11	0.864	22	211	1.4	12	1.6	33	242	1.0
671.6	0.891	12	0.913	20	263	0.744	13	1.7	31	301	0.543
672.3	0.513	10	0.845	21	228	0.775	7.4	1.5	33	260	0.566
673.0	1.1	11	1.0	22	248	1.4	15	1.9	34	284	1.0
673.7	1.7	11	1.1	19	226	1.2	24	2.0	30	258	0.908
674.4	0.655	13	1.1	23	235	1.3	9.5	2.1	35	269	0.984
675.1	1.5	11	0.966	20	216	0.952	21	1.8	31	246	0.695
675.8	1.1	11	1.2	22	248	1.3	16	2.1	33	284	0.973
676.5	0.673	12	0.840	21	212	0.942	9.7	1.5	32	243	0.687
677.2	1.5	14	1.3	20	254	0.574	22	2.3	31	290	0.419



Minnow Environmental  
Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
677.9	0.717	14	0.742	26	224	1.1	10	1.4	40	257	0.789
678.6	1.1	9.5	0.964	24	210	1.0	15	1.8	37	240	0.756
679.3	0.917	11	1.3	19	250	1.5	13	2.4	29	285	1.1
680.0	1.4	14	0.900	24	274	1.3	20	1.6	36	314	0.913
680.7	1.3	9.7	0.834	25	254	1.2	19	1.5	38	290	0.846
681.4	0.513	11	1.2	24	202	1.3	7.4	2.2	37	230	0.968
682.1	0.541	12	0.842	23	234	0.878	7.8	1.5	35	268	0.641
682.8	1.4	10	0.704	18	214	0.926	20	1.3	27	245	0.676
683.5	1.3	13	0.893	24	255	1.1	19	1.6	36	292	0.798
684.2	1.5	12	0.734	26	207	0.803	21	1.3	40	237	0.586
684.9	0.953	11	0.771	24	224	0.760	14	1.4	36	256	0.555
685.6	0.951	11	0.770	21	215	0.799	14	1.4	33	246	0.583
686.3	1.2	12	1.5	26	211	0.505	18	2.8	40	241	0.369
687.0	0.688	12	0.779	25	204	0.787	9.9	1.4	39	233	0.574
687.7	0.893	12	1.1	27	220	1.1	13	2.0	41	251	0.817
688.4	0.865	14	0.625	22	203	0.939	12	1.1	33	233	0.685
689.1	0.852	12	0.939	25	239	1.3	12	1.7	38	274	0.983
689.8	1.0	13	1.0	25	244	0.647	15	1.9	39	279	0.472
690.5	1.4	14	0.831	27	209	0.636	21	1.5	41	239	0.464
691.2	1.5	12	0.963	26	186	0.912	22	1.8	40	213	0.665
691.9	0.966	11	1.0	27	220	0.631	14	1.9	41	251	0.460
692.6	1.0	9.5	1.0	24	216	0.834	15	1.9	37	247	0.609
693.3	1.4	12	0.855	22	260	0.590	21	1.6	34	297	0.430
694.0	1.8	16	0.904	23	217	0.659	25	1.6	35	248	0.481
694.7	1.2	13	0.551	24	207	0.663	18	1.0	37	237	0.483
695.4	1.3	11	0.902	24	213	0.688	18	1.6	37	243	0.502
696.0	1.9	13	0.698	26	224	1.0	28	1.3	40	256	0.743
696.7	1.3	12	0.870	27	227	1.1	19	1.6	42	260	0.835
697.4	1.3	14	0.622	28	220	0.677	19	1.1	42	251	0.494
698.1	1.3	11	0.867	23	180	0.647	19	1.6	35	206	0.472
698.8	1.4	14	0.779	22	216	0.612	21	1.4	33	247	0.446
699.5	1.0	11	0.763	21	211	0.752	15	1.4	32	242	0.549
700.2	1.6	13	0.810	26	224	1.4	23	1.5	40	256	1.0
700.9	1.6	13	0.934	23	237	0.857	23	1.7	36	270	0.625
701.6	1.3	9.5	0.593	22	205	1.1	18	1.1	34	235	0.793
702.3	1.2	12	0.847	21	219	0.451	18	1.5	33	251	0.329
703.0	0.917	9.3	0.724	22	191	1.2	13	1.3	34	218	0.848
703.7	2.0	12	0.919	23	243	1.0	28	1.7	35	278	0.752
704.4	1.5	13	0.623	23	209	0.726	22	1.1	36	239	0.529
705.1	1.7	11	0.826	29	218	0.883	25	1.5	44	250	0.644
705.8	0.973	12	0.632	18	254	0.863	14	1.2	28	290	0.630
706.5	2.0	13	1.1	19	253	1.7	28	1.9	29	289	1.2
707.2	1.7	12	0.620	20	206	0.798	25	1.1	31	236	0.582
707.9	1.2	12	0.699	22	236	1.2	17	1.3	33	270	0.907
708.6	1.1	12	0.454	20	231	0.988	16	0.828	30	264	0.721
709.3	1.5	9.3	0.673	16	219	0.477	22	1.2	25	250	0.348
710.0	1.7	13	0.675	23	249	1.1	24	1.2	35	285	0.833
710.7	0.772	11	0.696	22	225	1.5	11	1.3	33	258	1.1
711.4	1.3	12	0.876	22	264	0.914	19	1.6	34	302	0.667
712.1	0.942	8.8	0.555	16	201	1.0	14	1.0	24	230	0.732
712.8	1.2	12	0.615	17	253	0.985	18	1.1	25	289	0.719
713.5	1.5	15	1.0	18	249	1.2	22	1.9	28	284	0.910
714.2	1.1	11	0.583	19	228	1.1	16	1.1	29	261	0.796
714.9	0.665	10	0.504	15	201	0.506	9.6	0.920	23	230	0.370
715.6	1.2	11	0.811	16	207	0.993	17	1.5	24	237	0.725
716.3	1.5	11	0.453	15	244	0.446	22	0.826	22	279	0.326
717.0	2.0	13	0.797	18	269	1.2	29	1.5	28	308	0.873
717.7	0.951	10	0.690	17	196	1.6	14	1.3	27	224	1.2
718.4	1.8	9.8	0.554	15	222	1.0	26	1.0	23	254	0.747
719.1	1.4	10	0.760	13	213	0.436	21	1.4	20	244	0.318
719.8	1.7	11	0.860	14	278	1.7	24	1.6	22	317	1.3
720.5	1.0	11	0.567	13	259	1.3	15	1.0	19	297	0.972
721.2	1.5	11	0.702	17	242	1.6	21	1.3	26	276	1.2
721.9	1.0	8.2	0.647	13	221	1.1	15	1.2	20	253	0.768
722.6	1.7	9.0	0.679	13	245	0.679	24	1.2	20	280	0.495
723.2	0.945	11	0.767	16	249	1.4	14	1.4	24	285	1.0
723.9	0.513	11	0.630	12	246	1.2	7.4	1.1	18	281	0.871
724.6	0.805	13	0.655	11	220	1.3	12	1.2	17	251	0.915
725.3	1.4	7.7	0.490	16	252	1.3	20	0.893	24	288	0.974
726.0	0.646	7.5	0.526	11	205	1.2	9.3	0.960	17	235	0.896
726.7	1.2	11	0.830	17	266	2.0	17	1.5	26	304	1.4
727.4	1.1	10	0.690	16	235	1.6	16	1.3	24	269	1.1
728.1	1.4	11	1.3	13	227	0.952	20	2.3	20	260	0.694
728.8	1.6	11	0.802	13	263	0.664	22	1.5	20	301	0.484
729.5	1.5	7.9	0.893	10	248	1.1	21	1.6	16	283	0.780
730.2	2.0	10	0.872	14	263	1.1	29	1.6	22	301	0.779
730.9	0.835	7.7	0.976	14	203	1.1	12	1.8	22	233	0.782
731.6	0.545	9.6	0.749	14	222	1.1	7.9	1.4	22	254	0.776
732.3	0.836	7.9	0.961	14	219	0.815	12	1.8	21	251	0.595
733.0	0.911	6.8	0.938	12	226	1.5	13	1.7	18	258	1.1
733.7	0.714	10	0.891	14	228	1.3	10	1.6	22	261	0.929



Minnow Environmental  
Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
734.4	1.1	9.5	0.649	15	243	1.0	16	1.2	23	277	0.754
735.1	1.4	8.6	0.841	16	271	1.5	21	1.5	25	310	1.1
735.8	1.6	9.5	0.631	13	250	0.919	23	1.2	20	286	0.670
736.5	1.6	12	1.1	13	239	1.5	23	1.9	21	273	1.1
737.2	0.994	11	0.605	13	218	1.2	14	1.1	21	249	0.901
737.9	1.1	11	0.638	16	260	1.2	15	1.2	24	298	0.853
738.6	1.1	10	1.3	15	281	1.0	16	2.3	23	321	0.759
739.3	0.600	9.2	0.881	13	230	1.2	8.7	1.6	20	263	0.901
740.0	1.4	9.8	1.4	17	250	1.2	21	2.5	25	286	0.888
740.7	1.1	8.6	0.811	15	217	1.0	16	1.5	22	248	0.759
741.4	1.4	6.4	1.4	12	260	1.0	21	2.6	19	297	0.766
742.1	0.765	7.8	0.849	15	236	1.1	11	1.5	22	270	0.795
742.8	0.761	7.7	1.1	12	237	1.1	11	2.0	19	271	0.791
743.5	0.993	9.7	0.923	16	246	0.615	14	1.7	24	281	0.449
744.2	1.0	12	1.1	17	222	1.3	14	2.0	26	254	0.958
744.9	1.0	8.3	1.3	14	213	1.0	15	2.4	21	243	0.748
745.6	0.845	9.6	0.984	15	243	1.4	12	1.8	24	278	1.0
746.3	1.2	11	1.4	20	265	1.1	17	2.5	31	303	0.789
747.0	0.707	10	0.972	22	243	1.2	10	1.8	33	278	0.849
747.7	0.624	9.3	0.723	20	217	1.4	9.0	1.3	30	248	1.0
748.4	0.616	7.9	1.2	19	213	0.845	8.9	2.2	29	244	0.617
749.0	0.765	8.5	1.0	19	255	0.817	11	1.9	29	291	0.596
749.7	0.607	9.4	1.0	20	240	0.690	8.8	1.8	31	275	0.503
750.4	1.2	8.7	1.2	22	230	1.1	17	2.1	34	263	0.803
751.1	1.3	10	1.0	24	219	1.1	18	1.8	37	251	0.828
751.8	0.717	8.2	1.0	20	212	0.851	10	1.8	31	243	0.621
752.5	1.8	8.3	1.2	19	301	1.5	25	2.3	29	345	1.1
753.2	1.4	11	0.959	24	261	0.820	20	1.7	36	298	0.598
753.9	1.0	12	1.4	25	219	1.0	15	2.5	38	251	0.732
754.6	1.0	8.6	1.0	24	233	0.721	15	1.8	36	267	0.526
755.3	0.994	8.3	1.2	20	239	1.3	14	2.2	31	274	0.965
756.0	1.1	9.1	1.2	21	225	1.7	16	2.3	32	257	1.2
756.7	1.5	9.2	1.6	33	248	0.981	22	2.8	50	283	0.716
757.4	0.945	9.5	1.2	24	217	1.1	14	2.1	37	248	0.773
758.1	1.6	8.0	1.2	28	208	1.3	23	2.3	42	238	0.933
758.8	1.1	11	1.5	23	268	0.548	16	2.7	35	307	0.400
759.5	0.908	11	1.3	29	230	0.356	13	2.4	44	263	0.260
760.2	1.7	10.0	1.2	31	270	1.3	24	2.1	47	309	0.941
760.9	1.0	10	1.2	27	207	0.865	15	2.2	42	237	0.631
761.6	0.668	11	1.2	30	230	0.732	9.6	2.2	45	263	0.534
762.3	0.942	8.8	1.3	22	215	0.880	14	2.4	33	246	0.642
763.0	1.4	11	1.4	29	259	1.1	20	2.5	45	297	0.832
763.7	1.0	14	1.3	31	232	1.0	15	2.4	47	265	0.759
764.4	1.3	9.4	1.2	34	256	0.364	19	2.1	52	293	0.266
765.1	1.2	8.4	1.3	26	232	0.497	17	2.4	40	266	0.363
765.8	1.2	11	0.857	25	237	0.736	17	1.6	38	271	0.537
766.5	1.3	11	0.877	28	241	0.715	18	1.6	43	276	0.522
767.2	1.7	12	0.830	32	237	1.0	24	1.5	49	271	0.748
767.9	1.4	8.4	0.965	30	196	0.507	21	1.8	45	224	0.370
768.6	0.587	10	1.0	29	210	0.239	8.5	1.8	44	240	0.175
769.3	1.1	8.2	0.851	26	210	0.778	15	1.6	40	240	0.568
770.0	2.0	15	0.970	33	195	0.886	28	1.8	50	223	0.647
770.7	1.3	12	1.0	30	220	0.958	19	1.9	46	251	0.699
771.4	0.808	12	0.901	29	237	0.537	12	1.6	44	271	0.392
772.1	1.0	10.0	0.988	28	230	0.918	15	1.8	43	263	0.670
772.8	1.5	11	1.1	32	240	0.953	21	2.1	48	274	0.696
773.5	1.4	12	0.920	32	222	0.672	21	1.7	49	254	0.490
774.2	1.1	12	0.632	31	251	0.828	16	1.2	48	286	0.604
774.9	1.4	12	1.0	27	199	0.553	20	1.8	42	228	0.403
775.5	1.8	11	0.724	29	220	0.324	25	1.3	45	251	0.236
776.2	1.9	14	1.3	31	220	0.909	27	2.3	47	252	0.663
776.9	1.5	12	0.858	34	235	0.374	21	1.6	52	269	0.273
777.6	0.954	14	0.859	32	224	0.375	14	1.6	49	256	0.273
778.3	1.5	11	0.837	27	212	0.511	22	1.5	41	242	0.373
779.0	1.3	11	1.0	24	229	0.410	19	1.9	37	262	0.299
779.7	1.6	13	0.880	28	257	1.0	24	1.6	42	294	0.755
780.4	0.939	17	0.722	27	213	0.749	14	1.3	41	243	0.547
781.1	1.6	14	0.707	27	214	0.501	23	1.3	41	245	0.365
781.8	1.2	13	0.679	24	222	0.423	17	1.2	36	254	0.309
782.5	1.8	9.9	0.799	23	221	0.978	25	1.5	34	253	0.714
783.2	1.1	11	0.904	21	207	0.949	16	1.6	32	237	0.692
783.9	1.3	13	0.902	26	218	0.899	18	1.6	39	249	0.656
784.6	1.6	9.7	0.613	25	234	0.355	23	1.1	39	268	0.259
785.3	1.0	10	0.719	21	243	1.1	15	1.3	32	278	0.808
786.0	1.6	12	0.841	19	236	0.719	24	1.5	29	270	0.525
786.7	1.1	15	0.391	23	232	0.942	15	0.713	35	265	0.687
787.4	1.2	12	0.664	17	212	1.2	17	1.2	27	243	0.874
788.1	1.0	11	0.733	17	235	0.713	15	1.3	26	269	0.520
788.8	0.857	8.3	0.746	14	194	0.913	12	1.4	21	222	0.666
789.5	1.5	14	0.700	17	263	1.5	21	1.3	27	301	1.1
790.2	1.1	13	0.888	19	217	1.1	16	1.6	29	248	0.822



Minnow Environmental  
Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
790.9	1.7	12	0.444	19	227	0.702	25	0.810	30	260	0.512
791.6	0.815	8.3	0.661	15	194	0.965	12	1.2	23	222	0.704
792.3	1.4	9.6	0.641	15	232	1.2	21	1.2	22	265	0.844
793.0	1.8	11	0.817	18	313	1.1	26	1.5	27	358	0.804
793.7	1.1	11	0.652	17	242	1.3	15	1.2	25	277	0.975
794.4	1.2	9.4	0.527	18	235	0.509	17	0.960	28	268	0.372
795.1	0.915	10	0.786	15	276	0.764	13	1.4	22	316	0.558
795.8	1.3	9.8	0.728	11	245	1.5	19	1.3	16	280	1.1
796.5	1.1	13	0.877	16	261	0.536	16	1.6	25	298	0.391
797.2	0.984	10	0.439	13	248	0.830	14	0.800	21	283	0.606
797.9	1.3	10	0.833	11	235	0.870	18	1.5	18	269	0.635
798.6	1.0	8.2	0.638	11	211	0.621	15	1.2	16	241	0.453
799.3	0.905	11	0.855	13	291	0.624	13	1.6	19	333	0.455
800.0	2.3	10	0.877	12	258	0.561	33	1.6	18	295	0.409
800.7	0.920	10	0.459	13	240	1.4	13	0.837	19	274	0.994
801.4	0.652	8.6	0.607	12	238	0.746	9.4	1.1	18	273	0.544
802.0	1.7	7.1	0.589	9.2	255	0.887	25	1.1	14	292	0.647
802.7	0.541	8.3	0.445	14	239	1.5	7.8	0.811	22	274	1.1
803.4	1.3	7.3	0.989	12	264	1.6	18	1.8	18	302	1.2
804.1	1.0	8.6	0.875	12	251	0.936	14	1.6	18	287	0.683
804.8	0.645	8.7	0.867	8.6	229	0.795	9.3	1.6	13	262	0.580
805.5	1.3	9.2	1.1	12	229	1.2	18	2.1	19	262	0.878
806.2	1.3	10	0.882	13	254	2.0	19	1.6	20	290	1.4
806.9	1.4	9.5	0.583	12	220	1.4	21	1.1	19	252	1.0
807.6	1.0	8.6	0.780	12	241	0.899	15	1.4	19	275	0.656
808.3	1.1	7.1	1.2	10	282	1.0	16	2.2	16	322	0.761
809.0	1.0	10.0	0.892	14	290	2.0	15	1.6	21	331	1.5
809.7	1.3	8.4	0.961	13	220	1.5	19	1.8	21	251	1.1
810.4	1.4	11	0.841	13	252	1.2	20	1.5	20	288	0.898
811.1	1.2	8.1	1.0	13	225	3.0	18	1.9	19	257	2.2
811.8	1.6	8.7	0.744	12	251	0.752	23	1.4	18	287	0.549
812.5	1.3	8.1	1.4	14	269	1.0	19	2.5	21	307	0.740
813.2	1.2	94	1.1	16	230	1.4	17	1.9	24	263	0.985
813.9	0.903	8.3	1.3	19	228	1.7	13	2.3	28	261	1.2
814.6	0.808	8.4	1.2	13	247	1.9	12	2.2	20	282	1.4
815.3	0.616	8.7	1.1	16	261	1.7	8.9	2.1	24	298	1.2
816.0	0.513	10	1.6	18	258	1.4	7.4	2.9	28	295	1.0
816.7	1.2	9.3	0.998	17	228	0.860	17	1.8	26	260	0.627
817.4	0.531	8.5	1.2	17	241	0.950	7.7	2.1	26	276	0.693
818.1	1.3	8.2	0.996	17	220	1.0	18	1.8	26	252	0.741
818.8	1.2	7.4	1.4	18	277	1.2	17	2.6	27	317	0.877
819.5	1.0	10	1.4	16	244	23	15	2.6	25	279	17
820.2	1.3	9.9	1.3	24	247	1.0	18	2.4	36	282	0.750
820.9	0.963	9.8	1.2	22	221	0.940	14	2.2	33	253	0.686
821.6	1.2	10	1.2	17	210	0.607	17	2.2	26	240	0.443
822.3	1.2	9.8	1.3	17	255	0.897	17	2.3	26	292	0.654
823.0	1.2	9.3	1.5	22	224	1.2	18	2.7	33	257	0.854
823.7	1.6	13	1.4	23	246	0.991	23	2.5	36	282	0.723
824.4	1.1	8.8	1.4	22	233	1.1	16	2.6	34	267	0.823
825.1	0.942	9.5	1.3	25	250	1.0	14	2.4	38	286	0.732
825.8	1.2	10.0	1.2	20	247	0.779	17	2.2	31	283	0.568
826.5	1.4	8.8	1.4	25	230	1.6	20	2.5	38	263	1.1
827.2	0.513	9.9	1.4	26	234	1.2	7.4	2.6	41	267	0.855
827.9	0.853	9.7	1.4	25	270	0.355	12	2.6	38	309	0.259
828.5	1.2	9.3	1.4	21	244	0.783	18	2.6	33	279	0.571
829.2	1.3	9.4	1.9	27	266	0.527	19	3.4	42	304	0.385
829.9	1.4	11	1.5	29	241	0.843	21	2.8	45	275	0.615
830.6	0.736	11	1.4	27	240	0.522	11	2.6	41	274	0.381
831.3	0.905	8.3	1.5	28	223	0.561	13	2.8	43	255	0.409
832.0	1.7	11	1.4	24	228	0.510	25	2.6	37	261	0.372
832.7	1.0	10	1.5	30	245	1.0	15	2.8	46	280	0.746
833.4	1.1	11	1.2	24	221	1.1	16	2.2	37	253	0.780
834.1	0.824	9.4	1.5	32	214	0.405	12	2.7	48	245	0.295
834.8	1.1	11	1.4	26	239	1.0	16	2.6	40	273	0.733
835.5	1.0	10	1.3	29	249	0.340	15	2.4	44	284	0.248
836.2	1.4	12	1.3	32	251	0.483	20	2.5	49	286	0.353
836.9	1.1	13	1.2	34	249	0.587	15	2.2	52	285	0.428
837.6	1.3	9.7	1.3	29	273	0.277	18	2.4	45	312	0.202
838.3	1.1	11	1.2	31	249	0.814	16	2.1	48	285	0.594
839.0	1.9	12	1.3	36	263	0.543	27	2.4	56	300	0.396
839.7	1.7	12	1.2	32	253	0.360	25	2.3	49	290	0.263
840.4	1.4	12	1.2	31	221	0.185	20	2.3	48	252	0.135
841.1	1.7	9.6	0.881	30	227	0.878	25	1.6	46	260	0.641
841.8	1.3	10	1.5	28	238	0.590	19	2.7	43	272	0.430
842.5	1.3	11	1.5	32	247	0.542	19	2.8	49	283	0.395
843.2	2.0	13	1.2	34	279	0.582	29	2.2	52	319	0.425
843.9	0.982	12	1.0	28	220	0.330	14	1.8	43	251	0.241
844.6	1.3	11	1.0	33	227	0.742	19	1.9	50	260	0.542
845.3	0.935	11	0.963	26	245	0.330	13	1.8	40	280	0.241
846.0	1.3	14	1.3	33	252	0.931	18	2.4	50	288	0.679
846.7	1.8	12	0.877	27	204	0.984	26	1.6	42	234	0.718



Minnow Environmental  
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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
847.4	1.8	11	1.5	29	232	0.834	27	2.7	44	265	0.609
848.1	1.2	13	1.4	26	273	0.829	18	2.5	39	312	0.605
848.8	1.2	13	1.5	27	241	0.689	18	2.8	41	276	0.503
849.5	1.2	13	1.6	31	229	0.832	17	2.9	47	262	0.607
850.2	1.2	14	1.3	25	210	0.253	18	2.3	39	240	0.185
850.9	1.4	9.4	1.5	27	238	0.523	20	2.8	41	273	0.381
851.6	1.4	9.5	1.3	23	219	0.722	20	2.3	35	250	0.527
852.3	1.1	11	1.5	25	213	0.452	16	2.8	38	244	0.330
853.0	1.8	12	1.7	30	246	0.797	26	3.1	47	282	0.582
853.7	1.1	12	1.4	27	219	0.748	15	2.6	41	250	0.546
854.3	1.2	12	1.5	26	223	0.557	17	2.8	39	255	0.407
855.0	1.2	9.9	1.7	20	217	0.674	18	3.0	30	249	0.491
855.7	1.1	14	1.6	21	235	0.836	16	2.9	33	268	0.610
856.4	1.6	11	1.4	21	238	1.3	23	2.5	33	272	0.943
857.1	1.8	11	1.4	23	234	1.2	26	2.5	35	268	0.883
857.8	0.983	13	1.1	18	232	0.642	14	2.0	28	265	0.468
858.5	1.5	12	1.1	22	262	0.880	22	2.0	34	299	0.642
859.2	0.867	13	1.2	24	242	0.770	13	2.2	36	277	0.562
859.9	0.861	14	0.964	20	235	0.539	12	1.8	31	268	0.393
860.6	1.5	11	0.833	21	234	0.608	22	1.5	32	267	0.444
861.3	0.839	12	0.859	16	254	1.1	12	1.6	25	290	0.768
862.0	1.8	14	1.3	20	292	0.673	26	2.4	31	334	0.491
862.7	0.513	11	1.1	21	272	1.1	7.4	1.9	33	311	0.793
863.4	1.4	12	0.963	17	234	0.642	20	1.8	26	267	0.468
864.1	0.735	11	1.3	17	226	0.697	11	2.3	26	259	0.509
864.8	1.6	9.0	1.2	15	245	0.667	23	2.1	24	280	0.487
865.5	0.828	12	0.673	15	265	1.4	12	1.2	23	303	1.0
866.2	1.3	8.6	0.819	16	234	0.875	19	1.5	25	267	0.638
866.9	0.950	11	0.569	14	245	0.709	14	1.0	21	281	0.517
867.6	1.0	8.2	1.0	14	246	1.3	15	1.9	21	281	0.944
868.3	0.877	9.2	0.960	16	267	1.2	13	1.8	25	305	0.869
869.0	1.6	11	1.0	15	269	0.877	23	1.9	23	308	0.640
869.7	0.727	9.0	0.802	14	239	1.6	10	1.5	21	273	1.1
870.4	1.0	8.4	1.1	13	237	1.1	15	2.0	19	272	0.807
871.1	1.0	9.1	0.573	12	224	0.469	15	1.0	18	256	0.342
871.8	1.1	8.8	1.2	11	273	1.2	16	2.2	18	313	0.865
872.5	1.3	9.0	1.1	13	222	1.5	18	2.1	19	254	1.1
873.2	1.1	11	1.1	11	219	0.712	16	1.9	17	251	0.520
873.9	0.513	10	1.2	14	261	1.4	7.4	2.1	22	298	0.993
874.6	1.0	10	1.2	12	244	0.842	15	2.3	19	279	0.614
875.3	1.2	9.9	1.6	15	267	1.5	18	2.9	23	306	1.1
876.0	0.731	9.2	1.6	13	254	1.0	11	2.9	20	290	0.746
876.7	0.522	10	1.2	13	218	0.508	7.5	2.1	20	249	0.371
877.4	0.575	8.0	0.781	12	268	0.855	8.3	1.4	19	306	0.624
878.1	0.990	7.6	1.0	11	230	0.752	14	1.8	17	263	0.549
878.8	1.1	11	0.991	14	249	0.906	15	1.8	22	285	0.661
879.5	1.2	10	0.959	16	231	1.3	18	1.7	24	264	0.942
880.1	0.554	9.1	1.2	13	252	0.658	8.0	2.2	20	289	0.480
880.8	0.513	7.5	0.900	12	224	0.905	7.4	1.6	19	256	0.660
881.5	0.578	10	1.1	12	236	1.0	8.3	1.9	18	270	0.753
882.2	0.513	10	1.2	11	233	1.4	7.4	2.2	18	266	1.0
882.9	0.837	11	0.702	12	231	1.4	12	1.3	19	264	1.0
883.6	0.513	8.9	0.686	13	216	0.160	7.4	1.3	20	247	0.117
884.3	0.852	8.5	0.943	12	218	0.157	12	1.7	18	249	0.115
885.0	1.2	11	1.3	14	238	0.712	17	2.4	21	272	0.520
885.7	1.3	12	0.968	16	300	0.943	19	1.8	24	344	0.688
886.4	0.627	12	0.963	16	208	0.798	9.1	1.8	24	238	0.582
887.1	1.0	9.2	3.5	20	252	0.618	15	6.4	30	288	0.451
887.8	0.817	7.3	0.954	11	219	0.805	12	1.7	17	250	0.588
888.5	0.810	8.6	0.862	16	255	1.2	12	1.6	25	292	0.854
889.2	1.3	9.4	0.871	17	257	1.2	19	1.6	26	294	0.906
889.9	0.513	9.7	0.788	13	235	0.690	7.4	1.4	20	269	0.503
890.6	0.906	9.7	0.773	12	224	1.0	13	1.4	19	256	0.741
891.3	1.1	7.6	0.785	12	238	0.687	15	1.4	18	273	0.502
892.0	1.0	11	1.2	15	265	0.661	15	2.2	23	303	0.482
892.7	1.3	9.0	0.664	15	230	1.8	19	1.2	23	263	1.3
893.4	1.8	9.5	0.846	16	245	0.665	26	1.5	25	280	0.485
894.1	0.820	8.2	0.782	14	219	0.943	12	1.4	21	250	0.688
894.8	0.812	9.8	1.1	14	255	0.630	12	2.0	22	291	0.460
895.5	1.4	11	0.966	15	297	1.4	20	1.8	23	340	1.1
896.2	0.939	11	0.962	18	260	1.2	14	1.8	27	297	0.860
896.9	1.2	8.1	0.762	16	234	0.526	18	1.4	25	268	0.384
897.6	0.513	8.2	0.940	13	223	0.916	7.4	1.7	21	255	0.668
898.3	1.4	10	1.1	14	218	0.326	20	2.0	21	249	0.238
899.0	0.819	9.8	1.1	16	265	1.2	12	2.0	24	303	0.864
899.7	1.7	11	1.1	16	239	0.843	24	1.9	25	274	0.615
900.4	0.885	8.4	0.955	15	200	0.610	13	1.7	24	229	0.445
901.1	0.513	10	1.1	19	229	0.271	7.4	1.9	30	262	0.198
901.8	0.749	9.1	0.730	13	270	0.888	11	1.3	19	309	0.648
902.5	0.868	9.3	0.967	17	255	0.384	13	1.8	26	292	0.280
903.2	0.875	9.8	1.1	17	220	0.604	13	2.0	26	251	0.440



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
903.9	0.695	10	1.1	18	224	0.884	10	2.1	27	256	0.645
904.6	0.807	9.4	0.773	11	196	1.1	12	1.4	18	224	0.771
905.3	0.714	10	0.808	14	247	1.1	10	1.5	21	282	0.796
906.0	0.809	12	0.516	15	214	0.538	12	0.941	23	245	0.393
906.6	0.784	11	0.736	15	218	0.783	11	1.3	23	249	0.572
907.3	1.3	8.9	0.696	11	190	0.958	18	1.3	17	217	0.699
908.0	1.0	10	0.653	13	251	0.644	15	1.2	20	287	0.470
908.7	0.884	9.9	0.676	14	256	0.368	13	1.2	22	293	0.268
909.4	0.768	8.0	0.779	16	235	1.2	11	1.4	24	268	0.872
910.1	1.3	12	0.726	14	238	0.263	19	1.3	22	272	0.192
910.8	1.0	10	0.668	12	261	0.363	15	1.2	19	298	0.265
911.5	0.839	8.7	0.379	12	235	0.390	12	0.691	19	269	0.285
912.2	1.6	11	0.773	16	253	0.595	23	1.4	24	289	0.434
912.9	0.908	11	0.415	11	278	1.1	13	0.758	17	318	0.831
913.6	0.542	9.6	0.823	9.0	252	0.704	7.8	1.5	14	289	0.513
914.3	0.884	8.7	0.529	11	214	0.597	13	0.966	18	245	0.435
915.0	0.904	10	0.955	12	277	0.534	13	1.7	18	317	0.390
915.7	1.4	11	0.609	13	273	0.885	21	1.1	21	312	0.646
916.4	1.4	9.1	0.590	13	240	0.711	20	1.1	20	274	0.519
917.1	1.0	9.5	0.674	9.1	250	0.803	15	1.2	14	285	0.586
917.8	0.621	9.9	0.843	11	257	0.831	9.0	1.5	17	294	0.606
918.5	0.920	9.3	0.704	11	270	0.865	13	1.3	17	309	0.631
919.2	0.967	9.7	0.375	11	211	0.722	14	0.684	16	241	0.527
919.9	0.723	9.3	0.821	12	230	0.857	10	1.5	18	262	0.625
920.6	1.2	7.2	0.641	8.7	207	0.494	18	1.2	13	236	0.361
921.3	0.826	9.6	0.651	11	255	0.826	12	1.2	17	291	0.603
922.0	0.964	11	0.496	8.6	206	1.2	14	0.905	13	235	0.855
922.7	1.0	10	0.532	9.6	238	1.1	15	0.970	15	272	0.781
923.4	0.785	9.9	0.597	14	250	0.464	11	1.1	21	286	0.338
924.1	0.513	9.0	0.576	8.7	274	1.1	7.4	1.1	13	314	0.816
924.8	1.1	10	0.704	10	263	0.997	15	1.3	16	301	0.727
925.5	0.785	9.6	0.681	12	230	1.1	11	1.2	18	264	0.815
926.2	0.549	12	0.497	12	222	1.3	7.9	0.906	18	254	0.932
926.9	1.1	8.5	0.614	13	237	1.3	15	1.1	20	270	0.914
927.6	1.2	6.8	0.723	9.8	219	0.834	18	1.3	15	250	0.608
928.3	0.513	9.9	0.807	12	303	1.1	7.4	1.5	18	347	0.788
929.0	1.1	11	0.630	15	273	1.6	17	1.1	23	312	1.2
929.7	0.513	12	0.479	11	238	1.2	7.4	0.873	17	273	0.899
930.4	0.525	8.2	0.374	10	232	0.682	7.6	0.681	16	265	0.498
931.1	0.545	8.5	0.588	13	227	0.797	7.9	1.1	20	260	0.581
931.8	0.948	8.6	0.428	8.8	245	1.4	14	0.780	14	280	1.0
932.4	0.926	9.9	0.813	9.7	246	0.638	13	1.5	15	281	0.466
933.1	0.938	9.5	0.594	11	260	1.1	14	1.1	16	298	0.811
933.8	0.831	8.0	0.577	9.7	240	1.0	12	1.1	15	274	0.761
934.5	0.975	7.9	0.937	10	225	1.3	14	1.7	15	257	0.962
935.2	1.6	11	0.729	11	218	0.637	23	1.3	17	249	0.465
935.9	0.513	9.5	0.757	10	222	0.085	7.4	1.4	16	254	0.062
936.6	0.969	7.6	0.726	12	233	0.860	14	1.3	19	266	0.627
937.3	0.887	9.2	0.739	12	233	1.1	13	1.3	19	266	0.766
938.0	1.3	9.5	0.641	12	253	0.746	19	1.2	18	289	0.545
938.7	1.6	11	0.746	12	227	1.0	23	1.4	18	259	0.749
939.4	1.1	9.4	0.766	12	260	0.670	16	1.4	19	297	0.489
940.1	1.2	7.5	0.750	12	239	0.865	18	1.4	18	274	0.631
940.8	1.3	8.1	0.536	13	261	1.2	19	0.977	20	298	0.854
941.5	0.972	10	0.500	14	239	0.999	14	0.913	21	274	0.729
942.2	0.513	9.1	0.685	12	255	0.997	7.4	1.2	19	291	0.728
942.9	1.1	12	0.745	13	234	0.882	17	1.4	20	268	0.644
943.6	0.686	8.4	0.835	13	245	0.959	9.9	1.5	20	280	0.700
944.3	0.819	6.9	0.704	12	242	0.770	12	1.3	18	277	0.562
945.0	1.7	11	0.643	13	280	0.902	25	1.2	20	320	0.658
945.7	1.5	9.8	0.830	14	215	0.709	21	1.5	21	246	0.517
946.4	1.3	9.3	0.644	13	208	0.853	19	1.2	20	238	0.623
947.1	0.940	9.3	0.623	12	270	0.702	14	1.1	19	309	0.512
947.8	1.4	9.9	1.1	13	280	1.0	20	2.0	21	320	0.763
948.5	1.1	10	0.976	12	284	0.474	16	1.8	18	325	0.346
949.2	1.3	11	1.1	13	220	0.939	19	1.9	20	251	0.685
949.9	0.992	12	0.903	13	239	0.703	14	1.6	21	274	0.513
950.6	1.0	7.1	0.775	11	223	0.679	15	1.4	16	255	0.495
951.3	1.2	10	0.730	12	282	1.0	18	1.3	19	322	0.757
952.0	1.1	11	0.535	13	228	0.431	16	0.977	20	261	0.315
952.7	1.8	13	1.1	14	228	0.626	26	2.0	21	261	0.457
953.4	1.2	9.5	0.828	13	215	0.864	18	1.5	20	245	0.630
954.1	1.2	8.5	0.796	11	270	1.1	18	1.5	17	309	0.789
954.8	1.1	10	1.0	12	297	0.859	16	1.8	19	339	0.627
955.5	1.3	11	0.796	12	238	1.3	18	1.5	18	273	0.963
956.2	1.6	9.5	0.454	14	202	1.1	23	0.828	21	231	0.816
956.9	1.5	11	0.704	15	267	0.993	22	1.3	23	305	0.725
957.6	1.8	7.5	0.553	11	204	1.0	26	1.0	16	233	0.764
958.3	1.5	12	0.689	11	255	0.531	22	1.3	17	292	0.387
958.9	1.7	12	0.359	8.5	240	0.915	24	0.656	13	275	0.668
959.6	1.4	10	0.618	13	230	0.783	21	1.1	20	263	0.571



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
960.3	1.6	12	0.494	11	227	1.0	23	0.901	16	260	0.755
961.0	1.5	10	0.808	12	254	0.530	21	1.5	18	291	0.387
961.7	2.8	13	0.833	11	296	1.2	40	1.5	18	339	0.912
962.4	2.3	11	0.740	11	230	0.612	34	1.4	18	263	0.447
963.1	1.8	9.7	0.442	13	265	0.752	25	0.805	20	304	0.549
963.8	2.3	8.4	0.877	9.9	283	0.561	33	1.6	15	324	0.409
964.5	1.7	8.7	0.638	9.6	345	0.697	25	1.2	15	394	0.509
965.2	2.5	12	0.781	12	256	0.539	36	1.4	18	293	0.393
965.9	2.2	10	0.742	13	350	1.4	31	1.4	20	400	1.0
966.6	1.8	10	0.745	12	332	0.543	26	1.4	19	380	0.396
967.3	3.3	9.4	0.704	11	341	1.2	48	1.3	17	390	0.875
968.0	3.4	11	0.861	16	495	1.9	49	1.6	25	566	1.4
968.7	4.1	12	1.2	15	458	1.7	59	2.3	22	524	1.2
969.4	3.3	10	0.707	14	461	0.795	48	1.3	21	527	0.580
970.1	3.6	11	1.1	15	476	1.3	52	2.0	23	544	0.962
970.8	2.7	9.4	0.960	12	583	0.577	39	1.8	18	667	0.421
971.5	5.0	13	1.1	15	642	1.1	72	2.0	23	734	0.811
972.2	4.6	8.5	1.1	13	579	1.4	66	2.1	20	662	1.0
972.9	4.2	12	0.992	21	651	1.3	60	1.8	32	744	0.936
973.6	4.0	8.9	1.5	14	705	0.949	57	2.7	22	806	0.693
974.3	4.0	13	2.0	19	779	1.2	58	3.7	30	891	0.904
975.0	5.8	13	1.7	20	904	1.5	84	3.1	30	1034	1.1
975.7	4.2	14	2.1	24	847	1.6	61	3.7	36	969	1.1
976.4	4.0	10	1.4	21	873	0.939	58	2.5	32	998	0.685
977.1	4.6	10.0	1.7	21	785	1.1	66	3.1	32	898	0.788
977.8	5.8	10	2.3	23	1067	0.901	83	4.1	35	1220	0.657
978.5	5.3	15	2.2	22	869	2.1	77	4.0	33	994	1.5
979.2	5.6	16	2.5	31	1249	1.9	81	4.5	48	1428	1.4
979.9	6.0	13	2.5	30	1055	1.4	87	4.5	46	1206	1.0
980.6	5.6	11	2.6	27	1017	0.800	81	4.8	41	1163	0.584
981.3	6.0	12	2.7	31	1134	1.7	86	4.9	48	1297	1.2
982.0	6.9	16	3.1	35	1235	2.5	100	5.7	54	1412	1.8
982.7	6.0	13	2.6	31	1192	1.0	86	4.7	48	1363	0.748
983.4	6.5	11	2.5	31	1230	1.1	95	4.5	47	1406	0.823
984.1	8.3	15	3.8	27	1371	1.4	120	6.9	42	1568	1.0
984.7	8.7	15	4.2	34	1291	1.6	125	7.6	52	1477	1.2
985.4	8.2	18	2.8	38	1436	2.2	119	5.1	58	1642	1.6
986.1	6.7	17	4.0	41	1424	1.3	96	7.3	63	1628	0.928
986.8	8.7	14	3.4	36	1425	2.3	126	6.2	56	1629	1.7
987.5	7.1	15	4.1	31	1576	2.3	102	7.5	48	1802	1.7
988.2	8.9	14	4.2	32	1584	2.5	128	7.6	50	1812	1.8
988.9	7.1	17	3.8	38	1560	1.1	102	6.8	58	1784	0.819
989.6	8.3	15	4.4	42	1561	1.9	120	8.1	64	1785	1.4
990.3	7.5	14	4.1	33	1528	2.2	108	7.4	51	1748	1.6
991.0	11	16	5.0	38	1765	1.6	156	9.1	58	2019	1.2
991.7	10	19	3.8	46	1712	1.8	150	7.0	70	1958	1.3
992.4	9.5	19	4.1	50	1788	1.2	137	7.5	77	2044	0.873
993.1	10	16	4.0	41	1822	1.5	149	7.4	64	2083	1.1
993.8	7.9	15	4.2	38	1636	1.6	113	7.6	58	1871	1.1
994.5	11	17	4.4	42	1915	1.7	156	8.1	64	2190	1.3
995.2	11	19	4.4	43	1968	2.7	157	8.0	65	2250	2.0
995.9	8.3	19	4.9	48	1996	1.9	119	8.9	73	2282	1.4
996.6	7.9	15	4.7	43	1786	1.3	115	8.6	66	2043	0.954
997.3	9.6	16	3.5	40	1847	1.6	139	6.4	62	2112	1.2
998.0	8.1	17	5.4	41	2112	2.3	117	9.8	63	2415	1.7
998.7	11	21	4.7	55	1968	3.6	159	8.6	85	2251	2.6
999.4	7.5	16	4.3	43	1666	1.6	109	7.8	66	1905	1.2
1000.1	8.7	16	4.4	43	2022	2.0	125	8.1	66	2312	1.5
1000.8	8.9	22	4.1	36	1914	2.3	129	7.5	55	2189	1.7
1001.5	9.0	17	3.6	36	1639	2.8	130	6.5	56	1874	2.1
1002.2	8.0	19	3.6	48	1878	2.1	115	6.6	74	2147	1.6
1002.9	8.3	20	3.6	46	1865	2.3	120	6.6	70	2132	1.7
1003.6	7.4	18	3.5	38	1635	1.4	108	6.4	59	1870	1.0
1004.3	7.3	17	3.9	35	1745	1.8	105	7.1	54	1996	1.3
1005.0	7.9	22	4.1	44	1824	2.1	114	7.5	68	2086	1.5
1005.7	6.3	20	3.8	48	1637	1.3	91	6.9	74	1872	0.942
1006.4	6.1	19	3.5	39	1646	1.7	89	6.4	59	1883	1.3
1007.1	6.5	17	3.3	32	1425	1.9	94	6.0	50	1629	1.4
1007.8	6.7	17	3.5	41	1722	2.8	97	6.4	63	1969	2.0
1008.5	5.0	20	3.2	40	1493	2.3	72	5.8	61	1707	1.7
1009.2	5.5	20	3.0	41	1509	2.2	79	5.5	63	1725	1.6
1009.9	6.6	19	2.5	36	1666	2.1	95	4.5	55	1906	1.6
1010.5	6.0	17	2.7	36	1781	1.2	87	5.0	55	2037	0.881
1011.2	4.7	19	2.9	35	1432	1.8	68	5.3	54	1638	1.3
1011.9	4.8	23	2.7	38	1260	2.7	69	4.9	59	1440	1.9
1012.6	4.1	21	2.5	36	1201	1.5	60	4.5	56	1373	1.1
1013.3	4.5	20	1.9	29	1405	1.9	66	3.5	44	1606	1.4
1014.0	4.0	19	2.1	33	1191	0.739	58	3.8	50	1362	0.539
1014.7	3.7	19	2.0	33	1340	1.9	54	3.7	51	1532	1.4
1015.4	3.4	23	1.9	31	1234	2.0	49	3.4	47	1411	1.4
1016.1	3.9	19	1.8	34	1300	1.9	57	3.3	51	1487	1.4



Minnow Environmental  
Sample ID: 013

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
1016.8	3.5	18	1.9	25	1312	1.4	51	3.5	38	1500	1.0
1017.5	2.7	24	1.6	28	1185	2.7	39	2.9	43	1355	2.0
1018.2	3.0	24	1.2	28	1142	1.8	43	2.2	43	1306	1.3
1018.9	2.4	25	1.5	34	1153	1.8	34	2.8	52	1319	1.3
1019.6	2.8	21	0.987	28	1062	2.7	41	1.8	42	1214	2.0
1020.3	2.0	17	1.2	25	900	1.6	29	2.2	38	1030	1.2
1021.0	2.4	20	1.2	26	1082	1.7	35	2.1	40	1237	1.2
1021.7	2.0	24	1.1	27	893	1.1	29	1.9	42	1021	0.780
1022.4	1.8	25	1.1	26	1104	2.1	26	2.0	39	1263	1.5
1023.1	1.4	20	0.908	23	1025	1.5	20	1.7	35	1172	1.1
1023.8	0.848	23	0.866	20	835	0.792	12	1.6	31	955	0.578
1024.5	2.1	21	0.907	21	1016	1.8	30	1.7	32	1161	1.3
1025.2	2.1	26	0.937	22	917	1.4	30	1.7	34	1048	1.0
1025.9	1.6	20	0.555	20	896	2.3	23	1.0	30	1025	1.7
1026.6	1.6	18	0.393	21	818	1.7	23	0.717	33	935	1.2
1027.3	2.4	20	0.769	17	872	1.5	34	1.4	26	997	1.1
1028.0	1.8	21	0.473	20	1077	1.6	26	0.863	31	1231	1.2
1028.7	2.3	24	0.800	17	888	2.1	33	1.5	26	1015	1.5
1029.4	2.0	21	0.518	16	760	1.8	29	0.944	25	869	1.3
1030.1	2.0	19	0.481	16	883	1.6	29	0.878	24	1009	1.1
1030.8	2.8	21	0.551	14	928	1.7	40	1.0	22	1061	1.3
1031.5	3.4	19	0.487	17	913	1.6	49	0.888	25	1044	1.2
1032.2	3.0	20	0.524	15	728	0.932	44	0.956	22	833	0.680
1032.9	3.1	15	0.594	16	722	1.7	45	1.1	24	825	1.2
1033.6	4.5	16	0.986	13	801	1.5	66	1.8	20	916	1.1
1034.3	5.6	17	0.664	13	836	1.3	81	1.2	20	956	0.943
1035.0	5.7	17	0.612	16	797	1.5	82	1.1	25	912	1.1
1035.7	6.5	18	0.769	15	1003	3.1	94	1.4	24	1147	2.3
1036.4	5.0	16	1.2	16	845	1.8	72	2.1	25	966	1.3
1037.0	6.4	15	1.1	14	896	1.9	92	2.0	22	1025	1.4
1037.7	7.1	16	1.3	16	865	1.9	103	2.4	24	989	1.4
1038.4	6.0	15	1.3	15	930	2.2	87	2.3	22	1063	1.6
1039.1	7.9	16	1.1	13	906	2.2	114	2.0	20	1036	1.6
1039.8	7.2	15	1.6	15	963	2.3	104	2.8	23	1102	1.7
1040.5	7.4	14	1.6	15	1041	2.8	107	2.9	23	1190	2.1
1041.2	9.1	17	2.2	19	1149	2.1	131	4.0	30	1314	1.6
1041.9	7.6	17	2.0	15	1021	2.5	110	3.7	24	1168	1.8
1042.6	9.1	15	1.9	17	949	1.7	132	3.5	26	1085	1.2
1043.3	9.8	14	1.8	15	1079	2.7	142	3.3	23	1234	2.0
1044.0	8.9	14	2.6	18	1142	2.8	129	4.8	28	1306	2.0
1044.7	11	15	3.4	19	1174	3.3	163	6.2	28	1342	2.4
1045.4	9.8	16	2.9	20	1335	4.1	142	5.3	31	1527	3.0
1046.1	9.6	16	3.5	20	1157	2.5	138	6.4	31	1323	1.9
1046.8	9.3	14	3.1	18	1142	2.7	135	5.6	27	1305	2.0
1047.5	8.6	16	3.5	20	1318	3.3	125	6.3	30	1507	2.4
1048.2	10	18	4.0	18	1259	3.1	150	7.3	28	1440	2.3
1048.9	8.8	18	4.4	24	1390	3.5	127	8.0	37	1589	2.5
1049.6	11	19	4.2	22	1391	2.3	152	7.6	33	1591	1.7
1050.3	8.2	15	3.8	17	1319	2.1	118	6.9	26	1509	1.5
1051.0	8.5	18	4.6	22	1507	2.7	122	8.3	33	1723	2.0
1051.7	9.4	15	5.0	27	1471	2.8	136	9.1	41	1682	2.0
1052.4	9.0	19	5.0	28	1536	3.9	130	9.1	42	1756	2.8
1053.1	8.4	16	4.6	28	1570	2.6	121	8.3	42	1795	1.9
1053.8	8.4	15	5.1	29	1504	2.6	122	9.3	45	1720	1.9
1054.5	9.6	19	6.6	31	1624	3.4	138	12	48	1857	2.5
1055.2	8.8	19	4.9	31	1521	3.4	127	9.0	47	1739	2.4
1055.9	11	18	5.1	29	1494	3.3	156	9.2	44	1708	2.4
1056.6	7.5	14	4.5	25	1417	2.3	108	8.3	38	1621	1.7
1057.3	9.6	19	5.2	28	1680	3.6	138	9.5	43	1921	2.6
1058.0	9.3	21	4.8	32	1612	4.6	134	8.8	48	1844	3.4
1058.7	8.6	19	4.8	34	1500	3.9	124	8.8	52	1715	2.8
1059.4	8.0	19	4.6	29	1736	3.5	116	8.4	44	1986	2.5
1060.1	6.8	18	4.9	31	1575	2.3	98	8.9	47	1801	1.7
1060.8	7.2	18	4.8	33	1504	3.6	104	8.7	51	1720	2.6
1061.5	7.6	21	4.7	28	1406	4.0	110	8.5	43	1607	2.9
1062.2	6.2	17	4.5	36	1613	3.1	90	8.1	55	1844	2.2
1062.9	3.6	16	3.7	30	1461	3.4	52	6.8	45	1670	2.5
1063.5	6.8	19	4.4	26	1440	3.2	98	8.0	40	1647	2.3
1064.2	9.9	22	4.9	38	1692	3.2	143	8.9	58	1934	2.3
1064.9	6.4	23	4.7	35	1680	3.4	92	8.6	53	1921	2.5
1065.6	4.5	19	4.1	32	1472	2.8	65	7.4	49	1683	2.0
1066.3	3.9	17	3.5	29	1379	3.1	57	6.3	44	1577	2.3
1067.0	4.0	24	3.5	30	1456	2.6	58	6.4	46	1665	1.9
1067.7	4.8	21	3.6	31	1691	3.4	55	6.6	47	1933	2.5
1068.4	3.7	24	3.1	32	1284	2.4	53	5.7	49	1468	1.8
1069.1	3.2	19	3.8	31	1297	2.4	47	7.0	48	1484	1.7
1069.8	4.8	20	3.5	32	1537	1.9	70	6.3	49	1757	1.4
1070.5	4.3	25	3.1	29	1544	3.3	62	5.7	44	1765	2.4
1071.2	2.8	24	3.0	29	1301	2.3	41	5.4	44	1487	1.7
1071.9	2.4	24	2.8	33	1287	2.8	34	5.1	51	1472	2.1
1072.6	2.5	20	3.1	25	1213	2.7	36	5.6	38	1388	2.0



Minnow Environmental  
Sample ID: 013

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
1073.3	2.4	21	3.1	21	1293	2.8	35	5.7	32	1478	2.1
1074.0	2.4	21	3.6	28	1380	3.3	34	6.6	43	1578	2.4
1074.7	2.0	23	3.2	26	1247	2.6	28	5.9	40	1426	1.9
1075.4	1.8	23	2.2	23	1152	1.9	27	4.1	35	1317	1.4
1076.1	1.2	19	1.3	23	1168	1.4	17	2.4	35	1335	1.1
1076.8	2.9	22	1.9	24	1141	2.2	42	3.5	37	1304	1.6
1077.5	1.8	23	1.9	23	1118	1.4	25	3.5	35	1278	1.0
1078.2	1.4	20	2.3	24	962	2.3	20	4.2	37	1100	1.7
1078.9	1.8	20	1.6	23	1110	1.5	25	2.9	36	1269	1.1
1079.6	1.4	21	1.4	20	1056	2.0	21	2.6	31	1207	1.4
1080.3	1.3	18	1.4	20	947	1.8	18	2.6	31	1083	1.3
1081.0	1.3	21	1.4	22	1061	2.8	19	2.5	33	1213	2.1
1081.7	1.3	20	1.1	18	936	1.1	19	1.9	27	1071	0.832
1082.4	0.854	19	0.774	19	929	1.2	12	1.4	30	1063	0.847
1083.1	1.5	16	1.1	16	967	1.7	21	2.0	24	1105	1.2
1083.8	1.6	17	1.1	19	1036	2.0	23	2.1	29	1185	1.5
1084.5	1.2	19	0.762	19	993	0.857	17	1.4	29	1135	0.625
1085.2	2.1	19	0.956	17	1012	2.5	31	1.7	26	1158	1.8
1085.9	1.8	17	0.834	14	901	2.0	26	1.5	21	1030	1.4
1086.6	0.963	13	0.669	15	865	1.5	14	1.2	23	989	1.1
1087.3	0.930	16	0.796	15	960	1.8	13	1.5	23	1098	1.3
1088.0	1.3	20	0.705	15	978	1.7	19	1.3	23	1119	1.2
1088.6	1.3	14	0.584	14	822	1.4	19	1.1	21	940	1.0
1089.3	1.8	19	0.757	12	955	1.1	26	1.4	18	1092	0.829
1090.0	1.2	16	0.713	9.9	862	0.780	18	1.3	15	986	0.569
1090.7	0.862	12	0.373	12	983	2.0	12	0.679	18	1124	1.5
1091.4	1.8	19	0.633	13	991	1.8	27	1.2	20	1133	1.3
1092.1	1.2	17	0.486	10	846	2.1	17	0.886	16	967	1.5
1092.8	1.8	16	0.608	11	990	1.8	26	1.1	17	1132	1.3
1093.5	0.743	14	0.371	9.4	975	1.2	11	0.677	14	1115	0.897
1094.2	1.3	13	0.555	11	915	1.6	19	1.0	17	1046	1.2
1094.9	1.6	17	0.396	10	989	1.4	24	0.721	16	1131	1.1
1095.6	1.4	15	0.386	10	897	0.882	21	0.704	16	1026	0.644
1096.3	2.0	15	0.456	9.2	925	1.7	29	0.831	14	1058	1.3
1097.0	2.3	15	0.297	8.9	867	1.9	34	0.542	14	992	1.4
1097.7	3.0	15	0.484	11	959	1.5	43	0.883	16	1096	1.1
1098.4	3.1	15	0.415	11	924	2.1	45	0.758	17	1057	1.5
1099.1	2.4	14	0.514	12	1024	2.2	34	0.937	19	1172	1.6
1099.8	3.1	13	0.379	8.4	975	1.8	45	0.691	13	1115	1.3
1100.5	4.1	12	0.416	9.4	1062	1.4	59	0.760	14	1214	1.0
1101.2	4.3	14	0.666	15	1037	1.8	62	1.2	23	1186	1.3
1101.9	4.6	16	0.521	11	979	2.1	67	0.951	17	1119	1.5
1102.6	3.4	15	0.510	7.9	891	1.1	48	0.931	12	1019	0.813
1103.3	3.5	13	0.337	8.8	1021	1.0	51	0.614	13	1168	0.751
1104.0	4.1	17	0.570	11	1213	1.5	60	1.0	17	1387	1.1
1104.7	5.1	17	0.717	9.3	1080	1.8	73	1.3	14	1235	1.3
1105.4	4.4	16	0.618	12	1076	1.5	63	1.1	18	1230	1.1
1106.1	3.8	14	0.453	9.4	1074	2.3	55	0.827	14	1228	1.6
1106.8	3.9	15	0.672	9.7	1134	2.4	57	1.2	15	1297	1.8
1107.5	4.6	17	0.768	12	1208	2.4	66	1.4	19	1381	1.8
1108.2	4.1	18	0.488	13	1004	1.9	59	0.891	20	1149	1.4
1108.9	2.7	16	0.954	12	1105	1.9	38	1.7	19	1264	1.4
1109.6	3.2	16	0.895	13	1200	1.2	46	1.6	19	1372	0.912
1110.3	3.7	18	0.579	11	1272	1.5	54	1.1	17	1454	1.1
1111.0	4.0	18	0.764	9.2	1219	1.2	58	1.4	14	1394	0.882
1111.7	4.0	17	0.522	12	1155	1.1	58	0.953	18	1321	0.798
1112.4	3.8	15	0.722	14	1082	1.3	55	1.3	21	1237	0.923
1113.1	2.6	17	0.330	10	1231	1.7	38	0.601	16	1408	1.2
1113.8	4.1	18	0.627	13	1286	2.4	59	1.1	20	1470	1.7
1114.5	2.4	16	0.593	11	1102	1.3	35	1.1	16	1260	0.978
1115.1	3.7	19	0.578	12	1061	2.2	53	1.1	18	1213	1.6
1115.8	3.2	15	0.736	14	1139	2.1	46	1.3	21	1302	1.5
1116.5	3.3	19	0.681	14	1368	1.2	48	1.2	22	1564	0.898
1117.2	2.8	17	1.1	15	1130	2.4	41	1.9	23	1292	1.7
1117.9	3.7	18	0.866	13	1154	2.2	54	1.6	20	1319	1.6
1118.6	4.7	20	0.913	14	1172	2.1	67	1.7	22	1340	1.5
1119.3	3.4	20	0.776	13	1176	1.9	49	1.4	19	1345	1.4
1120.0	3.0	19	0.491	13	1162	1.0	43	0.895	19	1329	0.749
1120.7	5.3	21	0.790	16	1283	1.4	76	1.4	24	1468	0.994
1121.4	3.0	22	0.743	14	1095	2.0	43	1.4	22	1252	1.5
1122.1	2.6	17	0.839	14	1070	1.4	37	1.5	21	1224	1.0
1122.8	2.7	18	0.856	13	1080	1.0	39	1.6	20	1235	0.735
1123.5	3.1	25	0.571	13	993	1.7	45	1.0	19	1136	1.2
1124.2	2.4	19	0.782	14	1014	1.9	34	1.4	21	1160	1.4
1124.9	3.5	21	0.655	15	976	2.6	51	1.2	23	1117	1.9
1125.6	1.7	19	0.728	14	1077	1.5	25	1.3	21	1232	1.1
1126.3	1.9	18	0.823	11	1028	1.4	28	1.5	17	1176	1.0
1127.0	2.4	19	0.554	12	1061	1.4	34	1.0	18	1213	1.1
1127.7	1.7	22	0.553	13	926	1.8	25	1.0	21	1059	1.3
1128.4	1.2	18	0.823	12	851	1.2	18	1.5	18	973	0.879
1129.1	2.0	18	0.469	11	961	0.936	29	0.855	17	1099	0.683



Minnow Environmental  
Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1129.8	1.9	18	0.540	9.4	940	1.0	28	0.985	14	1075	0.738
1130.5	2.1	20	0.743	11	1072	0.994	31	1.4	17	1226	0.725
1131.2	0.987	19	0.571	11	967	1.7	14	1.0	16	1106	1.2
1131.9	2.1	21	0.433	8.9	928	1.5	31	0.790	14	1061	1.1
1132.6	1.2	15	0.407	8.6	849	1.3	17	0.742	13	971	0.985
1133.3	1.3	16	0.396	9.7	826	0.820	19	0.723	15	944	0.599
1134.0	1.0	19	0.332	9.9	906	1.3	15	0.605	15	1036	0.916
1134.7	1.5	18	0.462	9.2	913	1.5	22	0.843	14	1044	1.1
1135.4	0.974	16	0.471	7.4	810	0.245	14	0.860	11	926	0.178
1136.1	1.6	17	0.162	10	884	2.1	24	0.295	16	1011	1.6
1136.8	1.5	16	0.413	10	848	0.536	22	0.752	16	970	0.391
1137.5	1.6	17	0.428	8.2	860	1.4	24	0.781	13	983	1.0
1138.2	2.5	20	0.198	7.4	819	0.847	37	0.362	11	937	0.618
1138.9	1.5	15	0.268	9.2	810	1.2	22	0.489	14	926	0.907
1139.6	3.2	15	0.302	6.4	848	0.815	46	0.550	9.7	969	0.594
1140.3	3.7	17	0.642	9.9	943	2.1	53	1.2	15	1078	1.5
1141.0	4.8	14	0.381	6.2	808	1.5	70	0.695	9.6	924	1.1
1141.6	4.9	15	0.357	7.3	758	0.946	71	0.652	11	866	0.691
1142.3	4.4	15	0.246	8.8	931	1.8	63	0.449	13	1064	1.3
1143.0	4.2	14	0.529	6.7	751	1.2	61	0.964	10	858	0.842
1143.7	4.4	15	0.564	7.0	883	1.0	63	1.0	11	1009	0.731
1144.4	5.0	13	0.657	8.3	838	1.6	72	1.2	13	958	1.2
1145.1	4.5	16	0.615	7.7	848	1.3	65	1.1	12	970	0.982
1145.8	4.8	13	0.660	6.5	756	0.423	70	1.2	10.0	864	0.309
1146.5	4.2	12	0.628	6.1	789	1.3	60	1.1	9.3	902	0.972
1147.2	4.6	19	0.995	9.3	973	1.7	67	1.8	14	1113	1.2
1147.9	5.6	17	0.793	9.1	984	2.1	81	1.4	14	1125	1.6
1148.6	5.4	17	0.899	8.5	860	1.3	78	1.6	13	983	0.959
1149.3	5.6	15	0.915	11	1154	2.5	81	1.7	16	1319	1.8
1150.0	5.8	16	0.850	11	1199	1.1	83	1.6	17	1371	0.816
1150.7	7.3	18	1.6	13	1048	1.5	105	2.9	20	1198	1.1
1151.4	5.2	19	1.1	14	1170	3.2	75	2.0	21	1338	2.4
1152.1	7.4	16	1.2	9.7	1099	1.1	107	2.3	15	1257	0.768
1152.8	5.9	15	1.2	8.4	1104	1.7	85	2.3	13	1263	1.2
1153.5	5.3	17	1.5	9.5	1314	2.1	76	2.7	15	1502	1.5
1154.2	5.6	19	1.2	13	1076	1.3	80	2.1	20	1230	0.947
1154.9	5.2	19	1.5	13	1248	0.845	75	2.6	20	1427	0.617
1155.6	5.3	16	1.3	14	1256	2.3	76	2.3	21	1437	1.7
1156.3	4.8	17	0.945	12	1098	1.6	69	1.7	18	1256	1.2
1157.0	6.8	19	1.6	11	1325	1.4	99	2.9	17	1515	1.1
1157.7	5.7	21	1.3	14	1327	1.3	82	2.3	22	1518	0.979
1158.4	4.7	22	1.3	13	1359	2.0	68	2.3	20	1554	1.5
1159.1	3.7	18	1.4	12	1259	2.0	54	2.6	19	1439	1.5
1159.8	4.2	20	0.968	11	1299	1.6	60	1.8	16	1486	1.1
1160.5	5.1	20	1.4	14	1453	1.9	73	2.6	21	1662	1.4
1161.2	4.3	20	1.3	14	1450	1.6	62	2.3	22	1658	1.2
1161.9	4.2	17	1.6	13	1192	1.6	61	2.9	20	1364	1.2
1162.6	3.7	18	1.1	12	1342	1.8	54	2.0	19	1534	1.3
1163.3	3.5	21	1.7	13	1450	2.4	51	3.1	19	1658	1.8
1164.0	4.5	21	1.4	12	1221	1.3	64	2.6	18	1397	0.934
1164.7	3.2	22	1.3	13	1275	1.3	47	2.4	20	1458	0.938
1165.4	2.8	19	0.974	13	1137	1.5	40	1.8	20	1301	1.1
1166.1	4.1	19	1.1	12	1346	0.922	59	1.9	19	1539	0.673
1166.8	4.2	23	1.2	11	1309	3.5	60	2.1	17	1497	2.6
1167.4	4.5	24	0.647	15	1128	0.638	64	1.2	23	1290	0.465
1168.1	3.6	23	0.951	14	1166	1.6	52	1.7	22	1333	1.2
1168.8	2.9	18	1.0	11	1227	1.2	42	1.9	17	1403	0.845
1169.5	2.8	19	0.871	11	1172	1.7	40	1.6	17	1340	1.2
1170.2	2.9	23	1.1	14	1172	1.9	42	2.1	21	1340	1.4
1170.9	2.9	24	0.936	11	1030	1.3	41	1.7	17	1178	0.937
1171.6	2.3	21	0.915	11	1167	1.5	34	1.7	17	1335	1.1
1172.3	2.3	19	0.930	12	1144	1.5	33	1.7	19	1308	1.1
1173.0	2.7	22	1.0	11	1396	1.7	39	1.9	17	1597	1.3
1173.7	4.5	25	1.1	9.2	1163	2.3	65	2.0	14	1330	1.7
1174.4	3.1	26	0.968	10	1115	2.0	45	1.8	15	1275	1.5
1175.1	2.1	21	1.3	8.9	1011	1.2	30	2.3	14	1156	0.884
1175.8	2.3	18	0.743	11	1036	1.1	33	1.4	17	1185	0.792
1176.5	2.1	22	0.662	9.7	1126	1.4	30	1.2	15	1287	1.0
1177.2	1.9	23	0.424	13	1020	1.8	28	0.773	20	1167	1.3
1177.9	2.5	22	0.555	9.1	949	1.4	36	1.0	14	1086	1.0
1178.6	0.857	18	0.767	8.8	958	1.5	12	1.4	13	1096	1.1
1179.3	1.5	17	0.388	5.6	987	1.7	21	0.708	8.6	1129	1.2
1180.0	1.7	23	0.575	6.5	1084	1.1	25	1.0	10	1240	0.805
1180.7	1.6	24	0.688	7.8	983	1.3	23	1.3	12	1125	0.961
1181.4	0.637	23	0.607	7.4	1128	2.1	9.2	1.1	11	1290	1.5
1182.1	1.4	21	0.399	5.9	885	0.577	20	0.727	9.1	1012	0.421
1182.8	1.3	17	0.411	5.8	860	0.895	19	0.749	8.9	983	0.653
1183.5	1.9	18	0.231	7.1	1094	2.4	27	0.421	11	1251	1.7
1184.2	1.8	19	0.438	6.9	996	1.9	26	0.799	11	1140	1.4
1184.9	1.2	19	0.432	7.1	923	1.6	17	0.788	11	1056	1.2
1185.6	1.2	17	0.307	6.7	884	0.912	18	0.559	10	1011	0.665



Minnow Environmental Sample ID: 013											
Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
1186.3	1.7	17	0.297	5.7	1048	1.9	25	0.541	8.8	1198	1.4
1187.0	2.4	20	0.395	8.3	913	2.2	34	0.720	13	1044	1.6
1187.7	1.8	19	0.284	6.4	954	1.8	26	0.517	9.8	1091	1.3
1188.4	1.8	15	0.174	5.4	866	1.6	26	0.317	8.2	990	1.2
1189.1	2.0	18	0.531	6.4	970	1.3	28	0.969	9.8	1110	0.976
1189.8	3.1	22	0.353	6.4	1041	1.1	45	0.644	9.7	1190	0.836
1190.5	2.8	18	0.432	7.7	906	1.7	40	0.788	12	1036	1.2
1191.2	4.3	18	0.432	4.8	968	1.4	62	0.788	7.4	1107	1.0
1191.9	4.5	13	0.278	4.0	884	0.828	66	0.507	6.1	1011	0.604
1192.6	4.9	14	0.207	3.3	1011	1.5	71	0.378	5.0	1156	1.1
1193.2	5.2	14	0.318	5.6	1012	1.2	75	0.579	8.6	1158	0.877
1193.9	4.7	17	0.215	4.2	906	2.2	68	0.393	6.4	1035	1.6
1194.6	4.1	15	0.343	4.6	1099	1.9	59	0.625	7.1	1257	1.4
1195.3	4.3	14	0.493	4.8	985	2.2	62	0.899	7.4	1126	1.6
1196.0	4.3	15	0.341	4.8	1124	1.2	62	0.622	7.4	1286	0.875
1196.7	3.8	14	0.343	4.5	1162	2.2	55	0.626	6.9	1329	1.6
1197.4	4.5	17	0.538	7.2	1207	2.3	65	0.982	11	1381	1.7
1198.1	3.6	18	0.533	5.8	1110	1.5	51	0.972	8.9	1270	1.1
1198.8	3.6	15	0.474	5.6	978	2.1	51	0.864	8.6	1118	1.5
1199.5	4.5	14	0.663	5.8	1254	1.5	65	1.2	8.9	1433	1.1
1200.2	4.4	21	0.494	5.3	1287	2.7	64	0.900	8.1	1471	2.0
1200.9	4.1	17	0.672	7.5	1214	2.8	59	1.2	12	1388	2.0
1201.6	3.1	16	0.398	6.4	1228	2.6	45	0.725	9.8	1405	1.9
1202.3	3.2	16	0.629	6.4	1169	2.0	46	1.1	9.8	1337	1.5
1203.0	3.6	15	0.781	6.1	1373	2.5	52	1.4	9.4	1570	1.8
1203.7	4.3	22	0.625	7.2	1265	1.9	61	1.1	11	1446	1.4
1204.4	3.5	18	0.496	5.1	1310	2.0	50	0.904	7.8	1498	1.4
1205.1	2.9	18	0.601	5.2	1310	1.8	42	1.1	7.9	1498	1.3
1205.8	2.8	13	0.700	5.6	1301	1.9	40	1.3	8.6	1488	1.4
1206.5	4.2	19	0.578	6.6	1430	1.8	61	1.1	10	1635	1.3
1207.2	2.6	17	0.602	7.8	1211	1.5	38	1.1	12	1385	1.1
1207.9	2.5	20	0.736	5.2	1220	2.2	35	1.3	7.9	1396	1.6
1208.6	2.1	15	0.601	4.4	1068	1.9	30	1.1	6.7	1221	1.4
1209.3	2.6	14	0.537	5.8	1095	1.3	37	0.979	8.9	1253	0.971
1210.0	3.5	17	0.650	4.7	1095	1.1	51	1.2	7.3	1253	0.818
1210.7	3.1	20	0.673	5.9	1188	2.2	45	1.2	9.0	1359	1.6
1211.4	2.4	18	0.608	7.8	1155	2.1	35	1.1	12	1321	1.6
1212.1	2.4	17	0.674	4.6	1038	1.3	34	1.2	7.1	1187	0.985
1212.8	2.9	16	0.421	5.1	1056	1.5	42	0.767	7.8	1208	1.1
1213.5	3.9	18	0.590	6.1	1016	1.5	56	1.1	9.3	1161	1.1
1214.2	2.1	15	0.560	5.3	972	1.2	30	1.0	8.2	1111	0.894
1214.9	1.9	15	0.283	6.8	958	1.7	28	0.517	10	1095	1.3
1215.6	2.1	14	0.702	4.8	1048	1.9	30	1.3	7.3	1198	1.4
1216.3	3.6	17	0.726	5.9	992	1.5	51	1.3	9.1	1135	1.1
1217.0	2.5	18	0.566	5.7	1182	2.3	36	1.0	8.7	1351	1.7
1217.7	2.8	16	0.620	6.0	932	1.6	41	1.1	9.2	1065	1.1
1218.4	2.4	14	0.524	5.3	1044	1.4	35	0.956	8.1	1194	1.0
1219.1	2.7	14	0.536	4.9	918	1.7	40	0.977	7.5	1050	1.3
1219.7	3.3	17	0.716	5.2	1173	2.0	47	1.3	7.9	1341	1.5
1220.4	1.9	17	0.498	3.9	950	1.8	27	0.908	6.0	1086	1.3
1221.1	2.2	16	0.604	5.4	1100	2.0	32	1.1	8.3	1258	1.5
1221.8	1.6	12	0.342	4.3	903	1.3	24	0.624	6.6	1033	0.971
1222.5	1.4	16	0.372	4.1	1038	1.3	20	0.679	6.3	1187	0.931
1223.2	1.4	16	0.261	5.0	1074	2.2	20	0.476	7.7	1229	1.6
1223.9	2.7	18	0.401	5.4	971	1.4	39	0.731	8.3	1110	1.1
1224.6	2.0	15	0.501	5.0	974	1.3	29	0.914	7.7	1114	0.929
1225.3	1.7	13	0.394	4.5	940	1.1	24	0.718	6.9	1075	0.796
1226.0	2.0	13	0.664	3.7	1270	1.6	28	1.2	5.7	1452	1.1
1226.7	0.918	16	0.312	3.9	1072	1.4	13	0.568	6.0	1226	1.1
1227.4	1.4	16	0.286	4.1	796	1.5	21	0.521	6.3	911	1.1
1228.1	1.2	14	0.174	4.5	872	1.4	17	0.318	6.9	997	1.0
1228.8	1.1	14	0.234	3.4	894	1.3	16	0.426	5.3	1023	0.977
1229.5	0.589	14	0.372	3.0	859	1.3	8.5	0.678	4.6	983	0.944
1230.2	1.7	18	0.366	6.0	1036	1.8	24	0.667	9.1	1184	1.3
1230.9	2.3	18	0.288	4.2	913	1.3	33	0.526	6.4	1044	0.973
1231.6	1.8	16	0.156	3.8	982	0.845	25	0.285	5.9	1123	0.616
1232.3	1.3	13	0.172	3.7	805	1.2	19	0.314	5.7	920	0.891
1233.0	0.565	14	0.234	4.0	798	1.3	8.2	0.427	6.1	913	0.962
1233.7	0.696	14	0.156	4.4	831	2.1	10	0.285	6.8	950	1.5
1234.4	1.2	15	0.411	4.7	787	0.935	17	0.749	7.2	900	0.682
1235.1	1.0	14	0.266	5.6	766	1.5	15	0.485	8.5	876	1.1
1235.8	0.885	14	0.231	2.9	921	1.6	13	0.421	4.4	1054	1.1
1236.5	0.910	14	0.170	3.3	833	1.4	13	0.310	5.1	952	1.0
1237.2	0.783	16	0.197	4.3	864	0.929	11	0.359	6.6	988	0.678
1237.9	0.823	13	0.276	4.0	812	0.823	12	0.504	6.1	928	0.600
1238.6	0.518	15	0.178	3.3	836	1.0	7.5	0.325	5.1	956	0.738
1239.3	0.664	14	0.198	3.4	704	1.0	9.6	0.361	5.1	805	0.740
1240.0	1.4	15	0.266	1.1	749	0.791	20	0.485	1.7	857	0.577
1240.7	0.539	16	0.315	2.1	720	0.963	7.8	0.574	3.2	824	0.702
1241.4	0.513	16	0.514	3.9	728	1.4	7.4	0.938	6.0	832	1.0
1242.1	0.944	17	0.537	2.9	745	1.3	14	0.979	4.4	852	0.917



Minnow Environmental  
Sample ID: 013

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1242.8	0.651	21	0.452	3.8	711	1.4	9.4	0.824	5.8	813	1.0
1243.5	1.1	15	0.430	2.4	652	0.731	15	0.783	3.7	745	0.534
1244.2	1.2	16	0.360	1.8	685	1.0	17	0.656	2.7	783	0.758
1244.9	0.513	17	0.423	3.2	723	0.962	7.4	0.771	5.0	826	0.702
1245.6	0.831	16	0.600	3.2	674	1.3	12	1.1	4.8	770	0.958
1246.2	0.581	15	0.424	1.5	629	1.3	8.4	0.773	2.3	720	0.917
1246.9	0.751	19	0.672	1.4	651	0.891	11	1.2	2.1	744	0.650
1247.6	1.1	17	0.639	2.7	630	0.677	15	1.2	4.2	720	0.494
1248.3	0.513	19	0.810	2.0	766	1.1	7.4	1.5	3.0	876	0.797
1249.0	0.604	18	0.400	1.2	540	1.2	8.7	0.730	1.8	617	0.847
1249.7	0.513	16	0.454	3.1	642	1.3	7.4	0.829	4.8	734	0.919
1250.4	0.945	18	0.893	2.0	676	1.8	14	1.6	3.1	773	1.3
1251.1	0.631	17	0.542	3.3	641	0.923	9.1	0.988	5.0	733	0.673
1251.8	1.2	17	0.435	0.859	670	1.4	17	0.794	1.3	766	1.1
1252.5	0.605	18	0.573	2.9	608	2.1	8.7	1.0	4.5	695	1.5
1253.2	0.513	18	1.1	2.7	651	1.5	7.4	2.0	4.1	744	1.1
1253.9	0.941	17	0.892	2.4	633	1.1	14	1.6	3.7	723	0.814
1254.6	1.0	19	0.665	1.7	533	1.0	15	1.2	2.6	610	0.730
1255.3	0.861	22	1.6	1.7	625	0.985	12	2.9	2.6	715	0.719
1256.0	0.940	21	0.741	1.2	637	1.4	14	1.4	1.9	728	0.991
1256.7	0.513	21	0.952	1.9	587	1.3	7.4	1.7	2.9	672	0.937
1257.4	0.915	21	1.2	2.4	683	1.3	13	2.3	3.7	781	0.935
1258.1	0.998	24	1.1	2.3	605	1.4	14	2.0	3.5	692	1.0
1258.8	0.851	24	1.1	1.2	481	0.581	12	2.0	1.8	550	0.424
1259.5	0.964	23	1.2	1.5	606	1.6	14	2.1	2.3	693	1.2
1260.2	0.857	27	1.8	2.5	546	1.3	12	3.3	3.8	625	0.930
1260.9	0.513	27	1.7	2.2	668	2.1	7.4	3.1	3.3	764	1.5
1261.6	0.680	29	1.8	2.3	576	1.2	9.8	3.2	3.5	659	0.889
1262.3	1.5	27	1.6	2.6	546	1.2	21	2.8	4.0	625	0.848
1263.0	0.513	27	1.6	1.7	571	1.3	7.4	2.9	2.6	653	0.970
1263.7	0.982	30	1.8	2.9	694	1.8	14	3.2	4.4	794	1.3
1264.4	1.2	28	1.6	2.0	520	0.949	17	2.9	3.1	595	0.693
1265.1	0.513	26	1.5	0.611	498	0.899	7.4	2.8	0.936	569	0.656
1265.8	1.1	25	1.2	1.9	450	0.979	16	2.3	2.9	515	0.715
1266.5	0.513	27	1.7	2.6	548	1.1	7.4	3.2	4.0	626	0.807
1267.2	1.2	27	2.0	2.7	539	0.812	17	3.7	4.2	617	0.593
1267.9	0.513	31	2.3	1.4	479	1.9	7.4	4.2	2.1	548	1.4
1268.6	0.513	42	2.9	1.4	536	1.5	7.4	5.3	2.1	613	1.1
1269.3	1.1	42	3.3	18	531	2.8	16	6.0	28	607	2.1
1270.0	0.513	42	4.4	5.1	456	2.9	7.4	8.0	7.8	522	2.1
1270.7	1.1	44	4.8	3.1	506	0.958	15	8.7	4.7	579	0.699
1271.4	1.8	40	4.2	1.4	507	2.1	26	7.7	2.1	580	1.6
1272.0	0.908	37	2.8	0.917	558	1.4	13	5.1	1.4	638	1.0
1272.7	0.513	40	2.6	2.2	483	1.5	7.4	4.7	3.4	552	1.1
1273.4	0.513	40	3.3	3.3	540	1.8	7.4	6.0	5.0	617	1.3
1274.1	0.513	42	2.6	0.611	429	1.8	7.4	4.8	0.936	491	1.3
1274.8	1.5	42	2.9	5.8	554	5.2	22	5.2	8.9	633	3.8
1275.5	0.513	42	2.8	4.0	497	0.302	7.4	5.1	6.2	568	0.221
1276.2	0.513	42	2.1	3.9	410	1.3	7.4	3.8	6.0	469	0.925
1276.9	0.513	42	4.8	0.611	408	1.6	7.4	8.8	0.936	466	1.1
1277.6	0.513	45	3.3	1.2	381	3.9	7.4	6.0	1.8	436	2.9
1278.3	0.513	61	4.1	2.1	509	4.1	7.4	7.4	3.2	582	3.0
1279.0	0.513	47	5.0	3.1	313	1.5	7.4	9.2	4.7	358	1.1
1279.7	0.513	55	4.7	0.611	370	1.0	7.4	8.7	0.936	423	0.743
1280.4	1.4	92	6.5	12	473	3.6	20	12	18	541	2.6
1281.1	2.6	73	5.4	2.2	376	2.9	37	9.9	3.3	430	2.1
1281.8	0.513	78	5.2	4.3	367	4.3	7.4	9.5	6.6	420	3.1
1282.5	0.513	70	5.0	3.2	368	2.5	7.4	9.2	4.9	420	1.8
1283.2	0.513	62	3.5	7.1	324	4.3	7.4	6.4	11	371	3.1
1283.9	0.513	84	4.9	2.8	427	4.3	7.4	8.9	4.3	488	3.1
1284.6	1.7	95	5.8	7.9	571	3.0	24	11	12	653	2.2
1285.3	0.513	75	4.8	8.1	382	1.7	7.4	8.8	12	437	1.2
1286.0	0.937	99	6.6	5.9	469	0.877	14	12	9.0	536	0.640
1286.7	0.513	113	9.6	13	497	0.952	7.4	18	19	569	0.695
1287.4	0.513	175	9.4	12	458	6.6	7.4	17	18	524	4.8
1288.1	0.513	135	10	13	341	1.1	7.4	19	20	391	0.781
1288.8	0.513	136	11	22	391	8.5	7.4	20	34	447	6.2
1289.5	0.513	176	18	31	555	9.1	7.4	32	47	635	6.6



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
0.6	0.513	493	2.5	21	645	6.0	7.4	4.6	32	738	4.4
1.3	0.513	221	2.5	27	763	2.1	7.4	4.5	41	872	1.5
2.0	2.4	347	1.3	47	400	2.0	35	2.3	72	458	1.5
2.7	2.5	175	3.0	40	477	2.1	35	5.4	61	545	1.5
3.4	2.8	238	2.3	26	584	1.9	41	4.2	40	668	1.4
4.1	1.9	201	4.6	23	708	2.5	28	8.3	35	810	1.8
4.8	0.513	394	2.5	32	473	0.009	7.4	4.5	49	541	0.006
5.5	1.8	258	2.0	15	715	2.3	26	3.7	22	818	1.7
6.2	0.513	283	3.6	21	488	3.0	7.4	6.6	32	558	2.2
6.9	0.513	228	2.4	38	555	0.716	7.4	4.4	58	635	0.522
7.6	0.513	210	1.5	18	731	6.2	7.4	2.7	28	836	4.5
8.2	0.513	377	3.0	22	500	0.617	7.4	5.4	33	572	0.450
8.9	2.4	179	0.992	26	788	1.8	34	1.8	40	901	1.3
9.6	0.513	249	2.0	13	440	2.7	7.4	3.7	20	503	2.0
10.3	2.2	233	0.535	8.0	705	5.4	31	0.976	12	806	3.9
11.0	2.0	291	1.7	16	1056	4.2	29	3.0	24	1208	3.1
11.7	1.1	257	0.802	17	901	3.3	17	1.5	27	1030	2.4
12.4	1.4	171	1.9	8.8	464	2.4	20	3.4	14	531	1.7
13.1	0.513	147	1.8	19	505	1.5	7.4	3.3	29	577	1.1
13.8	0.745	160	0.716	8.5	459	0.009	11	1.3	13	524	0.006
14.5	1.5	238	0.989	12	556	1.0	22	1.8	19	636	0.747
15.2	0.513	228	1.2	10	726	1.0	7.4	2.2	16	831	0.740
15.9	0.798	179	1.6	9.7	702	0.441	12	2.9	15	803	0.322
16.6	0.513	149	0.446	5.4	517	0.719	7.4	0.813	8.3	591	0.525
17.3	0.513	157	0.510	12	571	1.0	7.4	0.929	18	653	0.764
18.0	0.614	177	0.510	9.3	573	1.4	8.9	0.930	14	655	1.0
18.7	1.3	152	0.412	6.8	424	1.4	19	0.751	10	485	1.0
19.4	0.513	130	0.758	7.2	421	1.2	7.4	1.4	11	482	0.909
20.1	0.629	234	0.948	6.8	517	0.809	9.1	1.7	10	591	0.590
20.8	0.934	129	0.576	12	659	1.9	13	1.0	18	753	1.4
21.5	2.1	142	0.316	8.5	586	2.1	30	0.577	13	670	1.5
22.2	0.551	175	0.399	5.4	577	1.9	8.0	0.728	8.2	659	1.4
22.9	0.513	138	0.480	8.0	510	0.812	7.4	0.875	12	583	0.592
23.6	0.657	131	0.123	12	616	1.1	9.5	0.225	18	704	0.829
24.3	0.513	139	0.480	7.7	586	0.812	7.4	0.875	12	670	0.592
25.0	0.640	133	1.3	7.3	717	1.1	9.2	2.4	11	820	0.807
25.7	0.513	134	0.769	8.4	760	2.1	7.4	1.4	13	869	1.5
26.4	0.513	131	0.736	6.9	710	1.4	7.4	1.3	11	811	1.0
27.1	0.513	101	0.401	8.0	657	1.5	7.4	0.732	12	751	1.1
27.8	0.679	102	0.589	7.9	688	1.5	9.8	1.1	12	786	1.1
28.5	0.513	99	0.399	6.1	734	1.2	7.4	0.728	9.3	839	0.904
29.2	0.878	106	0.291	6.6	622	1.4	13	0.531	10	712	1.0
29.9	0.513	89	0.228	7.1	691	1.2	7.4	0.416	11	790	0.895
30.6	0.513	102	0.358	7.2	734	0.972	7.4	0.654	11	839	0.709
31.3	0.513	91	0.443	7.3	653	1.5	7.4	0.808	11	747	1.1
32.0	0.513	106	0.561	8.2	809	3.5	7.4	1.0	13	925	2.5
32.7	0.513	101	0.420	7.5	654	1.5	7.4	0.767	12	748	1.1
33.4	0.615	104	0.527	6.8	796	2.7	8.9	0.962	10	910	2.0
34.1	0.513	100	0.723	8.1	805	2.5	7.4	1.3	12	920	1.8
34.8	0.548	103	0.470	8.8	829	2.2	7.9	0.857	13	948	1.6
35.4	0.513	106	0.418	9.8	835	1.9	7.4	0.763	15	955	1.4
36.1	0.513	111	0.584	9.2	801	1.8	7.4	1.1	14	916	1.3
36.8	0.513	97	0.754	5.0	862	1.8	7.4	1.4	7.7	986	1.3
37.5	0.513	99	0.692	8.9	780	1.6	7.4	1.3	14	892	1.2
38.2	0.513	116	0.765	8.8	838	1.7	7.4	1.4	13	958	1.2
38.9	0.513	107	0.570	11	863	1.9	7.4	1.0	17	987	1.4
39.6	0.513	119	0.554	7.8	821	1.5	7.4	1.0	12	939	1.1
40.3	0.513	101	0.425	7.8	827	1.8	7.4	0.776	12	946	1.3
41.0	0.513	97	0.581	11	895	2.7	7.4	1.1	17	1023	2.0
41.7	0.513	112	0.641	8.0	914	1.9	7.4	1.2	12	1046	1.4
42.4	0.817	114	0.656	9.1	885	1.9	12	1.2	14	1012	1.4
43.1	0.513	93	0.183	7.8	740	2.2	7.4	0.334	12	846	1.6
43.8	0.513	84	0.304	5.1	879	1.6	7.4	0.555	7.8	1005	1.2
44.5	0.520	92	0.603	7.2	884	1.8	7.5	1.1	11	1011	1.3
45.2	0.513	116	0.684	10	911	2.7	7.4	1.2	16	1041	1.9
45.9	0.513	103	0.445	7.7	802	1.5	7.4	0.812	12	917	1.1
46.6	0.513	106	0.575	7.2	905	2.4	7.4	1.0	11	1034	1.8
47.3	0.513	86	0.557	6.6	915	1.6	7.4	1.0	10	1046	1.2
48.0	0.513	90	0.359	5.4	959	3.0	7.4	0.654	8.3	1096	2.2
48.7	0.513	99	0.282	5.5	758	1.4	7.4	0.515	8.4	867	1.0
49.4	0.513	87	0.553	7.4	821	1.8	7.4	1.0	11	939	1.3
50.1	0.574	80	0.653	6.8	779	1.5	8.3	1.2	10	891	1.1
50.8	0.513	90	0.746	7.8	881	2.9	7.4	1.4	12	1007	2.1
51.5	0.513	94	0.623	7.5	996	2.2	7.4	1.1	12	1139	1.6
52.2	0.513	97	0.668	6.7	864	2.7	7.4	1.2	10	988	2.0
52.9	0.513	99	0.548	8.2	876	2.2	7.4	1.000	12	1002	1.6
53.6	0.542	97	0.596	9.3	833	1.8	7.8	1.1	14	952	1.3
54.3	0.513	79	0.578	11	937	2.1	7.4	1.1	17	1071	1.6
55.0	0.513	103	0.511	9.9	1041	1.9	7.4	0.932	15	1191	1.4
55.7	0.513	89	0.514	9.3	850	1.2	7.4	0.938	14	972	0.877
56.4	0.513	78	0.353	8.3	894	2.2	7.4	0.643	13	1022	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
57.1	0.513	85	0.642	10	1042	2.4	7.4	1.2	15	1191	1.7
57.8	0.513	98	0.442	9.4	1028	2.4	7.4	0.806	14	1176	1.8
58.5	1.0	100	0.826	12	979	3.0	15	1.5	18	1119	2.2
59.2	0.513	88	0.490	13	948	2.3	7.4	0.894	19	1084	1.7
59.9	0.513	84	0.818	10	1033	2.1	7.4	1.5	16	1181	1.5
60.6	0.513	83	0.631	11	1153	2.8	7.4	1.2	17	1318	2.0
61.3	0.513	101	0.443	16	1155	2.0	7.4	0.809	24	1321	1.5
61.9	0.905	91	0.441	14	937	2.0	13	0.805	22	1071	1.5
62.6	0.678	78	0.669	16	1160	2.9	9.8	1.2	25	1327	2.1
63.3	0.513	65	0.498	13	1079	1.9	7.4	0.908	20	1234	1.4
64.0	0.513	77	0.622	15	1118	2.0	7.4	1.1	23	1279	1.5
64.7	0.580	82	0.634	16	1151	2.3	8.4	1.2	25	1316	1.7
65.4	0.720	88	0.732	17	1246	3.2	10	1.3	26	1425	2.3
66.1	0.513	70	0.540	14	1277	2.4	7.4	0.984	21	1460	1.8
66.8	0.837	88	0.848	13	1282	3.3	12	1.5	21	1466	2.4
67.5	0.513	72	0.942	19	1308	3.2	7.4	1.7	30	1495	2.4
68.2	0.596	64	0.715	16	1127	2.5	8.6	1.3	25	1289	1.8
68.9	0.513	59	0.989	19	1203	3.0	7.4	1.8	29	1375	2.2
69.6	0.621	53	0.858	18	1194	2.4	9.0	1.6	27	1365	1.8
70.3	0.513	57	1.1	22	1338	2.5	7.4	2.0	33	1530	1.8
71.0	0.565	54	0.902	19	1201	3.2	8.2	1.6	30	1374	2.3
71.7	0.513	61	1.1	20	1299	2.8	7.4	2.1	31	1486	2.0
72.4	0.934	60	0.879	23	1341	3.3	13	1.6	36	1534	2.4
73.1	0.513	63	1.1	25	1410	3.1	7.4	1.9	39	1612	2.2
73.8	0.513	67	1.5	24	1371	4.0	7.4	2.7	36	1567	2.9
74.5	0.675	56	1.5	25	1434	4.6	9.7	2.7	38	1640	3.4
75.2	1.1	62	1.8	25	1500	2.9	16	3.2	38	1715	2.1
75.9	0.735	48	1.0	22	1279	2.9	11	1.9	34	1463	2.2
76.6	0.840	49	1.5	23	1342	3.1	12	2.7	35	1535	2.3
77.3	0.702	43	0.756	22	1360	2.9	10	1.4	34	1555	2.1
78.0	0.935	50	1.3	25	1456	2.4	14	2.4	38	1665	1.8
78.7	0.893	51	1.4	24	1377	3.2	13	2.6	37	1575	2.4
79.4	1.2	42	1.3	25	1369	3.0	17	2.4	39	1566	2.2
80.1	0.676	40	1.2	28	1345	3.3	9.8	2.1	42	1539	2.4
80.8	1.3	43	1.2	22	1396	3.5	19	2.2	34	1596	2.6
81.5	0.986	38	1.1	23	1309	3.0	14	2.1	35	1497	2.2
82.2	1.3	37	1.0	22	1173	2.5	18	1.8	34	1342	1.8
82.9	1.1	32	0.778	21	1274	3.7	15	1.4	32	1457	2.7
83.6	0.745	28	0.914	20	1159	1.9	11	1.7	31	1325	1.4
84.3	0.597	28	1.0	23	1249	3.1	8.6	1.9	35	1429	2.3
85.0	1.5	26	1.0	24	1314	4.1	22	1.9	37	1503	3.0
85.7	1.1	23	0.833	19	1261	3.5	17	1.5	28	1442	2.5
86.4	1.3	22	1.1	25	1184	1.9	18	1.9	39	1354	1.4
87.1	1.4	26	1.2	24	1231	3.0	20	2.1	37	1408	2.2
87.7	1.4	19	1.1	22	1449	2.9	20	1.9	34	1657	2.1
88.4	0.843	20	0.787	24	1288	2.0	12	1.4	38	1473	1.4
89.1	0.699	19	0.793	20	1323	2.3	10	1.4	30	1513	1.7
89.8	0.513	16	1.2	25	1173	2.7	7.4	2.2	38	1342	2.0
90.5	0.934	17	1.2	29	1241	3.2	13	2.2	44	1419	2.3
91.2	1.0	15	1.2	22	1339	3.1	15	2.3	34	1531	2.2
91.9	1.4	21	1.5	23	1336	3.8	21	2.8	35	1528	2.8
92.6	0.693	16	0.978	22	1202	3.1	10	1.8	34	1375	2.3
93.3	0.513	15	1.6	26	1371	1.9	7.4	2.8	40	1568	1.4
94.0	1.4	16	1.2	23	1360	2.2	20	2.3	35	1556	1.6
94.7	0.642	15	1.3	21	1301	3.6	9.3	2.3	32	1488	2.6
95.4	1.1	13	0.901	19	1288	1.9	16	1.6	29	1473	1.4
96.1	1.0	13	1.1	25	1250	2.5	15	1.9	38	1429	1.9
96.8	0.833	13	0.730	21	1213	3.1	12	1.3	32	1387	2.3
97.5	1.7	12	0.725	18	1262	2.5	25	1.3	27	1443	1.9
98.2	1.6	15	0.997	22	1387	3.3	23	1.8	34	1586	2.4
98.9	1.4	16	1.1	22	1398	2.2	21	1.9	34	1598	1.6
99.6	1.3	14	0.979	20	1236	2.8	18	1.8	31	1414	2.0
100.3	2.1	15	1.3	22	1294	2.9	31	2.3	34	1480	2.1
101.0	2.0	13	1.2	20	1366	2.3	28	2.1	30	1562	1.6
101.7	1.3	16	1.0	19	1243	2.3	19	1.9	29	1421	1.7
102.4	1.6	15	0.764	20	1184	2.0	23	1.4	30	1354	1.5
103.1	2.0	12	0.883	18	1262	1.9	29	1.6	27	1443	1.4
103.8	2.6	13	1.2	19	1244	2.7	37	2.2	30	1423	2.0
104.5	1.8	15	1.1	19	1305	2.1	26	2.1	30	1493	1.5
105.2	1.5	14	1.3	23	1320	2.3	22	2.4	36	1510	1.7
105.9	1.5	14	0.839	20	1377	2.6	21	1.5	31	1574	1.9
106.6	1.5	12	1.2	21	1296	1.7	22	2.3	33	1482	1.2
107.3	1.5	15	1.2	19	1256	2.8	22	2.2	28	1436	2.0
108.0	2.0	15	1.5	17	1389	1.5	29	2.8	26	1588	1.1
108.7	2.1	14	0.784	21	1190	2.5	30	1.4	32	1360	1.8
109.4	1.5	15	1.4	21	1184	2.0	21	2.5	32	1354	1.5
110.1	1.1	14	1.3	21	1278	2.6	16	2.4	32	1462	1.9
110.8	1.3	14	1.0	22	1137	2.7	18	1.9	33	1300	2.0
111.5	1.3	16	0.993	22	1169	2.3	19	1.8	34	1337	1.7
112.2	1.5	15	1.3	22	1286	3.4	22	2.4	34	1470	2.5
112.9	0.904	14	1.0	24	1275	2.1	13	1.9	37	1458	1.6



Minnow Environmental  
Sample ID: 014

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.6	1.6	15	1.1	22	1274	2.2	23	1.9	34	1457	1.6
114.2	1.5	14	0.982	22	1241	1.7	21	1.8	34	1420	1.2
114.9	1.8	12	1.4	20	1108	1.7	26	2.5	30	1267	1.2
115.6	1.7	13	1.2	21	1359	2.6	24	2.1	32	1554	1.9
116.3	1.8	15	1.4	23	1216	1.9	26	2.5	35	1390	1.4
117.0	1.4	16	1.5	22	1391	4.3	20	2.8	34	1590	3.2
117.7	2.1	16	1.3	21	1331	1.5	31	2.4	32	1522	1.1
118.4	2.2	17	1.1	22	1276	2.6	31	2.0	34	1459	1.9
119.1	1.4	15	1.1	24	1260	2.5	21	2.1	36	1441	1.8
119.8	1.7	14	1.1	26	1169	2.1	24	2.0	40	1337	1.5
120.5	1.4	16	1.2	21	1193	2.6	21	2.3	31	1364	1.9
121.2	1.3	14	0.967	23	1294	2.2	19	1.8	35	1480	1.6
121.9	1.2	16	1.1	22	1335	3.1	17	2.0	33	1526	2.3
122.6	1.8	16	1.2	21	1244	1.9	26	2.2	32	1423	1.4
123.3	1.5	14	1.1	20	1259	2.7	22	2.0	31	1440	2.0
124.0	1.7	16	0.988	24	1181	2.2	25	1.8	37	1350	1.6
124.7	1.4	13	0.892	23	1402	2.9	20	1.6	36	1603	2.1
125.4	1.7	16	0.970	22	1367	2.9	24	1.8	34	1563	2.1
126.1	1.4	18	1.1	20	1278	2.7	20	2.0	30	1461	2.0
126.8	1.9	14	1.1	21	1144	2.1	27	2.0	33	1308	1.6
127.5	1.1	17	0.910	22	1255	2.0	16	1.7	33	1435	1.5
128.2	2.3	16	0.862	23	1306	2.8	33	1.6	35	1493	2.0
128.9	1.1	13	1.1	18	1117	2.3	16	2.0	28	1277	1.7
129.6	0.951	16	1.4	23	1461	4.1	14	2.6	36	1671	3.0
130.3	1.0	16	0.853	22	1242	1.8	15	1.6	34	1421	1.3
131.0	1.4	15	0.677	21	1177	2.3	21	1.2	32	1345	1.7
131.7	1.1	15	1.2	22	1265	2.2	16	2.2	34	1446	1.6
132.4	1.1	18	1.0	25	1310	2.3	16	1.8	39	1498	1.7
133.1	1.4	15	1.2	19	1238	2.5	20	2.3	30	1416	1.9
133.8	1.2	16	1.2	22	1278	3.4	17	2.2	34	1461	2.5
134.5	0.866	18	1.6	24	1290	2.7	12	2.9	36	1475	1.9
135.2	1.1	16	0.867	24	1377	2.2	16	1.6	36	1575	1.6
135.9	0.636	18	1.4	28	1365	2.2	9.2	2.5	43	1561	1.6
136.6	0.640	19	0.975	29	1389	2.4	9.2	1.8	45	1588	1.8
137.3	1.2	16	1.1	21	1320	1.9	17	2.0	33	1510	1.4
138.0	0.785	15	1.4	28	1469	2.0	11	2.5	43	1680	1.5
138.7	1.2	18	1.4	26	1316	2.6	18	2.5	40	1505	1.9
139.4	1.1	20	1.5	30	1586	3.3	15	2.8	46	1813	2.4
140.0	1.2	19	1.5	25	1395	2.8	17	2.8	39	1595	2.0
140.7	0.884	17	1.8	33	1485	2.6	13	3.2	50	1698	1.9
141.4	1.4	19	2.0	31	1578	3.4	21	3.7	47	1805	2.5
142.1	0.651	20	1.7	31	1735	3.0	9.4	3.1	47	1985	2.2
142.8	1.1	18	1.9	31	1559	3.1	15	3.5	47	1783	2.2
143.5	0.974	18	2.1	31	1510	2.9	14	3.8	48	1727	2.1
144.2	1.6	17	2.0	34	1810	2.9	22	3.7	52	2069	2.2
144.9	2.1	19	2.2	33	1719	5.1	30	4.1	50	1966	3.7
145.6	1.2	20	2.1	36	1913	3.7	17	3.9	55	2188	2.7
146.3	2.6	21	2.0	42	1746	2.9	37	3.7	64	1996	2.1
147.0	1.6	18	2.0	34	1711	3.5	22	3.7	52	1956	2.5
147.7	1.4	17	2.3	36	1734	2.8	20	4.1	55	1982	2.1
148.4	1.7	19	2.1	33	1617	3.1	25	3.8	50	1849	2.3
149.1	1.7	18	2.9	35	1921	3.8	25	5.2	54	2197	2.7
149.8	1.7	19	2.3	32	1702	2.0	25	4.2	49	1946	1.4
150.5	1.7	16	2.3	31	1629	3.1	25	4.2	47	1863	2.3
151.2	1.3	16	2.4	36	1772	3.7	19	4.4	55	2027	2.7
151.9	2.3	17	3.2	37	1692	3.6	33	5.8	56	1934	2.6
152.6	2.6	16	2.5	37	1691	3.2	38	4.6	57	1934	2.3
153.3	2.2	19	2.6	36	1842	3.9	31	4.7	54	2106	2.8
154.0	2.0	16	3.1	41	1702	3.4	29	5.7	62	1947	2.5
154.7	2.8	18	2.4	33	1764	4.4	40	4.4	50	2017	3.2
155.4	3.0	16	2.3	34	1561	3.3	44	4.3	52	1785	2.4
156.1	3.5	17	2.7	31	1573	3.2	51	4.9	48	1798	2.3
156.8	3.0	17	2.4	35	1717	3.1	43	4.3	53	1964	2.3
157.5	3.5	16	2.8	38	1507	3.1	51	5.1	59	1723	2.3
158.2	2.8	17	2.5	34	1717	2.9	40	4.6	52	1964	2.2
158.9	2.6	15	2.6	40	1657	3.8	38	4.7	61	1895	2.7
159.6	3.4	14	2.2	33	1440	2.9	50	4.0	50	1647	2.1
160.3	3.6	16	2.4	30	1493	4.0	53	4.3	47	1707	2.9
161.0	3.2	17	2.9	38	1554	2.9	46	5.2	59	1777	2.1
161.7	3.9	16	2.2	36	1442	3.1	56	4.1	55	1649	2.3
162.4	3.7	16	1.9	35	1312	2.5	53	3.5	54	1500	1.8
163.1	3.1	13	2.1	30	1284	1.7	45	3.8	46	1469	1.2
163.8	3.4	16	2.4	34	1508	2.7	49	4.4	52	1724	2.0
164.5	4.0	14	1.7	31	1366	3.0	57	3.1	48	1562	2.2
165.2	3.2	17	1.9	33	1405	2.9	47	3.5	51	1607	2.1
165.8	2.5	13	2.0	32	1276	3.7	36	3.7	50	1460	2.7
166.5	2.5	15	2.1	32	1390	2.6	37	3.8	49	1589	1.9
167.2	3.7	16	1.8	31	1335	3.0	53	3.3	48	1527	2.2
167.9	2.8	13	1.8	33	1270	2.6	40	3.3	51	1452	1.9
168.6	2.6	15	1.5	30	1347	3.2	38	2.7	46	1541	2.3
169.3	2.1	14	1.6	31	1251	2.1	31	2.9	47	1430	1.6



Minnow Environmental  
Sample ID: 014

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
170.0	2.8	14	2.1	26	1253	3.2	41	3.7	40	1433	2.4
170.7	2.2	13	1.8	28	1144	2.1	32	3.3	43	1308	1.5
171.4	2.5	13	1.5	25	1184	2.4	36	2.8	39	1354	1.8
172.1	2.9	16	2.2	29	1203	2.6	42	4.0	45	1375	1.9
172.8	3.7	16	1.3	29	1251	2.3	53	2.3	45	1431	1.7
173.5	2.9	13	1.3	28	1129	3.2	42	2.3	42	1291	2.3
174.2	2.9	14	1.7	26	1223	2.7	42	3.1	40	1398	2.0
174.9	2.1	15	1.0	24	1143	1.0	30	1.9	36	1307	0.761
175.6	1.8	14	1.3	23	1273	3.0	25	2.4	35	1456	2.2
176.3	2.7	15	1.6	24	1156	2.1	39	2.9	37	1322	1.5
177.0	2.3	16	1.5	29	1199	3.0	33	2.7	44	1371	2.2
177.7	2.0	15	1.4	27	1107	2.0	29	2.6	41	1266	1.5
178.4	2.9	17	1.3	24	1163	3.0	42	2.4	36	1330	2.2
179.1	2.2	15	1.2	29	1096	2.8	32	2.2	44	1253	2.0
179.8	1.8	16	1.3	28	1267	3.7	25	2.3	44	1449	2.7
180.5	1.7	16	1.3	25	1134	1.6	24	2.3	39	1297	1.2
181.2	1.8	17	1.0	27	1244	2.4	26	1.9	41	1422	1.8
181.9	1.8	16	1.0	27	988	1.5	25	1.9	42	1130	1.1
182.6	1.7	17	0.912	27	1140	2.6	25	1.7	42	1304	1.9
183.3	2.0	13	0.943	27	1123	3.1	29	1.7	41	1284	2.3
184.0	1.8	15	0.874	23	1226	3.3	26	1.6	36	1402	2.4
184.7	2.2	13	1.0	23	1224	2.9	31	1.9	35	1399	2.1
185.4	2.0	13	0.853	24	1101	3.4	29	1.6	37	1259	2.5
186.1	1.3	15	1.2	26	1147	3.1	18	2.1	40	1311	2.2
186.8	1.3	14	1.0	26	1215	2.1	18	1.9	40	1389	1.6
187.5	1.1	14	0.735	25	1213	2.0	16	1.3	38	1387	1.5
188.2	1.7	15	0.883	26	1212	3.1	24	1.6	40	1386	2.3
188.9	0.925	12	0.913	28	1278	2.7	13	1.7	43	1461	2.0
189.6	1.1	13	0.912	21	1142	3.2	16	1.7	33	1306	2.4
190.3	1.7	13	1.2	20	1132	1.8	24	2.3	31	1295	1.3
191.0	0.911	13	0.956	24	1172	1.5	13	1.7	37	1341	1.1
191.7	0.629	15	1.2	27	1203	2.7	9.1	2.2	41	1376	2.0
192.3	0.664	14	0.965	28	1247	2.6	9.6	1.8	43	1426	1.9
193.0	1.2	12	1.1	23	1046	2.9	18	2.0	35	1196	2.1
193.7	0.513	14	0.964	26	1194	2.6	7.4	1.8	39	1366	1.9
194.4	0.868	13	0.811	25	1199	1.8	13	1.5	39	1371	1.3
195.1	0.513	12	0.714	25	1158	3.0	7.4	1.3	38	1324	2.2
195.8	0.754	12	0.514	28	1115	2.4	11	0.937	43	1275	1.8
196.5	0.836	13	0.803	24	1122	2.3	12	1.5	36	1283	1.7
197.2	1.4	15	0.943	24	1278	1.6	21	1.7	37	1462	1.2
197.9	0.513	14	0.975	23	1154	2.5	7.4	1.8	35	1320	1.9
198.6	1.1	16	0.980	28	1227	3.1	16	1.8	42	1404	2.2
199.3	0.513	12	0.548	24	1092	2.0	7.4	0.999	38	1249	1.5
200.0	0.575	12	0.964	25	1220	2.1	8.3	1.8	38	1395	1.5
200.7	0.513	14	0.572	21	1192	2.0	7.4	1.0	33	1363	1.5
201.4	0.792	13	0.703	24	1192	2.3	11	1.3	37	1363	1.7
202.1	0.513	13	0.922	26	1080	1.8	7.4	1.7	40	1235	1.3
202.8	0.530	14	0.870	25	1245	1.9	7.6	1.6	39	1423	1.4
203.5	0.513	10	0.912	26	1175	2.6	7.4	1.7	40	1344	1.9
204.2	0.513	14	0.638	21	1122	2.0	7.4	1.2	32	1283	1.5
204.9	0.612	13	0.844	23	1106	2.1	8.8	1.5	35	1265	1.6
205.6	0.797	13	0.752	21	1154	2.6	11	1.4	32	1319	1.9
206.3	0.546	13	0.632	27	1205	2.3	7.9	1.2	42	1378	1.7
207.0	0.513	11	0.946	18	1049	1.5	7.4	1.7	27	1200	1.1
207.7	0.513	12	0.977	23	1150	1.5	7.4	1.8	35	1315	1.1
208.4	0.513	12	0.827	24	1075	2.3	7.4	1.5	37	1230	1.7
209.1	0.513	10	0.709	22	1144	2.2	7.4	1.3	34	1308	1.6
209.8	0.513	10	0.610	20	1146	2.1	7.4	1.1	31	1311	1.5
210.5	0.513	11	0.890	22	1147	3.0	7.4	1.6	33	1312	2.2
211.2	0.513	13	0.719	21	1220	2.1	7.4	1.3	32	1395	1.5
211.9	0.513	11	0.739	25	1087	2.2	7.4	1.3	38	1243	1.6
212.6	0.513	11	0.548	22	1093	1.9	7.4	0.999	34	1250	1.4
213.3	0.513	10	0.735	20	1160	1.8	7.4	1.3	31	1326	1.3
214.0	0.513	11	0.527	22	1224	1.6	7.4	0.961	34	1400	1.2
214.7	1.0	12	0.573	19	1198	2.3	15	1.0	30	1370	1.7
215.4	0.513	10	0.434	21	1086	1.7	7.4	0.792	33	1242	1.2
216.1	0.534	8.6	0.472	18	1056	1.8	7.7	0.861	27	1207	1.3
216.8	0.513	10.0	0.771	23	1133	2.6	7.4	1.4	36	1295	1.9
217.5	0.513	9.4	0.483	17	1071	2.4	7.4	0.881	26	1224	1.8
218.2	0.671	11	0.491	21	1137	2.1	9.7	0.896	32	1300	1.6
218.9	0.513	9.9	0.427	22	1052	1.6	7.4	0.778	33	1203	1.1
219.5	0.513	11	0.583	19	1038	2.0	7.4	1.1	29	1187	1.4
220.2	0.660	9.9	0.683	19	1094	0.672	9.5	1.2	30	1250	0.490
220.9	0.513	18	0.891	22	1062	1.8	7.4	1.6	34	1215	1.3
221.6	0.517	11	0.281	17	1056	3.9	7.5	0.513	27	1208	2.9
222.3	0.513	12	0.249	23	998	2.2	7.4	0.454	35	1141	1.6
223.0	0.513	9.7	0.283	20	971	1.6	7.4	0.516	30	1110	1.2
223.7	0.513	11	0.560	17	1014	1.6	7.4	1.0	27	1160	1.2
224.4	0.513	11	0.367	23	973	1.6	7.4	0.669	35	1113	1.2
225.1	0.555	11	0.777	21	925	1.8	8.0	1.4	33	1058	1.3
225.8	0.513	11	0.297	18	986	1.6	7.4	0.541	28	1128	1.1



Minnow Environmental  
Sample ID: 014

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.5	0.513	10	0.448	18	927	1.6	7.4	0.818	27	1060	1.1
227.2	0.513	10	0.649	21	1012	2.2	7.4	1.2	33	1158	1.6
227.9	0.513	10	0.387	20	985	2.6	7.4	0.706	31	1126	1.9
228.6	0.513	11	0.284	17	881	1.5	7.4	0.518	25	1007	1.1
229.3	0.513	10	0.388	23	993	2.1	7.4	0.707	35	1135	1.6
230.0	0.637	10	0.491	20	941	1.7	9.2	0.896	30	1076	1.2
230.7	0.513	12	0.597	26	994	2.0	7.4	1.1	39	1137	1.5
231.4	0.513	10	0.543	22	912	1.9	7.4	0.990	33	1043	1.4
232.1	0.513	12	0.388	22	817	0.932	7.4	0.707	34	934	0.680
232.8	0.513	10	0.792	23	993	1.7	7.4	1.4	35	1136	1.2
233.5	0.513	12	0.559	22	1009	2.7	7.4	1.0	34	1154	2.0
234.2	0.513	11	0.656	23	897	2.6	7.4	1.2	34	1025	1.9
234.9	0.513	12	0.394	23	879	3.0	7.4	0.718	36	1005	2.2
235.6	0.513	13	0.630	23	934	0.947	7.4	1.1	35	1068	0.691
236.3	0.513	13	0.538	22	902	2.3	7.4	0.982	34	1031	1.6
237.0	0.513	11	0.427	23	921	1.4	7.4	0.778	35	1053	1.0
237.7	0.513	12	0.418	23	968	2.2	7.4	0.762	36	1107	1.6
238.4	0.513	13	0.503	24	1034	2.8	7.4	0.918	37	1183	2.0
239.1	0.513	12	0.483	24	929	2.3	7.4	0.880	37	1062	1.7
239.8	0.513	12	0.471	22	862	1.4	7.4	0.859	33	985	1.0
240.5	0.607	13	0.664	25	935	2.3	8.8	1.2	39	1069	1.7
241.2	0.513	12	0.570	28	947	2.2	7.4	1.0	43	1083	1.6
241.9	0.513	13	0.836	29	1017	2.4	7.4	1.5	44	1163	1.7
242.6	0.513	14	0.549	27	1012	2.2	7.4	1.0	42	1157	1.6
243.3	0.523	11	0.670	31	944	1.9	7.6	1.2	47	1080	1.4
244.0	0.513	9.8	0.752	34	967	3.5	7.4	1.4	52	1105	2.5
244.7	0.513	14	0.579	33	938	2.7	7.4	1.1	51	1072	2.0
245.3	0.513	14	0.773	29	926	2.0	7.4	1.4	44	1059	1.5
246.0	0.513	13	0.723	30	833	2.4	7.4	1.3	46	952	1.8
246.7	0.513	12	0.669	46	919	3.4	7.4	1.2	71	1051	2.5
247.4	0.513	13	1.1	35	987	2.2	7.4	2.0	54	1128	1.6
248.1	0.513	13	0.674	35	933	3.0	7.4	1.2	53	1067	2.2
248.8	0.513	14	0.846	38	1051	2.9	7.4	1.5	58	1201	2.1
249.5	0.513	13	0.920	36	894	1.9	7.4	1.7	55	1022	1.4
250.2	0.513	14	1.1	36	899	2.5	7.4	2.0	55	1028	1.8
250.9	0.513	14	1.1	40	975	3.0	7.4	2.1	62	1115	2.2
251.6	0.513	13	0.652	34	931	2.7	7.4	1.2	53	1065	1.9
252.3	0.513	15	1.2	45	1138	3.0	7.4	2.2	70	1301	2.2
253.0	0.513	14	1.4	40	927	2.5	7.4	2.6	62	1060	1.8
253.7	0.513	14	1.3	38	1012	2.3	7.4	2.4	59	1157	1.6
254.4	0.513	17	1.0	44	1130	3.5	7.4	1.9	68	1292	2.6
255.1	0.513	14	1.3	46	1059	3.4	7.4	2.4	71	1211	2.5
255.8	0.513	15	1.2	45	1074	2.7	7.4	2.1	69	1229	1.9
256.5	0.513	16	1.1	43	1163	3.2	7.4	2.0	66	1330	2.3
257.2	0.513	14	1.6	48	1163	2.9	7.4	3.0	73	1329	2.1
257.9	0.513	13	1.3	46	1132	3.5	7.4	2.3	71	1295	2.6
258.6	0.533	15	1.5	56	1165	3.1	7.7	2.8	86	1333	2.2
259.3	0.513	15	1.9	56	1183	2.4	7.4	3.5	85	1352	1.8
260.0	0.513	14	1.4	50	1104	2.2	7.4	2.6	77	1262	1.6
260.7	0.654	13	1.9	46	1120	3.3	9.4	3.4	71	1281	2.4
261.4	0.513	15	2.0	50	1201	2.8	7.4	3.6	76	1374	2.0
262.1	0.513	14	2.0	51	1182	3.2	7.4	3.6	78	1352	2.3
262.8	0.513	12	1.4	52	1212	3.1	7.4	2.6	80	1386	2.2
263.5	0.513	13	1.6	52	1200	1.7	7.4	3.0	80	1372	1.2
264.2	0.513	13	2.1	60	1349	3.5	7.4	3.9	92	1543	2.6
264.9	0.513	14	2.9	57	1500	3.5	7.4	5.4	88	1715	2.6
265.6	0.513	14	2.0	49	1230	2.8	7.4	3.6	75	1406	2.1
266.3	0.513	14	2.0	53	1480	3.6	7.4	3.7	81	1693	2.6
267.0	0.513	14	2.2	53	1395	2.2	7.4	3.9	81	1595	1.6
267.7	0.513	15	2.1	54	1645	4.5	7.4	3.8	83	1881	3.3
268.4	0.581	13	2.4	59	1461	3.1	8.4	4.3	91	1671	2.2
269.1	0.692	14	2.2	62	1588	3.1	10.0	4.0	95	1816	2.2
269.8	0.513	11	2.0	59	1505	2.7	7.4	3.7	91	1721	2.0
270.4	0.513	14	2.6	65	1735	3.9	7.4	4.7	99	1984	2.8
271.1	0.513	13	2.4	51	1494	3.0	7.4	4.3	78	1709	2.2
271.8	0.513	14	2.5	66	1715	3.1	7.4	4.6	101	1961	2.3
272.5	0.513	15	2.4	55	1627	2.5	7.4	4.3	84	1861	1.8
273.2	0.513	15	2.4	58	1614	3.4	7.4	4.4	89	1846	2.5
273.9	0.513	15	2.5	56	1746	2.1	7.4	4.5	86	1996	1.5
274.6	0.513	14	2.6	61	1780	2.3	7.4	4.7	93	2036	1.7
275.3	0.513	18	2.8	70	1791	3.0	7.4	5.2	107	2048	2.2
276.0	0.513	15	2.8	64	1696	3.0	7.4	5.1	98	1939	2.2
276.7	0.513	15	2.5	63	1906	2.9	7.4	4.6	96	2179	2.1
277.4	0.513	13	2.7	61	1977	3.3	7.4	4.8	93	2261	2.4
278.1	0.513	13	2.8	63	1875	2.8	7.4	5.2	96	2144	2.0
278.8	0.513	14	2.8	64	1900	3.1	7.4	5.2	98	2173	2.3
279.5	0.513	13	3.0	59	1895	3.7	7.4	5.4	91	2167	2.7
280.2	0.668	15	3.2	54	1794	2.4	9.6	5.8	82	2051	1.8
280.9	0.513	15	2.8	65	1996	4.4	7.4	5.1	100	2282	3.2
281.6	0.513	13	3.2	59	1834	3.5	7.4	5.9	91	2097	2.6
282.3	0.513	14	3.0	57	1962	2.9	7.4	5.4	87	2244	2.2



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Sample ID: 014

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
283.0	0.513	13	3.0	62	1808	3.2	7.4	5.5	95	2068	2.3
283.7	0.513	15	2.7	57	1961	3.2	7.4	4.9	88	2243	2.3
284.4	0.513	14	2.7	59	2166	2.0	7.4	4.9	90	2476	1.4
285.1	0.587	13	3.5	71	2250	3.7	8.5	6.3	109	2573	2.7
285.8	0.789	14	2.6	58	2011	2.9	11	4.8	89	2300	2.1
286.5	0.513	13	3.5	63	2066	3.2	7.4	6.3	97	2363	2.3
287.2	0.623	12	3.1	65	2097	2.4	9.0	5.7	100	2397	1.7
287.9	0.513	12	3.4	62	1918	2.7	7.4	6.2	95	2194	2.0
288.6	0.759	15	3.4	66	2072	3.4	11	6.2	101	2370	2.5
289.3	0.513	12	3.6	65	2084	3.3	7.4	6.6	100	2383	2.4
290.0	0.583	13	3.6	58	2204	2.6	8.4	6.6	88	2520	1.9
290.7	0.553	14	3.2	70	2182	2.6	8.0	5.8	108	2495	1.9
291.4	0.640	16	3.8	75	2094	2.3	9.2	6.9	115	2394	1.7
292.1	0.613	15	4.3	82	2358	2.2	8.9	7.8	125	2696	1.6
292.8	0.933	14	4.4	65	1989	2.3	13	8.0	100	2274	1.7
293.5	0.562	16	4.3	70	2128	3.0	8.1	7.8	108	2434	2.2
294.2	0.719	13	3.2	72	1953	2.7	10	5.9	110	2233	2.0
294.9	1.0	16	3.8	79	2307	3.7	15	7.0	122	2638	2.7
295.6	0.855	17	4.5	79	2295	2.9	12	8.2	121	2624	2.1
296.3	0.838	15	4.3	79	2158	2.8	12	7.8	121	2467	2.0
296.9	1.4	14	4.1	77	2188	4.1	20	7.5	118	2502	3.0
297.6	0.940	14	4.5	81	2373	3.8	14	8.1	124	2713	2.8
298.3	0.513	15	4.4	76	2203	3.2	7.4	8.1	116	2519	2.3
299.0	1.0	14	4.5	82	2407	2.8	15	8.2	126	2752	2.1
299.7	0.999	16	5.6	77	2242	3.6	14	10	117	2564	2.6
300.4	1.5	17	5.8	84	2407	3.9	21	11	129	2753	2.8
301.1	0.763	15	5.4	84	2209	2.5	11	9.9	129	2526	1.8
301.8	0.740	17	5.6	89	2455	5.6	11	10	136	2808	4.1
302.5	1.4	15	5.1	80	2127	3.8	20	9.3	122	2432	2.8
303.2	1.1	14	5.5	83	2359	4.5	16	10	127	2697	3.3
303.9	1.6	16	5.2	98	2339	3.7	22	9.6	151	2675	2.7
304.6	1.5	15	5.2	91	2373	5.9	22	9.5	139	2713	4.3
305.3	1.6	18	5.7	89	2525	4.2	24	10	137	2888	3.1
306.0	1.7	14	5.3	83	2234	4.5	25	9.6	128	2555	3.3
306.7	1.9	14	5.9	84	2215	4.3	27	11	129	2533	3.1
307.4	1.5	17	6.7	92	2317	4.7	21	12	141	2649	3.4
308.1	1.9	16	6.5	87	2107	4.7	27	12	133	2410	3.4
308.8	1.8	17	5.5	87	2321	3.7	27	10	134	2654	2.7
309.5	1.2	18	7.1	103	2313	3.6	17	13	158	2645	2.6
310.2	2.0	14	6.5	91	2202	5.7	29	12	139	2518	4.1
310.9	1.9	17	6.9	104	2273	4.4	28	13	160	2600	3.2
311.6	2.3	16	7.1	93	2096	4.3	34	13	142	2396	3.2
312.3	2.6	16	6.9	114	2261	7.1	37	13	175	2586	5.2
313.0	2.0	18	6.8	107	2337	4.8	28	12	164	2673	3.5
313.7	3.0	15	6.6	85	2088	4.3	43	12	131	2388	3.1
314.4	2.4	21	7.4	105	2228	4.8	34	13	161	2548	3.5
315.1	3.0	17	6.6	95	2126	4.2	43	12	146	2431	3.1
315.8	2.9	16	6.8	95	1942	5.9	43	12	146	2220	4.3
316.5	3.4	15	7.2	109	2153	4.9	48	13	167	2463	3.6
317.2	3.7	18	7.5	94	2263	4.5	53	14	144	2588	3.3
317.9	3.7	16	8.3	94	2115	4.8	53	15	144	2418	3.5
318.6	3.0	16	7.6	109	2055	6.1	44	14	167	2350	4.4
319.3	3.8	20	8.5	94	2115	4.8	55	16	144	2419	3.5
320.0	4.0	20	7.2	102	1899	3.8	58	13	156	2172	2.8
320.7	3.9	20	7.3	103	2321	5.5	56	13	158	2654	4.0
321.4	4.8	20	8.4	97	2202	5.3	69	15	148	2518	3.9
322.1	3.8	19	7.8	111	2131	6.7	55	14	170	2437	4.9
322.7	4.5	21	8.5	89	2102	5.4	65	15	136	2404	3.9
323.4	4.4	22	7.6	99	2149	6.4	63	14	152	2458	4.7
324.1	3.2	24	7.4	94	2060	5.7	46	13	143	2355	4.1
324.8	4.4	25	8.5	95	2154	5.3	64	16	146	2463	3.9
325.5	4.6	25	7.9	86	1857	3.9	66	14	132	2123	2.8
326.2	5.6	24	7.5	76	1856	4.4	81	14	116	2123	3.2
326.9	5.7	24	7.2	86	2050	6.0	82	13	132	2344	4.4
327.6	5.8	28	8.1	86	1989	5.7	84	15	131	2275	4.2
328.3	4.6	23	6.5	92	1920	5.1	66	12	141	2196	3.7
329.0	6.1	24	6.8	85	1791	5.7	88	12	130	2048	4.1
329.7	5.7	30	6.9	75	1867	5.7	83	13	116	2135	4.2
330.4	6.7	32	6.9	83	1837	5.8	97	13	126	2100	4.2
331.1	6.3	29	6.5	80	1755	4.5	91	12	123	2007	3.3
331.8	7.5	29	6.5	74	1586	4.6	109	12	113	1814	3.3
332.5	7.2	30	5.6	81	1599	4.8	104	10	125	1829	3.5
333.2	6.9	27	6.7	63	1637	6.3	100	12	96	1871	4.6
333.9	6.3	29	5.8	68	1634	5.4	90	11	105	1869	3.9
334.6	6.4	33	5.1	72	1571	5.8	93	9.3	110	1796	4.2
335.3	5.3	30	5.0	67	1665	5.4	77	9.1	102	1904	3.9
336.0	6.3	28	4.9	63	1330	3.7	91	9.0	97	1521	2.7
336.7	5.8	32	5.2	62	1575	3.8	83	9.6	96	1800	2.8
337.4	6.0	30	5.1	63	1385	4.1	86	9.4	96	1584	3.0
338.1	6.3	29	4.8	71	1417	4.0	91	8.8	110	1620	2.9
338.8	5.6	24	4.1	67	1232	3.1	81	7.5	103	1409	2.2



Minnow Environmental  
Sample ID: 014

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.5	6.2	24	4.3	81	1144	4.0	90	7.8	124	1309	2.9
340.2	6.6	26	4.4	2373	1237	3.9	96	8.1	3637	1415	2.8
340.9	6.1	27	4.2	175	1292	3.6	88	7.6	268	1477	2.6
341.6	5.5	23	4.0	152	1133	4.2	79	7.4	233	1296	3.1
342.3	4.5	18	2.7	125	1191	3.0	66	5.0	192	1362	2.2
343.0	4.9	20	2.8	148	1207	2.7	71	5.2	227	1380	2.0
343.7	4.2	17	3.0	85	1168	2.1	60	5.5	130	1335	1.6
344.4	3.8	19	2.3	90	1130	3.1	55	4.2	138	1292	2.3
345.1	3.9	16	2.2	74	1016	3.2	57	4.1	114	1161	2.3
345.8	3.6	15	2.3	65	1131	2.5	52	4.1	99	1294	1.8
346.5	3.7	16	2.1	58	1122	2.5	54	3.8	89	1283	1.8
347.2	3.2	18	2.0	64	1063	2.2	46	3.7	98	1216	1.6
347.9	2.9	17	1.8	61	1042	3.0	43	3.2	93	1192	2.2
348.6	2.2	15	1.8	47	990	2.5	32	3.3	72	1132	1.8
349.2	2.4	16	2.2	51	1096	3.7	34	4.0	77	1254	2.7
349.9	2.6	14	1.8	44	1044	2.6	38	3.2	68	1194	1.9
350.6	2.6	19	1.6	46	969	3.2	37	2.9	70	1108	2.3
351.3	2.1	17	1.8	49	952	2.2	30	3.3	75	1088	1.6
352.0	3.6	14	1.6	36	914	2.0	51	2.9	55	1046	1.5
352.7	2.1	15	1.0	44	937	3.1	31	1.9	68	1072	2.3
353.4	2.8	12	1.2	44	919	2.4	41	2.2	67	1051	1.7
354.1	2.8	17	1.4	39	908	1.6	40	2.5	59	1039	1.2
354.8	2.2	18	1.6	45	1002	2.9	31	2.9	68	1146	2.1
355.5	2.2	14	1.1	33	852	2.2	32	1.9	51	975	1.6
356.2	1.9	14	0.807	36	913	2.1	27	1.5	55	1044	1.6
356.9	1.5	12	0.859	33	790	2.0	22	1.6	50	903	1.5
357.6	1.6	16	1.2	40	959	2.9	24	2.3	61	1097	2.1
358.3	1.6	15	0.875	46	951	3.5	22	1.6	70	1087	2.6
359.0	1.5	16	0.604	35	803	2.6	21	1.1	53	919	1.9
359.7	1.9	14	0.939	44	997	2.9	27	1.7	67	1140	2.1
360.4	2.8	17	1.1	41	1028	2.2	40	2.0	62	1175	1.6
361.1	1.3	12	0.760	41	780	2.7	18	1.4	62	892	2.0
361.8	2.5	15	0.684	41	918	2.6	36	1.2	63	1050	1.9
362.5	1.6	13	0.842	37	842	3.2	23	1.5	56	963	2.3
363.2	2.1	14	0.810	40	919	2.4	31	1.5	61	1051	1.8
363.9	1.3	15	0.800	43	927	1.8	19	1.5	65	1060	1.3
364.6	1.4	17	0.832	47	939	2.3	20	1.5	72	1074	1.7
365.3	1.6	16	0.747	44	951	2.2	24	1.4	68	1087	1.6
366.0	1.1	14	0.594	41	847	2.3	15	1.1	63	969	1.7
366.7	0.989	16	0.901	39	866	2.3	14	1.6	60	990	1.7
367.4	1.4	19	0.759	43	929	2.6	20	1.4	66	1063	1.9
368.1	0.627	16	0.865	39	835	2.6	9.1	1.6	61	954	1.9
368.8	1.3	16	0.609	47	936	3.1	18	1.1	72	1070	2.2
369.5	0.829	14	0.927	44	885	2.1	12	1.7	68	1012	1.6
370.2	1.1	14	0.667	48	981	2.0	16	1.2	73	1122	1.5
370.9	1.0	16	0.543	48	993	3.4	15	0.990	73	1135	2.4
371.6	0.513	13	0.597	47	875	2.5	7.4	1.1	72	1000	1.8
372.3	0.513	16	0.861	45	935	2.9	7.4	1.6	69	1070	2.1
373.0	0.531	18	0.824	50	959	2.5	7.7	1.5	77	1097	1.8
373.7	0.767	16	0.681	48	929	2.6	11	1.2	73	1062	1.9
374.4	0.526	19	0.736	48	919	2.6	7.6	1.3	73	1051	1.9
375.1	0.513	19	0.630	45	971	3.3	7.4	1.1	69	1111	2.4
375.7	0.513	15	0.499	45	904	2.2	7.4	0.910	69	1034	1.6
376.4	0.513	14	0.260	43	971	2.5	7.4	0.474	67	1110	1.8
377.1	0.602	15	0.722	48	926	3.0	8.7	1.3	73	1059	2.2
377.8	0.513	18	0.663	53	979	3.2	7.4	1.2	82	1119	2.3
378.5	0.513	18	0.718	55	943	1.5	7.4	1.3	84	1078	1.1
379.2	0.688	16	0.644	53	1062	3.2	9.9	1.2	82	1215	2.3
379.9	0.513	15	0.714	52	975	3.5	7.4	1.3	80	1115	2.6
380.6	0.513	17	0.521	52	990	3.1	7.4	0.950	79	1132	2.3
381.3	0.513	16	0.468	59	1016	3.2	7.4	0.854	90	1162	2.3
382.0	0.513	16	0.584	45	949	3.1	7.4	1.1	70	1086	2.3
382.7	1.2	16	0.899	60	1053	2.4	17	1.6	92	1204	1.7
383.4	1.2	15	0.835	63	1090	3.5	18	1.5	97	1246	2.5
384.1	0.513	16	0.739	60	1179	3.8	7.4	1.3	92	1349	2.8
384.8	0.513	18	0.707	60	1024	2.6	7.4	1.3	92	1171	1.9
385.5	0.513	17	0.609	61	1112	2.1	7.4	1.1	93	1271	1.5
386.2	0.513	16	0.653	54	1247	3.3	7.4	1.2	82	1426	2.4
386.9	0.513	17	0.832	68	1249	2.8	7.4	1.5	105	1428	2.1
387.6	0.513	18	0.982	55	1123	2.1	7.4	1.8	85	1284	1.5
388.3	0.513	17	0.937	61	1278	1.8	7.4	1.7	93	1461	1.3
389.0	0.513	17	0.960	66	1360	2.1	7.4	1.8	102	1555	1.5
389.7	0.513	18	0.704	69	1437	2.5	7.4	1.3	106	1644	1.9
390.4	0.513	19	0.830	65	1314	2.0	7.4	1.5	99	1502	1.4
391.1	0.513	18	1.1	66	1347	3.1	7.4	2.0	101	1541	2.3
391.8	0.513	16	0.773	65	1412	2.1	7.4	1.4	99	1614	1.6
392.5	0.513	15	0.759	61	1318	2.0	7.4	1.4	93	1507	1.4
393.2	0.513	17	0.933	68	1563	3.6	7.4	1.7	104	1788	2.6
393.9	0.513	21	0.950	65	1566	2.4	7.4	1.7	100	1791	1.7
394.6	0.513	18	0.963	71	1575	3.2	7.4	1.8	109	1801	2.4
395.3	0.513	20	1.2	64	1762	2.3	7.4	2.2	98	2014	1.7



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
396.0	0.513	16	0.780	63	1579	1.8	7.4	1.4	97	1806	1.3
396.7	0.513	16	1.2	70	1845	2.1	7.4	2.3	107	2110	1.5
397.4	0.600	17	0.915	60	1659	3.1	8.7	1.7	92	1897	2.2
398.1	0.513	19	0.932	66	1732	2.0	7.4	1.7	101	1980	1.5
398.8	0.634	19	1.2	74	1961	1.5	9.2	2.2	113	2243	1.1
399.5	0.513	19	1.6	73	2024	2.2	7.4	2.8	112	2315	1.6
400.2	0.513	18	1.3	69	1891	1.0	7.4	2.3	106	2163	0.739
400.9	0.513	19	1.1	75	1808	1.4	7.4	2.0	115	2068	1.1
401.6	0.607	16	0.794	73	2145	1.4	8.8	1.4	112	2453	0.986
402.2	0.679	18	1.4	77	2130	1.7	9.8	2.6	118	2436	1.2
402.9	0.742	17	1.2	80	2214	1.2	11	2.2	123	2531	0.875
403.6	0.902	18	1.3	79	2005	2.0	13	2.4	122	2293	1.4
404.3	0.513	17	1.1	68	1833	1.5	7.4	2.0	105	2096	1.1
405.0	0.651	17	1.1	81	2091	1.6	9.4	2.1	125	2391	1.2
405.7	0.727	16	1.2	74	2073	1.5	10	2.2	114	2371	1.1
406.4	0.841	21	1.2	84	2245	1.5	12	2.3	129	2568	1.1
407.1	0.810	18	1.1	93	2276	1.7	12	2.0	142	2603	1.3
407.8	0.810	17	1.3	82	2214	1.5	12	2.4	126	2532	1.1
408.5	0.521	14	1.0	80	2082	1.5	7.5	1.9	122	2381	1.1
409.2	0.943	16	1.3	78	2009	1.1	14	2.3	120	2298	0.825
409.9	0.970	19	2.0	89	2556	2.1	14	3.6	136	2923	1.6
410.6	0.655	16	1.3	76	2097	1.3	9.5	2.5	116	2398	0.976
411.3	0.667	17	1.3	89	2290	1.9	9.6	2.4	136	2618	1.4
412.0	0.513	16	1.4	78	2110	2.4	7.4	2.5	120	2413	1.7
412.7	0.770	18	1.8	86	2340	2.1	11	3.2	131	2676	1.5
413.4	0.632	18	1.3	87	2478	1.7	9.1	2.4	134	2833	1.2
414.1	0.781	19	1.3	87	2169	2.1	11	2.4	134	2480	1.5
414.8	0.871	17	1.3	83	1982	2.5	13	2.4	128	2267	1.8
415.5	0.859	18	1.6	79	2201	2.3	12	3.0	122	2517	1.7
416.2	0.864	18	1.9	94	2095	2.2	12	3.4	144	2396	1.6
416.9	0.771	18	1.4	90	2072	0.829	11	2.5	137	2369	0.605
417.6	0.761	18	1.7	87	2051	1.4	11	3.1	133	2346	1.0
418.3	0.686	17	1.3	83	1975	1.9	9.9	2.4	127	2258	1.4
419.0	0.579	21	1.8	79	2143	1.4	8.4	3.4	121	2451	1.0
419.7	0.513	19	2.3	82	2236	2.0	7.4	4.2	126	2557	1.5
420.4	0.767	23	1.9	88	2139	2.7	11	3.5	134	2447	2.0
421.1	0.573	18	1.5	79	1816	2.5	8.3	2.7	121	2076	1.8
421.8	0.717	17	1.7	78	1925	1.7	10	3.1	119	2201	1.3
422.5	0.768	20	2.0	85	1990	1.8	11	3.6	130	2275	1.3
423.2	0.565	17	2.3	79	1847	2.2	8.2	4.2	121	2112	1.6
423.9	1.4	24	3.0	90	2119	2.0	20	5.4	138	2423	1.5
424.6	0.526	22	2.6	83	1903	2.7	7.6	4.7	127	2176	1.9
425.3	0.878	23	2.0	77	2041	2.7	13	3.7	118	2334	1.9
426.0	1.4	26	2.4	82	1945	1.6	20	4.4	125	2224	1.1
426.7	0.513	23	2.2	80	2078	1.9	7.4	3.9	123	2377	1.4
427.4	1.1	20	2.7	86	2002	2.9	16	4.9	132	2290	2.1
428.1	0.564	22	2.6	85	1877	2.2	8.1	4.7	131	2147	1.6
428.7	1.3	25	2.5	77	1760	2.5	18	4.5	118	2013	1.8
429.4	1.0	28	1.7	81	1781	1.8	15	3.1	124	2036	1.3
430.1	0.748	30	2.1	88	1866	2.9	11	3.8	134	2134	2.1
430.8	0.513	29	1.7	77	1826	3.0	7.4	3.2	118	2088	2.2
431.5	1.0	25	2.4	78	1812	2.2	15	4.4	120	2073	1.6
432.2	0.552	29	2.2	71	1639	1.7	8.0	4.0	109	1875	1.2
432.9	0.940	30	2.6	98	1892	2.4	14	4.7	149	2164	1.7
433.6	0.866	34	1.9	94	1994	2.7	13	3.4	144	2280	2.0
434.3	1.1	28	2.5	80	1719	1.7	15	4.5	122	1966	1.2
435.0	1.0	29	2.3	81	1826	3.1	15	4.2	123	2088	2.2
435.7	0.938	28	2.5	78	1973	1.9	14	4.6	119	2257	1.4
436.4	1.1	31	2.1	76	1888	2.4	15	3.9	116	2159	1.8
437.1	0.737	33	2.1	75	1710	2.4	11	3.8	115	1955	1.7
437.8	0.513	32	2.6	91	1962	2.5	7.4	4.7	140	2243	1.8
438.5	0.626	30	2.8	82	1893	2.8	9.0	5.1	126	2164	2.0
439.2	0.541	34	2.7	73	1765	2.1	7.8	4.9	111	2018	1.5
439.9	0.931	37	1.7	77	1848	2.1	13	3.1	118	2114	1.6
440.6	0.629	30	1.9	78	1719	3.4	9.1	3.5	120	1966	2.5
441.3	0.913	26	2.2	82	1801	2.0	13	4.1	125	2060	1.5
442.0	1.0	28	2.5	66	1732	1.7	15	4.5	102	1980	1.2
442.7	0.733	26	2.6	73	1725	2.7	11	4.7	113	1972	1.9
443.4	1.8	29	2.2	87	1922	2.5	25	4.1	134	2198	1.8
444.1	0.733	31	2.3	84	1828	2.8	11	4.2	129	2090	2.0
444.8	1.6	27	1.9	71	1641	2.6	23	3.5	109	1877	1.9
445.5	0.915	26	2.4	79	1778	2.1	13	4.4	121	2034	1.5
446.2	1.0	25	2.6	75	1963	3.3	15	4.7	116	2244	2.4
446.9	1.3	26	2.6	84	1941	2.5	19	4.7	128	2220	1.9
447.6	1.2	24	1.9	79	1684	2.7	17	3.5	121	1926	2.0
448.3	0.853	23	1.9	72	1780	2.6	12	3.5	111	2035	1.9
449.0	0.745	20	2.5	69	1767	2.3	11	4.5	106	2021	1.7
449.7	1.3	26	2.4	78	1775	3.4	18	4.4	120	2030	2.5
450.4	0.617	25	2.2	81	1723	1.9	8.9	3.9	125	1971	1.4
451.1	0.853	22	2.5	80	1628	1.7	12	4.5	123	1861	1.2
451.8	1.9	22	2.6	85	1982	2.9	28	4.8	130	2266	2.1



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
452.5	2.0	22	2.4	80	1789	2.9	29	4.3	123	2046	2.1
453.2	1.1	21	2.0	79	1718	2.2	15	3.7	120	1964	1.6
453.9	0.513	23	2.1	85	1965	3.6	7.4	3.8	130	2247	2.6
454.5	0.881	20	1.8	76	1689	1.9	13	3.4	116	1931	1.4
455.2	1.4	22	1.8	72	1707	2.0	20	3.3	110	1952	1.4
455.9	0.911	21	2.5	75	1738	2.5	13	4.6	115	1988	1.8
456.6	1.0	20	2.4	77	1829	2.8	15	4.3	118	2092	2.0
457.3	0.666	17	2.1	88	1716	2.1	9.6	3.9	134	1962	1.5
458.0	1.6	19	1.8	84	1823	2.5	23	3.3	129	2084	1.9
458.7	0.718	19	2.7	81	1945	3.0	10	5.0	124	2224	2.2
459.4	1.3	21	2.1	84	1744	2.2	19	3.9	129	1994	1.6
460.1	1.1	20	2.0	85	1747	2.8	16	3.6	130	1997	2.0
460.8	0.894	21	2.0	83	1783	1.5	13	3.6	127	2039	1.1
461.5	1.1	17	2.2	77	1769	1.8	16	4.0	118	2023	1.3
462.2	1.6	20	2.6	88	1801	2.9	23	4.8	134	2060	2.1
462.9	1.5	21	2.3	88	1815	1.8	22	4.2	135	2076	1.3
463.6	0.769	22	2.2	88	1869	2.1	11	4.0	135	2138	1.5
464.3	0.967	19	1.7	83	1897	1.4	14	3.1	127	2169	1.0
465.0	1.1	23	2.7	84	1955	1.6	15	5.0	129	2236	1.1
465.7	1.2	20	2.6	86	1943	3.3	17	4.8	131	2222	2.4
466.4	1.4	20	2.4	91	1922	2.9	20	4.3	139	2198	2.1
467.1	1.2	19	2.4	87	1745	1.3	17	4.4	133	1995	0.975
467.8	1.0	19	2.1	80	1757	1.5	15	3.8	123	2009	1.1
468.5	1.5	17	2.4	79	1823	2.1	21	4.4	120	2085	1.5
469.2	1.4	18	2.3	86	1749	3.1	20	4.2	132	2000	2.2
469.9	1.3	21	2.0	98	1890	2.5	18	3.7	151	2162	1.8
470.6	1.4	18	2.9	86	1860	2.9	20	5.3	131	2127	2.1
471.3	0.855	19	2.2	83	1693	2.1	12	4.0	127	1935	1.5
472.0	0.660	20	2.2	89	1760	2.4	9.5	4.1	137	2012	1.8
472.7	1.4	18	2.1	88	1805	2.3	21	3.8	135	2064	1.7
473.4	1.0	22	2.5	85	1745	1.5	15	4.6	130	1995	1.1
474.1	0.823	19	2.3	93	1900	3.1	12	4.1	142	2172	2.3
474.8	1.4	19	2.2	80	1714	2.5	21	4.0	123	1960	1.9
475.5	1.8	18	2.8	88	2006	2.2	26	5.2	134	2293	1.6
476.2	1.0	20	2.8	90	1882	2.0	15	5.1	138	2152	1.5
476.9	1.3	18	2.2	90	2008	1.7	19	4.1	138	2296	1.3
477.6	1.0	16	2.4	98	1901	2.7	15	4.4	150	2174	2.0
478.3	1.1	19	3.1	87	1740	1.4	15	5.7	133	1989	1.0
479.0	1.4	19	3.3	89	1850	2.4	20	6.0	136	2115	1.8
479.7	1.2	20	2.8	92	1749	1.8	17	5.1	140	2000	1.3
480.3	1.5	22	3.4	103	1826	2.5	22	6.2	157	2088	1.9
481.0	1.7	18	2.9	104	1807	2.9	25	5.3	159	2066	2.1
481.7	2.3	17	3.4	93	1888	2.2	33	6.2	142	2159	1.6
482.4	1.5	21	2.9	97	1877	2.8	22	5.4	149	2146	2.1
483.1	2.0	21	2.6	96	1599	2.3	28	4.8	147	1829	1.7
483.8	1.5	23	3.1	105	1859	2.9	22	5.6	162	2125	2.1
484.5	1.5	18	2.2	78	1531	3.1	22	4.0	119	1750	2.3
485.2	1.5	19	2.7	77	1530	2.8	21	4.9	119	1750	2.1
485.9	2.8	18	2.8	92	1557	3.2	41	5.1	141	1780	2.3
486.6	1.8	20	2.3	80	1524	2.8	25	4.2	123	1742	2.0
487.3	2.8	21	2.5	78	1442	1.7	40	4.6	120	1649	1.3
488.0	1.1	16	2.4	82	1446	1.8	15	4.3	126	1653	1.3
488.7	1.5	19	2.3	86	1500	1.9	22	4.2	132	1715	1.4
489.4	1.5	18	2.4	83	1474	2.5	21	4.4	126	1685	1.8
490.1	2.1	18	1.9	83	1286	2.4	30	3.5	127	1470	1.8
490.8	0.814	15	1.9	67	1114	2.0	12	3.5	102	1274	1.4
491.5	0.893	18	1.7	69	1200	2.9	13	3.1	105	1372	2.1
492.2	1.8	16	2.4	68	1336	2.3	26	4.3	104	1528	1.7
492.9	2.2	18	1.8	80	1267	2.6	32	3.4	122	1449	1.9
493.6	1.7	18	1.6	68	1128	2.7	25	2.9	104	1289	2.0
494.3	1.4	16	1.6	70	1039	2.6	21	2.9	107	1188	1.9
495.0	1.9	16	1.8	70	1245	2.5	28	3.2	107	1423	1.8
495.7	1.4	16	2.1	60	1038	1.6	20	3.7	92	1187	1.2
496.4	1.0	18	1.6	70	1027	1.4	15	3.0	107	1175	0.986
497.1	0.845	16	1.5	64	858	1.7	12	2.8	99	981	1.2
497.8	1.8	15	1.2	60	825	1.4	26	2.3	93	943	0.998
498.5	1.0	15	1.3	57	874	1.9	15	2.4	88	1000	1.4
499.2	0.778	17	1.3	55	709	2.7	11	2.3	84	811	2.0
499.9	1.8	17	1.2	63	710	2.0	27	2.2	97	812	1.4
500.6	1.3	19	1.4	61	708	1.6	19	2.5	93	810	1.2
501.3	0.513	13	1.5	48	668	1.3	7.4	2.8	73	763	0.934
502.0	1.0	14	1.1	52	651	0.956	15	2.1	79	744	0.698
502.7	0.940	15	0.972	55	628	1.3	14	1.8	84	719	0.919
503.4	0.513	16	1.0	45	590	1.3	7.4	1.9	70	674	0.938
504.1	0.535	14	0.902	51	614	1.8	7.7	1.6	78	702	1.3
504.8	0.530	13	1.0	48	544	1.5	7.7	1.9	73	623	1.1
505.5	0.851	15	0.924	51	598	1.1	12	1.7	79	684	0.776
506.2	0.724	18	1.2	48	597	1.4	10	2.2	73	682	1.0
506.8	0.661	14	1.0	56	758	1.4	9.5	1.8	86	867	0.996
507.5	0.828	14	0.751	46	562	0.965	12	1.4	71	642	0.704
508.2	0.697	13	0.815	46	553	0.938	10	1.5	71	632	0.684



Minnow Environmental  
Sample ID: 014

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.9	0.679	16	1.5	47	491	1.8	9.8	2.7	71	561	1.3
509.6	0.693	15	1.2	45	486	0.807	10	2.2	69	556	0.589
510.3	0.513	15	0.766	46	453	0.985	7.4	1.4	70	518	0.719
511.0	0.590	14	0.877	42	409	1.8	8.5	1.6	65	468	1.3
511.7	1.1	17	0.792	45	452	2.0	16	1.4	68	517	1.5
512.4	0.796	15	0.729	39	494	1.1	11	1.3	60	564	0.799
513.1	0.586	16	0.958	51	515	1.0	8.5	1.7	78	588	0.746
513.8	0.535	15	0.667	47	568	1.4	7.7	1.2	72	649	0.985
514.5	0.738	15	0.933	51	505	2.3	11	1.7	78	578	1.7
515.2	0.513	15	0.894	49	467	1.2	7.4	1.6	76	534	0.901
515.9	0.631	16	0.945	42	392	1.8	9.1	1.7	64	449	1.3
516.6	0.513	15	0.838	47	434	0.941	7.4	1.5	72	497	0.687
517.3	0.513	13	0.847	39	368	1.3	7.4	1.5	59	420	0.972
518.0	0.513	14	0.809	41	339	1.6	7.4	1.5	62	387	1.2
518.7	0.513	15	0.739	46	521	1.2	7.4	1.3	71	595	0.912
519.4	0.868	15	0.903	44	431	1.4	13	1.6	67	493	1.0
520.1	1.0	15	0.595	45	417	0.723	15	1.1	70	477	0.528
520.8	0.513	15	1.0	49	445	1.5	7.4	1.9	75	509	1.1
521.5	1.0	13	1.0	45	425	0.884	15	1.8	69	486	0.645
522.2	0.901	14	0.794	42	434	1.6	13	1.4	65	496	1.2
522.9	1.1	16	0.727	48	401	1.2	16	1.3	74	458	0.870
523.6	0.513	16	0.781	50	428	1.6	7.4	1.4	77	489	1.1
524.3	0.820	16	0.658	45	381	1.5	12	1.2	68	435	1.1
525.0	0.900	15	0.868	43	378	1.5	13	1.6	66	432	1.1
525.7	0.513	16	0.906	44	326	1.7	7.4	1.7	67	373	1.2
526.4	0.513	15	0.749	49	391	2.3	7.4	1.4	75	448	1.7
527.1	0.513	16	0.668	45	376	1.6	7.4	1.2	68	430	1.1
527.8	0.513	14	0.728	42	398	1.8	7.4	1.3	64	455	1.3
528.5	0.853	15	0.853	49	450	1.7	12	1.6	75	515	1.2
529.2	0.513	16	0.902	42	338	2.0	7.4	1.6	65	387	1.4
529.9	0.513	19	0.648	48	388	1.7	7.4	1.2	74	444	1.2
530.6	1.0	13	0.721	44	312	0.740	15	1.3	68	356	0.540
531.3	0.513	13	0.922	40	311	1.2	7.4	1.7	62	356	0.871
532.0	0.513	15	0.930	39	291	1.5	7.4	1.7	60	333	1.1
532.7	0.643	17	1.0	48	403	1.2	9.3	1.8	73	461	0.895
533.4	0.513	14	0.959	41	325	0.859	7.4	1.7	62	372	0.627
534.0	0.513	16	0.897	39	309	1.6	7.4	1.6	59	353	1.2
534.7	0.513	15	0.989	43	363	1.8	7.4	1.8	66	415	1.3
535.4	0.537	16	0.976	41	324	2.3	7.8	1.8	64	371	1.7
536.1	0.513	14	1.1	42	304	1.3	7.4	2.0	64	348	0.922
536.8	0.513	16	0.899	44	285	1.7	7.4	1.6	67	325	1.2
537.5	0.706	12	0.718	38	268	0.950	10	1.3	58	306	0.693
538.2	0.513	15	0.732	42	273	1.2	7.4	1.3	65	313	0.868
538.9	0.513	16	0.841	41	326	1.3	7.4	1.5	62	373	0.920
539.6	0.513	18	1.0	32	292	1.8	7.4	1.9	50	333	1.3
540.3	0.513	15	0.650	37	283	1.3	7.4	1.2	57	324	0.960
541.0	0.513	13	0.735	36	327	1.9	7.4	1.3	55	374	1.4
541.7	0.633	17	0.535	36	326	2.3	9.1	0.976	55	373	1.7
542.4	0.513	15	1.1	41	296	2.0	7.4	2.0	62	339	1.4
543.1	0.599	16	0.633	39	308	0.761	8.6	1.2	60	353	0.555
543.8	0.820	15	0.896	33	274	1.2	12	1.6	51	314	0.908
544.5	0.513	15	0.859	43	294	1.0	7.4	1.6	66	336	0.741
545.2	0.513	16	0.908	38	288	1.4	7.4	1.7	59	329	1.0
545.9	0.513	14	0.606	37	298	1.8	7.4	1.1	57	341	1.3
546.6	0.513	13	0.609	40	274	1.2	7.4	1.1	61	314	0.861
547.3	0.513	15	0.841	38	275	1.5	7.4	1.5	58	314	1.1
548.0	0.513	14	0.927	38	256	1.1	7.4	1.7	58	293	0.795
548.7	0.513	16	0.735	36	264	1.1	7.4	1.3	55	302	0.780
549.4	0.513	14	0.791	44	274	1.2	7.4	1.4	68	314	0.894
550.1	0.513	16	0.614	44	283	1.2	7.4	1.1	67	323	0.901
550.8	0.513	14	0.588	39	267	1.5	7.4	1.1	59	305	1.1
551.5	0.623	17	0.815	42	278	1.7	9.0	1.5	64	318	1.2
552.2	0.513	17	0.697	45	252	1.0	7.4	1.3	69	288	0.763
552.9	0.513	16	0.968	44	247	1.3	7.4	1.8	68	282	0.964
553.6	0.513	14	0.700	44	253	1.6	7.4	1.3	67	289	1.2
554.3	0.513	14	0.799	43	250	0.643	7.4	1.5	66	285	0.469
555.0	0.513	14	0.508	46	258	1.3	7.4	0.926	71	295	0.982
555.7	0.513	15	0.664	56	314	1.1	7.4	1.2	86	359	0.811
556.4	0.513	14	0.819	44	263	2.0	7.4	1.5	67	301	1.5
557.1	0.513	15	0.764	39	282	1.5	7.4	1.4	59	323	1.1
557.8	0.624	17	0.592	47	273	1.3	9.0	1.1	71	313	0.942
558.5	0.513	14	1.0	50	268	1.1	7.4	1.8	76	307	0.785
559.2	0.513	17	0.710	48	261	1.2	7.4	1.3	74	298	0.876
559.8	0.513	14	0.818	52	253	0.185	7.4	1.5	79	290	0.135
560.5	0.513	15	0.926	51	284	1.5	7.4	1.7	79	325	1.1
561.2	0.513	14	1.2	52	267	1.0	7.4	2.3	80	305	0.748
561.9	0.513	14	0.863	49	245	1.6	7.4	1.6	75	280	1.2
562.6	0.513	13	0.590	56	260	1.3	7.4	1.1	85	297	0.938
563.3	0.513	17	0.917	49	266	1.5	7.4	1.7	75	304	1.1
564.0	0.513	15	0.876	54	266	1.6	7.4	1.6	83	304	1.1
564.7	0.513	15	0.713	51	301	1.9	7.4	1.3	78	344	1.4



Minnow Environmental  
Sample ID: 014

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
565.4	0.513	18	0.803	56	297	1.7	7.4	1.5	86	340	1.2
566.1	0.615	15	0.760	61	264	1.2	8.9	1.4	94	302	0.856
566.8	0.513	13	0.826	66	298	1.6	7.4	1.5	101	341	1.2
567.5	0.513	13	0.995	65	275	0.969	7.4	1.8	99	314	0.707
568.2	0.513	16	1.2	54	280	1.5	7.4	2.2	82	320	1.1
568.9	0.513	16	1.2	60	248	2.0	7.4	2.2	92	284	1.5
569.6	0.513	14	0.629	62	254	1.4	7.4	1.1	94	291	1.0
570.3	0.513	14	0.899	58	242	2.1	7.4	1.6	89	277	1.5
571.0	0.513	12	0.872	59	257	1.2	7.4	1.6	91	294	0.906
571.7	0.699	17	1.2	52	272	2.3	10	2.2	79	311	1.7
572.4	0.513	15	1.0	66	284	1.4	7.4	1.9	101	325	0.997
573.1	0.713	15	0.926	74	272	2.0	10	1.7	114	311	1.4
573.8	0.513	15	1.1	53	275	1.5	7.4	2.0	82	314	1.1
574.5	0.513	12	1.0	57	269	1.1	7.4	1.8	88	308	0.826
575.2	0.513	15	0.765	62	264	1.1	7.4	1.4	96	302	0.767
575.9	0.524	16	1.5	71	269	1.8	7.6	2.7	109	308	1.3
576.6	0.513	16	1.2	69	272	1.6	7.4	2.2	106	311	1.2
577.3	0.513	17	1.2	62	274	0.938	7.4	2.2	95	313	0.684
578.0	0.513	14	1.2	67	280	1.7	7.4	2.1	102	320	1.2
578.7	0.513	18	0.918	65	281	1.6	7.4	1.7	100	321	1.2
579.4	0.513	16	1.4	61	268	0.996	7.4	2.5	94	307	0.727
580.1	0.513	15	1.2	63	277	1.4	7.4	2.2	96	317	1.0
580.8	0.513	14	1.0	64	269	1.7	7.4	1.8	99	308	1.2
581.5	0.698	15	0.930	67	279	1.3	10	1.7	103	319	0.966
582.2	0.513	15	1.3	66	293	1.3	7.4	2.3	101	335	0.916
582.9	0.513	14	0.994	63	267	0.294	7.4	1.8	96	306	0.215
583.6	0.513	17	0.757	60	290	1.5	7.4	1.4	92	331	1.1
584.3	0.513	17	1.0	67	284	1.7	7.4	1.8	102	325	1.2
585.0	0.513	15	1.1	57	256	1.3	7.4	2.1	88	293	0.983
585.7	0.513	14	1.2	61	302	1.2	7.4	2.1	94	345	0.878
586.3	0.513	16	0.961	59	291	1.1	7.4	1.8	90	333	0.805
587.0	0.558	14	1.0	57	296	1.4	8.1	1.8	88	338	0.997
587.7	0.513	14	1.2	53	320	1.4	7.4	2.1	82	366	1.1
588.4	0.513	16	0.849	59	289	1.4	7.4	1.5	90	331	0.999
589.1	0.661	16	0.722	55	266	1.5	9.5	1.3	84	305	1.1
589.8	0.532	15	1.1	66	274	1.4	7.7	2.0	100	313	1.1
590.5	0.513	15	0.768	56	306	2.1	7.4	1.4	86	350	1.6
591.2	0.514	16	1.5	58	280	1.3	7.4	2.7	90	321	0.947
591.9	0.513	17	0.933	55	252	1.1	7.4	1.7	84	288	0.819
592.6	0.698	16	0.653	61	259	1.4	10	1.2	94	296	1.0
593.3	0.513	13	0.821	56	275	0.696	7.4	1.5	86	315	0.508
594.0	0.513	15	1.0	53	275	0.748	7.4	1.9	82	315	0.546
594.7	0.513	14	1.0	50	319	1.6	7.4	1.8	76	364	1.2
595.4	0.513	19	0.951	63	289	1.3	7.4	1.7	96	331	0.935
596.1	0.513	18	0.825	59	259	1.7	7.4	1.5	91	296	1.2
596.8	0.513	16	1.0	55	261	1.6	7.4	1.9	84	299	1.1
597.5	0.513	17	0.668	46	302	1.8	7.4	1.2	71	345	1.3
598.2	0.513	18	1.2	55	266	1.6	7.4	2.2	84	304	1.2
598.9	0.513	18	0.923	57	280	1.9	7.4	1.7	87	320	1.4
599.6	0.539	17	0.719	51	283	1.9	7.8	1.3	79	324	1.4
600.3	0.513	15	0.661	48	310	1.1	7.4	1.2	74	354	0.772
601.0	0.513	13	0.791	47	294	1.9	7.4	1.4	72	336	1.4
601.7	0.513	15	0.874	44	256	1.9	7.4	1.6	68	293	1.4
602.4	0.513	16	0.849	45	264	1.3	7.4	1.5	69	302	0.927
603.1	0.569	14	1.2	51	268	1.3	8.2	2.2	79	306	0.944
603.8	0.676	17	1.2	43	275	1.4	9.8	2.1	67	315	0.997
604.5	0.513	16	1.4	45	284	1.5	7.4	2.6	70	325	1.1
605.2	0.513	15	1.2	46	276	0.847	7.4	2.1	70	316	0.618
605.9	0.513	18	1.1	43	253	2.3	7.4	2.1	66	289	1.7
606.6	1.0	14	0.986	42	260	1.9	15	1.8	64	297	1.4
607.3	0.513	11	1.1	43	267	1.7	7.4	2.0	66	305	1.2
608.0	0.513	18	0.794	45	287	1.2	7.4	1.4	69	328	0.898
608.7	0.547	14	1.3	41	267	2.0	7.9	2.4	63	306	1.5
609.4	0.513	16	1.0	41	268	1.5	7.4	1.9	62	306	1.1
610.1	0.513	15	0.729	41	257	1.1	7.4	1.3	63	294	0.825
610.8	0.513	14	0.738	37	325	2.2	7.4	1.3	57	371	1.6
611.5	0.513	15	1.2	41	269	1.4	7.4	2.3	62	307	1.000
612.2	0.513	14	0.828	42	262	1.1	7.4	1.5	64	299	0.808
612.8	0.772	15	0.902	39	280	2.3	11	1.6	59	320	1.7
613.5	0.617	15	0.918	37	244	1.7	8.9	1.7	56	279	1.2
614.2	0.513	15	1.1	36	248	1.5	7.4	2.0	55	283	1.1
614.9	0.513	15	0.832	38	270	1.4	7.4	1.5	58	309	1.0
615.6	0.513	13	0.798	37	246	1.3	7.4	1.5	57	281	0.974
616.3	0.513	16	1.2	42	271	2.6	7.4	2.3	64	310	1.9
617.0	0.513	13	0.890	35	245	1.5	7.4	1.6	54	281	1.1
617.7	0.513	16	0.980	38	284	2.0	7.4	1.8	57	325	1.5
618.4	0.513	16	0.784	35	245	1.8	7.4	1.4	53	280	1.3
619.1	0.513	15	0.831	35	255	1.3	7.4	1.5	54	291	0.958
619.8	0.590	14	0.896	36	294	1.9	8.5	1.6	56	336	1.4
620.5	0.513	16	0.652	33	272	2.3	7.4	1.2	51	311	1.7
621.2	0.513	15	0.711	42	285	0.747	7.4	1.3	64	326	0.545



Minnow Environmental  
Sample ID: 014

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.9	0.513	17	0.711	42	266	1.9	7.4	1.3	64	304	1.4
622.6	0.513	15	0.516	36	276	1.2	7.4	0.941	55	316	0.856
623.3	0.513	17	0.651	34	238	0.757	7.4	1.2	51	273	0.552
624.0	0.513	15	0.730	35	268	1.1	7.4	1.3	54	306	0.798
624.7	0.513	15	0.607	34	282	0.979	7.4	1.1	52	323	0.715
625.4	0.513	17	0.690	40	301	1.6	7.4	1.3	61	344	1.1
626.1	0.513	12	0.661	33	232	0.993	7.4	1.2	50	265	0.724
626.8	0.513	16	0.700	33	270	1.5	7.4	1.3	50	309	1.1
627.5	0.513	16	0.671	34	268	1.3	7.4	1.2	52	306	0.916
628.2	0.718	19	0.862	36	289	1.8	10	1.6	55	330	1.3
628.9	0.513	15	0.587	40	258	0.920	7.4	1.1	62	296	0.671
629.6	0.513	16	0.748	42	256	1.3	7.4	1.4	65	293	0.983
630.3	0.513	15	0.558	39	253	1.0	7.4	1.0	59	289	0.751
631.0	0.513	14	0.641	39	280	2.1	7.4	1.2	60	321	1.6
631.7	0.695	14	0.627	41	255	1.5	10	1.1	62	291	1.1
632.4	0.513	17	0.692	41	278	1.1	7.4	1.3	63	318	0.836
633.1	0.513	19	0.933	46	271	1.1	7.4	1.7	70	309	0.800
633.8	0.752	19	0.695	44	242	1.1	11	1.3	68	277	0.812
634.5	0.706	18	0.442	46	281	2.2	10	0.805	70	322	1.6
635.2	0.719	17	0.837	46	288	0.798	10	1.5	70	329	0.582
635.9	0.513	18	0.537	47	255	2.0	7.4	0.980	72	292	1.5
636.6	0.513	16	0.500	49	257	1.2	7.4	0.911	75	293	0.864
637.3	0.559	15	0.517	41	259	1.6	8.1	0.943	62	296	1.1
638.0	0.513	17	0.554	46	267	0.904	7.4	1.0	71	305	0.659
638.7	0.513	18	0.496	57	238	1.0	7.4	0.905	88	272	0.748
639.3	0.513	16	0.580	49	247	0.909	7.4	1.1	75	283	0.663
640.0	0.513	15	0.721	55	275	0.867	7.4	1.3	84	314	0.632
640.7	0.513	16	0.648	50	286	1.6	7.4	1.2	76	328	1.1
641.4	0.663	17	0.796	53	276	1.1	9.6	1.5	81	316	0.769
642.1	0.513	17	0.788	57	275	1.5	7.4	1.4	88	314	1.1
642.8	0.513	14	0.701	56	240	1.3	7.4	1.3	86	274	0.978
643.5	0.607	14	0.751	56	259	1.4	8.8	1.4	87	297	0.987
644.2	0.896	17	0.695	56	313	1.5	13	1.3	85	358	1.1
644.9	0.513	16	1.2	65	272	0.629	7.4	2.3	99	311	0.459
645.6	0.513	15	0.773	64	268	0.793	7.4	1.4	98	307	0.579
646.3	0.513	16	0.983	57	234	1.7	7.4	1.8	88	268	1.2
647.0	0.513	14	1.1	55	254	1.1	7.4	2.0	84	290	0.784
647.7	0.513	14	1.4	55	258	0.875	7.4	2.6	84	295	0.639
648.4	0.513	14	1.2	61	284	1.4	7.4	2.2	94	325	1.0
649.1	0.893	17	1.5	62	260	1.3	13	2.7	94	297	0.978
649.8	0.513	12	0.843	56	224	0.775	7.4	1.5	86	256	0.566
650.5	0.513	14	0.984	57	262	0.945	7.4	1.8	87	300	0.689
651.2	0.513	13	1.3	57	237	0.567	7.4	2.4	87	271	0.414
651.9	0.527	15	1.1	62	259	1.2	7.6	2.1	95	296	0.896
652.6	0.513	14	1.0	59	258	0.494	7.4	1.9	91	294	0.361
653.3	0.513	15	1.5	57	252	0.940	7.4	2.6	87	288	0.686
654.0	0.513	16	1.2	64	268	0.103	7.4	2.1	99	307	0.075
654.7	0.513	13	1.3	69	271	1.8	7.4	2.4	105	310	1.3
655.4	0.588	16	1.2	56	250	1.1	8.5	2.2	86	286	0.825
656.1	0.513	15	1.5	62	263	1.3	7.4	2.7	96	301	0.916
656.8	0.513	16	1.0	70	298	1.1	7.4	1.9	107	341	0.833
657.5	0.513	13	1.1	67	307	0.636	7.4	2.1	103	351	0.464
658.2	0.513	13	1.3	65	253	1.1	7.4	2.3	99	289	0.794
658.9	0.681	14	1.3	61	265	1.6	9.8	2.3	93	303	1.2
659.6	0.513	16	1.3	65	300	0.939	7.4	2.4	100	343	0.685
660.3	0.513	12	1.4	63	275	0.729	7.4	2.5	96	314	0.532
661.0	0.797	14	1.5	65	265	1.2	12	2.7	99	303	0.873
661.7	0.513	14	0.891	58	258	0.820	7.4	1.6	89	295	0.598
662.4	0.513	15	1.1	63	283	0.590	7.4	1.9	97	323	0.430
663.1	0.513	14	1.2	56	240	0.942	7.4	2.1	86	275	0.687
663.8	0.513	11	0.973	64	235	1.3	7.4	1.8	97	269	0.948
664.5	0.513	13	0.809	51	254	0.983	7.4	1.5	79	290	0.717
665.1	0.513	14	0.969	52	258	0.754	7.4	1.8	80	295	0.550
665.8	0.513	15	1.0	62	325	0.665	7.4	1.9	96	371	0.485
666.5	0.513	14	1.2	54	250	1.1	7.4	2.1	82	286	0.768
667.2	0.513	10	1.1	48	267	0.880	7.4	2.0	73	306	0.642
667.9	0.513	15	1.2	57	263	1.3	7.4	2.2	88	300	0.980
668.6	0.513	15	0.813	56	236	1.7	7.4	1.5	86	270	1.2
669.3	0.513	14	1.0	59	261	1.3	7.4	1.9	90	298	0.931
670.0	0.872	14	1.0	56	274	1.3	13	1.9	86	314	0.965
670.7	0.513	13	1.2	51	254	1.2	7.4	2.2	77	291	0.843
671.4	0.513	14	1.2	53	289	0.978	7.4	2.2	81	330	0.714
672.1	0.513	15	1.1	49	245	1.0	7.4	2.0	75	280	0.760
672.8	0.513	15	0.993	55	257	1.6	7.4	1.8	84	294	1.2
673.5	0.709	12	1.0	46	258	1.1	10	1.9	70	295	0.836
674.2	0.513	13	1.1	43	256	1.3	7.4	2.0	66	292	0.953
674.9	0.513	10	0.685	44	235	0.724	7.4	1.2	67	269	0.528
675.6	0.513	13	0.915	47	259	1.6	7.4	1.7	71	296	1.2
676.3	0.513	13	1.5	42	267	2.0	7.4	2.8	65	305	1.5
677.0	0.513	11	1.3	44	271	1.5	7.4	2.4	67	309	1.1
677.7	0.513	15	1.3	49	271	0.403	7.4	2.3	74	310	0.294



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
678.4	0.513	14	1.0	40	237	1.4	7.4	1.9	61	271	1.0
679.1	0.747	15	0.965	46	277	1.5	11	1.8	70	317	1.1
679.8	0.513	14	1.2	45	251	0.501	7.4	2.3	70	287	0.366
680.5	0.513	14	1.0	42	285	1.3	7.4	1.9	65	326	0.939
681.2	0.513	13	0.644	36	239	1.1	7.4	1.2	55	273	0.795
681.9	0.513	14	1.1	38	264	1.9	7.4	2.0	58	302	1.4
682.6	0.513	16	0.985	42	274	1.4	7.4	1.8	65	313	1.0
683.3	0.513	14	0.976	41	246	1.3	7.4	1.8	63	281	0.966
684.0	0.513	16	0.907	36	259	0.916	7.4	1.7	56	296	0.668
684.7	0.513	16	0.863	35	260	1.1	7.4	1.6	53	297	0.777
685.4	0.513	16	0.960	39	261	1.4	7.4	1.8	60	298	1.0
686.1	0.724	15	0.654	33	236	1.4	10	1.2	50	270	1.0
686.8	0.662	16	0.707	30	267	0.964	9.6	1.3	46	305	0.703
687.5	0.513	15	0.736	37	250	1.0	7.4	1.3	57	286	0.756
688.2	0.513	16	0.879	35	241	1.1	7.4	1.6	54	276	0.813
688.9	0.513	17	0.723	33	258	1.6	7.4	1.3	50	295	1.2
689.6	0.513	16	0.753	34	238	0.996	7.4	1.4	52	272	0.727
690.3	0.513	13	0.673	29	245	0.853	7.4	1.2	45	280	0.622
691.0	0.513	16	0.708	29	227	0.843	7.4	1.3	45	259	0.615
691.6	0.513	15	0.672	32	205	0.756	7.4	1.2	48	235	0.551
692.3	0.513	13	0.565	34	219	0.588	7.4	1.0	52	250	0.429
693.0	0.513	16	0.530	32	246	2.2	7.4	0.967	50	281	1.6
693.7	0.513	14	0.695	36	227	1.4	7.4	1.3	55	259	1.0
694.4	0.564	17	0.855	34	226	0.787	8.1	1.6	53	258	0.574
695.1	0.513	16	0.635	36	238	1.1	7.4	1.2	54	273	0.767
695.8	0.513	16	0.656	29	214	0.284	7.4	1.2	45	245	0.207
696.5	0.513	15	0.475	35	268	0.686	7.4	0.867	54	307	0.501
697.2	0.513	14	0.702	36	279	0.508	7.4	1.3	55	319	0.371
697.9	0.513	16	0.683	33	233	0.850	7.4	1.2	51	266	0.620
698.6	0.513	16	0.994	37	213	1.3	7.4	1.8	57	244	0.968
699.3	0.513	13	0.715	33	198	0.624	7.4	1.3	51	226	0.455
700.0	0.513	11	0.760	33	244	1.0	7.4	1.4	51	279	0.734
700.7	0.513	14	0.619	37	250	0.725	7.4	1.1	56	286	0.529
701.4	0.513	13	0.976	35	251	1.4	7.4	1.8	53	287	0.989
702.1	0.513	18	0.462	37	254	1.0	7.4	0.842	57	290	0.730
702.8	0.513	16	0.672	39	245	1.1	7.4	1.2	60	280	0.829
703.5	0.521	17	0.626	38	260	0.807	7.5	1.1	59	298	0.589
704.2	0.513	13	0.577	41	264	1.1	7.4	1.1	63	301	0.839
704.9	0.513	16	0.695	46	240	0.808	7.4	1.3	70	274	0.590
705.6	0.513	13	0.604	37	238	1.0	7.4	1.1	57	272	0.739
706.3	0.513	13	0.574	33	269	0.768	7.4	1.0	51	307	0.560
707.0	0.513	11	0.618	39	245	1.0	7.4	1.1	60	281	0.746
707.7	0.513	15	0.931	38	259	1.3	7.4	1.7	58	296	0.944
708.4	0.629	15	0.642	39	238	1.000	9.1	1.2	60	272	0.729
709.1	0.513	14	0.604	37	235	1.000	7.4	1.1	57	268	0.729
709.8	0.513	14	0.827	31	239	0.760	7.4	1.5	48	274	0.555
710.5	0.513	16	0.674	39	264	2.0	7.4	1.2	60	302	1.5
711.2	0.513	13	0.749	39	255	0.480	7.4	1.4	59	291	0.350
711.9	0.513	15	0.898	37	230	1.6	7.4	1.6	57	263	1.1
712.6	0.513	13	0.721	31	212	0.720	7.4	1.3	48	243	0.525
713.3	0.513	15	0.861	36	275	1.4	7.4	1.6	55	314	1.0
714.0	0.513	14	1.2	32	266	0.749	7.4	2.3	50	304	0.546
714.7	0.513	16	0.922	45	258	0.848	7.4	1.7	70	295	0.619
715.4	0.513	15	0.673	35	264	1.1	7.4	1.2	53	302	0.812
716.1	0.601	12	0.635	33	263	0.667	8.7	1.2	51	301	0.486
716.8	0.513	13	0.923	32	260	1.2	7.4	1.7	48	297	0.864
717.4	0.513	13	0.535	29	259	0.909	7.4	0.975	45	296	0.663
718.1	0.513	14	0.991	42	257	1.3	7.4	1.8	65	294	0.981
718.8	0.513	14	1.0	35	233	1.2	7.4	1.9	54	266	0.850
719.5	0.513	11	0.614	30	238	1.2	7.4	1.1	47	272	0.877
720.2	0.513	10	0.960	32	235	1.3	7.4	1.8	48	269	0.956
720.9	0.513	11	0.732	30	262	1.3	7.4	1.3	46	299	0.949
721.6	0.821	13	0.775	36	255	0.923	12	1.4	56	291	0.673
722.3	0.513	11	0.383	29	228	0.551	7.4	0.699	45	261	0.402
723.0	0.513	13	1.2	29	240	0.960	7.4	2.2	45	275	0.701
723.7	0.513	12	1.1	29	235	0.453	7.4	2.0	44	269	0.330
724.4	0.513	14	0.975	34	259	0.813	7.4	1.8	52	296	0.593
725.1	0.513	12	0.738	30	228	1.5	7.4	1.3	47	261	1.1
725.8	0.513	10	0.869	28	240	0.834	7.4	1.6	43	275	0.609
726.5	0.513	10	0.752	28	238	0.579	7.4	1.4	42	273	0.422
727.2	0.513	10	0.668	23	227	0.874	7.4	1.2	35	260	0.638
727.9	0.513	11	0.921	22	254	0.894	7.4	1.7	34	290	0.652
728.6	0.513	11	0.717	31	302	0.754	7.4	1.3	48	345	0.550
729.3	0.513	13	0.780	26	252	0.825	7.4	1.4	39	289	0.602
730.0	0.513	8.6	0.725	22	217	1.4	7.4	1.3	34	248	0.992
730.7	0.513	12	0.641	25	251	1.3	7.4	1.2	39	287	0.947
731.4	0.513	14	0.965	24	254	0.757	7.4	1.8	36	290	0.552
732.1	0.513	11	0.517	25	219	1.2	7.4	0.942	38	250	0.889
732.8	0.513	11	0.653	28	229	1.3	7.4	1.2	42	262	0.966
733.5	0.513	13	0.729	26	273	1.6	7.4	1.3	40	312	1.2
734.2	0.513	13	0.934	23	243	0.217	7.4	1.7	35	278	0.158



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
734.9	0.513	14	0.845	22	236	1.4	7.4	1.5	34	269	1.0
735.6	0.513	13	0.792	26	234	0.916	7.4	1.4	40	268	0.668
736.3	0.513	10	0.539	19	233	1.8	7.4	0.983	29	267	1.3
737.0	0.513	9.9	0.497	20	251	1.3	7.4	0.906	31	287	0.931
737.7	0.513	13	0.788	22	251	0.391	7.4	1.4	34	286	0.285
738.4	0.513	15	0.616	27	235	1.1	7.4	1.1	42	269	0.799
739.1	0.513	12	0.772	27	239	0.992	7.4	1.4	41	274	0.724
739.8	0.530	13	0.591	19	244	0.512	7.7	1.1	30	279	0.374
740.5	0.513	12	0.638	21	244	1.4	7.4	1.2	32	279	1.1
741.2	0.513	13	0.563	22	238	1.8	7.4	1.0	33	272	1.3
741.9	0.513	16	0.583	23	248	1.5	7.4	1.1	35	284	1.1
742.6	0.513	14	0.575	30	264	1.4	7.4	1.0	45	302	0.989
743.2	0.513	15	0.669	22	232	0.803	7.4	1.2	34	265	0.586
743.9	0.513	14	0.713	22	236	1.3	7.4	1.3	33	270	0.965
744.6	0.513	13	0.464	22	267	1.4	7.4	0.847	34	305	1.0
745.3	0.513	13	0.588	26	243	0.920	7.4	1.1	40	277	0.671
746.0	0.513	12	0.405	21	261	0.460	7.4	0.739	33	298	0.336
746.7	0.513	13	0.504	16	229	0.965	7.4	0.919	25	261	0.704
747.4	0.513	14	0.700	18	198	0.765	7.4	1.3	28	227	0.558
748.1	0.513	13	0.775	21	260	0.896	7.4	1.4	33	297	0.654
748.8	0.513	16	0.748	27	246	0.792	7.4	1.4	41	281	0.578
749.5	0.513	16	0.578	23	234	1.5	7.4	1.1	35	268	1.1
750.2	0.513	15	0.748	23	292	0.303	7.4	1.4	36	333	0.221
750.9	0.513	15	0.682	25	273	1.1	7.4	1.2	39	313	0.796
751.6	0.861	16	0.827	26	241	0.500	12	1.5	40	276	0.365
752.3	0.513	12	0.598	25	218	1.4	7.4	1.1	38	249	0.985
753.0	0.513	13	0.666	28	234	0.871	7.4	1.2	42	268	0.636
753.7	0.513	14	0.663	29	264	0.797	7.4	1.2	44	301	0.582
754.4	0.513	13	0.753	28	247	0.408	7.4	1.4	43	283	0.298
755.1	0.513	13	0.570	28	217	0.955	7.4	1.0	43	248	0.697
755.8	0.513	13	0.773	27	262	1.1	7.4	1.4	41	299	0.823
756.5	0.513	11	0.932	29	229	0.971	7.4	1.7	44	262	0.709
757.2	0.513	13	0.674	31	252	1.8	7.4	1.2	48	289	1.3
757.9	0.513	15	1.1	32	223	1.1	7.4	2.0	50	255	0.772
758.6	0.513	12	0.623	35	253	0.904	7.4	1.1	53	290	0.659
759.3	0.513	13	0.836	27	233	0.709	7.4	1.5	42	266	0.518
760.0	0.513	11	0.842	30	220	1.3	7.4	1.5	46	252	0.966
760.7	0.513	13	0.853	28	200	0.270	7.4	1.6	43	229	0.197
761.4	0.513	15	0.549	32	225	0.795	7.4	1.0	49	257	0.580
762.1	0.513	12	0.738	36	226	1.0	7.4	1.3	54	258	0.735
762.8	0.513	12	1.2	35	233	1.4	7.4	2.2	54	267	0.987
763.5	0.513	11	0.646	34	218	1.3	7.4	1.2	52	249	0.955
764.2	0.513	12	0.727	32	244	0.632	7.4	1.3	50	279	0.461
764.9	0.513	13	0.794	35	245	0.865	7.4	1.4	54	280	0.631
765.6	0.513	11	0.733	38	227	0.469	7.4	1.3	58	260	0.342
766.3	0.513	14	0.855	32	194	0.712	7.4	1.6	48	222	0.520
767.0	0.513	13	1.1	40	246	1.0	7.4	2.1	61	282	0.765
767.7	0.513	11	0.991	35	239	0.674	7.4	1.8	54	273	0.492
768.4	0.513	13	0.883	34	218	1.1	7.4	1.6	52	249	0.796
769.0	0.513	13	1.3	35	214	0.810	7.4	2.4	53	245	0.591
769.7	0.513	11	0.661	32	201	0.595	7.4	1.2	49	230	0.434
770.4	0.513	15	0.883	40	216	0.965	7.4	1.6	62	247	0.704
771.1	0.513	15	0.988	39	279	0.864	7.4	1.8	59	319	0.630
771.8	0.513	12	0.974	36	205	1.2	7.4	1.8	55	235	0.869
772.5	0.513	12	0.962	32	201	1.3	7.4	1.8	50	230	0.917
773.2	0.513	14	0.752	41	220	0.966	7.4	1.4	62	251	0.705
773.9	0.513	13	0.814	31	224	0.382	7.4	1.5	47	256	0.279
774.6	0.513	11	0.715	34	186	0.567	7.4	1.3	52	212	0.413
775.3	0.513	13	0.822	40	215	1.3	7.4	1.5	61	245	0.948
776.0	0.513	15	1.1	37	207	0.576	7.4	2.0	57	237	0.420
776.7	0.513	15	0.956	36	238	0.697	7.4	1.7	56	272	0.508
777.4	0.513	12	1.4	37	206	0.698	7.4	2.5	56	236	0.509
778.1	0.513	12	0.762	38	208	0.401	7.4	1.4	59	238	0.293
778.8	0.513	14	1.2	38	197	0.509	7.4	2.2	59	226	0.371
779.5	0.513	15	0.999	34	238	0.609	7.4	1.8	53	272	0.444
780.2	0.513	12	1.2	34	238	0.801	7.4	2.2	53	272	0.584
780.9	0.513	14	1.2	34	210	0.915	7.4	2.2	53	240	0.667
781.6	0.513	13	0.998	37	218	0.710	7.4	1.8	57	249	0.518
782.3	0.513	13	0.997	36	226	0.726	7.4	1.8	55	258	0.530
783.0	0.513	12	1.1	29	203	0.831	7.4	1.9	44	233	0.606
783.7	0.513	14	0.667	27	200	1.6	7.4	1.2	42	229	1.2
784.4	0.513	12	0.935	34	201	0.570	7.4	1.7	52	230	0.416
785.1	0.513	14	1.1	34	221	0.940	7.4	1.9	52	253	0.686
785.8	0.513	12	0.758	31	203	0.661	7.4	1.4	48	232	0.483
786.5	0.537	15	1.1	29	223	1.4	7.8	2.1	45	256	0.990
787.2	0.513	12	1.3	32	213	0.723	7.4	2.3	48	244	0.527
787.9	0.513	11	1.1	29	201	1.4	7.4	2.0	44	230	0.988
788.6	0.513	14	1.2	28	233	1.1	7.4	2.2	43	266	0.773
789.3	0.513	12	0.889	26	214	1.7	7.4	1.6	40	245	1.2
790.0	0.513	14	1.0	31	266	0.630	7.4	1.8	47	304	0.460
790.7	0.513	16	1.2	27	230	0.760	7.4	2.2	42	263	0.555



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
791.4	0.513	13	0.705	24	212	0.745	7.4	1.3	37	243	0.544
792.1	0.513	12	0.821	27	194	1.8	7.4	1.5	41	222	1.3
792.8	0.513	14	0.589	26	227	1.4	7.4	1.1	40	259	1.0
793.5	0.513	16	1.2	23	227	1.0	7.4	2.1	36	259	0.765
794.2	0.513	14	0.966	24	192	0.604	7.4	1.8	37	219	0.441
794.9	0.513	14	0.881	21	236	0.877	7.4	1.6	33	270	0.640
795.5	0.513	12	0.905	26	216	0.943	7.4	1.7	40	247	0.688
796.2	0.513	12	0.840	19	211	1.8	7.4	1.5	30	242	1.3
796.9	0.513	15	0.932	24	204	1.0	7.4	1.7	36	233	0.745
797.6	0.513	14	0.577	26	245	0.537	7.4	1.1	40	280	0.392
798.3	0.876	13	0.911	22	244	1.6	13	1.7	34	279	1.2
799.0	0.513	12	0.988	23	218	1.2	7.4	1.8	36	250	0.843
799.7	0.513	13	1.0	19	214	0.944	7.4	1.8	29	244	0.689
800.4	0.513	13	0.960	21	231	1.3	7.4	1.8	32	264	0.928
801.1	0.513	14	1.1	17	195	0.961	7.4	2.1	27	223	0.701
801.8	0.566	14	0.993	21	213	1.4	8.2	1.8	32	244	1.0
802.5	0.513	12	0.531	18	191	0.513	7.4	0.969	28	218	0.374
803.2	0.513	13	0.711	18	209	0.777	7.4	1.3	27	239	0.567
803.9	0.513	15	0.805	20	234	2.1	7.4	1.5	30	268	1.5
804.6	0.513	21	0.708	23	217	1.4	7.4	1.3	35	248	0.988
805.3	0.513	12	0.779	17	231	1.0	7.4	1.4	27	264	0.760
806.0	0.513	14	0.760	17	210	0.699	7.4	1.4	26	240	0.510
806.7	0.513	18	1.2	19	230	1.2	7.4	2.2	29	263	0.892
807.4	0.513	15	0.813	18	223	1.8	7.4	1.5	28	255	1.3
808.1	0.513	14	0.832	20	225	1.2	7.4	1.5	31	257	0.910
808.8	0.513	14	0.596	18	221	1.6	7.4	1.1	27	253	1.2
809.5	0.513	13	0.788	19	228	0.985	7.4	1.4	29	261	0.718
810.2	0.513	13	0.826	18	253	0.721	7.4	1.5	27	290	0.526
810.9	0.513	15	0.910	18	248	1.5	7.4	1.7	27	284	1.1
811.6	0.513	16	0.846	17	236	1.5	7.4	1.5	25	269	1.1
812.3	0.513	14	0.632	15	218	0.890	7.4	1.2	24	250	0.650
813.0	0.513	17	0.640	16	229	0.896	7.4	1.2	24	262	0.654
813.7	0.513	14	0.387	16	210	1.2	7.4	0.705	25	240	0.882
814.4	0.513	17	0.340	20	249	1.1	7.4	0.620	30	284	0.838
815.1	0.513	15	0.800	14	275	1.4	7.4	1.5	22	314	1.1
815.8	0.513	12	0.500	14	226	1.3	7.4	0.912	22	258	0.927
816.5	0.513	14	0.722	17	214	1.2	7.4	1.3	25	245	0.857
817.2	0.513	16	0.789	17	221	1.2	7.4	1.4	25	253	0.840
817.9	0.513	15	0.921	13	209	1.2	7.4	1.7	20	239	0.879
818.6	0.513	15	0.581	19	255	1.2	7.4	1.1	28	291	0.853
819.3	0.513	14	0.712	15	223	1.4	7.4	1.3	22	255	1.0
820.0	0.513	20	0.649	16	250	0.836	7.4	1.2	24	286	0.610
820.7	0.513	17	0.566	14	215	0.853	7.4	1.0	21	246	0.622
821.3	0.513	17	0.601	20	245	1.4	7.4	1.1	31	280	1.0
822.0	0.513	17	0.489	19	218	1.5	7.4	0.893	29	249	1.1
822.7	0.513	14	0.940	17	239	0.842	7.4	1.7	26	273	0.614
823.4	0.513	19	0.465	16	239	1.2	7.4	0.848	24	273	0.842
824.1	0.513	19	0.796	20	228	1.4	7.4	1.5	30	261	1.0
824.8	0.513	977	0.375	13	217	1.1	7.4	0.685	20	249	0.832
825.5	0.513	16	0.478	12	214	1.7	7.4	0.871	19	244	1.3
826.2	0.513	398	1.7	15	217	1.6	7.4	3.2	24	248	1.2
826.9	0.513	18	0.687	19	236	0.798	7.4	1.3	30	270	0.582
827.6	0.513	19	0.711	22	236	1.8	7.4	1.3	33	270	1.3
828.3	0.513	15	0.635	12	212	1.2	7.4	1.2	19	243	0.907
829.0	0.513	19	0.480	17	240	2.7	7.4	0.875	26	274	2.0
829.7	0.513	17	0.536	18	239	1.2	7.4	0.978	28	274	0.888
830.4	0.513	21	0.594	15	227	1.5	7.4	1.1	23	260	1.1
831.1	0.513	17	0.646	18	223	0.972	7.4	1.2	28	255	0.709
831.8	0.513	19	0.488	16	238	0.806	7.4	0.890	25	272	0.588
832.5	0.513	17	0.859	20	223	1.1	7.4	1.6	30	255	0.785
833.2	0.513	20	0.704	19	221	0.575	7.4	1.3	29	253	0.419
833.9	0.513	24	0.606	18	219	0.781	7.4	1.1	28	250	0.570
834.6	0.513	20	0.645	22	247	1.1	7.4	1.2	34	283	0.779
835.3	0.513	18	0.734	19	212	1.3	7.4	1.3	30	242	0.923
836.0	0.513	17	0.762	20	255	1.2	7.4	1.4	31	292	0.858
836.7	0.513	18	0.747	19	227	1.7	7.4	1.4	29	260	1.2
837.4	0.513	23	1.0	21	224	1.6	7.4	1.9	32	256	1.2
838.1	0.513	21	0.422	19	217	0.962	7.4	0.769	28	248	0.702
838.8	0.513	20	0.637	22	221	1.1	7.4	1.2	34	252	0.770
839.5	0.513	21	0.690	22	228	1.1	7.4	1.3	33	260	0.780
840.2	0.513	18	0.533	21	215	0.462	7.4	0.971	32	246	0.337
840.9	0.513	21	0.595	21	207	0.381	7.4	1.1	33	236	0.278
841.6	0.513	21	0.541	23	221	1.4	7.4	0.987	35	253	0.993
842.3	0.513	21	0.344	18	202	1.0	7.4	0.627	28	232	0.765
843.0	0.513	23	0.800	23	242	0.736	7.4	1.5	35	277	0.537
843.7	0.513	23	0.746	23	233	0.815	7.4	1.4	35	266	0.595
844.4	0.513	23	0.532	26	223	1.0	7.4	0.970	40	255	0.743
845.1	0.529	23	0.761	22	236	0.831	7.6	1.4	33	270	0.606
845.8	0.736	22	0.570	21	232	0.920	11	1.0	33	266	0.671
846.5	0.537	23	1.1	24	215	1.8	7.8	2.0	37	245	1.3
847.2	0.513	23	0.641	25	228	1.3	7.4	1.2	39	261	0.915



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
847.8	0.513	24	0.559	23	218	0.466	7.4	1.0	36	250	0.340
848.5	0.513	24	0.685	24	205	0.770	7.4	1.2	36	235	0.562
849.2	0.513	23	0.655	25	234	0.491	7.4	1.2	38	268	0.358
849.9	0.513	22	0.587	25	197	0.638	7.4	1.1	39	225	0.466
850.6	0.513	23	0.438	26	223	1.2	7.4	0.799	40	255	0.875
851.3	0.513	19	0.709	31	203	0.820	7.4	1.3	48	232	0.598
852.0	0.513	22	0.897	29	208	1.0	7.4	1.6	44	238	0.734
852.7	0.513	19	1.0	30	209	1.2	7.4	1.9	47	239	0.874
853.4	0.579	20	0.903	30	200	0.828	8.4	1.6	46	229	0.604
854.1	0.661	19	0.880	31	212	0.866	9.5	1.6	47	243	0.632
854.8	0.513	19	1.0	36	229	0.397	7.4	1.8	54	261	0.290
855.5	0.513	18	1.1	33	196	0.263	7.4	1.9	50	224	0.192
856.2	0.513	15	1.1	32	246	0.894	7.4	2.1	48	282	0.652
856.9	0.513	17	0.952	34	196	1.3	7.4	1.7	52	224	0.953
857.6	0.513	22	0.930	38	217	0.662	7.4	1.7	58	248	0.483
858.3	0.513	18	0.818	36	200	0.425	7.4	1.5	56	228	0.310
859.0	0.513	19	1.0	32	258	0.375	7.4	1.9	49	295	0.274
859.7	0.513	19	1.2	36	232	0.852	7.4	2.1	56	265	0.622
860.4	0.513	20	1.1	38	213	0.897	7.4	2.0	59	244	0.654
861.1	0.513	21	1.4	40	226	1.3	7.4	2.5	61	258	0.926
861.8	0.513	17	1.2	36	226	0.605	7.4	2.2	54	258	0.441
862.5	0.513	18	1.7	35	228	1.5	7.4	3.0	53	261	1.1
863.2	0.513	22	1.0	46	234	1.3	7.4	1.9	70	267	0.931
863.9	0.513	20	1.0	36	211	0.591	7.4	1.9	56	242	0.432
864.6	0.513	14	0.974	35	191	0.940	7.4	1.8	54	219	0.686
865.3	0.513	18	1.2	38	217	0.738	7.4	2.2	58	248	0.539
866.0	0.513	16	0.941	43	232	0.669	7.4	1.7	66	265	0.488
866.7	0.513	17	1.1	42	219	1.2	7.4	1.9	64	250	0.882
867.4	0.513	16	1.3	39	192	0.876	7.4	2.3	60	220	0.639
868.1	0.513	16	1.3	44	218	0.891	7.4	2.3	67	249	0.650
868.8	0.513	18	1.3	37	211	0.745	7.4	2.3	57	241	0.543
869.5	0.513	16	1.3	42	235	0.873	7.4	2.4	64	268	0.637
870.2	0.513	16	1.4	44	204	1.2	7.4	2.6	67	234	0.844
870.9	0.513	18	1.5	45	223	0.763	7.4	2.8	69	255	0.556
871.6	0.513	15	1.3	47	260	0.875	7.4	2.3	72	297	0.638
872.3	0.513	14	1.2	47	223	0.982	7.4	2.2	73	255	0.716
873.0	0.513	19	1.7	43	255	1.3	7.4	3.2	66	291	0.916
873.6	0.513	16	1.4	43	229	2.1	7.4	2.5	67	262	1.6
874.3	0.513	16	1.3	45	242	0.571	7.4	2.4	69	276	0.416
875.0	0.513	14	1.3	42	207	0.953	7.4	2.4	65	236	0.695
875.7	0.513	14	1.3	43	216	0.713	7.4	2.4	66	247	0.520
876.4	0.513	16	1.1	44	213	1.2	7.4	2.0	67	244	0.842
877.1	0.513	16	1.3	50	231	0.566	7.4	2.4	77	264	0.413
877.8	0.513	16	1.5	48	233	0.464	7.4	2.7	74	267	0.339
878.5	0.513	15	1.1	49	215	0.363	7.4	2.1	74	245	0.265
879.2	0.513	18	1.5	50	258	2.0	7.4	2.7	77	295	1.4
879.9	0.513	14	1.1	48	221	0.713	7.4	2.0	73	253	0.520
880.6	0.513	15	1.3	46	227	0.674	7.4	2.3	71	260	0.491
881.3	0.513	13	1.5	53	243	0.540	7.4	2.8	82	277	0.394
882.0	0.513	13	1.9	43	246	0.632	7.4	3.5	66	281	0.461
882.7	0.513	15	1.5	52	221	1.0	7.4	2.8	80	253	0.765
883.4	0.513	17	1.6	49	211	0.890	7.4	2.9	75	241	0.649
884.1	0.513	14	1.5	46	219	0.427	7.4	2.8	71	251	0.312
884.8	0.513	17	1.8	46	233	0.563	7.4	3.2	70	266	0.410
885.5	0.513	13	1.8	46	283	0.830	7.4	3.2	70	324	0.606
886.2	0.513	15	1.6	42	226	1.3	7.4	2.9	65	259	0.931
886.9	0.780	13	2.1	51	236	1.0	11	3.7	78	270	0.748
887.6	0.513	15	1.7	50	238	1.1	7.4	3.1	77	272	0.830
888.3	0.513	14	1.7	47	249	0.745	7.4	3.1	73	285	0.543
889.0	0.549	14	2.0	48	252	1.1	7.9	3.7	73	288	0.769
889.7	0.513	13	1.4	39	220	1.0	7.4	2.6	59	251	0.757
890.4	0.513	17	1.7	52	276	0.590	7.4	3.1	80	316	0.430
891.1	0.513	17	1.5	54	285	1.3	7.4	2.8	82	326	0.978
891.8	0.513	15	1.4	40	228	1.1	7.4	2.5	61	260	0.825
892.5	0.513	15	1.5	50	248	1.1	7.4	2.8	77	284	0.797
893.2	0.668	15	1.5	44	242	0.973	9.6	2.7	68	276	0.710
893.9	0.513	16	1.4	48	227	1.5	7.4	2.6	74	259	1.1
894.6	0.513	16	1.6	50	228	0.727	7.4	3.0	76	261	0.531
895.3	0.513	14	1.5	42	221	1.2	7.4	2.8	65	252	0.882
896.0	0.513	13	1.4	46	253	0.865	7.4	2.6	70	289	0.631
896.7	0.513	15	1.4	43	229	0.936	7.4	2.6	66	262	0.683
897.4	0.513	15	1.5	42	219	1.2	7.4	2.8	64	250	0.861
898.1	0.513	13	1.7	41	241	0.754	7.4	3.1	63	275	0.550
898.8	0.513	14	1.4	48	235	1.1	7.4	2.5	74	269	0.817
899.5	0.513	14	1.3	36	251	1.6	7.4	2.4	55	287	1.1
900.1	0.513	16	1.4	39	215	1.2	7.4	2.5	60	246	0.854
900.8	0.513	15	1.7	42	265	1.3	7.4	3.2	64	303	0.972
901.5	0.513	14	1.3	33	212	0.943	7.4	2.3	51	242	0.688
902.2	0.513	17	1.4	42	225	0.573	7.4	2.5	65	257	0.418
902.9	0.513	16	1.4	50	237	1.1	7.4	2.5	77	272	0.778
903.6	0.513	14	1.4	33	208	0.861	7.4	2.6	51	238	0.628



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
904.3	0.513	13	0.956	38	237	1.2	7.4	1.7	58	271	0.904
905.0	0.513	14	1.4	36	238	0.995	7.4	2.5	55	272	0.726
905.7	0.513	13	1.3	36	213	0.696	7.4	2.3	54	243	0.508
906.4	0.979	13	1.3	37	245	1.1	14	2.4	56	281	0.809
907.1	0.513	15	1.1	36	229	0.798	7.4	2.0	55	262	0.583
907.8	0.513	13	0.896	35	207	1.1	7.4	1.6	53	236	0.799
908.5	0.513	16	1.3	37	252	0.824	7.4	2.4	57	288	0.601
909.2	0.513	14	1.3	33	235	1.2	7.4	2.4	50	268	0.883
909.9	0.513	15	1.4	33	256	1.1	7.4	2.5	50	293	0.791
910.6	0.513	13	0.900	29	266	1.2	7.4	1.6	44	304	0.842
911.3	0.513	11	1.1	29	218	1.1	7.4	2.0	45	249	0.793
912.0	0.513	14	1.2	32	266	0.609	7.4	2.2	48	305	0.445
912.7	0.513	13	0.982	26	210	0.916	7.4	1.8	40	240	0.668
913.4	0.513	14	1.1	26	197	0.874	7.4	2.1	41	225	0.637
914.1	0.513	12	0.583	27	213	1.0	7.4	1.1	41	244	0.740
914.8	0.513	17	1.3	31	223	0.806	7.4	2.3	47	255	0.588
915.5	0.513	13	0.923	27	245	1.8	7.4	1.7	42	280	1.3
916.2	0.513	14	0.855	25	277	0.934	7.4	1.6	38	316	0.681
916.9	0.513	16	1.0	28	226	0.282	7.4	1.9	42	258	0.206
917.6	0.513	13	0.892	34	228	0.780	7.4	1.6	52	261	0.569
918.3	0.513	15	1.0	25	238	0.714	7.4	1.8	38	272	0.521
919.0	0.513	16	0.789	28	270	1.2	7.4	1.4	42	308	0.888
919.7	0.513	14	0.891	23	245	0.999	7.4	1.6	36	280	0.729
920.4	0.513	13	0.716	24	195	0.984	7.4	1.3	36	223	0.718
921.1	0.513	14	0.807	22	244	1.2	7.4	1.5	34	279	0.884
921.8	0.526	17	0.762	18	281	0.916	7.6	1.4	28	321	0.669
922.5	0.513	14	1.3	23	251	0.938	7.4	2.3	36	287	0.684
923.2	0.513	15	0.573	20	266	1.4	7.4	1.0	31	304	0.986
923.9	0.513	14	0.785	19	235	1.4	7.4	1.4	29	269	1.0
924.6	0.513	13	0.810	17	237	0.530	7.4	1.5	26	271	0.387
925.3	0.513	14	0.743	19	223	0.721	7.4	1.4	30	255	0.526
926.0	0.513	14	0.722	26	290	1.0	7.4	1.3	40	332	0.766
926.7	0.513	15	0.571	21	214	0.695	7.4	1.0	32	245	0.507
927.4	0.513	14	0.595	17	204	0.535	7.4	1.1	26	233	0.390
928.0	0.513	14	0.747	17	225	1.1	7.4	1.4	26	257	0.771
928.7	0.513	13	0.524	16	273	0.890	7.4	0.955	25	312	0.650
929.4	0.513	14	0.567	17	246	0.590	7.4	1.0	25	282	0.431
930.1	0.513	13	0.721	15	227	1.1	7.4	1.3	23	260	0.790
930.8	0.513	17	0.709	17	250	0.720	7.4	1.3	26	286	0.525
931.5	0.513	16	0.476	15	259	1.3	7.4	0.868	23	297	0.933
932.2	0.513	14	0.632	18	246	1.5	7.4	1.2	28	282	1.1
932.9	0.513	13	0.443	14	228	0.731	7.4	0.808	22	260	0.534
933.6	0.513	14	0.586	18	231	1.4	7.4	1.1	27	264	1.0
934.3	0.513	15	0.423	19	245	1.0	7.4	0.771	28	280	0.741
935.0	0.513	15	0.639	14	234	1.7	7.4	1.2	22	267	1.2
935.7	0.513	13	0.674	15	219	0.663	7.4	1.2	23	251	0.484
936.4	0.513	15	0.871	14	252	1.0	7.4	1.6	21	288	0.732
937.1	0.513	15	0.701	18	272	0.917	7.4	1.3	27	311	0.669
937.8	0.513	13	0.439	14	253	1.0	7.4	0.801	21	289	0.764
938.5	0.513	15	0.396	13	240	0.813	7.4	0.723	21	274	0.593
939.2	0.513	16	0.428	15	240	1.4	7.4	0.781	22	275	0.998
939.9	0.513	15	0.683	17	262	1.4	7.4	1.2	25	300	1.0
940.6	0.513	13	0.800	13	232	0.736	7.4	1.5	21	265	0.537
941.3	0.513	15	0.612	14	256	0.666	7.4	1.1	21	293	0.486
942.0	0.513	15	0.428	14	240	0.741	7.4	0.780	22	275	0.541
942.7	0.513	16	0.651	13	235	1.7	7.4	1.2	19	268	1.2
943.4	0.513	15	0.776	16	257	0.469	7.4	1.4	25	293	0.342
944.1	0.921	15	0.556	14	245	0.805	13	1.0	21	280	0.587
944.8	0.513	18	0.794	13	257	0.523	7.4	1.4	20	293	0.382
945.5	0.513	18	0.742	18	279	1.2	7.4	1.4	28	319	0.887
946.2	0.513	16	0.604	17	249	1.8	7.4	1.1	27	285	1.3
946.9	0.513	15	0.462	17	224	1.1	7.4	0.843	27	256	0.799
947.6	0.513	13	0.736	17	232	1.2	7.4	1.3	26	265	0.854
948.3	0.513	13	0.771	14	238	0.963	7.4	1.4	22	272	0.703
949.0	0.513	13	0.559	16	242	1.6	7.4	1.0	24	277	1.1
949.7	0.513	13	0.593	17	227	0.794	7.4	1.1	26	259	0.579
950.4	0.513	15	0.595	17	234	1.1	7.4	1.1	26	267	0.800
951.1	0.513	14	0.393	18	236	1.2	7.4	0.717	28	270	0.875
951.8	0.513	15	0.694	18	242	1.1	7.4	1.3	27	276	0.829
952.5	0.513	12	0.621	16	217	1.3	7.4	1.1	25	248	0.924
953.2	0.513	16	0.451	18	236	0.978	7.4	0.823	27	270	0.713
953.8	0.513	15	0.318	17	246	1.4	7.4	0.580	25	281	1.000
954.5	0.513	11	0.799	20	248	0.849	7.4	1.5	31	283	0.619
955.2	0.513	12	0.810	18	258	0.669	7.4	1.5	28	295	0.488
955.9	0.513	15	0.693	20	242	0.945	7.4	1.3	31	276	0.689
956.6	0.513	14	0.625	20	212	1.4	7.4	1.1	31	242	0.997
957.3	0.513	14	0.641	23	252	1.6	7.4	1.2	35	288	1.2
958.0	0.513	12	0.585	21	230	1.1	7.4	1.1	32	264	0.827
958.7	0.513	14	0.777	25	242	1.5	7.4	1.4	39	277	1.1
959.4	0.513	15	0.636	20	235	0.461	7.4	1.2	31	269	0.336
960.1	0.513	14	0.631	22	250	0.785	7.4	1.2	34	286	0.573



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.8	0.513	16	0.663	21	243	1.5	7.4	1.2	32	278	1.1
961.5	0.513	14	0.648	24	239	1.4	7.4	1.2	36	274	0.999
962.2	0.513	14	0.612	24	288	1.3	7.4	1.1	37	329	0.973
962.9	0.513	17	0.749	21	229	1.1	7.4	1.4	32	262	0.821
963.6	0.513	16	0.728	24	265	0.867	7.4	1.3	37	303	0.633
964.3	0.513	13	0.853	25	234	1.3	7.4	1.6	39	268	0.932
965.0	0.518	13	0.872	28	254	1.3	7.5	1.6	42	290	0.953
965.7	0.513	13	0.862	33	251	1.1	7.4	1.6	50	287	0.776
966.4	0.513	15	0.440	26	237	1.4	7.4	0.802	40	272	1.0
967.1	0.513	13	0.838	29	249	0.895	7.4	1.5	45	285	0.653
967.8	0.513	15	0.955	30	268	1.5	7.4	1.7	47	306	1.1
968.5	0.513	13	0.968	29	262	0.848	7.4	1.8	44	300	0.619
969.2	0.513	15	1.4	30	257	0.372	7.4	2.6	46	294	0.272
969.9	0.513	16	0.847	34	241	0.900	7.4	1.5	52	275	0.657
970.6	0.513	15	1.2	33	235	0.772	7.4	2.1	51	269	0.563
971.3	0.513	14	0.978	32	274	1.1	7.4	1.8	49	313	0.816
972.0	0.513	15	1.4	38	260	1.2	7.4	2.5	58	297	0.844
972.7	0.513	18	0.920	34	251	1.7	7.4	1.7	52	287	1.2
973.4	0.513	17	1.3	36	250	0.839	7.4	2.4	56	286	0.612
974.1	0.513	15	0.959	38	236	0.913	7.4	1.7	58	269	0.666
974.8	0.513	13	0.935	28	249	1.1	7.4	1.7	43	285	0.794
975.5	0.513	16	1.2	31	234	0.874	7.4	2.1	47	268	0.637
976.2	0.513	14	1.6	37	249	1.7	7.4	2.9	57	284	1.2
976.9	0.513	18	0.921	37	250	0.864	7.4	1.7	57	286	0.630
977.6	0.513	15	1.1	35	217	1.0	7.4	2.0	54	248	0.755
978.3	0.513	12	1.6	41	271	0.757	7.4	2.8	62	310	0.553
979.0	0.513	18	1.2	47	254	1.1	7.4	2.1	72	291	0.780
979.7	0.513	17	1.1	39	249	1.6	7.4	2.1	59	284	1.2
980.4	0.513	17	1.2	39	241	1.0	7.4	2.1	59	275	0.744
981.0	0.513	18	1.0	42	301	1.2	7.4	1.9	64	344	0.875
981.7	0.513	17	1.5	38	242	1.2	7.4	2.7	58	277	0.870
982.4	0.513	16	0.876	41	243	1.1	7.4	1.6	63	278	0.810
983.1	0.513	16	0.850	36	224	0.837	7.4	1.6	55	256	0.611
983.8	0.513	18	1.5	44	228	0.884	7.4	2.7	68	261	0.645
984.5	0.513	17	1.2	46	266	1.2	7.4	2.2	71	304	0.886
985.2	0.513	16	1.1	42	244	1.1	7.4	2.0	64	279	0.826
985.9	0.513	18	1.2	50	268	1.2	7.4	2.2	76	306	0.904
986.6	0.536	17	1.4	48	235	1.3	7.7	2.6	74	269	0.957
987.3	0.513	16	1.2	42	269	1.2	7.4	2.2	65	308	0.851
988.0	0.513	18	1.5	46	238	0.566	7.4	2.7	70	272	0.413
988.7	0.513	17	1.4	49	252	1.5	7.4	2.6	75	288	1.1
989.4	0.513	16	1.2	40	235	1.4	7.4	2.2	62	268	1.0
990.1	0.513	20	1.3	48	252	1.0	7.4	2.4	74	288	0.747
990.8	0.513	16	1.4	57	303	1.0	7.4	2.5	88	347	0.754
991.5	0.564	18	1.5	50	247	1.2	8.1	2.8	77	283	0.850
992.2	0.513	20	1.9	50	252	1.1	7.4	3.4	76	288	0.801
992.9	0.513	19	1.2	46	249	0.986	7.4	2.2	70	285	0.719
993.6	0.513	20	1.5	58	289	1.5	7.4	2.7	88	331	1.1
994.3	0.513	21	1.1	51	235	1.2	7.4	2.0	79	269	0.883
995.0	0.513	18	1.6	58	253	1.0	7.4	3.0	89	289	0.742
995.7	0.513	17	1.3	57	256	1.1	7.4	2.4	87	293	0.834
996.4	0.513	16	1.2	48	217	1.7	7.4	2.2	73	248	1.2
997.1	0.579	18	1.5	51	265	1.6	8.4	2.7	79	303	1.1
997.8	0.513	20	1.3	55	253	1.5	7.4	2.4	84	289	1.1
998.5	0.513	19	1.5	55	255	1.5	7.4	2.7	85	292	1.1
999.2	0.513	17	1.3	52	259	1.9	7.4	2.4	79	296	1.4
999.9	0.777	21	1.7	48	247	1.2	11	3.2	74	283	0.869
1000.6	0.743	21	2.1	64	291	2.0	11	3.9	97	333	1.5
1001.3	0.513	18	1.6	58	225	1.5	7.4	2.9	90	257	1.1
1002.0	0.513	17	1.4	52	231	0.499	7.4	2.5	80	265	0.364
1002.7	0.513	17	1.6	54	238	1.2	7.4	2.9	82	272	0.870
1003.4	0.513	16	1.5	49	250	1.6	7.4	2.7	75	286	1.2
1004.1	0.513	18	1.8	66	236	1.8	7.4	3.2	101	270	1.3
1004.8	0.513	19	1.4	54	199	1.4	7.4	2.6	83	228	1.0
1005.5	0.513	19	1.3	51	250	0.532	7.4	2.4	78	286	0.388
1006.2	0.513	18	1.7	63	283	1.5	7.4	3.2	97	323	1.1
1006.9	0.513	20	1.5	60	251	1.6	7.4	2.8	92	287	1.2
1007.5	0.513	18	1.8	61	230	2.0	7.4	3.3	94	263	1.5
1008.2	0.513	19	1.6	52	225	2.0	7.4	3.0	79	258	1.4
1008.9	0.513	19	1.4	53	251	1.0	7.4	2.6	82	288	0.763
1009.6	0.513	17	1.5	54	251	1.3	7.4	2.7	83	287	0.953
1010.3	0.536	17	1.8	52	238	2.0	7.7	3.2	80	272	1.5
1011.0	0.513	19	1.6	62	247	2.1	7.4	2.9	94	283	1.5
1011.7	0.513	19	1.3	62	241	1.6	7.4	2.4	94	275	1.2
1012.4	0.628	17	1.5	55	265	1.1	9.1	2.7	85	303	0.801
1013.1	0.524	15	1.4	50	294	1.8	7.6	2.6	77	336	1.3
1013.8	0.513	19	1.4	52	259	1.6	7.4	2.6	80	296	1.1
1014.5	0.513	19	1.6	61	221	1.8	7.4	3.0	93	252	1.3
1015.2	0.513	17	1.6	50	234	1.7	7.4	3.0	77	267	1.3
1015.9	0.513	17	1.4	54	230	1.9	7.4	2.6	83	263	1.4
1016.6	0.524	19	1.3	61	235	1.4	7.6	2.4	94	268	1.0



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1017.3	0.513	17	1.2	52	209	1.6	7.4	2.1	80	239	1.2
1018.0	0.513	16	1.5	49	223	1.7	7.4	2.7	75	255	1.2
1018.7	0.513	15	1.6	59	235	1.2	7.4	2.8	91	268	0.865
1019.4	0.513	16	1.4	45	224	1.8	7.4	2.5	69	256	1.3
1020.1	0.513	17	0.977	51	218	1.2	7.4	1.8	78	249	0.847
1020.8	0.513	20	1.4	51	229	1.3	7.4	2.6	78	261	0.915
1021.5	0.513	18	1.4	50	238	2.2	7.4	2.5	77	273	1.6
1022.2	0.513	16	1.2	49	220	1.2	7.4	2.2	74	252	0.892
1022.9	0.513	16	1.4	54	218	1.9	7.4	2.5	83	249	1.4
1023.6	0.513	19	1.5	56	224	1.8	7.4	2.8	86	256	1.3
1024.3	0.513	16	1.3	58	214	2.4	7.4	2.4	89	245	1.7
1025.0	0.513	15	1.3	47	210	1.2	7.4	2.3	72	240	0.906
1025.7	0.513	16	1.4	47	225	1.9	7.4	2.6	71	258	1.4
1026.4	0.513	16	1.4	48	233	2.0	7.4	2.6	73	266	1.5
1027.1	0.513	17	1.4	54	209	2.0	7.4	2.5	83	239	1.4
1027.8	0.513	16	1.0	51	216	2.5	7.4	1.9	78	247	1.8
1028.5	0.513	16	0.972	38	224	1.9	7.4	1.8	58	256	1.4
1029.2	0.513	14	0.977	43	224	1.4	7.4	1.8	66	257	0.990
1029.9	0.513	14	1.0	48	237	1.6	7.4	1.8	73	271	1.2
1030.6	0.513	17	0.841	49	199	0.669	7.4	1.5	76	227	0.488
1031.3	0.513	16	0.905	43	206	1.8	7.4	1.7	66	236	1.3
1032.0	0.513	18	0.802	51	233	2.6	7.4	1.5	78	266	1.9
1032.7	0.634	15	1.1	50	205	1.9	9.2	1.9	77	235	1.4
1033.3	0.513	13	0.979	45	199	1.5	7.4	1.8	69	228	1.1
1034.0	0.513	14	1.1	45	221	1.5	7.4	2.0	69	253	1.1
1034.7	0.513	14	1.2	46	196	2.0	7.4	2.2	71	225	1.5
1035.4	0.513	14	0.981	48	231	1.6	7.4	1.8	74	264	1.1
1036.1	0.513	15	0.970	41	188	2.0	7.4	1.8	62	215	1.4
1036.8	0.513	13	0.820	51	213	1.0	7.4	1.5	79	243	0.758
1037.5	0.513	12	0.721	41	201	2.1	7.4	1.3	63	229	1.5
1038.2	0.513	13	0.980	41	235	2.0	7.4	1.8	62	269	1.5
1038.9	0.513	14	0.610	38	202	2.1	7.4	1.1	59	231	1.6
1039.6	0.513	14	0.986	42	219	1.2	7.4	1.8	64	250	0.892
1040.3	0.513	12	0.679	35	187	2.4	7.4	1.2	53	214	1.8
1041.0	0.513	13	0.630	31	208	1.8	7.4	1.1	48	238	1.3
1041.7	0.513	13	0.704	41	210	2.3	7.4	1.3	63	240	1.7
1042.4	0.513	11	0.806	39	224	2.4	7.4	1.5	59	257	1.8
1043.1	0.513	11	0.560	35	192	1.8	7.4	1.0	54	219	1.3
1043.8	0.513	13	0.713	35	200	1.9	7.4	1.3	53	228	1.4
1044.5	0.513	12	0.788	28	176	1.4	7.4	1.4	43	201	0.998
1045.2	0.513	13	1.2	32	205	1.5	7.4	2.2	49	235	1.1
1045.9	0.513	13	0.615	30	187	1.6	7.4	1.1	46	214	1.1
1046.6	0.513	12	0.642	31	186	1.9	7.4	1.2	48	212	1.4
1047.3	0.513	11	0.598	33	180	1.1	7.4	1.1	50	206	0.816
1048.0	0.513	11	0.522	28	183	2.2	7.4	0.952	43	209	1.6
1048.7	0.513	9.9	0.615	29	179	0.862	7.4	1.1	44	205	0.629
1049.4	0.513	13	0.616	27	205	1.9	7.4	1.1	42	234	1.4
1050.1	0.513	7.9	0.354	30	187	1.1	7.4	0.646	45	214	0.837
1050.8	0.513	13	0.561	27	192	1.8	7.4	1.0	41	220	1.3
1051.5	0.513	10	0.324	23	191	1.0	7.4	0.591	35	219	0.766
1052.2	0.513	9.6	0.666	26	197	2.3	7.4	1.2	39	225	1.7
1052.9	0.513	11	0.545	30	180	1.3	7.4	0.994	46	206	0.970
1053.6	0.513	9.9	0.468	25	191	1.7	7.4	0.853	39	218	1.3
1054.3	0.513	9.4	0.651	21	176	0.947	7.4	1.2	33	201	0.691
1055.0	0.513	10	0.423	23	184	1.3	7.4	0.772	35	210	0.916
1055.7	0.513	12	0.965	26	205	1.9	7.4	1.8	40	234	1.4
1056.4	0.639	11	0.560	26	199	1.0	9.2	1.0	40	228	0.741
1057.1	0.513	9.4	0.258	20	174	1.1	7.4	0.470	31	199	0.805
1057.8	0.513	12	0.591	24	221	1.9	7.4	1.1	37	252	1.4
1058.5	0.575	10	0.767	23	219	2.1	8.3	1.4	36	250	1.5
1059.1	0.513	10	0.655	21	235	2.2	7.4	1.2	32	269	1.6
1059.8	0.513	9.9	0.712	23	210	1.9	7.4	1.3	35	240	1.4
1060.5	0.513	8.6	0.544	21	215	0.821	7.4	0.991	32	246	0.599
1061.2	0.672	11	0.363	21	203	1.6	9.7	0.662	32	232	1.1
1061.9	0.513	11	0.226	20	218	1.9	7.4	0.413	30	249	1.4
1062.6	0.529	11	0.334	18	209	2.6	7.6	0.609	27	239	1.9
1063.3	0.513	11	0.406	19	189	1.6	7.4	0.740	30	216	1.1
1064.0	0.513	12	0.538	22	206	2.2	7.4	0.981	34	235	1.6
1064.7	0.513	13	0.431	23	214	2.0	7.4	0.787	36	245	1.4
1065.4	0.513	13	0.882	20	227	1.9	7.4	1.6	30	259	1.4
1066.1	0.726	11	0.607	23	204	1.2	10	1.1	35	233	0.849
1066.8	0.513	13	0.527	19	193	1.6	7.4	0.962	29	221	1.1
1067.5	0.513	12	0.647	18	204	1.3	7.4	1.2	27	233	0.949
1068.2	0.513	12	0.551	22	254	2.4	7.4	1.0	34	291	1.7
1068.9	0.513	10	0.641	22	211	2.1	7.4	1.2	34	241	1.5
1069.6	0.513	11	0.597	18	227	2.5	7.4	1.1	28	260	1.8
1070.3	0.513	12	0.521	19	211	2.3	7.4	0.950	29	242	1.7
1071.0	0.513	10.0	0.542	19	217	2.3	7.4	0.988	28	248	1.6
1071.7	0.513	14	0.876	21	231	1.9	7.4	1.6	31	264	1.4
1072.4	0.513	14	0.297	21	239	2.0	7.4	0.543	32	273	1.5
1073.1	0.513	12	0.434	22	233	1.8	7.4	0.791	34	267	1.3



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.8	0.513	12	0.537	21	212	2.0	7.4	0.980	33	243	1.4
1074.5	0.513	12	0.390	17	231	1.9	7.4	0.711	26	264	1.4
1075.2	0.513	12	0.670	22	222	1.4	7.4	1.2	34	254	1.0
1075.9	0.513	12	0.336	19	206	2.0	7.4	0.613	29	236	1.5
1076.6	0.513	14	0.563	23	210	3.4	7.4	1.0	36	241	2.5
1077.3	0.513	10	0.459	20	208	2.6	7.4	0.837	31	237	1.9
1078.0	0.513	13	0.444	25	233	2.0	7.4	0.810	38	266	1.5
1078.7	0.513	11	0.644	23	221	2.2	7.4	1.2	35	252	1.6
1079.4	0.513	12	0.596	18	203	2.5	7.4	1.1	28	232	1.8
1080.1	0.513	11	0.668	21	204	2.4	7.4	1.2	32	233	1.7
1080.8	0.513	12	0.491	25	198	3.1	7.4	0.896	38	227	2.2
1081.5	0.513	13	0.607	23	237	2.9	7.4	1.1	35	271	2.1
1082.2	0.513	13	0.414	21	209	2.4	7.4	0.755	32	239	1.7
1082.9	0.513	14	0.865	27	218	3.4	7.4	1.6	41	249	2.5
1083.6	0.665	11	0.667	25	206	2.1	9.6	1.2	38	236	1.6
1084.3	0.513	11	0.326	19	206	2.1	7.4	0.594	29	235	1.5
1085.0	0.513	14	0.774	23	225	3.0	7.4	1.4	35	257	2.2
1085.7	0.513	13	0.614	25	224	2.1	7.4	1.1	39	256	1.5
1086.3	0.513	13	0.413	22	224	3.2	7.4	0.753	34	256	2.3
1087.0	0.513	13	0.411	25	226	2.9	7.4	0.750	39	259	2.1
1087.7	0.513	11	0.544	28	214	2.3	7.4	0.992	44	245	1.7
1088.4	0.513	11	0.657	27	205	2.3	7.4	1.2	42	235	1.7
1089.1	0.513	12	0.916	30	232	3.3	7.4	1.7	45	265	2.4
1089.8	0.513	11	0.679	27	218	2.2	7.4	1.2	42	249	1.6
1090.5	0.513	13	0.666	29	217	3.1	7.4	1.2	44	249	2.3
1091.2	0.513	13	0.435	24	213	3.1	7.4	0.793	37	244	2.2
1091.9	0.513	11	0.535	27	221	2.3	7.4	0.975	41	252	1.7
1092.6	0.557	13	0.734	31	212	2.0	8.0	1.3	48	242	1.5
1093.3	0.513	11	0.946	27	224	2.3	7.4	1.7	41	256	1.7
1094.0	0.736	11	0.367	29	233	2.3	11	0.670	44	266	1.7
1094.7	0.513	13	0.662	30	217	3.8	7.4	1.2	46	249	2.7
1095.4	0.513	13	0.641	34	241	2.8	7.4	1.2	52	275	2.0
1096.1	0.513	11	0.856	38	221	2.9	7.4	1.6	59	253	2.1
1096.8	0.513	12	0.811	32	215	3.0	7.4	1.5	49	246	2.2
1097.5	0.513	13	0.737	31	244	3.2	7.4	1.3	48	278	2.4
1098.2	0.513	12	0.872	29	215	2.9	7.4	1.6	44	246	2.1
1098.9	0.513	13	0.716	32	216	4.2	7.4	1.3	50	247	3.1
1099.6	0.513	13	0.960	37	229	3.6	7.4	1.8	56	262	2.6
1100.3	0.513	12	0.716	33	206	2.8	7.4	1.3	50	236	2.0
1101.0	0.513	11	0.634	26	236	4.1	7.4	1.2	40	270	3.0
1101.7	0.513	13	1.1	42	243	4.1	7.4	1.9	64	277	3.0
1102.4	0.712	11	0.834	39	233	4.6	10	1.5	60	266	3.3
1103.1	0.513	13	0.721	39	226	3.8	7.4	1.3	60	258	2.8
1103.8	0.513	12	0.828	33	214	3.4	7.4	1.5	51	245	2.5
1104.5	0.513	11	0.639	37	195	3.6	7.4	1.2	56	224	2.6
1105.2	0.513	12	0.826	37	211	3.5	7.4	1.5	57	242	2.6
1105.9	0.513	14	0.639	39	224	4.9	7.4	1.2	59	257	3.5
1106.6	0.513	12	0.786	36	227	3.3	7.4	1.4	55	260	2.4
1107.3	0.513	12	0.729	38	201	3.4	7.4	1.3	58	230	2.5
1108.0	0.513	13	0.987	43	229	5.0	7.4	1.8	66	262	3.7
1108.7	0.513	15	0.537	44	224	3.6	7.4	0.979	67	256	2.6
1109.4	0.513	14	0.882	42	215	5.5	7.4	1.6	64	246	4.0
1110.1	0.513	13	0.977	43	254	6.8	7.4	1.8	66	291	5.0
1110.8	0.513	13	1.1	41	238	5.2	7.4	1.9	63	272	3.8
1111.5	0.513	12	1.3	39	206	4.1	7.4	2.3	60	236	3.0
1112.2	0.513	17	1.5	47	229	3.3	7.4	2.8	72	262	2.4
1112.8	0.581	17	0.974	44	232	4.0	8.4	1.8	67	265	2.9
1113.5	0.513	11	1.2	43	221	3.7	7.4	2.1	65	253	2.7
1114.2	0.513	14	0.939	42	240	5.2	7.4	1.7	65	275	3.8
1114.9	0.513	16	1.2	41	277	4.9	7.4	2.2	62	317	3.5
1115.6	0.513	15	0.990	49	243	6.0	7.4	1.8	75	278	4.4
1116.3	0.829	14	1.2	41	223	3.4	12	2.1	62	254	2.5
1117.0	0.590	12	0.963	39	239	4.0	8.5	1.8	60	273	2.9
1117.7	0.513	15	1.1	43	233	3.9	7.4	2.0	66	266	2.8
1118.4	0.518	17	1.0	40	232	4.4	7.5	1.9	62	265	3.2
1119.1	0.513	19	1.2	54	250	5.9	7.4	2.3	83	285	4.3
1119.8	0.513	14	1.2	47	223	5.2	7.4	2.1	72	255	3.8
1120.5	0.513	16	0.999	44	263	4.2	7.4	1.8	67	301	3.1
1121.2	0.513	17	0.844	45	242	5.1	7.4	1.5	70	277	3.7
1121.9	0.513	17	1.6	50	241	4.8	7.4	2.9	77	276	3.5
1122.6	0.513	16	1.1	47	217	4.6	7.4	2.0	73	249	3.4
1123.3	0.591	18	0.731	40	259	4.4	8.5	1.3	62	296	3.2
1124.0	0.513	17	1.2	45	230	4.2	7.4	2.2	69	263	3.1
1124.7	0.513	19	1.0	41	245	4.3	7.4	1.8	63	280	3.1
1125.4	0.513	19	0.994	47	263	5.1	7.4	1.8	73	300	3.7
1126.1	0.513	17	1.5	50	241	4.8	7.4	2.7	77	275	3.5
1126.8	0.513	16	1.4	47	252	5.0	7.4	2.5	72	288	3.7
1127.5	0.513	16	0.951	47	236	4.3	7.4	1.7	72	270	3.1
1128.2	0.513	17	1.1	42	250	4.5	7.4	1.9	64	286	3.3
1128.9	0.634	17	1.3	42	211	5.2	9.2	2.3	64	241	3.8
1129.6	0.513	18	1.0	50	244	4.5	7.4	1.9	77	280	3.3



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1130.3	0.513	17	0.896	46	221	3.1	7.4	1.6	70	253	2.2
1131.0	0.513	18	1.3	43	224	6.1	7.4	2.3	66	256	4.5
1131.7	0.572	20	1.4	49	258	4.6	8.3	2.5	75	295	3.4
1132.4	0.513	18	1.2	42	237	5.3	7.4	2.1	64	271	3.9
1133.1	0.536	17	0.792	45	215	4.5	7.7	1.4	70	246	3.3
1133.8	0.513	17	1.3	43	228	4.4	7.4	2.4	66	260	3.2
1134.5	0.694	16	1.4	41	227	3.3	10	2.6	62	260	2.4
1135.2	0.513	16	1.3	45	263	3.3	7.4	2.3	69	301	2.4
1135.9	0.513	19	1.1	48	247	3.5	7.4	1.9	74	282	2.5
1136.6	0.651	16	0.979	42	260	4.7	9.4	1.8	64	297	3.5
1137.3	0.513	17	1.1	46	249	3.5	7.4	2.0	70	285	2.6
1138.0	0.689	18	1.1	40	275	5.1	9.9	2.0	61	314	3.7
1138.6	0.513	19	1.4	43	251	4.1	7.4	2.6	65	287	3.0
1139.3	0.513	15	0.822	45	226	3.5	7.4	1.5	69	259	2.6
1140.0	0.513	16	0.987	41	233	3.6	7.4	1.8	62	267	2.6
1140.7	0.513	19	1.1	42	261	4.3	7.4	2.1	65	299	3.1
1141.4	0.513	20	1.1	43	247	3.1	7.4	2.0	66	283	2.2
1142.1	0.513	17	0.939	38	202	3.1	7.4	1.7	59	231	2.2
1142.8	0.555	17	0.688	40	226	3.9	8.0	1.3	62	259	2.8
1143.5	0.513	18	1.0	35	229	4.2	7.4	1.9	53	262	3.1
1144.2	0.561	17	1.0	47	254	4.2	8.1	1.9	72	291	3.1
1144.9	1.1	19	1.1	34	256	3.8	16	2.0	52	293	2.8
1145.6	0.560	18	1.1	39	231	4.0	8.1	2.0	60	265	2.9
1146.3	0.581	15	1.0	37	220	3.4	8.4	1.8	57	252	2.5
1147.0	0.604	15	0.845	34	225	3.1	8.7	1.5	51	257	2.3
1147.7	0.513	20	0.637	40	245	3.7	7.4	1.2	61	280	2.7
1148.4	0.729	18	1.2	34	266	3.9	11	2.2	52	304	2.9
1149.1	0.513	18	0.930	37	222	4.0	7.4	1.7	56	254	2.9
1149.8	0.513	14	0.909	36	213	3.9	7.4	1.7	55	244	2.8
1150.5	0.513	15	1.0	35	232	3.0	7.4	1.9	54	265	2.2
1151.2	0.732	18	0.855	34	243	4.8	11	1.6	53	278	3.5
1151.9	0.513	19	1.1	35	225	4.6	7.4	2.0	53	258	3.4
1152.6	0.513	17	0.709	41	216	4.3	7.4	1.3	63	247	3.1
1153.3	0.513	18	0.922	34	255	2.9	7.4	1.7	53	291	2.1
1154.0	0.513	19	0.894	26	235	4.6	7.4	1.6	41	269	3.4
1154.7	0.513	18	1.0	36	237	2.6	7.4	1.8	55	270	1.9
1155.4	0.621	19	0.990	34	226	3.6	9.0	1.8	53	259	2.6
1156.1	0.513	14	1.0	32	219	3.7	7.4	1.9	49	250	2.7
1156.8	0.513	15	0.856	32	209	4.9	7.4	1.6	50	240	3.5
1157.5	0.513	18	1.0	31	236	4.8	7.4	1.8	48	269	3.5
1158.2	0.565	18	0.835	39	225	4.9	8.2	1.5	61	258	3.5
1158.9	0.513	18	0.703	31	238	3.8	7.4	1.3	47	272	2.8
1159.6	0.513	16	0.627	32	235	4.1	7.4	1.1	49	269	3.0
1160.3	0.513	15	0.608	29	220	4.1	7.4	1.1	44	251	3.0
1161.0	0.513	16	0.585	30	225	5.5	7.4	1.1	47	258	4.0
1161.7	0.513	17	0.943	30	237	6.2	7.4	1.7	46	271	4.5
1162.4	0.513	14	0.616	34	208	3.9	7.4	1.1	52	238	2.8
1163.1	0.513	16	0.523	28	227	4.8	7.4	0.954	43	259	3.5
1163.8	0.513	15	0.711	28	214	4.2	7.4	1.3	43	244	3.1
1164.5	0.513	14	0.796	31	234	4.8	7.4	1.5	47	267	3.5
1165.1	0.513	16	0.222	26	226	4.4	7.4	0.405	40	258	3.2
1165.8	0.626	13	0.459	27	219	4.8	9.0	0.837	42	250	3.5
1166.5	0.513	14	0.460	23	215	4.1	7.4	0.838	35	246	3.0
1167.2	0.661	16	0.485	24	248	4.0	9.5	0.884	37	283	2.9
1167.9	0.513	13	0.291	21	199	3.7	7.4	0.530	33	227	2.7
1168.6	0.513	13	0.637	21	223	5.3	7.4	1.2	32	255	3.9
1169.3	0.513	15	0.615	28	222	5.1	7.4	1.1	43	254	3.7
1170.0	0.513	12	0.633	19	246	5.3	7.4	1.2	29	282	3.8
1170.7	0.513	13	0.683	24	257	5.3	7.4	1.2	37	294	3.9
1171.4	0.513	14	0.875	22	280	6.1	7.4	1.6	34	320	4.5
1172.1	0.513	13	0.892	23	210	5.8	7.4	1.6	35	240	4.3
1172.8	0.513	16	0.639	25	240	4.7	7.4	1.2	38	274	3.4
1173.5	0.513	14	0.734	22	256	7.1	7.4	1.3	34	292	5.2
1174.2	0.513	11	0.573	26	266	6.0	7.4	1.0	40	304	4.4
1174.9	0.513	15	0.369	19	269	7.6	7.4	0.673	30	307	5.5
1175.6	0.513	15	0.626	22	229	6.7	7.4	1.1	34	262	4.9
1176.3	0.513	11	0.420	23	231	6.3	7.4	0.766	35	264	4.6
1177.0	0.513	10	0.498	20	247	5.7	7.4	0.908	31	282	4.1
1177.7	0.513	12	0.607	18	234	6.7	7.4	1.1	27	267	4.9
1178.4	0.513	13	0.668	19	243	7.4	7.4	1.2	29	278	5.4
1179.1	0.513	13	0.320	23	227	5.0	7.4	0.583	35	260	3.7
1179.8	0.513	11	0.473	19	277	5.9	7.4	0.863	29	317	4.3
1180.5	0.513	13	0.492	21	262	8.4	7.4	0.896	33	300	6.1
1181.2	0.513	11	0.616	23	247	7.3	7.4	1.1	35	282	5.3
1181.9	0.745	12	0.485	23	255	5.7	11	0.884	35	291	4.2
1182.6	0.513	11	0.464	22	243	5.6	7.4	0.846	34	278	4.1
1183.3	0.513	9.4	0.592	20	221	6.3	7.4	1.1	31	252	4.6
1184.0	0.513	11	0.414	19	253	8.3	7.4	0.756	29	290	6.1
1184.7	0.513	11	0.582	20	237	6.3	7.4	1.1	31	271	4.6
1185.4	0.529	11	0.636	27	260	7.9	7.6	1.2	42	297	5.8
1186.1	0.513	12	0.580	21	236	5.9	7.4	1.1	32	269	4.3



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1186.8	0.513	9.8	0.314	23	269	6.0	7.4	0.573	36	308	4.4
1187.5	0.513	9.5	0.532	24	258	7.4	7.4	0.971	36	295	5.4
1188.2	0.513	11	0.504	24	246	7.8	7.4	0.920	36	282	5.7
1188.9	0.513	12	0.670	24	302	8.9	7.4	1.2	37	345	6.5
1189.6	0.513	8.8	0.677	23	243	8.4	7.4	1.2	36	278	6.1
1190.3	0.513	11	0.365	25	255	8.7	7.4	0.666	38	291	6.3
1191.0	0.513	12	0.563	26	250	11	7.4	1.0	40	286	7.9
1191.6	0.513	11	0.776	25	239	8.1	7.4	1.4	39	274	5.9
1192.3	0.513	12	0.647	30	256	6.9	7.4	1.2	47	293	5.1
1193.0	0.513	12	0.498	27	254	9.4	7.4	0.908	41	291	6.9
1193.7	0.513	12	0.532	27	258	8.5	7.4	0.970	41	295	6.2
1194.4	0.592	11	0.710	24	239	11	8.5	1.3	38	273	8.2
1195.1	0.513	13	0.510	34	244	11	7.4	0.930	53	279	8.0
1195.8	0.513	12	0.746	37	291	14	7.4	1.4	56	333	9.9
1196.5	0.513	13	0.591	31	244	8.5	7.4	1.1	47	279	6.2
1197.2	0.513	11	0.829	30	259	9.9	7.4	1.5	47	296	7.2
1197.9	0.513	12	0.526	35	248	11	7.4	0.959	53	283	8.1
1198.6	0.513	11	0.683	33	253	12	7.4	1.2	51	290	8.7
1199.3	0.513	11	0.587	37	251	12	7.4	1.1	56	287	8.5
1200.0	0.513	10	0.787	32	247	12	7.4	1.4	49	283	8.5
1200.7	0.513	13	0.691	43	284	15	7.4	1.3	67	325	11
1201.4	0.559	13	0.936	36	295	11	8.1	1.7	55	337	8.2
1202.1	0.513	13	0.791	39	244	16	7.4	1.4	60	279	12
1202.8	0.513	15	0.997	38	261	13	7.4	1.8	58	299	9.6
1203.5	0.513	11	1.2	43	265	15	7.4	2.2	66	302	11
1204.2	0.753	11	1.3	44	263	16	11	2.5	67	300	12
1204.9	0.513	10	1.0	37	243	13	7.4	1.9	56	278	9.7
1205.6	0.513	12	1.2	53	262	20	7.4	2.1	81	299	14
1206.3	0.513	10	1.3	46	243	15	7.4	2.4	70	278	11
1207.0	0.513	13	0.995	55	277	15	7.4	1.8	84	316	11
1207.7	0.513	12	0.885	60	261	17	7.4	1.6	92	299	12
1208.4	0.805	23	1.3	45	235	18	12	2.4	69	269	13
1209.1	0.513	12	0.945	52	244	16	7.4	1.7	79	279	12
1209.8	0.513	11	1.3	52	251	20	7.4	2.4	79	287	15
1210.5	0.513	9.4	1.3	55	281	19	7.4	2.4	84	322	14
1211.2	0.513	9.3	1.5	50	247	17	7.4	2.8	76	282	12
1211.9	0.513	12	1.3	65	346	21	7.4	2.4	100	396	16
1212.6	0.513	10.0	1.0	51	256	18	7.4	1.9	78	293	13
1213.3	0.513	9.8	1.4	47	228	15	7.4	2.5	72	261	11
1214.0	0.513	12	1.2	57	254	21	7.4	2.3	87	290	15
1214.7	0.513	12	1.6	65	260	19	7.4	2.9	100	297	14
1215.4	0.513	13	1.8	61	280	22	7.4	3.2	93	321	16
1216.1	0.513	12	1.6	60	274	23	7.4	3.0	91	313	17
1216.8	0.513	14	1.6	47	257	20	7.4	2.8	73	294	15
1217.4	0.513	13	1.8	65	299	26	7.4	3.2	99	342	19
1218.1	0.513	15	1.5	71	258	21	7.4	2.8	109	295	15
1218.8	0.513	16	1.5	56	265	22	7.4	2.7	86	303	16
1219.5	0.513	14	1.8	68	267	22	7.4	3.3	105	306	16
1220.2	0.513	10	1.6	67	267	24	7.4	2.9	103	306	17
1220.9	0.513	14	1.6	66	252	24	7.4	3.0	102	288	17
1221.6	0.513	14	1.9	81	277	23	7.4	3.4	124	317	17
1222.3	0.513	13	1.6	66	265	23	7.4	2.9	101	303	17
1223.0	0.513	13	1.5	66	275	21	7.4	2.7	102	314	15
1223.7	0.737	12	1.5	66	305	22	11	2.7	101	349	16
1224.4	0.513	13	1.7	66	266	26	7.4	3.1	101	304	19
1225.1	0.639	15	1.6	75	291	32	9.2	2.9	115	333	24
1225.8	0.513	12	2.1	67	259	26	7.4	3.8	103	296	19
1226.5	0.513	15	1.9	74	287	33	7.4	3.4	113	328	24
1227.2	0.513	16	1.7	69	286	32	7.4	3.1	106	327	24
1227.9	1.1	16	1.8	71	378	28	16	3.3	108	432	21
1228.6	0.513	16	1.7	68	321	35	7.4	3.2	104	367	25
1229.3	0.513	16	1.8	88	329	30	7.4	3.3	134	377	22
1230.0	0.513	17	1.9	88	331	32	7.4	3.5	134	379	24
1230.7	0.513	19	1.9	85	289	29	7.4	3.4	130	330	21
1231.4	0.513	17	2.1	80	311	31	7.4	3.8	123	356	23
1232.1	0.563	15	2.1	75	334	34	8.1	3.7	115	382	25
1232.8	0.513	13	2.1	95	320	32	7.4	3.7	146	366	23
1233.5	0.513	15	1.7	102	377	38	7.4	3.1	157	431	28
1234.2	0.821	16	1.9	94	318	36	12	3.4	144	363	26
1234.9	0.513	16	2.1	91	306	33	7.4	3.9	140	349	24
1235.6	0.513	16	2.6	91	344	41	7.4	4.8	139	394	30
1236.3	0.513	16	2.0	89	332	35	7.4	3.6	137	379	26
1237.0	0.904	18	2.3	97	363	43	13	4.2	149	415	32
1237.7	0.513	18	2.5	111	365	46	7.4	4.6	171	417	33
1238.4	0.730	17	1.9	96	333	41	11	3.5	148	380	30
1239.1	0.513	15	2.8	93	349	39	7.4	5.2	142	399	28
1239.8	0.513	16	2.8	94	324	42	7.4	5.1	144	371	31
1240.5	0.513	17	3.2	100	345	49	7.4	5.8	153	395	35
1241.2	0.576	16	2.9	100	346	49	8.3	5.3	154	396	36
1241.9	0.513	15	3.1	89	318	45	7.4	5.6	137	364	33
1242.6	0.513	16	2.5	99	320	43	7.4	4.5	151	366	32



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1243.3	0.513	17	2.7	93	331	42	7.4	5.0	142	378	31
1244.0	0.513	15	3.4	89	338	47	7.4	6.2	137	387	34
1244.7	0.513	17	2.9	110	335	52	7.4	5.2	168	383	38
1245.3	0.513	17	3.0	93	310	53	7.4	5.4	142	355	38
1246.0	0.513	17	3.1	95	364	55	7.4	5.6	146	416	40
1246.7	0.513	15	3.7	104	374	53	7.4	6.7	159	428	39
1247.4	0.513	16	3.5	88	333	58	7.4	6.3	134	380	42
1248.1	0.513	16	3.2	100	322	49	7.4	5.8	153	369	36
1248.8	0.513	15	2.7	99	345	54	7.4	5.0	152	395	39
1249.5	0.513	17	3.1	98	344	52	7.4	5.7	151	393	38
1250.2	0.547	14	3.6	104	332	50	7.9	6.5	159	380	37
1250.9	0.859	17	3.3	96	325	53	12	6.0	147	371	39
1251.6	0.513	17	2.9	96	328	55	7.4	5.3	147	375	40
1252.3	0.513	16	3.0	96	311	52	7.4	5.5	147	356	38
1253.0	0.620	16	2.6	101	343	54	9.0	4.7	154	392	40
1253.7	0.513	20	3.0	102	406	63	7.4	5.5	156	464	46
1254.4	0.609	17	2.4	101	367	63	8.8	4.3	155	419	46
1255.1	0.527	18	3.0	101	391	64	7.6	5.5	155	447	47
1255.8	0.513	15	2.6	93	381	59	7.4	4.7	142	436	43
1256.5	0.513	15	2.4	98	408	65	7.4	4.4	150	467	48
1257.2	0.513	18	3.1	99	350	59	7.4	5.7	151	400	43
1257.9	0.913	18	3.0	99	382	55	13	5.5	152	437	40
1258.6	0.537	14	3.0	110	386	62	7.7	5.5	169	441	45
1259.3	0.513	14	2.6	91	303	63	7.4	4.7	139	346	46
1260.0	0.513	17	3.2	106	390	69	7.4	5.9	162	446	50
1260.7	0.809	15	2.9	109	329	64	12	5.3	167	376	46
1261.4	0.513	14	2.8	103	311	60	7.4	5.1	157	356	44
1262.1	0.513	13	2.8	99	347	53	7.4	5.2	152	396	39
1262.8	0.513	16	2.5	108	362	61	7.4	4.5	165	414	45
1263.5	0.759	18	3.1	108	356	63	11	5.6	166	408	46
1264.2	0.513	16	3.1	116	381	54	7.4	5.6	178	435	39
1264.9	0.527	16	2.9	106	340	55	7.6	5.2	162	388	40
1265.6	0.547	19	2.7	107	372	55	7.9	5.0	163	425	40
1266.3	0.513	16	3.1	101	330	49	7.4	5.6	155	378	36
1267.0	0.513	17	3.1	111	371	56	7.4	5.6	171	425	41
1267.7	0.587	15	2.7	103	321	41	8.5	4.9	157	367	30
1268.4	0.513	17	2.8	125	355	48	7.4	5.0	191	406	35
1269.1	0.513	17	2.8	120	329	43	7.4	5.0	184	377	31
1269.8	0.513	19	2.8	110	335	49	7.4	5.0	169	383	36
1270.5	0.571	18	2.9	110	347	48	8.2	5.2	168	397	35
1271.1	0.513	19	2.5	117	324	43	7.4	4.5	180	370	32
1271.8	0.513	19	3.4	109	337	40	7.4	6.3	168	385	29
1272.5	0.646	17	3.1	119	364	43	9.3	5.6	183	417	31
1273.2	0.609	18	2.5	111	385	39	8.8	4.6	170	440	29
1273.9	0.513	19	3.0	113	307	35	7.4	5.4	174	352	26
1274.6	0.513	19	2.2	125	328	41	7.4	4.1	191	375	30
1275.3	0.513	18	3.0	106	278	36	7.4	5.4	162	318	26
1276.0	0.513	16	2.7	102	298	38	7.4	4.9	156	341	27
1276.7	0.547	20	2.6	122	359	34	7.9	4.7	187	411	25
1277.4	0.522	19	2.6	105	299	30	7.5	4.7	161	342	22
1278.1	0.695	20	2.8	126	299	30	10	5.1	193	342	22
1278.8	0.900	19	3.2	111	273	26	13	5.9	170	312	19
1279.5	0.735	19	2.2	106	313	30	11	4.1	162	358	22
1280.2	0.513	20	2.8	106	278	26	7.4	5.2	163	318	19
1280.9	0.930	20	2.7	120	281	33	13	4.9	184	321	24
1281.6	0.513	20	2.3	121	287	30	7.4	4.3	185	329	22
1282.3	0.624	19	2.3	100	282	24	9.0	4.2	153	323	18
1283.0	1.1	19	3.3	105	321	28	16	6.1	161	367	21
1283.7	0.513	21	2.6	114	332	31	7.4	4.7	174	379	22
1284.4	0.513	20	2.5	109	285	25	7.4	4.6	166	326	18
1285.1	0.644	20	2.1	108	295	24	9.3	3.8	166	337	18
1285.8	0.840	20	2.1	100	257	22	12	3.9	153	294	16
1286.5	0.581	18	2.2	94	286	24	8.4	3.9	144	327	18
1287.2	0.513	19	2.1	109	315	24	7.4	3.8	167	360	18
1287.9	0.513	21	2.3	98	268	30	7.4	4.2	150	307	22
1288.6	0.513	19	1.9	87	265	23	7.4	3.4	133	304	16
1289.3	0.551	19	2.4	100	303	27	8.0	4.4	154	347	20
1290.0	0.785	22	2.4	94	302	28	11	4.3	144	345	20
1290.7	0.513	22	3.1	104	311	27	7.4	5.7	160	356	20
1291.4	0.644	19	2.2	101	297	26	9.3	4.0	155	340	19
1292.1	0.750	21	2.5	85	269	24	11	4.6	130	308	18
1292.8	0.513	15	2.3	85	256	28	7.4	4.1	130	292	21
1293.5	0.513	16	2.4	87	270	26	7.4	4.4	133	309	19
1294.2	1.2	17	2.4	92	312	33	18	4.4	141	357	24
1294.9	0.513	18	2.5	92	276	32	7.4	4.6	140	315	23
1295.6	0.513	18	2.5	88	265	35	7.4	4.6	135	303	25
1296.3	0.513	18	3.2	82	286	33	7.4	5.8	125	327	24
1297.0	0.513	16	2.9	94	285	39	7.4	5.3	144	326	28
1297.6	0.513	17	3.1	94	327	44	7.4	5.7	144	374	32
1298.3	0.513	19	2.9	89	274	38	7.4	5.4	137	313	28
1299.0	0.561	18	3.1	106	276	41	8.1	5.7	162	315	30



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1299.7	0.719	19	3.2	90	288	46	10	5.8	137	329	33
1300.4	0.513	20	3.5	103	292	52	7.4	6.5	158	334	38
1301.1	0.596	18	2.9	93	259	50	8.6	5.3	143	296	36
1301.8	0.605	15	3.2	87	244	46	8.7	5.8	134	279	34
1302.5	0.529	16	2.8	79	254	47	7.6	5.1	121	290	34
1303.2	0.765	15	3.5	92	313	64	11	6.4	140	357	47
1303.9	0.513	16	2.9	94	288	66	7.4	5.2	143	329	48
1304.6	0.513	20	3.2	99	299	65	7.4	5.8	151	342	47
1305.3	0.876	15	3.2	92	290	80	13	5.9	141	331	59
1306.0	0.557	15	3.2	93	261	70	8.0	5.9	143	299	51
1306.7	0.513	18	3.3	103	302	80	7.4	6.1	158	345	58
1307.4	0.513	16	3.1	88	284	81	7.4	5.6	135	325	59
1308.1	0.513	14	3.1	90	277	63	7.4	5.6	138	316	46
1308.8	1.1	14	2.7	90	267	70	16	5.0	138	305	51
1309.5	0.513	15	3.3	82	261	72	7.4	6.0	126	298	53
1310.2	0.513	14	2.6	86	291	79	7.4	4.8	131	333	58
1310.9	0.513	16	2.2	79	238	72	7.4	4.1	121	272	52
1311.6	0.699	13	2.2	77	264	68	10	4.0	117	302	50
1312.3	0.513	14	2.6	80	237	69	7.4	4.7	123	271	51
1313.0	0.513	16	3.0	83	316	83	7.4	5.5	127	362	61
1313.7	0.577	15	1.7	76	271	74	8.3	3.1	116	310	54
1314.4	0.677	13	2.2	82	268	65	9.8	4.0	126	306	47
1315.1	0.979	15	2.3	74	289	63	14	4.2	113	330	46
1315.8	0.513	15	2.6	64	250	50	7.4	4.8	98	286	37
1316.5	0.513	16	2.2	68	257	56	7.4	4.1	104	294	41
1317.2	0.636	17	1.9	74	265	52	9.2	3.5	114	303	38
1317.9	0.513	14	2.1	67	272	51	7.4	3.9	103	311	37
1318.6	0.513	13	1.7	59	220	43	7.4	3.2	91	251	31
1319.3	0.513	11	1.7	63	229	42	7.4	3.2	96	262	30
1320.0	0.627	14	1.4	63	280	43	9.0	2.6	96	321	31
1320.7	0.801	16	1.1	55	228	34	12	2.0	85	261	25
1321.4	0.539	12	1.1	46	198	29	7.8	2.1	70	226	21
1322.1	0.781	14	1.1	59	256	36	11	1.9	90	293	26
1322.8	0.513	17	1.4	63	247	30	7.4	2.6	96	283	22
1323.4	0.513	17	0.928	59	239	28	7.4	1.7	90	273	21
1324.1	0.723	15	0.987	59	227	19	10	1.8	90	260	14
1324.8	0.513	15	1.1	59	244	19	7.4	2.0	91	279	14
1325.5	0.513	17	0.780	49	254	17	7.4	1.4	76	291	13
1326.2	0.513	13	1.1	57	244	19	7.4	1.9	87	279	14
1326.9	0.533	13	0.851	50	239	22	7.7	1.6	77	273	16
1327.6	1.1	16	0.982	55	237	14	16	1.8	85	270	10
1328.3	0.513	15	0.943	61	241	14	7.4	1.7	93	275	11
1329.0	0.513	13	0.743	51	229	10	7.4	1.4	77	262	7.6
1329.7	0.948	15	0.911	54	270	15	14	1.7	83	308	11
1330.4	0.513	14	0.503	50	241	9.9	7.4	0.917	77	276	7.2
1331.1	0.645	14	0.589	57	238	7.3	9.3	1.1	87	272	5.3
1331.8	0.513	13	0.760	67	252	10	7.4	1.4	102	288	7.3
1332.5	0.513	13	0.860	50	246	5.7	7.4	1.6	77	281	4.1
1333.2	1.1	16	0.512	54	274	8.0	16	0.934	83	314	5.9
1333.9	0.909	14	0.729	52	253	6.1	13	1.3	80	289	4.4
1334.6	0.513	18	0.451	55	253	7.3	7.4	0.823	84	289	5.3
1335.3	0.513	16	0.429	47	269	7.4	7.4	0.782	73	307	5.4
1336.0	0.513	13	0.617	47	259	7.0	7.4	1.1	73	296	5.1
1336.7	0.513	14	0.338	47	256	8.8	7.4	0.617	72	293	6.4
1337.4	0.513	15	0.498	52	258	6.1	7.4	0.908	79	295	4.4
1338.1	0.599	16	0.743	57	271	8.0	8.6	1.4	88	309	5.8
1338.8	0.513	13	0.585	52	258	6.5	7.4	1.1	80	295	4.7
1339.5	0.513	15	0.508	58	261	6.0	7.4	0.927	89	298	4.4
1340.2	0.513	15	0.517	58	288	6.8	7.4	0.944	89	330	4.9
1340.9	0.513	14	0.710	52	256	7.0	7.4	1.3	80	293	5.1
1341.6	0.560	12	0.474	51	263	5.8	8.1	0.864	78	300	4.2
1342.3	0.513	14	0.494	56	293	6.2	7.4	0.901	87	336	4.5
1343.0	0.538	14	0.458	53	280	6.4	7.8	0.835	81	320	4.7
1343.7	0.513	13	0.585	56	257	5.3	7.4	1.1	85	294	3.9
1344.4	0.513	15	0.744	55	288	5.1	7.4	1.4	84	329	3.7
1345.1	0.513	14	0.464	43	292	5.8	7.4	0.846	66	334	4.2
1345.8	0.513	14	0.520	41	266	5.0	7.4	0.949	63	304	3.7
1346.5	0.513	16	0.312	49	292	8.6	7.4	0.569	75	334	6.3
1347.2	0.718	14	0.553	59	284	7.5	10	1.0	91	325	5.4
1347.9	0.846	13	0.488	55	273	4.2	12	0.889	84	313	3.1
1348.6	0.513	14	1.2	49	245	5.7	7.4	2.1	75	280	4.1
1349.3	0.513	15	0.627	55	274	5.7	7.4	1.1	84	313	4.1
1349.9	0.513	12	0.561	58	328	5.2	7.4	1.0	89	375	3.8
1350.6	0.739	11	0.399	62	284	6.3	11	0.728	95	324	4.6
1351.3	0.513	13	0.464	42	269	6.7	7.4	0.846	65	307	4.9
1352.0	0.691	12	0.464	41	306	4.5	10.0	0.847	64	350	3.3
1352.7	0.534	13	0.619	50	293	5.5	7.7	1.1	76	335	4.0
1353.4	0.734	13	0.411	52	274	5.4	11	0.749	80	313	4.0
1354.1	0.513	14	0.284	57	282	5.1	7.4	0.518	87	322	3.7
1354.8	0.605	12	0.574	53	274	5.2	8.7	1.0	82	313	3.8
1355.5	0.513	13	0.559	49	315	6.0	7.4	1.0	75	361	4.4



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
1356.2	0.513	13	0.438	55	283	5.9	7.4	0.798	85	324	4.3
1356.9	0.513	15	0.719	48	291	4.7	7.4	1.3	74	332	3.4
1357.6	0.667	14	0.536	46	253	5.5	9.6	0.978	70	290	4.0
1358.3	0.636	14	0.558	51	266	5.1	9.2	1.0	78	304	3.7
1359.0	0.519	13	0.487	48	255	5.9	7.5	0.888	74	292	4.3
1359.7	0.513	12	0.482	47	259	5.4	7.4	0.880	73	296	3.9
1360.4	0.920	13	0.601	48	272	4.7	13	1.1	73	311	3.5
1361.1	0.513	14	0.410	53	290	7.0	7.4	0.748	82	332	5.1
1361.8	0.513	12	0.685	48	285	4.9	7.4	1.2	74	325	3.6
1362.5	0.667	13	0.602	46	316	6.1	9.6	1.1	71	361	4.5
1363.2	0.513	12	0.679	50	314	6.5	7.4	1.2	77	359	4.7
1363.9	0.513	15	0.601	49	274	5.6	7.4	1.1	75	314	4.1
1364.6	0.513	15	0.592	54	293	6.0	7.4	1.1	82	335	4.4
1365.3	0.513	16	0.616	48	316	4.8	7.4	1.1	73	361	3.5
1366.0	0.769	14	0.595	45	269	5.5	11	1.1	70	308	4.0
1366.7	0.640	14	0.492	53	278	6.5	9.2	0.897	81	318	4.8
1367.4	0.513	15	0.607	48	312	5.5	7.4	1.1	74	357	4.0
1368.1	0.626	13	0.481	47	274	5.2	9.0	0.878	72	313	3.8
1368.8	0.513	12	0.449	42	276	5.0	7.4	0.819	65	316	3.6
1369.5	0.513	15	0.440	45	309	5.7	7.4	0.802	69	353	4.2
1370.2	0.513	16	0.500	51	282	5.1	7.4	0.911	79	323	3.7
1370.9	0.626	16	0.459	53	273	4.9	9.0	0.836	81	312	3.6
1371.6	0.513	15	0.415	48	264	5.2	7.4	0.758	74	301	3.8
1372.3	0.513	13	0.671	46	271	5.4	7.4	1.2	70	310	3.9
1373.0	0.513	15	0.374	47	305	5.1	7.4	0.683	72	348	3.7
1373.7	0.639	16	0.744	51	245	5.7	9.2	1.4	78	280	4.2
1374.4	0.513	17	0.608	46	298	4.4	7.4	1.1	70	340	3.2
1375.1	0.513	13	0.608	44	290	5.8	7.4	1.1	68	332	4.3
1375.8	0.513	13	0.507	46	297	5.2	7.4	0.924	71	339	3.8
1376.4	0.715	16	0.739	48	295	6.2	10	1.3	74	337	4.5
1377.1	0.513	17	0.413	48	287	6.0	7.4	0.753	73	328	4.4
1377.8	0.513	15	0.223	47	319	5.5	7.4	0.406	73	365	4.0
1378.5	0.658	14	0.529	44	292	7.6	9.5	0.965	68	334	5.6
1379.2	0.513	14	0.669	45	275	5.3	7.4	1.2	69	315	3.8
1379.9	0.737	16	0.301	52	305	6.5	11	0.549	79	348	4.7
1380.6	0.622	12	0.623	41	250	5.3	9.0	1.1	63	286	3.9
1381.3	0.653	13	0.314	52	288	6.0	9.4	0.573	80	329	4.4
1382.0	0.513	15	0.510	44	290	5.9	7.4	0.930	67	332	4.3
1382.7	0.730	16	0.409	50	321	5.5	11	0.746	76	367	4.0
1383.4	0.701	16	0.656	50	308	6.1	10	1.2	77	353	4.5
1384.1	0.513	15	0.593	41	271	4.4	7.4	1.1	63	310	3.2
1384.8	0.513	14	0.576	39	282	5.3	7.4	1.1	60	322	3.9
1385.5	0.837	14	0.506	43	286	5.2	12	0.922	66	327	3.8
1386.2	0.513	13	0.431	42	289	6.0	7.4	0.786	65	330	4.4
1386.9	0.755	15	0.606	45	289	5.0	11	1.1	69	330	3.6
1387.6	0.735	14	0.747	38	286	5.6	11	1.4	58	328	4.1
1388.3	0.513	14	0.718	32	263	4.6	7.4	1.3	50	301	3.4
1389.0	0.513	12	0.676	38	310	5.6	7.4	1.2	58	355	4.1
1389.7	1.3	16	0.679	44	352	8.8	18	1.2	67	403	6.4
1390.4	0.651	15	0.480	44	281	5.0	9.4	0.876	67	322	3.7
1391.1	0.867	13	0.650	45	303	6.2	13	1.2	68	347	4.5
1391.8	0.513	15	0.618	39	306	5.2	7.4	1.1	60	350	3.8
1392.5	0.513	12	0.562	34	264	5.2	7.4	1.0	53	302	3.8
1393.2	0.646	14	0.682	44	298	6.7	9.3	1.2	68	341	4.9
1393.9	0.574	15	0.871	45	331	6.4	8.3	1.6	69	379	4.7
1394.6	0.513	16	0.577	42	297	5.5	7.4	1.1	64	339	4.0
1395.3	0.513	15	0.221	41	308	6.2	7.4	0.402	63	353	4.5
1396.0	0.513	16	0.659	41	318	8.0	7.4	1.2	63	364	5.9
1396.7	0.513	17	0.513	46	338	6.8	7.4	0.936	70	387	5.0
1397.4	0.513	17	0.423	46	305	6.9	7.4	0.771	71	349	5.0
1398.1	0.522	16	0.503	35	279	6.4	7.5	0.917	54	319	4.7
1398.8	1.2	16	0.741	39	306	6.5	17	1.4	60	350	4.7
1399.5	0.747	18	0.532	38	310	7.4	11	0.970	58	355	5.4
1400.2	0.775	18	0.929	41	350	6.2	11	1.7	63	400	4.5
1400.9	0.520	15	0.579	39	319	6.1	7.5	1.1	59	365	4.4
1401.6	0.620	15	0.521	38	310	6.2	8.9	0.950	58	355	4.5
1402.2	0.726	19	0.429	34	307	6.8	10	0.782	52	351	4.9
1402.9	0.513	19	0.719	40	333	7.1	7.4	1.3	61	381	5.2
1403.6	0.622	15	0.657	41	303	5.9	9.0	1.2	62	347	4.3
1404.3	0.598	18	0.567	38	323	4.6	8.6	1.0	59	370	3.3
1405.0	0.546	14	0.332	32	300	5.2	7.9	0.606	49	343	3.8
1405.7	0.847	15	0.490	32	321	5.0	12	0.895	49	367	3.7
1406.4	0.513	18	0.484	41	333	7.2	7.4	0.882	63	380	5.2
1407.1	0.513	15	0.764	32	304	5.3	7.4	1.4	48	348	3.9
1407.8	0.720	16	0.491	27	304	5.4	10	0.895	41	348	4.0
1408.5	0.565	19	0.388	31	322	6.8	8.2	0.708	48	368	5.0
1409.2	0.513	21	0.831	41	350	7.7	7.4	1.5	62	400	5.6
1409.9	0.613	20	0.604	36	313	7.2	8.9	1.1	56	358	5.3
1410.6	0.701	18	0.627	36	331	5.6	10	1.1	54	378	4.1
1411.3	0.513	16	0.475	35	309	6.5	7.4	0.866	53	354	4.7
1412.0	0.708	19	0.763	30	329	6.4	10	1.4	47	376	4.7



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1412.7	0.529	19	0.682	40	369	7.5	7.6	1.2	61	422	5.5
1413.4	0.719	20	0.490	38	319	6.6	10	0.893	58	365	4.8
1414.1	0.513	21	0.724	31	327	6.6	7.4	1.3	47	374	4.8
1414.8	1.1	19	0.786	33	322	6.3	17	1.4	51	368	4.6
1415.5	0.794	18	0.490	31	322	5.9	11	0.894	48	368	4.3
1416.2	0.513	20	0.803	38	342	9.5	7.4	1.5	58	392	6.9
1416.9	1.2	19	0.558	35	340	7.1	17	1.0	53	389	5.2
1417.6	0.513	22	0.710	34	346	6.3	7.4	1.3	51	396	4.6
1418.3	0.689	20	0.577	33	362	8.9	9.9	1.1	51	414	6.5
1419.0	0.537	20	0.645	30	346	6.5	7.7	1.2	46	396	4.7
1419.7	0.622	19	0.590	32	351	6.4	9.0	1.1	50	402	4.7
1420.4	1.2	21	0.489	32	318	7.4	17	0.892	48	364	5.4
1421.1	1.0	18	0.594	36	371	8.7	14	1.1	56	425	6.4
1421.8	0.513	21	0.867	28	322	6.0	7.4	1.6	43	368	4.4
1422.5	0.761	21	0.704	32	367	6.9	11	1.3	50	420	5.0
1423.2	0.713	20	0.644	29	328	7.4	10	1.2	45	375	5.4
1423.9	0.870	24	0.698	32	365	7.3	13	1.3	49	418	5.4
1424.6	0.579	21	0.695	29	341	6.7	8.4	1.3	44	390	4.9
1425.3	0.740	23	0.865	30	347	6.7	11	1.6	46	397	4.9
1426.0	0.550	24	0.726	26	336	6.6	7.9	1.3	39	384	4.8
1426.7	0.737	20	0.704	36	339	6.1	11	1.3	55	388	4.4
1427.4	0.535	20	0.558	30	329	4.9	7.7	1.0	46	376	3.6
1428.0	0.648	23	0.478	28	328	6.4	9.4	0.872	43	375	4.7
1428.7	0.793	22	0.591	32	405	8.3	11	1.1	49	463	6.0
1429.4	0.539	22	0.626	28	358	6.2	7.8	1.1	42	409	4.6
1430.1	0.513	25	0.629	26	327	5.9	7.4	1.1	40	374	4.3
1430.8	0.564	23	0.877	29	325	6.1	8.1	1.6	45	371	4.5
1431.5	0.513	20	0.566	34	325	6.2	7.4	1.0	51	372	4.5
1432.2	0.801	25	0.537	23	354	6.5	12	0.979	35	405	4.7
1432.9	0.527	22	0.653	24	345	5.8	7.6	1.2	37	394	4.2
1433.6	0.544	22	0.610	25	355	7.2	7.8	1.1	39	406	5.2
1434.3	0.513	21	0.553	28	344	5.2	7.4	1.0	43	393	3.8
1435.0	0.825	22	0.814	26	370	4.5	12	1.5	40	424	3.3
1435.7	0.699	21	1.1	25	336	6.5	10	1.9	39	384	4.8
1436.4	0.805	21	0.623	27	325	5.1	12	1.1	42	372	3.8
1437.1	0.513	25	0.784	26	313	5.5	7.4	1.4	40	358	4.0
1437.8	0.559	21	0.848	26	333	5.1	8.1	1.5	40	381	3.7
1438.5	0.585	20	0.771	25	362	5.7	8.4	1.4	38	414	4.2
1439.2	0.513	21	0.676	29	371	7.7	7.4	1.2	44	424	5.6
1439.9	0.693	21	0.397	22	322	5.2	10.0	0.724	34	368	3.8
1440.6	0.513	20	0.853	28	316	6.0	7.4	1.6	43	362	4.4
1441.3	0.927	19	0.881	24	325	4.5	13	1.6	37	371	3.3
1442.0	0.791	23	1.1	24	320	4.5	11	2.0	37	366	3.3
1442.7	0.513	20	1.2	29	374	4.7	7.4	2.3	44	428	3.4
1443.4	0.513	20	0.815	27	288	6.0	7.4	1.5	42	329	4.4
1444.1	0.513	17	0.747	26	286	4.5	7.4	1.4	40	327	3.3
1444.8	0.750	20	0.991	24	322	4.7	11	1.8	38	368	3.4
1445.5	0.513	18	1.1	23	298	5.0	7.4	2.1	36	341	3.7
1446.2	0.513	20	1.1	28	334	4.2	7.4	2.1	42	381	3.0
1446.9	0.513	18	1.4	26	321	4.7	7.4	2.6	40	367	3.4
1447.6	0.559	18	0.893	18	270	3.4	8.1	1.6	28	309	2.5
1448.3	1.0	16	0.955	25	315	5.7	15	1.7	38	360	4.1
1449.0	0.513	20	1.3	24	293	5.2	7.4	2.3	37	335	3.8
1449.7	0.596	34	1.4	30	290	6.0	8.6	2.5	45	332	4.3
1450.4	0.513	28	1.4	33	311	6.1	7.4	2.6	50	356	4.4
1451.1	0.513	24	1.5	25	292	5.0	7.4	2.7	38	333	3.6
1451.8	0.513	21	1.4	20	294	5.4	7.4	2.5	31	336	4.0
1452.5	0.513	25	1.7	23	317	5.1	7.4	3.2	36	362	3.7
1453.2	0.513	24	1.4	30	310	4.1	7.4	2.6	46	354	3.0
1453.9	0.513	21	1.4	20	288	6.0	7.4	2.6	31	330	4.4
1454.5	0.513	21	1.6	21	323	3.8	7.4	2.9	32	369	2.7
1455.2	0.611	18	1.7	26	340	6.0	8.8	3.1	39	389	4.4
1455.9	0.889	20	1.5	24	325	4.4	13	2.8	37	372	3.2
1456.6	0.513	19	1.4	23	335	4.6	7.4	2.6	35	383	3.4
1457.3	0.513	19	1.6	22	295	5.3	7.4	3.0	33	337	3.8
1458.0	0.513	21	1.8	22	334	4.8	7.4	3.3	33	382	3.5
1458.7	0.513	21	1.8	26	329	4.2	7.4	3.3	39	376	3.0
1459.4	0.731	23	1.6	21	329	4.8	11	3.0	32	376	3.5
1460.1	0.513	23	1.7	26	332	4.6	7.4	3.1	39	380	3.4
1460.8	0.513	20	1.5	19	346	3.3	7.4	2.8	30	396	2.4
1461.5	0.513	23	1.7	22	318	5.6	7.4	3.1	34	364	4.1
1462.2	0.804	22	1.8	25	342	6.7	12	3.3	38	391	4.9
1462.9	0.513	23	1.5	23	324	7.1	7.4	2.8	35	371	5.2
1463.6	0.513	23	1.4	22	358	6.1	7.4	2.5	33	409	4.4
1464.3	0.513	23	1.3	26	364	4.2	7.4	2.3	40	416	3.0
1465.0	0.513	21	1.7	21	326	5.3	7.4	3.1	32	372	3.8
1465.7	0.573	27	1.4	24	323	4.4	8.3	2.6	36	370	3.2
1466.4	0.513	24	2.0	25	325	4.9	7.4	3.7	38	372	3.6
1467.1	0.513	24	1.8	24	339	4.4	7.4	3.2	37	388	3.2
1467.8	0.513	26	2.2	23	346	4.9	7.4	4.1	35	396	3.6
1468.5	0.513	28	1.7	26	364	5.2	7.4	3.2	40	416	3.8



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1469.2	0.513	29	2.1	23	339	5.8	7.4	3.9	35	388	4.3
1469.9	0.513	28	1.7	19	368	4.4	7.4	3.1	30	420	3.2
1470.6	0.805	30	1.6	24	321	6.3	12	2.8	37	367	4.6
1471.3	0.911	28	1.6	21	340	5.6	13	3.0	32	389	4.1
1472.0	1.2	28	2.0	24	417	5.9	17	3.6	37	477	4.3
1472.7	0.772	29	2.5	24	353	5.8	11	4.6	37	403	4.2
1473.4	0.524	39	2.2	21	376	6.7	7.6	4.0	32	430	4.9
1474.1	0.513	39	3.7	24	354	6.2	7.4	6.8	37	405	4.5
1474.8	0.551	47	6.1	31	344	7.3	8.0	11	48	394	5.3
1475.5	0.754	41	5.6	34	341	5.3	11	10	52	390	3.9
1476.2	0.513	57	6.1	31	365	6.4	7.4	11	48	417	4.7
1476.9	0.513	45	5.2	25	326	5.2	7.4	9.5	38	373	3.8
1477.6	0.763	47	6.4	26	357	6.9	11	12	40	409	5.0
1478.3	0.513	43	4.4	24	316	6.5	7.4	8.0	37	361	4.8
1479.0	0.513	44	5.0	24	344	7.3	7.4	9.2	36	394	5.4
1479.7	0.513	44	4.4	22	313	5.2	7.4	8.1	34	358	3.8
1480.3	0.513	44	4.6	21	355	6.4	7.4	8.4	32	406	4.7
1481.0	0.603	50	3.9	26	369	6.2	8.7	7.2	40	422	4.5
1481.7	0.513	45	5.0	23	322	6.7	7.4	9.2	36	368	4.9
1482.4	0.697	48	3.1	25	331	5.3	10	5.7	38	378	3.9
1483.1	0.591	47	3.8	22	333	7.2	8.5	6.9	33	381	5.2
1483.8	0.513	44	4.9	24	355	8.4	7.4	8.8	36	406	6.1
1484.5	0.662	48	4.0	25	358	8.1	9.6	7.4	38	410	5.9
1485.2	0.513	44	4.0	23	355	8.8	7.4	7.3	35	406	6.4
1485.9	0.513	37	4.4	25	322	6.3	7.4	8.1	38	368	4.6
1486.6	0.710	44	4.8	21	318	6.5	10	8.8	32	364	4.7
1487.3	0.615	49	4.8	28	404	9.5	8.9	8.8	43	462	7.0
1488.0	0.513	43	4.8	20	338	5.7	7.4	8.7	30	386	4.2
1488.7	0.627	49	5.3	27	376	6.8	9.0	9.7	41	430	5.0
1489.4	0.584	42	9.1	26	335	8.1	8.4	17	40	384	5.9
1490.1	0.827	49	6.6	28	364	5.5	12	12	42	416	4.0
1490.8	0.522	52	6.6	37	337	6.4	7.5	12	56	386	4.7
1491.5	0.513	45	9.1	27	306	4.8	7.4	17	41	349	3.5
1492.2	0.513	39	5.1	23	297	6.7	7.4	9.3	36	339	4.9
1492.9	0.513	41	5.3	22	312	6.0	7.4	9.8	34	357	4.3
1493.6	0.672	45	4.3	22	374	6.2	9.7	7.8	34	428	4.5
1494.3	0.513	41	4.1	23	314	6.7	7.4	7.5	36	359	4.9
1495.0	0.616	44	3.5	26	349	6.7	8.9	6.4	39	399	4.9
1495.7	0.689	32	3.5	23	325	5.2	9.9	6.4	35	372	3.8
1496.4	0.857	44	3.9	23	376	6.3	12	7.2	35	429	4.6
1497.1	0.513	41	2.9	24	319	6.2	7.4	5.4	37	364	4.5
1497.8	0.513	35	3.3	22	348	6.4	7.4	6.0	34	398	4.7
1498.5	0.564	33	2.9	25	324	6.2	8.1	5.3	39	370	4.5
1499.2	0.513	37	2.7	22	318	6.9	7.4	4.9	34	364	5.1
1499.9	0.806	37	2.4	25	344	6.3	12	4.3	39	393	4.6
1500.6	0.581	35	2.7	28	360	8.3	8.4	5.0	43	412	6.0
1501.3	0.700	33	2.4	27	349	7.3	10	4.4	42	399	5.3
1502.0	0.559	33	2.5	29	327	5.0	8.1	4.6	44	374	3.6
1502.7	0.513	34	1.9	26	337	5.9	7.4	3.4	40	386	4.3
1503.4	0.513	37	2.1	24	332	5.2	7.4	3.9	37	379	3.8
1504.1	0.631	32	1.9	25	356	7.2	9.1	3.5	39	407	5.3
1504.8	0.513	32	2.3	24	311	5.0	7.4	4.1	37	356	3.6
1505.5	0.608	27	1.4	27	303	7.3	8.8	2.6	42	347	5.3
1506.1	0.513	65	2.5	28	333	6.9	7.4	4.5	43	381	5.0
1506.8	0.513	32	2.4	24	324	5.6	7.4	4.4	36	371	4.1
1507.5	0.748	34	2.3	31	317	6.2	11	4.1	48	363	4.5
1508.2	0.695	32	2.2	32	380	6.1	10	4.0	49	435	4.4
1508.9	0.513	26	1.5	23	311	5.2	7.4	2.7	35	355	3.8
1509.6	0.849	31	1.7	28	421	5.8	12	3.1	43	481	4.2
1510.3	0.513	30	2.1	25	301	6.3	7.4	3.8	39	344	4.6
1511.0	0.785	37	1.8	26	341	6.7	11	3.3	40	390	4.9
1511.7	0.513	32	1.8	27	341	7.7	7.4	3.3	42	390	5.6
1512.4	0.547	24	1.6	26	366	6.1	7.9	2.8	40	418	4.5
1513.1	0.629	29	1.4	25	386	8.3	9.1	2.5	39	441	6.0
1513.8	0.513	29	1.5	26	342	6.5	7.4	2.7	40	391	4.7
1514.5	0.513	28	1.7	31	333	8.0	7.4	3.1	48	380	5.8
1515.2	0.513	30	1.6	29	393	6.6	7.4	3.0	44	449	4.8
1515.9	0.757	28	1.3	30	310	7.5	11	2.5	46	354	5.5
1516.6	0.559	30	2.6	31	312	6.3	8.1	4.7	47	357	4.6
1517.3	0.631	27	1.3	30	332	5.8	9.1	2.4	45	380	4.2
1518.0	0.513	24	1.2	30	311	7.5	7.4	2.3	46	356	5.5
1518.7	0.563	23	1.2	32	353	5.5	8.1	2.2	49	404	4.0
1519.4	0.687	26	1.4	31	319	6.4	9.9	2.5	48	364	4.7
1520.1	0.851	25	1.5	32	318	6.1	12	2.7	49	363	4.4
1520.8	0.572	25	1.3	32	307	7.1	8.3	2.4	50	351	5.2
1521.5	0.682	23	1.3	32	296	7.3	9.8	2.4	50	339	5.3
1522.2	1.1	25	1.3	33	298	6.4	16	2.3	50	341	4.6
1522.9	0.585	24	1.4	34	318	7.1	8.4	2.6	52	364	5.2
1523.6	0.513	26	1.1	32	288	7.6	7.4	1.9	50	329	5.5
1524.3	0.645	25	1.5	30	308	6.2	9.3	2.8	46	352	4.5
1525.0	0.600	27	1.1	35	314	7.4	8.7	2.0	54	359	5.4



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1525.7	0.968	24	1.4	39	357	5.4	14	2.5	59	409	4.0
1526.4	1.1	26	1.5	31	322	6.2	16	2.7	48	368	4.5
1527.1	0.513	23	0.934	33	297	8.5	7.4	1.7	50	340	6.2
1527.8	0.513	22	1.2	30	270	5.4	7.4	2.1	47	309	4.0
1528.5	0.668	27	0.874	34	330	6.9	9.6	1.6	53	377	5.1
1529.2	0.627	25	1.1	33	318	6.4	9.1	2.0	51	364	4.7
1529.9	0.513	27	1.2	35	308	6.9	7.4	2.2	53	352	5.0
1530.6	0.513	27	1.1	36	319	7.8	7.4	2.1	55	364	5.7
1531.3	0.513	25	1.4	39	277	6.7	7.4	2.5	60	317	4.9
1532.0	0.739	25	1.1	38	296	5.5	11	2.0	58	339	4.0
1532.6	0.561	24	0.772	37	326	7.4	8.1	1.4	57	372	5.4
1533.3	0.712	25	1.1	34	298	8.7	10	2.1	53	341	6.4
1534.0	0.513	28	1.1	33	290	7.5	7.4	2.0	51	332	5.5
1534.7	0.986	26	0.766	36	296	6.2	14	1.4	55	338	4.5
1535.4	0.513	29	0.975	40	288	7.1	7.4	1.8	61	329	5.2
1536.1	0.513	24	0.652	37	268	5.5	7.4	1.2	57	307	4.0
1536.8	0.523	21	0.526	42	299	7.3	7.5	0.959	64	342	5.3
1537.5	0.513	25	1.2	43	305	7.7	7.4	2.1	66	349	5.6
1538.2	0.822	26	1.1	37	298	7.3	12	2.0	57	341	5.3
1538.9	0.708	27	1.5	52	291	7.2	10	2.7	80	333	5.3
1539.6	0.513	25	0.932	45	291	5.4	7.4	1.7	70	333	3.9
1540.3	0.846	23	1.1	41	341	7.4	12	2.0	63	390	5.4
1541.0	0.527	21	0.980	39	295	8.9	7.6	1.8	60	337	6.5
1541.7	0.963	25	0.844	45	286	7.8	14	1.5	68	327	5.7
1542.4	0.513	25	0.846	45	287	7.4	7.4	1.5	69	328	5.4
1543.1	0.534	24	0.807	43	318	9.1	7.7	1.5	65	364	6.6
1543.8	1.8	24	1.000	48	304	9.5	26	1.8	73	347	6.9
1544.5	0.617	20	1.2	41	293	10	8.9	2.2	63	335	7.5
1545.2	0.513	23	0.961	49	282	11	7.4	1.8	75	323	7.9
1545.9	0.514	23	0.847	47	305	11	7.4	1.5	72	349	8.0
1546.6	0.513	20	0.874	50	301	12	7.4	1.6	76	344	9.0
1547.3	0.513	16	0.910	41	275	12	7.4	1.7	62	314	8.6
1548.0	0.513	21	1.2	46	267	12	7.4	2.3	71	305	9.1
1548.7	0.513	17	0.995	36	266	13	7.4	1.8	54	304	9.3
1549.4	0.513	22	1.0	55	283	11	7.4	1.9	84	324	8.0
1550.1	0.676	18	0.766	43	257	11	9.8	1.4	66	293	8.4
1550.8	0.677	19	1.2	48	274	14	9.8	2.2	73	313	10
1551.5	0.513	22	0.962	45	269	17	7.4	1.8	69	307	13
1552.2	1.3	20	1.3	51	308	18	18	2.4	78	352	13
1552.9	0.513	21	0.792	56	272	17	7.4	1.4	87	311	13
1553.6	0.513	18	1.1	47	269	20	7.4	2.0	72	307	15
1554.3	0.699	18	1.3	54	274	16	10	2.3	82	313	12
1555.0	0.773	20	1.3	45	275	19	11	2.4	69	314	14
1555.7	0.513	18	1.3	54	289	20	7.4	2.4	83	330	14
1556.4	0.513	17	1.6	55	279	16	7.4	2.9	84	319	12
1557.1	0.724	19	1.1	54	269	17	10	2.0	83	308	12
1557.8	1.0	18	1.1	61	293	19	15	2.0	93	335	14
1558.5	1.0	21	1.6	57	310	20	15	2.9	87	354	14
1559.1	0.513	21	1.6	60	267	19	7.4	2.9	91	305	14
1559.8	0.878	19	1.3	55	268	18	13	2.4	85	307	13
1560.5	0.513	18	1.3	50	276	17	7.4	2.4	77	316	13
1561.2	0.513	17	1.4	47	243	17	7.4	2.6	72	278	12
1561.9	0.513	19	1.3	56	253	20	7.4	2.3	86	290	15
1562.6	0.513	17	1.4	56	260	21	7.4	2.5	86	297	15
1563.3	0.943	17	1.7	60	292	20	14	3.1	92	334	15
1564.0	0.513	18	1.5	53	269	23	7.4	2.6	82	308	17
1564.7	0.900	17	1.7	51	257	23	13	3.1	78	294	17
1565.4	0.513	18	1.5	55	271	20	7.4	2.7	84	310	15
1566.1	0.757	20	1.5	59	279	24	11	2.7	90	319	17
1566.8	0.513	16	1.7	59	288	19	7.4	3.2	91	329	14
1567.5	0.513	19	1.1	50	262	24	7.4	2.0	77	299	17
1568.2	0.513	20	1.7	62	289	25	7.4	3.1	95	330	18
1568.9	0.624	18	1.7	62	263	27	9.0	3.1	94	300	20
1569.6	0.513	19	1.5	71	288	31	7.4	2.8	109	329	23
1570.3	0.601	16	1.4	54	248	22	8.7	2.6	83	284	16
1571.0	0.513	17	1.3	60	252	24	7.4	2.4	93	289	18
1571.7	0.513	20	1.4	54	274	28	7.4	2.5	83	314	20
1572.4	1.3	19	2.1	67	275	25	19	3.9	103	315	18
1573.1	0.513	17	1.4	66	289	27	7.4	2.6	102	330	20
1573.8	0.513	19	2.1	64	257	26	7.4	3.8	97	294	19
1574.5	0.740	17	1.6	66	295	28	11	2.9	102	337	20
1575.2	0.564	24	2.1	68	292	26	8.1	3.8	104	334	19
1575.9	0.737	18	1.6	63	250	23	11	2.9	97	286	17
1576.6	0.761	16	1.6	65	248	22	11	2.9	99	284	16
1577.3	0.513	19	1.7	68	295	24	7.4	3.1	104	338	18
1578.0	1.1	19	2.0	70	286	28	16	3.6	107	327	20
1578.7	0.513	21	1.7	69	294	29	7.4	3.0	105	337	21
1579.4	0.513	21	1.6	76	290	28	7.4	2.9	117	332	20
1580.1	0.513	20	2.1	71	319	27	7.4	3.8	109	364	20
1580.8	0.513	19	1.8	61	265	27	7.4	3.2	93	303	19
1581.5	0.913	21	2.1	74	290	29	13	3.8	114	332	21



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1582.2	0.745	23	1.9	65	354	29	11	3.5	100	405	21
1582.9	0.648	20	2.5	76	277	29	9.4	4.6	117	316	21
1583.6	0.513	21	2.1	78	305	31	7.4	3.9	119	349	23
1584.3	0.628	18	1.7	64	247	26	9.1	3.2	97	283	19
1584.9	0.513	22	2.3	76	297	37	7.4	4.2	116	340	27
1585.6	0.513	20	1.6	78	299	30	7.4	2.8	120	342	22
1586.3	0.513	16	1.9	76	276	26	7.4	3.5	116	315	19
1587.0	0.513	21	1.9	74	292	34	7.4	3.5	114	334	25
1587.7	0.513	22	2.4	70	298	31	7.4	4.4	107	341	23
1588.4	0.513	22	2.5	84	315	34	7.4	4.6	129	360	25
1589.1	0.644	23	2.0	74	298	35	9.3	3.7	114	341	26
1589.8	0.513	19	2.3	87	278	32	7.4	4.2	133	318	24
1590.5	0.611	18	2.1	71	280	31	8.8	3.8	109	320	23
1591.2	0.712	21	2.1	72	327	36	10	3.7	110	374	26
1591.9	0.513	23	2.3	85	279	36	7.4	4.2	130	319	26
1592.6	1.3	23	2.2	82	306	36	19	4.0	125	350	26
1593.3	0.513	21	2.0	75	280	34	7.4	3.6	115	320	25
1594.0	0.513	19	2.6	75	307	33	7.4	4.7	115	351	24
1594.7	0.513	20	2.8	80	301	36	7.4	5.2	122	344	26
1595.4	0.513	23	2.8	80	291	37	7.4	5.1	122	333	27
1596.1	0.564	19	2.5	81	281	36	8.1	4.6	124	321	26
1596.8	0.627	21	2.4	81	295	36	9.0	4.4	124	338	27
1597.5	0.695	18	3.2	86	328	41	10	5.9	131	375	30
1598.2	0.513	20	2.6	82	271	35	7.4	4.7	126	310	25
1598.9	0.513	19	2.6	82	315	35	7.4	4.7	126	361	26
1599.6	0.513	21	2.8	86	331	34	7.4	5.1	131	378	25
1600.3	0.513	19	1.9	75	289	37	7.4	3.5	115	330	27
1601.0	0.833	17	2.8	70	259	38	12	5.1	108	296	28
1601.7	0.513	18	2.7	80	292	42	7.4	4.9	122	334	30
1602.4	0.513	22	2.3	85	304	45	7.4	4.2	130	348	33
1603.1	0.942	22	2.6	82	339	43	14	4.7	125	388	31
1603.8	0.910	19	2.7	93	297	43	13	4.8	142	339	32
1604.5	0.513	20	2.9	82	323	43	7.4	5.2	126	369	31
1605.2	0.513	20	2.9	84	314	40	7.4	5.2	128	360	29
1605.9	0.631	25	2.7	89	302	47	9.1	5.0	137	345	34
1606.6	0.725	20	3.1	79	306	40	10	5.7	121	350	29
1607.3	0.915	19	2.7	79	305	39	13	4.8	121	349	28
1608.0	0.820	19	3.0	81	303	42	12	5.5	125	346	31
1608.7	0.513	20	3.0	80	373	49	7.4	5.4	122	427	36
1609.4	0.513	21	2.9	95	362	52	7.4	5.3	146	414	38
1610.1	0.566	22	2.6	88	298	45	8.2	4.8	135	341	33
1610.8	0.513	19	2.3	75	298	41	7.4	4.1	115	341	30
1611.4	0.513	19	2.6	82	300	40	7.4	4.7	126	343	29
1612.1	0.513	18	2.5	76	287	40	7.4	4.5	117	328	29
1612.8	0.513	23	2.8	94	373	51	7.4	5.1	144	426	37
1613.5	0.513	19	2.8	81	301	48	7.4	5.1	125	344	35
1614.2	0.513	18	2.9	83	322	41	7.4	5.2	126	368	30
1614.9	0.559	19	2.9	80	318	38	8.1	5.4	122	363	27
1615.6	0.529	20	3.3	98	324	47	7.6	6.0	151	371	35
1616.3	0.733	21	2.9	92	326	50	11	5.2	141	373	36
1617.0	0.513	21	2.7	89	328	50	7.4	4.9	137	376	37
1617.7	0.933	20	2.6	76	327	44	13	4.8	116	373	32
1618.4	0.513	19	2.9	73	317	47	7.4	5.2	113	362	34
1619.1	0.513	20	2.3	81	318	45	7.4	4.2	124	364	33
1619.8	0.513	20	3.4	89	293	44	7.4	6.2	136	335	32
1620.5	0.513	17	2.4	89	294	43	7.4	4.4	136	337	31
1621.2	1.2	19	2.9	85	334	43	18	5.3	130	382	32
1621.9	0.578	18	2.9	78	296	43	8.3	5.2	120	338	32
1622.6	1.0	18	3.1	86	308	47	15	5.7	131	352	34
1623.3	0.513	19	2.6	85	278	44	7.4	4.8	130	318	32
1624.0	0.513	23	3.4	86	361	49	7.4	6.2	131	413	35
1624.7	0.902	20	2.6	80	296	42	13	4.8	123	339	31
1625.4	0.513	20	3.3	96	315	46	7.4	6.1	147	361	33
1626.1	0.513	21	3.0	90	319	41	7.4	5.5	137	364	30
1626.8	0.513	19	2.6	87	316	38	7.4	4.8	134	361	28
1627.5	0.763	20	2.6	76	311	42	11	4.7	116	356	30
1628.2	0.513	24	2.5	82	323	44	7.4	4.6	126	369	32
1628.9	0.513	21	3.0	94	340	39	7.4	5.4	144	389	28
1629.6	0.704	21	2.7	80	306	43	10	4.9	122	350	31
1630.3	0.513	21	3.2	91	375	45	7.4	5.8	140	429	33
1631.0	0.790	21	3.0	86	360	43	11	5.5	133	411	31
1631.7	0.513	21	2.5	89	304	45	7.4	4.6	136	348	33
1632.4	0.523	20	2.6	87	342	42	7.5	4.8	134	391	31
1633.1	0.770	18	2.6	78	329	39	11	4.7	120	376	28
1633.8	0.513	20	3.2	88	332	52	7.4	5.8	135	379	38
1634.5	0.513	19	2.7	88	349	46	7.4	4.9	134	399	34
1635.2	0.905	20	2.8	88	325	46	13	5.0	135	372	34
1635.9	0.513	20	2.4	90	344	40	7.4	4.4	138	393	29
1636.6	0.671	19	2.9	90	313	39	9.7	5.2	139	358	28
1637.3	0.513	18	2.6	82	365	45	7.4	4.7	126	417	33
1637.9	0.513	22	2.9	86	328	48	7.4	5.3	131	375	35



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1638.6	0.513	18	2.8	91	316	41	7.4	5.2	140	361	30
1639.3	0.513	20	3.2	92	313	46	7.4	5.8	142	358	33
1640.0	0.757	18	2.3	78	315	38	11	4.3	119	360	28
1640.7	0.513	20	3.0	91	357	44	7.4	5.4	140	408	32
1641.4	0.532	19	3.4	89	332	48	7.7	6.2	137	379	35
1642.1	0.513	19	2.8	88	311	46	7.4	5.2	134	356	33
1642.8	0.513	21	2.5	83	322	46	7.4	4.6	127	368	33
1643.5	0.626	17	2.8	83	326	42	9.0	5.0	127	372	31
1644.2	0.513	19	3.1	84	358	53	7.4	5.6	129	410	39
1644.9	0.513	19	2.9	86	340	38	7.4	5.3	132	388	28
1645.6	0.861	19	2.8	81	316	40	12	5.1	124	362	29
1646.3	0.513	15	2.6	85	294	35	7.4	4.7	130	336	25
1647.0	0.513	19	2.6	73	305	45	7.4	4.8	112	349	33
1647.7	0.890	19	3.1	82	356	46	13	5.7	126	407	34
1648.4	0.544	21	2.5	89	362	47	7.9	4.5	136	413	34
1649.1	0.592	21	2.2	89	381	46	8.6	4.0	137	436	33
1649.8	1.0	21	3.0	92	405	47	14	5.5	140	463	34
1650.5	0.762	18	2.3	72	334	45	11	4.1	110	381	33
1651.2	0.513	22	2.9	88	332	41	7.4	5.3	135	379	30
1651.9	1.2	23	2.8	86	324	40	17	5.2	131	370	29
1652.6	0.513	17	2.8	77	317	38	7.4	5.1	119	363	28
1653.3	0.513	19	2.3	74	299	39	7.4	4.2	113	342	28
1654.0	0.833	20	3.6	87	341	46	12	6.6	133	390	33
1654.7	0.562	18	2.8	87	335	42	8.1	5.0	134	383	31
1655.4	0.513	22	2.6	87	334	41	7.4	4.8	133	382	30
1656.1	0.513	17	2.1	80	325	42	7.4	3.8	123	372	30
1656.8	0.513	20	2.6	87	326	46	7.4	4.8	134	373	33
1657.5	0.550	17	2.8	81	302	43	7.9	5.1	124	346	31
1658.2	0.513	20	2.6	85	326	41	7.4	4.8	130	373	30
1658.9	0.513	21	2.3	84	290	41	7.4	4.2	129	331	30
1659.6	0.513	17	2.3	84	332	39	7.4	4.1	129	380	28
1660.3	0.513	17	2.5	87	314	34	7.4	4.5	133	359	25
1661.0	0.513	21	3.1	80	340	45	7.4	5.6	122	389	33
1661.7	0.533	20	2.4	80	345	44	7.7	4.5	122	395	32
1662.4	0.513	17	3.0	76	292	39	7.4	5.4	116	334	28
1663.1	0.672	18	2.5	75	303	36	9.7	4.5	115	347	26
1663.8	0.513	19	2.8	75	300	37	7.4	5.1	115	344	27
1664.4	0.513	20	2.4	88	364	37	7.4	4.4	135	416	27
1665.1	0.523	20	2.3	84	304	45	7.6	4.1	129	347	33
1665.8	0.971	18	2.2	80	305	37	14	4.0	123	349	27
1666.5	0.513	17	2.1	75	283	30	7.4	3.8	115	323	22
1667.2	0.513	18	2.2	72	286	31	7.4	4.0	110	327	23
1667.9	0.513	19	2.2	85	318	36	7.4	4.0	130	364	26
1668.6	0.513	20	2.1	87	301	37	7.4	3.9	134	345	27
1669.3	0.513	17	2.4	75	350	32	7.4	4.4	115	401	23
1670.0	0.513	16	1.9	61	274	29	7.4	3.4	93	313	21
1670.7	0.513	20	1.8	69	315	36	7.4	3.3	106	360	26
1671.4	0.513	19	2.1	68	262	26	7.4	3.8	105	299	19
1672.1	0.564	18	1.9	75	280	31	8.1	3.5	115	320	23
1672.8	0.513	18	2.0	73	286	28	7.4	3.6	112	327	20
1673.5	1.1	17	2.3	69	326	32	16	4.1	106	373	24
1674.2	0.513	18	1.9	67	318	32	7.4	3.5	103	364	24
1674.9	0.513	18	1.9	76	307	31	7.4	3.5	116	351	23
1675.6	0.513	16	1.9	73	289	29	7.4	3.5	112	331	21
1676.3	0.679	17	1.8	71	331	27	9.8	3.2	108	379	20
1677.0	0.513	18	1.9	70	336	29	7.4	3.5	107	385	21
1677.7	0.513	18	1.9	74	309	32	7.4	3.5	113	353	23
1678.4	0.788	18	1.9	71	277	30	11	3.5	109	317	22
1679.1	0.513	17	1.6	74	308	30	7.4	2.9	113	353	22
1679.8	0.513	19	2.0	67	293	28	7.4	3.6	103	335	21
1680.5	0.513	15	2.0	67	306	25	7.4	3.7	103	350	19
1681.2	0.513	20	1.8	75	288	29	7.4	3.3	115	329	21
1681.9	0.691	15	1.4	63	299	26	10.0	2.6	97	342	19
1682.6	0.694	16	1.5	64	292	23	10	2.7	99	334	17
1683.3	0.513	16	1.9	63	277	25	7.4	3.4	96	317	19
1684.0	0.513	15	1.9	67	300	24	7.4	3.5	102	343	18
1684.7	0.513	23	2.1	72	292	26	7.4	3.9	110	334	19
1685.4	0.513	17	1.5	66	267	26	7.4	2.7	101	306	19
1686.1	0.513	16	2.1	64	272	20	7.4	3.8	99	311	15
1686.8	0.513	16	1.7	61	284	25	7.4	3.2	94	324	18
1687.5	0.513	14	1.4	61	285	20	7.4	2.6	93	326	15
1688.2	0.583	15	1.4	56	269	21	8.4	2.6	85	308	16
1688.9	0.513	16	1.4	58	278	18	7.4	2.5	89	318	13
1689.6	0.513	15	1.4	57	291	22	7.4	2.5	88	333	16
1690.2	0.513	15	1.5	60	297	23	7.4	2.7	92	339	17
1690.9	0.513	16	1.7	55	288	22	7.4	3.1	84	329	16
1691.6	0.513	16	1.8	60	280	17	7.4	3.2	92	320	13
1692.3	0.513	17	1.3	62	283	18	7.4	2.3	95	324	13
1693.0	0.513	15	1.1	52	278	19	7.4	2.0	79	318	14
1693.7	0.533	15	1.3	46	260	18	7.7	2.4	70	298	13
1694.4	0.513	13	1.2	52	242	18	7.4	2.3	79	277	13



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Sample ID: 014

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1695.1	0.513	14	1.3	53	282	20	7.4	2.3	81	323	15
1695.8	0.513	11	1.4	55	267	20	7.4	2.5	84	305	14
1696.5	0.513	12	1.3	55	285	15	7.4	2.4	84	326	11
1697.2	0.513	14	1.3	46	271	16	7.4	2.3	70	310	12
1697.9	0.513	14	1.1	48	269	15	7.4	2.0	73	308	11
1698.6	0.513	14	1.3	49	306	19	7.4	2.4	75	349	14
1699.3	0.513	12	1.3	47	268	15	7.4	2.3	72	306	11
1700.0	0.513	13	1.1	43	273	18	7.4	2.1	66	313	13
1700.7	0.513	13	0.936	49	285	18	7.4	1.7	75	326	13
1701.4	0.513	13	1.2	52	279	18	7.4	2.2	79	319	13
1702.1	0.513	13	1.0	47	266	13	7.4	1.9	72	304	9.6
1702.8	0.513	13	1.5	47	269	14	7.4	2.7	71	308	10
1703.5	0.513	13	1.0	42	277	16	7.4	1.8	64	317	12
1704.2	0.513	13	1.3	49	278	14	7.4	2.3	76	317	10
1704.9	0.513	13	0.965	47	289	17	7.4	1.8	72	331	12
1705.6	0.513	12	1.2	44	268	16	7.4	2.2	68	307	12
1706.3	0.513	10	1.0	41	277	14	7.4	1.9	63	316	10
1707.0	0.513	12	1.0	46	277	14	7.4	1.9	70	316	9.9
1707.7	0.513	12	1.0	41	269	16	7.4	1.9	63	307	12
1708.4	0.513	12	0.822	42	259	14	7.4	1.5	64	297	10
1709.1	0.513	12	0.594	39	277	13	7.4	1.1	60	316	9.2
1709.8	0.513	11	0.956	43	261	13	7.4	1.7	66	298	9.2
1710.5	0.513	12	0.980	40	266	12	7.4	1.8	62	304	8.6
1711.2	0.513	9.5	0.773	41	275	13	7.4	1.4	63	314	9.4
1711.9	0.513	14	0.735	37	258	11	7.4	1.3	56	295	8.0
1712.6	0.513	11	1.1	36	266	12	7.4	2.0	55	304	8.8
1713.3	0.513	12	0.528	39	269	13	7.4	0.963	60	308	9.6
1714.0	0.513	12	0.843	40	272	14	7.4	1.5	61	311	10
1714.7	0.513	11	1.0	36	268	12	7.4	1.8	56	307	8.8
1715.4	0.513	11	0.576	34	249	12	7.4	1.1	53	285	8.5
1716.0	0.513	10	0.589	35	300	12	7.4	1.1	54	343	8.8
1716.7	0.513	11	0.666	35	277	10	7.4	1.2	54	317	7.3
1717.4	0.513	14	0.714	40	265	10	7.4	1.3	61	303	7.6
1718.1	0.513	11	0.647	33	256	9.2	7.4	1.2	50	293	6.7
1718.8	0.513	9.5	1.0	31	253	9.4	7.4	1.8	48	290	6.8
1719.5	0.513	11	0.728	34	280	11	7.4	1.3	52	321	7.8
1720.2	0.513	12	1.0	35	293	11	7.4	1.8	54	335	8.3
1720.9	0.513	12	0.785	29	284	9.4	7.4	1.4	45	325	6.9
1721.6	0.513	12	0.520	30	254	8.1	7.4	0.948	47	291	5.9
1722.3	0.513	9.5	0.638	31	286	8.6	7.4	1.2	47	327	6.3
1723.0	0.513	11	0.873	32	266	9.9	7.4	1.6	49	304	7.2
1723.7	0.513	9.9	0.775	31	262	9.2	7.4	1.4	48	299	6.7
1724.4	0.513	12	0.673	33	246	7.6	7.4	1.2	50	281	5.6
1725.1	0.513	11	0.761	32	272	8.7	7.4	1.4	49	311	6.3
1725.8	0.513	11	0.614	31	252	7.0	7.4	1.1	47	288	5.1
1726.5	0.513	9.3	0.443	34	274	8.8	7.4	0.808	52	314	6.4
1727.2	0.513	9.3	0.365	36	253	7.8	7.4	0.665	55	290	5.7
1727.9	0.513	11	0.429	30	265	7.0	7.4	0.782	46	303	5.1
1728.6	0.513	13	0.469	27	251	9.4	7.4	0.856	41	288	6.9
1729.3	0.513	8.9	0.829	30	276	7.3	7.4	1.5	46	316	5.3
1730.0	0.513	11	0.611	32	234	6.6	7.4	1.1	48	267	4.8
1730.7	0.513	11	0.640	31	251	6.9	7.4	1.2	47	287	5.1
1731.4	0.513	11	0.382	29	244	6.9	7.4	0.696	45	279	5.1
1732.1	0.513	9.8	0.633	34	255	7.1	7.4	1.2	53	291	5.2
1732.8	0.513	14	0.313	27	252	7.7	7.4	0.570	42	289	5.6
1733.5	0.513	11	0.522	30	271	5.2	7.4	0.953	46	309	3.8
1734.2	0.513	12	0.649	29	260	8.0	7.4	1.2	44	297	5.8
1734.9	0.513	11	0.616	32	270	7.9	7.4	1.1	49	308	5.7
1735.6	0.513	12	0.573	32	263	9.1	7.4	1.0	49	301	6.6
1736.3	0.513	12	0.701	29	257	6.6	7.4	1.3	44	294	4.8
1737.0	0.513	12	0.562	26	258	7.9	7.4	1.0	39	295	5.7
1737.7	0.513	13	0.522	33	277	6.4	7.4	0.952	50	317	4.7
1738.4	0.513	12	0.768	33	249	6.3	7.4	1.4	50	285	4.6
1739.1	0.513	14	0.568	30	276	9.0	7.4	1.0	47	315	6.6
1739.8	0.577	10	0.442	28	270	6.4	8.3	0.806	42	309	4.7
1740.5	0.513	13	0.640	26	294	6.8	7.4	1.2	40	336	5.0
1741.1	0.628	13	0.505	30	241	7.9	9.1	0.922	45	275	5.8
1741.8	0.513	10	0.545	32	229	8.4	7.4	0.994	49	262	6.2
1742.5	0.705	11	0.545	28	242	5.0	10	0.994	43	277	3.6
1743.2	0.779	14	0.273	31	263	6.6	11	0.497	47	300	4.8
1743.9	0.513	11	0.856	34	229	8.5	7.4	1.6	52	262	6.2
1744.6	0.513	12	0.801	36	247	6.6	7.4	1.5	55	283	4.8
1745.3	0.513	14	0.734	34	256	5.4	7.4	1.3	53	293	4.0
1746.0	0.621	12	0.642	32	227	7.1	9.0	1.2	49	259	5.2
1746.7	0.513	12	0.681	33	253	6.8	7.4	1.2	51	290	5.0
1747.4	0.513	15	0.451	37	247	5.3	7.4	0.822	57	283	3.9
1748.1	0.513	13	0.508	34	258	5.0	7.4	0.927	53	295	3.6
1748.8	0.513	13	0.582	36	257	7.5	7.4	1.1	55	294	5.5
1749.5	0.513	15	0.478	34	232	5.3	7.4	0.871	52	265	3.9
1750.2	0.552	12	0.401	37	240	5.5	8.0	0.732	57	274	4.0
1750.9	0.513	17	0.611	35	246	5.8	7.4	1.1	54	282	4.3



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1751.6	0.680	15	0.883	35	246	5.3	9.8	1.6	54	281	3.8
1752.3	0.551	13	0.793	41	231	5.5	8.0	1.4	62	265	4.0
1753.0	0.513	13	0.561	37	232	5.4	7.4	1.0	57	266	3.9
1753.7	0.513	14	0.404	38	249	7.1	7.4	0.737	58	285	5.2
1754.4	0.626	14	0.729	41	226	5.3	9.0	1.3	62	258	3.9
1755.1	0.513	17	0.660	41	238	6.2	7.4	1.2	62	273	4.5
1755.8	0.513	15	0.656	42	249	5.4	7.4	1.2	65	285	3.9
1756.5	0.513	15	0.692	39	226	6.3	7.4	1.3	59	259	4.6
1757.2	0.513	16	0.764	47	256	6.2	7.4	1.4	72	293	4.5
1757.9	0.715	17	0.763	43	252	5.0	10	1.4	66	288	3.7
1758.6	0.513	14	0.446	42	233	5.6	7.4	0.814	64	266	4.1
1759.3	0.641	14	0.685	39	232	4.1	9.3	1.2	60	266	3.0
1760.0	0.513	14	0.873	43	231	5.6	7.4	1.6	66	264	4.1
1760.7	0.538	17	0.623	43	275	5.7	7.8	1.1	66	315	4.1
1761.4	0.513	21	0.987	45	250	6.2	7.4	1.8	69	286	4.5
1762.1	0.513	12	0.867	41	246	5.6	7.4	1.6	62	282	4.1
1762.8	0.513	16	0.911	43	248	4.1	7.4	1.7	66	283	3.0
1763.5	0.581	17	0.951	40	247	4.4	8.4	1.7	61	282	3.2
1764.2	0.513	14	0.973	38	227	5.2	7.4	1.8	58	259	3.8
1764.9	0.513	18	0.563	43	232	4.1	7.4	1.0	66	265	3.0
1765.6	0.513	16	0.982	38	232	3.4	7.4	1.8	58	265	2.5
1766.3	0.513	16	0.633	41	249	5.0	7.4	1.2	62	284	3.7
1767.0	0.661	20	0.579	41	241	5.6	9.5	1.1	63	276	4.1
1767.6	0.694	18	0.696	46	236	5.2	10	1.3	70	270	3.8
1768.3	0.513	15	1.0	49	231	4.4	7.4	1.8	76	264	3.2
1769.0	0.513	16	1.0	44	214	5.7	7.4	1.8	67	244	4.2
1769.7	0.513	15	0.833	39	228	5.1	7.4	1.5	60	261	3.7
1770.4	0.513	17	1.1	39	245	5.2	7.4	2.1	60	280	3.8
1771.1	0.513	17	0.838	52	238	3.5	7.4	1.5	79	272	2.5
1771.8	0.513	15	1.0	54	239	4.5	7.4	1.9	82	273	3.3
1772.5	0.767	14	1.0	39	227	4.5	11	1.9	60	260	3.3
1773.2	0.513	17	0.824	46	244	4.3	7.4	1.5	70	280	3.1
1773.9	0.513	15	0.528	41	211	3.9	7.4	0.962	64	241	2.9
1774.6	0.513	14	0.853	45	199	4.3	7.4	1.6	68	227	3.2
1775.3	0.513	15	0.788	41	220	3.4	7.4	1.4	63	252	2.5
1776.0	0.689	15	0.742	39	216	3.1	9.9	1.4	59	247	2.2
1776.7	0.513	14	0.671	39	225	4.5	7.4	1.2	60	257	3.3
1777.4	0.513	15	0.762	44	230	3.7	7.4	1.4	67	262	2.7
1778.1	0.513	16	0.479	41	219	4.5	7.4	0.874	63	251	3.3
1778.8	0.513	15	0.932	42	215	2.4	7.4	1.7	65	246	1.8
1779.5	0.513	16	0.722	38	222	2.7	7.4	1.3	58	254	1.9
1780.2	0.513	15	0.832	40	211	4.4	7.4	1.5	61	242	3.2
1780.9	0.513	15	0.849	39	214	3.9	7.4	1.5	59	245	2.9
1781.6	0.668	15	0.394	45	229	3.1	9.6	0.718	68	262	2.3
1782.3	0.513	13	0.548	32	227	3.3	7.4	0.999	49	260	2.4
1783.0	0.513	13	0.778	34	231	3.1	7.4	1.4	53	264	2.3
1783.7	0.513	15	0.698	36	236	3.6	7.4	1.3	56	270	2.6
1784.4	0.513	16	0.734	41	249	4.4	7.4	1.3	63	285	3.2
1785.1	0.513	15	0.803	35	223	3.4	7.4	1.5	53	255	2.5
1785.8	0.513	14	0.729	33	230	3.2	7.4	1.3	51	263	2.3
1786.5	0.625	16	0.615	34	229	2.7	9.0	1.1	53	262	2.0
1787.2	0.513	15	0.930	37	237	4.3	7.4	1.7	57	271	3.1
1787.9	0.513	16	0.666	36	239	3.0	7.4	1.2	55	273	2.2
1788.6	0.513	11	0.490	36	234	3.6	7.4	0.894	55	268	2.6
1789.3	0.513	14	0.992	31	231	3.3	7.4	1.8	47	265	2.4
1790.0	0.540	15	0.720	36	249	4.0	7.8	1.3	55	284	2.9
1790.7	0.513	14	0.522	40	255	5.4	7.4	0.951	61	291	3.9
1791.4	0.513	13	0.858	34	228	2.8	7.4	1.6	52	261	2.1
1792.1	0.513	16	0.477	31	223	2.7	7.4	0.870	47	255	2.0
1792.8	0.513	14	0.506	35	277	3.2	7.4	0.923	54	317	2.3
1793.5	0.513	17	0.642	38	250	2.9	7.4	1.2	58	286	2.1
1794.1	0.665	15	0.799	44	251	3.3	9.6	1.5	67	287	2.4
1794.8	0.513	15	0.473	41	237	3.6	7.4	0.863	63	271	2.6
1795.5	0.513	14	0.587	35	243	5.2	7.4	1.1	54	278	3.8
1796.2	0.889	16	0.513	32	262	3.3	13	0.935	48	299	2.4
1796.9	0.513	15	0.475	34	223	3.2	7.4	0.866	51	255	2.3
1797.6	0.558	14	0.604	35	226	1.9	8.1	1.1	54	259	1.4
1798.3	0.517	17	0.440	40	231	3.3	7.5	0.802	61	264	2.4
1799.0	0.640	12	0.725	33	236	3.1	9.2	1.3	50	270	2.3
1799.7	0.513	12	0.812	36	238	3.5	7.4	1.5	55	272	2.5
1800.4	0.513	14	0.678	34	216	3.3	7.4	1.2	52	247	2.4
1801.1	0.716	14	0.989	36	258	3.8	10	1.8	55	295	2.7
1801.8	0.568	13	0.548	31	216	3.0	8.2	0.999	47	247	2.2
1802.5	0.513	14	0.539	34	244	2.6	7.4	0.984	52	278	1.9
1803.2	0.513	16	0.792	40	284	3.1	7.4	1.4	61	325	2.3
1803.9	0.557	14	0.864	38	244	3.6	8.0	1.6	58	280	2.6
1804.6	0.513	12	0.681	32	228	2.7	7.4	1.2	48	261	1.9
1805.3	0.513	12	0.759	35	241	2.4	7.4	1.4	54	276	1.7
1806.0	0.513	13	0.646	33	225	3.1	7.4	1.2	51	257	2.3
1806.7	0.825	12	0.400	34	224	2.1	12	0.730	52	257	1.5
1807.4	0.513	12	0.771	33	261	2.8	7.4	1.4	50	298	2.0



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1808.1	0.513	12	0.578	35	222	2.1	7.4	1.1	54	254	1.6
1808.8	0.513	12	0.553	29	221	2.3	7.4	1.0	45	253	1.7
1809.5	0.513	12	0.565	30	225	3.5	7.4	1.0	46	257	2.5
1810.2	0.513	12	0.525	33	224	2.7	7.4	0.958	50	256	2.0
1810.9	0.513	12	0.730	33	223	1.7	7.4	1.3	51	255	1.2
1811.6	0.513	12	0.783	30	211	2.2	7.4	1.4	45	242	1.6
1812.3	0.513	12	0.577	31	253	2.1	7.4	1.1	47	289	1.5
1813.0	0.513	11	0.531	33	234	2.5	7.4	0.968	51	267	1.8
1813.7	0.595	11	0.362	28	239	1.7	8.6	0.660	42	273	1.2
1814.4	0.513	11	0.703	30	236	2.8	7.4	1.3	46	270	2.0
1815.1	0.513	11	0.574	28	211	2.7	7.4	1.0	43	242	2.0
1815.8	0.513	12	0.565	28	264	2.2	7.4	1.0	42	302	1.6
1816.5	0.513	11	0.592	29	206	2.3	7.4	1.1	45	236	1.7
1817.2	0.513	11	0.579	29	213	2.9	7.4	1.1	44	244	2.1
1817.9	0.513	15	0.779	27	231	2.1	7.4	1.4	41	264	1.6
1818.6	0.513	10	0.572	28	229	1.9	7.4	1.0	43	262	1.4
1819.3	0.518	8.9	0.486	26	232	3.3	7.5	0.886	39	266	2.4
1819.9	0.513	9.3	0.445	26	225	2.8	7.4	0.812	40	257	2.0
1820.6	0.525	12	0.424	30	237	3.6	7.6	0.773	46	271	2.6
1821.3	0.513	12	0.367	28	221	1.8	7.4	0.669	42	253	1.3
1822.0	0.513	9.4	0.447	25	220	2.0	7.4	0.816	39	252	1.5
1822.7	0.513	11	0.781	28	230	1.8	7.4	1.4	43	262	1.3
1823.4	0.513	11	0.425	25	217	1.8	7.4	0.774	38	248	1.3
1824.1	0.513	10	0.516	26	218	2.7	7.4	0.940	40	249	1.9
1824.8	0.513	10	0.587	27	214	2.8	7.4	1.1	42	245	2.0
1825.5	0.513	8.6	0.563	29	233	2.7	7.4	1.0	44	267	2.0
1826.2	0.513	11	0.447	30	205	1.8	7.4	0.815	45	235	1.3
1826.9	0.513	11	0.566	31	209	2.4	7.4	1.0	48	239	1.7
1827.6	0.513	9.1	0.376	29	246	1.6	7.4	0.687	45	281	1.2
1828.3	0.513	8.5	0.404	29	206	2.0	7.4	0.736	45	235	1.5
1829.0	0.548	12	0.637	28	235	2.5	7.9	1.2	43	269	1.8
1829.7	0.678	8.7	0.679	29	215	1.9	9.8	1.2	44	246	1.4
1830.4	0.513	11	0.487	28	218	2.3	7.4	0.887	43	249	1.7
1831.1	0.513	13	0.534	29	213	1.8	7.4	0.973	45	244	1.3
1831.8	0.513	9.2	0.480	31	211	1.5	7.4	0.876	47	242	1.1
1832.5	0.513	10	0.323	31	239	1.1	7.4	0.588	48	274	0.796
1833.2	0.513	14	0.413	33	236	2.3	7.4	0.754	51	270	1.7
1833.9	0.513	12	0.357	31	219	2.2	7.4	0.651	48	250	1.6
1834.6	0.513	9.4	0.263	31	222	1.1	7.4	0.480	47	253	0.823
1835.3	0.513	11	0.660	31	223	1.5	7.4	1.2	47	255	1.1
1836.0	0.513	10	0.565	27	217	1.5	7.4	1.0	41	248	1.1
1836.7	0.513	11	0.590	33	198	1.9	7.4	1.1	50	227	1.4
1837.4	0.513	11	0.378	28	186	1.2	7.4	0.690	43	213	0.882
1838.1	0.513	11	0.632	28	201	1.7	7.4	1.2	43	230	1.3
1838.8	0.513	11	0.374	30	212	2.4	7.4	0.682	46	242	1.7
1839.5	0.513	9.6	0.480	30	216	1.1	7.4	0.876	46	247	0.795
1840.2	0.513	11	0.646	36	233	1.8	7.4	1.2	56	267	1.3
1840.9	0.513	10	0.582	34	202	1.7	7.4	1.1	52	231	1.3
1841.6	0.513	13	0.678	39	246	1.4	7.4	1.2	59	281	1.0
1842.3	0.513	12	0.625	35	240	2.3	7.4	1.1	54	275	1.7
1843.0	0.513	12	0.648	33	215	1.2	7.4	1.2	50	246	0.854
1843.7	0.513	12	0.663	37	223	1.8	7.4	1.2	57	255	1.3
1844.4	0.513	13	0.655	36	234	1.6	7.4	1.2	55	268	1.2
1845.0	0.513	12	0.467	28	198	1.3	7.4	0.852	43	226	0.943
1845.7	0.581	12	0.592	34	202	1.1	8.4	1.1	52	231	0.808
1846.4	0.513	13	1.2	39	221	2.1	7.4	2.2	60	253	1.5
1847.1	0.539	12	0.669	34	257	2.2	7.8	1.2	52	294	1.6
1847.8	0.513	15	0.854	40	240	1.6	7.4	1.6	62	274	1.2
1848.5	0.513	12	0.595	34	224	1.1	7.4	1.1	51	256	0.812
1849.2	0.513	12	0.692	37	211	1.7	7.4	1.3	57	242	1.3
1849.9	0.513	13	0.585	43	223	1.8	7.4	1.1	65	255	1.3
1850.6	0.839	15	0.385	35	225	2.7	12	0.702	53	258	2.0
1851.3	0.513	15	0.792	37	218	1.9	7.4	1.4	57	250	1.4
1852.0	0.513	14	0.647	42	224	2.2	7.4	1.2	64	256	1.6
1852.7	0.513	13	0.639	33	230	2.4	7.4	1.2	50	263	1.8
1853.4	0.513	14	0.681	40	242	2.1	7.4	1.2	61	277	1.5
1854.1	0.513	15	0.708	34	230	1.6	7.4	1.3	52	263	1.2
1854.8	0.513	14	0.764	37	229	3.0	7.4	1.4	56	261	2.2
1855.5	0.513	14	0.731	34	248	2.3	7.4	1.3	53	284	1.7
1856.2	0.513	16	0.342	30	230	2.7	7.4	0.624	46	263	1.9
1856.9	0.513	13	0.778	37	229	2.3	7.4	1.4	56	262	1.7
1857.6	0.513	12	0.665	35	229	2.3	7.4	1.2	53	262	1.7
1858.3	0.513	11	0.425	33	223	1.9	7.4	0.775	51	255	1.4
1859.0	0.513	15	0.954	35	281	3.2	7.4	1.7	53	321	2.4
1859.7	0.513	13	0.746	31	237	1.4	7.4	1.4	47	271	1.1
1860.4	0.513	15	0.690	35	249	2.7	7.4	1.3	53	284	2.0
1861.1	0.513	13	0.953	39	236	2.4	7.4	1.7	59	270	1.7
1861.8	0.513	15	0.757	40	253	1.7	7.4	1.4	61	290	1.2
1862.5	0.513	13	0.828	31	227	2.5	7.4	1.5	47	260	1.8
1863.2	0.538	14	0.623	43	234	1.9	7.8	1.1	66	268	1.4
1863.9	0.513	13	0.753	41	228	1.9	7.4	1.4	62	261	1.4



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1864.6	0.513	13	0.795	38	223	1.3	7.4	1.4	59	255	0.942
1865.3	0.513	14	1.1	33	234	2.0	7.4	2.0	51	267	1.5
1866.0	0.513	13	0.680	34	253	1.6	7.4	1.2	52	290	1.2
1866.7	0.513	13	0.831	39	222	2.0	7.4	1.5	60	253	1.5
1867.4	0.513	14	0.507	37	228	1.6	7.4	0.924	57	260	1.2
1868.1	0.513	12	0.541	38	229	1.7	7.4	0.986	58	262	1.2
1868.8	0.513	13	0.686	35	215	1.4	7.4	1.3	54	246	1.0
1869.5	0.513	15	0.638	33	222	2.2	7.4	1.2	51	254	1.6
1870.2	0.513	16	0.836	41	226	1.8	7.4	1.5	62	258	1.3
1870.9	0.513	13	0.799	34	218	1.4	7.4	1.5	52	249	1.1
1871.5	0.513	12	0.525	33	227	1.3	7.4	0.958	50	260	0.942
1872.2	0.513	15	0.738	40	221	1.9	7.4	1.3	62	252	1.4
1872.9	0.513	14	0.822	36	230	2.0	7.4	1.5	55	263	1.4
1873.6	0.513	12	0.458	37	235	1.4	7.4	0.836	57	269	1.0
1874.3	0.513	11	0.694	26	206	2.1	7.4	1.3	40	235	1.5
1875.0	0.513	14	0.653	38	226	1.3	7.4	1.2	59	259	0.923
1875.7	0.513	13	0.489	34	213	1.2	7.4	0.892	52	243	0.885
1876.4	0.513	14	0.734	36	206	1.5	7.4	1.3	55	235	1.1
1877.1	0.513	13	0.609	36	214	1.1	7.4	1.1	55	244	0.773
1877.8	0.513	12	0.453	38	205	2.0	7.4	0.826	58	235	1.4
1878.5	0.513	11	0.611	32	208	1.4	7.4	1.1	49	237	1.0
1879.2	0.513	13	0.950	38	216	1.5	7.4	1.7	58	247	1.1
1879.9	0.513	11	0.311	34	207	1.6	7.4	0.566	52	236	1.2
1880.6	0.513	12	0.861	30	216	1.3	7.4	1.6	47	247	0.916
1881.3	0.513	10	0.383	33	186	1.6	7.4	0.699	51	212	1.1
1882.0	0.513	13	0.547	36	216	1.6	7.4	0.997	56	247	1.2
1882.7	0.513	12	0.406	45	223	1.4	7.4	0.741	69	256	1.1
1883.4	0.513	14	0.763	41	223	1.9	7.4	1.4	63	255	1.4
1884.1	0.584	14	0.747	38	232	2.4	8.4	1.4	59	265	1.7
1884.8	0.513	12	0.460	38	217	1.0	7.4	0.839	59	249	0.764
1885.5	0.513	14	0.896	42	259	2.0	7.4	1.6	64	297	1.4
1886.2	0.546	16	0.871	40	221	1.3	7.9	1.6	62	253	0.927
1886.9	0.513	15	0.532	36	198	1.3	7.4	0.969	55	226	0.976
1887.6	0.513	13	0.734	38	211	2.0	7.4	1.3	59	241	1.4
1888.3	0.690	14	0.874	42	218	1.2	10.0	1.6	64	249	0.881
1889.0	0.513	15	0.968	47	222	1.3	7.4	1.8	72	254	0.952
1889.7	0.513	12	0.938	36	201	1.3	7.4	1.7	55	230	0.977
1890.4	0.542	11	1.0	38	205	0.851	7.8	1.9	58	234	0.621
1891.1	0.513	12	1.2	44	243	3.0	7.4	2.1	67	278	2.2
1891.8	0.513	13	0.852	40	217	1.1	7.4	1.6	62	248	0.797
1892.5	0.513	13	0.872	41	216	2.1	7.4	1.6	63	247	1.6
1893.2	0.513	12	0.662	45	220	1.4	7.4	1.2	70	251	1.0
1893.9	0.513	13	0.630	46	203	1.7	7.4	1.1	71	232	1.2
1894.6	0.513	15	0.932	43	216	1.8	7.4	1.7	67	247	1.3
1895.3	0.580	17	1.2	50	222	1.3	8.4	2.1	77	254	0.962
1896.0	0.625	14	0.908	48	268	1.7	9.0	1.7	74	306	1.2
1896.7	0.513	17	1.1	54	239	1.9	7.4	2.0	82	273	1.4
1897.4	0.513	11	0.801	42	220	1.2	7.4	1.5	65	252	0.896
1898.0	0.513	11	0.957	49	224	1.9	7.4	1.7	75	256	1.4
1898.7	0.513	12	0.867	48	231	1.9	7.4	1.6	73	265	1.4
1899.4	0.536	15	1.1	48	213	2.3	7.7	2.0	74	244	1.6
1900.1	0.513	15	0.596	46	219	1.8	7.4	1.1	71	251	1.3
1900.8	0.513	14	0.779	49	223	2.0	7.4	1.4	75	255	1.5
1901.5	0.513	13	1.1	46	223	1.4	7.4	1.9	70	254	0.995
1902.2	0.513	14	1.3	46	215	1.4	7.4	2.4	71	246	1.0
1902.9	0.513	13	1.1	48	224	1.3	7.4	2.1	74	256	0.948
1903.6	0.513	13	1.1	50	219	1.6	7.4	2.0	77	251	1.1
1904.3	0.513	14	1.1	53	229	2.0	7.4	2.1	81	262	1.5
1905.0	0.513	14	0.860	51	235	1.9	7.4	1.6	79	269	1.4
1905.7	0.513	16	1.1	51	251	1.5	7.4	2.1	78	287	1.1
1906.4	0.513	15	1.4	51	221	0.968	7.4	2.6	78	253	0.706
1907.1	0.513	13	1.2	46	208	1.4	7.4	2.2	70	238	1.1
1907.8	0.513	13	1.4	49	228	0.950	7.4	2.5	74	261	0.693
1908.5	0.513	14	0.956	42	218	1.5	7.4	1.7	64	249	1.1
1909.2	0.513	15	1.2	53	244	1.8	7.4	2.2	81	279	1.3
1909.9	0.513	14	1.2	47	211	0.852	7.4	2.2	73	242	0.622
1910.6	0.513	16	1.1	52	239	1.7	7.4	2.0	80	273	1.3
1911.3	0.513	13	1.0	54	251	1.1	7.4	1.9	82	287	0.826
1912.0	0.513	17	1.2	56	231	1.6	7.4	2.1	86	264	1.2
1912.7	0.513	17	1.3	61	254	2.1	7.4	2.5	93	290	1.5
1913.4	0.513	16	1.2	54	228	1.5	7.4	2.1	82	260	1.1
1914.1	0.513	16	1.7	47	239	1.8	7.4	3.0	72	273	1.3
1914.8	0.513	16	1.2	53	250	1.7	7.4	2.2	81	285	1.2
1915.5	0.513	16	1.5	54	226	1.7	7.4	2.7	83	258	1.3
1916.2	0.513	16	1.1	55	209	1.1	7.4	2.0	85	239	0.829
1916.9	0.513	15	1.2	50	231	1.3	7.4	2.1	77	265	0.945
1917.6	0.546	14	1.5	48	217	1.1	7.9	2.7	74	249	0.836
1918.3	0.513	13	1.2	44	209	1.6	7.4	2.1	67	239	1.2
1919.0	0.513	18	1.1	47	256	1.3	7.4	1.9	72	292	0.967
1919.7	0.513	15	1.2	48	230	1.0	7.4	2.3	74	263	0.735
1920.4	0.513	12	0.929	47	203	1.3	7.4	1.7	72	233	0.949



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1921.1	0.513	15	1.4	51	220	1.3	7.4	2.5	79	251	0.940
1921.8	0.513	14	1.2	41	207	1.3	7.4	2.3	63	237	0.973
1922.5	0.513	18	1.3	52	258	2.0	7.4	2.3	80	295	1.4
1923.2	0.537	16	0.976	59	250	1.3	7.8	1.8	91	286	0.913
1923.8	0.513	13	1.1	54	231	1.3	7.4	2.1	83	264	0.915
1924.5	0.567	13	1.1	40	229	1.4	8.2	2.1	61	262	1.1
1925.2	0.513	15	1.3	55	253	1.8	7.4	2.4	84	289	1.3
1925.9	0.513	13	1.4	48	236	1.6	7.4	2.5	73	270	1.2
1926.6	0.513	18	0.891	53	247	1.2	7.4	1.6	81	283	0.898
1927.3	0.513	20	0.957	49	232	1.8	7.4	1.7	75	265	1.3
1928.0	0.513	14	1.0	53	225	1.2	7.4	1.9	81	257	0.854
1928.7	0.513	12	0.866	44	231	1.6	7.4	1.6	67	264	1.2
1929.4	0.722	16	0.641	50	224	1.2	10	1.2	76	256	0.856
1930.1	0.666	17	0.909	51	253	0.776	9.6	1.7	78	289	0.566
1930.8	0.513	14	1.1	55	247	1.7	7.4	1.9	85	282	1.2
1931.5	0.538	15	0.761	48	214	0.940	7.8	1.4	74	245	0.686
1932.2	0.513	17	1.2	54	259	0.608	7.4	2.2	82	296	0.444
1932.9	0.513	17	1.1	57	246	1.6	7.4	1.9	87	281	1.2
1933.6	0.513	19	1.5	61	245	1.2	7.4	2.8	93	280	0.909
1934.3	0.513	14	0.865	49	203	1.4	7.4	1.6	75	232	1.1
1935.0	0.513	15	1.2	54	230	1.4	7.4	2.1	82	263	1.0
1935.7	0.513	18	1.2	50	237	2.5	7.4	2.2	77	271	1.8
1936.4	0.513	17	1.0	57	219	1.7	7.4	1.9	87	250	1.2
1937.1	0.513	15	0.888	45	219	1.5	7.4	1.6	69	250	1.1
1937.8	0.513	13	1.1	51	208	1.7	7.4	2.1	79	238	1.3
1938.5	0.513	17	1.0	55	252	1.6	7.4	1.9	84	288	1.2
1939.2	0.513	19	1.5	54	261	1.9	7.4	2.7	83	298	1.4
1939.9	0.513	16	1.1	51	233	1.3	7.4	2.1	78	267	0.921
1940.6	0.513	16	1.3	57	251	1.1	7.4	2.4	87	288	0.779
1941.3	0.513	16	1.0	58	246	1.9	7.4	1.9	89	281	1.4
1942.0	0.542	13	1.5	58	241	2.2	7.8	2.7	89	276	1.6
1942.7	0.513	18	1.5	65	256	1.9	7.4	2.7	100	293	1.4
1943.4	0.513	17	1.4	55	267	1.9	7.4	2.6	84	305	1.4
1944.1	0.513	14	1.5	61	240	1.5	7.4	2.8	93	275	1.1
1944.8	0.513	14	1.2	58	257	1.6	7.4	2.2	88	294	1.1
1945.5	0.513	18	1.2	56	226	1.7	7.4	2.2	86	258	1.2
1946.2	0.513	18	1.6	58	276	2.0	7.4	2.9	90	315	1.4
1946.9	0.513	15	1.7	56	218	0.885	7.4	3.1	85	249	0.646
1947.6	0.513	15	1.2	58	259	2.1	7.4	2.2	90	297	1.5
1948.3	0.513	14	1.4	54	243	0.964	7.4	2.6	83	278	0.703
1949.0	0.701	16	1.6	52	238	1.1	10	3.0	80	272	0.831
1949.6	0.513	16	1.4	59	238	1.4	7.4	2.6	90	273	0.999
1950.3	0.662	16	1.1	63	299	1.8	9.6	2.0	96	342	1.3
1951.0	0.513	14	1.2	70	274	1.9	7.4	2.2	107	313	1.4
1951.7	0.513	14	1.3	54	238	1.2	7.4	2.3	83	272	0.864
1952.4	0.513	16	1.3	55	235	1.1	7.4	2.4	85	269	0.835
1953.1	0.513	15	1.5	63	259	1.0	7.4	2.8	96	297	0.740
1953.8	0.513	14	1.2	52	239	1.1	7.4	2.2	80	274	0.814
1954.5	0.557	14	1.3	56	273	1.2	8.0	2.4	86	312	0.852
1955.2	0.513	16	1.0	58	256	0.888	7.4	1.9	89	293	0.648
1955.9	0.513	17	1.6	59	260	1.2	7.4	2.9	90	297	0.901
1956.6	0.513	19	1.6	68	290	1.4	7.4	2.9	105	332	1.0
1957.3	0.513	15	1.7	64	254	0.628	7.4	3.1	97	290	0.458
1958.0	0.513	15	1.4	56	249	1.1	7.4	2.6	86	285	0.811
1958.7	0.513	14	1.9	60	307	1.2	7.4	3.4	92	351	0.845
1959.4	0.513	15	1.6	67	247	0.849	7.4	3.0	102	282	0.620
1960.1	0.513	16	1.7	64	260	0.835	7.4	3.0	98	297	0.609
1960.8	0.513	13	1.7	67	238	1.7	7.4	3.1	103	272	1.3
1961.5	0.513	15	2.0	62	268	1.1	7.4	3.6	95	306	0.773
1962.2	0.513	15	1.9	61	275	1.1	7.4	3.4	93	314	0.825
1962.9	0.513	14	1.7	65	257	0.750	7.4	3.2	99	293	0.547
1963.6	0.517	18	1.9	63	285	0.902	7.5	3.5	96	326	0.658
1964.3	0.513	17	1.5	61	283	1.7	7.4	2.6	93	323	1.3
1965.0	0.513	16	1.3	60	292	0.979	7.4	2.3	93	334	0.714
1965.7	0.513	15	1.6	56	300	1.1	7.4	2.9	86	343	0.829
1966.4	0.553	17	1.5	67	263	1.1	8.0	2.6	103	301	0.776
1967.1	0.513	12	1.5	59	271	1.6	7.4	2.7	90	310	1.2
1967.8	0.513	15	1.7	54	314	0.583	7.4	3.2	83	359	0.425
1968.5	0.513	16	1.5	54	283	0.835	7.4	2.7	82	324	0.609
1969.2	0.513	16	1.4	57	274	1.1	7.4	2.5	88	314	0.834
1969.9	0.513	15	1.4	59	271	0.868	7.4	2.5	90	309	0.633
1970.6	0.513	15	1.4	54	238	0.774	7.4	2.6	83	272	0.564
1971.3	0.513	14	1.2	53	267	1.1	7.4	2.2	81	305	0.780
1972.0	0.513	15	1.4	62	306	1.2	7.4	2.5	94	350	0.873
1972.7	0.513	14	1.1	59	278	0.931	7.4	1.9	90	318	0.679
1973.4	0.513	15	1.1	64	261	0.863	7.4	2.0	98	299	0.629
1974.1	0.513	14	1.1	49	269	0.807	7.4	1.9	75	307	0.589
1974.8	0.513	16	1.1	52	320	0.592	7.4	2.0	80	366	0.432
1975.4	0.513	14	1.6	57	273	0.724	7.4	2.9	88	312	0.528
1976.1	0.513	17	1.2	54	255	0.700	7.4	2.2	82	292	0.511
1976.8	0.513	12	1.2	56	271	0.890	7.4	2.3	86	310	0.649



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1977.5	0.796	14	1.1	52	256	1.4	11	2.0	79	292	1.0
1978.2	0.653	15	1.3	48	282	0.761	9.4	2.5	74	323	0.555
1978.9	0.653	15	1.1	49	237	1.0	9.4	1.9	76	271	0.764
1979.6	0.513	15	1.2	50	258	1.1	7.4	2.2	77	295	0.820
1980.3	0.513	15	1.1	59	299	1.4	7.4	1.9	90	341	0.994
1981.0	0.513	13	1.2	47	268	1.0	7.4	2.1	72	306	0.752
1981.7	0.513	17	1.0	53	278	0.604	7.4	1.8	82	317	0.441
1982.4	0.513	12	1.1	47	271	0.927	7.4	2.0	72	310	0.677
1983.1	0.513	12	0.799	49	238	0.962	7.4	1.5	75	272	0.702
1983.8	0.513	12	1.2	46	263	1.1	7.4	2.1	71	301	0.814
1984.5	0.513	15	1.3	52	299	0.914	7.4	2.4	79	342	0.667
1985.2	0.513	15	1.1	46	289	0.642	7.4	2.0	70	331	0.469
1985.9	0.666	16	1.0	54	249	1.4	9.6	1.9	82	284	0.993
1986.6	0.575	13	1.2	49	256	1.3	8.3	2.1	74	292	0.934
1987.3	0.513	13	0.606	47	278	0.819	7.4	1.1	72	318	0.598
1988.0	0.513	16	1.3	45	255	1.1	7.4	2.4	69	292	0.802
1988.7	0.513	14	1.2	46	271	0.831	7.4	2.2	71	310	0.606
1989.4	0.513	15	0.834	57	282	0.832	7.4	1.5	87	323	0.607
1990.1	0.513	15	0.731	44	265	0.773	7.4	1.3	67	303	0.564
1990.8	0.513	13	0.732	41	271	1.2	7.4	1.3	63	310	0.893
1991.5	0.513	14	0.646	39	243	1.5	7.4	1.2	60	278	1.1
1992.2	0.513	16	0.864	47	260	1.1	7.4	1.6	72	297	0.778
1992.9	0.513	17	0.782	46	245	1.5	7.4	1.4	70	280	1.1
1993.6	0.513	15	0.996	42	265	0.969	7.4	1.8	64	303	0.707
1994.3	0.513	12	1.3	40	264	0.462	7.4	2.3	61	302	0.337
1995.0	0.513	16	0.926	39	275	1.0	7.4	1.7	60	314	0.758
1995.7	0.513	15	0.627	43	270	0.943	7.4	1.1	66	309	0.688
1996.4	0.513	14	0.826	40	244	0.683	7.4	1.5	62	279	0.498
1997.1	0.513	13	0.538	39	248	0.681	7.4	0.981	59	284	0.497
1997.8	0.513	13	0.755	36	265	1.3	7.4	1.4	55	304	0.921
1998.5	0.513	14	0.594	41	255	0.995	7.4	1.1	63	292	0.726
1999.2	0.513	13	0.967	40	275	0.502	7.4	1.8	61	314	0.366
1999.9	0.513	12	0.591	30	244	1.2	7.4	1.1	46	279	0.879
2000.6	0.513	16	0.772	32	272	1.1	7.4	1.4	49	311	0.774
2001.2	0.513	14	0.649	34	264	0.754	7.4	1.2	52	302	0.550
2001.9	0.513	13	0.724	31	259	1.4	7.4	1.3	47	296	1.1
2002.6	0.513	13	0.591	35	242	0.953	7.4	1.1	54	277	0.695
2003.3	0.513	14	0.967	37	267	0.962	7.4	1.8	57	305	0.702
2004.0	0.513	14	0.636	31	242	1.4	7.4	1.2	47	277	1.0
2004.7	0.513	15	0.802	37	270	1.2	7.4	1.5	57	309	0.877
2005.4	0.513	13	0.689	36	260	1.4	7.4	1.3	55	297	1.000
2006.1	0.513	16	0.610	36	290	1.0	7.4	1.1	55	331	0.763
2006.8	0.513	13	0.725	28	234	0.513	7.4	1.3	43	268	0.374
2007.5	0.513	15	0.281	35	267	1.1	7.4	0.513	54	305	0.814
2008.2	0.513	15	0.706	32	273	1.2	7.4	1.3	50	312	0.887
2008.9	0.513	13	0.634	30	262	1.4	7.4	1.2	45	299	1.0
2009.6	0.513	13	0.539	31	266	1.8	7.4	0.983	47	304	1.3
2010.3	0.554	13	0.687	35	269	0.871	8.0	1.3	54	308	0.635
2011.0	0.527	12	0.591	28	268	1.5	7.6	1.1	43	306	1.1
2011.7	0.513	14	0.618	26	240	0.674	7.4	1.1	40	275	0.492
2012.4	0.513	15	0.561	27	276	0.611	7.4	1.0	41	316	0.445
2013.1	0.513	14	0.837	28	266	0.770	7.4	1.5	43	304	0.562
2013.8	0.513	13	0.771	31	290	0.454	7.4	1.4	47	332	0.331
2014.5	0.782	14	0.462	27	265	1.1	11	0.843	41	303	0.799
2015.2	0.624	13	0.605	25	264	1.2	9.0	1.1	39	302	0.863
2015.9	0.513	14	1.0	26	283	0.698	7.4	1.9	40	324	0.509
2016.6	0.513	12	0.554	26	264	1.3	7.4	1.0	39	302	0.949
2017.3	0.513	11	0.550	25	271	0.921	7.4	1.0	38	310	0.672
2018.0	0.513	14	0.651	23	270	1.0	7.4	1.2	35	309	0.760
2018.7	0.513	11	0.864	24	275	2.1	7.4	1.6	37	314	1.5
2019.4	0.513	12	0.646	28	278	1.6	7.4	1.2	43	318	1.1
2020.1	0.513	9.7	0.644	22	271	1.4	7.4	1.2	33	310	0.991
2020.8	0.513	10	0.542	19	281	0.908	7.4	0.988	30	321	0.662
2021.5	0.513	9.3	0.530	25	319	2.0	7.4	0.966	39	365	1.5
2022.2	0.513	12	0.678	26	278	0.986	7.4	1.2	40	318	0.719
2022.9	0.513	12	0.490	26	264	1.0	7.4	0.894	39	302	0.739
2023.6	0.513	9.7	0.462	21	277	1.5	7.4	0.843	33	316	1.1
2024.3	0.513	9.9	0.582	19	265	1.4	7.4	1.1	28	303	0.994
2025.0	0.513	12	0.614	19	269	0.792	7.4	1.1	28	308	0.578
2025.7	0.513	11	0.727	23	254	1.5	7.4	1.3	36	290	1.1
2026.4	0.513	8.8	0.788	18	257	1.4	7.4	1.4	28	294	1.0
2027.1	0.513	9.2	0.784	21	307	0.857	7.4	1.4	32	351	0.625
2027.7	0.513	11	0.410	20	296	1.2	7.4	0.747	30	338	0.863
2028.4	0.513	10	0.554	20	297	0.480	7.4	1.0	30	340	0.350
2029.1	0.513	10	0.384	21	266	1.4	7.4	0.701	32	305	0.999
2029.8	0.513	9.2	0.719	21	266	1.0	7.4	1.3	32	305	0.742
2030.5	0.513	11	0.637	18	274	1.1	7.4	1.2	28	313	0.769
2031.2	0.513	11	0.444	19	263	0.673	7.4	0.810	29	301	0.491
2031.9	0.513	11	0.599	21	261	1.7	7.4	1.1	32	299	1.3
2032.6	0.513	11	0.643	20	262	0.967	7.4	1.2	31	300	0.706
2033.3	0.513	11	0.318	18	241	1.3	7.4	0.581	27	276	0.935



Minnow Environmental  
Sample ID: 014

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2034.0	0.513	10	0.567	20	311	1.7	7.4	1.0	31	355	1.2
2034.7	0.513	12	0.328	21	281	1.2	7.4	0.598	32	321	0.895
2035.4	0.513	9.6	0.311	20	234	1.2	7.4	0.567	30	267	0.857
2036.1	0.513	12	0.460	19	270	1.2	7.4	0.839	28	309	0.903
2036.8	0.513	9.3	0.364	19	272	1.2	7.4	0.663	29	311	0.894
2037.5	0.513	11	0.486	18	254	0.651	7.4	0.886	28	290	0.475
2038.2	0.513	9.7	0.278	22	252	0.195	7.4	0.507	34	288	0.142
2038.9	0.513	11	0.399	17	279	1.7	7.4	0.727	26	319	1.3
2039.6	0.513	8.0	0.421	19	239	0.820	7.4	0.767	29	273	0.598
2040.3	0.513	8.4	0.224	18	224	1.0	7.4	0.409	28	256	0.763
2041.0	0.513	10	0.331	20	266	1.1	7.4	0.604	30	304	0.783
2041.7	0.513	8.2	0.405	23	280	0.973	7.4	0.738	35	320	0.710
2042.4	0.513	13	0.439	25	250	0.900	7.4	0.800	38	286	0.656
2043.1	0.513	9.9	0.392	21	234	0.754	7.4	0.716	32	268	0.550
2043.8	0.513	9.7	0.468	23	244	0.481	7.4	0.853	35	279	0.351
2044.5	0.513	10	0.471	19	276	1.1	7.4	0.859	28	315	0.815
2045.2	0.530	11	0.323	27	243	1.3	7.7	0.588	42	278	0.948
2045.9	0.513	14	0.287	27	243	0.662	7.4	0.523	41	278	0.483
2046.6	0.513	10	0.480	28	225	0.634	7.4	0.876	42	257	0.463
2047.3	0.513	11	0.304	22	246	0.961	7.4	0.554	34	281	0.701
2048.0	0.513	13	0.325	25	266	0.411	7.4	0.592	38	304	0.300
2048.7	0.513	12	0.729	35	254	0.974	7.4	1.3	53	291	0.710
2049.4	0.513	21	0.457	34	246	1.4	7.4	0.833	52	282	1.0
2050.1	0.513	13	0.444	34	225	0.260	7.4	0.810	52	258	0.190
2050.8	0.513	14	0.817	38	254	1.3	7.4	1.5	58	291	0.914
2051.5	0.513	12	0.706	37	240	0.634	7.4	1.3	56	275	0.462
2052.2	0.513	10	0.932	42	228	0.694	7.4	1.7	65	260	0.507
2052.9	0.513	12	0.752	41	263	1.1	7.4	1.4	63	301	0.800
2053.5	0.513	14	0.761	51	257	0.950	7.4	1.4	78	294	0.693
2054.2	0.513	11	0.903	41	212	0.808	7.4	1.6	63	242	0.589
2054.9	0.513	14	0.928	45	236	1.6	7.4	1.7	69	270	1.1
2055.6	0.513	10	0.707	35	216	1.2	7.4	1.3	54	247	0.869
2056.3	0.513	14	1.1	43	229	0.768	7.4	2.0	66	262	0.561
2057.0	0.513	15	1.3	41	258	1.3	7.4	2.4	64	295	0.925
2057.7	0.513	16	0.961	51	251	0.716	7.4	1.8	77	287	0.522
2058.4	0.513	11	1.1	45	280	1.3	7.4	2.0	68	320	0.925
2059.1	0.513	13	1.2	43	228	1.1	7.4	2.2	66	260	0.811
2059.8	0.513	15	1.6	51	262	1.5	7.4	3.0	79	299	1.1
2060.5	0.513	12	1.2	48	225	1.1	7.4	2.2	74	257	0.785
2061.2	0.513	13	1.2	50	249	0.633	7.4	2.1	77	285	0.462
2061.9	0.513	13	1.2	51	240	1.1	7.4	2.2	78	274	0.791
2062.6	0.513	13	1.2	48	232	0.747	7.4	2.1	73	265	0.545
2063.3	0.513	14	1.3	52	223	0.882	7.4	2.4	80	255	0.643
2064.0	0.513	13	1.2	51	264	0.904	7.4	2.3	78	302	0.660
2064.7	0.513	14	1.2	53	246	1.1	7.4	2.1	82	281	0.805
2065.4	0.513	13	1.3	49	250	0.532	7.4	2.3	75	286	0.388
2066.1	0.513	16	1.6	55	263	0.672	7.4	3.0	85	301	0.490
2066.8	0.513	13	1.2	52	239	1.2	7.4	2.2	80	274	0.850
2067.5	0.513	16	1.3	58	262	1.2	7.4	2.3	88	299	0.840
2068.2	0.513	16	1.3	51	251	0.733	7.4	2.4	78	287	0.535
2068.9	0.513	13	1.6	53	231	1.1	7.4	2.9	81	265	0.789
2069.6	0.513	18	1.1	57	254	0.781	7.4	2.1	87	291	0.570
2070.3	0.513	13	1.1	48	212	0.956	7.4	2.1	73	242	0.697
2071.0	0.513	16	1.5	60	257	1.2	7.4	2.7	92	294	0.889
2071.7	0.513	16	1.3	52	223	0.648	7.4	2.4	79	255	0.473
2072.4	0.513	14	1.5	57	216	1.1	7.4	2.8	87	247	0.785
2073.1	0.513	17	1.2	61	243	1.3	7.4	2.2	93	278	0.960
2073.8	0.513	14	1.3	56	265	0.557	7.4	2.4	85	304	0.406
2074.5	0.513	16	1.6	56	245	1.5	7.4	2.8	86	280	1.1
2075.2	0.513	15	1.1	53	253	1.4	7.4	2.0	81	289	1.0
2075.9	0.513	17	1.5	65	247	0.980	7.4	2.8	99	282	0.715
2076.6	0.513	17	1.6	52	228	0.702	7.4	2.8	80	261	0.512
2077.3	0.513	17	1.5	50	233	0.703	7.4	2.7	76	266	0.513
2078.0	0.513	14	1.3	51	237	0.872	7.4	2.4	78	271	0.637
2078.7	0.513	14	1.6	55	220	0.896	7.4	3.0	85	251	0.653
2079.3	0.513	15	1.4	62	266	1.0	7.4	2.5	96	304	0.731
2080.0	0.513	16	1.5	60	231	0.832	7.4	2.6	93	265	0.607
2080.7	0.513	17	1.4	55	251	0.680	7.4	2.5	84	287	0.496
2081.4	0.513	17	1.5	56	255	0.710	7.4	2.8	85	292	0.518
2082.1	0.513	17	1.1	52	227	0.914	7.4	2.1	80	260	0.667
2082.8	0.513	15	0.897	54	215	0.180	7.4	1.6	83	246	0.131
2083.5	0.513	16	1.5	55	236	0.864	7.4	2.7	84	270	0.630
2084.2	0.824	18	1.0	56	274	0.616	12	1.9	86	313	0.449
2084.9	0.513	19	1.3	52	240	0.696	7.4	2.4	80	275	0.508
2085.6	0.513	19	1.3	50	232	0.628	7.4	2.4	76	265	0.458
2086.3	0.513	16	1.2	56	232	1.1	7.4	2.2	86	265	0.785
2087.0	0.513	14	0.898	46	198	0.547	7.4	1.6	71	226	0.399
2087.7	0.513	14	1.2	51	231	1.4	7.4	2.2	78	264	1.0
2088.4	0.547	12	0.895	52	218	0.956	7.9	1.6	80	249	0.697
2089.1	0.513	15	1.2	54	256	0.770	7.4	2.2	82	293	0.562
2089.8	0.513	18	1.2	47	228	0.896	7.4	2.2	71	261	0.654



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2090.5	0.513	15	0.963	48	214	0.590	7.4	1.8	73	244	0.431
2091.2	0.513	17	0.934	58	250	0.909	7.4	1.7	89	286	0.663
2091.9	0.513	15	0.936	43	232	0.967	7.4	1.7	65	265	0.705
2092.6	0.513	17	1.1	49	242	2.1	7.4	2.0	75	277	1.5
2093.3	0.513	18	1.2	58	287	1.4	7.4	2.2	89	328	1.0
2094.0	0.513	15	1.5	42	267	0.359	7.4	2.7	64	306	0.262
2094.7	0.513	17	1.1	46	223	0.961	7.4	2.0	70	254	0.701
2095.4	0.513	16	0.787	52	256	0.687	7.4	1.4	80	292	0.501
2096.1	0.513	15	0.820	43	222	0.565	7.4	1.5	66	254	0.412
2096.8	0.513	15	1.3	43	252	0.914	7.4	2.3	66	288	0.667
2097.5	0.513	15	1.0	39	259	0.336	7.4	1.8	60	296	0.245
2098.2	0.513	17	0.736	45	224	1.1	7.4	1.3	69	257	0.783
2098.9	0.513	13	0.833	47	243	1.7	7.4	1.5	72	278	1.2
2099.6	0.513	15	1.0	52	220	1.3	7.4	1.9	79	252	0.983
2100.3	0.513	14	1.1	41	220	1.4	7.4	2.0	63	252	1.0
2101.0	0.513	14	1.1	39	237	0.742	7.4	2.0	59	271	0.542
2101.7	0.513	14	0.430	38	234	0.784	7.4	0.785	58	268	0.572
2102.4	0.636	16	0.742	41	203	0.461	9.2	1.4	62	232	0.336
2103.1	0.513	13	0.906	40	231	0.849	7.4	1.7	61	264	0.620
2103.8	0.513	11	0.835	34	188	0.915	7.4	1.5	53	215	0.668
2104.5	0.513	13	0.909	33	211	0.763	7.4	1.7	50	241	0.556
2105.2	0.513	14	0.840	36	243	0.280	7.4	1.5	55	278	0.204
2105.8	0.513	14	0.820	39	246	1.2	7.4	1.5	60	281	0.896
2106.5	0.513	11	0.655	33	201	0.606	7.4	1.2	50	230	0.442
2107.2	0.513	11	0.660	32	230	0.658	7.4	1.2	49	263	0.480
2107.9	0.513	12	0.693	38	228	0.851	7.4	1.3	58	260	0.621
2108.6	0.539	13	0.562	36	236	1.5	7.8	1.0	54	270	1.1
2109.3	0.513	12	0.520	31	239	0.375	7.4	0.949	47	274	0.273
2110.0	0.598	14	0.825	30	239	0.950	8.6	1.5	46	273	0.693
2110.7	0.530	12	0.616	37	228	1.4	7.6	1.1	56	261	1.0
2111.4	0.513	13	0.504	28	209	0.845	7.4	0.920	43	240	0.616
2112.1	0.513	14	0.704	31	263	0.632	7.4	1.3	47	301	0.461
2112.8	0.556	11	0.612	29	211	0.892	8.0	1.1	44	241	0.651
2113.5	0.513	12	0.566	31	234	0.527	7.4	1.0	48	267	0.385
2114.2	0.513	10	0.670	27	263	1.1	7.4	1.2	41	301	0.777
2114.9	0.513	11	0.765	31	237	1.4	7.4	1.4	47	271	0.991
2115.6	0.541	12	0.543	28	230	1.2	7.8	0.990	43	263	0.897
2116.3	0.513	15	0.508	29	244	1.4	7.4	0.926	45	279	1.1
2117.0	0.513	9.7	0.479	28	252	0.996	7.4	0.873	43	288	0.726
2117.7	0.513	11	0.546	26	229	0.792	7.4	0.995	40	262	0.578
2118.4	0.513	12	0.575	26	270	0.867	7.4	1.0	41	309	0.632
2119.1	0.513	12	0.559	26	218	0.812	7.4	1.0	40	249	0.592
2119.8	0.513	10	0.381	23	227	0.640	7.4	0.695	35	260	0.467
2120.5	0.513	11	0.664	24	229	0.747	7.4	1.2	36	261	0.545
2121.2	0.513	8.7	0.327	24	233	1.0	7.4	0.596	37	267	0.733
2121.9	0.513	12	0.330	21	247	1.5	7.4	0.602	32	283	1.1
2122.6	0.513	8.2	0.542	23	235	0.818	7.4	0.988	35	269	0.597
2123.3	0.513	7.9	0.731	21	241	1.2	7.4	1.3	32	276	0.847
2124.0	0.513	11	0.701	21	234	1.1	7.4	1.3	33	267	0.812
2124.7	0.513	11	0.323	20	249	1.2	7.4	0.589	31	285	0.869
2125.4	0.513	9.6	0.513	20	232	0.743	7.4	0.936	31	266	0.542
2126.1	0.513	9.2	0.487	20	257	1.5	7.4	0.889	30	294	1.1
2126.8	0.513	9.8	0.265	18	260	1.1	7.4	0.483	28	298	0.825
2127.5	0.513	9.0	0.602	22	245	1.0	7.4	1.1	34	280	0.735
2128.2	0.513	9.1	0.434	16	223	1.1	7.4	0.791	24	255	0.794
2128.9	0.513	7.7	0.272	18	214	1.2	7.4	0.496	27	244	0.852
2129.6	0.513	7.5	0.466	15	229	0.828	7.4	0.851	23	262	0.604
2130.3	0.513	7.9	0.482	19	250	0.952	7.4	0.879	29	286	0.694
2131.0	0.513	9.2	0.720	20	267	1.8	7.4	1.3	31	305	1.3
2131.7	0.513	8.7	0.380	15	228	1.1	7.4	0.693	23	260	0.800
2132.3	0.513	7.7	0.311	15	214	0.894	7.4	0.568	23	244	0.653
2133.0	0.513	7.7	0.583	15	238	1.4	7.4	1.1	24	272	0.999
2133.7	0.513	8.6	0.487	18	237	0.962	7.4	0.888	27	272	0.702
2134.4	0.513	8.0	0.397	16	265	0.604	7.4	0.724	25	303	0.441
2135.1	0.513	8.5	0.524	19	245	1.5	7.4	0.955	29	280	1.1
2135.8	0.513	8.6	0.363	17	240	1.1	7.4	0.663	26	274	0.809
2136.5	0.513	9.7	0.508	16	265	2.3	7.4	0.927	25	303	1.7
2137.2	0.513	8.9	0.585	22	262	0.375	7.4	1.1	34	299	0.274
2137.9	0.513	9.1	0.326	18	250	0.841	7.4	0.594	27	286	0.614
2138.6	0.513	7.1	0.279	17	227	1.0	7.4	0.508	26	260	0.739
2139.3	0.513	9.8	0.638	15	253	1.2	7.4	1.2	23	290	0.912
2140.0	0.513	8.0	0.706	16	228	2.2	7.4	1.3	25	260	1.6
2140.7	0.513	7.8	0.523	17	254	0.728	7.4	0.954	25	290	0.531
2141.4	0.513	9.1	0.767	17	233	1.0	7.4	1.4	26	267	0.740
2142.1	0.513	8.7	0.253	21	255	1.3	7.4	0.461	32	292	0.932
2142.8	0.513	6.8	0.481	18	281	1.1	7.4	0.877	28	322	0.798
2143.5	0.513	7.5	0.359	20	224	1.3	7.4	0.655	31	256	0.933
2144.2	0.513	8.0	0.530	18	243	0.459	7.4	0.966	28	278	0.335
2144.9	0.513	10	0.625	21	257	0.876	7.4	1.1	32	294	0.639
2145.6	0.513	8.5	0.569	20	245	1.2	7.4	1.0	30	280	0.905
2146.3	0.513	9.8	0.340	20	225	1.3	7.4	0.619	31	257	0.937



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2147.0	0.513	9.4	0.503	19	240	0.819	7.4	0.917	30	274	0.598
2147.7	0.513	9.5	0.723	20	217	0.916	7.4	1.3	30	248	0.668
2148.4	0.513	9.6	0.729	21	257	0.748	7.4	1.3	32	293	0.546
2149.1	0.513	10	0.563	25	288	1.2	7.4	1.0	38	329	0.859
2149.8	0.513	10	0.478	24	201	0.832	7.4	0.872	37	230	0.607
2150.5	0.513	10	0.567	25	221	0.990	7.4	1.0	39	252	0.722
2151.2	0.513	7.9	0.652	22	271	0.815	7.4	1.2	34	310	0.594
2151.9	0.513	8.0	1.0	23	223	0.976	7.4	1.8	35	255	0.712
2152.6	0.513	8.0	0.783	26	218	0.832	7.4	1.4	40	249	0.607
2153.3	0.513	9.0	0.700	26	205	0.874	7.4	1.3	40	234	0.638
2154.0	0.513	10	0.847	23	236	0.990	7.4	1.5	35	270	0.722
2154.7	0.513	9.8	0.479	30	218	0.693	7.4	0.873	45	249	0.506
2155.4	0.513	9.4	0.975	29	215	1.0	7.4	1.8	44	246	0.749
2156.1	0.513	12	0.794	31	224	0.848	7.4	1.4	47	257	0.619
2156.8	0.513	8.5	0.824	31	232	0.687	7.4	1.5	47	265	0.501
2157.5	0.513	9.4	0.676	30	227	0.398	7.4	1.2	46	260	0.290
2158.1	0.513	10.0	1.1	28	250	0.869	7.4	2.1	43	286	0.634
2158.8	0.513	11	0.812	31	239	1.1	7.4	1.5	48	273	0.804
2159.5	0.513	11	0.688	33	204	1.4	7.4	1.3	50	233	1.0
2160.2	0.513	11	1.1	30	225	1.0	7.4	1.9	47	257	0.762
2160.9	0.513	10	1.2	30	228	0.856	7.4	2.3	45	260	0.624
2161.6	0.513	8.4	1.1	47	246	0.833	7.4	2.1	73	281	0.608
2162.3	0.621	12	0.820	40	229	0.919	9.0	1.5	61	261	0.671
2163.0	0.513	13	1.1	33	212	0.672	7.4	2.0	51	242	0.491
2163.7	0.513	9.7	0.850	36	207	0.285	7.4	1.6	55	237	0.208
2164.4	0.513	10	0.839	38	233	0.817	7.4	1.5	59	266	0.596
2165.1	0.513	8.6	0.863	29	220	0.509	7.4	1.6	44	251	0.371
2165.8	0.513	11	1.2	39	276	0.863	7.4	2.2	60	315	0.629
2166.5	0.513	9.5	0.822	40	201	0.751	7.4	1.5	61	230	0.548
2167.2	0.513	10	0.842	41	248	1.1	7.4	1.5	63	283	0.769
2167.9	0.513	10	0.661	38	240	0.338	7.4	1.2	58	275	0.246
2168.6	0.513	10	0.889	33	205	0.894	7.4	1.6	50	235	0.652
2169.3	0.513	12	1.3	41	222	0.899	7.4	2.3	63	253	0.656
2170.0	0.513	9.6	0.963	43	220	0.760	7.4	1.8	66	251	0.554
2170.7	0.513	11	0.746	35	221	0.687	7.4	1.4	54	252	0.501
2171.4	0.513	7.9	0.782	35	220	0.683	7.4	1.4	53	252	0.499
2172.1	0.514	11	0.881	37	247	0.447	7.4	1.6	57	282	0.326
2172.8	0.513	11	1.0	34	203	0.866	7.4	1.8	52	232	0.632
2173.5	1.1	9.8	0.649	35	234	0.945	16	1.2	54	267	0.689
2174.2	0.513	11	0.874	42	232	0.433	7.4	1.6	64	265	0.316
2174.9	0.513	13	1.1	35	225	0.734	7.4	2.0	53	258	0.536
2175.6	0.513	11	0.785	30	242	0.736	7.4	1.4	45	277	0.537
2176.3	0.513	11	0.852	32	209	0.663	7.4	1.6	49	239	0.484
2177.0	0.513	10	0.651	36	226	0.332	7.4	1.2	56	258	0.243
2177.7	0.513	10	0.785	35	249	0.408	7.4	1.4	53	285	0.297
2178.4	0.513	9.3	0.591	27	230	1.0	7.4	1.1	41	263	0.753
2179.1	0.513	13	0.633	36	232	0.761	7.4	1.2	54	266	0.555
2179.8	0.513	9.4	0.471	34	206	0.596	7.4	0.859	52	235	0.435
2180.5	0.513	11	0.516	31	234	0.537	7.4	0.940	48	267	0.392
2181.2	0.513	10	0.800	32	221	0.717	7.4	1.5	49	253	0.523
2181.9	0.513	8.8	0.580	31	225	0.653	7.4	1.1	47	257	0.477
2182.6	0.513	11	0.424	26	199	0.238	7.4	0.774	41	228	0.174
2183.3	0.513	9.9	0.653	28	225	0.533	7.4	1.2	43	257	0.389
2183.9	0.513	9.7	0.731	24	216	0.175	7.4	1.3	37	247	0.127
2184.6	0.513	12	0.652	26	222	0.882	7.4	1.2	40	254	0.644
2185.3	0.513	9.7	0.549	29	241	0.735	7.4	1.0	45	276	0.536
2186.0	0.513	12	0.437	31	201	0.603	7.4	0.797	47	230	0.440
2186.7	0.513	9.1	0.394	28	230	0.898	7.4	0.718	44	264	0.655
2187.4	0.513	9.9	0.369	27	235	0.843	7.4	0.673	42	268	0.615
2188.1	0.513	11	0.464	24	240	1.2	7.4	0.847	36	275	0.841
2188.8	0.513	9.0	0.747	20	218	0.971	7.4	1.4	30	249	0.709
2189.5	0.513	9.4	0.574	22	222	0.625	7.4	1.0	34	254	0.456
2190.2	0.513	10	0.709	20	251	0.467	7.4	1.3	30	287	0.341
2190.9	0.513	10.0	0.662	23	248	1.2	7.4	1.2	35	283	0.885
2191.6	0.513	8.1	0.385	23	222	0.740	7.4	0.703	36	254	0.540
2192.3	0.513	8.4	0.472	21	241	1.3	7.4	0.861	32	275	0.953
2193.0	0.513	8.3	0.627	18	248	1.2	7.4	1.1	28	283	0.886
2193.7	0.513	9.5	0.625	20	250	0.973	7.4	1.1	30	286	0.710
2194.4	0.513	10	0.330	22	242	1.3	7.4	0.601	33	277	0.968
2195.1	0.513	11	0.466	24	247	0.867	7.4	0.850	37	283	0.632
2195.8	0.513	6.8	0.413	18	218	0.535	7.4	0.752	28	250	0.390
2196.5	0.513	10.0	0.358	17	254	1.1	7.4	0.652	27	291	0.797
2197.2	0.513	8.5	0.531	15	253	0.769	7.4	0.968	23	289	0.561
2197.9	0.513	8.5	0.566	18	231	1.4	7.4	1.0	27	264	1.0
2198.6	0.513	8.6	0.390	19	245	0.264	7.4	0.710	29	280	0.192
2199.3	0.513	8.4	0.485	17	231	0.703	7.4	0.885	27	264	0.513
2200.0	0.513	8.3	0.641	19	229	0.875	7.4	1.2	29	261	0.639
2200.7	0.513	9.4	0.394	20	241	0.662	7.4	0.719	31	275	0.483
2201.4	0.513	9.0	0.360	22	250	1.2	7.4	0.656	33	286	0.869
2202.1	0.513	7.6	0.397	20	251	0.814	7.4	0.724	31	287	0.594
2202.8	0.513	7.9	0.536	22	249	0.465	7.4	0.978	33	284	0.339



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2203.5	0.513	9.9	0.411	20	303	0.790	7.4	0.750	30	346	0.577
2204.2	0.513	8.7	0.337	20	280	0.685	7.4	0.615	30	320	0.500
2204.9	0.513	9.7	0.264	20	214	1.1	7.4	0.482	31	245	0.831
2205.6	0.513	11	0.451	22	258	1.5	7.4	0.822	34	295	1.1
2206.3	0.513	9.6	0.351	19	244	0.720	7.4	0.640	29	279	0.525
2207.0	0.513	7.7	0.525	16	216	1.5	7.4	0.958	25	247	1.1
2207.7	0.513	7.3	0.461	20	208	1.5	7.4	0.841	30	237	1.1
2208.4	0.513	8.1	0.561	19	241	1.1	7.4	1.0	30	276	0.830
2209.1	0.513	7.5	0.381	25	241	0.751	7.4	0.694	38	276	0.548
2209.8	0.513	9.0	0.682	22	261	0.788	7.4	1.2	34	298	0.575
2210.4	0.513	8.3	0.511	19	230	1.4	7.4	0.932	29	263	1.0
2211.1	0.513	11	0.592	21	260	0.980	7.4	1.1	32	297	0.715
2211.8	0.513	9.8	0.686	23	259	1.2	7.4	1.3	35	297	0.889
2212.5	0.513	8.6	0.395	16	219	0.857	7.4	0.720	24	251	0.626
2213.2	0.513	9.0	0.361	22	256	0.694	7.4	0.659	34	293	0.506
2213.9	0.513	10	0.555	23	257	0.806	7.4	1.0	35	294	0.588
2214.6	0.513	8.2	0.655	21	250	0.396	7.4	1.2	31	285	0.289
2215.3	0.513	10	0.443	27	273	1.0	7.4	0.807	42	312	0.766
2216.0	0.513	10	0.483	23	238	0.672	7.4	0.882	35	272	0.491
2216.7	0.513	7.2	0.355	21	240	1.0	7.4	0.648	33	274	0.731
2217.4	0.513	11	0.610	24	239	0.915	7.4	1.1	36	274	0.668
2218.1	0.513	11	0.815	23	260	0.509	7.4	1.5	35	298	0.371
2218.8	0.513	10	0.586	23	281	0.882	7.4	1.1	35	322	0.643
2219.5	0.513	10	0.734	26	276	0.825	7.4	1.3	40	316	0.602
2220.2	0.513	11	0.686	23	254	0.833	7.4	1.3	35	290	0.608
2220.9	0.513	10.0	0.545	26	240	0.615	7.4	0.995	40	275	0.449
2221.6	0.513	11	0.925	24	244	1.8	7.4	1.7	36	279	1.3
2222.3	0.513	11	0.923	25	242	0.826	7.4	1.7	38	277	0.603
2223.0	0.513	9.5	0.437	22	234	0.991	7.4	0.796	34	268	0.723
2223.7	0.513	9.6	0.692	26	277	0.443	7.4	1.3	40	317	0.323
2224.4	0.513	9.2	0.661	23	230	0.883	7.4	1.2	35	263	0.645
2225.1	0.513	10	0.794	24	228	1.0	7.4	1.4	37	260	0.761
2225.8	0.513	11	0.815	28	231	1.4	7.4	1.5	43	264	1.0
2226.5	0.513	10	0.557	28	289	0.837	7.4	1.0	43	331	0.611
2227.2	0.513	11	0.684	26	243	0.968	7.4	1.2	39	278	0.706
2227.9	0.513	8.4	0.602	28	231	0.524	7.4	1.1	43	264	0.382
2228.6	0.513	11	0.657	29	236	0.859	7.4	1.2	45	270	0.627
2229.3	0.513	10	0.676	26	228	0.830	7.4	1.2	40	261	0.606
2230.0	0.513	9.9	0.664	31	241	1.2	7.4	1.2	47	275	0.860
2230.7	0.535	12	0.516	26	272	0.841	7.7	0.941	40	311	0.613
2231.4	0.513	14	0.822	26	244	0.971	7.4	1.5	41	279	0.709
2232.1	0.513	11	0.677	28	278	1.0	7.4	1.2	43	317	0.741
2232.8	0.513	10	0.553	25	284	0.581	7.4	1.0	38	325	0.424
2233.5	0.513	11	0.747	26	222	1.1	7.4	1.4	40	254	0.817
2234.2	0.513	11	0.561	28	267	0.905	7.4	1.0	44	306	0.660
2234.9	0.513	12	0.620	27	229	0.522	7.4	1.1	42	262	0.381
2235.6	0.513	11	0.642	28	226	0.840	7.4	1.2	43	259	0.613
2236.3	0.513	11	0.548	27	265	0.734	7.4	1.000	41	303	0.535
2236.9	0.513	9.2	0.605	20	235	1.4	7.4	1.1	31	269	1.0
2237.6	0.513	11	0.534	29	258	1.3	7.4	0.973	45	295	0.918
2238.3	0.513	10	0.605	27	278	0.941	7.4	1.1	42	318	0.687
2239.0	0.513	9.3	0.539	25	227	1.1	7.4	0.983	38	260	0.791
2239.7	0.513	9.8	0.497	29	248	1.0	7.4	0.907	44	283	0.754
2240.4	0.513	11	0.520	26	243	0.193	7.4	0.949	39	278	0.141
2241.1	0.513	9.0	0.653	26	236	0.444	7.4	1.2	39	270	0.324
2241.8	0.513	9.0	0.655	24	230	1.6	7.4	1.2	37	262	1.2
2242.5	0.513	10	0.677	25	271	0.553	7.4	1.2	38	310	0.403
2243.2	0.513	11	0.556	25	241	0.651	7.4	1.0	38	276	0.475
2243.9	0.513	12	0.600	26	251	0.774	7.4	1.1	40	287	0.564
2244.6	0.513	11	0.448	28	253	0.970	7.4	0.816	43	289	0.708
2245.3	0.513	10	0.328	22	224	1.3	7.4	0.598	33	256	0.964
2246.0	0.513	9.3	0.583	19	236	0.725	7.4	1.1	30	270	0.529
2246.7	0.513	10	0.564	27	244	0.850	7.4	1.0	41	279	0.620
2247.4	0.513	9.1	0.685	26	236	1.0	7.4	1.2	40	270	0.752
2248.1	0.513	10	0.379	24	210	0.576	7.4	0.690	36	240	0.420
2248.8	0.513	9.8	0.399	24	222	0.635	7.4	0.727	37	254	0.463
2249.5	0.513	9.3	0.462	19	238	1.3	7.4	0.843	29	272	0.958
2250.2	0.513	7.8	0.389	24	233	0.559	7.4	0.709	37	267	0.408
2250.9	0.513	11	0.500	23	257	1.6	7.4	0.912	36	294	1.2
2251.6	0.513	11	0.646	21	273	0.776	7.4	1.2	32	313	0.566
2252.3	0.513	10	0.471	25	240	0.680	7.4	0.859	38	275	0.496
2253.0	0.513	9.2	0.521	22	246	0.886	7.4	0.951	33	282	0.646
2253.7	0.513	12	0.629	21	279	0.851	7.4	1.1	32	319	0.621
2254.4	0.513	11	0.465	24	260	0.962	7.4	0.849	37	297	0.702
2255.1	0.513	8.8	0.551	20	232	0.800	7.4	1.0	31	265	0.584
2255.8	0.513	7.5	0.634	20	231	0.922	7.4	1.2	31	265	0.673
2256.5	0.513	10	0.479	18	221	0.906	7.4	0.874	28	252	0.661
2257.2	0.513	11	0.586	21	229	0.686	7.4	1.1	32	262	0.501
2257.9	0.513	10	0.414	23	265	1.2	7.4	0.755	35	303	0.872
2258.6	0.513	10	0.343	22	240	1.1	7.4	0.625	34	275	0.810
2259.3	0.513	8.9	0.504	21	275	1.3	7.4	0.919	32	314	0.944



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2260.0	0.513	9.1	0.489	17	241	0.965	7.4	0.892	26	276	0.704
2260.7	0.513	10	0.510	19	236	1.1	7.4	0.929	29	270	0.808
2261.4	0.513	7.2	0.282	19	218	0.837	7.4	0.514	29	249	0.611
2262.1	0.513	10	0.519	18	243	1.3	7.4	0.947	28	278	0.962
2262.7	0.513	9.7	0.681	22	252	0.863	7.4	1.2	33	288	0.630
2263.4	0.513	8.8	0.616	20	231	1.5	7.4	1.1	31	265	1.1
2264.1	0.513	10	0.348	18	251	0.898	7.4	0.634	27	287	0.655
2264.8	0.513	8.5	0.255	20	226	0.544	7.4	0.465	31	258	0.397
2265.5	0.513	7.4	0.614	18	230	1.0	7.4	1.1	28	263	0.758
2266.2	0.513	8.3	0.553	22	265	1.4	7.4	1.0	34	303	0.985
2266.9	0.513	10	0.349	18	234	0.847	7.4	0.637	27	267	0.618
2267.6	0.513	8.1	0.580	21	225	1.1	7.4	1.1	32	258	0.780
2268.3	0.513	8.4	0.472	16	239	0.657	7.4	0.861	24	273	0.479
2269.0	0.513	9.8	0.664	23	268	1.2	7.4	1.2	36	307	0.846
2269.7	0.513	8.1	0.621	21	241	0.523	7.4	1.1	33	276	0.382
2270.4	0.513	8.3	0.627	23	229	1.2	7.4	1.1	35	261	0.865
2271.1	0.513	9.0	0.380	25	208	1.4	7.4	0.693	39	238	1.0
2271.8	0.513	6.9	0.401	21	240	1.5	7.4	0.731	32	274	1.1
2272.5	0.513	6.3	0.519	19	223	1.0	7.4	0.946	30	255	0.761
2273.2	0.513	7.4	0.564	19	250	1.6	7.4	1.0	29	285	1.2
2273.9	0.513	8.4	0.648	23	222	1.5	7.4	1.2	34	254	1.1
2274.6	0.513	8.3	0.507	21	239	0.958	7.4	0.924	33	273	0.699
2275.3	0.513	7.8	0.622	26	241	0.813	7.4	1.1	40	276	0.593
2276.0	0.533	8.1	0.535	21	259	0.651	7.7	0.976	32	296	0.475
2276.7	0.622	10	0.837	21	254	1.1	9.0	1.5	32	291	0.794
2277.4	0.513	9.4	0.582	26	232	0.815	7.4	1.1	40	266	0.595
2278.1	0.513	9.9	0.958	24	277	1.0	7.4	1.7	37	316	0.766
2278.8	0.513	9.4	0.824	32	253	1.6	7.4	1.5	49	289	1.1
2279.5	0.513	8.8	0.416	27	245	0.948	7.4	0.759	41	280	0.692
2280.2	0.513	10	0.722	29	294	1.8	7.4	1.3	45	336	1.3
2280.9	0.513	9.2	0.643	26	287	1.3	7.4	1.2	40	328	0.950
2281.6	0.513	10	0.736	27	256	1.0	7.4	1.3	42	292	0.738
2282.3	0.513	10	0.855	30	242	1.4	7.4	1.6	47	276	1.0
2283.0	0.513	9.1	0.768	31	292	0.766	7.4	1.4	48	334	0.559
2283.7	0.513	7.3	1.0	26	231	1.2	7.4	1.9	40	264	0.911
2284.4	0.513	8.8	0.994	28	234	1.1	7.4	1.8	43	268	0.826
2285.1	0.513	9.8	0.698	31	258	0.553	7.4	1.3	48	296	0.403
2285.8	0.549	8.1	0.837	33	248	0.697	7.9	1.5	50	284	0.509
2286.5	0.513	8.1	0.812	30	274	0.889	7.4	1.5	46	313	0.649
2287.2	0.513	11	0.938	35	297	0.747	7.4	1.7	53	340	0.545
2287.8	0.513	10.0	0.740	37	278	0.488	7.4	1.4	56	318	0.356
2288.5	0.513	9.5	0.676	29	231	0.923	7.4	1.2	44	264	0.673
2289.2	0.513	11	0.959	38	263	0.955	7.4	1.7	59	301	0.697
2289.9	0.513	13	1.2	39	296	1.5	7.4	2.1	59	338	1.1
2290.6	0.513	8.2	0.868	30	242	0.761	7.4	1.6	46	276	0.556
2291.3	0.513	10	1.1	35	253	0.796	7.4	2.0	53	289	0.581
2292.0	0.513	12	1.2	34	260	0.930	7.4	2.2	53	297	0.678
2292.7	0.513	11	0.574	36	232	0.516	7.4	1.0	55	265	0.377
2293.4	0.513	9.6	0.787	36	278	0.617	7.4	1.4	56	318	0.450
2294.1	0.513	10	0.803	32	243	1.4	7.4	1.5	50	278	1.0
2294.8	0.513	11	0.799	37	286	0.828	7.4	1.5	56	327	0.604
2295.5	0.513	12	0.898	31	219	1.1	7.4	1.6	47	251	0.839
2296.2	0.513	10	0.788	38	242	0.776	7.4	1.4	58	277	0.566
2296.9	0.513	10	0.791	33	272	0.819	7.4	1.4	51	312	0.597
2297.6	0.513	10	0.882	31	273	1.1	7.4	1.6	48	312	0.769
2298.3	0.513	10	0.939	37	291	0.625	7.4	1.7	57	333	0.456
2299.0	0.513	9.8	0.542	31	225	0.569	7.4	0.988	48	258	0.415
2299.7	0.513	11	0.861	31	253	0.789	7.4	1.6	48	290	0.576
2300.4	0.513	9.9	0.763	32	252	0.878	7.4	1.4	50	289	0.641
2301.1	0.513	11	0.726	31	280	1.2	7.4	1.3	48	320	0.902
2301.8	0.513	11	0.715	33	223	0.893	7.4	1.3	51	255	0.651
2302.5	0.513	13	0.726	31	239	0.772	7.4	1.3	47	273	0.563
2303.2	0.513	9.9	0.606	30	247	1.5	7.4	1.1	46	283	1.1
2303.9	0.513	10	0.863	32	240	1.0	7.4	1.6	49	274	0.753
2304.6	0.513	13	0.479	32	218	0.955	7.4	0.874	49	249	0.697
2305.3	0.513	11	0.623	27	269	0.613	7.4	1.1	41	308	0.447
2306.0	0.513	8.9	0.490	28	239	0.992	7.4	0.893	43	273	0.724
2306.7	0.513	12	0.543	27	258	0.945	7.4	0.990	42	295	0.690
2307.4	0.513	12	0.471	25	267	0.680	7.4	0.859	38	305	0.496
2308.1	0.513	10	0.623	25	229	1.0	7.4	1.1	38	262	0.752
2308.8	0.513	12	0.623	27	249	0.678	7.4	1.1	41	285	0.494
2309.5	0.513	11	0.470	25	277	0.874	7.4	0.857	38	316	0.637
2310.2	0.513	11	0.160	21	252	0.764	7.4	0.291	32	288	0.557
2310.9	0.513	8.4	0.472	25	255	0.932	7.4	0.861	39	292	0.680
2311.6	0.513	9.2	0.454	25	242	0.687	7.4	0.828	38	277	0.501
2312.3	0.513	9.5	0.301	20	259	0.952	7.4	0.549	30	296	0.694
2313.0	0.513	10	0.493	23	266	1.4	7.4	0.900	35	304	1.0
2313.7	0.513	12	0.365	26	262	1.2	7.4	0.666	39	300	0.863
2314.3	0.513	10	0.376	18	243	0.632	7.4	0.686	27	277	0.461
2315.0	0.513	9.7	0.271	19	264	0.831	7.4	0.493	30	302	0.606
2315.7	0.513	9.7	0.450	18	288	0.462	7.4	0.820	27	329	0.337



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Sample ID: 014

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2316.4	0.513	10.0	0.499	20	257	1.6	7.4	0.910	30	293	1.2
2317.1	0.513	11	0.315	21	241	0.967	7.4	0.574	32	276	0.705
2317.8	0.513	8.2	0.527	12	217	0.617	7.4	0.961	19	248	0.450
2318.5	0.513	9.4	0.513	18	224	1.1	7.4	0.935	27	256	0.815
2319.2	0.513	9.1	0.205	15	229	0.962	7.4	0.375	23	262	0.702
2319.9	0.513	11	0.449	18	256	1.2	7.4	0.819	28	293	0.853
2320.6	0.513	10.0	0.570	17	221	1.2	7.4	1.0	25	253	0.848
2321.3	0.513	8.4	0.358	22	230	0.687	7.4	0.652	33	263	0.501
2322.0	0.513	8.3	0.547	19	240	1.2	7.4	0.997	29	274	0.870
2322.7	0.513	9.1	0.547	21	262	1.7	7.4	0.997	31	299	1.2
2323.4	0.513	9.6	0.418	22	241	1.8	7.4	0.763	34	276	1.3
2324.1	0.513	8.9	0.659	19	258	0.742	7.4	1.2	29	295	0.541
2324.8	0.513	8.5	0.628	16	270	1.3	7.4	1.1	24	309	0.966
2325.5	0.513	9.2	0.402	19	260	1.8	7.4	0.733	29	297	1.3
2326.2	0.513	9.2	0.782	18	250	1.1	7.4	1.4	28	286	0.789
2326.9	0.513	10	0.849	23	243	1.9	7.4	1.5	36	278	1.4
2327.6	0.513	9.3	0.428	22	245	1.5	7.4	0.781	34	280	1.1
2328.3	0.513	10.0	0.626	24	248	1.5	7.4	1.1	36	284	1.1
2329.0	0.513	8.0	0.552	19	280	1.2	7.4	1.0	29	321	0.845
2329.7	0.513	9.8	0.565	21	236	1.6	7.4	1.0	33	269	1.2
2330.4	0.513	9.3	0.399	26	248	1.4	7.4	0.729	39	284	1.1
2331.1	0.513	8.9	0.591	23	252	1.0	7.4	1.1	35	288	0.766
2331.8	0.513	7.6	0.703	22	246	1.3	7.4	1.3	34	282	0.924
2332.5	0.513	8.6	0.829	28	284	1.7	7.4	1.5	43	325	1.2
2333.2	0.513	9.2	0.531	21	273	0.711	7.4	0.969	32	312	0.519
2333.9	0.513	10	0.711	23	268	1.4	7.4	1.3	35	306	1.0
2334.6	0.513	10	0.663	24	265	1.6	7.4	1.2	37	303	1.2
2335.3	0.513	9.2	0.658	25	293	0.669	7.4	1.2	38	335	0.488
2336.0	0.513	8.8	0.891	27	241	1.1	7.4	1.6	41	276	0.814
2336.7	0.513	9.8	0.957	26	257	1.1	7.4	1.7	39	294	0.816
2337.4	0.513	11	0.699	34	263	1.6	7.4	1.3	52	301	1.2
2338.1	0.513	12	0.833	26	242	1.3	7.4	1.5	40	277	0.981
2338.8	0.513	11	1.1	29	245	1.8	7.4	2.1	45	280	1.3
2339.5	0.871	8.8	0.957	31	267	1.3	13	1.7	48	305	0.975
2340.2	0.513	11	1.1	30	237	1.1	7.4	2.0	46	271	0.789
2340.9	0.513	9.9	0.711	31	240	1.7	7.4	1.3	47	274	1.2
2341.5	0.513	11	0.803	31	286	0.924	7.4	1.5	48	327	0.674
2342.2	0.513	8.8	0.640	29	281	0.901	7.4	1.2	45	321	0.657
2342.9	0.513	11	0.812	31	259	0.934	7.4	1.5	48	296	0.682
2343.6	0.513	12	0.896	32	266	1.3	7.4	1.6	49	304	0.954
2344.3	0.513	11	0.966	32	315	1.4	7.4	1.8	50	361	1.0
2345.0	0.599	10	0.935	33	288	1.2	8.7	1.7	51	329	0.904
2345.7	0.513	11	1.1	37	257	0.896	7.4	2.1	57	293	0.654
2346.4	0.513	12	1.0	28	256	0.889	7.4	1.9	44	293	0.649
2347.1	0.513	13	1.2	30	242	0.653	7.4	2.3	47	277	0.477
2347.8	0.567	12	1.2	34	270	1.4	8.2	2.2	52	309	1.1
2348.5	0.513	11	1.1	32	238	0.716	7.4	2.1	48	272	0.522
2349.2	0.513	13	0.657	29	271	0.821	7.4	1.2	45	310	0.599
2349.9	0.513	12	0.835	29	261	1.6	7.4	1.5	44	299	1.1
2350.6	0.513	12	0.768	30	267	0.948	7.4	1.4	46	305	0.692
2351.3	0.513	11	0.727	30	223	0.945	7.4	1.3	45	255	0.690
2352.0	0.513	11	0.762	30	249	0.941	7.4	1.4	47	285	0.686
2352.7	0.513	14	1.0	34	297	1.3	7.4	1.8	52	340	0.949
2353.4	0.513	10.0	0.944	34	230	1.5	7.4	1.7	53	263	1.1
2354.1	0.513	11	0.985	31	311	1.1	7.4	1.8	48	355	0.789
2354.8	0.513	9.1	0.763	27	275	0.919	7.4	1.4	42	315	0.671
2355.5	0.513	11	0.881	25	242	0.858	7.4	1.6	38	276	0.626
2356.2	0.513	10	0.299	26	232	1.3	7.4	0.546	40	265	0.940
2356.9	0.513	11	0.686	29	262	0.936	7.4	1.3	44	300	0.683
2357.6	0.531	9.9	0.805	28	265	1.1	7.7	1.5	43	303	0.812
2358.3	0.513	9.8	0.423	24	252	1.2	7.4	0.771	37	288	0.894
2359.0	0.513	13	0.918	24	279	0.685	7.4	1.7	37	320	0.500
2359.7	0.513	12	0.552	26	240	1.1	7.4	1.0	41	274	0.811
2360.4	0.513	11	0.503	27	305	0.569	7.4	0.917	41	349	0.415
2361.1	0.513	9.5	0.446	23	255	1.2	7.4	0.814	35	292	0.901
2361.8	0.513	12	0.548	23	235	0.617	7.4	0.999	35	268	0.451
2362.5	0.513	11	0.649	25	294	1.3	7.4	1.2	39	336	0.959
2363.2	0.513	14	0.645	26	273	1.0	7.4	1.2	40	312	0.732
2363.9	0.513	12	0.335	22	269	1.2	7.4	0.611	34	308	0.858
2364.6	0.513	9.2	0.372	24	282	1.2	7.4	0.679	37	323	0.898
2365.3	0.513	11	0.864	23	307	1.5	7.4	1.6	35	351	1.1
2366.0	0.513	10	0.736	30	293	1.1	7.4	1.3	45	335	0.833
2366.7	0.513	8.7	0.638	21	239	0.478	7.4	1.2	33	273	0.348
2367.4	0.513	10	0.440	16	226	0.361	7.4	0.802	25	258	0.263
2368.0	0.659	9.6	0.747	27	257	0.767	9.5	1.4	42	293	0.560
2368.7	0.513	9.5	0.619	17	252	0.990	7.4	1.1	25	289	0.723
2369.4	0.513	8.5	0.477	19	245	1.1	7.4	0.870	30	281	0.821
2370.1	0.513	9.5	0.712	19	280	0.847	7.4	1.3	30	320	0.618
2370.8	0.513	10	0.502	17	233	1.2	7.4	0.916	26	266	0.894
2371.5	0.513	8.8	0.571	17	230	1.0	7.4	1.0	25	263	0.753
2372.2	0.513	9.8	0.590	17	304	1.7	7.4	1.1	26	348	1.3



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2372.9	0.513	9.6	0.372	22	277	0.802	7.4	0.678	33	316	0.585
2373.6	0.513	10	0.509	15	255	1.7	7.4	0.928	23	292	1.2
2374.3	0.513	6.8	0.463	14	248	1.4	7.4	0.845	22	283	1.0
2375.0	0.513	8.9	0.407	16	288	1.7	7.4	0.743	24	329	1.2
2375.7	0.513	10	0.493	16	266	1.5	7.4	0.898	25	304	1.1
2376.4	0.513	10	0.639	18	246	1.1	7.4	1.2	28	281	0.828
2377.1	0.513	9.5	0.360	19	260	1.2	7.4	0.657	30	297	0.851
2377.8	0.513	7.5	0.497	19	242	0.953	7.4	0.907	29	277	0.695
2378.5	0.513	9.1	0.681	16	263	0.680	7.4	1.2	24	301	0.496
2379.2	0.513	10	0.574	19	275	1.7	7.4	1.0	29	314	1.2
2379.9	0.513	9.7	0.842	18	249	0.921	7.4	1.5	28	285	0.672
2380.6	0.513	9.7	0.342	20	244	0.831	7.4	0.625	30	279	0.606
2381.3	0.513	7.6	0.703	18	250	1.3	7.4	1.3	27	286	0.924
2382.0	0.578	8.1	0.465	18	274	0.457	8.3	0.849	28	313	0.334
2382.7	0.513	11	0.774	24	294	1.1	7.4	1.4	38	336	0.795
2383.4	0.513	9.0	0.816	23	263	1.5	7.4	1.5	35	301	1.1
2384.1	0.513	9.7	0.463	20	269	1.1	7.4	0.845	31	308	0.807
2384.8	0.513	11	0.540	20	273	0.723	7.4	0.985	30	312	0.527
2385.5	0.565	7.7	0.821	22	254	1.2	8.2	1.5	33	290	0.852
2386.2	0.528	8.9	0.676	19	245	0.923	7.6	1.2	30	280	0.673
2386.9	0.513	10.0	0.561	23	262	0.751	7.4	1.0	35	300	0.548
2387.6	0.513	7.5	0.481	21	259	0.759	7.4	0.877	33	296	0.553
2388.3	0.533	9.4	0.746	20	290	1.6	7.7	1.4	31	331	1.2
2389.0	0.617	8.3	0.697	21	280	0.685	8.9	1.3	33	321	0.500
2389.7	0.513	9.1	0.902	23	226	1.0	7.4	1.6	35	259	0.755
2390.4	0.513	8.5	0.695	25	237	0.894	7.4	1.3	38	271	0.652
2391.1	0.550	8.9	0.486	26	243	1.1	7.9	0.887	39	278	0.771
2391.8	0.513	7.6	0.544	22	271	1.7	7.4	0.993	34	310	1.2
2392.5	0.513	11	0.664	28	249	0.771	7.4	1.2	43	285	0.563
2393.2	0.513	9.2	0.622	26	293	0.465	7.4	1.1	40	335	0.340
2393.8	0.513	10	0.846	22	248	0.903	7.4	1.5	33	284	0.659
2394.5	0.513	7.7	0.543	25	266	0.471	7.4	0.990	39	305	0.343
2395.2	0.601	9.7	0.830	23	245	1.6	8.7	1.5	36	280	1.2
2395.9	0.513	7.8	0.734	26	225	0.943	7.4	1.3	39	257	0.688
2396.6	0.513	9.1	0.664	28	273	0.826	7.4	1.2	43	312	0.603
2397.3	0.513	11	0.708	28	301	1.2	7.4	1.3	43	344	0.902
2398.0	0.530	8.4	0.655	25	230	1.0	7.6	1.2	38	263	0.738
2398.7	0.570	9.7	0.520	24	236	0.905	8.2	0.948	37	270	0.660
2399.4	0.513	12	0.903	31	261	1.4	7.4	1.6	47	299	1.0
2400.1	0.734	12	0.859	28	279	1.2	11	1.6	43	319	0.871
2400.8	0.513	9.8	0.764	26	264	0.555	7.4	1.4	40	302	0.405
2401.5	0.513	11	0.794	22	262	0.869	7.4	1.4	34	300	0.634
2402.2	0.513	9.8	0.771	23	258	1.0	7.4	1.4	35	295	0.751
2402.9	0.513	12	0.690	26	237	0.174	7.4	1.3	40	271	0.127
2403.6	0.513	8.5	0.576	20	253	0.987	7.4	1.1	31	289	0.720
2404.3	0.513	12	0.726	26	263	0.991	7.4	1.3	39	301	0.723
2405.0	0.513	13	0.680	25	258	0.989	7.4	1.2	38	295	0.722
2405.7	0.513	11	0.585	20	236	0.791	7.4	1.1	30	270	0.577
2406.4	0.513	10	0.405	21	259	0.923	7.4	0.738	33	296	0.673
2407.1	0.526	11	0.798	19	261	0.826	7.6	1.5	29	299	0.603
2407.8	0.513	9.1	0.313	16	208	0.316	7.4	0.571	24	238	0.231
2408.5	0.513	9.6	0.516	21	242	0.807	7.4	0.940	33	277	0.589
2409.2	0.513	8.4	0.596	17	242	0.587	7.4	1.1	27	277	0.428
2409.9	0.513	10	0.670	19	274	0.603	7.4	1.2	29	313	0.440
2410.6	0.513	8.0	0.675	17	254	0.828	7.4	1.2	26	291	0.604
2411.3	0.513	9.0	0.651	22	240	0.825	7.4	1.2	34	274	0.602
2412.0	0.513	8.9	0.609	17	236	0.915	7.4	1.1	26	270	0.668
2412.7	0.513	9.5	0.285	19	228	0.965	7.4	0.520	29	260	0.704
2413.4	0.513	9.5	0.505	18	277	0.475	7.4	0.920	28	317	0.346
2414.1	0.621	9.0	0.253	17	241	0.584	9.0	0.461	25	275	0.426
2414.8	0.513	8.4	0.248	16	244	0.886	7.4	0.453	25	279	0.647
2415.5	0.513	8.4	0.351	21	258	0.802	7.4	0.640	33	295	0.585
2416.2	0.513	8.2	0.333	16	259	1.6	7.4	0.606	24	296	1.2
2416.9	0.513	8.9	0.504	19	278	1.2	7.4	0.920	29	318	0.868
2417.6	0.513	8.6	0.379	18	241	1.0	7.4	0.691	27	276	0.731
2418.3	0.653	9.5	0.202	13	257	1.0	9.4	0.368	20	293	0.764
2419.0	0.513	8.9	0.356	18	299	0.919	7.4	0.649	27	342	0.670
2419.6	0.513	11	0.547	17	265	1.3	7.4	0.997	25	303	0.941
2420.3	0.513	7.7	0.238	13	295	0.830	7.4	0.434	19	337	0.606
2421.0	0.513	7.7	0.334	18	305	0.900	7.4	0.609	27	348	0.657
2421.7	0.513	9.1	0.339	15	274	0.876	7.4	0.618	23	313	0.639
2422.4	0.513	11	0.481	17	264	1.9	7.4	0.877	26	302	1.4
2423.1	0.513	10	0.296	19	299	0.880	7.4	0.541	29	342	0.642
2423.8	0.513	8.9	0.359	15	273	0.864	7.4	0.655	22	312	0.630
2424.5	0.513	10	0.455	17	266	0.590	7.4	0.830	26	304	0.430
2425.2	0.513	7.1	0.420	17	267	0.957	7.4	0.765	26	305	0.698
2425.9	0.513	8.5	0.163	14	257	0.875	7.4	0.296	22	294	0.638
2426.6	0.513	8.9	0.465	18	255	0.907	7.4	0.849	28	292	0.662
2427.3	0.513	11	0.816	17	255	1.1	7.4	1.5	27	291	0.774
2428.0	0.513	8.7	0.692	19	262	1.8	7.4	1.3	30	300	1.3
2428.7	0.513	8.5	0.680	17	251	1.4	7.4	1.2	27	288	1.0



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2429.4	0.513	9.4	0.418	16	247	1.0	7.4	0.763	24	283	0.766
2430.1	0.513	8.1	0.494	18	223	0.986	7.4	0.902	27	255	0.719
2430.8	0.513	6.6	0.319	13	247	0.861	7.4	0.583	20	282	0.629
2431.5	0.513	8.3	0.539	16	297	0.879	7.4	0.983	24	340	0.641
2432.2	0.513	9.9	0.788	15	274	0.911	7.4	1.4	24	314	0.665
2432.9	1.4	11	0.281	20	266	1.0	21	0.513	30	304	0.745
2433.6	0.513	9.5	0.467	19	239	0.883	7.4	0.852	29	273	0.644
2434.3	0.513	8.6	0.329	18	254	0.669	7.4	0.600	27	290	0.488
2435.0	0.513	9.8	0.703	21	281	0.959	7.4	1.3	32	321	0.700
2435.7	0.513	7.9	0.659	20	328	0.958	7.4	1.2	30	375	0.699
2436.4	0.513	10	0.414	21	236	0.898	7.4	0.756	33	270	0.655
2437.1	0.660	10	0.357	20	289	0.769	9.5	0.651	31	331	0.561
2437.8	0.513	8.5	0.630	18	230	0.946	7.4	1.1	27	263	0.690
2438.5	0.513	8.8	0.524	17	236	1.3	7.4	0.955	25	270	0.932
2439.2	0.513	9.1	0.503	19	246	1.5	7.4	0.918	29	282	1.1
2439.9	0.513	8.6	5.5	21	255	0.658	7.4	10	32	291	0.480
2440.6	0.513	8.1	0.531	19	275	1.4	7.4	0.968	30	314	1.0
2441.3	0.513	7.7	0.637	19	300	0.833	7.4	1.2	30	343	0.608
2442.0	0.513	9.8	0.510	18	263	0.905	7.4	0.930	28	301	0.661
2442.7	0.513	12	0.485	17	259	0.298	7.4	0.884	26	297	0.217
2443.4	0.513	9.5	0.472	15	267	0.744	7.4	0.861	23	305	0.543
2444.1	0.513	9.2	0.489	18	277	0.924	7.4	0.892	28	317	0.674
2444.8	0.513	9.5	0.481	13	236	0.522	7.4	0.877	20	270	0.380
2445.5	0.513	9.0	0.477	14	303	0.986	7.4	0.870	21	347	0.719
2446.1	0.513	9.2	0.554	16	267	0.674	7.4	1.0	25	306	0.492
2446.8	0.513	9.2	0.725	18	272	0.767	7.4	1.3	28	311	0.560
2447.5	0.513	9.5	0.437	18	245	0.994	7.4	0.797	27	280	0.725
2448.2	0.513	8.9	0.365	14	293	0.928	7.4	0.666	22	336	0.677
2448.9	0.513	11	0.419	16	273	0.860	7.4	0.765	24	312	0.627
2449.6	0.513	8.9	0.478	15	279	1.2	7.4	0.872	23	320	0.896
2450.3	0.513	10	0.408	20	265	0.784	7.4	0.745	30	304	0.572
2451.0	0.513	9.1	0.253	16	263	0.994	7.4	0.462	24	301	0.725
2451.7	0.513	8.2	0.496	15	289	0.628	7.4	0.905	24	331	0.458
2452.4	0.513	8.1	0.343	18	342	1.3	7.4	0.626	28	391	0.937
2453.1	0.513	8.4	0.457	17	279	1.1	7.4	0.834	27	320	0.828
2453.8	0.513	9.6	0.532	16	261	1.4	7.4	0.971	24	298	1.0
2454.5	0.513	9.9	0.680	14	283	0.591	7.4	1.2	22	323	0.432
2455.2	0.513	7.5	0.377	19	310	1.2	7.4	0.688	29	355	0.861
2455.9	0.513	9.3	0.677	15	318	1.1	7.4	1.2	22	363	0.791
2456.6	0.513	9.2	0.349	15	314	1.2	7.4	0.636	23	359	0.893
2457.3	0.513	8.0	0.480	14	261	1.0	7.4	0.875	21	299	0.762
2458.0	0.513	8.2	0.595	12	265	0.626	7.4	1.1	18	303	0.457
2458.7	0.664	9.0	0.675	17	287	0.804	9.6	1.2	26	328	0.587
2459.4	0.513	7.8	0.349	16	309	1.1	7.4	0.636	24	353	0.824
2460.1	0.513	7.8	0.678	17	279	1.3	7.4	1.2	27	320	0.936
2460.8	0.585	9.5	0.597	16	307	1.3	8.5	1.1	25	351	0.951
2461.5	0.513	8.1	0.712	13	317	1.0	7.4	1.3	20	363	0.757
2462.2	0.513	8.9	0.610	18	360	1.1	7.4	1.1	28	412	0.777
2462.9	0.513	9.4	0.569	21	419	0.857	7.4	1.0	32	479	0.626
2463.6	0.513	8.4	0.544	19	442	0.877	7.4	0.992	30	505	0.640
2464.3	0.936	8.2	0.606	22	487	1.0	14	1.1	33	557	0.731
2465.0	0.776	8.0	0.658	21	465	0.478	11	1.2	33	532	0.349
2465.7	1.2	11	0.549	24	623	0.995	18	1.0	36	713	0.726
2466.4	1.2	10	0.837	26	640	1.4	18	1.5	40	732	1.0
2467.1	1.6	8.4	0.831	27	681	1.0	22	1.5	42	779	0.737
2467.8	1.1	8.8	0.969	29	623	1.5	16	1.8	45	713	1.1
2468.5	1.2	11	1.1	24	687	1.6	18	2.1	36	785	1.2
2469.2	0.978	9.0	1.2	25	723	1.8	14	2.1	38	827	1.3
2469.9	0.754	7.9	1.0	33	700	1.3	11	1.9	50	801	0.965
2470.6	0.805	7.6	1.1	23	712	0.861	12	1.9	36	815	0.628
2471.3	1.9	8.5	1.7	27	768	0.882	27	3.0	41	878	0.643
2471.9	1.3	7.1	1.8	35	928	1.9	18	3.2	54	1061	1.4
2472.6	1.9	11	1.3	33	861	0.789	28	2.3	51	985	0.576
2473.3	1.1	9.9	1.2	34	847	1.7	16	2.2	51	969	1.2
2474.0	0.690	9.3	1.2	37	981	1.3	10.0	2.2	56	1122	0.949
2474.7	0.806	8.8	1.3	32	899	1.2	12	2.3	49	1028	0.910
2475.4	1.2	8.8	1.7	32	856	0.885	18	3.0	48	979	0.646
2476.1	0.980	7.5	1.6	30	972	1.6	14	2.8	47	1111	1.2
2476.8	1.0	8.8	1.5	34	1092	1.0	15	2.7	52	1249	0.754
2477.5	0.819	10	1.4	32	1107	1.9	12	2.5	49	1265	1.4
2478.2	1.8	11	1.6	38	1194	1.4	26	2.9	58	1365	1.0
2478.9	1.0	12	1.5	35	1046	2.1	15	2.8	54	1196	1.5
2479.6	0.513	12	1.7	39	1193	1.7	7.4	3.1	60	1364	1.3
2480.3	0.912	9.7	1.5	42	1287	1.8	13	2.7	64	1472	1.3
2481.0	1.1	10	1.7	39	1309	0.962	16	3.1	61	1497	0.702
2481.7	0.859	12	2.0	38	1304	1.4	12	3.7	58	1492	1.0
2482.4	1.0	13	1.6	41	1363	141	15	3.0	63	1558	103
2483.1	0.874	11	1.5	43	1425	1.7	13	2.8	66	1629	1.3
2483.8	1.2	13	1.4	38	1521	1.2	17	2.5	59	1739	0.887
2484.5	1.2	11	2.0	42	1434	1.7	17	3.7	64	1640	1.2
2485.2	1.1	11	1.7	38	1619	1.8	15	3.0	58	1851	1.3



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
2485.9	1.5	13	1.8	42	1356	1.4	21	3.3	64	1550	1.0
2486.6	0.664	12	1.9	38	1311	1.6	9.6	3.6	58	1499	1.2
2487.3	1.0	13	2.0	38	1333	1.3	15	3.7	57	1524	0.982
2488.0	1.6	10.0	1.8	42	1402	2.2	24	3.3	64	1604	1.6
2488.7	1.0	11	1.7	39	1527	1.5	15	3.2	60	1747	1.1
2489.4	0.856	12	1.8	44	1490	1.4	12	3.3	68	1704	1.0
2490.1	0.901	13	1.5	38	1316	1.8	13	2.7	58	1505	1.3
2490.8	0.714	11	1.3	37	1446	2.1	10	2.4	57	1653	1.5
2491.5	0.513	13	1.6	39	1489	1.3	7.4	2.9	59	1702	0.940
2492.2	0.513	14	1.6	46	1514	2.3	7.4	3.0	71	1731	1.7
2492.9	0.579	13	1.8	45	1488	1.8	8.4	3.2	69	1701	1.3
2493.6	0.937	14	1.6	41	1477	1.5	14	3.0	64	1689	1.1
2494.3	1.2	12	2.0	42	1540	1.7	17	3.6	64	1761	1.2
2495.0	0.629	12	1.5	48	1522	1.5	9.1	2.7	74	1740	1.1
2495.7	0.947	13	1.4	39	1503	1.8	14	2.6	59	1719	1.3
2496.4	0.807	12	1.4	46	1614	1.5	12	2.5	71	1846	1.1
2497.1	1.1	12	1.5	41	1433	2.2	16	2.8	63	1639	1.6
2497.7	1.7	15	1.3	44	1640	1.5	24	2.4	67	1876	1.1
2498.4	0.513	14	1.6	46	1705	1.7	7.4	2.9	70	1949	1.2
2499.1	0.949	18	1.9	50	1627	2.1	14	3.4	76	1861	1.5
2499.8	1.1	12	1.5	44	1615	1.4	16	2.8	67	1847	1.0
2500.5	0.513	14	1.5	40	1468	1.2	7.4	2.8	61	1679	0.848
2501.2	0.513	14	1.5	43	1556	1.7	7.4	2.7	65	1779	1.2
2501.9	0.632	14	1.6	43	1398	1.7	9.1	2.8	66	1599	1.2
2502.6	0.605	15	1.3	42	1660	2.4	8.7	2.4	64	1898	1.8
2503.3	0.513	14	1.3	39	1452	1.4	7.4	2.4	60	1660	0.997
2504.0	0.521	17	1.5	38	1405	1.1	7.5	2.7	58	1607	0.798
2504.7	0.513	14	1.3	38	1469	1.6	7.4	2.4	58	1679	1.2
2505.4	0.587	16	1.4	45	1551	1.4	8.5	2.6	69	1773	1.0
2506.1	0.513	14	1.1	35	1286	2.2	7.4	2.0	53	1471	1.6
2506.8	0.513	14	1.3	33	1337	1.9	7.4	2.4	50	1529	1.4
2507.5	0.540	12	1.2	38	1430	2.2	7.8	2.1	58	1636	1.6
2508.2	0.819	15	0.981	30	1338	1.6	12	1.8	46	1530	1.2
2508.9	0.541	14	0.884	32	1316	1.5	7.8	1.6	50	1505	1.1
2509.6	0.619	14	0.947	35	1247	1.4	8.9	1.7	54	1426	0.988
2510.3	0.513	14	0.960	32	1284	1.3	7.4	1.7	49	1468	0.915
2511.0	0.520	12	0.790	32	1311	1.8	7.5	1.4	48	1499	1.3
2511.7	0.606	14	0.726	28	1024	1.5	8.7	1.3	42	1171	1.1
2512.4	0.513	15	0.675	27	1431	3.1	7.4	1.2	41	1636	2.3
2513.1	0.513	12	0.629	28	1199	2.1	7.4	1.1	42	1371	1.5
2513.8	0.513	11	0.723	25	1163	1.6	7.4	1.3	39	1329	1.2
2514.5	0.608	13	0.877	25	1209	2.0	8.8	1.6	38	1382	1.4
2515.2	0.634	12	0.432	24	1135	2.5	9.2	0.788	37	1298	1.8
2515.9	0.612	13	0.835	30	1057	1.4	8.8	1.5	46	1209	1.0
2516.6	0.773	14	0.722	26	1133	2.1	11	1.3	40	1296	1.5
2517.3	0.513	11	0.709	25	1094	2.0	7.4	1.3	38	1251	1.4
2518.0	0.513	13	0.536	24	1117	0.835	7.4	0.978	37	1278	0.609
2518.7	1.5	13	1.1	27	1060	1.1	21	2.1	41	1213	0.830
2519.4	1.2	13	0.688	24	1135	2.3	17	1.3	37	1298	1.7
2520.1	0.775	13	0.643	26	1079	2.7	11	1.2	40	1233	2.0
2520.8	2.3	11	0.717	24	1156	1.9	33	1.3	36	1321	1.4
2521.5	1.9	12	0.886	24	1184	2.0	27	1.6	37	1354	1.5
2522.2	1.3	10	0.913	25	1040	2.4	19	1.7	38	1189	1.7
2522.9	2.0	12	1.2	27	1112	1.8	29	2.1	41	1272	1.3
2523.6	1.9	10	0.961	25	1116	2.4	28	1.8	38	1277	1.7
2524.2	1.7	9.8	1.0	23	982	1.8	24	1.9	36	1123	1.3
2524.9	2.1	11	0.773	22	1115	2.2	31	1.4	33	1275	1.6
2525.6	2.5	12	0.970	22	999	2.0	36	1.8	34	1142	1.5
2526.3	1.7	13	1.6	36	1155	1.9	24	2.9	56	1321	1.4
2527.0	1.4	11	1.9	27	1275	2.1	20	3.5	41	1458	1.5
2527.7	2.6	11	1.4	22	1004	1.6	37	2.6	34	1149	1.1
2528.4	2.7	12	2.1	33	1351	2.4	38	3.9	51	1545	1.8
2529.1	3.0	13	2.4	33	1244	2.6	43	4.4	51	1423	1.9
2529.8	2.8	10	2.0	30	1144	2.2	40	3.6	47	1308	1.6
2530.5	1.9	11	1.8	30	1148	2.7	27	3.3	47	1313	2.0
2531.2	3.2	9.0	2.2	26	1153	3.0	47	4.0	40	1318	2.2
2531.9	3.1	11	2.5	29	1246	2.1	45	4.5	45	1425	1.5
2532.6	2.6	12	1.9	30	1091	3.2	38	3.4	45	1248	2.3
2533.3	2.0	12	2.3	31	1316	3.1	29	4.3	48	1505	2.3
2534.0	3.5	9.7	2.3	33	1320	2.5	51	4.3	50	1510	1.8
2534.7	3.4	11	2.9	31	1434	3.2	49	5.2	48	1639	2.4
2535.4	2.1	12	3.2	40	1561	4.2	31	5.9	61	1785	3.1
2536.1	2.7	11	2.9	36	1250	2.7	39	5.4	55	1430	2.0
2536.8	3.3	14	2.9	38	1402	2.7	48	5.3	59	1603	2.0
2537.5	2.4	12	3.8	29	1502	3.0	35	6.9	44	1717	2.2
2538.2	3.7	11	3.4	31	1264	2.5	54	6.2	47	1445	1.8
2538.9	3.3	11	2.7	36	1573	3.4	48	4.9	55	1799	2.5
2539.6	2.1	10	3.5	36	1587	3.3	30	6.3	55	1815	2.4
2540.3	3.7	12	3.2	36	1532	3.1	54	5.8	55	1752	2.3
2541.0	2.9	9.7	3.0	35	1488	3.9	42	5.4	53	1701	2.9
2541.7	2.9	13	3.5	36	1742	3.5	41	6.5	56	1991	2.6



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2542.4	2.4	13	3.4	37	1617	2.8	35	6.2	57	1850	2.0
2543.1	3.0	12	3.0	39	1587	2.9	43	5.5	59	1815	2.1
2543.8	2.8	11	3.5	41	1681	3.5	41	6.4	63	1922	2.6
2544.5	1.9	10	2.8	27	1364	2.7	27	5.1	42	1560	2.0
2545.2	2.8	9.8	3.7	37	1543	2.7	40	6.8	56	1764	2.0
2545.9	3.2	14	3.4	41	1784	2.6	46	6.3	63	2040	1.9
2546.6	2.7	13	3.2	39	1484	2.1	39	5.8	60	1697	1.5
2547.3	2.5	12	3.5	36	1774	2.4	36	6.5	55	2028	1.7
2548.0	2.3	11	3.2	31	1872	3.3	34	5.8	48	2140	2.4
2548.7	3.0	15	3.6	36	1610	1.9	44	6.5	55	1841	1.4
2549.4	2.4	14	2.7	47	1813	3.1	35	4.9	72	2074	2.3
2550.1	2.7	13	3.3	42	1740	3.4	39	6.0	64	1989	2.5
2550.8	2.6	13	3.1	41	2053	2.6	38	5.6	63	2348	1.9
2551.4	2.5	15	4.3	45	1939	3.5	36	7.8	68	2217	2.5
2552.1	1.8	14	4.0	35	1745	3.4	26	7.3	53	1995	2.5
2552.8	2.3	15	3.7	39	1716	4.5	33	6.8	60	1962	3.3
2553.5	1.7	13	3.4	48	1607	2.6	25	6.1	73	1838	1.9
2554.2	1.6	15	3.5	42	1686	3.6	24	6.4	65	1928	2.7
2554.9	1.6	18	3.4	45	1640	3.5	23	6.2	69	1876	2.6
2555.6	1.8	13	3.2	36	1650	2.1	26	5.9	56	1886	1.5
2556.3	2.2	17	3.4	42	1880	3.3	31	6.1	64	2150	2.4
2557.0	1.4	16	3.0	39	1633	3.0	20	5.5	60	1868	2.2
2557.7	2.0	14	2.9	46	1658	3.0	29	5.4	70	1896	2.2
2558.4	1.1	11	2.9	34	1662	2.4	16	5.3	52	1901	1.8
2559.1	1.8	14	3.4	48	1569	2.8	26	6.2	74	1794	2.0
2559.8	1.6	15	2.8	42	1590	3.0	23	5.1	65	1818	2.2
2560.5	1.4	14	3.1	44	1446	2.6	20	5.6	67	1654	1.9
2561.2	1.1	11	2.9	42	1634	2.7	17	5.3	64	1868	2.0
2561.9	1.6	14	2.6	38	1575	3.4	22	4.7	58	1801	2.5
2562.6	1.6	17	3.1	40	1852	3.5	24	5.7	62	2118	2.6
2563.3	1.2	13	3.1	38	1388	2.4	17	5.6	58	1587	1.8
2564.0	0.513	15	2.4	37	1409	2.1	7.4	4.4	56	1611	1.5
2564.7	0.906	13	2.4	37	1446	3.0	13	4.4	57	1653	2.2
2565.4	0.769	13	2.8	36	1570	3.5	11	5.2	56	1795	2.6
2566.1	1.0	14	2.3	39	1636	3.2	15	4.1	59	1871	2.3
2566.8	0.513	15	2.9	43	1562	2.9	7.4	5.3	66	1786	2.1
2567.5	0.513	11	2.4	35	1354	2.0	7.4	4.4	53	1549	1.5
2568.2	0.513	11	2.1	30	1398	2.1	7.4	3.8	47	1599	1.5
2568.9	0.513	12	2.6	33	1759	2.8	7.4	4.7	51	2012	2.0
2569.6	0.513	14	1.9	32	1315	2.6	7.4	3.4	49	1503	1.9
2570.3	0.523	11	1.8	29	1302	2.8	7.6	3.3	45	1489	2.1
2571.0	0.513	12	1.5	30	1334	1.7	7.4	2.7	46	1525	1.2
2571.7	0.513	13	1.7	25	1205	2.3	7.4	3.0	39	1377	1.7
2572.4	0.665	14	1.4	30	1455	2.6	9.6	2.5	46	1664	1.9
2573.1	0.661	14	1.2	30	1200	0.866	9.5	2.2	47	1373	0.632
2573.8	0.513	15	1.7	31	1244	1.9	7.4	3.1	47	1422	1.4
2574.5	0.592	13	1.5	27	1299	1.8	8.6	2.8	41	1485	1.3
2575.2	0.513	13	1.7	25	1167	2.5	7.4	3.0	38	1335	1.8
2575.9	0.513	11	1.4	26	1113	2.0	7.4	2.5	40	1273	1.5
2576.6	0.513	10	1.1	20	1225	2.5	7.4	2.0	31	1401	1.8
2577.2	0.513	8.6	1.1	20	981	1.1	7.4	2.0	31	1122	0.787
2577.9	0.513	10	1.3	20	1108	2.7	7.4	2.4	31	1267	2.0
2578.6	0.513	12	1.2	25	1154	1.8	7.4	2.1	38	1319	1.3
2579.3	0.513	9.7	0.938	23	1127	1.5	7.4	1.7	35	1289	1.1
2580.0	0.513	11	0.831	23	1034	1.8	7.4	1.5	36	1182	1.3
2580.7	0.513	8.9	0.903	20	1117	1.9	7.4	1.6	31	1277	1.4
2581.4	0.513	10.0	0.691	20	1072	1.6	7.4	1.3	31	1226	1.2
2582.1	0.513	12	0.847	21	1202	2.0	7.4	1.5	32	1374	1.5
2582.8	0.513	10.0	0.747	18	949	1.7	7.4	1.4	27	1086	1.2
2583.5	0.513	9.5	0.787	18	985	1.7	7.4	1.4	28	1126	1.3
2584.2	0.513	9.0	0.538	16	1044	1.1	7.4	0.982	25	1194	0.796
2584.9	0.513	7.5	0.628	16	1030	1.2	7.4	1.1	25	1178	0.850
2585.6	0.513	9.5	0.568	19	1029	1.7	7.4	1.0	29	1177	1.2
2586.3	0.513	8.8	0.565	14	949	0.791	7.4	1.0	22	1085	0.577
2587.0	0.513	9.5	0.552	18	966	1.3	7.4	1.0	27	1105	0.943
2587.7	0.513	8.8	0.549	15	954	1.5	7.4	1.0	23	1091	1.1
2588.4	0.513	7.9	0.663	17	895	1.8	7.4	1.2	25	1023	1.3
2589.1	0.513	8.6	0.707	15	1084	1.6	7.4	1.3	23	1240	1.2
2589.8	0.513	9.7	0.395	17	967	1.4	7.4	0.721	26	1106	1.0
2590.5	0.513	7.3	0.603	18	1021	2.0	7.4	1.1	27	1168	1.5
2591.2	0.513	8.9	0.659	14	1138	1.5	7.4	1.2	22	1301	1.1
2591.9	0.513	11	0.418	16	1066	2.1	7.4	0.763	25	1219	1.5
2592.6	0.513	8.0	0.720	18	1051	1.9	7.4	1.3	28	1202	1.4
2593.3	0.513	9.3	0.449	16	1143	1.7	7.4	0.819	25	1307	1.2
2594.0	0.513	8.1	0.417	15	1023	2.2	7.4	0.760	23	1170	1.6
2594.7	0.999	8.7	0.641	14	1146	1.5	14	1.2	22	1311	1.1
2595.4	0.513	8.2	0.441	18	1044	1.6	7.4	0.805	27	1194	1.2
2596.1	0.513	8.4	0.431	15	1058	2.4	7.4	0.785	23	1210	1.8
2596.8	0.559	7.9	0.451	13	1288	2.0	8.1	0.822	20	1473	1.4
2597.5	0.513	7.7	0.619	16	1188	2.1	7.4	1.1	24	1358	1.6
2598.2	0.513	7.5	0.766	13	1150	2.3	7.4	1.4	21	1315	1.7



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Sample ID: 014

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2598.9	0.513	11	1.1	17	1337	2.1	7.4	2.0	25	1529	1.5
2599.6	0.660	7.8	0.683	16	1299	1.8	9.5	1.2	24	1485	1.3
2600.3	0.513	11	0.440	15	1284	1.8	7.4	0.802	23	1469	1.3
2601.0	0.513	9.8	0.668	13	1312	2.8	7.4	1.2	21	1501	2.1
2601.7	0.513	12	0.767	17	1328	2.1	7.4	1.4	26	1519	1.5
2602.4	0.513	9.9	0.966	19	1337	1.9	7.4	1.8	30	1529	1.4
2603.0	0.513	8.6	0.674	14	1230	1.1	7.4	1.2	21	1406	0.782
2603.7	0.513	10	0.690	17	1309	2.6	7.4	1.3	27	1496	1.9
2604.4	0.513	9.7	0.503	16	1311	1.4	7.4	0.918	24	1500	1.0
2605.1	0.540	12	0.578	16	1480	2.5	7.8	1.1	25	1692	1.8
2605.8	0.513	8.6	0.510	16	1263	1.7	7.4	0.931	25	1444	1.2
2606.5	0.513	12	0.538	16	1272	2.0	7.4	0.981	24	1454	1.4
2607.2	0.564	13	0.856	15	1364	2.5	8.1	1.6	23	1560	1.8
2607.9	0.513	11	0.622	14	1208	1.8	7.4	1.1	22	1381	1.3
2608.6	0.513	11	0.728	18	1193	2.0	7.4	1.3	27	1364	1.4
2609.3	0.513	9.8	0.747	14	1172	2.4	7.4	1.4	21	1341	1.7
2610.0	0.515	12	0.801	15	1279	3.0	7.4	1.5	24	1462	2.2
2610.7	0.513	8.6	0.697	16	1319	2.3	7.4	1.3	24	1508	1.7
2611.4	0.513	12	0.962	16	1269	2.2	7.4	1.8	24	1451	1.6
2612.1	0.513	10	0.804	15	1207	2.2	7.4	1.5	23	1380	1.6
2612.8	0.513	8.1	0.539	14	1059	1.1	7.4	0.983	22	1211	0.797
2613.5	0.513	9.1	0.807	16	1244	1.5	7.4	1.5	25	1423	1.1
2614.2	0.517	8.9	0.580	16	1176	1.4	7.5	1.1	25	1345	1.1
2614.9	0.513	9.8	0.563	17	1163	2.4	7.4	1.0	26	1330	1.7
2615.6	0.513	8.3	0.611	15	1182	0.888	7.4	1.1	22	1352	0.648
2616.3	0.513	10	0.666	15	1198	2.4	7.4	1.2	23	1370	1.7
2617.0	0.513	9.4	0.642	14	1094	1.6	7.4	1.2	21	1250	1.2
2617.7	0.513	11	0.494	15	1206	1.8	7.4	0.900	23	1379	1.3
2618.4	0.513	8.6	0.597	14	1131	1.9	7.4	1.1	22	1293	1.4
2619.1	0.513	9.2	0.559	14	1090	1.8	7.4	1.0	21	1246	1.3
2619.8	0.513	8.2	0.791	13	1276	1.7	7.4	1.4	20	1459	1.3
2620.5	0.920	10	0.780	14	1250	1.8	13	1.4	22	1430	1.3
2621.2	0.712	12	0.807	17	1335	2.0	10	1.5	27	1527	1.4
2621.9	1.5	12	0.838	19	1334	1.5	22	1.5	29	1526	1.1
2622.6	0.904	10.0	0.565	15	1258	1.3	13	1.0	23	1439	0.963
2623.3	0.513	12	0.897	17	1369	2.1	7.4	1.6	26	1566	1.6
2624.0	1.2	8.1	0.883	15	1235	1.3	17	1.6	23	1412	0.963
2624.7	0.809	9.1	0.952	15	923	1.6	12	1.7	22	1055	1.2
2625.4	1.1	9.4	0.925	20	1259	1.8	16	1.7	31	1440	1.3
2626.1	0.888	8.8	0.906	14	1189	2.6	13	1.7	22	1360	1.9
2626.8	1.9	10	1.3	19	1351	2.2	27	2.4	28	1544	1.6
2627.5	1.1	8.7	1.4	17	1365	1.8	16	2.6	26	1561	1.3
2628.2	1.3	10.0	1.0	16	1323	2.3	19	1.9	25	1513	1.7
2628.9	1.9	10	1.1	19	1313	2.5	27	2.1	29	1502	1.8
2629.5	1.8	11	1.5	18	1262	2.3	26	2.7	27	1444	1.7
2630.2	1.3	10	1.3	19	1213	3.0	19	2.4	29	1387	2.2
2630.9	2.0	7.6	1.3	17	1315	2.3	29	2.3	27	1503	1.7
2631.6	1.9	11	1.4	19	1206	1.9	28	2.6	29	1379	1.4
2632.3	1.2	9.8	0.812	19	1265	2.5	18	1.5	29	1447	1.8
2633.0	1.0	7.9	1.2	20	1391	2.8	15	2.3	30	1590	2.1
2633.7	1.7	11	1.4	19	1360	2.7	25	2.6	29	1556	2.0
2634.4	1.8	11	1.3	19	1288	2.2	27	2.4	29	1473	1.6
2635.1	1.5	12	1.6	23	1386	2.5	21	2.9	35	1584	1.9
2635.8	1.1	10	1.3	21	1373	2.2	15	2.3	32	1570	1.6
2636.5	1.5	12	1.5	23	1509	3.1	22	2.7	35	1725	2.3
2637.2	0.981	12	1.3	19	1292	2.9	14	2.4	30	1477	2.1
2637.9	2.0	9.7	1.4	21	1585	3.2	29	2.6	32	1812	2.3
2638.6	1.6	13	1.4	26	1443	2.2	23	2.5	40	1650	1.6
2639.3	0.935	11	1.5	18	1475	3.2	14	2.8	28	1686	2.3
2640.0	1.2	12	1.3	18	1289	2.2	18	2.3	27	1474	1.6
2640.7	1.7	12	1.4	21	1360	2.8	25	2.6	32	1555	2.1
2641.4	1.4	12	1.5	21	1432	2.8	20	2.8	33	1637	2.0
2642.1	1.4	13	1.3	19	1310	1.9	20	2.4	30	1498	1.4
2642.8	1.4	12	1.0	15	1269	2.1	20	1.9	23	1451	1.5
2643.5	0.956	10.0	1.1	19	1317	1.7	14	2.0	29	1506	1.2
2644.2	2.2	12	0.939	19	1391	2.1	32	1.7	29	1590	1.5
2644.9	1.5	13	1.3	23	1357	2.5	22	2.4	36	1552	1.8
2645.6	1.1	11	0.901	19	1260	2.4	16	1.6	29	1441	1.8
2646.3	0.772	12	0.987	14	1229	1.2	11	1.8	21	1405	0.856
2647.0	1.5	15	1.1	15	1297	2.0	22	1.9	24	1483	1.4
2647.7	0.966	13	0.838	16	1147	1.8	14	1.5	25	1311	1.3
2648.4	1.1	11	1.3	20	1276	2.2	16	2.3	31	1459	1.6
2649.1	0.991	10	1.1	15	1220	2.9	14	2.0	24	1395	2.1
2649.8	1.8	9.7	1.3	16	1268	2.2	26	2.4	25	1450	1.6
2650.5	1.5	11	1.2	16	1118	1.5	22	2.3	25	1279	1.1
2651.2	1.1	11	1.1	18	1320	1.8	15	2.0	28	1509	1.3
2651.9	0.965	12	0.943	17	1242	1.9	14	1.7	25	1420	1.4
2652.6	1.1	9.5	1.1	15	1081	1.5	16	2.0	23	1236	1.1
2653.3	1.1	8.1	0.802	15	1031	1.3	16	1.5	23	1179	0.970
2654.0	0.565	9.3	0.698	14	1215	1.5	8.2	1.3	21	1389	1.1
2654.7	2.0	12	0.937	16	1259	2.6	30	1.7	24	1439	1.9



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2655.4	1.1	11	0.756	16	1236	2.1	16	1.4	24	1413	1.5
2656.0	0.715	11	0.978	17	1309	2.1	10	1.8	26	1497	1.5
2656.7	1.2	11	1.2	12	1356	2.4	18	2.2	18	1551	1.7
2657.4	1.3	12	1.2	18	1372	2.2	19	2.2	27	1569	1.6
2658.1	1.4	10	1.1	14	1236	2.6	20	2.0	21	1413	1.9
2658.8	1.2	11	1.1	12	1291	2.9	17	2.0	19	1477	2.1
2659.5	1.8	9.6	1.1	18	1423	2.5	26	2.1	28	1627	1.8
2660.2	1.9	10	1.1	15	1290	2.2	27	2.0	24	1475	1.6
2660.9	1.3	10	1.2	16	1390	2.9	19	2.2	25	1590	2.1
2661.6	1.4	12	1.1	17	1451	3.1	20	2.1	27	1659	2.3
2662.3	0.739	12	1.1	13	1368	2.5	11	2.0	20	1565	1.8
2663.0	1.2	10	0.995	14	1311	2.0	17	1.8	22	1499	1.4
2663.7	0.845	9.8	1.2	14	1388	2.7	12	2.2	21	1587	2.0
2664.4	0.513	11	1.1	14	1393	3.3	7.4	2.0	22	1593	2.4
2665.1	0.686	8.0	1.2	14	1256	2.3	9.9	2.1	21	1436	1.7
2665.8	1.0	9.7	0.773	16	1327	1.8	15	1.4	25	1517	1.3
2666.5	0.924	10	0.956	14	1449	3.2	13	1.7	22	1657	2.4
2667.2	1.1	12	1.2	12	1345	2.2	16	2.2	19	1538	1.6
2667.9	0.896	11	1.1	14	1393	2.2	13	2.0	21	1593	1.6
2668.6	1.1	13	0.992	14	1189	2.5	16	1.8	22	1359	1.8
2669.3	0.513	11	0.947	15	1260	2.3	7.4	1.7	23	1440	1.7
2670.0	0.538	13	0.625	13	1472	2.5	7.8	1.1	20	1683	1.9
2670.7	0.945	12	0.570	10	1241	1.9	14	1.0	16	1419	1.4
2671.4	0.900	15	0.610	15	1239	2.0	13	1.1	23	1417	1.4
2672.1	1.2	14	0.821	10	1229	2.2	18	1.5	15	1406	1.6
2672.8	0.513	11	0.717	10	1177	2.4	7.4	1.3	15	1346	1.8
2673.5	0.877	11	0.757	7.8	1110	1.4	13	1.4	12	1269	1.0
2674.2	0.513	13	0.503	11	1123	1.8	7.4	0.917	16	1284	1.3
2674.9	0.797	15	0.698	14	1101	2.6	12	1.3	22	1259	1.9
2675.6	1.2	15	0.568	8.6	996	1.5	18	1.0	13	1139	1.1
2676.3	0.570	20	0.534	10	1085	1.4	8.2	0.974	16	1240	1.0
2677.0	0.513	15	0.665	9.9	1060	1.5	7.4	1.2	15	1213	1.1
2677.7	0.776	15	0.479	10	1280	2.0	11	0.874	16	1464	1.5
2678.4	0.594	21	0.517	8.9	1263	2.1	8.6	0.943	14	1445	1.5
2679.1	0.513	14	0.513	11	997	1.7	7.4	0.935	17	1140	1.2
2679.8	0.513	13	0.700	9.9	1006	2.0	7.4	1.3	15	1150	1.5
2680.5	0.688	18	0.262	4.8	956	1.1	9.9	0.478	7.3	1093	0.825
2681.2	0.944	26	0.569	8.9	1261	4.1	14	1.0	14	1442	3.0
2681.9	0.594	21	0.399	7.7	924	1.5	8.6	0.728	12	1056	1.1
2682.5	0.699	19	0.634	7.7	1035	1.3	10	1.2	12	1183	0.953
2683.2	0.513	18	0.562	9.0	978	1.4	7.4	1.0	14	1118	1.0
2683.9	0.513	18	0.388	7.6	1031	2.0	7.4	0.708	12	1179	1.5
2684.6	1.1	22	0.350	7.4	959	1.2	16	0.639	11	1097	0.888
2685.3	0.524	25	0.525	6.5	1009	1.8	7.6	0.957	10.0	1154	1.3
2686.0	0.808	23	0.327	8.4	1006	1.7	12	0.597	13	1151	1.2
2686.7	0.513	23	0.495	5.7	926	1.3	7.4	0.903	8.7	1059	0.925
2687.4	0.513	22	0.540	6.7	1182	2.0	7.4	0.984	10	1352	1.5
2688.1	0.513	22	0.560	5.5	1084	1.8	7.4	1.0	8.4	1239	1.3
2688.8	0.513	25	0.701	6.4	1084	1.6	7.4	1.3	9.8	1239	1.2
2689.5	0.644	24	0.608	7.0	1015	2.2	9.3	1.1	11	1161	1.6
2690.2	0.513	28	0.493	5.6	907	0.965	7.4	0.899	8.5	1037	0.704
2690.9	0.513	28	0.674	5.7	1065	2.1	7.4	1.2	8.7	1218	1.5
2691.6	0.795	31	0.322	8.0	1058	1.5	11	0.587	12	1210	1.1
2692.3	0.687	32	0.732	8.5	1066	1.4	9.9	1.3	13	1219	1.1
2693.0	0.942	31	0.380	6.0	860	1.3	14	0.694	9.2	984	0.919
2693.7	0.637	30	0.344	7.8	1077	2.0	9.2	0.628	12	1232	1.4
2694.4	1.0	23	0.639	7.3	1006	2.6	15	1.2	11	1150	1.9
2695.1	0.513	29	0.502	6.2	1109	1.4	7.4	0.915	9.5	1268	1.0
2695.8	1.0	31	0.474	6.5	903	1.9	15	0.864	10.0	1033	1.4
2696.5	0.703	28	0.525	7.7	1055	2.2	10	0.957	12	1206	1.6
2697.2	0.799	36	0.621	6.9	1021	1.5	12	1.1	11	1167	1.1
2697.9	0.513	27	0.788	5.9	935	1.9	7.4	1.4	9.1	1069	1.4
2698.6	0.800	30	0.582	7.1	1019	2.2	12	1.1	11	1165	1.6
2699.3	0.513	27	0.646	6.6	984	1.6	7.4	1.2	10	1125	1.2
2700.0	0.513	22	0.505	5.6	992	1.5	7.4	0.921	8.6	1135	1.1
2700.7	0.513	29	0.753	3.7	979	1.3	7.4	1.4	5.7	1120	0.950
2701.4	0.513	30	0.510	4.3	1012	1.0	7.4	0.931	6.6	1157	0.742
2702.1	0.513	26	0.353	4.8	948	1.6	7.4	0.644	7.3	1084	1.2
2702.8	0.513	34	0.617	3.4	875	1.7	7.4	1.1	5.2	1000	1.3
2703.5	0.513	26	0.439	3.7	947	1.3	7.4	0.801	5.6	1083	0.928
2704.2	0.513	25	0.476	4.3	910	1.2	7.4	0.869	6.6	1041	0.855
2704.9	0.513	26	0.307	6.1	963	1.6	7.4	0.560	9.4	1101	1.2
2705.6	0.513	29	0.482	5.7	968	2.3	7.4	0.880	8.7	1107	1.7
2706.3	0.513	33	0.667	5.2	913	1.4	7.4	1.2	8.0	1044	1.0
2707.0	0.513	32	0.309	4.9	810	1.5	7.4	0.563	7.6	926	1.1
2707.7	0.513	31	0.459	4.1	701	2.0	7.4	0.837	6.4	802	1.5
2708.4	0.513	33	0.538	5.7	927	1.3	7.4	0.981	8.7	1060	0.926
2709.0	0.513	31	0.464	4.9	888	1.4	7.4	0.846	7.5	1016	1.0
2709.7	0.513	35	0.654	3.7	826	1.5	7.4	1.2	5.7	944	1.1
2710.4	0.513	36	0.490	5.4	897	1.8	7.4	0.893	8.2	1026	1.3
2711.1	0.513	31	0.402	4.7	775	2.1	7.4	0.734	7.1	886	1.5



Minnow Environmental  
Sample ID: 014

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2711.8	0.513	33	0.361	2.5	945	1.6	7.4	0.659	3.9	1081	1.1
2712.5	0.513	28	0.335	6.2	756	0.774	7.4	0.612	9.5	864	0.565
2713.2	0.513	32	0.730	14	908	2.2	7.4	1.3	22	1038	1.6
2713.9	0.513	29	0.467	2.5	914	1.2	7.4	0.852	3.9	1045	0.902
2714.6	0.513	32	0.391	5.6	848	1.2	7.4	0.713	8.6	970	0.876
2715.3	0.513	32	0.255	6.9	897	2.7	7.4	0.466	11	1026	1.9
2716.0	0.513	36	0.354	3.5	792	1.3	7.4	0.646	5.3	906	0.922
2716.7	0.513	37	0.322	4.5	835	1.4	7.4	0.588	6.9	955	1.0
2717.4	0.513	27	0.563	4.0	761	1.2	7.4	1.0	6.2	870	0.842
2718.1	0.513	26	0.321	2.3	798	1.5	7.4	0.586	3.6	913	1.1
2718.8	0.513	34	0.478	3.0	800	1.9	7.4	0.871	4.7	915	1.4
2719.5	0.513	32	0.567	2.6	737	1.7	7.4	1.0	4.0	843	1.3
2720.2	0.513	40	0.297	4.1	776	1.3	7.4	0.542	6.3	887	0.922
2720.9	0.513	31	0.228	3.7	580	1.1	7.4	0.416	5.6	663	0.783
2721.6	0.513	36	0.363	3.9	771	0.775	7.4	0.662	6.0	881	0.565
2722.3	0.513	30	0.145	2.2	716	1.1	7.4	0.264	3.4	819	0.780
2723.0	0.513	22	0.202	2.7	568	0.209	7.4	0.368	4.1	650	0.152
2723.7	0.513	29	0.327	4.7	704	0.973	7.4	0.597	7.3	805	0.710
2724.4	0.513	20	0.058	2.4	650	0.476	7.4	0.105	3.7	743	0.348
2725.1	0.513	29	0.346	2.3	684	1.1	7.4	0.631	3.6	782	0.783
2725.8	0.513	38	0.180	2.4	785	0.736	7.4	0.328	3.6	898	0.537
2726.5	0.513	37	0.473	3.3	740	0.723	7.4	0.862	5.0	846	0.527
2727.2	0.612	46	0.634	4.2	719	1.1	8.8	1.2	6.5	822	0.777
2727.9	0.513	69	2.1	2.4	655	1.5	7.4	3.8	3.7	749	1.1
2728.6	0.513	117	2.6	3.9	747	0.815	7.4	4.8	6.0	854	0.594
2729.3	0.595	85	1.6	2.6	636	1.0	8.6	3.0	3.9	727	0.755
2730.0	0.513	110	0.762	2.9	613	1.6	7.4	1.4	4.5	701	1.1
2730.7	0.513	47	0.616	5.8	809	0.525	7.4	1.1	8.9	925	0.383
2731.4	0.513	38	0.495	4.7	607	0.650	7.4	0.903	7.2	694	0.474
2732.1	0.513	35	0.498	5.6	681	1.1	7.4	0.909	8.6	779	0.776
2732.8	0.513	35	0.463	3.8	603	0.353	7.4	0.845	5.8	689	0.258
2733.5	0.513	38	1.0	2.5	749	0.739	7.4	1.9	3.9	856	0.539
2734.2	0.513	44	1.0	2.7	695	0.588	7.4	1.9	4.1	794	0.429
2734.8	0.513	42	2.1	5.0	739	2.2	7.4	3.8	7.6	845	1.6
2735.5	0.544	48	0.701	7.2	639	1.1	7.9	1.3	11	731	0.825
2736.2	0.513	45	3.0	6.1	677	2.1	7.4	5.4	9.4	775	1.5
2736.9	0.513	36	0.630	5.3	558	1.2	7.4	1.1	8.2	638	0.844
2737.6	0.513	46	0.513	4.6	658	2.0	7.4	0.935	7.1	752	1.4
2738.3	0.513	41	0.656	5.6	1081	1.4	7.4	1.2	8.5	1236	1.0
2739.0	0.674	40	0.498	4.1	941	1.4	9.7	0.907	6.2	1076	1.0
2739.7	0.513	30	0.292	2.5	532	0.398	7.4	0.533	3.8	608	0.290
2740.4	0.513	50	0.640	4.8	725	0.415	7.4	1.2	7.3	829	0.303
2741.1	0.695	37	0.513	2.3	677	0.960	10	0.936	3.6	774	0.701
2741.8	0.513	48	0.258	4.2	939	1.6	7.4	0.470	6.4	1074	1.1
2742.5	0.513	39	0.723	5.1	826	0.767	7.4	1.3	7.9	945	0.559
2743.2	0.513	50	0.359	9.3	643	2.1	7.4	0.656	14	735	1.5
2743.9	0.513	40	0.472	7.1	1011	0.840	7.4	0.862	11	1156	0.613
2744.6	0.779	35	0.071	2.5	565	0.444	11	0.129	3.8	646	0.324
2745.3	0.513	45	0.153	2.4	755	0.840	7.4	0.278	3.7	863	0.613
2746.0	0.513	40	0.284	4.6	617	1.1	7.4	0.517	7.1	706	0.828
2746.7	0.513	41	0.269	7.2	544	1.6	7.4	0.491	11	622	1.2
2747.4	0.513	27	0.298	0.951	457	0.613	7.4	0.544	1.5	523	0.448
2748.1	0.816	44	0.089	4.6	651	1.4	12	0.162	7.0	745	1.0
2748.8	1.1	72	0.688	3.2	543	0.637	16	1.3	4.8	620	0.465
2749.5	0.513	46	0.269	1.6	668	0.533	7.4	0.491	2.4	763	0.389
2750.2	0.513	55	0.770	3.5	716	1.4	7.4	1.4	5.4	818	1.1
2750.9	0.513	54	0.221	2.9	643	1.6	7.4	0.403	4.5	735	1.2
2751.6	0.513	29	0.264	3.9	496	0.256	7.4	0.481	6.0	567	0.187
2752.3	0.513	48	0.829	9.3	874	0.767	7.4	1.5	14	1000	0.560
2753.0	1.9	50	0.149	8.3	549	0.937	28	0.273	13	628	0.684
2753.7	0.513	64	0.601	1.9	518	0.818	7.4	1.1	2.9	592	0.597
2754.4	0.513	51	0.666	10	587	1.0	7.4	1.2	16	671	0.760
2755.1	0.513	53	0.869	6.6	542	0.009	7.4	1.6	10	620	0.006
2755.8	0.513	43	0.287	8.9	494	1.9	7.4	0.523	14	565	1.4
2756.5	0.576	59	0.599	6.0	551	1.5	8.3	1.1	9.3	630	1.1
2757.2	0.513	69	0.904	10	672	0.602	7.4	1.6	15	769	0.439
2757.9	1.0	42	0.651	6.7	512	0.009	15	1.2	10	585	0.006
2758.6	0.513	75	1.5	7.5	604	0.009	7.4	2.6	12	690	0.006
2759.3	0.513	53	0.523	7.8	408	0.507	7.4	0.955	12	467	0.370
2759.9	0.513	47	0.673	2.7	437	0.916	7.4	1.2	4.2	500	0.668
2760.6	0.513	72	0.058	7.1	438	0.554	7.4	0.105	11	501	0.404
2761.3	0.513	66	1.8	3.2	418	0.009	7.4	3.2	4.8	478	0.006
2762.0	0.513	72	1.4	10	453	0.806	7.4	2.6	16	518	0.588
2762.7	4.5	79	0.531	18	557	0.009	65	0.969	28	637	0.006
2763.4	0.513	43	0.945	11	340	1.1	7.4	1.7	16	389	0.811
2764.1	0.513	92	3.8	17	657	0.009	7.4	6.9	26	752	0.006
2764.8	0.513	86	1.8	0.838	633	2.1	7.4	3.3	1.3	724	1.6



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
0.6	0.997	22	2.5	53	161	2.6	14	4.6	81	184	1.9
1.3	2.0	23	2.6	60	166	2.8	28	4.7	93	189	2.1
2.0	2.1	21	2.1	59	154	1.9	31	3.8	90	176	1.4
2.7	2.4	20	2.2	61	158	2.6	35	4.1	93	181	1.9
3.4	2.4	22	2.5	58	153	2.2	35	4.5	89	175	1.6
4.1	1.5	21	2.2	56	149	2.2	21	3.9	86	171	1.6
4.8	2.3	19	2.5	68	174	2.9	34	4.5	105	199	2.1
5.5	1.8	22	2.7	62	160	2.3	26	5.0	95	183	1.7
6.2	1.6	20	2.2	62	146	2.9	23	4.1	95	167	2.1
6.9	2.5	21	1.8	60	163	3.1	36	3.3	91	186	2.3
7.6	1.8	25	3.0	66	175	2.2	25	5.5	101	200	1.6
8.3	2.8	21	2.8	61	152	3.1	40	5.1	93	174	2.2
9.0	1.3	22	2.6	67	158	2.7	19	4.8	102	181	1.9
9.7	1.8	20	2.2	53	157	2.6	26	4.0	80	180	1.9
10.3	1.9	22	2.5	64	155	2.2	27	4.6	98	178	1.6
11.0	1.5	21	2.9	61	159	2.1	21	5.3	94	182	1.5
11.7	1.8	20	2.0	60	152	2.8	27	3.6	92	174	2.0
12.4	1.9	23	2.4	67	160	2.5	28	4.4	102	182	1.8
13.1	2.1	19	2.3	52	156	2.3	31	4.2	80	179	1.6
13.8	1.3	20	2.5	57	152	2.5	19	4.5	88	174	1.8
14.5	2.5	22	2.2	63	158	2.4	36	3.9	97	181	1.8
15.2	1.8	20	2.3	65	146	1.8	26	4.1	100	167	1.3
15.9	1.5	20	2.7	61	148	3.0	22	4.9	94	170	2.2
16.6	1.4	21	2.6	64	162	2.6	20	4.8	99	185	1.9
17.3	1.8	21	2.6	60	153	2.3	26	4.8	92	175	1.7
18.0	1.7	21	2.6	63	168	2.5	25	4.7	97	192	1.8
18.7	2.0	21	2.5	61	147	2.6	29	4.5	94	169	1.9
19.4	1.6	18	2.5	64	151	4.1	23	4.6	98	172	3.0
20.1	1.5	17	2.3	58	148	3.4	22	4.1	88	169	2.5
20.8	1.4	21	2.5	63	150	1.9	21	4.5	96	171	1.4
21.5	1.4	21	2.2	67	148	2.4	20	3.9	102	169	1.7
22.2	1.2	18	2.4	63	151	2.5	18	4.4	96	172	1.8
22.9	1.1	21	2.4	63	159	2.4	16	4.4	96	181	1.7
23.6	2.0	20	2.7	67	145	3.2	29	5.0	103	166	2.3
24.3	1.9	21	2.4	64	153	2.2	28	4.4	98	175	1.6
25.0	1.7	20	2.0	66	159	2.6	24	3.6	101	182	1.9
25.7	1.2	21	2.6	61	149	1.7	18	4.7	94	170	1.2
26.4	1.7	19	2.7	64	155	2.7	24	4.8	98	177	2.0
27.1	1.7	22	2.2	66	151	1.3	24	4.1	101	172	0.928
27.8	1.6	21	2.7	68	154	2.8	24	4.9	104	176	2.0
28.5	1.7	20	2.4	62	143	2.5	25	4.3	94	163	1.8
29.2	1.7	18	2.7	60	150	2.2	25	5.0	92	171	1.6
29.9	1.7	19	2.3	66	149	1.9	24	4.2	101	171	1.4
30.6	1.2	22	2.4	67	153	3.2	18	4.5	102	175	2.3
31.3	1.8	21	2.8	67	145	2.1	26	5.1	103	166	1.6
32.0	1.5	18	2.8	67	147	2.4	22	5.1	103	168	1.7
32.7	1.3	18	2.3	64	148	2.0	19	4.3	98	169	1.5
33.4	1.9	20	2.2	63	147	1.8	28	4.0	96	168	1.3
34.1	2.4	21	2.4	68	159	2.4	34	4.3	105	182	1.7
34.8	1.6	21	2.5	69	136	2.2	22	4.6	106	155	1.6
35.5	1.5	21	2.3	64	146	2.3	21	4.1	98	167	1.7
36.2	2.0	19	3.1	74	138	1.6	29	5.6	114	158	1.2
36.8	2.4	18	2.8	71	146	2.4	35	5.1	109	167	1.8
37.5	1.5	19	2.9	75	153	1.4	21	5.3	114	175	1.0
38.2	2.4	19	2.5	65	136	1.7	35	4.5	99	155	1.3
38.9	1.7	20	2.6	64	148	1.7	25	4.8	98	169	1.2
39.6	2.5	18	2.7	67	146	1.9	36	5.0	103	167	1.4
40.3	1.5	20	2.7	64	136	1.9	22	5.0	98	155	1.4
41.0	1.6	21	2.8	65	144	2.2	23	5.2	100	165	1.6
41.7	1.9	21	2.4	65	146	2.5	27	4.4	99	167	1.8
42.4	1.4	19	2.9	65	155	2.1	20	5.2	99	177	1.5
43.1	1.4	17	2.6	67	129	2.4	20	4.7	103	148	1.8
43.8	1.5	19	2.6	77	145	2.4	22	4.7	117	166	1.8
44.5	2.0	18	2.4	66	135	1.5	29	4.3	101	155	1.1
45.2	1.2	20	3.3	75	142	1.8	17	6.0	115	162	1.3
45.9	1.5	19	2.7	79	141	2.3	22	4.8	121	161	1.6
46.6	1.5	17	2.4	71	137	2.4	21	4.3	109	157	1.7
47.3	1.2	21	2.7	71	151	1.9	18	4.9	108	172	1.4
48.0	1.5	22	3.2	73	156	2.5	22	5.9	112	178	1.8
48.7	1.9	16	3.1	70	144	2.0	27	5.7	108	165	1.4
49.4	1.4	21	2.7	74	139	1.8	20	4.9	113	159	1.3
50.1	1.9	22	2.8	71	160	2.2	27	5.0	109	183	1.6
50.8	0.961	19	2.7	77	139	2.2	14	4.9	117	159	1.6
51.5	1.1	20	2.3	74	133	2.1	16	4.2	114	152	1.6
52.2	1.0	19	2.7	84	156	2.1	15	5.0	128	179	1.6
52.9	1.5	20	2.4	70	141	2.4	22	4.3	108	162	1.8
53.6	1.7	20	3.0	72	138	1.8	24	5.5	110	158	1.3
54.3	0.802	18	2.8	76	140	3.5	12	5.0	117	160	2.6
55.0	0.809	19	3.0	74	142	1.6	12	5.4	113	162	1.2
55.7	1.1	19	2.8	73	138	2.3	17	5.1	112	158	1.7
56.4	1.8	19	2.8	75	130	2.4	26	5.1	115	149	1.7



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
57.1	1.3	19	2.9	76	130	1.6	19	5.3	116	149	1.2
57.8	2.0	18	3.2	80	131	2.0	29	5.8	123	150	1.5
58.5	1.7	19	2.8	77	140	1.3	25	5.1	118	160	0.948
59.2	1.4	18	3.0	69	121	1.6	21	5.5	106	139	1.2
59.9	1.1	19	2.4	78	142	1.7	16	4.4	119	163	1.2
60.6	1.9	19	2.6	75	139	2.0	27	4.8	115	159	1.4
61.3	1.4	16	2.4	75	127	1.2	20	4.3	115	145	0.875
62.0	1.4	16	2.3	69	123	2.3	20	4.2	105	141	1.7
62.7	1.7	19	3.1	81	128	2.0	25	5.6	124	146	1.4
63.3	1.7	18	3.2	80	136	1.4	24	5.8	123	156	1.0
64.0	2.1	19	3.0	82	137	2.6	31	5.5	125	157	1.9
64.7	1.6	19	2.8	79	134	2.0	23	5.1	121	153	1.5
65.4	0.683	17	3.1	70	127	1.8	9.9	5.7	107	146	1.3
66.1	1.7	18	3.1	81	128	2.4	24	5.6	125	146	1.7
66.8	1.7	19	3.2	77	127	2.2	25	5.8	119	146	1.6
67.5	1.2	18	2.4	71	115	1.9	17	4.4	109	132	1.4
68.2	2.0	20	3.1	76	139	1.8	29	5.6	116	159	1.3
68.9	1.5	18	3.2	79	126	1.4	21	5.9	120	144	1.0
69.6	2.1	19	3.1	87	145	2.1	30	5.7	133	166	1.5
70.3	1.9	18	2.9	83	136	1.7	28	5.3	128	155	1.2
71.0	1.4	17	2.9	78	125	1.8	20	5.3	120	143	1.3
71.7	1.6	19	2.8	84	122	1.6	23	5.1	129	140	1.1
72.4	0.939	17	2.7	81	133	1.5	14	4.9	124	152	1.1
73.1	1.6	16	2.6	72	121	1.4	23	4.8	111	138	0.987
73.8	1.1	19	2.8	83	128	1.6	16	5.0	128	146	1.2
74.5	1.4	22	2.6	82	128	1.4	21	4.8	125	147	1.0
75.2	1.3	17	2.3	73	110	1.1	19	4.3	111	125	0.833
75.9	1.2	20	3.0	85	133	2.3	18	5.4	131	152	1.6
76.6	1.1	18	3.0	90	120	1.3	16	5.5	138	137	0.944
77.3	1.1	18	3.3	87	131	2.3	16	6.1	133	150	1.7
78.0	1.5	16	2.5	79	132	1.3	21	4.6	122	151	0.920
78.7	1.1	20	2.4	85	130	1.8	16	4.5	130	149	1.3
79.4	1.5	19	2.9	77	129	1.5	21	5.4	118	148	1.1
80.1	1.1	21	2.6	80	131	2.3	16	4.7	123	150	1.7
80.8	1.4	19	3.1	93	130	1.8	20	5.7	142	149	1.3
81.5	1.6	18	2.6	85	128	2.3	23	4.7	130	146	1.7
82.2	1.4	17	2.8	74	110	1.2	20	5.2	113	125	0.871
82.9	1.8	17	2.3	73	114	1.6	26	4.1	111	130	1.2
83.6	1.2	17	3.2	79	115	2.0	18	5.8	121	132	1.5
84.3	1.3	17	2.9	87	129	1.9	19	5.3	134	148	1.4
85.0	1.0	17	2.9	81	118	2.6	15	5.4	124	135	1.9
85.7	0.827	18	2.5	76	112	1.9	12	4.5	117	128	1.4
86.4	0.795	18	2.6	76	116	1.5	11	4.8	117	133	1.1
87.1	1.2	18	3.1	86	121	1.9	17	5.7	132	138	1.4
87.8	0.798	17	3.0	79	110	1.7	12	5.4	121	126	1.2
88.5	1.0	19	3.0	92	127	1.3	15	5.5	141	145	0.917
89.1	1.0	17	2.9	82	119	1.2	15	5.3	125	136	0.854
89.8	1.2	20	3.1	91	122	1.3	18	5.7	139	140	0.928
90.5	1.7	18	2.8	87	126	2.2	24	5.2	134	144	1.6
91.2	1.1	16	2.4	90	118	1.7	16	4.4	138	135	1.2
91.9	1.5	17	2.9	81	106	1.7	22	5.3	124	121	1.3
92.6	1.3	17	2.7	85	116	1.8	18	5.0	130	132	1.3
93.3	0.924	17	3.2	77	117	1.2	13	5.8	118	134	0.860
94.0	1.1	20	3.3	92	126	2.4	16	6.1	141	144	1.7
94.7	1.9	18	2.9	93	118	1.7	27	5.2	143	135	1.3
95.4	0.921	15	2.8	76	108	1.2	13	5.0	116	123	0.858
96.1	1.3	18	2.5	85	113	1.9	19	4.5	130	129	1.4
96.8	1.0	18	2.7	96	132	1.2	15	5.0	147	151	0.910
97.5	1.2	19	2.9	81	112	1.2	17	5.2	123	128	0.851
98.2	1.6	18	3.0	87	118	1.6	23	5.4	133	135	1.2
98.9	0.779	17	2.6	77	102	0.972	11	4.7	118	117	0.709
99.6	0.547	17	2.9	87	120	1.9	7.9	5.4	133	138	1.4
100.3	1.1	19	2.4	80	101	1.9	17	4.3	123	115	1.4
101.0	1.2	20	3.2	84	109	1.3	17	5.8	129	125	0.970
101.7	1.4	17	2.4	94	124	1.7	20	4.4	145	141	1.3
102.4	1.5	19	2.3	85	114	0.651	22	4.3	130	131	0.475
103.1	1.1	16	3.1	80	116	1.6	16	5.6	123	133	1.2
103.8	0.613	17	2.6	88	116	1.4	8.8	4.7	135	133	1.0
104.5	1.1	19	3.1	84	116	2.0	15	5.6	129	133	1.4
105.2	0.856	15	2.8	91	114	0.851	12	5.0	139	130	0.621
105.9	1.3	16	3.2	107	127	1.7	19	5.8	164	145	1.2
106.6	1.3	14	2.4	76	109	2.1	18	4.5	116	125	1.6
107.3	0.859	20	2.7	93	133	1.0	12	5.0	143	152	0.761
108.0	0.894	20	3.3	92	117	1.9	13	6.0	141	134	1.4
108.7	0.975	17	2.6	86	114	1.5	14	4.7	131	131	1.1
109.4	0.859	16	2.2	81	116	1.5	12	4.1	125	133	1.1
110.1	1.3	16	2.5	75	102	2.0	19	4.6	115	117	1.4
110.8	1.2	18	2.7	88	125	2.1	18	4.9	134	143	1.6
111.5	0.902	21	2.8	86	109	1.5	13	5.0	131	124	1.1
112.2	1.4	18	2.3	93	116	1.8	20	4.1	143	132	1.3
112.9	1.2	17	2.1	74	112	1.7	18	3.9	114	128	1.2



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.6	1.2	19	2.7	84	121	1.3	18	5.0	128	138	0.955
114.3	1.0	18	3.0	85	112	0.720	15	5.4	131	128	0.525
115.0	1.1	16	2.9	86	111	1.6	15	5.3	131	127	1.2
115.7	1.2	18	3.5	97	127	2.0	17	6.3	149	145	1.5
116.3	0.944	17	2.4	80	111	1.8	14	4.4	123	127	1.3
117.0	1.1	19	2.4	94	134	0.764	16	4.4	145	153	0.557
117.7	0.903	18	2.3	76	108	1.3	13	4.3	117	123	0.980
118.4	0.944	18	3.1	82	123	1.8	14	5.7	126	141	1.3
119.1	1.1	17	2.3	82	117	1.1	16	4.2	126	134	0.810
119.8	0.679	17	2.7	84	119	1.3	9.8	4.8	129	136	0.938
120.5	0.898	18	2.8	83	118	2.0	13	5.1	127	135	1.4
121.2	1.0	18	2.8	85	116	0.950	15	5.1	131	133	0.693
121.9	0.513	15	2.3	81	112	0.550	7.4	4.1	124	128	0.401
122.6	1.1	19	2.9	88	120	1.7	16	5.3	134	137	1.2
123.3	0.977	19	2.9	81	113	1.1	14	5.2	124	129	0.795
124.0	1.7	17	2.6	88	132	1.5	25	4.7	136	151	1.1
124.7	1.1	19	2.5	90	109	1.5	16	4.6	137	125	1.1
125.4	0.554	17	2.8	86	118	1.4	8.0	5.0	132	135	1.0
126.1	1.3	18	2.6	92	117	0.789	19	4.8	140	133	0.576
126.8	0.873	18	2.4	89	109	0.998	13	4.4	136	125	0.728
127.5	0.699	15	2.2	81	108	1.7	10	3.9	125	124	1.2
128.2	1.2	19	3.0	81	116	1.5	17	5.5	124	133	1.1
128.9	0.744	15	3.0	80	110	1.2	11	5.5	122	126	0.891
129.6	1.0	17	2.4	73	102	1.6	15	4.3	112	116	1.2
130.3	1.0	17	2.5	80	105	1.3	15	4.5	123	120	0.973
131.0	1.1	15	2.6	79	110	1.1	16	4.7	121	125	0.773
131.7	0.513	17	3.0	83	119	1.3	7.4	5.4	128	136	0.954
132.4	1.1	18	2.7	87	113	1.1	16	4.9	133	129	0.796
133.1	1.4	16	2.2	76	121	0.879	21	4.0	117	138	0.641
133.8	1.5	17	2.5	86	107	1.5	22	4.6	132	122	1.1
134.5	0.576	20	2.1	83	110	1.9	8.3	3.9	127	126	1.4
135.2	0.876	17	2.4	78	107	0.946	13	4.4	119	123	0.690
135.9	1.0	17	2.8	91	117	1.4	15	5.1	140	133	1.0
136.6	1.0	19	2.7	83	116	1.2	15	5.0	127	133	0.907
137.3	1.3	17	2.6	84	120	1.5	18	4.8	128	137	1.1
138.0	1.3	19	2.5	89	113	1.1	18	4.6	137	130	0.808
138.7	0.702	17	2.7	86	111	1.1	10	4.9	131	127	0.776
139.4	0.987	17	2.3	80	109	1.6	14	4.1	123	124	1.1
140.1	0.855	14	2.3	80	108	1.4	12	4.2	123	123	0.991
140.8	1.3	17	2.8	80	115	2.0	18	5.1	122	131	1.5
141.5	0.669	18	3.0	78	118	1.5	9.7	5.4	120	135	1.1
142.1	0.647	15	2.2	78	108	1.6	9.3	4.0	120	124	1.1
142.8	0.738	14	2.6	75	107	1.1	11	4.7	115	122	0.773
143.5	1.0	19	3.0	77	102	1.3	14	5.5	117	117	0.982
144.2	1.3	19	2.7	83	109	0.752	19	4.9	127	125	0.549
144.9	1.1	20	2.3	83	120	1.4	16	4.3	127	138	1.1
145.6	1.4	20	2.3	81	114	1.3	20	4.3	125	130	0.970
146.3	0.721	16	2.0	79	110	0.797	10	3.7	121	126	0.581
147.0	1.2	17	2.7	81	107	0.899	17	4.9	124	123	0.656
147.7	0.610	19	3.0	87	121	1.4	8.8	5.5	133	138	1.0
148.4	1.3	15	2.5	74	104	1.5	18	4.5	113	119	1.1
149.1	1.1	19	2.7	76	109	1.5	16	5.0	117	125	1.1
149.8	1.1	18	2.7	81	112	1.6	15	4.9	124	129	1.2
150.5	1.2	20	2.6	72	110	1.1	17	4.8	110	125	0.822
151.2	0.676	19	2.9	80	113	1.6	9.8	5.2	122	129	1.2
151.9	0.935	18	2.6	72	108	0.908	13	4.7	111	123	0.663
152.6	0.853	19	2.5	88	111	1.3	12	4.6	134	127	0.917
153.3	1.2	19	2.8	79	112	1.7	17	5.1	122	128	1.3
154.0	0.815	18	2.5	84	126	1.4	12	4.6	128	144	0.985
154.7	1.1	19	2.6	86	107	1.3	16	4.8	132	123	0.973
155.4	0.677	18	2.8	83	111	1.3	9.8	5.2	127	127	0.935
156.1	0.934	17	3.0	86	114	2.0	13	5.5	131	130	1.5
156.8	1.1	17	2.1	74	94	1.1	15	3.7	114	108	0.829
157.5	0.633	19	2.2	79	117	1.3	9.1	3.9	121	133	0.953
158.2	0.946	18	2.6	86	103	1.3	14	4.7	132	117	0.962
158.9	0.783	19	2.1	76	107	1.3	11	3.8	116	123	0.946
159.6	1.3	17	2.3	74	108	0.905	19	4.3	113	123	0.661
160.3	1.1	15	2.5	71	98	1.0	15	4.6	109	112	0.747
161.0	0.564	20	2.8	79	102	1.1	8.1	5.1	121	117	0.789
161.7	0.936	19	2.0	79	110	1.2	14	3.6	121	126	0.872
162.4	0.747	16	2.3	71	99	1.4	11	4.3	109	113	1.0
163.1	0.513	18	2.8	80	104	1.6	7.4	5.1	122	119	1.2
163.8	0.914	17	2.3	73	114	1.5	13	4.2	112	130	1.1
164.5	1.1	20	3.0	83	121	1.4	16	5.6	128	138	1.0
165.2	1.1	18	2.3	80	112	1.5	16	4.2	122	128	1.1
165.9	0.550	20	2.7	69	99	1.5	7.9	4.9	106	114	1.1
166.6	1.0	20	2.3	75	100	1.4	15	4.2	115	115	0.988
167.3	0.612	19	2.9	85	109	1.1	8.8	5.3	130	125	0.789
168.0	0.888	19	2.7	82	108	1.2	13	4.9	125	123	0.876
168.7	0.566	20	2.6	80	103	1.3	8.2	4.8	122	118	0.930
169.3	1.4	20	2.6	80	109	2.2	20	4.7	123	125	1.6



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
170.0	0.544	18	2.7	78	106	1.7	7.8	5.0	119	122	1.2
170.7	0.756	22	2.7	77	113	0.860	11	5.0	119	130	0.627
171.4	1.3	18	2.5	82	106	1.7	19	4.5	126	121	1.3
172.1	0.672	17	2.6	79	104	1.5	9.7	4.7	121	119	1.1
172.8	1.1	19	2.5	74	107	1.3	15	4.6	113	123	0.970
173.5	0.513	17	2.8	77	97	1.6	7.4	5.0	118	111	1.2
174.2	0.650	19	2.5	84	120	1.9	9.4	4.5	129	137	1.4
174.9	1.2	19	2.1	75	102	1.1	17	3.8	115	116	0.810
175.6	0.756	18	2.0	68	98	0.864	11	3.7	104	112	0.630
176.3	0.667	16	2.6	75	104	0.926	9.6	4.7	114	119	0.676
177.0	1.0	20	2.5	73	128	1.5	15	4.6	112	146	1.1
177.7	1.6	21	2.1	84	108	0.975	22	3.9	128	123	0.711
178.4	0.728	16	2.8	72	96	1.1	11	5.1	110	110	0.814
179.1	0.549	21	1.9	79	103	0.971	7.9	3.5	121	117	0.708
179.8	0.533	19	2.2	80	114	1.1	7.7	4.0	123	130	0.813
180.5	1.1	18	2.3	77	97	0.538	16	4.2	119	111	0.392
181.2	1.2	19	2.6	82	116	2.3	17	4.7	126	133	1.7
181.9	0.536	19	2.2	82	97	1.6	7.7	4.0	126	111	1.2
182.6	0.513	16	2.1	74	98	0.750	7.4	3.8	113	111	0.547
183.3	0.973	15	2.2	71	101	1.4	14	4.0	109	115	1.0
184.0	0.741	14	2.4	67	81	1.3	11	4.4	103	93	0.955
184.7	0.851	19	2.5	85	116	1.4	12	4.5	130	133	1.0
185.4	0.513	18	2.1	85	98	0.902	7.4	3.9	130	112	0.658
186.1	0.969	17	2.1	91	108	1.4	14	3.8	139	124	0.999
186.8	1.3	18	2.6	79	115	1.1	19	4.8	120	131	0.769
187.5	1.0	21	2.7	79	108	1.6	15	4.9	120	124	1.2
188.2	1.2	17	2.4	86	102	1.1	17	4.4	131	116	0.804
188.9	0.513	18	2.4	81	97	0.666	7.4	4.4	125	111	0.486
189.6	1.2	16	2.5	79	102	0.797	17	4.6	122	116	0.581
190.3	0.888	18	2.7	72	101	1.0	13	4.9	111	116	0.744
191.0	0.916	20	2.2	86	102	1.3	13	4.0	132	117	0.919
191.7	1.3	19	2.0	79	104	0.607	19	3.6	121	119	0.443
192.4	0.688	18	2.2	68	116	1.1	9.9	4.1	105	133	0.828
193.1	0.844	15	2.2	71	97	1.3	12	4.0	109	111	0.916
193.8	1.1	18	1.8	71	98	1.6	15	3.3	108	112	1.2
194.5	1.2	16	2.0	80	102	1.3	18	3.7	122	116	0.961
195.1	1.3	23	3.0	80	106	1.1	18	5.6	123	121	0.821
195.8	1.4	16	2.2	75	99	0.632	20	4.0	115	113	0.461
196.5	0.576	15	2.2	72	105	1.4	8.3	4.0	110	120	0.990
197.2	0.719	16	2.1	74	99	1.3	10	3.8	114	113	0.927
197.9	0.973	17	2.3	75	94	0.945	14	4.3	115	108	0.689
198.6	0.993	18	2.0	75	91	0.919	14	3.6	115	104	0.670
199.3	0.736	18	2.1	83	114	0.901	11	3.9	127	131	0.657
200.0	0.772	17	2.3	81	93	1.0	11	4.1	123	106	0.746
200.7	1.1	16	2.5	89	106	1.9	16	4.5	136	122	1.4
201.4	1.4	18	1.7	82	103	1.6	20	3.0	125	118	1.1
202.1	0.692	16	2.3	77	107	0.961	10.0	4.2	118	122	0.701
202.8	1.3	19	1.9	68	98	0.938	18	3.4	104	112	0.684
203.5	0.725	18	2.3	75	108	0.940	10	4.2	115	123	0.685
204.2	1.1	20	2.1	82	107	0.734	16	3.7	126	122	0.535
204.9	1.4	19	2.1	76	100	1.4	20	3.8	117	114	1.0
205.6	0.745	18	2.1	70	94	0.790	11	3.8	108	107	0.577
206.3	1.5	14	2.3	70	96	0.939	21	4.3	108	110	0.685
207.0	1.8	18	1.7	73	99	1.6	27	3.1	112	114	1.2
207.7	0.965	16	2.2	74	110	1.4	14	4.0	114	126	1.0
208.4	0.513	16	1.8	75	110	1.2	7.4	3.2	115	126	0.901
209.1	0.837	15	1.8	73	90	0.739	12	3.4	111	103	0.539
209.8	1.4	17	1.8	71	91	0.568	20	3.3	108	104	0.415
210.5	1.1	17	1.9	75	101	1.1	16	3.5	115	115	0.774
211.2	1.5	17	2.1	77	98	0.715	21	3.9	118	112	0.522
211.9	0.859	15	1.9	77	105	1.2	12	3.5	118	120	0.846
212.6	1.3	18	1.5	79	96	1.9	19	2.8	121	110	1.4
213.3	1.2	18	2.0	71	102	0.641	17	3.6	108	116	0.468
214.0	1.3	17	1.7	81	98	1.0	19	3.1	124	112	0.764
214.7	1.6	17	1.7	84	116	0.558	24	3.1	128	132	0.407
215.4	0.911	15	1.5	72	95	1.4	13	2.8	110	108	0.989
216.1	0.982	18	1.9	75	111	0.955	14	3.4	114	127	0.696
216.8	1.5	18	1.9	63	89	0.937	22	3.5	97	102	0.684
217.5	1.7	18	2.1	71	102	0.944	25	3.8	109	116	0.688
218.2	1.5	15	1.5	76	99	0.815	22	2.8	116	113	0.594
218.9	1.1	14	1.9	66	92	0.502	16	3.4	101	105	0.366
219.6	0.659	14	2.1	68	112	0.627	9.5	3.8	103	128	0.457
220.3	1.0	16	1.7	68	103	1.6	15	3.1	105	118	1.1
221.0	1.2	14	1.7	75	100	1.5	18	3.1	115	115	1.1
221.6	0.870	17	1.6	71	108	0.480	13	2.9	108	124	0.351
222.3	1.3	12	1.7	63	102	0.737	19	3.1	96	117	0.538
223.0	0.966	17	1.6	71	100	0.719	14	2.9	109	114	0.524
223.7	1.3	16	2.1	67	95	1.8	19	3.9	102	108	1.3
224.4	0.834	16	1.8	75	99	1.4	12	3.3	114	113	1.0
225.1	0.983	17	1.6	75	109	0.772	14	2.9	115	124	0.563
225.8	1.4	17	1.6	65	94	0.906	20	2.9	100	108	0.661



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.5	1.3	14	1.5	67	100	0.490	19	2.7	102	114	0.357
227.2	1.3	17	1.6	67	103	0.902	18	3.0	102	118	0.658
227.9	1.0	15	1.8	71	101	0.872	15	3.2	109	115	0.636
228.6	1.2	15	1.9	68	107	0.763	17	3.5	105	122	0.556
229.3	1.1	13	1.5	64	93	1.3	15	2.8	98	106	0.937
230.0	1.2	16	2.2	73	100	1.3	17	4.0	113	114	0.971
230.7	0.685	16	1.5	83	104	1.1	9.9	2.7	127	119	0.810
231.4	0.740	17	1.9	72	105	0.906	11	3.5	110	120	0.661
232.1	1.8	16	1.7	66	101	0.716	26	3.1	101	116	0.522
232.8	1.7	16	1.7	71	98	1.0	24	3.1	109	112	0.742
233.5	1.0	13	1.5	65	98	0.812	15	2.7	99	112	0.592
234.2	1.7	16	2.0	81	108	6.1	25	3.7	125	124	4.5
234.9	1.4	15	1.4	67	99	0.364	20	2.5	102	113	0.265
235.6	1.6	17	2.2	75	104	0.776	23	4.0	115	118	0.566
236.3	1.4	13	1.4	62	103	1.1	20	2.6	95	118	0.814
237.0	1.1	17	1.3	64	102	0.782	15	2.4	98	116	0.570
237.7	1.7	19	1.5	68	94	1.2	24	2.7	104	107	0.857
238.4	1.4	16	1.5	66	102	0.925	20	2.7	101	116	0.675
239.1	1.4	13	1.3	58	95	0.962	21	2.4	89	109	0.702
239.8	1.3	13	0.944	53	89	1.1	19	1.7	81	102	0.775
240.5	1.5	15	1.8	66	104	0.872	22	3.4	102	119	0.636
241.2	1.1	17	1.4	72	99	0.878	16	2.6	110	113	0.641
241.9	1.3	15	1.4	57	91	1.0	19	2.5	87	105	0.740
242.6	1.3	17	1.6	64	104	1.1	19	3.0	98	119	0.833
243.3	2.1	16	1.3	65	95	0.722	31	2.4	99	109	0.527
244.0	1.1	14	1.4	68	127	1.2	15	2.5	105	145	0.905
244.7	1.1	15	1.1	56	93	0.617	16	1.9	86	106	0.450
245.4	1.1	14	1.2	58	99	0.812	16	2.2	89	113	0.593
246.1	1.0	14	1.7	56	90	0.985	15	3.0	85	103	0.718
246.8	1.2	16	1.1	74	105	0.748	17	2.0	113	120	0.545
247.4	1.5	13	1.5	65	104	0.640	21	2.8	100	119	0.467
248.1	1.0	16	1.2	61	90	0.865	15	2.2	94	103	0.631
248.8	1.2	15	1.3	61	95	0.915	18	2.4	94	108	0.668
249.5	1.0	14	1.2	54	96	1.1	15	2.2	82	110	0.818
250.2	0.956	16	1.5	57	98	1.1	14	2.7	87	112	0.821
250.9	0.601	17	1.3	58	100	1.5	8.7	2.4	89	114	1.1
251.6	1.4	15	1.2	62	101	0.663	20	2.2	95	115	0.484
252.3	1.3	16	1.2	58	101	0.663	19	2.2	88	115	0.484
253.0	1.9	15	1.4	57	101	1.3	27	2.5	88	115	0.981
253.7	0.753	17	1.4	60	98	0.760	11	2.5	91	112	0.555
254.4	0.760	16	0.974	51	100	0.985	11	1.8	79	114	0.719
255.1	1.0	15	1.1	55	105	1.3	14	2.0	84	120	0.950
255.8	1.1	15	1.2	53	94	0.505	17	2.2	81	108	0.369
256.5	1.2	18	1.3	54	95	1.3	17	2.4	82	109	0.916
257.2	0.814	17	1.4	56	100	0.719	12	2.5	86	114	0.525
257.9	1.7	14	1.7	53	98	0.711	25	3.1	82	112	0.519
258.6	1.3	15	1.5	57	110	1.2	19	2.7	87	125	0.904
259.3	1.0	16	1.2	57	120	0.795	15	2.2	88	137	0.580
260.0	1.6	13	1.4	52	97	1.8	23	2.6	80	111	1.3
260.7	1.3	16	1.1	53	101	1.1	19	2.0	81	116	0.778
261.4	1.3	17	1.3	51	95	0.997	19	2.3	79	108	0.727
262.1	1.5	14	0.896	57	100	0.552	21	1.6	87	115	0.403
262.8	0.788	13	1.3	48	86	1.1	11	2.4	73	98	0.777
263.5	1.1	15	1.5	53	101	1.2	15	2.8	82	115	0.908
264.2	1.6	16	1.1	57	104	1.3	23	1.9	88	119	0.974
264.9	1.2	14	0.874	52	100	0.459	17	1.6	79	114	0.335
265.6	0.878	17	1.6	53	106	0.724	13	2.9	82	121	0.528
266.3	1.3	14	1.5	47	105	0.710	19	2.7	72	120	0.518
267.0	2.3	15	1.1	45	98	1.2	33	2.1	69	112	0.844
267.7	1.1	17	1.1	48	96	0.701	16	1.9	73	110	0.511
268.4	1.5	16	1.4	55	108	0.696	22	2.5	84	124	0.508
269.1	0.598	16	1.4	53	107	1.3	8.6	2.5	81	123	0.912
269.8	0.966	14	1.3	49	100	1.2	14	2.4	75	114	0.852
270.5	0.969	17	1.1	56	112	1.3	14	2.1	86	128	0.956
271.2	0.710	14	1.6	52	118	1.2	10	2.9	79	135	0.840
271.9	1.1	15	1.1	54	102	0.748	16	2.0	83	116	0.546
272.6	1.1	13	1.0	52	101	1.0	16	1.8	80	115	0.762
273.3	1.4	13	0.880	55	92	2.0	20	1.6	84	105	1.5
273.9	0.696	17	1.1	48	106	1.2	10	2.1	73	121	0.898
274.6	2.0	16	0.818	59	114	0.584	29	1.5	90	130	0.426
275.3	0.836	15	1.5	42	98	0.647	12	2.7	64	112	0.472
276.0	1.0	17	1.4	51	108	0.921	15	2.5	78	123	0.672
276.7	1.3	17	1.2	54	121	1.6	18	2.2	82	139	1.1
277.4	1.5	17	0.753	49	95	1.2	22	1.4	75	109	0.874
278.1	0.513	15	0.885	42	89	1.2	7.4	1.6	65	102	0.907
278.8	0.978	15	1.1	47	113	1.0	14	2.0	73	129	0.742
279.5	1.3	15	1.1	47	126	1.2	18	2.0	71	144	0.886
280.2	1.1	14	1.2	46	98	1.2	16	2.2	71	112	0.882
280.9	0.835	15	0.781	47	93	0.885	12	1.4	73	106	0.646
281.6	1.2	15	1.2	45	103	0.990	18	2.2	68	117	0.722
282.3	1.3	15	0.816	42	97	0.389	19	1.5	64	110	0.284



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Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
283.0	0.893	15	0.955	44	112	1.5	13	1.7	68	128	1.1
283.7	1.2	14	0.963	47	100	1.8	17	1.8	72	114	1.3
284.4	0.513	16	1.7	44	100	1.6	7.4	3.0	67	115	1.1
285.1	1.1	17	1.4	50	96	0.814	16	2.6	77	110	0.594
285.8	1.1	15	1.1	49	103	0.645	16	2.0	75	118	0.471
286.5	1.1	13	1.2	38	95	1.2	16	2.2	58	109	0.894
287.2	1.1	14	1.0	47	95	1.6	16	1.9	72	109	1.2
287.9	0.513	15	1.1	45	97	1.7	7.4	2.0	69	111	1.3
288.6	1.3	11	1.1	42	96	0.688	18	2.0	65	109	0.502
289.3	1.000	15	1.2	36	104	1.2	14	2.2	55	118	0.882
290.0	0.665	15	1.4	42	101	1.1	9.6	2.6	65	115	0.792
290.7	0.924	16	0.945	39	96	1.4	13	1.7	61	110	0.993
291.4	0.964	13	1.0	50	103	1.3	14	1.9	76	117	0.981
292.1	1.0	14	0.983	44	102	1.5	15	1.8	67	117	1.1
292.8	0.914	14	1.3	45	104	1.0	13	2.3	69	119	0.736
293.5	1.3	13	1.5	46	114	1.0	19	2.7	71	130	0.760
294.2	1.2	14	1.2	45	106	0.715	17	2.3	69	121	0.522
294.9	1.2	14	1.1	45	96	1.8	17	2.0	69	110	1.3
295.6	1.0	13	1.1	39	96	1.2	15	2.0	60	109	0.877
296.3	0.633	14	0.992	48	139	2.0	9.1	1.8	73	159	1.5
297.0	0.676	16	1.1	45	104	1.7	9.8	1.9	69	119	1.3
297.7	0.870	15	0.936	39	102	1.1	13	1.7	60	116	0.771
298.4	1.3	14	1.4	50	116	0.606	19	2.6	77	132	0.442
299.1	1.4	15	1.3	43	104	1.6	20	2.4	65	119	1.2
299.7	0.802	14	1.3	44	100	1.4	12	2.5	68	114	1.0
300.4	0.804	15	1.4	45	103	0.947	12	2.5	70	118	0.691
301.1	1.2	14	1.4	45	109	1.4	17	2.5	69	124	1.0
301.8	1.3	15	1.2	42	105	1.6	19	2.3	64	120	1.1
302.5	1.1	14	1.2	43	111	1.1	16	2.2	65	127	0.802
303.2	1.7	15	1.2	48	143	1.9	25	2.2	74	163	1.4
303.9	1.1	16	1.3	51	108	1.8	17	2.4	78	124	1.3
304.6	0.704	14	1.2	55	116	1.6	10	2.1	84	133	1.2
305.3	0.522	13	1.2	49	97	1.0	7.5	2.1	75	111	0.741
306.0	0.611	13	1.2	45	100	0.990	8.8	2.1	70	115	0.722
306.7	1.1	20	1.1	54	110	1.2	16	2.1	83	126	0.870
307.4	0.715	15	1.0	38	94	1.2	10	1.9	58	108	0.856
308.1	1.1	13	1.2	44	107	1.5	15	2.2	68	122	1.1
308.8	0.886	17	1.3	47	106	1.9	13	2.4	72	121	1.4
309.5	1.0	14	1.2	44	104	1.3	15	2.3	67	118	0.963
310.2	1.4	16	1.2	45	103	1.5	20	2.2	70	117	1.1
310.9	0.754	17	0.986	43	92	1.2	11	1.8	66	105	0.907
311.6	1.2	12	1.1	49	97	0.454	17	2.0	76	111	0.331
312.3	0.897	13	0.850	43	100	1.8	13	1.6	66	115	1.3
313.0	1.1	14	0.994	39	92	1.9	16	1.8	60	105	1.4
313.7	0.745	14	0.935	48	103	1.8	11	1.7	74	118	1.3
314.4	1.3	17	1.5	43	103	1.0	19	2.7	65	117	0.735
315.1	0.709	14	0.870	43	91	1.3	10	1.6	67	104	0.914
315.8	0.596	12	1.0	41	102	1.1	8.6	1.8	63	117	0.828
316.5	1.6	18	1.3	47	104	1.5	23	2.4	72	119	1.1
317.2	0.986	15	1.5	52	104	1.0	14	2.7	80	118	0.736
317.9	0.773	14	1.2	46	107	1.1	11	2.1	71	122	0.797
318.6	0.513	12	1.4	39	92	0.417	7.4	2.5	59	106	0.304
319.3	1.5	11	1.2	42	88	1.1	21	2.1	64	101	0.793
320.0	0.513	14	0.997	55	105	1.2	7.4	1.8	84	121	0.856
320.7	0.992	15	0.834	49	102	0.964	14	1.5	74	116	0.703
321.4	1.0	16	0.970	52	97	0.972	15	1.8	80	111	0.710
322.1	0.513	16	1.4	51	112	1.1	7.4	2.6	78	128	0.773
322.8	0.738	19	1.2	45	111	1.0	11	2.2	68	127	0.748
323.5	1.1	16	0.888	48	110	1.5	16	1.6	74	126	1.1
324.2	0.513	15	1.5	53	110	1.8	7.4	2.6	81	126	1.3
324.9	0.865	14	1.2	61	104	1.7	12	2.2	94	118	1.2
325.6	0.808	17	1.3	41	97	1.2	12	2.4	62	110	0.846
326.3	1.4	19	1.3	44	106	0.844	20	2.4	67	121	0.615
326.9	1.2	16	1.4	43	99	0.850	17	2.6	66	114	0.620
327.6	0.662	14	0.994	55	104	0.975	9.6	1.8	85	119	0.711
328.3	0.734	15	1.3	51	107	1.3	11	2.3	78	122	0.947
329.0	0.513	15	1.1	39	80	1.2	7.4	2.0	60	91	0.886
329.7	0.763	13	1.5	51	107	1.3	11	2.7	79	123	0.984
330.4	0.784	16	1.4	53	102	0.924	11	2.5	82	117	0.674
331.1	1.1	17	1.4	51	104	1.5	16	2.5	79	119	1.1
331.8	1.1	13	0.974	38	93	0.675	16	1.8	58	106	0.492
332.5	0.513	15	1.6	47	91	0.817	7.4	3.0	73	104	0.596
333.2	1.2	16	1.3	52	116	1.6	17	2.5	79	133	1.2
333.9	1.4	17	1.5	50	106	1.2	21	2.7	76	121	0.893
334.6	0.836	16	1.5	58	115	0.845	12	2.7	89	132	0.616
335.3	0.863	15	1.4	53	104	2.3	12	2.5	81	119	1.7
336.0	0.528	16	1.6	53	102	0.747	7.6	2.9	81	116	0.545
336.7	0.513	14	1.4	63	125	1.1	7.4	2.6	96	142	0.777
337.4	0.823	16	1.6	51	102	1.8	12	2.9	78	116	1.3
338.1	0.733	13	1.3	50	92	0.991	11	2.3	76	106	0.723
338.8	0.809	17	1.5	55	100	1.6	12	2.8	84	115	1.2



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.5	0.549	13	1.5	44	93	0.795	7.9	2.7	68	106	0.580
340.2	1.1	15	2.3	58	106	1.1	15	4.1	89	121	0.792
340.9	0.513	15	1.2	52	99	1.5	7.4	2.3	79	113	1.1
341.6	0.985	15	1.6	52	107	1.2	14	2.8	80	122	0.846
342.3	0.513	14	1.5	47	98	0.520	7.4	2.8	72	112	0.380
343.0	0.567	17	1.3	55	103	0.820	8.2	2.4	85	118	0.598
343.7	0.743	14	1.9	60	110	0.613	11	3.4	92	126	0.447
344.4	0.637	16	1.6	60	100	0.867	9.2	2.9	92	114	0.632
345.1	0.513	13	1.3	48	89	0.690	7.4	2.3	74	102	0.504
345.8	1.2	17	1.6	57	128	1.4	17	2.9	87	147	1.0
346.5	0.697	16	1.7	57	109	1.0	10	3.2	87	125	0.761
347.2	0.591	16	1.7	59	103	1.3	8.5	3.1	90	118	0.971
347.9	0.704	15	1.1	57	103	1.4	10	2.1	88	118	1.0
348.6	1.2	16	2.3	60	112	1.2	17	4.2	92	128	0.888
349.3	0.614	15	1.1	61	117	0.691	8.9	2.1	93	134	0.504
350.0	0.872	16	1.9	59	116	1.5	13	3.5	90	133	1.1
350.7	0.677	17	2.1	59	115	1.3	9.8	3.7	91	131	0.946
351.4	0.564	15	1.4	49	103	1.2	8.1	2.6	75	118	0.860
352.1	0.886	15	1.5	52	99	0.870	13	2.7	79	113	0.635
352.8	0.513	14	1.5	59	113	1.2	7.4	2.8	91	129	0.906
353.4	0.684	18	1.3	51	102	1.3	9.9	2.3	78	117	0.951
354.1	0.644	15	1.4	57	106	1.1	9.3	2.5	88	121	0.830
354.8	0.909	15	1.4	54	119	1.5	13	2.6	83	136	1.1
355.5	0.527	15	1.7	42	101	1.5	7.6	3.1	64	115	1.1
356.2	0.883	16	1.6	62	111	1.3	13	2.9	95	127	0.938
356.9	1.0	16	1.7	62	110	0.899	15	3.0	96	126	0.656
357.6	1.1	13	1.4	52	102	1.3	16	2.6	80	117	0.928
358.3	0.858	15	1.5	46	98	1.3	12	2.6	70	112	0.976
359.0	0.863	16	1.5	52	108	1.5	12	2.8	80	123	1.1
359.7	0.696	15	1.7	52	102	0.967	10	3.1	80	117	0.706
360.4	1.4	18	1.3	52	101	1.7	20	2.4	80	116	1.2
361.1	0.684	16	1.4	55	108	1.6	9.9	2.6	85	124	1.2
361.8	1.1	16	1.7	51	116	1.9	16	3.1	78	133	1.4
362.5	1.3	17	1.3	53	110	0.883	19	2.4	82	126	0.645
363.2	0.711	15	1.7	57	102	1.5	10	3.1	87	116	1.1
363.9	0.513	13	1.6	57	106	1.5	7.4	2.9	88	121	1.1
364.6	0.513	16	1.0	47	95	0.989	7.4	1.9	72	108	0.722
365.3	1.1	16	1.7	52	103	1.5	15	3.0	79	118	1.1
366.0	0.809	18	1.4	52	97	0.983	12	2.5	80	111	0.717
366.7	0.802	14	1.4	53	102	1.4	12	2.6	81	116	1.0
367.4	0.571	14	1.4	54	101	1.5	8.2	2.5	83	115	1.1
368.1	0.513	14	1.5	53	110	1.0	7.4	2.7	81	125	0.741
368.8	0.629	12	1.9	48	94	1.3	9.1	3.4	73	107	0.927
369.5	0.513	15	1.5	49	95	1.2	7.4	2.7	75	109	0.850
370.2	0.513	15	1.1	53	103	1.5	7.4	2.0	81	118	1.1
370.9	0.816	14	1.8	62	112	1.5	12	3.3	95	128	1.1
371.6	0.722	16	1.3	62	123	1.7	10	2.4	95	140	1.2
372.3	0.628	16	1.3	49	100	0.740	9.1	2.3	75	114	0.540
373.0	0.611	16	1.5	54	108	1.2	8.8	2.7	83	124	0.860
373.7	0.891	17	1.5	52	89	0.662	13	2.8	80	102	0.483
374.4	0.744	14	1.2	58	95	1.1	11	2.1	89	109	0.832
375.1	0.765	14	1.4	47	102	0.811	11	2.6	72	117	0.592
375.8	0.873	18	1.5	62	120	1.2	13	2.7	95	137	0.845
376.5	0.514	18	2.1	61	118	1.7	7.4	3.7	93	135	1.3
377.2	0.758	15	1.5	54	107	1.6	11	2.7	83	122	1.2
377.9	0.964	13	1.3	53	103	1.0	14	2.3	81	118	0.731
378.5	1.2	15	1.3	45	108	1.3	17	2.4	69	124	0.931
379.2	1.0	16	1.1	53	106	1.1	15	2.1	82	121	0.800
379.9	0.935	14	1.5	52	101	1.3	14	2.7	80	115	0.938
380.6	0.767	15	1.5	58	109	1.3	11	2.7	89	124	0.923
381.3	1.1	14	1.4	54	103	1.2	16	2.5	82	118	0.896
382.0	1.1	13	1.2	47	98	1.1	16	2.2	71	113	0.793
382.7	0.688	13	1.2	58	119	0.936	9.9	2.2	89	136	0.683
383.4	0.764	21	1.5	68	111	1.4	11	2.7	104	127	1.1
384.1	0.526	15	1.2	43	89	0.930	7.6	2.2	66	101	0.679
384.8	0.513	15	1.4	57	121	1.1	7.4	2.5	87	138	0.837
385.5	0.752	14	1.1	47	101	1.1	11	2.0	72	116	0.831
386.2	0.558	16	1.5	59	111	0.889	8.1	2.6	90	127	0.649
386.9	0.804	13	1.0	48	106	1.2	12	1.8	74	121	0.899
387.6	0.513	14	1.3	47	114	1.4	7.4	2.3	72	130	0.992
388.3	0.791	14	1.5	52	114	1.2	11	2.7	80	131	0.875
389.0	1.0	16	1.1	56	119	1.4	15	2.0	86	136	0.997
389.7	0.827	15	1.4	41	108	1.5	12	2.6	63	123	1.1
390.4	0.900	15	0.996	52	103	1.4	13	1.8	79	117	1.0
391.1	0.869	11	1.1	46	109	0.993	13	2.0	71	125	0.725
391.8	1.3	14	1.4	49	93	1.6	18	2.6	76	107	1.2
392.5	0.513	13	1.5	46	93	1.7	7.4	2.8	71	107	1.3
393.2	0.834	19	1.3	54	112	0.645	12	2.3	82	128	0.471
393.9	0.693	15	1.5	51	106	1.5	10	2.8	79	122	1.1
394.6	0.675	12	1.2	41	97	1.2	9.7	2.2	63	111	0.870
395.3	0.818	14	1.2	46	106	1.2	12	2.2	70	121	0.869



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
396.0	0.989	18	1.4	45	97	0.827	14	2.5	69	111	0.604
396.7	0.513	14	1.4	48	94	0.768	7.4	2.6	73	108	0.560
397.4	0.513	13	1.4	50	99	0.699	7.4	2.5	77	113	0.510
398.1	0.610	11	1.4	44	87	1.0	8.8	2.5	68	99	0.731
398.8	1.2	15	1.3	56	107	1.3	18	2.3	86	123	0.962
399.5	1.5	14	1.4	51	107	1.1	22	2.5	78	123	0.787
400.2	0.593	14	1.2	51	109	1.9	8.6	2.2	79	125	1.4
400.9	0.513	13	1.3	45	93	0.964	7.4	2.5	69	106	0.703
401.6	0.684	13	1.4	53	118	0.705	9.9	2.6	81	135	0.515
402.3	0.806	14	1.4	50	113	1.5	12	2.5	76	129	1.1
403.0	0.897	14	1.1	48	98	1.1	13	2.1	73	112	0.835
403.7	0.833	12	1.2	46	96	1.0	12	2.3	70	110	0.758
404.4	0.773	15	1.3	53	119	1.5	11	2.4	81	136	1.1
405.0	0.574	13	1.7	47	98	1.2	8.3	3.1	72	112	0.875
405.7	1.0	14	1.1	43	104	0.530	15	2.0	66	119	0.387
406.4	1.2	15	1.1	54	112	1.5	18	1.9	82	128	1.1
407.1	1.2	15	0.869	49	104	2.0	17	1.6	74	119	1.5
407.8	0.513	13	1.3	49	111	0.973	7.4	2.4	75	127	0.710
408.5	0.513	11	1.0	42	104	1.0	7.4	1.9	65	119	0.759
409.2	0.513	17	1.5	51	116	0.691	7.4	2.8	78	133	0.504
409.9	0.826	14	1.4	54	118	1.3	12	2.6	83	135	0.923
410.6	0.594	14	1.1	47	111	1.2	8.6	2.1	71	127	0.907
411.3	0.724	15	1.4	47	106	1.3	10	2.5	72	122	0.934
412.0	1.3	15	1.3	51	124	0.751	18	2.3	79	142	0.548
412.7	0.513	13	1.3	47	105	0.704	7.4	2.4	73	121	0.513
413.4	0.566	15	0.887	36	107	1.4	8.2	1.6	55	122	0.996
414.1	0.927	15	1.2	42	104	1.7	13	2.3	64	119	1.3
414.8	0.655	15	1.0	49	124	1.7	9.5	1.9	76	142	1.3
415.5	0.912	14	1.1	48	125	1.8	13	2.0	74	142	1.3
416.2	1.2	16	1.2	51	117	1.6	18	2.1	78	134	1.2
416.9	0.797	11	0.918	44	102	0.792	12	1.7	68	116	0.578
417.6	1.5	11	1.0	49	104	1.0	22	1.8	74	119	0.743
418.3	1.0	14	1.2	51	116	1.2	15	2.2	78	133	0.901
419.0	0.922	15	1.2	48	118	0.772	13	2.2	74	135	0.563
419.7	0.808	15	1.0	50	108	1.6	12	1.8	76	124	1.2
420.4	0.724	16	1.2	53	110	0.914	10	2.3	81	126	0.667
421.1	1.2	12	1.1	44	104	1.3	18	2.1	67	118	0.980
421.8	1.3	14	1.4	49	123	1.8	19	2.5	74	141	1.3
422.5	0.720	11	1.4	47	113	1.4	10	2.6	71	129	1.0
423.2	0.642	15	1.0	37	104	1.3	9.3	1.9	56	119	0.966
423.9	0.513	14	1.2	45	104	0.883	7.4	2.1	69	119	0.644
424.6	0.737	14	1.3	47	110	0.465	11	2.4	72	126	0.339
425.3	1.1	15	1.3	49	117	1.5	16	2.3	75	133	1.1
426.0	1.1	15	1.4	43	108	0.986	15	2.5	65	123	0.720
426.7	0.842	16	1.1	46	100	1.0	12	2.0	71	115	0.746
427.4	0.818	12	1.0	43	94	1.3	12	1.9	66	107	0.931
428.1	0.513	10	1.1	43	113	1.6	7.4	2.0	65	129	1.2
428.8	1.5	15	1.4	53	121	1.6	21	2.6	81	138	1.2
429.5	0.931	15	1.8	39	110	1.4	13	3.4	60	125	1.0
430.2	0.887	14	1.4	45	117	1.3	13	2.5	69	133	0.942
430.9	0.513	12	1.6	42	109	1.4	7.4	2.9	64	125	0.986
431.5	1.1	12	1.2	40	103	1.1	16	2.2	61	118	0.817
432.2	0.931	13	1.4	45	117	1.6	13	2.5	70	134	1.2
432.9	1.2	16	1.4	51	121	1.4	18	2.5	78	138	1.0
433.6	0.513	14	1.1	42	97	1.4	7.4	1.9	64	111	1.0
434.3	0.727	14	1.1	51	121	1.5	10	2.0	78	138	1.1
435.0	0.513	14	1.5	41	103	1.1	7.4	2.7	63	117	0.790
435.7	0.942	12	1.6	49	128	2.2	14	3.0	75	146	1.6
436.4	1.0	13	1.3	50	116	1.6	15	2.4	76	133	1.2
437.1	1.0	16	1.3	39	101	0.860	15	2.3	60	115	0.628
437.8	1.4	14	1.2	53	117	1.4	20	2.2	81	134	1.0
438.5	0.513	14	1.3	45	114	1.7	7.4	2.5	69	130	1.2
439.2	0.542	16	1.2	46	119	1.4	7.8	2.3	70	136	1.0
439.9	0.650	14	1.3	50	103	1.8	9.4	2.4	76	118	1.3
440.6	1.3	16	1.3	58	127	0.681	19	2.4	89	146	0.497
441.3	0.976	13	1.3	41	100	0.776	14	2.4	63	115	0.566
442.0	1.1	14	1.4	48	112	1.3	16	2.6	73	128	0.961
442.7	0.914	14	1.3	44	109	1.4	13	2.4	67	125	1.0
443.4	0.875	14	1.7	48	116	0.966	13	3.1	74	133	0.705
444.1	0.522	14	1.5	47	122	1.6	7.5	2.7	72	139	1.1
444.8	0.858	14	1.3	43	102	1.2	12	2.3	66	116	0.873
445.5	0.626	14	1.3	46	112	2.3	9.0	2.3	71	128	1.7
446.2	1.2	15	1.6	41	116	1.6	17	2.9	63	133	1.2
446.9	0.609	15	1.2	53	112	0.980	8.8	2.2	81	128	0.715
447.6	1.0	14	1.4	48	116	1.5	15	2.6	74	132	1.1
448.3	0.771	18	1.7	49	113	1.4	11	3.0	76	129	0.994
449.0	1.1	13	1.5	43	125	1.9	16	2.7	66	143	1.4
449.7	0.698	15	1.2	50	116	1.6	10	2.1	76	132	1.2
450.4	0.999	14	1.7	49	116	0.928	14	3.1	74	132	0.677
451.1	1.2	12	1.2	49	105	1.1	17	2.2	75	120	0.830
451.8	0.696	13	1.2	43	155	1.4	10	2.2	65	177	1.0



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
452.5	0.513	16	1.3	51	108	0.914	7.4	2.4	78	124	0.667
453.2	0.527	14	1.1	53	132	1.3	7.6	1.9	81	151	0.983
453.9	0.513	14	1.2	52	112	1.2	7.4	2.1	80	128	0.878
454.6	1.0	16	2.1	45	118	1.2	15	3.8	69	135	0.877
455.3	0.596	14	1.3	44	122	1.7	8.6	2.5	67	139	1.3
456.0	0.933	16	1.3	51	115	1.6	13	2.3	79	131	1.1
456.6	0.915	13	1.7	43	112	1.3	13	3.2	66	128	0.917
457.3	0.673	15	1.3	44	116	1.2	9.7	2.4	67	133	0.868
458.0	0.513	14	1.4	46	115	2.4	7.4	2.5	70	132	1.7
458.7	0.995	13	1.0	47	111	1.4	14	1.8	71	127	1.0
459.4	0.966	13	1.6	45	111	2.2	14	2.9	69	127	1.6
460.1	0.952	14	1.5	44	113	1.1	14	2.7	68	129	0.775
460.8	1.4	17	1.4	46	125	1.8	20	2.5	70	142	1.3
461.5	0.597	18	1.3	44	121	1.1	8.6	2.4	67	139	0.771
462.2	1.1	14	1.4	43	110	1.3	16	2.5	66	126	0.939
462.9	0.670	15	1.4	41	117	1.3	9.7	2.6	63	133	0.930
463.6	1.3	15	1.4	42	111	1.1	19	2.6	64	127	0.811
464.3	1.1	16	1.2	42	119	0.736	16	2.2	64	136	0.537
465.0	1.5	15	1.3	47	110	1.7	21	2.3	72	125	1.2
465.7	1.0	15	1.7	47	123	1.2	15	3.1	72	140	0.900
466.4	1.2	15	1.2	53	125	1.3	18	2.3	81	143	0.920
467.1	1.2	15	1.8	48	117	1.5	17	3.3	74	134	1.1
467.8	1.3	12	1.2	45	98	1.1	18	2.3	69	113	0.825
468.5	1.3	16	1.6	55	136	1.4	19	2.9	84	155	0.998
469.2	0.513	18	1.1	48	108	1.3	7.4	2.1	74	123	0.955
469.9	0.862	16	1.4	54	113	1.4	12	2.5	82	130	0.988
470.6	0.513	14	1.3	54	124	1.8	7.4	2.4	83	142	1.3
471.3	0.569	13	1.2	46	106	1.2	8.2	2.3	71	121	0.847
472.0	0.713	14	0.918	47	109	1.2	10	1.7	73	125	0.854
472.7	1.5	17	1.7	61	120	1.5	22	3.1	94	137	1.1
473.4	1.3	18	1.4	47	115	1.8	18	2.5	72	131	1.3
474.1	0.865	17	1.7	56	118	1.1	12	3.2	86	134	0.806
474.8	0.786	14	1.8	50	109	1.5	11	3.2	76	125	1.1
475.5	0.882	19	1.7	48	115	1.1	13	3.0	74	132	0.803
476.2	0.537	16	0.958	59	118	1.2	7.7	1.7	91	135	0.881
476.9	1.1	17	1.6	50	111	1.2	15	2.9	77	126	0.911
477.6	0.993	18	1.6	51	116	1.2	14	3.0	78	132	0.876
478.3	0.629	14	1.5	48	130	1.6	9.1	2.8	74	148	1.1
479.0	0.805	18	1.5	46	111	0.979	12	2.7	70	127	0.714
479.7	0.931	15	1.6	44	119	1.6	13	2.9	68	136	1.2
480.4	0.513	15	1.3	52	117	1.8	7.4	2.4	79	134	1.3
481.1	0.876	17	1.2	44	102	1.1	13	2.1	67	116	0.798
481.7	0.967	16	1.7	56	117	1.6	14	3.1	85	134	1.2
482.4	0.961	15	1.3	51	113	1.2	14	2.3	78	129	0.895
483.1	1.0	17	1.3	51	107	0.872	15	2.3	79	123	0.636
483.8	0.675	16	1.2	48	116	1.6	9.7	2.2	73	133	1.1
484.5	1.3	15	1.2	46	114	0.456	19	2.1	70	131	0.333
485.2	1.1	15	1.4	51	120	1.1	16	2.6	78	137	0.801
485.9	0.810	15	1.6	47	115	1.0	12	3.0	72	132	0.766
486.6	1.1	16	1.6	45	117	0.960	16	3.0	69	134	0.701
487.3	0.967	15	1.4	47	115	1.6	14	2.6	72	132	1.2
488.0	0.702	16	1.7	51	122	1.9	10	3.1	79	140	1.4
488.7	0.731	16	1.3	50	109	0.923	11	2.4	76	124	0.674
489.4	1.2	16	1.3	46	111	0.964	17	2.4	70	127	0.704
490.1	0.690	17	1.7	56	120	1.3	10.0	3.1	86	137	0.965
490.8	1.1	13	1.7	51	126	2.4	16	3.1	79	144	1.8
491.5	0.541	15	1.3	47	110	1.2	7.8	2.4	73	126	0.908
492.2	0.792	14	1.4	51	120	1.1	11	2.5	78	137	0.803
492.9	0.840	15	1.4	47	120	1.2	12	2.5	72	137	0.880
493.6	0.680	16	1.6	51	125	1.6	9.8	2.9	78	143	1.1
494.3	0.984	15	1.6	47	121	1.2	14	2.9	72	139	0.846
495.0	0.514	16	1.5	55	110	1.4	7.4	2.7	85	126	0.995
495.7	0.542	13	1.4	56	121	1.7	7.8	2.6	85	138	1.3
496.4	1.0	14	1.5	48	123	1.4	15	2.6	73	140	0.994
497.1	0.562	16	1.5	57	127	1.8	8.1	2.7	88	145	1.3
497.8	0.712	16	1.7	54	116	1.3	10	3.0	83	133	0.919
498.5	0.513	17	1.6	57	119	1.6	7.4	2.9	88	136	1.2
499.2	0.702	15	1.3	54	124	0.954	10	2.4	83	142	0.696
499.9	0.862	18	1.1	59	126	1.6	12	2.0	90	144	1.2
500.6	1.0	16	1.7	45	130	1.4	15	3.0	69	149	1.0
501.3	1.2	15	1.8	46	112	1.6	17	3.3	70	129	1.1
502.0	1.5	14	1.8	55	129	0.756	22	3.2	84	147	0.552
502.7	1.1	16	1.3	50	116	1.4	16	2.5	76	133	1.0
503.4	0.847	12	1.4	45	109	1.5	12	2.5	69	125	1.1
504.1	1.1	14	1.4	54	122	1.2	16	2.6	83	140	0.893
504.8	0.755	16	1.4	54	119	1.0	11	2.5	83	136	0.765
505.5	1.3	17	1.8	51	121	1.2	18	3.2	78	138	0.860
506.2	1.1	13	1.6	53	117	1.9	16	2.9	81	134	1.4
506.9	1.1	15	1.7	50	110	0.981	15	3.1	76	126	0.715
507.5	0.648	16	1.4	45	124	1.2	9.4	2.6	69	142	0.900
508.2	1.2	16	1.4	57	117	1.5	17	2.5	88	134	1.1



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.9	1.8	17	1.5	54	133	1.4	26	2.8	83	153	1.0
509.6	0.609	14	1.6	45	128	0.808	8.8	3.0	68	147	0.589
510.3	0.878	15	1.1	49	118	1.5	13	2.0	76	135	1.1
511.0	0.845	15	1.7	53	117	1.1	12	3.0	81	133	0.769
511.7	0.599	14	1.6	50	122	1.2	8.6	2.9	76	139	0.901
512.4	0.513	13	1.5	56	113	1.7	7.4	2.8	85	129	1.2
513.1	1.1	16	1.6	51	118	0.968	17	2.9	79	135	0.706
513.8	1.2	16	2.0	61	143	2.1	18	3.6	94	164	1.5
514.5	1.3	15	1.7	55	119	1.3	19	3.1	84	136	0.967
515.2	1.6	16	1.7	58	122	2.0	24	3.1	88	139	1.4
515.9	0.558	15	1.8	50	129	1.4	8.1	3.2	77	148	1.0
516.6	0.662	14	1.4	55	118	0.810	9.6	2.5	84	135	0.591
517.3	1.0	13	1.6	52	122	1.7	15	2.8	80	140	1.3
518.0	0.957	14	1.6	46	97	1.4	14	2.9	71	111	1.0
518.7	1.1	14	1.4	51	133	1.2	15	2.5	77	152	0.909
519.4	0.753	16	1.8	55	119	1.2	11	3.2	84	136	0.906
520.1	0.900	14	1.2	60	119	1.1	13	2.1	92	136	0.793
520.8	1.4	16	1.4	62	131	1.6	20	2.6	95	150	1.2
521.5	0.827	15	1.8	60	133	2.0	12	3.3	92	153	1.5
522.2	1.1	16	1.5	60	127	2.3	16	2.7	92	146	1.7
522.9	0.557	16	1.4	57	123	0.807	8.0	2.5	88	140	0.589
523.6	0.779	14	1.4	52	103	1.1	11	2.6	79	118	0.781
524.3	0.894	17	2.0	55	117	1.4	13	3.7	85	134	1.0
525.0	0.656	16	1.8	62	133	0.580	9.5	3.3	95	152	0.423
525.7	0.815	17	1.6	58	113	1.7	12	3.0	89	130	1.2
526.4	0.733	14	2.3	58	114	1.2	11	4.3	89	131	0.883
527.1	0.877	15	2.1	62	129	1.5	13	3.8	95	147	1.1
527.8	1.2	15	2.1	54	114	1.2	18	3.8	82	130	0.856
528.5	1.1	16	1.4	64	126	2.0	16	2.6	98	144	1.5
529.2	0.559	16	2.0	65	116	0.809	8.1	3.6	99	133	0.591
529.9	0.881	14	1.6	67	127	1.4	13	2.9	102	145	1.0
530.6	0.513	13	1.8	49	103	1.8	7.4	3.2	75	118	1.3
531.3	0.765	14	1.6	54	108	0.929	11	3.0	83	123	0.678
532.0	0.658	18	2.2	69	129	2.3	9.5	4.1	105	147	1.7
532.7	1.1	15	1.5	61	107	1.6	16	2.7	93	123	1.1
533.4	0.866	16	1.8	69	120	1.7	13	3.3	105	138	1.2
534.0	0.513	16	1.9	61	116	1.7	7.4	3.5	93	133	1.2
534.7	1.3	14	2.4	65	134	2.2	19	4.4	100	154	1.6
535.4	1.0	17	1.7	71	120	1.4	14	3.2	109	138	1.0
536.1	0.709	15	2.1	63	111	1.2	10	3.9	96	127	0.853
536.8	1.3	14	2.4	65	123	1.9	19	4.3	99	140	1.4
537.5	1.0	18	2.5	66	128	1.4	15	4.5	101	147	1.1
538.2	0.513	17	1.8	70	121	1.6	7.4	3.2	107	139	1.2
538.9	1.1	16	2.3	80	123	1.8	15	4.1	122	141	1.3
539.6	0.645	12	2.0	66	127	1.2	9.3	3.7	101	146	0.897
540.3	1.5	16	2.1	73	121	1.4	22	3.8	111	138	1.0
541.0	0.953	15	2.3	73	119	1.9	14	4.1	112	136	1.4
541.7	0.592	17	2.3	74	125	2.0	8.5	4.2	113	143	1.5
542.4	0.993	14	2.1	76	121	1.3	14	3.8	117	138	0.978
543.1	0.513	14	2.3	68	122	1.3	7.4	4.2	105	140	0.931
543.8	1.3	15	2.1	70	140	1.5	19	3.8	108	160	1.1
544.5	0.916	14	1.8	70	123	1.7	13	3.3	107	141	1.2
545.2	0.799	14	2.6	86	131	0.941	12	4.7	131	150	0.687
545.9	0.867	13	2.0	74	111	1.4	13	3.6	114	127	0.987
546.6	0.654	15	1.7	80	127	0.675	9.4	3.0	122	145	0.492
547.3	0.906	13	2.2	64	109	1.6	13	4.0	99	124	1.2
548.0	0.806	15	2.2	67	114	1.4	12	3.9	103	131	1.0
548.7	1.2	15	2.2	72	125	1.4	17	4.0	111	143	1.0
549.4	0.803	19	1.8	80	117	1.9	12	3.3	123	134	1.4
550.1	0.693	13	1.3	68	130	1.3	10.0	2.4	105	148	0.962
550.8	1.4	15	2.1	74	126	1.2	20	3.8	113	144	0.900
551.5	0.513	15	1.7	74	120	1.8	7.4	3.2	113	138	1.3
552.2	1.1	15	2.4	78	119	2.3	15	4.3	119	136	1.7
552.9	1.0	15	2.2	69	123	1.4	15	4.0	106	140	0.995
553.6	0.731	15	1.9	62	107	1.1	11	3.4	95	122	0.766
554.3	0.764	13	1.9	61	132	0.928	11	3.4	93	151	0.677
555.0	1.2	16	2.0	71	136	1.8	17	3.6	108	155	1.3
555.7	0.783	14	1.7	61	111	1.4	11	3.2	93	126	1.0
556.4	1.1	12	1.8	66	123	1.9	16	3.3	102	141	1.4
557.1	0.731	14	1.9	83	124	1.1	11	3.4	127	142	0.808
557.8	1.7	16	2.0	66	134	1.4	24	3.6	101	153	1.1
558.5	0.716	13	2.1	78	151	1.6	10	3.8	119	172	1.1
559.2	0.795	16	1.6	64	126	0.790	11	2.9	97	144	0.577
559.9	1.1	15	2.3	62	116	0.869	16	4.2	95	132	0.634
560.5	1.2	13	2.1	60	115	1.7	17	3.8	91	131	1.2
561.2	1.3	14	2.0	67	120	1.2	18	3.7	102	137	0.910
561.9	0.979	18	2.5	78	157	1.3	14	4.6	120	180	0.982
562.6	0.804	15	1.7	73	118	1.2	12	3.1	111	135	0.843
563.3	0.681	16	2.0	76	128	1.1	9.8	3.7	116	147	0.810
564.0	0.878	13	2.1	68	118	2.0	13	3.9	104	135	1.5
564.7	1.3	14	2.1	66	107	1.0	19	3.8	101	122	0.751



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Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
565.4	0.951	13	2.0	63	115	2.1	14	3.6	96	131	1.5
566.1	1.5	15	1.8	70	101	1.4	22	3.3	107	116	1.0
566.8	0.812	17	1.9	73	136	1.5	12	3.5	113	155	1.1
567.5	1.0	17	2.1	82	124	1.5	15	3.9	125	142	1.1
568.2	0.792	15	2.0	81	128	1.2	11	3.7	125	146	0.886
568.9	0.851	13	2.2	79	124	1.6	12	4.1	122	142	1.2
569.6	0.922	13	1.9	61	109	0.771	13	3.5	93	125	0.563
570.3	0.695	12	1.8	68	122	1.2	10	3.2	104	139	0.896
571.0	0.676	16	1.8	58	118	1.3	9.8	3.3	89	135	0.929
571.7	1.2	15	1.9	76	123	1.4	17	3.5	117	141	1.0
572.4	0.521	16	1.9	78	119	1.3	7.5	3.4	120	136	0.942
573.1	0.513	14	2.0	60	110	1.3	7.4	3.7	92	126	0.976
573.8	0.839	14	1.6	53	111	1.8	12	2.8	81	127	1.3
574.5	0.749	17	2.2	63	111	1.5	11	4.0	96	127	1.1
575.2	1.2	15	1.8	66	126	1.3	17	3.3	101	144	0.962
575.9	1.1	15	1.5	88	128	1.1	16	2.8	134	147	0.778
576.6	0.513	12	1.5	55	105	1.1	7.4	2.8	84	121	0.827
577.3	1.8	18	1.9	74	148	1.4	27	3.5	113	169	0.993
578.0	1.2	14	1.7	69	127	1.1	17	3.0	106	146	0.781
578.7	0.665	15	2.0	69	111	0.723	9.6	3.6	107	127	0.528
579.4	1.1	17	1.9	68	117	1.4	16	3.5	105	134	1.0
580.1	1.2	13	1.5	66	120	1.1	18	2.7	101	138	0.830
580.8	0.969	16	1.8	61	148	1.8	14	3.2	93	170	1.3
581.5	0.999	13	2.1	70	142	1.3	14	3.9	107	162	0.930
582.2	1.0	15	1.9	71	111	1.6	15	3.5	109	127	1.1
582.9	1.6	14	1.7	79	128	0.962	24	3.1	121	146	0.702
583.6	1.2	15	1.9	55	108	0.837	17	3.5	84	124	0.611
584.3	0.934	15	1.4	63	98	0.955	13	2.6	96	112	0.697
585.0	1.3	15	1.4	62	123	1.3	18	2.6	96	141	0.961
585.6	1.0	17	1.5	68	123	1.4	15	2.8	105	141	1.0
586.3	1.3	14	1.6	75	140	1.6	19	2.9	115	160	1.2
587.0	0.687	14	2.0	79	132	1.2	9.9	3.6	122	151	0.886
587.7	0.629	14	1.8	68	118	1.5	9.1	3.3	105	135	1.1
588.4	0.651	16	1.8	70	130	1.2	9.4	3.2	107	149	0.840
589.1	0.794	18	1.3	73	122	1.1	11	2.4	112	140	0.832
589.8	1.0	14	1.9	58	118	1.0	15	3.4	89	135	0.732
590.5	1.2	18	1.5	73	139	1.1	17	2.8	113	159	0.789
591.2	0.768	15	1.2	59	104	1.0	11	2.2	91	119	0.743
591.9	0.530	15	1.9	61	111	1.4	7.7	3.4	94	127	1.1
592.6	1.3	17	1.8	60	115	1.1	19	3.3	92	132	0.833
593.3	0.829	18	1.5	72	124	1.2	12	2.7	110	142	0.855
594.0	1.2	14	2.1	63	127	1.4	17	3.8	97	145	1.0
594.7	0.877	16	1.9	69	116	1.3	13	3.5	106	133	0.931
595.4	0.883	15	1.8	63	113	1.6	13	3.3	97	129	1.1
596.1	0.927	13	1.4	62	114	1.2	13	2.6	95	130	0.896
596.8	1.5	15	1.5	62	113	0.816	21	2.7	95	130	0.596
597.5	0.831	15	1.3	64	110	1.4	12	2.4	99	126	1.0
598.2	1.4	17	1.3	60	113	1.1	20	2.4	91	129	0.808
598.9	1.3	15	1.8	65	118	0.918	19	3.2	100	135	0.670
599.6	1.3	16	1.6	55	125	1.8	18	2.9	84	143	1.3
600.3	1.0	13	1.8	63	104	1.4	15	3.3	96	119	1.0
601.0	1.0	13	1.2	58	129	1.6	15	2.3	89	147	1.2
601.7	0.899	17	1.6	72	123	1.3	13	2.9	110	141	0.966
602.4	0.894	14	1.4	50	123	0.748	13	2.6	76	140	0.546
603.1	1.3	16	1.5	57	106	0.710	19	2.7	87	121	0.518
603.8	0.617	15	1.5	52	108	1.3	8.9	2.8	79	124	0.955
604.5	1.7	17	1.9	59	125	1.3	25	3.5	91	142	0.924
605.2	1.2	14	1.5	59	124	0.526	18	2.8	90	141	0.384
605.9	0.923	15	1.5	55	112	1.5	13	2.7	85	128	1.1
606.6	1.4	13	1.4	67	128	0.520	21	2.5	103	147	0.379
607.3	1.3	15	1.6	60	117	0.680	18	2.9	92	134	0.496
608.0	1.1	17	1.7	64	132	0.651	15	3.0	98	151	0.475
608.7	1.4	18	1.5	54	119	1.1	21	2.7	83	136	0.770
609.4	0.974	19	1.3	50	120	0.947	14	2.4	76	138	0.691
610.1	0.901	14	1.2	49	111	1.3	13	2.3	74	127	0.929
610.8	1.3	17	1.1	59	127	1.8	18	2.1	91	145	1.3
611.4	0.513	19	1.6	58	114	0.652	7.4	3.0	88	130	0.476
612.1	1.4	15	1.3	59	124	1.6	21	2.3	90	142	1.1
612.8	1.7	16	1.2	55	127	1.3	25	2.2	84	145	0.965
613.5	1.2	15	1.3	46	114	1.3	17	2.3	71	130	0.953
614.2	1.3	16	1.3	49	129	1.4	18	2.4	75	147	0.986
614.9	1.5	15	1.4	59	114	1.5	21	2.6	91	131	1.1
615.6	1.4	17	1.2	48	116	1.4	20	2.2	74	133	1.0
616.3	0.837	17	1.2	51	124	1.2	12	2.2	78	142	0.888
617.0	1.5	16	1.5	46	121	1.4	21	2.7	70	138	1.0
617.7	1.4	16	0.797	46	117	1.2	20	1.5	70	133	0.876
618.4	1.3	15	1.1	49	112	0.421	19	2.1	75	128	0.307
619.1	1.5	15	1.1	49	113	0.966	22	2.0	75	130	0.704
619.8	1.3	15	1.2	50	145	1.3	18	2.1	77	166	0.982
620.5	1.2	16	0.858	44	112	1.1	17	1.6	68	128	0.835
621.2	1.1	14	0.666	45	120	2.0	16	1.2	70	137	1.5



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.9	1.1	16	0.983	43	115	1.4	16	1.8	66	132	1.0
622.6	1.6	18	1.2	51	128	0.818	24	2.2	78	146	0.597
623.3	1.3	19	0.994	40	122	1.8	19	1.8	61	139	1.3
624.0	1.7	17	1.0	44	118	1.5	25	1.8	67	135	1.1
624.7	2.0	17	1.3	41	133	1.3	28	2.3	63	152	0.977
625.4	1.5	16	1.2	39	113	1.2	22	2.3	60	129	0.907
626.1	1.1	15	0.887	37	115	1.7	15	1.6	57	132	1.2
626.8	1.2	14	0.845	32	118	1.6	18	1.5	50	135	1.1
627.5	0.938	17	0.894	34	112	0.789	14	1.6	52	128	0.576
628.2	1.6	20	0.831	39	124	2.2	23	1.5	59	142	1.6
628.9	1.5	16	0.863	36	128	1.5	21	1.6	55	147	1.1
629.6	1.8	16	0.862	33	108	1.5	26	1.6	51	124	1.1
630.3	1.7	17	1.3	39	123	1.7	25	2.3	60	140	1.3
631.0	1.3	17	0.532	37	110	0.974	19	0.970	57	126	0.710
631.7	1.2	15	0.808	36	120	2.0	17	1.5	55	137	1.5
632.4	1.1	15	0.996	34	114	1.1	16	1.8	53	131	0.837
633.1	1.8	13	1.1	38	130	1.2	26	2.0	58	148	0.841
633.8	2.0	16	0.922	37	113	1.1	29	1.7	56	129	0.804
634.5	1.7	15	0.858	34	127	1.8	24	1.6	53	145	1.3
635.2	1.1	17	0.960	38	132	1.5	15	1.8	58	151	1.1
635.9	1.2	14	0.762	37	118	1.0	18	1.4	57	135	0.749
636.6	1.6	16	0.942	38	130	1.0	23	1.7	57	149	0.758
637.3	1.2	17	0.616	37	134	1.5	17	1.1	57	154	1.1
637.9	0.969	12	1.1	37	112	1.9	14	2.0	56	128	1.4
638.6	1.1	14	1.0	36	127	1.3	16	1.9	55	146	0.942
639.3	1.4	14	1.0	35	135	1.2	21	1.9	53	154	0.879
640.0	1.6	15	0.957	38	128	1.4	23	1.7	58	146	1.0
640.7	1.3	13	0.958	38	132	1.5	18	1.7	59	151	1.1
641.4	1.1	19	0.665	36	123	1.9	16	1.2	55	141	1.4
642.1	1.1	14	1.0	36	132	1.0	16	1.8	55	151	0.764
642.8	1.1	15	0.961	34	127	1.5	16	1.8	51	145	1.1
643.5	0.714	17	1.2	37	116	1.4	10	2.1	57	133	1.1
644.2	1.5	17	0.981	34	136	1.8	21	1.8	53	155	1.3
644.9	1.1	14	0.636	37	124	0.934	15	1.2	57	141	0.681
645.6	0.811	15	0.873	33	128	1.1	12	1.6	51	146	0.785
646.3	2.4	16	0.980	36	135	1.5	35	1.8	55	154	1.1
647.0	1.9	15	0.811	38	135	2.4	27	1.5	58	155	1.7
647.7	1.000	15	0.880	37	128	2.1	14	1.6	57	146	1.5
648.4	1.0	17	0.891	35	131	1.8	15	1.6	53	150	1.3
649.1	1.6	16	0.844	35	123	2.6	23	1.5	54	140	1.9
649.8	1.5	18	1.1	39	128	1.9	22	2.0	60	147	1.4
650.5	1.2	13	0.963	30	98	1.1	17	1.8	47	112	0.776
651.2	1.0	14	1.2	40	136	2.0	15	2.2	61	156	1.4
651.9	0.865	16	1.1	36	137	1.4	12	2.0	55	156	1.0
652.6	1.3	17	0.985	35	134	2.4	19	1.8	54	153	1.7
653.3	1.4	17	1.1	38	112	1.6	20	2.0	58	128	1.2
654.0	1.6	16	0.929	34	125	1.8	23	1.7	52	143	1.3
654.7	0.995	15	1.0	37	118	0.920	14	1.9	57	135	0.671
655.4	0.885	16	0.814	37	114	2.0	13	1.5	56	130	1.5
656.1	0.873	15	0.925	33	123	1.5	13	1.7	51	141	1.1
656.8	1.3	18	1.2	33	137	1.9	19	2.2	50	157	1.4
657.5	1.7	17	1.5	35	136	1.9	24	2.6	54	156	1.4
658.2	1.1	16	0.967	38	119	1.1	16	1.8	59	136	0.826
658.9	1.4	15	1.0	33	131	1.7	21	1.9	50	150	1.2
659.6	0.944	15	0.963	31	114	1.6	14	1.8	47	130	1.2
660.3	1.3	15	1.1	34	137	1.1	18	2.0	52	157	0.787
661.0	1.2	18	0.817	35	123	1.4	17	1.5	53	141	1.0
661.7	1.5	17	0.821	34	112	0.926	21	1.5	52	128	0.676
662.4	0.879	16	0.902	38	136	2.2	13	1.6	59	155	1.6
663.1	1.7	16	0.960	32	122	0.811	24	1.7	49	140	0.592
663.7	1.3	19	0.960	35	131	1.8	19	1.8	54	149	1.3
664.4	1.6	19	1.0	37	123	1.2	23	1.9	57	140	0.908
665.1	1.4	15	0.754	29	119	1.5	20	1.4	44	136	1.1
665.8	1.6	14	0.633	34	129	0.720	24	1.2	52	147	0.525
666.5	1.4	18	0.922	30	142	1.4	21	1.7	47	162	0.989
667.2	1.2	17	0.866	35	138	1.8	17	1.6	53	157	1.3
667.9	2.0	18	0.783	35	138	2.1	28	1.4	54	158	1.5
668.6	1.4	15	1.1	31	143	2.1	20	2.1	47	163	1.5
669.3	1.7	18	0.756	33	133	2.4	24	1.4	50	152	1.7
670.0	0.644	17	0.822	33	140	2.0	9.3	1.5	50	160	1.4
670.7	1.8	16	0.872	32	139	0.623	26	1.6	49	159	0.455
671.4	1.8	16	0.797	34	141	1.7	26	1.5	53	161	1.2
672.1	0.616	15	0.620	35	143	1.9	8.9	1.1	53	164	1.4
672.8	1.3	16	0.886	31	128	2.1	19	1.6	48	146	1.5
673.5	1.4	16	0.993	31	139	2.7	20	1.8	47	159	2.0
674.2	1.2	14	0.666	31	137	2.6	18	1.2	48	156	1.9
674.9	1.2	15	1.1	34	145	0.892	18	1.9	53	165	0.651
675.6	1.4	14	0.777	29	135	2.0	20	1.4	45	154	1.5
676.3	1.9	15	0.975	31	146	0.944	27	1.8	47	168	0.689
677.0	1.7	15	0.960	28	135	1.9	25	1.8	42	154	1.4
677.7	1.1	16	0.631	34	137	2.6	15	1.2	52	157	1.9



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
678.4	1.1	18	1.2	34	139	1.8	16	2.2	52	159	1.3
679.1	1.4	15	0.996	28	134	1.3	20	1.8	43	154	0.936
679.8	2.0	15	0.914	34	167	1.2	28	1.7	52	191	0.841
680.5	1.1	14	0.790	31	136	1.7	16	1.4	48	156	1.3
681.2	1.6	15	0.660	31	132	2.5	24	1.2	48	151	1.8
681.9	1.1	14	0.797	27	139	2.0	16	1.5	42	159	1.5
682.6	1.4	15	0.836	28	130	1.7	20	1.5	44	149	1.2
683.3	1.3	14	0.838	33	140	1.8	19	1.5	51	161	1.3
684.0	0.760	13	0.741	27	138	1.8	11	1.4	42	158	1.3
684.7	1.4	15	0.969	29	135	2.4	20	1.8	45	155	1.7
685.4	1.4	13	1.0	31	130	2.1	20	1.9	48	149	1.5
686.1	1.5	14	0.598	31	137	1.8	22	1.1	48	156	1.3
686.8	0.849	15	1.4	33	129	2.1	12	2.5	51	147	1.5
687.5	0.566	16	1.1	31	125	2.5	8.2	2.0	48	143	1.8
688.2	1.4	15	0.819	31	128	2.1	20	1.5	47	146	1.5
688.9	0.790	17	0.702	32	125	1.7	11	1.3	50	142	1.2
689.5	1.0	15	1.3	37	138	1.7	15	2.4	56	158	1.3
690.2	1.5	17	0.999	36	136	2.8	21	1.8	56	155	2.0
690.9	1.7	13	1.0	38	138	2.2	25	1.8	58	157	1.6
691.6	0.995	13	0.930	41	142	1.1	14	1.7	63	163	0.784
692.3	0.733	13	0.880	27	126	1.7	11	1.6	41	144	1.2
693.0	1.1	12	0.778	28	139	1.8	16	1.4	44	158	1.3
693.7	1.5	15	1.0	34	151	2.2	21	1.9	52	173	1.6
694.4	0.513	15	0.755	39	126	2.1	7.4	1.4	59	144	1.6
695.1	0.887	14	0.800	29	123	2.2	13	1.5	44	141	1.6
695.8	1.3	15	0.994	28	125	1.8	19	1.8	43	143	1.3
696.5	0.875	16	0.865	33	148	2.1	13	1.6	50	169	1.5
697.2	0.868	18	0.762	34	128	1.7	13	1.4	53	147	1.3
697.9	1.1	20	0.886	39	128	1.6	16	1.6	59	146	1.2
698.6	0.862	11	0.920	30	112	1.8	12	1.7	46	128	1.3
699.3	1.0	14	0.880	34	122	1.9	15	1.6	52	139	1.4
700.0	0.611	15	0.858	34	125	0.991	8.8	1.6	52	142	0.723
700.7	0.825	15	1.0	32	139	1.9	12	1.8	49	158	1.4
701.4	0.513	17	0.723	32	140	1.8	7.4	1.3	49	160	1.3
702.1	0.721	14	0.798	33	131	1.9	10	1.5	50	149	1.4
702.8	1.9	14	1.1	28	116	1.3	28	2.0	43	133	0.917
703.5	0.810	12	0.832	24	118	1.5	12	1.5	37	134	1.1
704.2	1.1	15	0.969	34	133	2.1	16	1.8	52	152	1.5
704.9	1.1	18	0.935	34	123	1.9	17	1.7	52	141	1.4
705.6	1.1	16	1.3	35	160	1.9	15	2.4	53	182	1.4
706.3	1.1	17	1.1	32	131	1.7	16	2.0	49	149	1.3
707.0	1.0	16	1.0	31	152	1.4	14	1.9	47	174	1.0
707.7	0.671	19	0.845	28	144	3.2	9.7	1.5	43	165	2.4
708.4	1.4	17	1.0	32	162	1.9	20	1.9	49	186	1.4
709.1	0.697	19	0.620	34	124	1.5	10	1.1	52	142	1.1
709.8	0.872	14	0.516	23	117	1.7	13	0.942	35	134	1.2
710.5	0.926	11	0.741	29	123	1.9	13	1.4	45	140	1.4
711.2	1.7	16	0.909	32	146	1.5	25	1.7	49	167	1.1
711.9	0.957	14	1.0	33	130	1.8	14	1.9	50	149	1.3
712.6	0.831	11	0.795	29	113	1.9	12	1.4	44	129	1.4
713.3	1.1	13	0.747	30	122	1.5	16	1.4	45	140	1.1
714.0	1.4	12	0.863	26	132	1.7	21	1.6	39	151	1.2
714.7	1.2	19	1.1	38	112	2.9	17	2.0	59	128	2.1
715.3	1.1	14	1.3	38	137	1.8	16	2.4	59	157	1.3
716.0	0.554	15	1.0	32	122	1.3	8.0	1.9	49	140	0.974
716.7	0.532	15	0.853	31	122	1.5	7.7	1.6	48	140	1.1
717.4	1.2	14	0.724	37	120	2.4	18	1.3	56	137	1.7
718.1	1.4	14	1.1	34	134	0.576	20	2.1	52	154	0.420
718.8	0.998	14	0.883	35	133	1.8	14	1.6	54	153	1.3
719.5	2.1	14	0.967	31	121	2.2	30	1.8	47	138	1.6
720.2	1.3	13	1.1	34	118	2.3	19	2.0	52	135	1.7
720.9	1.5	13	1.2	38	129	2.6	21	2.1	59	147	1.9
721.6	1.2	15	1.1	38	122	2.8	17	2.1	58	139	2.1
722.3	1.3	16	1.1	45	128	1.6	19	2.0	68	146	1.2
723.0	0.585	11	1.0	37	120	1.4	8.5	1.8	56	137	1.0
723.7	1.4	13	0.980	35	114	2.8	20	1.8	54	131	2.1
724.4	0.753	12	1.1	38	120	1.9	11	2.0	58	137	1.4
725.1	0.603	15	1.2	39	142	3.4	8.7	2.2	59	162	2.5
725.8	1.7	16	1.3	40	132	1.8	25	2.3	61	151	1.3
726.5	1.3	15	1.2	38	129	2.5	19	2.2	58	148	1.8
727.2	1.2	16	1.0	40	139	1.3	17	1.8	61	159	0.942
727.9	0.995	14	1.1	37	132	2.0	14	2.0	57	151	1.4
728.6	1.7	16	1.1	38	180	2.4	25	2.0	59	206	1.7
729.3	0.825	13	0.904	37	117	2.4	12	1.6	56	134	1.8
730.0	1.2	14	1.3	37	116	1.1	18	2.4	56	133	0.791
730.7	0.971	13	0.907	34	120	1.2	14	1.7	52	137	0.904
731.4	0.925	16	0.972	46	133	1.9	13	1.8	70	152	1.4
732.1	1.1	13	1.3	34	130	2.5	16	2.3	53	149	1.8
732.8	1.9	14	1.3	43	142	2.1	27	2.4	65	162	1.5
733.5	0.588	13	0.963	37	116	2.1	8.5	1.8	56	133	1.5
734.2	0.661	16	0.940	38	168	2.0	9.5	1.7	59	192	1.5



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
734.9	1.3	15	1.1	40	131	1.6	19	2.1	62	150	1.2
735.6	0.513	13	1.3	37	142	1.6	7.4	2.3	56	162	1.2
736.3	1.1	15	1.2	37	135	2.1	16	2.3	57	155	1.5
737.0	1.3	15	1.3	38	135	1.6	19	2.4	58	154	1.2
737.7	2.0	15	0.966	32	133	1.4	29	1.8	49	153	1.0
738.4	1.3	12	0.910	35	125	1.5	18	1.7	54	143	1.1
739.1	1.3	14	1.1	35	126	1.4	18	2.0	53	144	1.0
739.8	1.3	13	1.0	33	131	2.3	19	1.8	50	150	1.7
740.5	1.1	16	1.0	37	140	1.5	16	1.9	56	160	1.1
741.2	1.9	17	1.3	34	141	2.3	27	2.5	51	161	1.7
741.8	1.0	14	1.0	38	133	2.3	15	1.9	58	152	1.6
742.5	1.6	16	1.0	36	154	1.6	23	1.9	56	176	1.1
743.2	1.3	17	1.3	36	153	2.4	18	2.3	55	175	1.8
743.9	1.3	17	1.1	37	136	1.5	19	2.1	57	156	1.1
744.6	1.5	17	1.1	36	134	1.3	22	2.0	56	154	0.962
745.3	1.3	17	1.0	36	141	1.8	19	1.9	55	161	1.3
746.0	1.2	14	1.1	35	135	2.8	17	2.0	54	155	2.0
746.7	1.4	15	1.3	40	139	2.5	20	2.4	62	159	1.9
747.4	1.7	17	1.2	40	144	1.8	24	2.2	62	165	1.3
748.1	1.3	16	1.1	38	149	1.5	18	1.9	57	170	1.1
748.8	0.765	14	1.2	34	150	1.6	11	2.2	53	172	1.1
749.5	1.1	14	0.891	28	147	2.1	15	1.6	44	168	1.5
750.2	1.8	16	0.736	32	155	1.4	26	1.3	50	177	0.992
750.9	1.5	16	0.839	36	152	2.4	21	1.5	54	174	1.8
751.6	1.5	14	0.877	28	160	0.989	22	1.6	43	182	0.721
752.3	2.5	15	1.2	31	153	3.0	36	2.2	47	175	2.2
753.0	1.3	15	1.2	38	162	2.1	19	2.1	59	185	1.5
753.7	2.0	17	0.938	30	155	1.9	28	1.7	46	177	1.4
754.4	2.5	19	1.0	37	167	1.1	36	1.9	57	191	0.798
755.1	1.9	13	1.1	33	160	1.6	28	2.0	51	183	1.2
755.8	1.9	16	1.2	32	191	2.3	28	2.2	49	219	1.7
756.5	2.0	17	1.2	35	193	1.7	30	2.2	54	221	1.2
757.2	2.2	15	0.890	33	181	1.9	32	1.6	51	207	1.4
757.9	2.7	15	1.2	37	200	2.3	39	2.1	56	229	1.7
758.6	2.6	17	1.0	33	191	1.3	38	1.9	51	218	0.948
759.3	2.7	16	0.954	39	205	2.2	39	1.7	60	234	1.6
760.0	2.3	17	1.1	36	204	2.2	33	2.0	54	233	1.6
760.7	2.8	18	0.962	37	226	3.0	41	1.8	56	259	2.2
761.4	2.2	13	0.911	31	226	1.5	32	1.7	47	259	1.1
762.1	2.9	15	0.878	34	266	3.0	41	1.6	52	304	2.2
762.8	3.0	14	1.2	37	290	2.1	43	2.2	56	332	1.6
763.5	3.2	15	1.1	39	275	3.5	46	2.1	59	314	2.6
764.2	3.4	15	0.839	35	263	2.9	49	1.5	54	300	2.1
764.9	3.0	15	0.874	31	261	2.1	43	1.6	48	299	1.6
765.6	4.3	13	1.0	35	298	3.0	62	1.9	54	341	2.2
766.3	4.1	14	1.4	37	266	2.8	59	2.5	56	304	2.0
767.0	5.0	18	1.7	40	445	2.9	72	3.1	61	509	2.1
767.6	4.1	15	1.3	41	401	3.8	59	2.3	62	459	2.8
768.3	4.6	14	1.3	49	483	3.6	67	2.4	75	553	2.7
769.0	5.7	13	1.2	31	390	3.1	82	2.3	48	446	2.3
769.7	6.4	17	0.969	46	451	3.9	93	1.8	71	516	2.8
770.4	4.9	16	1.2	41	390	2.7	70	2.2	63	446	2.0
771.1	4.9	13	1.5	37	505	2.5	71	2.7	57	578	1.9
771.8	4.9	17	1.5	37	490	3.1	70	2.7	56	561	2.3
772.5	5.4	13	1.4	38	573	3.3	78	2.5	58	656	2.4
773.2	5.5	15	1.8	39	521	3.0	79	3.2	59	595	2.2
773.9	5.8	14	2.1	37	517	3.4	84	3.9	56	591	2.5
774.6	5.2	14	1.3	40	567	3.0	75	2.4	61	648	2.2
775.3	5.5	14	1.9	38	645	4.1	80	3.4	59	738	3.0
776.0	5.5	15	1.7	35	626	3.0	79	3.1	54	716	2.2
776.7	5.0	14	2.1	40	759	3.5	72	3.7	61	868	2.5
777.4	5.9	16	1.9	39	712	3.6	85	3.5	60	815	2.6
778.1	5.8	16	2.4	44	838	3.7	84	4.3	67	959	2.7
778.8	4.5	17	2.1	49	870	4.2	64	3.8	76	995	3.1
779.5	5.5	14	1.9	37	944	3.0	80	3.5	57	1079	2.2
780.2	5.9	16	1.7	44	860	4.2	85	3.1	67	984	3.1
780.9	5.7	15	2.3	44	988	3.0	82	4.1	67	1130	2.2
781.6	5.2	15	2.0	44	925	3.3	76	3.6	68	1058	2.4
782.3	5.5	13	1.9	41	1122	4.4	80	3.4	63	1283	3.2
783.0	5.0	15	2.2	45	977	4.8	72	4.0	69	1118	3.5
783.7	4.3	14	2.6	44	1040	4.7	62	4.7	67	1190	3.5
784.4	5.3	15	2.4	39	1130	4.2	77	4.4	60	1293	3.1
785.1	4.5	14	2.6	45	1117	4.7	65	4.7	70	1278	3.4
785.8	4.1	13	2.2	35	1112	4.6	60	3.9	54	1271	3.4
786.5	5.1	16	2.6	44	1180	2.7	74	4.7	68	1350	2.0
787.2	5.5	15	2.2	50	1244	4.6	80	4.0	77	1422	3.4
787.9	4.3	14	2.8	49	1257	3.3	62	5.0	76	1437	2.4
788.6	4.7	15	3.2	56	1369	5.1	67	5.8	86	1566	3.7
789.3	4.0	16	3.1	48	1340	4.3	58	5.6	74	1532	3.1
790.0	5.8	15	3.3	48	1363	6.3	84	6.1	73	1559	4.6
790.7	4.3	14	3.5	57	1440	4.8	62	6.4	87	1646	3.5



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
791.4	3.0	15	3.0	61	1644	4.7	43	5.5	94	1880	3.4
792.1	4.4	13	3.4	50	1540	4.3	63	6.1	76	1761	3.1
792.8	4.8	15	3.5	55	1527	3.5	70	6.3	85	1747	2.5
793.5	4.1	15	3.3	63	1531	3.5	59	6.0	96	1751	2.6
794.1	3.8	16	3.5	58	1612	4.1	55	6.4	89	1844	3.0
794.8	3.8	13	3.4	56	1619	4.0	55	6.3	86	1851	2.9
795.5	3.5	16	4.4	65	1711	3.8	51	8.0	100	1957	2.8
796.2	3.8	14	3.5	55	1571	3.1	55	6.3	84	1797	2.3
796.9	2.4	13	3.5	73	1857	3.3	34	6.5	112	2123	2.4
797.6	2.9	13	3.7	67	1795	4.9	42	6.8	102	2053	3.6
798.3	3.2	16	3.6	60	1753	3.5	47	6.6	92	2004	2.6
799.0	2.6	14	3.5	60	1710	2.6	38	6.3	91	1955	1.9
799.7	3.1	16	4.0	65	1856	3.6	45	7.2	100	2122	2.6
800.4	2.0	15	3.8	67	2028	4.4	29	6.9	102	2319	3.2
801.1	2.2	15	4.3	72	1876	3.9	32	7.9	110	2145	2.9
801.8	1.4	15	4.2	71	1897	3.2	20	7.7	109	2169	2.3
802.5	1.9	17	4.1	70	1863	2.9	27	7.5	108	2130	2.1
803.2	1.5	15	3.7	65	1696	3.4	22	6.8	100	1940	2.5
803.9	1.3	13	4.1	79	1914	3.5	18	7.5	121	2189	2.5
804.6	1.2	14	3.4	65	1871	4.8	18	6.3	100	2140	3.5
805.3	1.2	16	5.2	81	1972	3.5	18	9.5	124	2255	2.5
806.0	1.6	15	4.0	68	1946	4.3	23	7.3	104	2226	3.1
806.7	1.4	13	5.0	79	2033	5.2	21	9.1	121	2325	3.8
807.4	1.1	15	4.3	76	1889	3.1	16	7.9	116	2160	2.3
808.1	0.848	13	4.2	74	1879	3.2	12	7.7	114	2149	2.3
808.8	1.2	13	4.4	75	1972	3.2	17	7.9	115	2255	2.4
809.5	0.658	14	5.2	80	2084	4.0	9.5	9.5	123	2383	2.9
810.2	1.1	16	4.7	83	1884	3.0	16	8.5	127	2154	2.2
810.9	0.739	13	4.7	75	1904	2.9	11	8.5	114	2177	2.1
811.6	0.635	14	5.0	86	2232	3.0	9.2	9.2	133	2553	2.2
812.3	0.786	13	3.9	73	2055	2.5	11	7.1	111	2350	1.8
813.0	0.811	15	5.0	79	2078	2.4	12	9.2	121	2376	1.8
813.7	1.0	13	3.8	74	1809	2.8	15	6.9	114	2069	2.0
814.4	1.1	15	4.5	93	2069	3.6	16	8.2	143	2366	2.6
815.1	0.633	13	4.7	77	1889	2.6	9.1	8.6	117	2160	1.9
815.8	0.513	13	4.3	74	1937	2.8	7.4	7.9	114	2215	2.0
816.5	0.513	13	5.0	74	1982	2.3	7.4	9.1	113	2267	1.7
817.2	0.557	15	5.1	83	2190	2.4	8.0	9.3	127	2504	1.7
817.9	0.517	14	4.2	84	1905	1.8	7.5	7.6	129	2178	1.3
818.6	0.513	12	4.8	80	2030	2.2	7.4	8.8	122	2322	1.6
819.2	0.513	13	4.7	89	1982	2.1	7.4	8.5	137	2267	1.5
819.9	0.513	13	4.2	72	1864	2.3	7.4	7.6	110	2132	1.7
820.6	0.653	14	5.4	84	2200	2.6	9.4	9.8	128	2516	1.9
821.3	0.513	14	5.2	94	2048	2.0	7.4	9.4	145	2342	1.5
822.0	0.643	14	4.6	83	2126	1.8	9.3	8.5	128	2431	1.3
822.7	0.513	13	4.0	80	2013	1.5	7.4	7.3	122	2302	1.1
823.4	0.513	12	4.9	84	2095	1.8	7.4	9.0	129	2396	1.3
824.1	0.513	14	4.2	78	1928	2.6	7.4	7.6	120	2205	1.9
824.8	0.513	13	4.3	80	2106	2.4	7.4	7.9	123	2408	1.8
825.5	0.513	12	4.7	87	2036	1.0	7.4	8.6	134	2328	0.757
826.2	0.513	13	4.4	75	2131	2.0	7.4	8.1	115	2437	1.5
826.9	0.545	16	4.9	91	2288	2.9	7.9	8.9	140	2616	2.1
827.6	0.513	14	3.7	86	1969	2.3	7.4	6.8	131	2251	1.7
828.3	0.513	13	3.4	80	1962	2.2	7.4	6.2	122	2243	1.6
829.0	0.513	14	3.8	76	2026	2.3	7.4	7.0	117	2317	1.7
829.7	0.513	13	4.4	84	2089	1.7	7.4	8.0	129	2389	1.3
830.4	0.620	13	4.3	81	2010	1.9	9.0	7.9	124	2299	1.4
831.1	0.513	13	3.0	70	1606	1.5	7.4	5.5	108	1836	1.1
831.8	0.513	16	4.3	94	2284	1.5	7.4	7.8	144	2611	1.1
832.5	0.609	12	3.7	70	1938	1.8	8.8	6.7	108	2217	1.3
833.2	0.513	13	3.1	80	1983	1.6	7.4	5.7	123	2268	1.2
833.9	0.513	13	3.5	85	2104	2.2	7.4	6.4	130	2406	1.6
834.6	0.513	11	3.4	93	2066	1.5	7.4	6.1	142	2363	1.1
835.3	0.513	12	3.2	86	2035	1.6	7.4	5.9	132	2327	1.2
836.0	0.513	13	3.8	76	2104	1.6	7.4	6.9	116	2406	1.2
836.7	0.513	12	3.6	74	2002	1.7	7.4	6.6	113	2289	1.2
837.4	0.513	15	3.3	85	2067	1.5	7.4	6.1	130	2364	1.1
838.1	0.513	14	3.4	77	1992	1.8	7.4	6.1	117	2278	1.3
838.8	0.513	12	3.4	84	2088	1.2	7.4	6.3	129	2387	0.874
839.5	0.513	13	3.3	77	2027	1.2	7.4	6.1	118	2318	0.873
840.2	0.513	13	3.4	80	2126	1.1	7.4	6.2	122	2432	0.800
840.9	0.513	15	2.6	89	2193	1.7	7.4	4.8	136	2508	1.3
841.6	0.513	14	3.2	79	1967	1.4	7.4	5.9	121	2249	1.0
842.3	0.513	13	3.6	87	2032	1.7	7.4	6.6	133	2324	1.3
843.0	0.513	13	3.2	76	2174	2.0	7.4	5.9	117	2486	1.5
843.7	0.513	13	3.6	85	2347	2.0	7.4	6.6	130	2684	1.5
844.4	0.513	13	3.6	83	2135	1.7	7.4	6.6	127	2441	1.2
845.1	0.756	14	3.0	81	2168	1.8	11	5.4	124	2480	1.3
845.7	0.513	13	2.7	74	2086	2.4	7.4	5.0	114	2385	1.8
846.4	0.513	14	3.4	73	2038	1.3	7.4	6.3	112	2331	0.968
847.1	0.513	13	3.6	74	1946	2.0	7.4	6.6	114	2225	1.5



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
847.8	0.513	12	3.2	72	2076	1.9	7.4	5.9	110	2374	1.4
848.5	0.513	12	3.2	75	1964	0.789	7.4	5.9	116	2245	0.576
849.2	0.513	13	3.3	76	2079	1.9	7.4	5.9	117	2378	1.4
849.9	0.618	15	2.8	73	2103	2.0	8.9	5.2	111	2405	1.5
850.6	0.513	14	3.5	74	2143	2.5	7.4	6.3	114	2450	1.8
851.3	0.513	11	2.6	78	2014	2.0	7.4	4.7	119	2303	1.4
852.0	0.643	14	2.9	67	1845	1.8	9.3	5.3	102	2110	1.3
852.7	0.513	14	3.0	76	1978	1.4	7.4	5.5	116	2262	0.989
853.4	0.513	14	3.3	73	1848	2.3	7.4	6.0	111	2114	1.7
854.1	0.513	12	2.8	78	2003	2.1	7.4	5.1	119	2291	1.5
854.8	0.513	12	2.9	75	1857	2.1	7.4	5.2	115	2124	1.5
855.5	0.513	14	3.0	71	2077	1.7	7.4	5.6	110	2375	1.2
856.2	0.513	15	2.3	68	1807	2.5	7.4	4.2	104	2067	1.8
856.9	0.513	14	2.7	67	1784	2.6	7.4	5.0	102	2040	1.9
857.6	0.513	13	2.9	67	1707	2.3	7.4	5.3	102	1952	1.7
858.3	0.513	14	2.8	63	1701	2.0	7.4	5.2	96	1945	1.5
859.0	0.513	16	2.7	60	1957	1.9	7.4	4.8	92	2238	1.4
859.7	0.513	14	3.0	73	2153	2.8	7.4	5.5	112	2462	2.1
860.4	0.591	13	2.5	60	1619	2.0	8.5	4.5	92	1851	1.5
861.1	0.513	11	2.6	68	1644	3.8	7.4	4.8	104	1880	2.7
861.8	0.931	16	2.7	71	1707	4.1	13	4.9	109	1952	3.0
862.5	0.591	14	3.0	71	1729	3.1	8.5	5.4	108	1977	2.3
863.2	0.513	16	2.6	70	1623	4.2	7.4	4.8	107	1856	3.1
863.9	0.656	15	2.8	67	1662	3.6	9.5	5.0	103	1900	2.6
864.6	0.513	13	2.2	69	1573	3.1	7.4	4.1	106	1799	2.3
865.3	0.513	14	2.5	60	1598	4.3	7.4	4.5	92	1828	3.2
866.0	0.582	12	1.9	56	1255	2.8	8.4	3.4	86	1436	2.1
866.7	0.513	18	2.5	68	1502	5.3	7.4	4.6	105	1717	3.9
867.4	0.513	15	2.2	65	1472	4.0	7.4	4.1	99	1683	2.9
868.1	0.513	15	2.2	61	1257	5.7	7.4	4.0	93	1437	4.2
868.8	0.513	12	2.1	69	1385	4.9	7.4	3.7	106	1584	3.6
869.5	0.513	14	2.4	66	1472	5.6	7.4	4.4	101	1683	4.1
870.2	0.513	15	2.2	63	1519	6.3	7.4	4.0	96	1737	4.6
870.9	0.513	13	2.0	67	1324	5.7	7.4	3.6	102	1514	4.1
871.6	0.513	13	1.8	63	1334	6.0	7.4	3.3	97	1525	4.4
872.2	0.513	11	2.3	58	1122	6.9	7.4	4.1	89	1283	5.0
872.9	0.513	14	1.9	68	1250	7.0	7.4	3.5	105	1430	5.1
873.6	0.513	13	1.8	58	1167	5.4	7.4	3.3	90	1334	3.9
874.3	0.513	14	1.9	58	1181	6.6	7.4	3.4	89	1351	4.8
875.0	0.513	13	1.8	60	1148	6.1	7.4	3.4	92	1313	4.5
875.7	0.513	15	1.9	50	1080	6.6	7.4	3.4	77	1235	4.8
876.4	0.513	16	1.7	55	1015	7.5	7.4	3.1	85	1161	5.5
877.1	0.513	13	1.4	53	1141	5.8	7.4	2.6	81	1305	4.2
877.8	0.513	13	1.4	56	984	7.0	7.4	2.5	86	1125	5.1
878.5	0.513	13	1.6	57	1031	8.1	7.4	2.9	88	1178	5.9
879.2	0.513	15	1.8	60	1007	7.3	7.4	3.2	91	1151	5.3
879.9	0.696	16	1.3	58	949	6.5	10	2.3	89	1086	4.7
880.6	0.513	14	1.2	57	962	6.7	7.4	2.1	88	1100	4.9
881.3	0.513	15	1.5	58	990	8.4	7.4	2.8	88	1132	6.1
882.0	0.513	12	1.4	50	792	6.0	7.4	2.6	77	906	4.4
882.7	0.513	13	0.932	46	904	8.1	7.4	1.7	70	1034	5.9
883.4	0.513	12	1.0	52	866	9.0	7.4	1.8	79	991	6.6
884.1	0.513	14	1.4	57	882	7.5	7.4	2.5	87	1008	5.5
884.8	0.513	14	1.5	47	794	7.6	7.4	2.8	72	908	5.6
885.5	0.513	12	1.4	47	809	5.7	7.4	2.5	72	925	4.1
886.2	0.513	14	1.4	52	865	8.5	7.4	2.5	79	989	6.2
886.9	0.513	16	1.0	48	776	8.9	7.4	1.8	74	888	6.5
887.6	0.513	13	1.2	47	776	8.2	7.4	2.2	73	887	6.0
888.3	0.513	13	1.1	48	842	8.1	7.4	2.1	74	963	5.9
889.0	0.513	12	1.1	43	749	6.7	7.4	2.1	66	857	4.9
889.7	0.513	13	1.2	47	758	7.3	7.4	2.2	72	867	5.3
890.4	0.513	12	0.952	46	795	8.0	7.4	1.7	71	909	5.8
891.1	0.513	11	1.3	37	776	5.0	7.4	2.4	57	887	3.7
891.8	0.513	14	0.913	38	808	8.0	7.4	1.7	59	924	5.8
892.5	0.513	14	1.1	43	798	7.1	7.4	2.0	66	912	5.2
893.2	0.513	13	0.710	45	852	7.1	7.4	1.3	69	974	5.2
893.9	0.513	14	1.0	47	862	7.1	7.4	1.9	72	986	5.2
894.6	0.513	14	0.840	42	867	7.8	7.4	1.5	65	991	5.7
895.3	0.513	15	1.4	40	784	7.0	7.4	2.5	61	896	5.1
896.0	0.513	13	1.2	40	848	6.2	7.4	2.2	62	970	4.6
896.7	0.513	13	1.2	35	801	6.7	7.4	2.1	53	916	4.9
897.4	0.513	14	1.3	37	923	7.1	7.4	2.3	56	1056	5.2
898.1	0.513	12	0.856	33	758	4.2	7.4	1.6	51	866	3.1
898.7	0.513	14	1.1	38	922	7.8	7.4	2.0	59	1054	5.7
899.4	0.513	12	0.686	36	840	7.1	7.4	1.3	55	960	5.2
900.1	0.513	12	0.940	32	803	6.9	7.4	1.7	49	918	5.0
900.8	0.513	11	0.900	35	838	7.7	7.4	1.6	53	959	5.6
901.5	0.513	13	1.0	30	848	6.7	7.4	1.8	47	970	4.9
902.2	0.513	13	0.516	32	778	7.2	7.4	0.942	49	890	5.2
902.9	0.513	14	0.736	30	756	5.8	7.4	1.3	46	864	4.3
903.6	0.513	13	0.677	30	843	6.4	7.4	1.2	46	964	4.6



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
904.3	0.513	13	0.609	27	733	5.8	7.4	1.1	41	838	4.2
905.0	0.513	14	0.585	34	939	6.5	7.4	1.1	52	1074	4.7
905.7	0.513	14	0.558	35	781	6.4	7.4	1.0	54	893	4.7
906.4	0.549	14	0.465	28	814	6.1	7.9	0.848	43	931	4.5
907.1	0.513	11	0.668	28	820	5.6	7.4	1.2	42	937	4.1
907.8	0.513	14	0.459	33	911	4.2	7.4	0.837	50	1042	3.1
908.5	0.513	13	0.908	28	788	5.3	7.4	1.7	43	901	3.8
909.2	0.513	14	0.717	34	855	6.9	7.4	1.3	52	978	5.0
909.9	0.513	15	0.337	30	905	6.4	7.4	0.614	46	1035	4.7
910.6	0.538	11	0.609	21	831	6.2	7.8	1.1	32	950	4.5
911.3	0.535	16	0.517	26	914	8.2	7.7	0.943	39	1046	6.0
912.0	0.513	13	0.703	27	864	8.1	7.4	1.3	42	988	5.9
912.7	0.756	15	0.650	24	857	5.6	11	1.2	36	980	4.1
913.4	0.554	13	0.627	22	835	5.6	8.0	1.1	34	955	4.1
914.1	0.513	12	0.665	27	899	6.1	7.4	1.2	41	1029	4.4
914.8	0.513	12	0.608	23	794	6.4	7.4	1.1	36	908	4.7
915.5	0.513	17	0.451	27	931	5.5	7.4	0.822	41	1064	4.0
916.2	0.513	14	0.774	21	781	5.3	7.4	1.4	32	893	3.9
916.9	0.513	12	0.775	18	723	5.4	7.4	1.4	28	827	3.9
917.6	0.513	14	0.663	17	757	4.8	7.4	1.2	26	865	3.5
918.3	0.513	15	0.946	25	938	6.4	7.4	1.7	39	1073	4.7
919.0	0.513	15	0.530	19	804	5.8	7.4	0.966	29	920	4.2
919.7	0.513	18	0.484	23	743	7.4	7.4	0.882	35	850	5.4
920.4	0.513	14	0.481	23	759	5.9	7.4	0.877	36	868	4.3
921.1	0.570	13	0.289	23	705	5.5	8.2	0.527	35	806	4.0
921.8	0.513	14	0.400	23	853	7.8	7.4	0.729	35	976	5.7
922.5	0.513	16	0.573	22	748	5.4	7.4	1.0	33	855	4.0
923.2	0.513	14	0.534	26	877	5.6	7.4	0.973	40	1003	4.1
923.9	0.513	14	0.624	22	733	5.8	7.4	1.1	34	839	4.3
924.6	0.513	14	0.477	23	895	6.4	7.4	0.870	36	1023	4.7
925.2	0.513	16	0.329	21	712	7.8	7.4	0.600	32	815	5.7
925.9	0.513	16	0.492	24	833	9.1	7.4	0.898	37	952	6.7
926.6	0.513	16	0.350	20	746	3.7	7.4	0.638	31	853	2.7
927.3	0.513	20	0.598	22	758	7.7	7.4	1.1	33	867	5.6
928.0	0.655	18	0.788	22	772	6.1	9.5	1.4	34	883	4.4
928.7	0.513	18	0.536	23	790	4.9	7.4	0.978	35	904	3.6
929.4	0.513	18	1.0	20	726	5.1	7.4	1.8	31	830	3.7
930.1	0.513	17	0.390	23	724	6.8	7.4	0.711	35	828	4.9
930.8	0.513	22	0.537	27	774	5.4	7.4	0.979	42	886	4.0
931.5	0.513	21	0.409	25	781	7.4	7.4	0.746	38	893	5.4
932.2	0.513	23	0.710	22	837	6.6	7.4	1.3	33	957	4.8
932.9	0.514	24	0.415	26	785	6.1	7.4	0.756	40	898	4.4
933.6	0.513	18	0.401	20	738	5.3	7.4	0.732	31	844	3.9
934.3	0.537	19	0.705	20	770	6.1	7.7	1.3	30	881	4.5
935.0	0.513	23	0.428	25	874	7.1	7.4	0.781	39	999	5.2
935.7	0.513	22	0.589	25	770	3.9	7.4	1.1	38	880	2.9
936.4	0.513	23	0.525	29	779	5.4	7.4	0.958	45	891	4.0
937.1	0.513	21	0.558	24	756	7.3	7.4	1.0	36	864	5.3
937.8	0.513	21	0.445	22	751	5.3	7.4	0.812	34	859	3.9
938.5	0.513	24	0.774	21	861	5.7	7.4	1.4	33	985	4.2
939.2	0.598	22	0.742	25	842	5.9	8.6	1.4	39	963	4.3
939.9	0.513	20	0.561	24	706	4.0	7.4	1.0	36	807	2.9
940.6	0.673	25	0.630	29	809	6.3	9.7	1.1	44	925	4.6
941.3	0.513	21	0.565	26	934	4.1	7.4	1.0	41	1068	3.0
942.0	0.513	27	0.852	32	943	8.7	7.4	1.6	49	1078	6.3
942.7	0.513	25	0.666	28	898	7.6	7.4	1.2	43	1027	5.5
943.4	0.513	21	0.692	35	919	5.5	7.4	1.3	54	1051	4.0
944.1	0.513	20	0.831	27	863	5.3	7.4	1.5	41	987	3.9
944.8	0.737	25	0.729	26	950	4.8	11	1.3	40	1087	3.5
945.5	0.513	22	0.655	24	967	6.2	7.4	1.2	37	1106	4.5
946.2	0.513	26	0.947	24	918	5.2	7.4	1.7	37	1050	3.8
946.9	0.827	25	1.1	32	925	5.1	12	2.1	50	1057	3.7
947.6	0.989	23	1.1	35	1091	5.3	14	2.0	54	1248	3.9
948.3	0.953	24	1.2	34	967	4.1	14	2.2	52	1105	3.0
949.0	0.820	23	0.854	38	1004	4.8	12	1.6	59	1148	3.5
949.7	0.722	24	0.663	36	1061	5.0	10	1.2	55	1213	3.7
950.4	0.770	22	0.944	32	922	4.2	11	1.7	49	1055	3.0
951.1	1.4	25	1.1	35	1154	5.2	21	2.0	53	1320	3.8
951.7	1.1	20	1.4	33	1114	6.3	17	2.6	51	1274	4.6
952.4	1.5	24	1.1	38	1150	4.6	22	2.1	58	1315	3.4
953.1	0.763	20	1.2	43	1102	5.7	11	2.3	66	1261	4.1
953.8	1.1	23	1.2	40	1093	3.7	16	2.3	62	1249	2.7
954.5	1.1	25	1.4	38	1176	6.5	16	2.6	59	1345	4.7
955.2	1.0	24	1.6	43	1208	4.3	15	2.8	65	1381	3.1
955.9	1.3	20	1.8	46	1229	3.7	19	3.2	71	1405	2.7
956.6	1.3	19	1.7	36	1088	3.0	18	3.1	55	1245	2.2
957.3	1.1	18	1.6	36	1052	3.2	16	2.9	55	1203	2.3
958.0	1.4	20	1.8	44	1303	4.8	20	3.3	67	1490	3.5
958.7	0.967	22	1.8	37	1265	4.0	14	3.3	56	1447	3.0
959.4	1.7	20	1.8	43	1228	4.8	24	3.3	66	1405	3.5
960.1	1.3	21	2.6	42	1323	3.5	19	4.7	64	1513	2.5



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.8	1.5	17	1.8	41	1323	4.6	22	3.3	63	1513	3.3
961.5	1.7	22	2.9	47	1356	4.4	25	5.2	72	1551	3.2
962.2	1.8	19	2.8	53	1379	5.2	26	5.2	81	1576	3.8
962.9	1.4	17	2.2	43	1287	2.7	20	4.0	66	1472	1.9
963.6	1.7	17	2.5	48	1317	3.7	24	4.6	73	1506	2.7
964.3	2.0	20	2.3	45	1600	3.1	29	4.2	70	1829	2.2
965.0	2.8	20	2.5	49	1427	4.1	40	4.5	74	1632	3.0
965.7	1.8	19	2.9	51	1436	3.5	25	5.2	78	1642	2.6
966.4	2.4	18	2.3	50	1409	2.8	34	4.2	77	1611	2.0
967.1	2.1	19	2.6	51	1491	2.5	30	4.7	77	1705	1.8
967.8	1.9	18	3.5	57	1496	3.1	27	6.3	87	1711	2.3
968.5	2.1	19	3.0	46	1613	3.8	30	5.6	70	1844	2.8
969.2	1.5	18	2.6	54	1707	3.5	22	4.7	82	1952	2.5
969.9	1.7	18	3.9	49	1509	2.7	25	7.0	76	1726	2.0
970.6	2.1	15	3.0	51	1435	2.4	31	5.4	78	1640	1.8
971.3	2.3	16	3.0	49	1665	2.4	34	5.4	76	1904	1.7
972.0	2.0	18	3.0	56	1539	3.9	29	5.5	86	1760	2.9
972.7	2.7	20	2.9	55	1613	3.0	38	5.4	85	1844	2.2
973.4	2.8	19	4.1	58	1629	2.1	40	7.5	89	1863	1.5
974.1	2.9	20	3.6	65	1871	2.6	42	6.5	99	2140	1.9
974.8	2.9	17	3.5	49	1588	1.8	42	6.5	75	1816	1.3
975.5	3.3	20	4.5	62	1820	2.7	48	8.3	95	2081	2.0
976.2	2.6	17	4.0	61	1707	1.9	38	7.3	94	1952	1.4
976.9	2.0	17	4.1	58	1653	1.9	29	7.4	88	1890	1.4
977.5	1.9	17	4.3	65	1745	2.8	28	7.8	100	1995	2.1
978.2	3.2	17	4.2	55	1506	2.2	47	7.6	85	1722	1.6
978.9	2.9	17	5.4	59	1669	3.6	41	9.8	90	1908	2.6
979.6	3.1	17	4.7	58	1445	1.7	44	8.5	88	1652	1.2
980.3	2.8	15	4.1	57	1484	1.9	40	7.6	87	1696	1.4
981.0	2.5	17	5.0	62	1647	2.8	36	9.1	95	1883	2.0
981.7	3.3	19	4.9	61	1655	2.1	48	9.0	94	1892	1.5
982.4	2.7	17	5.2	61	1682	1.7	38	9.5	93	1924	1.2
983.1	2.9	17	5.3	67	1572	2.7	41	9.7	102	1797	2.0
983.8	2.9	18	5.2	70	1827	2.8	41	9.6	107	2089	2.0
984.5	3.0	16	5.5	64	1659	2.0	43	10.0	98	1897	1.5
985.2	3.4	17	5.3	69	1820	4.1	49	9.7	106	2082	3.0
985.9	2.9	20	5.2	61	1467	2.8	41	9.4	93	1677	2.1
986.6	2.3	19	5.5	57	1728	2.2	34	10	87	1976	1.6
987.3	2.7	17	6.7	62	1740	2.7	39	12	95	1990	2.0
988.0	2.6	18	5.9	63	1777	1.9	37	11	97	2033	1.4
988.7	2.7	17	7.2	62	1795	2.4	39	13	95	2053	1.8
989.4	2.4	17	5.4	63	1524	1.7	34	9.8	96	1742	1.3
990.1	2.6	16	6.5	57	1611	2.1	37	12	87	1842	1.5
990.8	2.4	17	6.5	64	1691	2.4	35	12	98	1933	1.7
991.5	2.4	16	5.7	67	1546	1.7	34	10	103	1767	1.3
992.2	3.1	17	6.6	64	1759	2.3	45	12	99	2012	1.7
992.9	1.9	21	5.5	66	1781	2.0	28	10	101	2036	1.4
993.6	2.5	16	5.1	59	1688	2.4	36	9.4	90	1930	1.7
994.3	2.1	16	5.4	62	1774	2.2	30	9.9	94	2029	1.6
995.0	1.9	16	6.1	64	1741	2.3	27	11	97	1991	1.7
995.7	2.6	17	5.6	58	1549	1.7	38	10	88	1772	1.2
996.4	2.9	17	5.3	65	1697	1.6	42	9.7	99	1941	1.2
997.1	2.3	19	5.8	66	1748	1.7	34	11	101	1999	1.3
997.8	2.3	18	5.6	67	1812	2.7	34	10	102	2072	2.0
998.5	2.5	17	5.6	71	1797	1.3	36	10	109	2054	0.944
999.2	2.3	16	5.9	63	1735	1.4	33	11	96	1984	1.1
999.9	2.9	17	6.3	70	1896	1.8	42	11	108	2168	1.3
1000.6	3.4	18	6.3	68	1688	2.2	49	11	104	1930	1.6
1001.3	3.0	16	6.1	63	1883	1.9	43	11	97	2153	1.4
1002.0	2.8	15	6.0	63	1775	2.2	40	11	96	2030	1.6
1002.7	2.9	16	6.8	60	1963	2.1	41	12	92	2245	1.5
1003.4	2.6	16	6.0	64	1787	2.1	38	11	99	2043	1.5
1004.0	3.0	15	5.1	56	1812	2.7	43	9.3	86	2072	2.0
1004.7	2.6	16	5.8	73	1896	1.5	38	11	112	2168	1.1
1005.4	2.4	15	6.2	70	1764	1.9	35	11	107	2017	1.4
1006.1	2.3	22	6.5	75	2193	3.3	33	12	115	2508	2.4
1006.8	3.1	15	5.6	70	2012	2.0	44	10	108	2301	1.5
1007.5	4.2	17	6.1	73	1901	2.6	60	11	111	2174	1.9
1008.2	2.7	17	5.8	65	2135	1.3	38	11	99	2441	0.939
1008.9	4.2	17	5.7	68	1962	2.1	60	10	104	2243	1.5
1009.6	3.1	17	5.4	68	1970	2.0	45	9.9	104	2253	1.5
1010.3	3.9	20	5.6	72	2016	2.4	57	10	111	2306	1.8
1011.0	2.8	17	6.0	62	1855	2.5	40	11	95	2121	1.8
1011.7	4.4	18	5.1	63	1814	1.8	63	9.3	97	2075	1.3
1012.4	2.7	13	4.9	68	1798	1.4	38	9.0	105	2056	1.0
1013.1	3.1	17	5.1	60	1807	1.3	45	9.2	93	2066	0.971
1013.8	3.0	18	5.7	66	2060	2.0	43	10	101	2356	1.4
1014.5	3.2	15	5.8	61	1798	1.2	46	11	94	2056	0.851
1015.2	2.9	16	5.5	65	2111	1.9	42	10	99	2414	1.4
1015.9	4.2	17	5.7	60	2076	2.3	60	10	92	2373	1.7
1016.6	3.4	18	4.8	61	1835	1.8	49	8.8	93	2098	1.3



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Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1017.3	3.5	14	4.8	62	1849	1.3	51	8.8	95	2115	0.966
1018.0	3.2	16	4.7	58	1962	1.5	46	8.6	89	2244	1.1
1018.7	3.1	14	4.2	59	1807	1.4	45	7.7	91	2066	0.992
1019.4	2.7	15	4.8	62	1847	1.5	40	8.8	95	2113	1.1
1020.1	2.6	15	5.2	59	1763	1.5	37	9.4	91	2016	1.1
1020.8	3.3	14	4.6	57	1715	1.4	48	8.3	88	1961	1.0
1021.5	3.1	15	5.3	60	1779	1.3	44	9.7	93	2034	0.958
1022.2	2.4	15	4.1	62	1720	2.5	35	7.5	95	1967	1.8
1022.9	2.5	16	4.5	58	1648	1.9	36	8.3	89	1884	1.4
1023.6	2.6	13	4.4	60	1703	1.3	38	8.0	92	1947	0.983
1024.3	2.5	16	4.0	58	1676	1.8	35	7.3	90	1916	1.3
1025.0	2.1	17	4.8	58	1855	1.1	30	8.7	89	2121	0.835
1025.7	1.9	18	3.7	55	1624	2.1	27	6.7	84	1857	1.5
1026.4	1.9	15	3.4	50	1533	1.7	28	6.2	77	1752	1.3
1027.1	1.5	13	3.6	55	1638	1.7	22	6.6	85	1873	1.3
1027.8	1.8	15	3.4	51	1494	2.9	26	6.3	78	1708	2.1
1028.5	2.1	16	3.6	59	1546	2.4	30	6.5	90	1768	1.8
1029.2	1.9	13	3.6	53	1581	1.0	28	6.6	81	1808	0.755
1029.8	1.3	15	3.8	51	1563	2.5	19	7.0	79	1788	1.8
1030.5	1.3	12	3.4	49	1516	2.3	19	6.3	74	1734	1.7
1031.2	0.909	13	2.8	51	1443	2.3	13	5.1	79	1650	1.7
1031.9	1.6	14	3.0	51	1538	2.5	23	5.5	78	1759	1.8
1032.6	0.974	15	3.3	52	1408	2.2	14	6.0	79	1610	1.6
1033.3	0.746	16	2.7	46	1393	2.7	11	4.9	70	1593	2.0
1034.0	0.801	15	2.9	48	1292	1.5	12	5.2	74	1478	1.1
1034.7	0.513	14	2.3	45	1204	2.3	7.4	4.2	68	1376	1.6
1035.4	0.720	16	2.5	50	1292	1.5	10	4.6	76	1477	1.1
1036.1	0.891	17	2.3	44	1151	1.5	13	4.2	67	1316	1.1
1036.8	0.513	15	1.9	47	1187	3.3	7.4	3.5	72	1358	2.4
1037.5	0.576	15	2.4	43	1102	1.8	8.3	4.4	66	1261	1.3
1038.2	0.803	15	1.9	45	1227	2.5	12	3.5	68	1403	1.8
1038.9	0.539	17	2.2	47	1099	2.8	7.8	4.0	71	1257	2.0
1039.6	0.513	14	2.4	41	1067	3.3	7.4	4.4	63	1220	2.4
1040.3	0.553	15	2.1	44	1104	3.4	8.0	3.8	68	1262	2.5
1041.0	0.513	15	2.2	43	1098	2.4	7.4	4.0	65	1255	1.8
1041.7	0.612	16	1.5	47	1152	3.2	8.8	2.8	72	1318	2.4
1042.4	0.513	15	1.9	47	1002	2.4	7.4	3.5	73	1145	1.8
1043.1	0.513	14	1.7	40	1005	2.8	7.4	3.2	61	1149	2.0
1043.8	0.513	16	1.8	39	932	2.4	7.4	3.3	59	1065	1.8
1044.5	1.3	14	1.7	49	1134	3.0	18	3.2	75	1296	2.2
1045.2	0.513	14	1.4	39	984	3.2	7.4	2.6	60	1125	2.3
1045.9	0.770	16	1.4	39	873	2.3	11	2.6	60	998	1.7
1046.6	0.513	16	1.6	41	910	2.5	7.4	2.9	63	1041	1.8
1047.3	0.513	19	1.3	39	861	2.7	7.4	2.3	60	985	1.9
1048.0	0.866	15	1.3	33	856	2.3	13	2.4	50	979	1.6
1048.7	0.521	18	1.4	37	924	3.2	7.5	2.6	57	1056	2.3
1049.4	0.572	17	1.1	34	813	1.7	8.3	2.1	52	930	1.2
1050.1	0.513	19	1.2	31	894	2.1	7.4	2.1	47	1022	1.6
1050.8	0.893	17	0.854	32	834	2.3	13	1.6	49	954	1.7
1051.5	1.3	19	1.2	29	809	1.7	18	2.3	45	925	1.2
1052.2	0.715	18	0.935	26	777	2.4	10	1.7	40	889	1.7
1052.9	0.657	19	1.1	27	834	2.2	9.5	2.0	42	953	1.6
1053.6	0.658	17	1.3	26	782	2.8	9.5	2.3	40	894	2.1
1054.3	0.513	18	1.1	28	856	2.3	7.4	1.9	43	979	1.6
1055.0	0.834	18	1.2	28	877	1.8	12	2.2	42	1003	1.3
1055.7	0.748	18	0.939	22	771	3.0	11	1.7	33	881	2.2
1056.4	0.595	21	0.976	27	877	2.6	8.6	1.8	41	1003	1.9
1057.0	0.802	22	1.2	28	781	2.4	12	2.2	42	893	1.8
1057.7	0.513	16	0.598	25	793	2.4	7.4	1.1	38	907	1.8
1058.4	0.621	17	0.809	21	781	2.3	9.0	1.5	32	893	1.7
1059.1	1.1	15	0.699	24	805	1.7	16	1.3	37	920	1.2
1059.8	0.617	18	0.609	20	813	1.6	8.9	1.1	31	929	1.2
1060.5	0.513	16	0.915	21	852	2.6	7.4	1.7	32	974	1.9
1061.2	0.514	14	0.552	19	751	2.9	7.4	1.0	29	859	2.1
1061.9	0.785	13	0.463	18	808	3.5	11	0.845	28	924	2.6
1062.6	0.513	16	0.896	18	818	1.8	7.4	1.6	28	936	1.3
1063.3	0.991	16	0.349	22	836	2.2	14	0.636	33	956	1.6
1064.0	0.513	12	0.249	20	733	1.5	7.4	0.454	30	838	1.1
1064.7	0.718	13	0.578	22	836	2.8	10	1.1	33	956	2.0
1065.4	0.513	12	0.652	21	739	0.670	7.4	1.2	33	845	0.489
1066.1	0.513	12	0.459	24	887	2.5	7.4	0.837	37	1014	1.8
1066.8	0.513	14	0.852	19	810	2.2	7.4	1.6	29	926	1.6
1067.5	0.866	15	0.350	16	732	1.6	12	0.638	25	837	1.2
1068.2	0.592	15	0.832	21	845	1.9	8.6	1.5	32	967	1.4
1068.9	1.5	13	0.604	17	724	2.3	21	1.1	26	827	1.7
1069.6	0.885	15	0.644	18	811	2.6	13	1.2	27	928	1.9
1070.3	1.2	15	0.502	20	753	2.2	17	0.916	30	861	1.6
1071.0	0.593	15	0.692	20	837	2.6	8.6	1.3	31	957	1.9
1071.7	1.1	15	0.727	19	721	1.6	16	1.3	29	824	1.2
1072.4	1.0	13	0.679	18	769	1.4	15	1.2	28	879	1.0
1073.1	1.2	13	0.693	18	652	2.6	18	1.3	28	746	1.9



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.8	1.5	14	0.593	19	698	2.3	21	1.1	30	798	1.7
1074.5	1.4	13	0.603	22	781	1.6	20	1.1	33	893	1.2
1075.2	1.5	14	0.860	20	657	0.778	21	1.6	30	751	0.568
1075.9	1.9	15	0.827	26	827	2.6	28	1.5	40	945	1.9
1076.6	1.9	14	0.727	23	775	2.4	27	1.3	36	886	1.8
1077.3	1.9	14	1.4	22	843	2.4	28	2.6	33	964	1.8
1078.0	1.6	13	1.3	19	804	1.7	23	2.4	29	920	1.2
1078.7	1.9	12	1.3	20	728	2.4	28	2.3	31	832	1.7
1079.4	1.0	13	0.979	23	813	2.3	14	1.8	35	930	1.6
1080.1	0.946	13	1.2	22	794	2.6	14	2.3	34	908	1.9
1080.8	2.1	13	1.2	22	746	2.0	31	2.2	34	853	1.4
1081.5	1.3	15	1.5	29	913	1.4	19	2.8	44	1044	0.997
1082.2	1.2	13	1.6	29	886	1.8	17	2.8	45	1013	1.3
1082.8	2.2	13	1.8	26	815	2.0	31	3.3	40	932	1.5
1083.5	2.3	13	2.1	24	921	3.0	34	3.8	37	1053	2.2
1084.2	1.4	16	2.1	27	983	2.3	20	3.9	42	1124	1.7
1084.9	1.3	15	2.0	31	983	3.6	19	3.7	47	1124	2.6
1085.6	2.2	14	2.8	30	1090	2.5	32	5.2	46	1247	1.9
1086.3	1.9	15	2.6	33	1169	3.4	27	4.8	51	1337	2.5
1087.0	2.6	14	2.6	28	1081	2.5	38	4.8	43	1236	1.9
1087.7	2.3	13	3.6	30	1011	2.1	33	6.5	46	1156	1.6
1088.4	1.6	14	2.9	36	1215	2.3	23	5.2	55	1390	1.7
1089.1	2.0	13	3.7	41	1213	1.8	29	6.8	63	1387	1.3
1089.8	2.6	14	3.3	33	1282	2.4	38	6.0	51	1466	1.7
1090.5	1.8	13	4.4	42	1308	3.2	27	8.1	64	1496	2.4
1091.2	2.4	14	3.9	37	1169	2.1	35	7.1	56	1337	1.5
1091.9	1.7	11	3.4	39	1186	2.6	24	6.2	59	1356	1.9
1092.6	2.4	15	4.0	42	1330	1.6	35	7.3	64	1521	1.1
1093.3	2.5	14	3.8	38	1190	1.5	36	7.0	58	1361	1.1
1094.0	2.0	14	4.2	46	1440	3.0	28	7.7	71	1646	2.2
1094.7	2.0	15	4.0	43	1424	2.2	29	7.2	66	1628	1.6
1095.4	1.8	15	3.7	44	1314	1.6	27	6.7	67	1503	1.2
1096.1	2.0	13	4.0	37	1359	1.6	29	7.3	57	1554	1.2
1096.8	1.7	14	3.9	46	1399	2.2	25	7.1	71	1600	1.6
1097.5	1.5	11	4.0	43	1367	2.1	22	7.3	67	1563	1.5
1098.2	1.7	14	4.7	49	1355	2.5	25	8.6	76	1550	1.8
1098.9	1.2	15	3.7	40	1393	2.0	17	6.8	62	1593	1.4
1099.6	0.909	11	3.6	42	1418	1.4	13	6.5	65	1622	0.996
1100.3	0.951	15	4.3	44	1532	2.6	14	7.8	68	1752	1.9
1101.0	1.6	15	4.0	47	1431	1.6	23	7.3	72	1636	1.1
1101.7	1.1	15	3.4	49	1481	1.7	16	6.2	76	1694	1.3
1102.4	1.0	12	4.0	41	1293	2.7	15	7.2	63	1478	2.0
1103.1	1.1	11	3.3	42	1219	0.937	16	6.0	65	1394	0.684
1103.8	1.3	12	3.9	51	1367	2.0	19	7.1	77	1564	1.4
1104.5	0.925	14	3.4	49	1406	1.2	13	6.3	76	1608	0.861
1105.2	0.883	26	3.7	49	1365	1.6	13	6.8	75	1561	1.1
1105.9	1.3	12	3.3	48	1448	1.4	18	6.1	73	1656	1.0
1106.6	0.795	14	3.6	47	1297	1.7	11	6.5	72	1484	1.2
1107.3	1.0	13	4.1	48	1384	1.0	15	7.5	73	1582	0.730
1108.0	0.616	13	3.7	45	1424	2.8	8.9	6.8	69	1628	2.1
1108.6	1.2	14	3.2	48	1468	1.8	17	5.8	73	1679	1.3
1109.3	1.1	11	3.9	42	1527	1.3	16	7.2	65	1746	0.937
1110.0	1.2	14	3.7	43	1411	1.2	17	6.7	66	1613	0.877
1110.7	0.920	15	3.9	44	1465	2.4	13	7.2	68	1676	1.7
1111.4	0.522	15	2.9	49	1432	1.1	7.5	5.3	75	1637	0.808
1112.1	0.996	11	2.8	43	1465	1.3	14	5.2	66	1676	0.946
1112.8	0.755	14	3.6	49	1491	2.5	11	6.6	75	1705	1.8
1113.5	0.809	14	2.9	49	1526	1.1	12	5.2	75	1744	0.835
1114.2	0.513	15	3.3	43	1411	1.5	7.4	6.1	66	1613	1.1
1114.9	0.513	14	2.7	48	1445	0.999	7.4	4.9	73	1652	0.729
1115.6	0.513	13	2.1	44	1454	1.1	7.4	3.8	67	1663	0.834
1116.3	0.513	15	2.9	43	1519	1.7	7.4	5.4	66	1737	1.2
1117.0	0.513	11	3.0	41	1479	2.1	7.4	5.5	63	1691	1.5
1117.7	0.835	12	2.1	36	1424	1.8	12	3.8	55	1628	1.3
1118.4	0.920	14	2.1	41	1439	0.722	13	3.9	63	1645	0.527
1119.1	0.513	11	2.4	40	1386	1.8	7.4	4.4	61	1585	1.3
1119.8	0.513	12	2.2	41	1557	1.7	7.4	4.1	63	1780	1.2
1120.5	0.513	14	2.0	39	1313	1.0	7.4	3.7	59	1501	0.749
1121.2	0.562	15	2.1	40	1264	1.8	8.1	3.8	61	1446	1.3
1121.9	0.584	15	1.9	37	1357	1.9	8.4	3.5	56	1552	1.4
1122.6	0.513	10	1.8	43	1264	2.2	7.4	3.3	66	1446	1.6
1123.3	0.513	13	1.4	34	1131	1.5	7.4	2.6	53	1293	1.1
1124.0	0.513	14	1.6	38	1097	1.5	7.4	3.0	58	1255	1.1
1124.7	0.513	15	1.8	38	1173	1.7	7.4	3.2	58	1341	1.2
1125.4	0.513	13	1.4	37	1076	2.1	7.4	2.5	57	1230	1.6
1126.1	0.513	15	1.6	41	1238	2.1	7.4	3.0	62	1415	1.5
1126.8	0.513	13	1.5	32	1040	1.8	7.4	2.7	48	1189	1.3
1127.5	0.934	14	1.3	37	1056	2.2	13	2.4	56	1207	1.6
1128.2	0.854	15	1.2	33	1089	3.0	12	2.1	51	1245	2.2
1128.9	0.513	15	1.2	30	866	1.5	7.4	2.3	47	990	1.1
1129.6	0.590	12	1.1	28	833	1.3	8.5	1.9	42	953	0.952



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1130.3	0.513	16	1.2	32	936	2.6	7.4	2.3	49	1071	1.9
1131.0	0.513	14	1.2	32	973	2.0	7.4	2.2	48	1113	1.5
1131.7	0.513	13	1.1	27	937	2.6	7.4	2.0	41	1072	1.9
1132.4	0.977	14	1.1	27	906	2.1	14	2.0	41	1036	1.5
1133.1	0.683	13	0.840	29	867	1.6	9.9	1.5	45	992	1.2
1133.8	0.794	15	1.1	27	833	1.3	11	2.0	41	953	0.964
1134.5	1.1	16	0.834	23	833	2.1	16	1.5	35	953	1.6
1135.1	0.774	16	0.930	19	858	1.2	11	1.7	30	981	0.865
1135.8	1.6	15	0.721	21	811	2.0	23	1.3	33	927	1.5
1136.5	0.823	15	1.0	19	813	1.7	12	1.8	29	929	1.3
1137.2	0.513	16	0.759	18	819	1.2	7.4	1.4	28	936	0.907
1137.9	1.1	14	0.605	16	737	0.918	17	1.1	25	842	0.670
1138.6	0.566	12	0.641	17	813	2.1	8.2	1.2	27	930	1.5
1139.3	1.1	15	0.743	16	725	2.3	15	1.4	24	829	1.7
1140.0	1.1	13	0.630	17	749	1.6	15	1.1	26	857	1.2
1140.7	1.0	14	0.621	15	683	1.5	15	1.1	23	781	1.1
1141.4	0.660	13	0.612	15	658	1.3	9.5	1.1	24	753	0.917
1142.1	0.943	13	0.734	17	749	2.2	14	1.3	25	857	1.6
1142.8	1.0	11	0.628	14	676	1.3	15	1.1	21	772	0.979
1143.5	1.1	15	0.806	14	741	1.9	16	1.5	21	847	1.4
1144.2	0.627	11	0.755	15	630	1.7	9.1	1.4	23	721	1.2
1144.9	0.923	12	0.329	17	714	1.4	13	0.601	26	816	1.0
1145.6	1.2	13	0.426	17	713	2.2	17	0.776	26	816	1.6
1146.3	1.5	12	0.672	14	653	1.6	21	1.2	22	747	1.1
1147.0	1.1	12	0.696	13	637	1.2	16	1.3	19	728	0.855
1147.7	0.831	14	0.597	16	642	2.3	12	1.1	24	734	1.7
1148.4	1.4	13	0.545	14	648	2.0	20	0.993	21	741	1.4
1149.1	1.4	12	0.527	17	713	1.9	21	0.962	26	816	1.4
1149.8	1.2	11	0.805	14	646	1.6	17	1.5	22	738	1.1
1150.5	1.3	12	0.845	14	609	2.4	19	1.5	22	696	1.7
1151.2	0.965	13	0.503	18	684	2.2	14	0.916	27	782	1.6
1151.9	1.0	12	0.665	14	665	2.7	15	1.2	22	761	2.0
1152.6	0.901	12	0.665	14	597	1.9	13	1.2	22	682	1.4
1153.3	1.9	12	0.879	18	663	2.1	28	1.6	27	758	1.5
1154.0	2.0	13	0.604	17	567	2.6	28	1.1	26	648	1.9
1154.7	1.6	11	0.848	15	600	2.5	23	1.5	23	686	1.8
1155.4	1.6	11	0.914	18	588	2.7	23	1.7	28	672	2.0
1156.1	2.5	10.0	0.918	16	618	2.8	36	1.7	25	706	2.0
1156.8	1.8	13	1.0	13	583	2.5	27	1.8	19	667	1.9
1157.5	1.8	7.9	1.3	17	529	1.7	26	2.4	26	605	1.3
1158.2	2.1	12	1.1	19	649	2.5	30	1.9	28	742	1.8
1158.9	2.7	11	1.7	21	663	4.8	39	3.0	32	758	3.5
1159.6	3.7	12	1.6	15	533	7.3	53	3.0	24	610	5.4
1160.3	3.3	13	1.7	25	630	7.9	48	3.1	38	720	5.8
1160.9	4.2	14	3.2	24	747	11	61	5.7	36	854	7.8
1161.6	4.8	14	3.5	27	786	9.7	70	6.5	42	899	7.1
1162.3	5.4	15	4.0	32	1003	15	78	7.3	49	1147	11
1163.0	5.9	12	4.7	32	959	14	85	8.7	48	1096	9.9
1163.7	4.9	15	4.7	36	1054	19	70	8.5	56	1205	14
1164.4	6.1	14	5.5	29	1099	13	88	10	45	1257	9.8
1165.1	3.9	12	5.9	33	1170	17	56	11	50	1338	12
1165.8	5.3	14	6.4	42	1252	19	77	12	64	1432	14
1166.5	4.8	14	6.5	36	1238	17	69	12	56	1416	12
1167.2	4.7	14	6.4	39	1222	19	68	12	60	1397	14
1167.9	4.5	11	6.5	40	1267	16	65	12	62	1449	12
1168.6	5.5	14	7.4	39	1273	14	79	14	59	1455	10
1169.3	5.0	13	7.1	39	1378	15	72	13	60	1576	11
1170.0	5.1	15	7.4	40	1231	11	74	14	61	1408	8.2
1170.7	4.9	14	7.0	41	1421	12	71	13	63	1625	8.8
1171.4	4.8	14	7.5	35	1410	12	69	14	54	1612	8.7
1172.1	3.7	15	8.6	39	1193	11	53	16	60	1364	8.0
1172.8	4.6	13	9.2	47	1312	10	67	17	72	1500	7.4
1173.5	4.5	14	9.0	46	1433	11	65	16	70	1638	7.7
1174.2	4.3	14	8.2	46	1528	9.4	62	15	71	1747	6.8
1174.9	4.5	14	8.3	44	1306	8.2	65	15	67	1494	6.0
1175.6	3.8	11	8.2	35	1136	7.5	55	15	54	1299	5.5
1176.3	4.3	16	9.5	42	1473	8.5	62	17	65	1684	6.2
1177.0	5.5	15	8.4	55	1580	8.5	80	15	85	1807	6.2
1177.7	3.5	14	7.3	54	1564	7.0	51	13	83	1789	5.1
1178.4	3.9	13	7.7	41	1410	7.7	56	14	63	1612	5.6
1179.1	4.0	14	8.1	51	1624	8.0	58	15	78	1857	5.9
1179.8	3.9	17	6.5	46	1449	6.2	56	12	70	1657	4.5
1180.5	4.2	14	7.3	46	1442	5.6	61	13	70	1649	4.1
1181.2	3.9	14	5.3	47	1345	4.9	56	9.7	73	1538	3.6
1181.9	4.6	16	6.0	52	1751	4.6	67	11	79	2002	3.3
1182.6	3.4	12	6.1	44	1267	5.0	50	11	67	1449	3.6
1183.3	4.6	14	6.5	60	1708	5.8	66	12	92	1953	4.3
1184.0	3.3	15	7.0	53	1646	4.6	47	13	81	1882	3.3
1184.7	3.5	13	5.8	56	1765	5.0	50	11	85	2019	3.6
1185.4	3.6	16	6.5	50	1591	5.7	52	12	77	1819	4.2
1186.1	4.8	16	6.5	48	1460	5.2	70	12	74	1670	3.8



Minnow Environmental  
Sample ID: 015

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
1186.7	5.4	15	8.3	49	1720	5.0	78	15	75	1966	3.6
1187.4	4.3	14	7.1	50	1611	4.8	63	13	76	1842	3.5
1188.1	4.2	13	7.3	47	1620	5.3	61	13	72	1853	3.8
1188.8	4.7	12	8.5	54	1728	4.9	68	16	82	1976	3.5
1189.5	4.0	15	8.6	43	1585	5.2	57	16	66	1812	3.8
1190.2	4.4	17	8.1	55	1689	5.5	64	15	84	1931	4.0
1190.9	4.1	15	7.4	51	1401	3.6	59	13	78	1603	2.6
1191.6	4.1	13	6.7	47	1559	3.0	59	12	72	1782	2.2
1192.3	3.9	11	7.9	47	1573	3.0	56	14	72	1799	2.2
1193.0	5.8	14	7.4	48	1615	3.3	84	14	73	1847	2.4
1193.7	5.1	16	7.0	43	1701	3.2	74	13	65	1945	2.3
1194.4	3.5	17	6.3	40	1513	2.8	50	12	61	1730	2.1
1195.1	3.2	14	5.6	38	1551	4.0	47	10	58	1774	2.9
1195.8	2.0	13	5.4	37	1477	4.8	29	9.8	57	1689	3.5
1196.5	1.7	15	5.1	42	1605	3.1	24	9.2	65	1835	2.3
1197.2	1.8	14	4.0	42	1620	5.4	26	7.4	64	1852	3.9
1197.9	2.1	15	4.3	40	1455	4.1	30	7.9	61	1663	3.0
1198.6	1.6	12	3.5	42	1604	4.1	24	6.5	64	1834	3.0
1199.3	1.3	11	4.4	32	1284	3.9	19	7.9	49	1468	2.9
1200.0	1.1	14	4.2	42	1623	5.1	15	7.6	65	1856	3.7
1200.7	0.905	18	4.5	37	1412	3.8	13	8.2	57	1614	2.7
1201.4	1.1	14	3.1	36	1417	4.7	16	5.7	55	1620	3.4
1202.1	1.2	12	2.6	34	1509	4.7	17	4.7	52	1725	3.4
1202.8	0.839	12	51	29	1230	4.4	12	93	45	1406	3.2
1203.5	0.837	13	3.4	33	1447	4.5	12	6.2	50	1654	3.3
1204.2	1.3	16	2.5	36	1352	3.5	19	4.5	55	1546	2.6
1204.9	1.0	12	3.0	33	1348	4.8	15	5.5	51	1541	3.5
1205.6	0.513	15	3.0	33	1185	3.0	7.4	5.6	50	1355	2.2
1206.3	1.3	13	2.2	24	1138	3.1	19	4.0	37	1301	2.3
1207.0	0.652	11	2.5	33	1196	5.2	9.4	4.5	50	1368	3.8
1207.7	0.513	13	1.9	28	1035	5.2	7.4	3.4	43	1183	3.8
1208.4	0.513	14	2.2	25	1035	2.6	7.4	3.9	39	1184	1.9
1209.1	0.522	15	1.9	28	1007	3.3	7.5	3.5	44	1152	2.4
1209.8	0.668	14	2.2	32	1087	2.7	9.6	4.1	49	1242	2.0
1210.5	0.513	16	1.7	30	915	3.8	7.4	3.1	46	1047	2.7
1211.2	0.676	14	1.4	33	904	3.3	9.8	2.5	51	1034	2.4
1211.9	0.786	14	1.4	33	858	3.1	11	2.6	50	981	2.2
1212.5	0.513	13	1.7	27	876	3.3	7.4	3.2	42	1002	2.4
1213.2	0.513	14	1.5	33	891	3.7	7.4	2.7	50	1019	2.7
1213.9	0.913	15	1.1	35	881	4.2	13	2.0	53	1008	3.0
1214.6	0.786	13	1.3	25	797	2.5	11	2.4	39	912	1.8
1215.3	0.535	12	0.994	23	749	2.2	7.7	1.8	36	856	1.6
1216.0	0.513	15	0.936	24	757	2.5	7.4	1.7	37	865	1.9
1216.7	0.536	17	1.1	28	912	3.8	7.7	2.0	43	1043	2.8
1217.4	0.597	13	0.995	22	732	3.5	8.6	1.8	34	837	2.6
1218.1	0.513	13	0.759	25	729	2.7	7.4	1.4	39	833	2.0
1218.8	0.513	14	0.622	24	721	2.4	7.4	1.1	36	825	1.8
1219.5	1.2	15	0.893	23	770	3.0	17	1.6	36	880	2.2
1220.2	0.593	14	0.779	28	768	2.7	8.6	1.4	43	878	1.9
1220.9	0.851	14	1.5	27	794	2.5	12	2.8	42	908	1.9
1221.6	0.513	14	0.671	21	683	1.6	7.4	1.2	32	781	1.1
1222.3	0.513	12	0.973	19	612	1.8	7.4	1.8	29	699	1.3
1223.0	0.825	15	0.909	21	723	2.9	12	1.7	33	827	2.1
1223.7	0.675	14	0.853	23	726	2.1	9.7	1.6	35	830	1.5
1224.4	0.844	15	1.1	25	748	2.3	12	2.0	38	856	1.7
1225.1	1.6	17	0.985	22	762	3.2	23	1.8	33	872	2.3
1225.8	0.929	15	1.3	20	776	2.6	13	2.4	31	888	1.9
1226.5	0.704	20	0.588	17	761	3.0	10	1.1	27	870	2.2
1227.2	0.578	17	0.717	20	739	1.4	8.3	1.3	31	845	1.0
1227.9	0.578	16	0.843	17	745	2.7	8.3	1.5	26	852	2.0
1228.6	0.513	15	0.690	12	625	2.2	7.4	1.3	19	715	1.6
1229.3	0.615	14	1.0	15	716	2.0	8.9	1.8	23	819	1.5
1230.0	0.733	16	0.840	18	672	1.6	11	1.5	27	769	1.1
1230.7	0.883	16	0.853	18	754	2.5	13	1.6	28	862	1.8
1231.4	0.613	16	0.513	17	733	2.8	8.8	0.937	27	838	2.0
1232.1	0.698	16	0.711	18	721	2.8	10	1.3	28	825	2.1
1232.8	1.2	17	0.536	16	778	2.5	17	0.977	24	890	1.8
1233.5	0.679	16	0.637	18	784	3.5	9.8	1.2	27	896	2.6
1234.2	0.513	15	0.964	13	680	2.9	7.4	1.8	20	778	2.1
1234.9	0.518	14	0.666	18	717	2.7	7.5	1.2	28	820	2.0
1235.6	0.826	16	0.466	16	727	3.3	12	0.850	25	832	2.4
1236.3	0.513	15	0.415	15	667	1.8	7.4	0.758	23	762	1.3
1237.0	1.1	15	0.411	15	641	2.0	16	0.750	23	733	1.4
1237.7	0.802	15	0.452	20	712	1.6	12	0.825	31	814	1.2
1238.3	0.741	14	0.343	15	669	2.6	11	0.625	23	765	1.9
1239.0	1.5	16	0.496	17	774	2.1	21	0.905	27	885	1.5
1239.7	0.705	15	0.524	18	708	2.8	10	0.955	27	810	2.0
1240.4	0.513	17	0.376	17	690	2.8	7.4	0.686	26	789	2.0
1241.1	0.939	14	0.483	14	620	2.2	14	0.881	21	709	1.6
1241.8	0.851	12	0.492	20	743	2.3	12	0.898	30	850	1.6
1242.5	1.4	15	0.616	17	680	2.7	20	1.1	27	777	2.0



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
1243.2	1.2	17	0.500	17	704	2.3	17	0.912	26	805	1.7
1243.9	0.513	17	0.893	20	726	3.1	7.4	1.6	31	830	2.2
1244.6	0.668	12	0.480	16	609	2.1	9.6	0.875	24	697	1.5
1245.3	1.0	14	0.598	19	693	2.2	15	1.1	30	793	1.6
1246.0	1.0	14	0.286	20	782	2.9	15	0.522	30	895	2.1
1246.7	0.513	15	0.485	19	811	3.0	7.4	0.885	30	928	2.2
1247.4	0.686	13	0.552	19	712	2.3	9.9	1.0	29	814	1.6
1248.1	1.0	17	0.823	21	778	2.0	15	1.5	33	890	1.5
1248.8	0.640	16	0.643	18	854	2.9	9.2	1.2	28	977	2.1
1249.5	0.746	20	0.897	24	901	2.3	11	1.6	37	1030	1.6
1250.2	0.513	16	1.1	21	886	3.0	7.4	1.9	32	1013	2.2
1250.9	0.532	15	1.2	24	916	2.4	7.7	2.2	37	1048	1.7
1251.6	0.613	16	1.3	22	1027	1.6	8.9	2.4	33	1175	1.2
1252.3	0.685	17	1.0	25	1062	2.1	9.9	1.8	39	1215	1.6
1253.0	0.513	16	1.8	28	1055	2.0	7.4	3.3	42	1207	1.5
1253.7	0.684	15	1.3	26	1090	2.7	9.9	2.5	40	1247	2.0
1254.4	0.607	15	1.5	25	1030	2.1	8.8	2.7	39	1178	1.6
1255.1	0.924	13	1.4	22	1116	2.7	13	2.5	34	1277	2.0
1255.8	1.2	14	1.7	28	1073	1.6	18	3.2	44	1227	1.1
1256.5	0.513	18	2.7	27	1375	2.9	7.4	5.0	41	1572	2.1
1257.2	0.879	17	2.3	30	1193	1.7	13	4.2	45	1364	1.3
1257.9	1.2	15	1.9	30	1376	1.5	17	3.5	46	1574	1.1
1258.6	1.4	13	2.9	29	1301	3.1	20	5.3	45	1487	2.3
1259.3	1.7	14	3.5	38	1329	2.3	25	6.4	59	1519	1.7
1260.0	1.5	14	3.5	29	1439	2.3	22	6.3	44	1645	1.6
1260.7	2.0	14	3.2	40	1403	3.3	29	5.8	62	1605	2.4
1261.4	2.3	15	3.7	37	1644	1.6	33	6.7	57	1880	1.2
1262.1	2.8	14	3.7	32	1651	2.5	41	6.7	49	1888	1.9
1262.8	2.6	13	4.2	33	1624	2.6	37	7.6	51	1857	1.9
1263.5	3.5	13	4.7	33	1366	2.0	50	8.6	51	1562	1.5
1264.2	2.9	14	4.1	38	1528	2.6	41	7.6	58	1747	1.9
1264.8	2.7	13	4.8	42	1502	2.5	39	8.8	65	1717	1.9
1265.5	3.4	13	4.7	36	1798	2.8	49	8.5	55	2056	2.0
1266.2	3.5	14	5.2	43	1608	2.6	50	9.5	66	1838	1.9
1266.9	3.2	14	5.1	41	1617	2.9	46	9.3	63	1849	2.1
1267.6	3.8	13	4.6	37	1713	2.1	55	8.3	57	1959	1.5
1268.3	3.7	13	4.8	47	1876	2.3	54	8.8	72	2146	1.6
1269.0	2.9	12	5.1	36	1435	1.3	41	9.4	55	1641	0.936
1269.7	3.3	14	6.6	44	1784	3.7	47	12	67	2040	2.7
1270.4	2.2	15	5.2	46	1801	3.3	31	9.5	70	2059	2.4
1271.1	3.3	15	5.0	36	1729	2.9	47	9.1	55	1978	2.1
1271.8	1.8	14	6.2	35	1803	3.2	26	11	54	2062	2.3
1272.5	2.1	14	5.5	49	2034	3.8	30	10	75	2325	2.8
1273.2	3.3	15	6.2	39	1623	3.2	48	11	60	1856	2.4
1273.9	2.5	13	5.2	48	1824	3.6	37	9.6	74	2085	2.7
1274.6	1.4	12	5.8	38	1767	3.0	21	11	58	2021	2.2
1275.3	2.5	13	6.0	38	1727	4.2	37	11	58	1975	3.1
1276.0	1.4	13	5.2	36	1908	3.7	20	9.6	55	2182	2.7
1276.7	1.9	13	5.5	38	1780	4.4	27	10	58	2036	3.2
1277.4	2.2	15	5.3	45	1725	3.7	31	9.6	69	1972	2.7
1278.1	1.7	13	5.4	38	1880	4.3	25	9.9	59	2149	3.2
1278.8	1.7	14	6.2	37	1744	3.7	24	11	56	1994	2.7
1279.5	1.6	16	5.1	42	1733	3.1	23	9.3	64	1981	2.3
1280.2	2.4	16	5.4	40	1913	4.0	35	9.9	61	2188	2.9
1280.9	1.2	15	5.4	37	1681	4.3	18	9.8	57	1922	3.1
1281.6	1.4	15	5.0	36	1806	3.2	20	9.1	56	2066	2.4
1282.3	1.8	14	4.3	40	1836	3.7	26	7.8	61	2099	2.7
1283.0	2.2	14	4.2	36	1614	4.6	31	7.7	55	1845	3.4
1283.7	0.741	14	4.0	41	1671	5.1	11	7.3	62	1910	3.8
1284.4	0.690	17	3.9	36	1470	3.7	10.0	7.2	56	1682	2.7
1285.1	0.703	13	4.3	35	1704	3.3	10	7.8	54	1949	2.4
1285.8	0.628	15	3.8	33	1336	3.1	9.1	6.9	50	1528	2.2
1286.5	0.518	10	3.7	36	1453	7.8	7.5	6.7	55	1662	5.7
1287.2	0.836	13	3.3	33	1274	3.5	12	5.9	50	1457	2.6
1287.9	0.734	14	3.2	36	1505	4.5	11	5.8	55	1721	3.3
1288.6	0.549	73	2.6	36	1555	3.4	7.9	4.7	55	1778	2.5
1289.3	0.597	16	2.3	39	1252	3.1	8.6	4.3	59	1431	2.2
1290.0	0.757	15	2.2	39	1268	3.0	11	4.1	59	1450	2.2
1290.6	0.513	13	2.3	31	1060	2.7	7.4	4.1	48	1212	2.0
1291.3	0.609	15	2.8	42	1258	2.2	8.8	5.1	64	1438	1.6
1292.0	0.513	12	2.7	29	1070	2.5	7.4	4.9	45	1223	1.8
1292.7	0.659	15	2.2	36	1151	3.1	9.5	4.0	56	1316	2.3
1293.4	0.513	15	2.0	33	911	2.0	7.4	3.7	50	1041	1.5
1294.1	0.513	15	1.9	30	984	1.6	7.4	3.6	46	1125	1.2
1294.8	0.513	13	2.2	32	969	2.5	7.4	4.0	49	1108	1.8
1295.5	0.513	12	1.6	34	892	1.9	7.4	2.9	52	1019	1.4
1296.2	0.513	14	1.1	34	940	2.2	7.4	2.0	52	1075	1.6
1296.9	1.1	13	1.1	28	873	1.7	16	2.0	42	998	1.3
1297.6	0.513	12	1.9	32	850	1.0	7.4	3.4	49	972	0.733
1298.3	0.632	14	1.3	27	824	2.1	9.1	2.5	42	943	1.5
1299.0	0.513	17	1.4	31	871	1.1	7.4	2.5	47	996	0.823



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1299.7	0.513	13	1.4	33	870	1.7	7.4	2.6	51	995	1.3
1300.4	0.570	12	1.1	27	776	2.5	8.2	2.1	42	887	1.8
1301.1	0.513	14	1.0	34	763	2.0	7.4	1.9	53	872	1.5
1301.8	0.513	14	1.4	28	859	2.4	7.4	2.6	43	982	1.8
1302.5	1.1	14	1.1	30	681	1.8	15	2.0	45	779	1.3
1303.2	0.513	15	1.3	28	818	1.6	7.4	2.3	44	936	1.2
1303.9	1.3	15	0.992	31	809	1.7	18	1.8	47	925	1.2
1304.6	0.570	13	1.1	29	858	1.8	8.2	2.0	44	981	1.3
1305.3	0.513	13	1.1	29	748	2.2	7.4	2.0	45	855	1.6
1306.0	0.513	14	1.1	29	823	2.1	7.4	1.9	44	942	1.5
1306.7	1.1	14	0.746	31	758	2.4	16	1.4	48	867	1.7
1307.4	0.812	14	0.910	31	736	1.6	12	1.7	48	841	1.2
1308.1	0.513	15	0.849	30	674	1.4	7.4	1.5	46	770	1.0
1308.8	0.513	13	1.2	33	726	1.7	7.4	2.1	50	831	1.2
1309.5	1.0	16	1.1	32	755	1.9	15	2.1	49	863	1.4
1310.2	1.1	14	1.1	24	661	1.5	16	2.0	37	756	1.1
1310.9	0.513	13	1.3	28	786	1.3	7.4	2.4	43	899	0.978
1311.6	0.513	14	0.678	32	748	1.0	7.4	1.2	48	856	0.750
1312.3	0.513	12	0.838	27	726	1.3	7.4	1.5	41	830	0.946
1313.0	0.513	13	0.885	32	621	1.1	7.4	1.6	49	710	0.814
1313.7	0.644	14	0.625	27	683	1.9	9.3	1.1	41	781	1.4
1314.4	0.796	13	0.461	27	608	1.3	11	0.840	42	696	0.962
1315.1	1.3	14	0.881	24	719	2.3	19	1.6	37	823	1.7
1315.8	0.997	14	1.2	25	716	1.5	14	2.1	38	819	1.1
1316.4	1.0	14	0.547	25	633	1.4	15	0.997	38	724	1.0
1317.1	0.724	14	0.685	25	695	2.6	10	1.2	39	795	1.9
1317.8	1.2	16	0.568	26	728	1.7	18	1.0	39	832	1.2
1318.5	0.894	12	0.750	22	677	2.0	13	1.4	33	774	1.5
1319.2	0.781	16	0.899	26	749	1.6	11	1.6	39	857	1.2
1319.9	0.513	17	0.701	23	755	1.9	7.4	1.3	36	863	1.4
1320.6	0.534	15	0.353	20	610	0.944	7.7	0.643	30	698	0.689
1321.3	1.3	12	0.445	18	681	2.0	19	0.812	27	779	1.4
1322.0	0.865	14	0.813	14	553	1.3	12	1.5	22	633	0.948
1322.7	1.7	16	0.549	19	703	1.5	25	1.0	30	803	1.1
1323.4	1.1	15	0.613	20	743	1.1	17	1.1	30	849	0.772
1324.1	0.887	16	0.552	18	582	1.4	13	1.0	27	666	1.0
1324.8	1.2	16	0.542	14	714	2.1	17	0.989	21	817	1.6
1325.5	0.513	16	0.427	16	675	1.5	7.4	0.779	25	772	1.1
1326.2	0.701	15	0.607	18	769	2.6	10	1.1	27	880	1.9
1326.9	0.590	15	0.711	17	686	1.4	8.5	1.3	25	784	1.0
1327.6	1.2	16	0.544	18	849	1.7	17	0.992	28	971	1.3
1328.3	1.3	15	0.475	9.5	718	1.7	19	0.867	15	821	1.3
1329.0	0.513	19	0.579	14	730	2.2	7.4	1.1	21	834	1.6
1329.7	1.5	17	0.591	14	657	1.2	21	1.1	21	751	0.851
1330.4	0.513	11	0.365	14	663	1.8	7.4	0.666	21	758	1.3
1331.1	0.884	15	0.445	15	746	1.3	13	0.812	23	853	0.926
1331.8	1.0	12	0.460	13	724	1.5	15	0.839	20	828	1.1
1332.5	0.655	14	0.658	17	750	1.1	9.5	1.2	26	858	0.775
1333.2	0.734	15	0.339	15	696	1.9	11	0.619	24	796	1.4
1333.9	0.513	15	0.442	13	724	1.4	7.4	0.805	20	828	1.0
1334.6	0.602	12	0.644	12	801	2.1	8.7	1.2	18	916	1.6
1335.3	0.513	13	0.573	13	688	1.9	7.4	1.0	20	786	1.4
1336.0	0.567	14	0.548	17	817	2.3	8.2	1.0	27	934	1.7
1336.7	0.769	15	0.332	17	730	1.6	11	0.605	26	835	1.2
1337.4	0.721	15	0.381	19	783	1.5	10	0.695	29	895	1.1
1338.1	0.592	13	0.437	15	667	1.9	8.5	0.797	23	762	1.4
1338.8	1.0	15	0.658	16	721	1.3	15	1.2	24	825	0.934
1339.5	0.749	14	0.560	25	709	1.6	11	1.0	38	811	1.2
1340.2	0.513	14	0.461	16	750	1.2	7.4	0.841	25	858	0.873
1340.9	0.713	12	0.492	17	658	2.3	10	0.897	26	752	1.6
1341.6	0.513	15	0.435	19	776	1.6	7.4	0.794	29	887	1.2
1342.2	0.650	14	0.459	16	763	2.4	9.4	0.836	25	872	1.7
1342.9	0.521	16	0.545	17	719	1.8	7.5	0.994	26	822	1.3
1343.6	1.3	12	0.445	18	740	1.2	18	0.811	27	846	0.881
1344.3	0.645	13	0.702	16	616	2.0	9.3	1.3	24	705	1.4
1345.0	0.707	12	0.512	17	754	1.8	10	0.933	26	863	1.3
1345.7	0.806	15	0.747	20	788	1.6	12	1.4	30	901	1.2
1346.4	0.789	14	0.696	17	738	2.0	11	1.3	27	843	1.5
1347.1	0.764	13	0.918	23	783	1.2	11	1.7	35	895	0.854
1347.8	1.6	14	0.877	22	784	1.2	24	1.6	34	896	0.899
1348.5	1.2	12	0.941	20	672	1.3	17	1.7	31	769	0.928
1349.2	0.950	15	1.2	28	802	2.7	14	2.2	42	917	2.0
1349.9	1.0	16	0.927	20	778	1.5	15	1.7	30	890	1.1
1350.6	0.513	14	1.1	33	906	2.4	7.4	1.9	51	1036	1.7
1351.3	1.3	12	1.5	24	875	2.1	19	2.7	36	1000	1.5
1352.0	1.1	13	1.9	32	988	2.0	15	3.5	49	1130	1.4
1352.7	1.4	14	2.2	27	939	2.5	20	4.1	41	1074	1.8
1353.4	1.8	11	1.9	27	938	1.4	25	3.4	42	1072	0.995
1354.1	2.1	14	2.1	26	983	1.7	30	3.8	40	1124	1.3
1354.8	2.5	14	2.3	23	973	2.0	37	4.2	35	1112	1.4
1355.5	2.5	14	2.5	29	1259	1.4	36	4.6	44	1439	1.0



Minnow Environmental Sample ID: 015											
Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1356.2	2.0	13	2.5	32	1161	1.3	28	4.5	49	1327	0.934
1356.9	3.2	12	2.3	31	1328	2.1	46	4.2	47	1518	1.5
1357.6	2.9	13	3.4	29	1198	1.3	42	6.2	44	1370	0.949
1358.3	3.7	17	2.8	28	1396	2.3	53	5.0	43	1597	1.7
1359.0	4.2	17	3.1	36	1422	2.7	60	5.7	55	1626	2.0
1359.7	3.1	14	2.9	33	1428	1.4	45	5.2	50	1633	1.0
1360.4	3.5	13	3.9	32	1423	1.9	51	7.1	48	1627	1.4
1361.1	3.6	13	3.0	27	1302	1.5	52	5.5	41	1489	1.1
1361.8	4.1	13	3.0	30	1599	1.6	60	5.5	45	1828	1.2
1362.5	3.4	13	3.5	34	1527	1.9	49	6.3	53	1746	1.4
1363.2	3.5	15	3.4	31	1547	1.3	51	6.3	48	1769	0.947
1363.9	4.5	14	3.6	33	1485	1.7	65	6.6	50	1699	1.2
1364.6	3.6	13	3.3	31	1490	1.3	52	6.0	47	1704	0.977
1365.3	4.5	13	3.1	29	1473	2.5	66	5.6	44	1684	1.8
1366.0	4.8	13	4.1	35	1712	1.8	69	7.5	54	1958	1.3
1366.7	3.9	14	3.2	33	1515	1.8	56	5.8	50	1732	1.3
1367.4	3.3	13	3.1	32	1686	1.4	48	5.7	50	1928	0.996
1368.0	4.5	12	3.9	36	1731	1.6	65	7.1	55	1980	1.2
1368.7	4.4	14	3.9	35	1749	1.8	63	7.2	54	1999	1.3
1369.4	3.1	12	3.3	35	1556	1.7	45	6.0	53	1779	1.3
1370.1	3.4	11	3.4	38	1631	1.5	50	6.3	58	1866	1.1
1370.8	3.2	13	3.7	35	1815	2.4	46	6.8	54	2075	1.8
1371.5	3.9	14	3.9	37	1591	1.7	57	7.2	56	1820	1.3
1372.2	2.6	13	4.2	33	1523	1.1	38	7.6	51	1742	0.819
1372.9	2.6	13	4.4	36	1635	1.3	38	7.9	56	1869	0.966
1373.6	2.3	13	3.6	37	1555	2.0	33	6.6	57	1778	1.5
1374.3	2.9	15	4.3	38	1721	1.4	42	7.8	58	1968	0.988
1375.0	3.5	15	4.5	42	1952	1.9	51	8.3	65	2232	1.4
1375.7	2.6	11	4.5	39	1691	2.3	37	8.3	60	1934	1.6
1376.4	3.1	14	3.7	39	1445	1.9	45	6.8	60	1653	1.4
1377.1	2.7	14	4.5	44	1702	2.3	39	8.1	67	1946	1.7
1377.8	3.1	14	5.0	34	1520	1.2	45	9.1	52	1738	0.848
1378.5	2.2	15	4.5	35	1524	1.9	32	8.2	54	1742	1.4
1379.2	2.0	13	5.0	40	1592	2.5	29	9.2	62	1820	1.9
1379.9	3.5	13	4.4	32	1508	2.2	50	8.1	50	1724	1.6
1380.6	2.3	15	4.3	33	1376	1.9	34	7.8	50	1573	1.4
1381.3	3.2	16	4.5	34	1606	2.9	46	8.3	52	1837	2.1
1382.0	2.5	14	3.4	35	1467	2.3	36	6.2	54	1678	1.7
1382.7	3.4	15	4.1	36	1395	1.7	49	7.4	55	1596	1.3
1383.4	1.9	15	3.2	32	1297	1.1	28	5.8	50	1483	0.829
1384.1	1.1	11	2.9	31	1211	1.6	16	5.3	48	1384	1.2
1384.8	1.5	14	2.8	32	1226	2.1	21	5.0	48	1401	1.5
1385.5	1.2	13	2.7	28	1187	3.0	17	4.9	43	1357	2.2
1386.2	0.772	15	2.5	36	1192	2.0	11	4.6	55	1363	1.5
1386.9	0.769	14	2.0	27	1055	2.2	11	3.7	41	1206	1.6
1387.6	0.888	12	2.2	24	979	1.4	13	4.1	37	1119	1.0
1388.3	0.513	15	1.8	25	1159	2.5	7.4	3.2	39	1326	1.8
1389.0	0.513	15	1.9	28	1134	1.6	7.4	3.5	43	1296	1.2
1389.7	1.4	16	1.9	29	988	1.7	20	3.5	44	1129	1.3
1390.4	0.707	15	1.7	30	1013	1.4	10	3.0	45	1158	1.1
1391.1	1.2	16	1.7	26	971	1.5	17	3.1	40	1110	1.1
1391.8	0.513	15	1.5	25	848	1.7	7.4	2.7	38	970	1.3
1392.5	0.779	14	1.3	29	878	2.5	11	2.4	45	1004	1.8
1393.2	0.722	16	1.8	29	872	1.2	10	3.3	44	997	0.860
1393.9	0.513	14	1.1	24	878	1.8	7.4	2.0	37	1003	1.3
1394.5	0.624	15	1.6	21	829	2.0	9.0	2.8	32	948	1.5
1395.2	0.875	15	1.4	23	851	0.966	13	2.6	36	973	0.705
1395.9	0.574	16	1.3	22	780	1.6	8.3	2.4	34	892	1.2
1396.6	0.513	14	1.0	25	697	0.754	7.4	1.9	38	798	0.550
1397.3	0.513	14	1.5	21	809	0.650	7.4	2.8	33	925	0.475
1398.0	1.3	16	0.781	23	787	1.1	19	1.4	36	900	0.789
1398.7	0.954	14	1.1	22	757	1.6	14	2.1	34	866	1.2
1399.4	0.660	15	0.991	26	753	2.1	9.5	1.8	39	861	1.6
1400.1	0.935	14	1.5	23	734	0.826	13	2.7	35	839	0.603
1400.8	0.513	16	1.2	21	744	1.2	7.4	2.2	32	851	0.884
1401.5	0.604	15	0.945	22	728	1.4	8.7	1.7	34	832	1.0
1402.2	0.814	16	1.4	21	731	1.5	12	2.5	33	836	1.1
1402.9	0.513	15	0.802	24	763	1.2	7.4	1.5	37	873	0.884
1403.6	0.593	15	1.1	25	720	1.1	8.6	1.9	38	823	0.835
1404.3	0.556	15	0.791	19	671	0.805	8.0	1.4	29	767	0.587
1405.0	0.741	15	0.868	23	714	1.6	11	1.6	35	816	1.2
1405.7	0.513	12	0.906	22	645	1.1	7.4	1.7	33	737	0.782
1406.4	0.640	14	0.887	24	725	1.0	9.2	1.6	36	830	0.751
1407.1	0.513	13	0.823	24	618	1.3	7.4	1.5	36	706	0.931
1407.8	0.929	15	0.832	18	709	1.3	13	1.5	27	811	0.916
1408.5	1.1	13	0.548	22	714	1.1	16	0.999	34	816	0.804
1409.2	0.843	12	0.908	20	607	0.838	12	1.7	30	694	0.612
1409.9	0.926	14	0.807	26	662	0.866	13	1.5	39	757	0.632
1410.6	0.847	10	0.838	21	630	1.1	12	1.5	33	720	0.835
1411.3	0.790	16	0.703	18	821	0.998	11	1.3	28	939	0.728
1412.0	0.667	16	0.869	22	681	1.5	9.6	1.6	33	779	1.1



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1412.7	0.513	14	0.516	18	689	1.1	7.4	0.940	28	788	0.790
1413.4	0.513	14	0.689	18	647	2.1	7.4	1.3	28	739	1.5
1414.1	1.2	14	0.653	22	708	1.7	17	1.2	33	810	1.2
1414.8	0.565	15	0.774	15	651	1.4	8.2	1.4	22	745	1.0
1415.5	0.566	16	0.456	18	674	1.5	8.2	0.831	27	771	1.1
1416.2	0.744	13	0.380	18	625	1.3	11	0.693	28	715	0.959
1416.9	0.735	12	0.473	17	685	1.1	11	0.862	26	783	0.821
1417.6	1.2	13	0.703	17	666	1.7	18	1.3	27	762	1.3
1418.3	1.2	15	0.645	20	644	0.977	17	1.2	30	737	0.713
1419.0	0.722	15	0.806	16	717	1.3	10	1.5	25	820	0.931
1419.7	0.964	15	0.631	19	714	0.897	14	1.2	29	817	0.654
1420.4	1.4	14	0.539	18	765	1.1	21	0.983	27	875	0.830
1421.0	1.1	13	0.783	16	669	1.5	16	1.4	24	765	1.1
1421.7	2.0	14	0.890	19	782	1.4	29	1.6	28	894	1.000
1422.4	1.3	14	1.0	18	759	1.5	19	1.8	27	868	1.1
1423.1	1.1	15	0.779	19	760	1.8	16	1.4	29	870	1.3
1423.8	0.634	12	0.708	15	698	1.0	9.2	1.3	23	798	0.759
1424.5	1.2	16	0.619	20	868	0.973	17	1.1	30	993	0.710
1425.2	1.3	14	1.0	19	847	1.3	19	1.9	30	968	0.933
1425.9	1.2	14	0.844	17	736	1.2	18	1.5	27	842	0.905
1426.6	1.4	13	0.699	13	687	1.3	21	1.3	20	785	0.963
1427.3	1.5	13	0.833	15	684	0.962	21	1.5	23	782	0.702
1428.0	1.1	16	0.620	15	780	1.5	16	1.1	22	892	1.1
1428.7	1.7	13	0.706	12	691	1.2	24	1.3	19	791	0.867
1429.4	1.3	14	0.625	14	737	1.1	19	1.1	22	843	0.803
1430.1	1.2	12	0.615	15	708	1.1	17	1.1	23	809	0.828
1430.8	1.1	16	0.546	13	695	1.2	15	0.996	20	794	0.909
1431.5	0.762	13	0.699	14	821	2.1	11	1.3	22	939	1.5
1432.2	1.9	13	0.830	15	772	1.2	27	1.5	23	882	0.890
1432.9	0.677	12	0.508	10	686	0.878	9.8	0.926	16	784	0.641
1433.6	1.0	12	0.712	8.9	635	0.942	15	1.3	14	726	0.687
1434.3	0.897	14	0.951	13	772	1.0	13	1.7	19	883	0.748
1435.0	0.882	13	0.728	9.2	706	1.6	13	1.3	14	807	1.2
1435.7	1.1	12	0.768	11	751	2.2	17	1.4	16	859	1.6
1436.4	1.1	14	0.733	14	835	1.6	16	1.3	22	954	1.1
1437.1	1.0	13	0.575	12	825	1.1	15	1.0	18	944	0.791
1437.8	1.2	13	0.723	8.8	784	2.3	17	1.3	13	897	1.7
1438.5	1.8	13	0.987	12	864	1.6	26	1.8	18	988	1.2
1439.2	1.2	12	0.641	11	819	1.9	17	1.2	17	937	1.4
1439.9	0.620	12	0.581	9.2	821	1.5	8.9	1.1	14	938	1.1
1440.6	1.7	13	0.791	9.7	954	1.4	25	1.4	15	1091	0.990
1441.3	1.2	14	0.727	8.3	870	1.4	17	1.3	13	995	1.0
1442.0	0.926	15	0.808	10.0	902	1.8	13	1.5	15	1031	1.3
1442.7	0.914	13	0.605	16	957	2.0	13	1.1	25	1095	1.5
1443.4	1.6	12	0.563	14	854	1.3	23	1.0	22	976	0.937
1444.1	0.513	13	0.745	13	913	1.5	7.4	1.4	20	1044	1.1
1444.8	0.731	14	0.775	12	838	1.3	11	1.4	18	958	0.943
1445.5	0.565	12	0.726	14	897	1.7	8.2	1.3	21	1025	1.2
1446.1	1.5	10	0.961	9.4	1006	1.7	21	1.8	14	1151	1.3
1446.8	1.3	14	0.813	10	1032	1.7	19	1.5	16	1180	1.2
1447.5	1.0	12	0.613	11	908	1.3	15	1.1	16	1039	0.953
1448.2	1.3	15	1.0	11	892	1.6	19	1.9	17	1020	1.1
1448.9	1.3	13	0.841	11	1034	1.8	19	1.5	16	1183	1.3
1449.6	1.8	14	1.2	12	920	1.9	26	2.3	18	1052	1.4
1450.3	1.4	13	0.914	13	925	0.825	20	1.7	20	1058	0.602
1451.0	1.3	13	1.1	12	1047	2.2	19	2.0	18	1197	1.6
1451.7	1.8	14	0.651	13	892	1.7	27	1.2	21	1020	1.3
1452.4	1.2	13	0.716	13	977	1.2	17	1.3	19	1118	0.906
1453.1	1.2	12	0.829	13	1043	1.6	18	1.5	19	1193	1.2
1453.8	1.1	13	0.906	13	986	0.999	16	1.7	20	1127	0.729
1454.5	1.2	14	0.794	13	1036	2.2	17	1.4	20	1184	1.6
1455.2	1.5	14	0.569	16	1102	0.900	21	1.0	25	1260	0.657
1455.9	1.0	14	0.708	15	1151	1.7	15	1.3	23	1317	1.2
1456.6	1.4	14	0.889	14	1111	2.0	20	1.6	21	1270	1.4
1457.3	0.970	11	1.1	13	990	1.9	14	1.9	20	1132	1.4
1458.0	1.5	14	1.2	17	1185	2.1	22	2.3	27	1355	1.5
1458.7	1.3	16	1.1	18	1151	2.2	19	2.0	28	1317	1.6
1459.4	1.0	11	0.651	16	1119	2.2	15	1.2	25	1280	1.6
1460.1	0.513	14	1.2	18	1243	2.1	7.4	2.2	27	1421	1.5
1460.8	2.1	14	1.0	17	1254	1.3	30	1.8	25	1434	0.973
1461.5	0.735	14	1.3	14	1289	2.2	11	2.3	21	1474	1.6
1462.2	1.3	13	0.994	21	1309	1.6	19	1.8	32	1497	1.1
1462.9	1.3	14	1.4	18	1183	1.4	19	2.5	27	1353	1.0
1463.6	1.8	16	1.1	19	1367	1.3	26	1.9	29	1563	0.944
1464.3	0.767	11	1.5	15	1253	2.6	11	2.7	22	1433	1.9
1465.0	1.3	13	1.5	22	1394	2.2	19	2.7	34	1594	1.6
1465.7	0.966	16	1.4	18	1212	1.7	14	2.5	28	1386	1.2
1466.4	1.1	13	1.7	15	1213	2.1	16	3.1	24	1387	1.5
1467.1	1.7	14	1.5	17	1395	2.1	24	2.6	26	1595	1.6
1467.8	1.5	14	1.8	17	1484	2.4	22	3.2	26	1697	1.8
1468.5	0.599	16	1.9	20	1349	2.3	8.6	3.5	31	1543	1.7



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1469.2	0.666	14	1.5	19	1274	1.7	9.6	2.7	29	1457	1.3
1469.9	1.6	14	1.5	19	1342	2.6	23	2.7	29	1535	1.9
1470.6	0.903	16	1.7	16	1295	2.1	13	3.1	25	1481	1.5
1471.3	1.2	14	1.7	20	1306	1.7	17	3.1	31	1494	1.3
1472.0	1.3	15	1.7	23	1355	1.9	19	3.0	35	1549	1.4
1472.6	0.745	13	1.2	20	1166	1.6	11	2.2	31	1333	1.2
1473.3	0.789	14	1.9	23	1233	1.2	11	3.4	35	1410	0.872
1474.0	0.631	15	1.7	20	1124	2.2	9.1	3.1	31	1285	1.6
1474.7	0.640	12	1.2	20	1203	1.9	9.2	2.2	31	1376	1.4
1475.4	0.513	15	1.4	22	1168	1.5	7.4	2.5	34	1336	1.1
1476.1	0.513	14	1.3	17	1190	2.2	7.4	2.4	26	1360	1.6
1476.8	0.630	13	1.2	17	951	1.7	9.1	2.3	26	1088	1.2
1477.5	0.892	14	1.5	20	1013	1.6	13	2.7	31	1158	1.2
1478.2	0.583	15	1.2	23	1164	2.1	8.4	2.3	36	1331	1.5
1478.9	0.719	13	1.6	20	974	1.4	10	3.0	31	1114	1.0
1479.6	0.775	12	1.2	19	883	1.4	11	2.2	28	1010	1.000
1480.3	0.513	13	1.5	18	878	2.7	7.4	2.7	28	1004	2.0
1481.0	0.513	15	1.4	22	982	2.0	7.4	2.6	33	1123	1.5
1481.7	0.513	15	1.1	19	777	1.6	7.4	2.1	30	889	1.2
1482.4	1.0	15	1.4	23	983	1.4	15	2.5	35	1124	1.0
1483.1	0.683	13	1.6	19	763	1.5	9.9	2.8	30	873	1.1
1483.8	0.755	14	1.1	19	853	2.0	11	2.1	28	975	1.5
1484.5	0.543	14	1.3	21	850	2.3	7.8	2.5	31	972	1.7
1485.2	0.739	17	0.888	22	833	1.7	11	1.6	34	952	1.2
1485.9	0.513	13	1.2	20	851	1.4	7.4	2.3	31	973	1.1
1486.6	0.998	12	1.0	21	817	1.4	14	1.9	32	935	1.0
1487.3	0.929	12	1.2	19	722	1.5	13	2.1	30	826	1.1
1488.0	0.770	14	0.925	20	744	1.9	11	1.7	31	851	1.4
1488.7	0.803	11	1.1	22	752	0.851	12	2.0	34	860	0.621
1489.4	0.513	14	0.918	21	773	1.3	7.4	1.7	32	884	0.985
1490.1	0.513	14	1.0	18	745	1.3	7.4	1.8	28	852	0.960
1490.8	0.532	12	0.832	19	720	0.659	7.7	1.5	30	823	0.481
1491.5	0.599	17	1.0	25	795	1.2	8.6	1.9	38	910	0.843
1492.2	1.2	12	0.874	23	739	1.3	17	1.6	36	846	0.962
1492.9	0.569	14	0.788	21	683	1.5	8.2	1.4	32	781	1.1
1493.6	0.859	13	0.589	23	661	0.893	12	1.1	35	756	0.652
1494.3	0.513	12	0.994	22	713	1.4	7.4	1.8	33	815	0.986
1495.0	0.513	15	0.575	22	641	0.542	7.4	1.0	33	733	0.395
1495.7	0.513	14	0.832	25	734	1.0	7.4	1.5	39	840	0.755
1496.4	0.826	13	0.598	21	765	1.2	12	1.1	31	874	0.852
1497.1	0.537	13	0.569	21	782	0.949	7.7	1.0	32	894	0.693
1497.8	0.795	16	0.697	20	745	1.8	11	1.3	30	852	1.3
1498.4	0.518	15	0.480	22	700	1.1	7.5	0.876	34	801	0.803
1499.1	0.958	13	0.641	21	702	1.2	14	1.2	31	803	0.892
1499.8	1.1	13	0.762	19	763	0.671	16	1.4	30	872	0.490
1500.5	0.513	14	0.543	16	742	0.826	7.4	0.990	24	849	0.603
1501.2	1.3	13	0.651	14	780	1.9	19	1.2	22	891	1.4
1501.9	0.596	14	0.440	18	700	1.3	8.6	0.803	28	801	0.961
1502.6	1.1	15	0.530	18	708	0.986	15	0.967	27	810	0.719
1503.3	0.532	11	0.464	12	815	1.6	7.7	0.846	18	932	1.1
1504.0	0.859	13	0.706	14	742	0.959	12	1.3	22	848	0.699
1504.7	1.2	13	0.977	12	773	1.5	17	1.8	18	884	1.1
1505.4	1.1	15	0.680	15	833	1.1	16	1.2	23	953	0.794
1506.1	0.792	11	0.828	14	766	1.2	11	1.5	21	876	0.907
1506.8	1.2	11	0.744	12	928	1.2	17	1.4	18	1061	0.852
1507.5	0.880	12	1.3	13	1061	1.0	13	2.4	20	1213	0.734
1508.2	1.7	15	1.1	12	1008	1.5	24	2.1	18	1152	1.1
1508.9	0.803	14	1.2	12	922	1.7	12	2.2	18	1054	1.2
1509.6	1.9	14	0.816	13	1055	1.6	27	1.5	20	1206	1.2
1510.3	0.907	11	0.984	11	1018	1.7	13	1.8	17	1164	1.2
1511.0	0.962	11	1.0	15	1003	1.3	14	1.9	23	1147	0.913
1511.7	1.8	11	1.2	13	1138	2.2	26	2.2	20	1301	1.6
1512.4	0.751	11	0.823	19	1132	2.4	11	1.5	28	1294	1.7
1513.1	1.6	12	1.3	12	1102	2.2	23	2.4	18	1260	1.6
1513.8	1.9	12	1.2	11	1316	1.8	27	2.2	16	1504	1.3
1514.5	1.5	14	1.6	16	1252	1.8	22	2.9	25	1432	1.3
1515.2	1.3	12	1.5	15	1199	1.8	18	2.7	23	1372	1.3
1515.9	1.8	11	1.4	13	1208	2.0	26	2.5	19	1381	1.4
1516.6	1.7	10	1.4	12	1119	1.1	25	2.6	19	1279	0.804
1517.3	1.7	12	1.7	18	1303	2.0	25	3.0	27	1490	1.4
1518.0	1.3	10	1.7	17	1305	2.3	19	3.1	26	1492	1.7
1518.7	1.5	11	1.7	15	1115	1.6	21	3.2	22	1275	1.2
1519.4	0.862	11	1.6	13	1299	2.2	12	2.8	19	1485	1.6
1520.1	1.5	14	1.7	13	1280	2.6	22	3.1	20	1464	1.9
1520.8	1.5	14	1.7	17	1343	3.3	22	3.2	26	1535	2.4
1521.5	1.5	13	1.7	16	1391	1.9	21	3.1	25	1591	1.4
1522.2	1.8	15	1.3	17	1327	2.2	25	2.4	26	1517	1.6
1522.9	1.7	11	1.5	17	1306	2.5	25	2.7	25	1494	1.8
1523.6	1.4	14	1.6	18	1297	1.6	21	3.0	27	1483	1.1
1524.2	1.3	15	1.9	19	1232	1.9	19	3.4	29	1408	1.4
1524.9	1.4	15	1.8	18	1285	2.1	21	3.2	28	1469	1.5



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
1525.6	1.5	15	2.0	18	1425	2.4	22	3.6	27	1630	1.8
1526.3	0.885	13	1.7	22	1444	2.2	13	3.2	33	1651	1.6
1527.0	1.1	14	2.3	18	1475	2.2	15	4.3	28	1686	1.6
1527.7	1.6	12	1.5	21	1427	2.2	24	2.8	32	1632	1.6
1528.4	1.5	14	1.6	18	1247	2.9	21	2.9	28	1427	2.1
1529.1	1.8	14	1.6	24	1557	2.9	27	2.9	37	1780	2.2
1529.8	1.3	13	1.5	17	1286	1.4	19	2.8	25	1470	1.0
1530.5	1.6	13	1.2	20	1468	1.6	23	2.2	31	1679	1.2
1531.2	0.590	14	1.4	22	1284	2.3	8.5	2.5	34	1468	1.7
1531.9	1.3	15	1.6	20	1245	2.8	18	2.9	30	1423	2.1
1532.6	1.4	13	1.6	18	1249	2.3	21	2.9	28	1428	1.7
1533.3	0.735	15	1.4	17	1241	2.1	11	2.6	27	1419	1.5
1534.0	1.1	14	1.2	20	1137	1.6	16	2.1	30	1300	1.2
1534.7	0.583	13	1.4	19	1210	1.5	8.4	2.5	28	1384	1.1
1535.4	0.773	15	1.2	17	1015	1.8	11	2.1	27	1160	1.3
1536.1	0.841	13	1.1	19	1142	1.2	12	2.0	28	1306	0.882
1536.8	0.918	14	1.0	19	1088	2.3	13	1.9	29	1244	1.7
1537.5	0.896	16	1.7	20	1288	2.2	13	3.1	31	1472	1.6
1538.2	0.873	16	1.1	19	1026	1.8	13	2.0	29	1173	1.3
1538.9	0.672	15	1.1	12	896	1.4	9.7	2.1	19	1025	1.000
1539.6	1.3	11	0.871	20	1075	1.8	19	1.6	31	1229	1.3
1540.3	0.898	13	1.1	20	970	1.9	13	2.0	30	1110	1.4
1541.0	0.906	13	0.960	19	887	1.5	13	1.8	28	1014	1.1
1541.7	0.646	13	0.863	16	825	0.952	9.3	1.6	24	943	0.694
1542.4	0.513	12	0.689	17	882	0.736	7.4	1.3	26	1009	0.537
1543.1	0.513	13	0.678	13	784	1.4	7.4	1.2	20	896	1.1
1543.8	1.1	13	0.630	18	790	1.6	16	1.1	27	904	1.2
1544.5	0.621	14	0.906	20	816	1.1	9.0	1.7	30	933	0.802
1545.2	0.802	12	0.388	14	751	1.5	12	0.708	21	859	1.1
1545.9	0.706	14	1.0	13	801	1.1	10	1.9	20	916	0.770
1546.6	0.913	15	0.429	14	749	0.807	13	0.783	21	857	0.589
1547.3	0.602	13	0.616	15	854	1.3	8.7	1.1	23	976	0.918
1548.0	0.513	12	0.446	13	736	0.746	7.4	0.814	20	842	0.544
1548.7	1.1	12	0.440	16	697	1.2	17	0.802	25	797	0.844
1549.4	0.707	14	0.569	14	736	1.6	10	1.0	21	841	1.1
1550.1	0.902	11	0.174	11	621	1.1	13	0.318	17	710	0.821
1550.7	0.867	12	0.512	11	713	1.1	13	0.934	17	815	0.820
1551.4	0.686	13	0.493	11	677	0.867	9.9	0.899	17	774	0.632
1552.1	0.686	12	0.300	15	691	0.653	9.9	0.546	23	790	0.477
1552.8	0.708	12	0.226	12	638	1.2	10	0.413	18	730	0.847
1553.5	1.1	12	0.443	16	786	1.5	16	0.808	24	899	1.1
1554.2	0.783	13	0.340	12	662	1.5	11	0.619	18	758	1.1
1554.9	0.785	14	0.318	12	615	0.370	11	0.580	18	704	0.270
1555.6	0.558	12	0.187	10	567	1.3	8.1	0.341	16	648	0.981
1556.3	0.513	13	0.368	12	663	1.3	7.4	0.672	18	759	0.954
1557.0	0.513	14	0.310	7.2	607	0.721	7.4	0.565	11	694	0.526
1557.7	1.1	11	0.251	12	598	0.989	16	0.457	18	684	0.721
1558.4	0.513	13	0.419	8.8	547	0.700	7.4	0.764	14	625	0.510
1559.1	0.985	11	0.223	11	616	0.967	14	0.407	16	705	0.706
1559.8	0.524	11	0.261	11	612	2.0	7.6	0.476	16	700	1.4
1560.5	1.1	12	0.487	12	589	1.1	16	0.887	18	674	0.779
1561.2	1.1	15	0.308	9.9	546	0.987	15	0.562	15	625	0.720
1561.9	0.751	13	0.560	8.6	549	0.853	11	1.0	13	628	0.622
1562.6	0.681	12	0.276	9.8	498	0.774	9.8	0.504	15	570	0.565
1563.3	0.868	10	0.459	8.0	568	1.3	13	0.837	12	650	0.980
1564.0	1.2	12	0.542	10	536	0.857	18	0.988	16	613	0.626
1564.7	1.5	12	0.250	8.2	539	1.1	22	0.455	13	617	0.791
1565.4	1.4	11	0.468	7.9	620	1.1	21	0.853	12	709	0.785
1566.1	1.2	11	0.723	9.5	502	1.1	17	1.3	15	574	0.775
1566.8	1.5	12	0.441	12	605	1.1	22	0.803	19	692	0.806
1567.5	1.0	13	0.990	10	532	0.728	15	1.8	16	608	0.531
1568.2	1.4	16	0.711	8.5	564	1.3	20	1.3	13	645	0.970
1568.9	1.5	12	0.691	10	586	1.0	22	1.3	16	670	0.763
1569.6	1.5	12	0.659	12	590	0.635	22	1.2	19	675	0.463
1570.3	2.1	13	0.538	9.7	675	1.1	31	0.982	15	772	0.791
1571.0	0.711	12	0.875	13	585	0.629	10	1.6	20	669	0.459
1571.7	1.3	13	0.686	11	610	1.1	19	1.3	17	698	0.802
1572.4	2.3	15	0.704	13	670	0.775	33	1.3	21	766	0.566
1573.1	2.2	14	1.3	13	768	0.701	32	2.3	20	879	0.511
1573.8	2.3	16	1.0	14	770	0.852	33	1.8	22	881	0.622
1574.5	1.9	13	0.885	13	773	1.4	28	1.6	20	884	1.0
1575.2	2.4	11	0.768	11	866	0.774	35	1.4	17	990	0.565
1575.9	2.1	12	0.976	12	802	0.958	30	1.8	19	917	0.699
1576.6	2.4	11	1.0	16	898	1.4	35	1.9	24	1027	1.0
1577.2	2.5	13	1.2	14	881	1.4	36	2.2	21	1008	0.987
1577.9	3.4	11	1.3	13	877	1.9	50	2.4	20	1003	1.4
1578.6	2.1	11	1.3	14	927	1.6	31	2.3	21	1060	1.2
1579.3	2.7	12	1.2	13	973	2.2	39	2.2	20	1113	1.6
1580.0	3.7	9.7	1.1	12	801	1.2	53	1.9	19	916	0.910
1580.7	4.4	13	1.5	18	1076	2.1	63	2.8	28	1230	1.5
1581.4	3.5	11	1.3	18	980	2.5	50	2.4	27	1121	1.8



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1582.1	4.8	11	2.1	19	1231	1.4	69	3.8	30	1408	0.987
1582.8	5.1	11	1.8	17	1090	1.6	73	3.4	26	1247	1.1
1583.5	5.9	12	1.7	18	1331	1.8	85	3.1	27	1522	1.3
1584.2	5.6	11	1.7	21	1194	1.6	81	3.1	33	1366	1.2
1584.9	5.0	11	1.3	17	1222	1.2	72	2.5	25	1397	0.882
1585.6	5.3	12	1.7	15	1095	1.8	76	3.1	23	1252	1.3
1586.3	5.2	11	1.6	17	1147	1.6	75	3.0	26	1312	1.2
1587.0	5.5	11	2.2	21	1429	2.7	79	3.9	33	1635	2.0
1587.7	5.2	11	1.8	18	1207	3.3	75	3.2	28	1380	2.4
1588.4	4.7	11	2.4	21	1337	2.0	67	4.5	32	1529	1.4
1589.1	6.8	13	2.4	22	1612	3.0	98	4.4	34	1843	2.2
1589.8	4.9	11	2.5	23	1521	1.5	71	4.6	35	1740	1.1
1590.5	4.1	14	2.2	23	1603	2.0	59	3.9	35	1833	1.4
1591.2	4.8	11	2.6	24	1454	1.9	70	4.8	37	1663	1.4
1591.9	3.7	14	2.2	25	1558	2.7	53	4.0	39	1782	1.9
1592.6	3.3	14	2.8	30	1657	2.2	48	5.2	46	1895	1.6
1593.3	2.3	13	2.5	25	1498	1.7	34	4.6	38	1712	1.2
1594.0	3.8	13	3.2	29	2007	2.0	54	5.9	44	2295	1.5
1594.7	2.3	13	3.1	27	1491	1.4	33	5.7	42	1705	1.0
1595.4	2.6	13	2.5	25	1638	2.4	38	4.5	38	1873	1.8
1596.1	1.9	9.7	2.4	23	1695	1.5	28	4.3	36	1938	1.1
1596.8	2.1	14	2.6	31	1694	1.6	30	4.8	48	1937	1.2
1597.5	2.0	13	3.1	33	1795	1.5	29	5.7	50	2052	1.1
1598.2	2.3	12	2.4	26	1621	1.4	33	4.3	40	1853	1.0
1598.9	1.6	13	2.4	25	1715	2.4	24	4.3	38	1962	1.8
1599.6	1.2	16	2.7	31	1885	1.5	17	4.9	47	2155	1.1
1600.3	2.1	13	2.8	28	1807	1.3	30	5.2	42	2066	0.913
1601.0	1.5	12	1.7	28	1538	1.9	21	3.2	43	1758	1.4
1601.7	0.560	14	2.1	26	1594	1.5	8.1	3.8	41	1823	1.1
1602.4	0.982	13	1.9	23	1371	1.5	14	3.4	35	1568	1.1
1603.1	0.894	13	2.3	27	1783	1.9	13	4.2	41	2039	1.4
1603.8	0.964	14	1.9	28	1547	2.4	14	3.5	43	1769	1.7
1604.4	0.860	14	1.7	29	1400	0.760	12	3.0	44	1601	0.554
1605.1	0.987	13	1.8	32	1503	0.872	14	3.2	50	1719	0.636
1605.8	0.824	13	2.0	25	1394	1.6	12	3.7	39	1594	1.2
1606.5	0.513	13	1.4	28	1695	1.8	7.4	2.6	42	1938	1.3
1607.2	0.692	14	1.7	29	1529	1.1	10.0	3.0	45	1748	0.818
1607.9	0.831	16	1.5	25	1266	1.1	12	2.8	38	1448	0.804
1608.6	1.1	11	1.5	30	1336	1.4	17	2.7	46	1527	1.1
1609.3	0.816	14	1.7	27	1449	1.8	12	3.0	41	1657	1.3
1610.0	0.513	15	1.4	26	1301	0.716	7.4	2.5	40	1488	0.522
1610.7	0.951	14	1.4	27	1189	1.9	14	2.5	41	1359	1.4
1611.4	0.707	15	1.6	33	1302	1.6	10	3.0	50	1488	1.1
1612.1	0.796	12	1.4	24	1054	1.3	11	2.5	37	1205	0.962
1612.8	1.1	13	1.2	23	1107	0.943	15	2.1	36	1266	0.688
1613.5	0.700	17	0.888	28	1252	1.9	10	1.6	43	1431	1.4
1614.2	1.1	16	0.995	28	1035	1.7	16	1.8	43	1184	1.2
1614.9	0.716	13	0.598	26	1066	1.4	10	1.1	40	1220	0.995
1615.6	0.513	15	0.629	22	853	1.3	7.4	1.1	34	975	0.920
1616.3	0.513	14	0.921	20	1075	1.7	7.4	1.7	31	1229	1.2
1617.0	1.3	14	0.696	24	1085	2.0	19	1.3	37	1241	1.5
1617.7	1.0	16	0.631	20	845	1.3	15	1.2	30	966	0.945
1618.4	0.832	16	0.916	22	822	0.735	12	1.7	33	939	0.536
1619.1	0.586	12	0.813	24	859	0.660	8.5	1.5	37	982	0.482
1619.8	1.3	9.7	0.819	19	861	1.4	19	1.5	30	985	1.0
1620.5	0.927	14	0.744	23	1042	1.4	13	1.4	35	1191	1.1
1621.2	0.737	15	0.613	24	849	1.4	11	1.1	37	971	1.0
1621.9	0.603	14	0.726	21	847	1.2	8.7	1.3	32	969	0.843
1622.6	0.997	12	0.496	18	881	1.4	14	0.904	28	1008	1.0
1623.3	0.583	11	0.567	16	827	1.5	8.4	1.0	24	945	1.1
1624.0	0.876	14	0.986	21	959	1.1	13	1.8	32	1096	0.776
1624.7	0.795	11	0.512	21	885	0.937	11	0.933	32	1012	0.683
1625.4	0.865	12	0.390	17	837	1.1	12	0.711	27	957	0.787
1626.1	0.812	13	0.699	18	1013	2.2	12	1.3	27	1159	1.6
1626.8	0.927	14	0.331	17	871	1.1	13	0.604	27	997	0.773
1627.5	0.731	15	0.386	17	893	1.3	11	0.705	27	1021	0.943
1628.2	0.680	12	0.661	19	851	2.1	9.8	1.2	29	973	1.5
1628.9	1.1	13	0.233	17	962	2.0	16	0.424	25	1100	1.5
1629.6	0.945	14	0.194	19	939	1.6	14	0.353	28	1074	1.1
1630.3	0.513	12	0.390	15	916	1.4	7.4	0.711	23	1047	1.0
1630.9	0.811	13	0.565	15	863	1.2	12	1.0	23	987	0.906
1631.6	0.750	14	0.580	20	1080	1.9	11	1.1	30	1235	1.4
1632.3	0.666	11	0.659	11	772	0.942	9.6	1.2	18	883	0.687
1633.0	0.946	13	0.581	13	942	1.9	14	1.1	20	1078	1.4
1633.7	1.2	11	0.667	13	976	1.7	17	1.2	20	1116	1.3
1634.4	0.893	16	0.339	18	1005	0.986	13	0.618	27	1149	0.720
1635.1	0.972	13	0.527	12	910	1.1	14	0.961	18	1040	0.814
1635.8	0.513	12	0.588	17	1072	1.5	7.4	1.1	25	1226	1.1
1636.5	0.958	15	0.641	13	1311	1.1	14	1.2	19	1500	0.824
1637.2	0.530	14	0.724	11	995	1.3	7.7	1.3	17	1138	0.958
1637.9	0.513	13	0.504	14	1103	1.6	7.4	0.920	22	1261	1.2



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1638.6	0.709	15	0.752	13	972	1.5	10	1.4	20	1111	1.1
1639.3	0.898	15	0.382	14	1173	1.3	13	0.697	21	1341	0.964
1640.0	0.513	15	0.842	11	1072	1.8	7.4	1.5	17	1226	1.3
1640.7	1.3	19	0.546	15	1125	1.9	19	0.995	23	1287	1.4
1641.4	1.1	25	0.820	11	1178	1.2	15	1.5	17	1347	0.880
1642.1	0.519	22	0.456	13	1070	2.2	7.5	0.831	20	1224	1.6
1642.8	0.780	20	0.792	13	1203	3.9	11	1.4	20	1375	2.8
1643.5	0.513	24	0.640	13	1129	1.6	7.4	1.2	20	1291	1.2
1644.2	0.865	29	0.272	11	1037	1.1	12	0.497	16	1186	0.805
1644.9	0.695	23	0.638	13	1141	1.3	10	1.2	20	1305	0.961
1645.6	0.918	21	0.563	11	979	1.4	13	1.0	17	1119	0.996
1646.3	0.994	21	0.472	11	878	1.4	14	0.861	17	1004	0.990
1647.0	0.590	24	0.411	11	882	1.4	8.5	0.750	17	1009	1.0
1647.7	1.2	20	0.418	11	1004	1.3	17	0.763	16	1148	0.915
1648.4	0.513	21	0.436	10	846	1.6	7.4	0.795	16	967	1.2
1649.1	0.513	20	0.366	8.9	862	1.1	7.4	0.668	14	986	0.803
1649.8	0.513	21	0.601	10	913	1.1	7.4	1.1	15	1044	0.815
1650.5	0.590	31	0.476	11	955	1.4	8.5	0.868	17	1093	0.989
1651.2	0.675	31	0.460	6.4	883	0.551	9.7	0.840	9.8	1010	0.402
1651.9	0.565	31	0.537	9.9	913	1.1	8.1	0.979	15	1044	0.795
1652.6	0.513	29	0.290	10	878	0.812	7.4	0.528	16	1003	0.592
1653.3	0.513	27	0.371	8.8	816	1.1	7.4	0.676	13	933	0.789
1654.0	0.592	27	0.327	11	881	1.0	8.5	0.596	17	1008	0.764
1654.7	0.513	22	0.246	11	690	0.801	7.4	0.448	16	789	0.584
1655.4	0.560	24	0.139	9.1	864	1.1	8.1	0.254	14	988	0.795
1656.1	0.513	32	0.512	9.5	812	0.978	7.4	0.934	15	928	0.714
1656.7	0.530	29	0.523	7.6	789	1.4	7.7	0.955	12	902	0.995
1657.4	0.611	34	0.613	8.0	880	0.810	8.8	1.1	12	1006	0.591
1658.1	1.1	35	0.308	9.7	862	0.863	16	0.561	15	986	0.629
1658.8	0.567	35	0.642	8.8	799	1.2	8.2	1.2	13	914	0.865
1659.5	0.513	32	0.229	10	866	0.633	7.4	0.418	16	990	0.462
1660.2	0.783	35	0.504	6.9	822	1.1	11	0.920	11	940	0.808
1660.9	0.534	44	0.346	7.0	811	1.0	7.7	0.631	11	927	0.759
1661.6	0.939	34	0.379	8.9	738	1.0	14	0.691	14	844	0.765
1662.3	1.2	36	0.584	7.3	828	0.826	18	1.1	11	947	0.603
1663.0	0.750	39	0.682	6.7	844	1.1	11	1.2	10	965	0.774
1663.7	0.773	43	0.409	8.2	779	0.769	11	0.746	13	891	0.561
1664.4	1.3	43	0.417	8.0	871	1.5	19	0.761	12	996	1.1
1665.1	0.763	44	0.714	6.6	784	0.989	11	1.3	10	896	0.722
1665.8	0.614	40	0.739	7.8	860	1.2	8.9	1.3	12	983	0.858
1666.5	0.639	49	0.578	10	920	0.941	9.2	1.1	15	1052	0.687
1667.2	0.626	49	0.837	8.2	852	1.6	9.0	1.5	12	974	1.1
1667.9	0.765	43	0.879	8.9	909	1.4	11	1.6	14	1040	0.987
1668.6	0.513	46	0.918	10	944	1.4	7.4	1.7	15	1079	1.0
1669.3	0.875	38	0.811	8.1	1075	0.870	13	1.5	12	1229	0.635
1670.0	0.784	36	0.707	6.8	1103	1.5	11	1.3	10	1261	1.1
1670.7	0.984	49	0.508	7.5	1108	1.4	14	0.926	12	1267	1.0
1671.4	0.513	50	0.781	7.4	1110	1.8	7.4	1.4	11	1269	1.3
1672.1	0.679	50	0.379	8.2	937	1.4	9.8	0.692	13	1071	1.0
1672.8	0.513	48	0.870	8.2	1054	1.5	7.4	1.6	13	1205	1.1
1673.5	0.700	40	0.563	7.9	1033	1.1	10	1.0	12	1181	0.774
1674.2	0.817	51	0.808	7.4	1196	1.9	12	1.5	11	1367	1.4
1674.9	0.513	45	0.652	9.6	1267	1.1	7.4	1.2	15	1449	0.794
1675.6	0.644	51	0.985	9.8	1295	0.828	9.3	1.8	15	1481	0.604
1676.3	0.513	43	0.860	5.8	1300	2.3	7.4	1.6	8.8	1487	1.7
1677.0	0.753	43	0.698	8.8	1329	1.8	11	1.3	13	1520	1.3
1677.7	1.1	44	0.816	11	1285	2.3	16	1.5	17	1470	1.6
1678.4	1.1	39	1.0	8.9	1327	1.5	15	1.9	14	1517	1.1
1679.1	0.513	46	1.0	8.2	1345	2.0	7.4	1.8	13	1538	1.5
1679.8	0.513	40	0.738	7.9	1252	1.9	7.4	1.3	12	1432	1.4
1680.5	0.898	41	1.2	7.8	1257	1.6	13	2.1	12	1437	1.2
1681.2	0.524	43	1.1	7.5	1172	1.6	7.6	1.9	11	1340	1.2
1681.9	1.1	48	0.753	8.6	1428	1.2	16	1.4	13	1633	0.858
1682.5	0.701	46	0.704	7.3	1356	1.2	10	1.3	11	1551	0.905
1683.2	1.0	43	0.917	9.7	1261	1.6	15	1.7	15	1442	1.2
1683.9	0.701	43	0.960	9.3	1448	1.5	10	1.8	14	1656	1.1
1684.6	0.611	45	0.825	7.8	1353	1.4	8.8	1.5	12	1547	1.0
1685.3	0.925	51	0.894	6.2	1236	1.4	13	1.6	9.5	1413	1.1
1686.0	0.513	47	0.931	7.8	1158	2.9	7.4	1.7	12	1325	2.1
1686.7	0.598	49	0.937	7.4	1190	1.3	8.6	1.7	11	1361	0.982
1687.4	0.692	44	0.578	8.7	1127	1.1	10.0	1.1	13	1288	0.824
1688.1	0.513	52	0.869	8.7	1268	1.9	7.4	1.6	13	1450	1.4
1688.8	0.897	42	0.631	13	1251	2.4	13	1.2	21	1430	1.7
1689.5	0.513	46	0.763	7.6	1163	0.989	7.4	1.4	12	1330	0.722
1690.2	0.513	48	0.646	8.6	1139	1.8	7.4	1.2	13	1303	1.3
1690.9	0.513	48	0.454	7.5	1242	1.4	7.4	0.828	12	1420	0.993
1691.6	0.513	51	0.606	6.6	1092	0.790	7.4	1.1	10	1249	0.576
1692.3	0.513	57	0.902	7.5	1328	2.1	7.4	1.6	12	1518	1.5
1693.0	0.679	52	0.588	8.4	974	1.2	9.8	1.1	13	1113	0.876
1693.7	0.535	58	0.730	8.9	1102	1.0	7.7	1.3	14	1260	0.760
1694.4	0.591	65	0.807	8.0	1264	0.732	8.5	1.5	12	1445	0.534



Minnow Environmental  
Sample ID: 015

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1695.1	0.601	56	0.571	8.3	1102	1.4	8.7	1.0	13	1260	0.986
1695.8	0.691	74	0.831	7.0	1064	0.939	10.0	1.5	11	1217	0.685
1696.5	0.513	78	1.0	9.7	867	0.945	7.4	1.9	15	992	0.690
1697.2	0.700	80	1.3	6.4	1031	1.8	10	2.3	9.7	1179	1.3
1697.9	0.513	100	1.5	8.6	1026	1.5	7.4	2.7	13	1173	1.1
1698.6	0.769	109	1.5	8.4	882	1.5	11	2.7	13	1008	1.1
1699.3	0.513	120	1.8	7.2	878	1.0	7.4	3.3	11	1004	0.749
1700.0	0.513	120	2.0	6.9	1015	1.2	7.4	3.6	11	1161	0.865
1700.7	0.513	116	1.7	4.5	850	0.764	7.4	3.1	6.9	972	0.557
1701.4	0.777	114	1.6	6.2	762	0.916	11	3.0	9.5	871	0.668
1702.1	0.513	107	1.1	6.2	759	0.638	7.4	2.1	9.6	868	0.465
1702.8	0.513	98	0.925	4.7	769	1.1	7.4	1.7	7.2	880	0.820
1703.5	1.2	102	0.959	5.1	655	0.869	17	1.7	7.9	749	0.634
1704.2	0.543	76	0.792	2.4	674	0.481	7.8	1.4	3.6	771	0.351
1704.9	0.513	92	0.992	2.8	579	0.625	7.4	1.8	4.2	662	0.456
1705.6	0.513	89	1.5	4.4	670	1.2	7.4	2.8	6.8	766	0.901
1706.3	0.768	103	1.4	4.9	560	1.2	11	2.6	7.5	641	0.881
1707.0	0.513	106	1.5	6.4	609	0.641	7.4	2.7	9.8	697	0.468
1707.7	0.650	89	1.2	7.2	466	1.3	9.4	2.2	11	533	0.960
1708.4	0.513	82	0.784	6.8	605	0.491	7.4	1.4	10	691	0.358
1709.0	0.984	108	0.945	5.7	532	1.3	14	1.7	8.7	609	0.954
1709.7	0.513	90	1.0	7.7	563	0.714	7.4	1.9	12	643	0.521
1710.4	0.513	73	1.2	7.3	519	1.1	7.4	2.3	11	594	0.796
1711.1	0.513	119	0.892	7.2	604	1.1	7.4	1.6	11	691	0.811
1711.8	0.580	128	1.4	7.2	752	1.4	8.4	2.6	11	860	1.0
1712.5	1.4	94	2.1	5.8	592	0.733	21	3.8	8.9	676	0.535
1713.2	0.513	110	0.966	6.6	669	2.1	7.4	1.8	10	765	1.5
1713.9	0.546	121	1.0	9.6	438	2.0	7.9	1.9	15	501	1.4
1714.6	0.513	110	2.2	3.3	406	1.2	7.4	3.9	5.1	464	0.863
1715.3	0.513	147	1.6	7.4	554	3.9	7.4	3.0	11	633	2.8
1716.0	0.513	184	3.4	11	470	3.7	7.4	6.2	17	538	2.7
1716.7	0.513	125	2.9	9.8	504	0.911	7.4	5.3	15	576	0.665
1717.4	0.513	148	1.6	0.611	369	0.009	7.4	2.9	0.936	422	0.006
1718.1	0.513	600	2.3	21	581	0.009	7.4	4.3	32	665	0.006
1718.8	0.513	208	3.1	7.5	600	0.009	7.4	5.6	11	686	0.006
1719.5	1.1	138	2.5	8.1	396	2.0	16	4.6	12	453	1.5



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
0.1	2.7	342	3.4	24	500	1.8	39	6.3	37	572	1.3
0.8	0.513	320	2.6	30	482	1.2	7.4	4.7	47	552	0.898
1.5	0.513	434	2.7	30	696	4.4	7.4	5.0	47	796	3.2
2.2	1.5	504	3.5	24	541	3.4	22	6.4	37	619	2.5
2.9	0.513	307	4.0	26	428	23	7.4	7.4	39	490	17
3.6	1.2	311	1.9	20	611	8.2	18	3.5	30	699	6.0
4.3	0.513	282	3.7	8.2	556	3.7	7.4	6.8	13	635	2.7
5.0	3.2	254	9.0	9.7	543	2.5	47	16	15	621	1.8
5.6	2.2	240	11	18	536	3.3	32	20	28	613	2.4
6.3	0.513	206	12	15	521	0.846	7.4	22	24	596	0.617
7.0	0.923	320	28	13	580	4.1	13	52	20	663	3.0
7.7	0.513	237	29	13	402	2.9	7.4	53	20	460	2.1
8.4	1.2	863	35	12	563	2.5	18	63	18	643	1.8
9.1	2.7	211	26	16	447	3.8	40	47	25	511	2.8
9.8	1.6	270	36	20	551	2.3	23	66	30	630	1.7
10.5	0.513	302	31	26	491	1.2	7.4	56	41	561	0.881
11.2	1.2	231	40	19	452	3.0	18	72	29	516	2.2
11.9	0.513	302	47	27	498	4.4	7.4	86	41	570	3.2
12.6	0.513	293	35	27	446	2.1	7.4	64	42	510	1.6
13.3	2.0	306	36	11	514	7.6	28	66	16	587	5.5
14.0	0.513	347	31	13	448	6.4	7.4	56	20	512	4.7
14.7	0.513	330	25	11	544	3.7	7.4	46	16	622	2.7
15.4	0.513	346	19	9.7	571	2.5	7.4	35	15	653	1.8
16.1	0.563	367	20	14	539	3.7	8.1	37	22	616	2.7
16.8	2.5	335	19	11	648	1.3	35	34	17	741	0.953
17.5	0.513	355	19	9.4	594	2.2	7.4	35	14	679	1.6
18.2	0.513	426	11	8.0	497	1.4	7.4	20	12	568	1.0
18.9	0.513	431	10	10	729	2.3	7.4	19	16	833	1.6
19.6	0.513	310	7.6	8.6	760	1.5	7.4	14	13	869	1.1
20.3	0.830	224	7.8	7.3	459	0.009	12	14	11	524	0.006
21.0	0.513	276	5.2	10.0	486	1.4	7.4	9.4	15	556	0.997
21.7	0.513	244	10	16	548	2.0	7.4	19	24	627	1.5
22.4	1.3	264	5.8	14	553	0.844	19	11	21	632	0.616
23.1	1.3	217	2.1	6.8	504	1.2	19	3.9	10	576	0.884
23.8	0.513	308	1.7	13	529	0.771	7.4	3.1	20	605	0.563
24.5	0.513	225	2.6	9.8	506	0.342	7.4	4.7	15	579	0.250
25.2	0.513	244	1.8	4.2	575	1.2	7.4	3.4	6.4	658	0.883
25.9	0.513	196	1.6	5.0	534	0.707	7.4	3.0	7.7	611	0.516
26.6	0.636	171	1.2	5.6	509	0.009	9.2	2.2	8.6	582	0.006
27.3	0.513	194	1.5	5.7	574	1.0	7.4	2.7	8.8	656	0.746
28.0	0.513	193	2.0	10	609	1.1	7.4	3.7	16	696	0.782
28.7	0.848	223	1.3	7.1	519	1.3	12	2.3	11	593	0.946
29.4	0.513	186	0.690	6.8	502	0.659	7.4	1.3	10	574	0.481
30.1	0.725	170	0.979	15	603	1.1	10	1.8	23	690	0.775
30.8	0.513	162	0.775	8.3	505	1.0	7.4	1.4	13	577	0.756
31.5	0.513	164	1.1	5.9	579	1.3	7.4	2.0	9.0	663	0.981
32.1	0.978	193	0.956	4.4	524	1.0	14	1.7	6.7	599	0.761
32.8	0.513	160	1.1	5.2	531	1.4	7.4	2.0	7.9	607	1.0
33.5	0.513	134	0.778	4.7	513	0.677	7.4	1.4	7.1	587	0.494
34.2	0.964	143	0.465	1.5	533	0.009	14	0.848	2.2	610	0.006
34.9	0.513	163	0.415	7.2	607	1.0	7.4	0.757	11	695	0.742
35.6	0.513	164	0.749	8.4	574	1.8	7.4	1.4	13	656	1.3
36.3	0.513	155	0.210	4.3	598	0.438	7.4	0.383	6.5	683	0.320
37.0	0.513	147	0.201	5.2	600	0.420	7.4	0.367	7.9	686	0.307
37.7	0.513	145	0.764	6.2	659	0.624	7.4	1.4	9.4	753	0.455
38.4	0.513	127	0.400	8.3	620	0.860	7.4	0.729	13	709	0.627
39.1	0.513	106	0.860	1.6	555	0.717	7.4	1.6	2.5	634	0.523
39.8	0.513	114	0.185	2.8	581	1.9	7.4	0.337	4.2	664	1.4
40.5	0.652	118	0.149	4.5	611	1.2	9.4	0.272	6.9	699	0.897
41.2	0.513	107	0.616	5.1	557	1.1	7.4	1.1	7.8	637	0.785
41.9	0.645	146	0.377	3.9	637	1.2	9.3	0.687	6.0	729	0.888
42.6	0.513	116	0.251	4.8	609	0.892	7.4	0.457	7.4	696	0.651
43.3	0.555	121	0.324	2.7	624	0.871	8.0	0.591	4.1	714	0.636
44.0	0.513	145	0.217	3.1	665	1.8	7.4	0.396	4.7	761	1.3
44.7	0.513	120	0.058	7.0	757	1.5	7.4	0.105	11	866	1.1
45.4	0.513	112	0.271	0.665	649	0.497	7.4	0.494	1.0	743	0.362
46.1	0.513	107	0.480	3.9	685	0.159	7.4	0.875	6.0	783	0.116
46.8	0.513	116	0.317	2.4	743	1.2	7.4	0.579	3.7	849	0.873
47.5	0.513	110	0.295	4.3	740	0.793	7.4	0.537	6.6	846	0.579
48.2	0.630	128	0.122	4.3	802	0.503	9.1	0.223	6.6	917	0.367
48.9	0.513	153	0.281	3.6	854	1.2	7.4	0.513	5.4	976	0.881
49.6	0.601	139	0.696	2.3	722	0.319	8.7	1.3	3.5	825	0.233
50.3	0.513	164	0.609	2.8	748	0.830	7.4	1.1	4.3	855	0.606
51.0	0.513	157	0.490	4.8	797	0.820	7.4	0.893	7.4	912	0.598
51.7	0.513	157	0.421	3.2	760	2.2	7.4	0.768	4.9	869	1.6
52.4	0.513	152	0.438	6.1	835	0.953	7.4	0.799	9.4	954	0.695
53.1	0.513	148	1.1	2.2	786	1.1	7.4	2.0	3.4	899	0.788
53.8	0.513	154	1.1	4.0	840	1.2	7.4	1.9	6.1	960	0.855
54.5	0.513	170	0.964	3.7	866	1.4	7.4	1.8	5.7	990	0.994
55.2	0.535	139	0.523	3.3	753	1.000	7.7	0.954	5.1	862	0.729
55.9	0.624	137	0.670	3.4	764	1.5	9.0	1.2	5.3	874	1.1



Minnow Environmental  
Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
56.6	0.513	143	0.331	3.9	862	2.4	7.4	0.604	5.9	986	1.7
57.2	0.809	129	0.560	3.6	744	1.7	12	1.0	5.6	851	1.3
57.9	0.583	131	0.788	4.7	773	1.1	8.4	1.4	7.3	884	0.784
58.6	0.524	143	1.3	3.0	758	1.9	7.6	2.3	4.5	867	1.4
59.3	0.513	134	1.1	6.2	733	0.838	7.4	1.9	9.4	839	0.611
60.0	0.513	103	0.578	2.9	769	1.1	7.4	1.1	4.5	880	0.792
60.7	0.560	118	0.534	4.2	914	2.5	8.1	0.973	6.4	1045	1.8
61.4	0.515	141	0.329	5.2	763	0.955	7.4	0.600	8.0	872	0.697
62.1	0.513	94	0.387	7.1	841	0.723	7.4	0.706	11	961	0.527
62.8	0.513	100	0.360	3.7	940	1.2	7.4	0.656	5.6	1075	0.857
63.5	0.513	112	0.364	4.1	791	1.2	7.4	0.664	6.2	905	0.911
64.2	0.695	112	0.265	4.6	1032	2.4	10	0.484	7.0	1180	1.8
64.9	0.513	93	0.379	3.2	901	1.2	7.4	0.691	4.9	1030	0.862
65.6	0.513	128	0.275	2.1	877	1.7	7.4	0.502	3.2	1003	1.3
66.3	0.513	116	0.268	3.4	978	1.3	7.4	0.489	5.3	1118	0.933
67.0	0.513	155	0.416	4.4	880	1.5	7.4	0.759	6.7	1006	1.1
67.7	0.513	123	0.242	4.0	1095	1.4	7.4	0.441	6.2	1252	1.0
68.4	0.513	77	0.102	4.5	883	1.5	7.4	0.186	6.9	1010	1.1
69.1	0.513	83	0.218	7.8	855	1.3	7.4	0.398	12	978	0.919
69.8	0.513	113	0.597	6.0	878	1.5	7.4	1.1	9.2	1004	1.1
70.5	0.513	78	0.058	5.3	964	2.2	7.4	0.105	8.1	1102	1.6
71.2	0.513	85	0.272	4.9	974	1.6	7.4	0.495	7.6	1113	1.2
71.9	0.513	120	0.337	4.8	1004	1.7	7.4	0.615	7.4	1149	1.2
72.6	0.513	142	0.455	8.3	956	1.5	7.4	0.829	13	1094	1.1
73.3	0.579	101	1.7	7.4	1080	1.9	8.4	3.1	11	1235	1.4
74.0	0.513	82	0.523	5.0	969	1.6	7.4	0.954	7.7	1108	1.2
74.7	0.513	93	0.273	4.1	940	0.593	7.4	0.497	6.2	1075	0.432
75.4	0.513	88	0.237	6.1	1010	1.5	7.4	0.433	9.3	1154	1.1
76.1	0.829	74	0.637	5.2	1044	1.3	12	1.2	8.0	1194	0.949
76.8	0.513	74	0.484	4.5	1174	1.6	7.4	0.883	6.9	1343	1.2
77.5	0.513	83	0.526	5.2	1072	1.9	7.4	0.960	8.0	1226	1.4
78.2	0.608	77	0.347	8.4	1096	2.7	8.8	0.634	13	1253	2.0
78.9	0.513	70	0.808	6.6	1213	1.5	7.4	1.5	10	1387	1.1
79.6	0.513	71	0.744	11	1368	1.8	7.4	1.4	17	1564	1.3
80.3	0.513	75	1.2	4.3	1364	2.1	7.4	2.2	6.6	1560	1.6
81.0	0.513	91	0.879	6.8	1392	2.8	7.4	1.6	10	1592	2.1
81.7	0.738	71	0.949	6.8	1258	2.0	11	1.7	10	1439	1.4
82.4	0.615	84	0.806	12	1392	2.1	8.9	1.5	18	1592	1.5
83.0	0.513	78	1.0	8.1	1606	2.3	7.4	1.8	12	1836	1.7
83.7	0.513	73	0.951	7.2	1454	4.2	7.4	1.7	11	1662	3.1
84.4	0.513	70	1.0	7.0	1290	2.1	7.4	1.9	11	1476	1.6
85.1	0.523	82	0.770	5.9	1259	2.2	7.6	1.4	9.0	1439	1.6
85.8	0.513	64	0.760	5.4	1383	2.5	7.4	1.4	8.2	1582	1.8
86.5	1.0	67	0.640	5.5	1283	1.7	15	1.2	8.4	1467	1.2
87.2	0.910	70	1.0	5.6	1232	3.2	13	1.9	8.5	1409	2.3
87.9	0.522	61	0.416	4.9	1345	2.2	7.5	0.758	7.5	1539	1.6
88.6	0.513	57	0.463	7.9	1192	2.4	7.4	0.845	12	1363	1.8
89.3	0.513	60	0.257	6.9	1236	2.4	7.4	0.468	11	1413	1.8
90.0	0.940	40	0.905	6.8	1273	2.2	14	1.7	10	1456	1.6
90.7	0.720	44	0.612	7.0	1122	1.7	10	1.1	11	1283	1.3
91.4	0.979	42	0.569	5.7	1197	2.5	14	1.0	8.7	1369	1.8
92.1	0.539	47	0.452	7.3	1452	2.5	7.8	0.824	11	1660	1.8
92.8	0.825	54	0.656	5.0	1111	2.3	12	1.2	7.7	1270	1.7
93.5	0.915	41	0.522	8.7	1130	1.7	13	0.951	13	1292	1.2
94.2	0.513	41	0.611	7.1	1207	1.9	7.4	1.1	11	1380	1.4
94.9	1.2	33	0.302	4.0	1331	2.7	17	0.551	6.2	1522	2.0
95.6	1.1	34	0.334	6.9	1370	2.4	15	0.610	11	1566	1.7
96.3	0.724	37	0.668	6.1	1165	2.2	10	1.2	9.3	1332	1.6
97.0	0.513	43	0.364	4.8	1428	2.0	7.4	0.665	7.3	1633	1.5
97.7	0.593	33	0.472	5.5	1271	2.2	8.6	0.861	8.5	1454	1.6
98.4	0.542	27	0.498	5.3	1231	2.5	7.8	0.909	8.2	1408	1.8
99.1	0.513	27	0.294	5.7	1187	2.2	7.4	0.536	8.7	1357	1.6
99.8	0.513	22	0.485	5.8	1139	2.1	7.4	0.885	8.9	1302	1.6
100.5	0.651	21	0.451	4.8	1224	2.7	9.4	0.823	7.4	1399	1.9
101.2	0.576	22	0.350	7.2	1347	2.5	8.3	0.639	11	1540	1.8
101.9	0.513	23	0.212	7.4	1276	2.4	7.4	0.386	11	1459	1.7
102.6	0.513	18	0.400	6.8	1278	1.9	7.4	0.730	10	1461	1.4
103.3	0.513	21	0.423	6.2	1318	2.8	7.4	0.771	9.5	1507	2.1
104.0	0.513	25	0.305	5.8	1351	2.9	7.4	0.556	8.9	1545	2.2
104.7	0.599	20	0.518	8.8	1427	2.6	8.6	0.945	14	1631	1.9
105.4	0.513	20	0.755	7.1	1521	2.3	7.4	1.4	11	1739	1.7
106.1	0.513	19	0.589	8.1	1530	1.8	7.4	1.1	12	1750	1.3
106.8	0.513	19	0.654	9.8	1507	2.4	7.4	1.2	15	1723	1.7
107.5	0.587	19	1.2	9.5	1722	2.9	8.5	2.2	14	1969	2.1
108.2	0.513	19	0.639	10.0	1665	2.5	7.4	1.2	15	1904	1.8
108.9	0.513	16	0.808	9.2	1796	3.3	7.4	1.5	14	2054	2.4
109.5	0.625	19	0.735	11	1915	2.3	9.0	1.3	17	2190	1.7
110.2	0.591	17	0.713	8.8	1972	3.4	8.5	1.3	14	2255	2.5
110.9	0.785	17	0.907	7.8	1828	2.8	11	1.7	12	2091	2.0
111.6	0.718	36	0.992	9.4	1932	4.1	10	1.8	14	2210	3.0
112.3	0.549	14	0.870	12	1865	2.0	7.9	1.6	18	2133	1.5



Minnow Environmental  
Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.0	1.4	15	0.752	13	1847	2.8	20	1.4	19	2112	2.0
113.7	1.1	15	1.1	14	2006	3.2	15	2.0	21	2294	2.4
114.4	1.2	14	0.937	10	1996	3.7	17	1.7	16	2283	2.7
115.1	0.932	15	1.1	9.2	1549	2.2	13	2.0	14	1772	1.6
115.8	1.4	13	0.797	9.2	1807	2.7	20	1.5	14	2067	2.0
116.5	1.8	15	0.737	9.8	1641	3.4	26	1.3	15	1876	2.5
117.2	1.1	14	0.707	8.4	1608	2.5	16	1.3	13	1839	1.8
117.9	1.0	14	0.787	8.5	1465	1.9	15	1.4	13	1675	1.4
118.6	1.4	14	0.641	9.9	1448	2.4	20	1.2	15	1656	1.7
119.3	1.1	12	0.471	6.6	1258	2.1	16	0.860	10	1439	1.5
120.0	1.1	13	0.412	5.6	1261	1.6	15	0.752	8.6	1442	1.2
120.7	1.1	13	0.412	5.9	1224	1.8	15	0.751	9.0	1400	1.3
121.4	1.1	12	0.202	7.2	1205	2.1	16	0.368	11	1377	1.5
122.1	1.1	13	0.537	6.5	1135	2.2	15	0.980	10.0	1298	1.6
122.8	0.851	11	0.331	6.4	1056	2.2	12	0.604	9.9	1208	1.6
123.5	0.754	12	0.333	6.1	1290	1.5	11	0.608	9.3	1475	1.1
124.2	0.811	13	0.294	6.0	1097	1.8	12	0.536	9.2	1254	1.3
124.9	0.795	13	0.490	5.4	1176	1.4	11	0.894	8.3	1344	1.0
125.6	1.0	11	0.074	6.6	1040	1.5	15	0.134	10	1189	1.1
126.3	0.814	10	0.268	4.9	969	1.8	12	0.488	7.5	1108	1.3
127.0	0.513	11	0.333	5.5	997	2.2	7.4	0.608	8.4	1140	1.6
127.7	0.622	11	0.259	5.7	961	1.1	9.0	0.473	8.7	1098	0.825
128.4	0.630	13	0.223	6.6	1014	1.5	9.1	0.407	10	1160	1.1
129.1	0.631	13	0.184	7.0	963	1.7	9.1	0.335	11	1102	1.2
129.8	0.526	11	0.311	5.6	932	1.8	7.6	0.566	8.6	1066	1.3
130.5	0.662	12	0.565	6.2	1038	1.4	9.6	1.0	9.6	1187	1.0
131.2	0.513	11	0.534	6.5	987	1.6	7.4	0.975	9.9	1128	1.1
131.9	0.635	13	0.605	5.4	1023	1.2	9.2	1.1	8.3	1169	0.907
132.6	0.513	9.6	0.508	6.7	1045	1.5	7.4	0.926	10	1195	1.1
133.3	0.749	11	0.351	9.1	1151	2.4	11	0.641	14	1317	1.7
134.0	0.513	14	0.429	6.6	1221	2.4	7.4	0.783	10	1397	1.8
134.6	0.786	13	0.645	12	1240	2.6	11	1.2	19	1418	1.9
135.3	1.1	11	0.485	11	1172	1.9	16	0.885	16	1341	1.4
136.0	0.513	11	0.511	9.1	1209	1.6	7.4	0.932	14	1382	1.2
136.7	0.513	11	0.664	10	1364	1.7	7.4	1.2	16	1559	1.2
137.4	0.513	15	1.0	13	1406	2.2	7.4	1.9	20	1608	1.6
138.1	0.513	16	1.0	12	1383	1.8	7.4	1.9	18	1582	1.3
138.8	0.587	11	1.2	15	1360	2.4	8.5	2.1	24	1555	1.8
139.5	0.513	12	0.726	13	1361	1.8	7.4	1.3	19	1557	1.3
140.2	1.0	14	1.5	14	1524	1.1	15	2.8	22	1743	0.822
140.9	1.3	16	1.5	19	1621	2.5	19	2.7	29	1854	1.8
141.6	0.513	14	1.2	17	1486	2.4	7.4	2.1	25	1700	1.7
142.3	0.710	14	1.4	13	1554	2.6	10	2.5	20	1777	1.9
143.0	1.0	15	0.977	13	1618	1.6	15	1.8	20	1850	1.1
143.7	1.1	12	1.4	15	1689	1.9	16	2.6	23	1932	1.4
144.4	1.5	14	1.6	14	1592	2.9	21	2.9	22	1821	2.1
145.1	1.6	13	1.7	19	1640	3.0	23	3.1	30	1875	2.2
145.8	1.8	12	1.6	16	1531	2.1	26	2.8	24	1750	1.6
146.5	1.7	12	1.5	13	1584	2.7	24	2.8	20	1812	2.0
147.2	2.7	13	1.7	13	1730	2.8	39	3.1	19	1978	2.1
147.9	1.7	14	1.1	16	1675	2.7	25	2.0	25	1915	2.0
148.6	2.5	11	1.4	17	1529	1.9	37	2.6	26	1748	1.4
149.3	2.4	11	1.4	16	1537	2.1	35	2.6	25	1757	1.5
150.0	2.8	12	1.6	14	1492	2.2	41	2.9	21	1706	1.6
150.7	4.1	12	1.4	15	1556	1.9	59	2.5	24	1779	1.4
151.4	3.1	10	1.2	15	1485	2.3	44	2.1	23	1698	1.7
152.1	3.4	10.0	1.3	14	1471	2.4	49	2.4	22	1682	1.7
152.8	4.0	8.7	0.784	13	1361	2.2	58	1.4	19	1557	1.6
153.5	3.1	11	1.0	12	1309	3.3	45	1.8	18	1497	2.4
154.2	3.0	10	1.1	15	1287	1.6	43	2.0	23	1471	1.2
154.9	3.8	12	0.943	9.0	1141	2.5	54	1.7	14	1305	1.8
155.6	3.1	9.0	0.756	14	1178	1.9	45	1.4	21	1347	1.4
156.3	2.7	8.8	0.775	11	1116	3.7	38	1.4	16	1277	2.7
157.0	2.6	10	0.552	9.0	1141	2.2	38	1.0	14	1305	1.6
157.7	2.1	12	0.642	8.2	1161	3.0	31	1.2	13	1328	2.2
158.4	2.2	10	0.514	7.8	1122	1.7	32	0.937	12	1283	1.3
159.1	2.1	7.8	0.554	11	1077	2.9	31	1.0	17	1232	2.1
159.8	2.5	9.2	0.600	7.7	925	1.9	36	1.1	12	1058	1.4
160.4	1.9	8.3	0.636	7.8	1009	2.0	28	1.2	12	1153	1.4
161.1	2.0	9.0	0.390	8.4	965	1.9	29	0.711	13	1104	1.4
161.8	2.2	9.8	0.274	7.2	874	2.0	32	0.499	11	1000	1.5
162.5	1.5	9.0	0.141	7.0	909	1.9	21	0.258	11	1040	1.4
163.2	1.3	8.0	0.406	5.8	1010	1.4	19	0.740	8.9	1155	1.0
163.9	1.4	12	0.285	7.7	858	1.9	20	0.520	12	981	1.4
164.6	1.4	9.8	0.359	6.1	894	1.7	21	0.655	9.4	1023	1.2
165.3	1.3	9.7	0.136	7.0	854	2.5	19	0.248	11	976	1.8
166.0	0.786	9.4	0.197	7.5	820	2.1	11	0.360	12	938	1.5
166.7	0.725	9.6	0.182	5.5	784	1.1	10	0.332	8.4	897	0.829
167.4	1.1	9.6	0.412	5.5	895	2.2	16	0.752	8.4	1024	1.6
168.1	0.716	8.8	0.180	6.6	802	1.7	10	0.328	10	917	1.3
168.8	0.731	10	0.542	8.2	867	1.3	11	0.989	13	991	0.966



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
169.5	1.4	10	0.174	8.6	939	2.0	20	0.318	13	1073	1.4
170.2	0.513	8.6	0.303	8.7	849	2.2	7.4	0.552	13	971	1.6
170.9	1.2	11	0.456	11	894	1.8	17	0.831	17	1022	1.3
171.6	0.605	11	0.367	10	809	1.4	8.7	0.669	15	925	0.988
172.3	1.1	10	0.424	10	917	1.2	16	0.774	15	1048	0.865
173.0	0.513	9.4	0.677	12	1100	2.5	7.4	1.2	19	1258	1.8
173.7	1.0	11	0.672	11	965	1.6	15	1.2	17	1104	1.2
174.4	0.533	13	0.725	14	973	3.4	7.7	1.3	22	1113	2.5
175.1	0.513	10	0.588	12	1053	1.9	7.4	1.1	18	1204	1.4
175.8	0.529	11	0.620	13	1094	2.1	7.6	1.1	19	1250	1.5
176.5	0.776	9.7	0.639	11	1196	3.7	11	1.2	17	1368	2.7
177.2	0.667	11	0.889	13	1249	2.2	9.6	1.6	21	1428	1.6
177.9	0.513	11	0.928	19	1241	2.6	7.4	1.7	29	1419	1.9
178.6	0.520	12	0.648	14	1248	3.7	7.5	1.2	21	1427	2.7
179.3	0.543	12	0.636	13	1305	4.9	7.8	1.2	20	1492	3.6
180.0	0.961	12	0.852	15	1409	4.8	14	1.6	23	1611	3.5
180.7	0.555	13	0.733	17	1365	4.7	8.0	1.3	26	1561	3.4
181.4	0.641	13	0.854	14	1221	2.8	9.3	1.6	21	1397	2.0
182.1	0.805	12	0.558	17	1408	3.6	12	1.0	27	1610	2.7
182.8	0.826	9.7	0.900	17	1214	3.1	12	1.6	26	1389	2.3
183.5	0.745	12	0.735	17	1440	3.2	11	1.3	26	1647	2.4
184.2	1.5	11	1.2	14	1390	4.0	21	2.1	22	1590	3.0
184.9	1.1	9.6	0.741	17	1390	3.9	16	1.4	26	1590	2.8
185.6	1.2	11	0.702	16	1329	4.2	18	1.3	24	1520	3.1
186.3	0.707	12	0.500	13	1377	3.6	10	0.913	20	1574	2.6
186.9	1.1	13	0.574	17	1465	3.9	15	1.0	25	1676	2.9
187.6	1.4	12	0.479	14	1234	3.9	20	0.874	22	1411	2.8
188.3	1.3	11	0.615	16	1265	2.8	18	1.1	24	1447	2.0
189.0	1.8	11	0.697	15	1422	1.9	26	1.3	24	1626	1.4
189.7	0.866	11	0.689	14	1356	2.8	13	1.3	22	1550	2.1
190.4	0.935	10	0.544	13	1220	2.8	13	0.992	21	1395	2.1
191.1	1.7	9.4	0.554	14	1418	2.8	24	1.0	22	1621	2.1
191.8	0.980	10	0.691	14	1266	2.1	14	1.3	21	1447	1.5
192.5	0.669	11	0.617	13	1212	2.7	9.7	1.1	20	1386	2.0
193.2	1.2	9.7	0.597	13	1093	3.0	17	1.1	20	1250	2.2
193.9	1.0	9.2	0.534	9.3	1104	2.2	14	0.974	14	1262	1.6
194.6	0.666	11	0.404	11	1159	2.8	9.6	0.737	17	1325	2.0
195.3	0.842	9.8	0.327	11	1030	3.4	12	0.596	16	1178	2.5
196.0	0.690	11	0.375	11	1072	2.5	10.0	0.684	17	1226	1.8
196.7	0.615	9.3	0.342	11	1148	1.8	8.9	0.623	17	1312	1.3
197.4	0.648	11	0.250	11	1016	1.4	9.4	0.456	17	1162	0.992
198.1	1.0	8.6	0.110	10	1104	2.4	15	0.201	16	1263	1.8
198.8	0.513	8.3	0.224	7.7	1023	1.8	7.4	0.409	12	1170	1.3
199.5	1.5	9.2	0.519	10	1011	3.1	21	0.947	16	1156	2.3
200.2	0.852	11	0.244	10	1177	2.0	12	0.444	16	1346	1.5
200.9	0.514	9.0	0.132	8.6	1044	2.2	7.4	0.241	13	1193	1.6
201.6	0.550	9.3	0.273	7.5	992	1.6	7.9	0.498	11	1134	1.2
202.3	0.513	10	0.403	6.9	1066	2.2	7.4	0.735	11	1219	1.6
203.0	0.614	8.8	0.299	7.3	931	2.0	8.9	0.546	11	1065	1.4
203.7	0.513	8.6	0.346	8.2	1054	2.5	7.4	0.630	13	1206	1.8
204.4	0.699	9.3	0.225	6.6	985	1.8	10	0.411	10	1126	1.3
205.1	0.513	11	0.158	6.3	998	1.4	7.4	0.288	9.7	1141	0.991
205.8	0.513	8.8	0.322	7.4	968	2.1	7.4	0.588	11	1106	1.5
206.5	0.786	9.8	0.166	7.3	1217	1.7	11	0.303	11	1391	1.3
207.2	0.513	8.3	0.298	6.5	942	1.2	7.4	0.543	10	1078	0.881
207.9	0.513	8.0	0.098	5.5	846	1.2	7.4	0.179	8.5	968	0.852
208.6	0.513	7.2	0.173	6.4	909	1.7	7.4	0.315	9.8	1040	1.2
209.3	0.513	8.4	0.152	4.2	923	2.0	7.4	0.277	6.4	1055	1.4
210.0	0.513	8.5	0.201	7.9	958	1.7	7.4	0.367	12	1095	1.3
210.7	0.513	8.1	0.166	6.7	920	1.4	7.4	0.303	10	1052	1.0
211.4	0.513	11	0.242	8.3	906	2.4	7.4	0.441	13	1036	1.7
212.1	0.604	9.0	0.100	7.5	898	1.6	8.7	0.182	11	1027	1.2
212.7	0.566	9.5	0.198	8.1	943	0.946	8.2	0.362	12	1078	0.690
213.4	0.513	9.5	0.141	6.3	860	1.3	7.4	0.257	9.7	983	0.948
214.1	0.513	8.8	0.429	8.3	887	1.4	7.4	0.783	13	1015	1.0
214.8	0.513	11	0.427	11	847	0.814	7.4	0.778	18	969	0.594
215.5	0.513	11	0.235	11	972	1.2	7.4	0.429	18	1111	0.872
216.2	0.513	9.7	0.450	13	888	2.3	7.4	0.821	20	1015	1.7
216.9	0.578	12	0.785	15	1063	2.0	8.3	1.4	24	1216	1.5
217.6	0.649	12	0.660	21	1056	2.4	9.4	1.2	31	1208	1.7
218.3	0.513	13	0.737	18	998	2.8	7.4	1.3	28	1142	2.1
219.0	0.513	10	0.772	19	1053	1.9	7.4	1.4	30	1204	1.4
219.7	0.876	12	0.977	21	1137	1.2	13	1.8	32	1300	0.908
220.4	0.515	12	0.777	20	1225	2.6	7.4	1.4	31	1401	1.9
221.1	0.513	13	0.860	25	1251	1.8	7.4	1.6	39	1431	1.3
221.8	0.513	12	0.961	23	1212	2.7	7.4	1.8	35	1386	2.0
222.5	0.515	12	1.1	25	1257	2.3	7.4	1.9	38	1437	1.7
223.2	0.589	14	1.3	29	1313	2.6	8.5	2.4	44	1502	1.9
223.9	0.513	12	1.5	31	1609	4.2	7.4	2.8	47	1840	3.1
224.6	0.513	14	1.9	31	1608	1.9	7.4	3.4	48	1839	1.4
225.3	0.513	12	1.8	32	1538	3.0	7.4	3.3	49	1759	2.2



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.0	0.617	14	2.3	32	1669	1.9	8.9	4.3	49	1909	1.4
226.7	0.925	15	3.5	37	1746	2.6	13	6.4	56	1996	1.9
227.4	0.659	14	3.2	32	1686	2.2	9.5	5.8	49	1928	1.6
228.1	0.513	14	3.0	36	1808	2.6	7.4	5.4	54	2068	1.9
228.8	1.1	12	3.8	36	1955	3.0	15	6.8	55	2235	2.2
229.5	1.1	13	3.8	39	1913	2.3	16	6.9	59	2188	1.7
230.2	1.5	12	4.0	36	1855	3.1	21	7.2	55	2121	2.3
230.9	1.1	14	3.9	37	1809	4.2	15	7.1	56	2069	3.1
231.6	1.8	13	5.0	41	2193	2.4	26	9.2	63	2508	1.7
232.3	1.2	12	4.7	39	1954	4.1	17	8.5	60	2234	3.0
233.0	2.5	12	5.8	41	2046	3.1	36	11	63	2339	2.3
233.7	1.7	13	5.8	41	1886	4.0	25	11	62	2157	2.9
234.4	1.5	12	6.0	39	1843	2.3	22	11	60	2108	1.7
235.1	2.1	10	5.1	37	1850	3.5	30	9.4	56	2116	2.5
235.8	2.6	11	5.1	33	1773	3.8	37	9.4	50	2028	2.8
236.5	2.5	11	4.9	37	2054	4.9	36	9.0	57	2348	3.6
237.2	3.1	12	5.6	34	1809	4.1	45	10	53	2069	3.0
237.9	3.3	13	4.9	30	1732	2.1	48	9.0	47	1980	1.5
238.5	4.6	10	4.7	32	1538	4.4	67	8.6	49	1758	3.2
239.2	4.1	12	4.2	29	1440	4.9	59	7.7	44	1646	3.5
239.9	5.0	11	3.4	27	1539	4.2	73	6.3	42	1760	3.0
240.6	6.7	11	4.1	30	1369	2.2	97	7.5	45	1565	1.6
241.3	5.5	11	3.5	26	1344	3.5	79	6.4	41	1536	2.6
242.0	5.0	10	2.6	27	1275	3.3	73	4.8	42	1458	2.4
242.7	5.0	12	3.2	24	1271	3.1	72	5.9	36	1454	2.3
243.4	5.5	10	2.5	24	1381	3.4	79	4.5	36	1580	2.5
244.1	4.4	9.7	3.4	24	1230	2.7	64	6.2	36	1407	1.9
244.8	4.2	10	2.0	22	1109	1.7	60	3.6	33	1268	1.2
245.5	4.4	8.9	2.3	20	1080	2.4	64	4.2	31	1234	1.7
246.2	3.2	8.4	1.8	16	996	3.3	46	3.2	24	1138	2.4
246.9	4.8	9.7	2.0	16	1008	3.2	69	3.6	24	1153	2.3
247.6	3.7	12	1.5	18	953	2.8	53	2.8	28	1089	2.0
248.3	3.4	10	1.4	16	908	3.2	49	2.5	24	1039	2.4
249.0	2.5	13	1.2	18	864	2.6	36	2.2	27	987	1.9
249.7	1.8	14	0.870	23	928	2.3	25	1.6	35	1061	1.7
250.4	2.5	16	1.2	23	848	2.5	37	2.1	35	969	1.8
251.1	2.0	17	0.880	18	814	2.3	29	1.6	27	931	1.7
251.8	2.3	17	0.994	21	987	2.9	34	1.8	32	1128	2.1
252.5	2.1	17	0.904	23	834	2.1	30	1.6	36	953	1.6
253.2	2.4	14	1.2	27	869	1.7	35	2.3	41	994	1.2
253.9	1.9	16	1.2	26	908	3.1	27	2.1	40	1038	2.3
254.6	1.8	17	1.0	28	814	3.2	27	1.8	43	931	2.3
255.3	1.4	15	0.929	33	799	1.9	20	1.7	51	913	1.4
256.0	1.8	19	1.1	35	719	3.1	26	2.0	54	823	2.3
256.7	1.3	21	0.937	31	837	3.6	18	1.7	48	957	2.6
257.4	0.617	18	0.787	32	765	2.7	8.9	1.4	49	874	2.0
258.1	0.593	19	0.895	38	747	3.7	8.6	1.6	58	855	2.7
258.8	0.640	18	1.1	32	659	2.8	9.2	1.9	49	753	2.1
259.5	0.664	18	0.847	33	772	2.0	9.6	1.5	51	883	1.5
260.2	0.653	18	0.994	33	683	3.7	9.4	1.8	50	781	2.7
260.9	1.1	20	1.2	40	747	3.5	16	2.2	61	855	2.6
261.6	0.586	17	0.950	38	740	2.4	8.5	1.7	58	846	1.8
262.3	0.513	18	1.0	41	762	4.4	7.4	1.9	64	871	3.2
263.0	0.565	20	1.1	39	789	3.9	8.1	2.0	60	902	2.9
263.7	0.513	20	1.1	48	789	4.3	7.4	2.0	74	902	3.1
264.3	0.841	19	0.931	37	696	5.0	12	1.7	57	795	3.7
265.0	0.938	19	1.3	50	946	4.1	14	2.4	77	1082	3.0
265.7	0.668	16	1.5	44	769	4.1	9.6	2.8	68	879	3.0
266.4	0.513	18	1.4	43	948	5.0	7.4	2.5	66	1084	3.6
267.1	0.576	16	1.3	44	859	4.3	8.3	2.3	68	983	3.1
267.8	0.791	18	1.5	47	945	4.8	11	2.7	72	1081	3.5
268.5	0.754	15	1.3	41	968	3.5	11	2.3	62	1107	2.5
269.2	0.762	20	1.7	47	1227	4.3	11	3.1	71	1403	3.2
269.9	0.784	17	1.6	44	1194	3.7	11	2.9	68	1365	2.7
270.6	0.513	18	1.8	46	1282	3.0	7.4	3.3	70	1465	2.2
271.3	0.513	19	2.1	40	1404	3.2	7.4	3.8	62	1606	2.4
272.0	0.537	19	2.4	48	1629	3.8	7.8	4.4	74	1863	2.7
272.7	1.2	19	3.2	51	1612	4.3	18	5.9	78	1843	3.1
273.4	1.3	17	3.4	52	1615	2.8	19	6.2	79	1846	2.0
274.1	1.1	16	2.9	54	1720	2.6	16	5.3	83	1967	1.9
274.8	2.4	20	3.1	56	1795	2.9	35	5.6	86	2052	2.1
275.5	2.8	17	3.2	50	1823	2.5	41	5.8	77	2084	1.8
276.2	1.5	20	3.9	48	1778	2.6	21	7.1	73	2034	1.9
276.9	1.2	19	4.0	54	1836	2.1	17	7.3	83	2100	1.5
277.6	1.2	21	3.8	54	1831	2.8	18	6.9	82	2094	2.0
278.3	2.0	20	4.2	59	1903	2.2	28	7.6	91	2176	1.6
279.0	2.2	20	3.8	60	2137	3.2	32	7.0	92	2444	2.3
279.7	1.7	19	4.0	60	2113	2.7	24	7.4	92	2417	2.0
280.4	1.9	18	3.9	58	2258	2.5	27	7.1	89	2582	1.8
281.1	1.8	17	4.4	61	2160	2.5	26	8.1	93	2470	1.8
281.8	1.9	18	3.7	58	2067	2.6	27	6.7	89	2363	1.9



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
282.5	2.3	19	3.9	61	2201	2.3	33	7.1	93	2517	1.7
283.2	1.9	17	4.2	68	2108	2.2	28	7.7	105	2410	1.6
283.9	2.1	18	4.4	68	2135	2.7	30	8.0	104	2441	2.0
284.6	1.9	18	3.6	54	1943	2.3	27	6.5	83	2221	1.7
285.3	2.0	16	4.1	73	2140	2.3	29	7.5	112	2447	1.7
286.0	2.2	19	3.8	65	2094	1.6	31	6.9	99	2394	1.1
286.7	2.1	14	3.6	53	1799	2.8	30	6.6	81	2057	2.0
287.4	1.7	14	3.1	56	1840	1.9	24	5.6	85	2104	1.4
288.1	2.5	12	3.0	58	2018	3.1	36	5.4	89	2308	2.3
288.8	2.6	16	3.0	57	1868	2.0	37	5.4	87	2136	1.5
289.5	2.5	17	2.5	56	1846	1.6	36	4.6	86	2111	1.1
290.1	3.4	13	2.8	55	1696	2.0	49	5.1	84	1939	1.4
290.8	5.1	15	2.8	52	1607	1.8	74	5.1	79	1837	1.3
291.5	4.7	15	2.4	50	1531	2.1	68	4.4	77	1750	1.5
292.2	4.3	13	2.4	50	1317	1.7	63	4.4	77	1505	1.2
292.9	4.7	12	2.9	45	1316	2.1	67	5.2	70	1505	1.6
293.6	6.2	12	2.5	45	1259	2.7	89	4.5	68	1439	2.0
294.3	5.4	11	1.5	43	1104	2.2	78	2.8	66	1262	1.6
295.0	4.8	12	2.2	37	1040	2.8	69	4.1	57	1189	2.0
295.7	6.7	14	2.2	34	1061	2.5	96	4.0	52	1213	1.9
296.4	5.4	13	1.6	34	805	2.1	78	2.9	52	920	1.5
297.1	5.0	9.4	1.5	29	743	1.4	72	2.8	44	849	0.999
297.8	3.2	9.8	1.4	28	676	2.1	46	2.5	42	773	1.5
298.5	4.7	10	1.2	24	570	2.1	67	2.3	37	651	1.5
299.2	4.2	9.2	1.3	26	537	1.3	61	2.4	39	615	0.954
299.9	2.4	9.4	1.1	23	613	1.7	35	2.0	35	701	1.2
300.6	3.7	9.4	0.980	20	582	1.7	53	1.8	31	666	1.3
301.3	2.9	8.5	1.2	17	509	2.1	42	2.2	26	582	1.5
302.0	2.5	7.7	0.994	18	523	2.1	36	1.8	28	598	1.5
302.7	1.8	9.0	1.1	17	494	1.3	27	2.0	26	565	0.916
303.4	1.2	9.2	0.932	15	581	0.840	17	1.7	23	664	0.613
304.1	2.2	9.7	0.815	19	428	2.4	31	1.5	29	489	1.8
304.8	2.4	9.6	0.804	18	410	1.7	34	1.5	27	469	1.3
305.5	1.9	9.9	1.1	14	462	2.1	27	2.0	21	528	1.6
306.2	2.6	8.6	0.729	13	421	1.2	38	1.3	21	481	0.870
306.9	1.4	9.2	0.659	13	372	1.5	21	1.2	20	425	1.1
307.6	1.5	9.0	0.414	13	365	1.1	22	0.754	20	418	0.794
308.3	0.784	11	0.410	14	339	1.1	11	0.748	21	387	0.828
309.0	0.636	10	0.687	11	312	1.2	9.2	1.3	17	357	0.908
309.7	1.0	9.5	0.868	14	326	0.603	15	1.6	21	373	0.440
310.4	1.3	10	0.757	9.9	298	1.3	19	1.4	15	341	0.960
311.1	0.662	8.8	0.595	16	358	1.2	9.6	1.1	25	409	0.880
311.8	1.4	8.8	0.523	15	320	1.7	20	0.955	22	366	1.3
312.5	0.513	8.6	0.918	13	345	1.2	7.4	1.7	20	395	0.880
313.2	1.3	11	0.834	13	317	1.9	19	1.5	19	362	1.4
313.9	0.712	11	0.670	16	326	1.8	10	1.2	25	373	1.3
314.6	0.869	10	0.846	19	295	0.883	13	1.5	29	337	0.644
315.3	0.703	8.8	0.724	17	334	0.728	10	1.3	27	382	0.531
316.0	0.794	10	1.0	16	287	1.9	11	1.9	25	329	1.4
316.7	0.513	12	0.906	19	324	2.2	7.4	1.7	29	371	1.6
317.3	0.513	8.8	0.750	18	292	1.6	7.4	1.4	27	334	1.1
318.0	0.513	11	0.885	17	282	0.570	7.4	1.6	26	322	0.416
318.7	0.513	8.1	0.854	15	260	1.4	7.4	1.6	24	297	1.0
319.4	0.577	11	0.936	16	308	1.1	8.3	1.7	24	352	0.770
320.1	0.513	11	0.816	21	289	0.680	7.4	1.5	32	330	0.496
320.8	0.513	9.0	0.819	16	271	0.429	7.4	1.5	24	310	0.313
321.5	0.513	10	0.815	18	254	0.836	7.4	1.5	27	290	0.610
322.2	0.513	9.6	0.730	17	275	0.869	7.4	1.3	26	314	0.634
322.9	0.795	10	1.0	21	298	1.2	11	1.9	33	341	0.910
323.6	0.513	11	1.1	18	300	1.2	7.4	2.0	28	343	0.871
324.3	0.513	8.6	0.858	22	331	0.703	7.4	1.6	33	379	0.513
325.0	0.513	10	1.0	21	273	0.714	7.4	1.8	33	313	0.521
325.7	0.513	10.0	1.3	20	307	0.943	7.4	2.3	31	351	0.688
326.4	0.602	11	0.809	22	317	1.4	8.7	1.5	34	363	1.0
327.1	0.513	11	0.757	22	288	1.1	7.4	1.4	34	330	0.789
327.8	0.513	10	0.935	23	281	1.1	7.4	1.7	35	322	0.803
328.5	0.513	10	0.667	19	284	1.1	7.4	1.2	30	325	0.820
329.2	0.513	9.7	0.913	21	291	0.626	7.4	1.7	32	333	0.457
329.9	0.513	9.9	0.912	20	303	0.748	7.4	1.7	31	346	0.545
330.6	0.513	12	1.2	21	310	1.1	7.4	2.1	33	354	0.782
331.3	0.513	10	0.909	23	330	1.6	7.4	1.7	35	378	1.2
332.0	0.513	11	1.0	21	311	1.4	7.4	1.9	32	356	0.998
332.7	0.513	8.6	0.799	18	294	1.0	7.4	1.5	27	336	0.735
333.4	0.513	11	0.846	20	299	0.668	7.4	1.5	31	342	0.488
334.1	0.513	8.7	0.575	18	314	1.4	7.4	1.0	27	359	0.988
334.8	0.513	7.4	0.731	17	297	1.7	7.4	1.3	27	339	1.2
335.5	0.513	10	0.789	15	342	1.5	7.4	1.4	23	391	1.1
336.2	0.513	11	0.531	19	303	1.3	7.4	0.968	29	346	0.917
336.9	0.513	9.7	0.817	17	301	0.646	7.4	1.5	26	345	0.471
337.6	0.513	8.6	0.620	21	304	1.8	7.4	1.1	32	348	1.3
338.3	0.513	8.5	0.636	16	279	0.933	7.4	1.2	24	319	0.681



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.0	0.513	10	0.595	17	306	1.8	7.4	1.1	26	350	1.3
339.7	0.513	8.4	0.823	15	290	1.7	7.4	1.5	23	332	1.2
340.4	0.513	8.9	0.591	14	290	0.742	7.4	1.1	22	332	0.541
341.1	0.513	9.4	0.759	14	319	1.5	7.4	1.4	21	365	1.1
341.8	0.513	8.3	0.847	15	311	1.2	7.4	1.5	23	356	0.885
342.5	0.513	8.8	0.750	15	291	1.6	7.4	1.4	24	333	1.1
343.2	0.513	8.4	0.519	14	283	2.1	7.4	0.947	21	324	1.5
343.8	0.513	7.8	0.646	16	287	1.6	7.4	1.2	24	328	1.1
344.5	0.513	9.3	0.571	11	297	1.8	7.4	1.0	17	340	1.3
345.2	0.872	8.3	0.599	12	327	1.2	13	1.1	18	374	0.845
345.9	0.513	9.4	0.623	14	317	1.4	7.4	1.1	21	362	1.0
346.6	0.513	9.3	0.445	16	312	1.4	7.4	0.812	24	357	1.0
347.3	0.513	9.8	0.552	12	312	1.2	7.4	1.0	18	356	0.850
348.0	0.513	6.5	0.484	13	267	1.5	7.4	0.882	21	306	1.1
348.7	0.513	8.8	0.709	11	287	1.7	7.4	1.3	18	328	1.2
349.4	0.513	9.9	0.315	13	322	0.981	7.4	0.574	20	368	0.716
350.1	0.513	10	0.597	13	310	1.4	7.4	1.1	20	354	0.994
350.8	0.513	9.7	0.657	13	316	1.5	7.4	1.2	20	362	1.1
351.5	0.513	9.3	0.587	12	318	1.2	7.4	1.1	18	364	0.869
352.2	0.513	8.7	0.569	14	297	1.3	7.4	1.0	21	340	0.947
352.9	0.513	8.9	0.686	15	309	1.1	7.4	1.3	24	354	0.802
353.6	0.513	9.4	0.408	11	271	1.1	7.4	0.744	17	310	0.824
354.3	0.513	9.3	0.434	14	266	0.855	7.4	0.791	22	305	0.624
355.0	0.513	7.4	0.787	16	271	1.2	7.4	1.4	24	310	0.865
355.7	0.513	11	0.954	17	297	1.1	7.4	1.7	26	340	0.804
356.4	0.513	9.1	1.1	16	303	1.4	7.4	2.0	25	346	1.0
357.1	0.513	10	0.743	20	310	1.6	7.4	1.4	31	355	1.2
357.8	0.513	10	0.645	17	276	2.5	7.4	1.2	27	316	1.8
358.5	0.513	8.0	0.791	18	290	1.3	7.4	1.4	28	332	0.945
359.2	0.513	11	1.1	18	304	1.3	7.4	2.0	28	348	0.968
359.9	0.513	11	0.948	19	298	2.0	7.4	1.7	29	341	1.5
360.6	0.535	9.3	0.948	17	301	1.8	7.7	1.7	26	344	1.3
361.3	0.513	10	1.2	19	332	1.5	7.4	2.2	29	379	1.1
362.0	0.513	10	0.991	19	317	1.3	7.4	1.8	29	362	0.971
362.7	0.513	11	1.1	22	282	0.945	7.4	2.0	33	322	0.689
363.4	0.513	12	0.890	20	254	0.435	7.4	1.6	30	290	0.318
364.1	0.513	8.9	0.915	21	261	0.945	7.4	1.7	32	298	0.689
364.8	0.513	11	0.725	20	245	0.863	7.4	1.3	31	280	0.630
365.5	0.513	9.9	1.1	18	278	1.1	7.4	1.9	28	318	0.788
366.2	0.513	9.9	1.3	24	272	1.1	7.4	2.4	37	311	0.819
366.9	0.513	12	1.0	20	255	0.694	7.4	1.9	30	292	0.506
367.6	0.513	12	1.4	24	304	1.0	7.4	2.6	37	347	0.748
368.3	0.513	12	1.1	26	254	1.2	7.4	2.1	39	290	0.890
369.0	0.513	8.5	1.1	24	255	0.928	7.4	1.9	37	291	0.677
369.6	0.513	12	0.913	27	289	0.478	7.4	1.7	41	330	0.349
370.3	0.513	11	1.1	26	271	1.1	7.4	2.0	39	310	0.771
371.0	0.513	10.0	0.866	25	266	0.931	7.4	1.6	38	304	0.680
371.7	0.513	11	0.764	28	274	1.1	7.4	1.4	43	313	0.771
372.4	0.513	9.8	1.4	29	272	0.802	7.4	2.5	44	310	0.585
373.1	0.513	12	1.0	28	304	0.972	7.4	1.8	43	347	0.709
373.8	0.513	12	1.1	31	278	0.708	7.4	1.9	47	318	0.517
374.5	0.513	9.9	1.1	27	285	0.297	7.4	2.1	41	326	0.217
375.2	0.513	10	1.3	30	316	0.701	7.4	2.4	46	361	0.511
375.9	0.513	10	1.5	27	283	0.691	7.4	2.8	42	324	0.504
376.6	0.692	11	1.1	31	278	0.774	10.0	1.9	47	317	0.564
377.3	0.513	7.9	1.3	24	288	0.931	7.4	2.3	37	329	0.679
378.0	0.513	12	1.6	27	311	1.6	7.4	2.9	41	355	1.2
378.7	0.513	8.6	1.5	25	309	0.578	7.4	2.7	38	354	0.422
379.4	0.609	11	1.5	28	310	0.505	8.8	2.8	43	355	0.369
380.1	0.513	11	1.3	24	311	0.768	7.4	2.3	37	356	0.560
380.8	0.513	10	1.0	23	289	1.7	7.4	1.9	35	330	1.3
381.5	0.513	11	1.4	23	288	0.786	7.4	2.5	35	329	0.574
382.2	0.513	12	1.0	26	335	1.8	7.4	1.9	39	383	1.3
382.9	0.513	9.7	1.1	22	284	1.7	7.4	2.0	34	324	1.3
383.6	0.513	9.0	1.3	21	260	0.829	7.4	2.4	32	297	0.605
384.3	0.595	6.6	1.3	22	278	0.989	8.6	2.3	34	318	0.722
385.0	0.513	13	1.2	27	318	1.7	7.4	2.3	41	363	1.3
385.7	0.513	9.7	1.3	24	298	1.4	7.4	2.3	37	341	1.0
386.4	0.513	8.7	1.3	22	290	1.2	7.4	2.3	34	332	0.907
387.1	0.513	8.8	1.2	19	240	1.1	7.4	2.2	29	275	0.785
387.8	0.513	8.1	1.2	21	282	1.5	7.4	2.2	32	323	1.1
388.5	0.513	7.8	1.4	17	302	1.6	7.4	2.6	26	346	1.1
389.2	0.513	8.9	1.1	22	334	2.1	7.4	2.1	33	382	1.5
389.9	0.513	9.6	1.3	21	265	2.2	7.4	2.4	32	303	1.6
390.6	0.513	9.8	1.6	20	280	1.1	7.4	2.9	30	320	0.826
391.3	0.513	9.4	1.5	20	264	1.5	7.4	2.7	30	302	1.1
392.0	0.513	11	1.2	16	282	1.9	7.4	2.3	25	323	1.4
392.7	0.513	9.3	1.1	15	266	2.5	7.4	1.9	23	304	1.8
393.4	0.513	7.8	1.2	16	273	1.8	7.4	2.1	24	312	1.3
394.1	0.513	8.9	0.993	17	274	1.6	7.4	1.8	26	313	1.1
394.8	0.513	8.6	0.973	19	309	0.898	7.4	1.8	29	353	0.655



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
395.5	0.513	8.9	1.2	16	283	3.0	7.4	2.1	25	324	2.2
396.1	0.513	7.4	0.667	16	292	1.8	7.4	1.2	24	334	1.3
396.8	0.513	7.1	0.642	14	276	1.8	7.4	1.2	22	315	1.3
397.5	0.513	13	0.842	12	326	1.7	7.4	1.5	18	372	1.2
398.2	0.513	7.9	0.814	12	272	1.6	7.4	1.5	18	311	1.2
398.9	0.513	8.1	0.902	14	287	1.3	7.4	1.6	22	328	0.942
399.6	0.513	6.9	0.593	14	293	1.1	7.4	1.1	22	335	0.815
400.3	0.513	8.6	0.291	11	283	0.878	7.4	0.531	18	324	0.640
401.0	0.513	7.1	0.737	12	289	1.8	7.4	1.3	19	331	1.3
401.7	0.513	7.3	0.742	13	286	1.6	7.4	1.4	20	327	1.2
402.4	0.513	7.1	0.737	12	281	0.837	7.4	1.3	18	322	0.611
403.1	0.513	6.9	0.519	13	284	1.7	7.4	0.947	19	325	1.2
403.8	0.513	7.8	0.655	13	332	1.3	7.4	1.2	19	380	0.942
404.5	0.513	8.8	0.653	15	268	1.6	7.4	1.2	24	307	1.2
405.2	0.513	6.1	0.647	9.2	277	1.1	7.4	1.2	14	317	0.804
405.9	0.513	8.7	0.577	10	284	2.0	7.4	1.1	16	325	1.4
406.6	0.513	9.6	0.646	12	307	1.2	7.4	1.2	18	351	0.858
407.3	0.513	9.2	0.696	11	270	1.3	7.4	1.3	17	308	0.949
408.0	0.513	9.5	0.588	11	301	1.3	7.4	1.1	16	344	0.978
408.7	0.513	6.8	0.501	12	293	1.3	7.4	0.914	18	335	0.937
409.4	0.513	9.1	0.420	11	241	1.2	7.4	0.766	18	275	0.897
410.1	0.625	10	0.626	10	271	0.569	9.0	1.1	16	310	0.415
410.8	0.513	8.7	0.456	11	290	1.3	7.4	0.831	17	332	0.948
411.5	0.513	8.9	0.846	13	291	1.4	7.4	1.5	20	332	1.0
412.2	0.513	11	0.604	12	267	2.1	7.4	1.1	18	305	1.5
412.9	0.513	9.0	0.488	17	264	1.3	7.4	0.890	26	302	0.951
413.6	0.513	10	0.905	14	282	1.4	7.4	1.7	22	322	0.994
414.3	0.513	11	0.711	15	306	1.5	7.4	1.3	23	350	1.1
415.0	0.513	9.2	0.677	14	269	1.1	7.4	1.2	22	308	0.768
415.7	0.513	11	0.910	15	264	1.9	7.4	1.7	23	302	1.4
416.4	0.513	9.1	0.922	18	257	0.972	7.4	1.7	28	294	0.709
417.1	0.513	10	1.0	20	307	1.6	7.4	1.9	31	351	1.1
417.8	0.513	11	0.999	19	303	1.0	7.4	1.8	29	346	0.752
418.5	0.513	11	0.968	21	260	0.835	7.4	1.8	33	297	0.609
419.2	0.802	9.6	1.2	21	283	1.2	12	2.1	32	324	0.869
419.9	0.513	11	0.766	23	258	2.1	7.4	1.4	36	295	1.5
420.6	0.513	11	0.774	29	266	1.5	7.4	1.4	44	305	1.1
421.3	0.513	11	1.0	24	252	1.5	7.4	1.9	37	288	1.1
422.0	0.513	12	1.0	27	278	1.1	7.4	1.8	42	318	0.788
422.7	0.513	11	1.2	28	310	1.2	7.4	2.1	43	355	0.904
423.3	0.513	11	0.774	25	282	1.4	7.4	1.4	38	323	1.0
424.0	0.725	11	0.980	28	287	0.939	10	1.8	43	329	0.685
424.7	0.513	13	0.874	26	266	1.1	7.4	1.6	39	304	0.813
425.4	0.513	9.7	1.3	29	266	1.1	7.4	2.3	45	305	0.836
426.1	0.513	11	1.1	28	246	1.1	7.4	1.9	44	282	0.799
426.8	0.513	9.2	0.769	28	266	0.580	7.4	1.4	43	304	0.423
427.5	0.513	13	1.2	35	271	0.829	7.4	2.1	53	310	0.605
428.2	0.513	9.8	1.2	33	281	0.824	7.4	2.2	51	321	0.601
428.9	0.513	12	1.2	29	309	0.845	7.4	2.3	45	353	0.617
429.6	0.513	12	1.0	35	275	1.1	7.4	1.8	53	314	0.830
430.3	0.752	12	0.972	34	282	1.6	11	1.8	53	322	1.1
431.0	0.513	12	1.3	34	279	1.3	7.4	2.5	53	319	0.958
431.7	0.513	12	1.2	35	252	1.2	7.4	2.2	54	288	0.887
432.4	0.513	12	1.2	40	275	0.601	7.4	2.2	62	315	0.438
433.1	0.513	11	1.2	34	295	1.3	7.4	2.1	53	337	0.930
433.8	0.513	12	1.3	41	272	0.755	7.4	2.4	62	311	0.551
434.5	0.513	10	1.5	35	281	0.897	7.4	2.7	54	322	0.654
435.2	0.513	11	1.4	37	269	1.2	7.4	2.5	57	308	0.858
435.9	0.513	13	1.4	35	288	1.1	7.4	2.5	54	329	0.797
436.6	0.513	12	1.1	37	305	0.583	7.4	2.1	56	349	0.426
437.3	0.513	12	1.5	38	262	0.600	7.4	2.8	59	299	0.438
438.0	0.534	11	1.4	37	283	0.882	7.7	2.5	56	324	0.644
438.7	0.513	10	1.1	37	288	0.290	7.4	2.0	56	329	0.212
439.4	0.513	12	1.4	40	293	1.1	7.4	2.5	61	335	0.779
440.1	0.513	12	1.5	37	272	0.630	7.4	2.8	56	310	0.460
440.8	0.513	12	1.4	34	279	0.918	7.4	2.6	52	319	0.669
441.5	0.513	13	1.2	33	275	0.649	7.4	2.3	50	314	0.474
442.2	0.513	11	1.6	36	304	0.990	7.4	2.9	56	347	0.722
442.9	0.513	10	1.7	34	281	1.1	7.4	3.2	53	321	0.804
443.6	0.513	10	1.4	35	323	0.992	7.4	2.5	53	370	0.724
444.3	0.513	9.9	1.3	31	259	0.871	7.4	2.3	48	296	0.635
445.0	0.513	12	1.1	37	329	1.3	7.4	2.1	57	377	0.965
445.7	0.513	11	1.3	36	282	0.867	7.4	2.3	55	322	0.633
446.4	0.513	12	1.2	34	305	0.604	7.4	2.1	52	349	0.441
447.1	0.513	12	1.5	37	289	1.0	7.4	2.7	57	331	0.746
447.8	0.513	14	1.5	37	297	1.1	7.4	2.7	57	340	0.780
448.5	0.513	12	1.3	32	294	0.696	7.4	2.4	49	336	0.507
449.1	0.677	12	1.9	41	328	0.719	9.8	3.5	63	375	0.525
449.8	0.513	11	1.2	35	314	0.962	7.4	2.3	54	359	0.702
450.5	0.513	11	1.5	32	311	0.959	7.4	2.7	49	356	0.700
451.2	0.513	9.7	1.6	34	310	1.3	7.4	2.9	52	354	0.919



Minnow Environmental  
Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
451.9	0.609	11	1.5	29	303	0.832	8.8	2.7	45	346	0.607
452.6	0.513	11	1.6	39	306	0.858	7.4	3.0	60	350	0.626
453.3	0.513	12	1.1	30	309	0.274	7.4	2.0	46	353	0.200
454.0	0.513	10	1.3	30	290	0.624	7.4	2.4	45	331	0.455
454.7	0.513	10	1.5	33	303	1.4	7.4	2.8	51	346	1.0
455.4	0.513	12	1.4	30	291	2.0	7.4	2.6	46	332	1.5
456.1	0.578	8.5	1.1	29	335	1.3	8.3	1.9	45	383	0.982
456.8	0.673	10	1.4	26	290	1.3	9.7	2.6	40	332	0.962
457.5	0.513	11	1.5	27	304	1.2	7.4	2.7	42	348	0.873
458.2	0.513	10	1.6	31	318	1.0	7.4	2.8	48	364	0.740
458.9	0.513	9.3	1.8	26	286	1.6	7.4	3.3	39	327	1.2
459.6	0.513	8.1	1.2	25	290	1.1	7.4	2.2	38	332	0.789
460.3	0.513	10	1.6	25	283	2.4	7.4	3.0	38	323	1.7
461.0	0.513	11	1.4	25	303	1.4	7.4	2.6	38	347	0.992
461.7	0.513	8.8	1.2	23	283	2.2	7.4	2.2	35	324	1.6
462.4	0.513	10	0.922	27	302	1.3	7.4	1.7	42	345	0.944
463.1	0.757	9.5	1.1	23	293	1.5	11	2.0	35	336	1.1
463.8	0.513	10	0.955	26	286	1.7	7.4	1.7	40	327	1.2
464.5	0.513	9.1	1.3	24	301	1.3	7.4	2.4	36	344	0.948
465.2	0.513	6.7	1.4	28	296	2.1	7.4	2.5	42	338	1.5
465.9	0.513	10.0	1.1	24	275	1.6	7.4	2.0	37	314	1.1
466.6	0.513	8.9	1.1	22	268	1.2	7.4	2.0	33	307	0.878
467.3	0.513	8.3	1.0	21	291	1.9	7.4	1.8	32	333	1.4
468.0	0.513	6.9	1.3	24	276	1.4	7.4	2.3	36	316	1.0
468.7	0.513	9.7	0.910	18	274	2.2	7.4	1.7	28	313	1.6
469.4	0.513	8.2	1.3	22	286	1.6	7.4	2.3	34	327	1.2
470.1	0.513	8.3	1.0	17	294	1.6	7.4	1.9	27	337	1.2
470.8	0.756	8.5	1.1	19	302	1.6	11	2.1	29	345	1.1
471.5	0.513	8.9	1.0	17	302	2.0	7.4	1.9	25	346	1.4
472.2	0.513	7.0	1.2	20	301	1.8	7.4	2.2	30	344	1.3
472.9	0.513	8.5	1.0	18	276	1.5	7.4	1.9	27	316	1.1
473.6	0.513	11	0.891	16	281	2.9	7.4	1.6	24	322	2.1
474.3	0.752	9.8	0.752	18	271	0.974	11	1.4	28	310	0.711
475.0	0.513	10	0.758	21	286	1.2	7.4	1.4	32	327	0.859
475.6	0.513	11	0.878	17	284	1.6	7.4	1.6	26	325	1.2
476.3	0.513	11	0.895	19	277	1.6	7.4	1.6	29	317	1.2
477.0	0.513	10	0.836	15	272	1.5	7.4	1.5	22	311	1.1
477.7	0.513	8.9	0.687	16	282	1.7	7.4	1.3	24	322	1.2
478.4	0.513	17	0.692	17	291	1.6	7.4	1.3	25	333	1.1
479.1	0.513	11	0.778	16	334	0.666	7.4	1.4	24	382	0.486
479.8	0.513	10	0.890	17	291	1.2	7.4	1.6	25	332	0.908
480.5	0.513	11	0.847	15	261	1.5	7.4	1.5	22	299	1.1
481.2	0.513	8.9	0.983	14	281	1.3	7.4	1.8	21	321	0.943
481.9	0.513	12	0.767	18	277	1.4	7.4	1.4	27	316	1.0
482.6	0.513	10.0	0.787	17	297	1.3	7.4	1.4	26	340	0.967
483.3	0.513	11	0.899	18	270	1.0	7.4	1.6	27	309	0.760
484.0	0.627	9.0	1.1	16	305	1.0	9.0	2.1	25	349	0.760
484.7	0.513	10	0.768	17	295	1.1	7.4	1.4	26	337	0.771
485.4	0.513	10.0	1.0	22	280	1.0	7.4	1.9	34	320	0.760
486.1	0.553	9.5	1.1	19	264	1.2	8.0	2.0	30	302	0.889
486.8	0.513	9.4	0.911	21	275	1.4	7.4	1.7	32	315	1.1
487.5	0.513	12	0.958	19	272	0.649	7.4	1.7	30	311	0.473
488.2	0.513	10.0	1.5	20	279	1.1	7.4	2.8	30	319	0.837
488.9	0.513	12	0.925	20	278	1.1	7.4	1.7	31	318	0.798
489.6	0.513	10	0.968	23	287	1.4	7.4	1.8	35	328	0.987
490.3	0.513	11	1.0	23	268	0.825	7.4	1.9	35	306	0.602
491.0	0.513	11	0.992	22	269	0.875	7.4	1.8	34	308	0.638
491.7	0.513	12	0.887	26	261	0.879	7.4	1.6	40	298	0.642
492.4	0.513	10	1.0	22	278	1.3	7.4	1.9	34	318	0.944
493.1	0.544	13	0.883	29	282	0.698	7.8	1.6	45	322	0.509
493.8	0.513	12	1.3	27	276	1.4	7.4	2.3	42	315	0.996
494.5	0.513	12	1.2	20	281	2.1	7.4	2.1	31	321	1.5
495.2	0.513	10	1.4	24	286	1.2	7.4	2.5	37	327	0.875
495.9	0.513	10	1.4	27	264	1.5	7.4	2.5	41	301	1.1
496.6	0.513	13	1.4	27	278	1.2	7.4	2.6	41	318	0.902
497.3	0.513	12	1.1	30	263	1.0	7.4	2.1	46	300	0.760
498.0	0.513	12	1.4	29	272	1.6	7.4	2.5	44	311	1.1
498.7	0.513	12	1.1	27	282	1.1	7.4	2.1	41	323	0.780
499.4	0.513	9.6	1.3	29	294	1.5	7.4	2.3	44	336	1.1
500.1	0.513	11	1.2	34	252	0.804	7.4	2.1	52	289	0.587
500.8	0.513	8.6	0.953	27	288	0.730	7.4	1.7	42	329	0.533
501.4	0.513	11	1.4	27	295	1.1	7.4	2.6	41	337	0.782
502.1	0.513	10	1.5	32	270	1.8	7.4	2.8	49	308	1.3
502.8	0.513	11	1.1	30	263	0.658	7.4	2.0	46	301	0.480
503.5	0.513	11	0.971	31	312	0.407	7.4	1.8	48	357	0.297
504.2	0.513	11	0.947	28	250	0.835	7.4	1.7	43	286	0.609
504.9	0.513	13	1.3	32	267	0.989	7.4	2.4	50	306	0.721
505.6	0.513	11	1.2	28	275	1.5	7.4	2.2	44	315	1.1
506.3	0.513	13	1.5	37	294	1.8	7.4	2.8	57	337	1.3
507.0	0.513	11	1.1	30	248	1.2	7.4	1.9	46	283	0.865
507.7	0.513	12	0.985	34	277	1.2	7.4	1.8	52	317	0.845



Minnow Environmental  
Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.4	0.725	13	1.6	39	293	1.4	10	3.0	60	335	1.0
509.1	0.513	14	0.882	30	270	0.972	7.4	1.6	46	309	0.709
509.8	0.513	11	1.1	31	284	0.679	7.4	2.0	48	324	0.496
510.5	0.545	11	1.3	32	299	1.2	7.9	2.3	49	342	0.876
511.2	0.513	9.2	1.1	34	309	1.9	7.4	2.0	52	354	1.4
511.9	0.513	10	1.3	30	282	1.1	7.4	2.4	46	323	0.830
512.6	0.513	11	1.2	34	311	1.7	7.4	2.1	52	355	1.3
513.3	0.513	11	1.0	32	296	1.2	7.4	1.9	48	339	0.878
514.0	0.513	11	1.1	32	273	1.2	7.4	1.9	50	313	0.893
514.7	0.513	11	1.1	36	278	1.1	7.4	2.0	56	318	0.795
515.4	0.513	12	0.984	36	276	1.8	7.4	1.8	55	315	1.3
516.1	0.513	11	1.1	38	275	1.3	7.4	2.0	58	315	0.970
516.8	0.513	9.0	1.1	31	248	0.561	7.4	2.1	47	284	0.409
517.5	0.513	11	1.1	37	265	1.1	7.4	2.0	57	303	0.773
518.2	0.542	10	1.8	34	313	0.895	7.8	3.2	51	358	0.653
518.9	0.513	13	1.1	37	299	1.2	7.4	2.0	56	341	0.862
519.6	0.513	11	1.3	33	263	0.841	7.4	2.3	51	301	0.614
520.3	0.513	10	1.4	31	269	1.0	7.4	2.5	48	307	0.736
521.0	0.513	10	1.3	38	276	0.901	7.4	2.4	58	316	0.657
521.7	0.513	11	1.3	43	273	0.921	7.4	2.5	65	312	0.672
522.4	0.513	11	1.4	36	265	1.0	7.4	2.6	55	303	0.759
523.1	0.513	10	1.8	30	270	1.2	7.4	3.2	47	309	0.860
523.8	0.513	10	1.2	34	251	1.3	7.4	2.2	51	287	0.966
524.5	0.513	11	1.2	32	283	0.628	7.4	2.2	49	324	0.458
525.2	0.513	9.1	1.1	39	251	1.3	7.4	2.1	60	287	0.944
525.9	0.513	11	1.3	33	256	1.1	7.4	2.4	51	293	0.795
526.6	0.513	10	0.912	37	286	1.4	7.4	1.7	57	327	1.0
527.3	0.513	8.1	1.3	40	256	0.471	7.4	2.5	62	293	0.343
527.9	0.513	11	1.2	33	276	1.8	7.4	2.3	51	316	1.3
528.6	0.513	13	1.1	40	301	1.5	7.4	2.1	61	344	1.1
529.3	0.513	9.1	1.3	36	298	0.590	7.4	2.3	55	341	0.431
530.0	0.513	8.8	1.1	31	279	0.832	7.4	2.0	48	319	0.607
530.7	0.513	9.7	1.3	31	254	0.915	7.4	2.3	47	291	0.668
531.4	0.513	8.3	1.0	31	257	1.1	7.4	1.9	48	293	0.792
532.1	0.513	11	1.2	33	283	1.2	7.4	2.3	51	323	0.863
532.8	0.513	7.8	1.2	34	247	1.2	7.4	2.1	53	283	0.891
533.5	0.513	9.0	0.990	28	267	1.3	7.4	1.8	43	305	0.970
534.2	0.513	10	1.1	36	267	0.790	7.4	2.1	55	306	0.576
534.9	0.513	10	1.3	26	235	1.2	7.4	2.4	40	269	0.876
535.6	0.513	9.0	1.2	28	269	1.7	7.4	2.1	43	307	1.2
536.3	0.513	7.9	1.1	32	266	1.0	7.4	2.0	49	304	0.730
537.0	0.513	9.1	1.2	26	285	1.4	7.4	2.2	40	326	1.0
537.7	0.513	10	1.2	28	262	1.8	7.4	2.1	43	300	1.3
538.4	0.513	10	1.4	26	259	1.7	7.4	2.6	40	296	1.3
539.1	0.513	10	1.1	32	308	1.9	7.4	2.0	49	352	1.4
539.8	0.513	9.3	1.2	27	263	1.2	7.4	2.1	41	301	0.883
540.5	0.513	7.5	1.4	26	282	1.1	7.4	2.6	40	322	0.795
541.2	0.513	8.6	1.2	31	283	1.2	7.4	2.3	47	324	0.847
541.9	0.513	9.6	1.1	22	313	2.1	7.4	2.0	34	358	1.5
542.6	0.513	8.5	1.1	26	292	2.0	7.4	2.0	39	333	1.4
543.3	0.537	11	0.894	25	280	1.4	7.7	1.6	38	320	1.0
544.0	0.513	8.9	0.945	23	236	2.2	7.4	1.7	35	270	1.6
544.7	0.513	7.8	1.2	20	297	2.4	7.4	2.2	30	340	1.7
545.4	0.513	8.1	0.975	19	236	3.0	7.4	1.8	29	270	2.2
546.1	0.513	9.4	0.995	17	263	1.7	7.4	1.8	26	301	1.3
546.8	0.513	8.5	0.874	17	237	1.7	7.4	1.6	26	271	1.3
547.5	0.513	7.3	0.924	17	256	1.2	7.4	1.7	26	292	0.850
548.2	0.513	9.5	0.975	16	251	1.7	7.4	1.8	25	287	1.3
548.9	0.537	9.9	0.932	18	239	1.6	7.8	1.7	28	273	1.2
549.6	0.513	10	0.649	14	257	1.8	7.4	1.2	21	294	1.3
550.3	0.513	10	0.981	14	270	2.0	7.4	1.8	21	309	1.5
551.0	0.513	9.5	1.0	11	261	1.7	7.4	1.8	17	298	1.2
551.7	0.513	9.0	0.729	13	258	1.8	7.4	1.3	20	295	1.3
552.4	0.513	8.8	0.850	12	249	1.5	7.4	1.6	19	285	1.1
553.1	0.513	6.3	0.637	14	243	1.5	7.4	1.2	22	277	1.1
553.8	0.513	9.0	0.580	17	291	2.0	7.4	1.1	26	333	1.4
554.4	0.556	8.4	0.526	12	268	1.9	8.0	0.959	19	307	1.4
555.1	0.513	9.3	0.710	11	264	1.7	7.4	1.3	16	302	1.3
555.8	0.513	8.3	0.631	10	241	1.3	7.4	1.2	16	276	0.980
556.5	0.513	9.9	0.533	14	250	1.8	7.4	0.972	21	286	1.3
557.2	0.513	7.9	0.788	9.6	290	1.2	7.4	1.4	15	332	0.868
557.9	0.513	9.6	0.479	12	239	1.1	7.4	0.874	18	274	0.832
558.6	0.513	11	0.589	11	257	1.2	7.4	1.1	17	294	0.839
559.3	0.513	8.3	0.610	11	235	1.3	7.4	1.1	18	269	0.913
560.0	0.513	11	0.706	8.7	260	1.5	7.4	1.3	13	298	1.1
560.7	0.513	7.7	0.567	11	264	1.2	7.4	1.0	17	302	0.910
561.4	0.513	6.7	0.651	8.8	261	1.0	7.4	1.2	13	299	0.746
562.1	0.513	8.9	0.764	9.1	268	1.4	7.4	1.4	14	306	1.0
562.8	0.513	8.3	0.496	12	249	0.890	7.4	0.904	19	285	0.649
563.5	0.871	10	0.574	11	276	1.9	13	1.0	17	316	1.4
564.2	0.513	7.8	0.690	12	245	1.4	7.4	1.3	19	280	1.0



Minnow Environmental  
Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
564.9	0.513	9.6	0.534	8.9	249	1.2	7.4	0.973	14	285	0.890
565.6	0.513	8.5	0.421	13	294	0.678	7.4	0.767	20	336	0.495
566.3	0.513	9.3	0.536	13	233	0.725	7.4	0.978	20	267	0.529
567.0	0.513	10	0.352	11	241	1.3	7.4	0.641	17	276	0.982
567.7	0.513	9.0	0.867	13	268	1.7	7.4	1.6	20	307	1.2
568.4	0.513	9.1	0.718	13	255	1.2	7.4	1.3	20	291	0.865
569.1	0.513	9.5	0.625	15	258	1.6	7.4	1.1	23	295	1.1
569.8	0.513	9.4	0.386	15	266	0.939	7.4	0.704	23	304	0.685
570.5	0.572	10	0.455	16	252	0.855	8.3	0.830	24	288	0.624
571.2	0.513	11	0.781	15	254	1.7	7.4	1.4	23	290	1.3
571.9	0.523	10	0.611	18	249	1.3	7.6	1.1	27	285	0.981
572.6	0.513	12	0.800	16	272	1.2	7.4	1.5	24	311	0.881
573.3	0.513	10	0.618	17	227	1.3	7.4	1.1	26	259	0.931
574.0	0.513	10	0.245	19	243	0.386	7.4	0.446	28	278	0.281
574.7	0.513	11	0.853	21	258	0.692	7.4	1.6	33	295	0.505
575.4	0.513	11	0.635	20	221	0.721	7.4	1.2	30	253	0.526
576.1	0.513	9.9	0.790	24	253	1.0	7.4	1.4	37	289	0.735
576.8	0.513	13	0.602	20	236	1.1	7.4	1.1	31	270	0.828
577.5	0.513	11	0.511	24	220	0.936	7.4	0.933	37	252	0.683
578.2	0.513	12	0.544	27	252	0.622	7.4	0.992	41	288	0.454
578.9	0.513	12	0.675	24	244	0.478	7.4	1.2	37	280	0.349
579.6	0.553	10	0.856	23	224	0.551	8.0	1.6	35	256	0.402
580.2	0.513	10	0.780	25	203	0.835	7.4	1.4	39	232	0.609
580.9	0.513	13	0.704	25	225	0.775	7.4	1.3	38	258	0.565
581.6	0.513	14	0.960	26	227	0.941	7.4	1.8	41	260	0.686
582.3	0.513	14	0.830	32	232	0.769	7.4	1.5	49	266	0.561
583.0	0.513	12	0.933	35	231	0.601	7.4	1.7	54	264	0.438
583.7	0.522	10	1.1	25	205	0.607	7.5	2.0	39	235	0.443
584.4	0.513	14	0.929	30	212	0.666	7.4	1.7	45	242	0.486
585.1	0.513	12	0.682	32	223	1.0	7.4	1.2	49	255	0.730
585.8	0.513	11	1.2	30	251	0.881	7.4	2.2	46	287	0.643
586.5	0.513	11	0.943	38	243	1.3	7.4	1.7	58	278	0.939
587.2	0.513	11	1.1	32	242	0.876	7.4	2.0	49	277	0.639
587.9	0.565	11	1.0	31	252	0.750	8.1	1.9	48	288	0.548
588.6	0.513	12	1.2	36	246	1.2	7.4	2.2	55	282	0.865
589.3	0.513	11	1.2	34	231	0.755	7.4	2.2	53	264	0.551
590.0	0.513	12	1.1	30	239	1.0	7.4	2.0	47	274	0.763
590.7	0.513	12	1.5	36	239	0.486	7.4	2.8	55	273	0.354
591.4	0.513	11	1.2	31	231	1.0	7.4	2.2	47	264	0.751
592.1	0.699	12	1.1	31	249	0.879	10	1.9	48	285	0.642
592.8	0.513	10	1.3	32	255	0.693	7.4	2.3	49	291	0.506
593.5	0.591	14	1.4	30	242	0.785	8.5	2.5	46	276	0.573
594.2	0.513	12	1.2	31	251	0.743	7.4	2.3	47	287	0.542
594.9	0.513	11	1.2	28	256	0.657	7.4	2.2	43	292	0.479
595.6	0.513	9.5	1.1	29	220	0.475	7.4	1.9	45	251	0.347
596.3	0.513	11	1.2	24	253	1.2	7.4	2.2	37	289	0.871
597.0	0.513	12	1.3	28	222	0.978	7.4	2.4	43	254	0.713
597.7	0.513	11	1.2	32	248	1.5	7.4	2.2	50	284	1.1
598.4	0.513	9.9	0.947	28	241	1.7	7.4	1.7	43	276	1.3
599.1	0.513	17	1.3	27	251	0.891	7.4	2.3	41	287	0.650
599.8	0.513	11	1.5	32	265	1.5	7.4	2.7	49	303	1.1
600.5	0.513	8.9	1.7	26	235	1.3	7.4	3.0	40	268	0.955
601.2	0.642	11	1.5	24	273	1.1	9.3	2.8	37	313	0.783
601.9	0.530	10	1.1	20	224	1.2	7.7	2.0	31	256	0.900
602.6	0.513	8.3	1.3	23	252	0.936	7.4	2.4	35	288	0.683
603.3	0.513	10	0.753	23	225	1.5	7.4	1.4	35	257	1.1
604.0	0.513	8.1	1.2	18	244	1.4	7.4	2.1	28	279	1.0
604.7	0.513	8.4	1.5	23	243	1.1	7.4	2.7	35	278	0.834
605.4	0.513	9.2	1.4	25	245	1.9	7.4	2.6	38	281	1.3
606.1	0.513	11	1.1	16	248	1.7	7.4	2.1	24	284	1.2
606.7	0.513	9.6	1.2	17	241	1.9	7.4	2.2	25	276	1.4
607.4	0.513	9.9	1.1	17	272	1.6	7.4	2.0	26	311	1.2
608.1	0.513	9.4	0.966	15	264	1.8	7.4	1.8	23	302	1.3
608.8	0.513	12	0.795	16	255	1.5	7.4	1.4	25	292	1.1
609.5	0.513	10	0.615	13	257	0.902	7.4	1.1	20	294	0.658
610.2	0.513	12	0.721	10	242	1.7	7.4	1.3	16	277	1.2
610.9	0.513	12	0.614	12	243	1.0	7.4	1.1	18	278	0.747
611.6	0.513	11	0.761	14	291	1.1	7.4	1.4	22	333	0.838
612.3	0.513	9.6	0.739	12	263	1.6	7.4	1.3	19	301	1.2
613.0	0.513	10	0.728	12	248	2.4	7.4	1.3	18	283	1.8
613.7	0.513	11	0.605	13	243	1.2	7.4	1.1	20	277	0.901
614.4	0.513	11	0.446	11	249	2.0	7.4	0.814	17	285	1.4
615.1	0.513	11	0.419	11	267	1.5	7.4	0.764	17	306	1.1
615.8	0.513	10	0.429	11	227	1.5	7.4	0.783	17	259	1.1
616.5	0.513	12	0.391	11	258	1.0	7.4	0.712	17	295	0.733
617.2	0.513	11	0.291	9.2	206	1.4	7.4	0.532	14	236	0.991
617.9	0.513	14	0.358	13	220	1.3	7.4	0.653	21	252	0.928
618.6	0.513	13	0.359	13	249	1.2	7.4	0.654	20	285	0.859
619.3	0.513	13	0.616	12	227	1.0	7.4	1.1	19	260	0.749
620.0	0.513	13	0.381	14	265	1.2	7.4	0.694	22	303	0.878
620.7	0.513	13	0.515	16	254	0.687	7.4	0.939	24	291	0.502



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.4	0.513	14	0.453	18	229	0.661	7.4	0.826	28	262	0.483
622.1	0.513	13	0.407	20	230	1.2	7.4	0.742	31	263	0.845
622.8	0.513	13	0.674	19	229	1.3	7.4	1.2	29	262	0.947
623.5	0.513	13	0.338	21	252	1.2	7.4	0.617	33	288	0.877
624.2	0.513	14	0.706	26	248	0.777	7.4	1.3	41	284	0.567
624.9	0.513	13	0.604	22	249	0.885	7.4	1.1	34	285	0.646
625.6	0.513	14	0.457	26	253	0.820	7.4	0.834	39	289	0.599
626.3	0.513	15	0.634	27	243	1.2	7.4	1.2	41	278	0.842
627.0	0.513	16	0.616	23	246	0.677	7.4	1.1	36	282	0.494
627.7	0.513	17	0.481	29	276	0.903	7.4	0.876	45	316	0.659
628.4	0.513	19	0.903	34	245	0.895	7.4	1.6	52	280	0.653
629.1	0.513	12	0.433	25	226	0.604	7.4	0.790	39	259	0.441
629.8	0.513	14	0.784	36	272	0.295	7.4	1.4	55	311	0.215
630.5	0.825	18	0.970	39	258	0.640	12	1.8	60	295	0.467
631.2	0.513	19	1.3	45	271	1.4	7.4	2.4	69	310	0.998
631.9	0.513	15	1.0	35	233	1.1	7.4	1.9	54	266	0.786
632.6	0.513	15	0.890	47	258	0.529	7.4	1.6	72	296	0.386
633.2	0.513	18	1.1	36	237	1.0	7.4	2.0	55	271	0.735
633.9	0.607	15	1.1	40	226	1.5	8.8	2.0	61	259	1.1
634.6	0.513	13	1.1	42	252	0.996	7.4	1.9	64	288	0.727
635.3	0.513	16	1.6	44	248	1.3	7.4	2.8	67	283	0.914
636.0	0.513	14	1.4	39	258	0.535	7.4	2.6	60	295	0.390
636.7	0.513	14	1.2	36	256	0.923	7.4	2.2	56	293	0.674
637.4	0.513	16	1.5	41	243	0.462	7.4	2.8	62	277	0.337
638.1	0.513	13	0.911	39	240	0.668	7.4	1.7	60	275	0.487
638.8	0.513	12	1.5	38	248	0.825	7.4	2.7	58	284	0.602
639.5	0.513	13	1.1	36	234	0.738	7.4	2.1	56	268	0.539
640.2	0.513	10	1.1	37	230	0.709	7.4	2.1	57	263	0.517
640.9	0.513	11	1.3	38	209	0.872	7.4	2.3	57	239	0.636
641.6	0.513	11	0.894	34	253	1.1	7.4	1.6	53	290	0.832
642.3	0.513	11	1.5	34	271	1.2	7.4	2.8	53	310	0.841
643.0	0.853	12	1.2	40	271	0.720	12	2.2	61	310	0.526
643.7	0.723	11	1.5	39	226	0.808	10	2.7	59	259	0.590
644.4	0.513	14	1.4	35	251	0.671	7.4	2.6	54	288	0.489
645.1	0.513	9.8	1.5	37	238	0.415	7.4	2.7	57	273	0.302
645.8	0.513	11	1.3	36	258	0.863	7.4	2.5	55	295	0.629
646.5	0.513	10	1.2	35	240	0.699	7.4	2.1	53	274	0.510
647.2	0.513	11	1.6	34	249	0.900	7.4	2.9	52	284	0.656
647.9	0.513	11	1.1	40	262	1.6	7.4	2.1	62	299	1.2
648.6	0.513	12	1.3	31	253	1.2	7.4	2.3	48	290	0.905
649.3	0.513	11	1.4	30	231	1.1	7.4	2.6	46	264	0.823
650.0	0.513	9.9	1.4	34	249	0.884	7.4	2.6	51	284	0.645
650.7	0.513	8.9	0.955	28	273	0.685	7.4	1.7	44	313	0.500
651.4	0.513	8.6	0.806	24	214	1.2	7.4	1.5	36	244	0.864
652.1	0.513	11	1.2	28	228	0.840	7.4	2.1	43	261	0.613
652.8	0.513	10	1.5	29	255	0.817	7.4	2.7	44	291	0.596
653.5	0.513	9.7	1.5	29	240	1.5	7.4	2.7	45	275	1.1
654.2	0.513	9.2	1.4	28	267	1.2	7.4	2.5	44	305	0.848
654.9	0.513	11	1.3	27	274	1.1	7.4	2.4	42	313	0.788
655.6	0.513	9.5	1.1	25	250	0.815	7.4	1.9	39	286	0.595
656.3	0.513	11	1.2	19	242	1.4	7.4	2.2	29	276	1.0
657.0	0.513	9.7	1.1	21	285	1.3	7.4	2.0	31	326	0.977
657.7	0.556	9.4	0.902	20	235	0.713	8.0	1.6	30	269	0.520
658.4	0.513	10	1.1	21	264	1.2	7.4	2.0	32	301	0.870
659.1	0.513	9.1	1.0	19	254	1.5	7.4	1.8	29	291	1.1
659.7	0.513	9.2	1.2	21	260	1.6	7.4	2.2	32	297	1.2
660.4	0.513	9.5	1.1	21	258	1.2	7.4	1.9	33	295	0.856
661.1	0.513	7.4	0.916	16	228	1.2	7.4	1.7	25	260	0.863
661.8	0.513	9.5	1.2	16	245	0.968	7.4	2.3	25	280	0.707
662.5	0.513	7.3	0.984	18	261	2.1	7.4	1.8	27	298	1.5
663.2	0.525	6.6	0.831	20	279	1.4	7.6	1.5	31	320	1.0
663.9	0.513	7.5	0.642	17	256	1.9	7.4	1.2	25	292	1.4
664.6	0.513	9.2	0.805	16	259	1.0	7.4	1.5	24	296	0.760
665.3	0.513	9.0	0.980	18	258	0.804	7.4	1.8	27	296	0.586
666.0	0.513	7.9	0.823	20	284	1.8	7.4	1.5	31	325	1.3
666.7	0.513	9.6	0.590	16	240	1.5	7.4	1.1	24	275	1.1
667.4	0.513	8.0	0.856	15	271	1.5	7.4	1.6	23	310	1.1
668.1	0.513	8.0	0.835	15	266	1.1	7.4	1.5	23	304	0.820
668.8	0.513	10	0.970	12	262	0.939	7.4	1.8	19	300	0.685
669.5	0.513	10	0.804	15	262	1.1	7.4	1.5	23	299	0.783
670.2	0.513	9.3	0.667	15	303	1.1	7.4	1.2	23	347	0.792
670.9	0.513	8.7	0.673	15	259	1.3	7.4	1.2	23	296	0.925
671.6	0.513	9.6	0.899	12	272	0.879	7.4	1.6	18	311	0.641
672.3	0.513	7.3	0.537	12	256	1.5	7.4	0.979	18	293	1.1
673.0	0.513	9.6	0.707	13	264	1.2	7.4	1.3	20	302	0.908
673.7	0.513	11	0.569	16	288	0.760	7.4	1.0	24	330	0.554
674.4	0.559	8.7	0.746	13	260	1.6	8.1	1.4	20	298	1.2
675.1	0.513	10	0.619	13	269	0.906	7.4	1.1	21	307	0.661
675.8	0.513	10	0.817	12	281	2.0	7.4	1.5	19	321	1.4
676.5	0.513	10	0.418	9.7	226	1.2	7.4	0.762	15	259	0.891
677.2	0.513	12	0.594	11	255	1.0	7.4	1.1	17	291	0.733



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
677.9	0.513	9.6	0.717	13	288	1.1	7.4	1.3	20	329	0.817
678.6	0.513	9.7	0.519	10	286	1.0	7.4	0.946	16	327	0.731
679.3	0.513	11	0.685	13	277	1.5	7.4	1.2	19	317	1.1
680.0	0.513	13	0.449	13	286	1.5	7.4	0.819	20	327	1.1
680.7	0.513	11	0.390	14	284	1.7	7.4	0.712	21	325	1.2
681.4	0.513	14	0.637	13	296	2.0	7.4	1.2	19	338	1.5
682.1	2.1	14	0.655	15	311	1.4	31	1.2	23	355	1.0
682.8	0.513	15	0.674	17	274	1.4	7.4	1.2	26	313	1.0
683.5	0.513	15	0.620	18	287	0.704	7.4	1.1	27	328	0.514
684.2	0.513	15	0.863	19	281	1.1	7.4	1.6	29	321	0.769
684.9	0.513	14	0.839	15	267	1.2	7.4	1.5	23	305	0.880
685.5	0.513	16	0.678	20	270	1.2	7.4	1.2	31	308	0.898
686.2	0.513	19	0.590	22	306	1.4	7.4	1.1	34	350	1.1
686.9	0.513	16	0.721	24	289	0.865	7.4	1.3	36	331	0.631
687.6	0.513	17	0.679	23	286	1.1	7.4	1.2	36	327	0.794
688.3	0.513	13	0.725	22	275	1.1	7.4	1.3	33	314	0.799
689.0	0.513	16	1.0	29	324	1.2	7.4	1.9	44	370	0.879
689.7	0.513	12	0.824	22	274	1.4	7.4	1.5	33	313	0.986
690.4	0.513	14	1.0	27	284	1.3	7.4	1.9	41	325	0.969
691.1	0.513	13	0.970	26	253	0.493	7.4	1.8	41	289	0.360
691.8	0.513	16	1.1	25	318	0.507	7.4	2.1	38	364	0.370
692.5	0.513	17	0.700	25	285	0.974	7.4	1.3	38	326	0.711
693.2	0.513	18	0.929	30	320	1.4	7.4	1.7	46	365	0.996
693.9	0.513	15	0.827	27	288	0.531	7.4	1.5	41	329	0.388
694.6	0.513	18	0.892	31	336	1.9	7.4	1.6	48	384	1.4
695.3	0.513	20	0.890	31	307	1.1	7.4	1.6	47	351	0.802
696.0	0.513	20	1.1	33	305	1.2	7.4	2.1	51	349	0.850
696.7	0.513	21	1.1	34	281	1.3	7.4	1.9	53	322	0.970
697.4	0.513	22	1.3	33	308	0.509	7.4	2.3	50	352	0.372
698.1	0.513	18	0.837	30	264	0.527	7.4	1.5	46	302	0.385
698.8	0.513	19	0.933	36	301	1.2	7.4	1.7	55	344	0.901
699.5	0.513	20	1.7	39	319	0.928	7.4	3.0	60	364	0.677
700.2	0.513	15	0.738	36	320	1.0	7.4	1.3	55	366	0.750
700.9	0.513	19	0.681	26	303	1.3	7.4	1.2	39	346	0.973
701.6	0.513	16	0.930	35	317	0.698	7.4	1.7	53	362	0.509
702.3	0.513	15	0.713	35	308	2.0	7.4	1.3	54	352	1.5
703.0	0.513	18	0.822	34	290	1.5	7.4	1.5	53	331	1.1
703.7	0.513	17	1.1	32	355	1.7	7.4	2.1	49	406	1.2
704.4	0.513	17	1.0	35	337	2.1	7.4	1.9	54	385	1.5
705.1	0.513	22	0.886	34	320	1.0	7.4	1.6	52	366	0.760
705.8	0.513	17	1.3	35	274	1.1	7.4	2.4	53	313	0.766
706.5	0.513	16	1.2	31	262	0.994	7.4	2.1	48	299	0.725
707.2	0.513	17	0.868	36	367	1.5	7.4	1.6	55	420	1.1
707.9	0.513	15	1.4	33	361	2.2	7.4	2.5	50	412	1.6
708.6	0.513	17	0.655	28	292	1.6	7.4	1.2	43	334	1.2
709.3	0.513	16	1.2	38	300	2.2	7.4	2.2	58	343	1.6
710.0	0.513	14	0.979	36	304	1.4	7.4	1.8	55	348	1.0
710.6	0.758	17	0.796	34	308	1.5	11	1.5	52	352	1.1
711.3	0.513	15	0.775	28	308	1.1	7.4	1.4	44	352	0.812
712.0	0.513	16	0.484	31	306	2.0	7.4	0.883	48	350	1.5
712.7	0.513	17	0.876	33	305	1.4	7.4	1.6	51	349	1.0
713.4	0.513	16	1.2	32	304	0.778	7.4	2.2	49	348	0.567
714.1	0.513	16	1.1	29	331	0.931	7.4	2.0	44	379	0.679
714.8	0.513	15	1.1	29	325	1.4	7.4	2.0	44	371	1.0
715.5	0.513	16	0.939	27	303	1.5	7.4	1.7	41	346	1.1
716.2	0.513	15	1.2	26	309	1.3	7.4	2.2	39	353	0.924
716.9	0.513	13	0.674	26	294	1.6	7.4	1.2	40	337	1.2
717.6	0.513	16	0.788	27	348	0.970	7.4	1.4	42	398	0.708
718.3	0.513	16	0.832	26	373	2.1	7.4	1.5	40	427	1.6
719.0	0.513	16	0.745	23	373	2.0	7.4	1.4	35	427	1.5
719.7	0.513	15	0.793	28	393	1.6	7.4	1.4	43	449	1.2
720.4	0.513	14	0.753	21	312	1.4	7.4	1.4	32	357	0.993
721.1	0.513	15	0.905	28	351	1.7	7.4	1.7	44	401	1.2
721.8	0.513	15	1.0	25	354	1.8	7.4	1.9	39	404	1.3
722.5	0.513	14	0.574	19	323	1.1	7.4	1.0	29	370	0.818
723.2	0.513	16	0.778	23	325	2.3	7.4	1.4	35	372	1.7
723.9	0.513	13	0.942	25	370	1.9	7.4	1.7	38	423	1.4
724.6	0.513	16	0.850	19	314	2.0	7.4	1.6	29	359	1.4
725.3	0.513	17	0.395	26	406	2.0	7.4	0.720	40	464	1.5
726.0	0.513	13	0.625	23	341	1.7	7.4	1.1	35	390	1.2
726.7	0.513	14	0.458	23	331	1.1	7.4	0.835	36	378	0.829
727.4	0.513	15	0.767	24	341	1.7	7.4	1.4	37	390	1.2
728.1	0.513	14	0.666	24	342	0.977	7.4	1.2	36	391	0.713
728.8	0.513	14	0.671	23	417	2.2	7.4	1.2	35	476	1.6
729.5	0.513	15	0.597	23	351	1.1	7.4	1.1	36	402	0.821
730.2	0.513	15	0.882	26	362	1.3	7.4	1.6	40	414	0.946
730.9	0.513	13	0.578	24	349	2.4	7.4	1.1	36	400	1.7
731.6	0.513	15	0.493	24	401	1.2	7.4	0.900	37	459	0.861
732.3	0.513	15	0.535	25	346	1.2	7.4	0.976	38	396	0.858
733.0	0.513	15	0.570	26	393	1.4	7.4	1.0	41	450	1.1
733.7	0.513	13	0.769	28	352	1.3	7.4	1.4	42	402	0.961



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
734.4	0.513	17	0.525	27	350	1.8	7.4	0.958	41	400	1.3
735.1	0.513	15	0.661	30	355	1.3	7.4	1.2	47	406	0.920
735.8	0.513	19	0.851	34	437	2.2	7.4	1.6	52	500	1.6
736.4	0.513	18	0.847	32	372	1.1	7.4	1.5	49	425	0.797
737.1	0.513	15	0.487	29	336	1.4	7.4	0.888	44	384	1.0
737.8	0.513	16	0.538	32	368	1.2	7.4	0.981	49	421	0.895
738.5	0.513	17	0.483	40	419	1.9	7.4	0.880	61	480	1.4
739.2	0.513	17	1.1	35	383	1.6	7.4	2.0	54	437	1.2
739.9	0.513	17	0.557	39	408	1.3	7.4	1.0	60	466	0.968
740.6	0.513	16	0.636	41	379	2.0	7.4	1.2	64	434	1.4
741.3	0.513	17	0.870	38	362	1.8	7.4	1.6	58	414	1.3
742.0	0.513	18	0.957	39	373	1.7	7.4	1.7	60	427	1.2
742.7	0.513	16	0.848	38	319	1.4	7.4	1.5	58	364	1.0
743.4	0.513	21	0.987	46	419	1.4	7.4	1.8	70	479	1.0
744.1	0.632	20	0.785	44	419	1.2	9.1	1.4	68	479	0.911
744.8	0.513	18	1.0	51	421	1.3	7.4	1.9	78	482	0.965
745.5	0.513	14	0.777	37	316	0.914	7.4	1.4	56	361	0.667
746.2	0.513	18	1.2	45	373	1.1	7.4	2.1	69	427	0.789
746.9	0.513	17	0.878	51	412	2.2	7.4	1.6	78	472	1.6
747.6	0.637	17	1.1	46	400	1.5	9.2	2.0	71	458	1.1
748.3	0.513	18	0.958	49	422	1.6	7.4	1.7	75	483	1.2
749.0	0.513	16	0.958	53	419	1.7	7.4	1.7	82	479	1.3
749.7	0.513	15	0.627	54	404	1.1	7.4	1.1	82	462	0.805
750.4	0.513	20	1.1	50	444	1.5	7.4	1.9	76	508	1.1
751.1	0.513	20	1.1	51	417	1.7	7.4	2.0	78	477	1.3
751.8	0.513	18	0.890	55	434	1.3	7.4	1.6	84	497	0.931
752.5	0.513	19	0.954	48	374	1.5	7.4	1.7	73	428	1.1
753.2	0.513	17	1.1	52	390	1.7	7.4	1.9	79	446	1.2
753.9	0.513	18	1.0	61	407	2.3	7.4	1.9	93	465	1.7
754.6	0.513	15	1.0	47	431	1.5	7.4	1.9	71	493	1.1
755.3	0.513	21	0.994	64	429	1.5	7.4	1.8	98	491	1.1
756.0	0.513	19	0.940	48	395	2.3	7.4	1.7	74	452	1.6
756.7	0.513	15	1.0	53	426	1.8	7.4	1.8	82	487	1.3
757.4	0.513	19	1.4	63	441	2.3	7.4	2.5	97	504	1.7
758.1	0.513	18	1.6	66	434	1.3	7.4	2.9	101	497	0.935
758.8	0.513	21	1.5	63	407	2.2	7.4	2.8	96	465	1.6
759.5	0.537	19	1.4	62	470	1.5	7.8	2.6	95	538	1.1
760.2	0.513	16	1.2	55	418	1.1	7.4	2.2	84	478	0.828
760.9	0.513	21	1.5	59	465	1.6	7.4	2.7	90	532	1.2
761.6	0.513	18	1.3	63	458	2.3	7.4	2.3	96	524	1.6
762.2	0.513	14	1.7	55	457	2.1	7.4	3.1	84	523	1.5
762.9	0.513	19	1.5	62	459	1.7	7.4	2.7	95	525	1.3
763.6	0.513	21	1.7	69	466	3.1	7.4	3.1	106	533	2.3
764.3	0.513	18	1.6	60	472	2.4	7.4	3.0	92	540	1.7
765.0	0.513	15	1.6	56	427	2.4	7.4	2.9	86	488	1.7
765.7	0.513	21	2.1	66	480	1.9	7.4	3.8	100	549	1.4
766.4	0.513	17	1.8	64	476	2.4	7.4	3.2	98	545	1.8
767.1	0.513	20	1.7	75	482	2.7	7.4	3.1	115	551	2.0
767.8	0.513	16	2.1	58	447	2.6	7.4	3.8	88	511	1.9
768.5	0.513	16	2.1	65	479	2.5	7.4	3.8	99	548	1.8
769.2	0.513	19	2.0	69	460	2.1	7.4	3.6	106	526	1.5
769.9	0.513	18	2.3	74	523	2.8	7.4	4.2	113	598	2.1
770.6	0.513	19	1.6	70	468	2.8	7.4	2.9	107	535	2.1
771.3	0.513	16	1.6	62	461	2.1	7.4	2.8	95	527	1.5
772.0	0.513	18	2.2	64	511	1.9	7.4	3.9	97	584	1.4
772.7	0.513	17	2.3	72	509	2.3	7.4	4.1	110	583	1.7
773.4	0.513	17	2.2	71	476	1.5	7.4	4.1	109	544	1.1
774.1	0.513	17	2.3	71	488	3.5	7.4	4.1	109	558	2.6
774.8	0.513	16	2.1	67	456	1.7	7.4	3.8	103	521	1.3
775.5	0.513	19	2.3	71	476	2.2	7.4	4.1	109	545	1.6
776.2	0.513	15	2.0	64	461	2.7	7.4	3.6	97	528	1.9
776.9	0.513	15	2.1	72	465	3.2	7.4	3.9	111	531	2.3
777.6	0.598	16	1.8	73	515	3.6	8.6	3.4	112	589	2.6
778.3	0.513	18	2.0	67	532	3.2	7.4	3.7	102	608	2.3
779.0	0.513	18	2.1	81	504	3.1	7.4	3.8	124	576	2.2
779.7	0.513	17	2.3	71	507	3.3	7.4	4.2	109	580	2.4
780.4	0.513	16	2.2	74	486	3.0	7.4	4.0	114	556	2.2
781.1	0.513	19	2.6	74	562	3.3	7.4	4.8	113	643	2.4
781.8	0.513	18	1.8	76	522	3.1	7.4	3.2	116	597	2.2
782.5	0.513	18	2.8	68	493	2.5	7.4	5.2	104	564	1.8
783.2	0.513	15	2.7	63	404	2.9	7.4	5.0	96	462	2.1
783.9	0.513	17	3.2	79	504	4.1	7.4	5.9	121	576	3.0
784.6	0.513	18	2.5	69	477	3.3	7.4	4.5	106	545	2.4
785.3	0.513	16	2.8	66	458	2.9	7.4	5.1	102	524	2.1
786.0	0.513	19	2.8	78	526	3.3	7.4	5.1	119	602	2.4
786.7	0.513	19	2.3	66	456	3.1	7.4	4.2	102	522	2.3
787.4	0.513	16	3.1	69	432	3.5	7.4	5.6	106	494	2.6
788.1	0.697	20	2.6	76	503	4.9	10	4.8	117	575	3.6
788.7	0.513	20	2.9	71	487	3.4	7.4	5.3	110	557	2.5
789.4	0.513	17	3.1	74	478	3.4	7.4	5.6	113	547	2.5
790.1	0.513	17	3.2	65	456	3.8	7.4	5.8	100	521	2.7



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
790.8	0.702	17	2.7	69	454	3.7	10	4.9	105	519	2.7
791.5	0.548	18	3.4	67	485	3.1	7.9	6.2	103	555	2.3
792.2	0.513	22	3.1	73	483	3.6	7.4	5.6	112	553	2.6
792.9	0.513	19	3.3	71	441	2.4	7.4	6.0	108	505	1.7
793.6	0.513	16	3.3	72	416	3.1	7.4	6.1	110	475	2.3
794.3	0.513	15	2.9	70	452	3.6	7.4	5.3	107	517	2.6
795.0	0.513	19	2.7	71	448	2.8	7.4	5.0	108	512	2.0
795.7	0.513	17	3.5	78	399	3.2	7.4	6.3	119	457	2.3
796.4	0.513	17	3.4	68	414	4.4	7.4	6.3	104	474	3.2
797.1	0.513	16	2.9	64	384	3.5	7.4	5.3	97	439	2.6
797.8	0.513	17	3.2	77	412	3.9	7.4	5.9	118	471	2.8
798.5	0.760	18	3.4	67	446	5.0	11	6.2	102	510	3.7
799.2	0.513	22	3.3	77	438	4.1	7.4	6.0	118	501	3.0
799.9	0.513	17	3.3	68	357	2.3	7.4	6.0	104	408	1.7
800.6	0.513	21	3.5	65	370	3.2	7.4	6.4	99	423	2.3
801.3	0.513	16	3.3	66	399	3.3	7.4	6.0	101	457	2.4
802.0	0.513	18	3.2	62	403	3.6	7.4	5.9	95	461	2.7
802.7	0.513	21	3.9	64	399	4.9	7.4	7.1	98	457	3.6
803.4	0.513	18	3.4	70	371	3.4	7.4	6.2	108	424	2.5
804.1	0.513	18	3.1	67	370	4.1	7.4	5.7	103	423	3.0
804.8	0.513	18	3.1	68	370	4.5	7.4	5.7	104	424	3.3
805.5	0.513	20	3.3	72	319	3.2	7.4	5.9	110	365	2.3
806.2	0.750	20	3.6	69	361	4.8	11	6.6	105	412	3.5
806.9	0.924	17	3.7	68	342	3.3	13	6.7	104	391	2.4
807.6	0.513	18	3.4	68	367	4.1	7.4	6.3	104	420	3.0
808.3	0.513	17	3.1	69	335	3.4	7.4	5.6	106	383	2.5
809.0	0.513	20	3.1	62	325	3.5	7.4	5.6	94	372	2.5
809.7	0.513	19	3.0	66	376	3.0	7.4	5.5	101	430	2.2
810.4	0.513	18	3.6	63	327	3.5	7.4	6.5	96	374	2.5
811.1	0.513	20	3.2	63	318	2.7	7.4	5.9	96	364	2.0
811.8	0.513	14	2.8	58	318	2.9	7.4	5.2	89	364	2.1
812.5	0.513	19	3.0	64	368	2.8	7.4	5.6	98	421	2.1
813.2	0.513	19	3.1	65	363	3.7	7.4	5.7	100	415	2.7
813.9	0.513	18	3.1	63	308	2.5	7.4	5.7	97	353	1.8
814.5	0.513	17	2.8	67	316	2.2	7.4	5.2	103	361	1.6
815.2	0.513	20	2.7	66	305	3.7	7.4	4.9	102	348	2.7
815.9	0.513	19	2.6	62	279	1.8	7.4	4.8	95	319	1.3
816.6	0.513	16	3.3	64	294	2.7	7.4	5.9	99	336	1.9
817.3	0.513	16	2.7	63	317	2.6	7.4	4.9	97	362	1.9
818.0	0.513	17	2.9	55	257	2.4	7.4	5.3	85	294	1.7
818.7	0.513	16	2.7	62	259	2.2	7.4	4.9	95	296	1.6
819.4	0.513	17	2.4	61	303	2.5	7.4	4.4	94	347	1.8
820.1	0.513	15	3.0	62	302	3.4	7.4	5.4	94	345	2.4
820.8	0.513	16	3.0	54	259	1.9	7.4	5.4	83	297	1.4
821.5	0.513	19	2.7	55	254	2.8	7.4	4.9	84	290	2.0
822.2	0.513	17	2.4	56	300	2.8	7.4	4.5	86	344	2.0
822.9	0.513	16	2.2	57	260	2.0	7.4	4.0	87	297	1.5
823.6	0.513	19	2.6	60	268	2.6	7.4	4.7	92	306	1.9
824.3	0.513	15	1.9	57	333	2.1	7.4	3.5	87	381	1.5
825.0	0.513	17	2.3	59	283	1.8	7.4	4.2	91	324	1.3
825.7	0.513	15	1.9	52	244	1.5	7.4	3.5	80	279	1.1
826.4	0.513	18	2.5	54	249	2.2	7.4	4.5	83	285	1.6
827.1	0.513	17	2.0	55	263	2.3	7.4	3.7	84	300	1.7
827.8	0.513	13	2.1	49	266	1.7	7.4	3.8	75	305	1.3
828.5	0.513	16	2.3	54	283	2.4	7.4	4.3	83	324	1.7
829.2	0.513	16	1.9	52	306	2.1	7.4	3.5	80	350	1.5
829.9	0.513	14	1.9	49	252	2.1	7.4	3.4	76	288	1.5
830.6	0.513	15	1.8	50	265	1.6	7.4	3.3	77	303	1.2
831.3	0.513	14	2.0	54	269	2.5	7.4	3.6	82	307	1.8
832.0	0.513	14	1.5	46	300	0.891	7.4	2.7	71	343	0.650
832.7	0.513	14	1.7	46	256	1.8	7.4	3.1	71	293	1.3
833.4	0.513	12	1.9	41	252	2.1	7.4	3.4	63	288	1.5
834.1	0.513	16	1.6	46	267	2.5	7.4	2.9	71	306	1.8
834.8	0.513	15	1.4	46	257	2.3	7.4	2.6	71	293	1.7
835.5	0.513	13	1.3	40	258	1.5	7.4	2.4	61	295	1.1
836.2	0.513	13	1.7	42	277	1.9	7.4	3.0	64	317	1.4
836.9	0.513	12	1.6	50	296	2.3	7.4	3.0	76	338	1.7
837.6	0.513	14	1.4	48	308	2.3	7.4	2.6	73	352	1.7
838.3	0.783	12	1.2	40	321	1.8	11	2.2	61	367	1.3
839.0	0.513	12	1.2	45	307	1.3	7.4	2.1	69	351	0.925
839.7	0.531	12	1.2	46	275	2.6	7.7	2.1	70	314	1.9
840.3	0.513	11	0.971	36	263	1.3	7.4	1.8	56	301	0.972
841.0	0.513	12	1.4	38	282	1.9	7.4	2.5	59	323	1.4
841.7	0.513	11	1.1	36	275	1.2	7.4	2.1	56	315	0.847
842.4	0.513	11	0.773	33	252	1.8	7.4	1.4	50	289	1.3
843.1	0.513	11	0.788	36	287	1.3	7.4	1.4	55	328	0.941
843.8	0.513	11	0.841	29	254	1.4	7.4	1.5	44	291	0.990
844.5	0.513	10	0.949	31	284	1.6	7.4	1.7	47	324	1.2
845.2	0.513	11	0.889	33	288	1.5	7.4	1.6	51	330	1.1
845.9	0.586	11	0.774	32	282	1.1	8.5	1.4	49	323	0.781
846.6	0.513	11	0.695	31	313	2.7	7.4	1.3	48	358	1.9



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
847.3	0.513	8.5	0.690	29	277	1.6	7.4	1.3	44	317	1.1
848.0	0.513	11	0.811	27	284	2.1	7.4	1.5	42	325	1.5
848.7	0.513	9.7	0.632	31	277	1.5	7.4	1.2	47	317	1.1
849.4	0.513	9.5	0.740	24	279	1.5	7.4	1.3	37	319	1.1
850.1	0.513	9.0	0.538	25	288	2.1	7.4	0.981	39	329	1.5
850.8	0.513	8.4	0.512	25	340	2.0	7.4	0.933	38	388	1.4
851.5	0.513	9.5	0.581	30	290	1.6	7.4	1.1	46	331	1.2
852.2	0.513	9.4	0.540	27	293	1.6	7.4	0.986	42	335	1.2
852.9	0.513	8.2	0.573	23	292	2.2	7.4	1.0	35	333	1.6
853.6	0.625	7.3	0.474	26	294	1.5	9.0	0.865	39	336	1.1
854.3	0.513	8.8	0.416	26	301	2.1	7.4	0.759	40	344	1.6
855.0	0.513	6.8	0.287	20	275	1.7	7.4	0.523	30	315	1.2
855.7	0.513	9.5	0.564	26	290	1.4	7.4	1.0	41	332	1.0
856.4	0.513	8.7	0.566	25	307	1.3	7.4	1.0	39	352	0.943
857.1	0.513	9.0	0.688	18	298	1.7	7.4	1.3	28	341	1.2
857.8	0.513	8.6	0.407	19	380	1.4	7.4	0.742	29	435	1.0
858.5	0.513	8.1	0.562	20	297	1.6	7.4	1.0	31	340	1.1
859.2	0.513	8.7	0.402	21	315	1.4	7.4	0.733	33	360	0.999
859.9	0.513	9.0	0.527	25	365	1.6	7.4	0.961	38	418	1.2
860.6	0.513	8.9	0.351	20	379	1.2	7.4	0.641	30	434	0.896
861.3	0.513	7.9	0.233	22	335	0.809	7.4	0.426	34	383	0.590
862.0	0.513	8.9	0.559	21	318	1.6	7.4	1.0	33	364	1.2
862.7	0.513	7.8	0.372	20	332	0.916	7.4	0.679	31	380	0.668
863.4	0.513	7.3	0.372	20	320	1.4	7.4	0.678	30	366	1.0
864.1	0.513	8.3	0.540	22	317	1.3	7.4	0.984	33	363	0.969
864.8	0.513	8.6	0.457	20	324	1.5	7.4	0.833	31	370	1.1
865.5	0.767	7.8	0.520	21	361	2.2	11	0.949	32	412	1.6
866.2	0.513	8.2	0.666	22	328	2.3	7.4	1.2	34	375	1.7
866.8	0.513	7.8	0.469	26	299	0.985	7.4	0.856	39	342	0.719
867.5	0.660	8.8	0.150	18	313	2.1	9.5	0.274	28	358	1.6
868.2	0.953	8.5	0.530	25	349	1.0	14	0.967	39	399	0.738
868.9	0.513	7.7	0.256	26	316	1.9	7.4	0.468	39	361	1.4
869.6	0.683	8.9	0.586	26	342	2.0	9.9	1.1	40	391	1.5
870.3	0.513	9.8	0.434	25	342	1.9	7.4	0.791	38	391	1.4
871.0	0.520	9.0	0.393	23	367	1.7	7.5	0.716	36	420	1.3
871.7	0.513	8.8	0.765	26	331	2.7	7.4	1.4	39	379	2.0
872.4	0.513	9.7	0.444	29	343	2.2	7.4	0.809	45	393	1.6
873.1	0.513	9.2	0.499	29	387	2.5	7.4	0.910	44	443	1.8
873.8	0.513	9.5	0.472	29	341	1.6	7.4	0.862	45	390	1.1
874.5	0.513	8.8	0.380	30	345	1.8	7.4	0.693	45	395	1.3
875.2	0.513	11	0.497	30	393	2.6	7.4	0.907	46	449	1.9
875.9	0.513	10	0.651	30	380	1.8	7.4	1.2	45	434	1.3
876.6	0.513	9.3	0.539	30	337	1.6	7.4	0.984	46	386	1.2
877.3	0.815	11	0.420	31	339	2.1	12	0.766	47	387	1.5
878.0	0.513	9.9	0.552	30	369	1.8	7.4	1.0	46	422	1.3
878.7	0.513	8.7	0.552	33	373	1.4	7.4	1.0	50	426	1.0
879.4	0.703	10.0	0.662	35	335	2.4	10	1.2	53	383	1.7
880.1	0.675	10	0.579	33	347	0.943	9.7	1.1	51	396	0.688
880.8	0.513	9.2	0.494	36	352	1.9	7.4	0.901	55	402	1.4
881.5	0.513	11	0.675	35	379	2.5	7.4	1.2	54	434	1.8
882.2	0.513	11	0.633	34	360	1.6	7.4	1.2	52	412	1.2
882.9	0.513	8.4	0.464	38	391	1.9	7.4	0.846	58	447	1.4
883.6	0.513	10	0.474	44	392	1.5	7.4	0.864	67	449	1.1
884.3	0.513	12	0.642	43	375	1.5	7.4	1.2	66	429	1.1
885.0	0.513	11	0.536	40	389	1.9	7.4	0.977	61	445	1.4
885.7	0.513	11	0.708	47	390	2.0	7.4	1.3	73	446	1.5
886.4	0.513	10	0.900	43	382	1.5	7.4	1.6	66	436	1.1
887.1	0.513	11	0.493	47	431	2.0	7.4	0.899	71	493	1.4
887.8	0.513	11	0.636	42	378	2.2	7.4	1.2	65	432	1.6
888.5	0.513	9.4	0.679	45	346	1.3	7.4	1.2	68	396	0.926
889.2	0.513	12	0.575	43	356	2.2	7.4	1.0	66	407	1.6
889.9	0.513	8.7	0.594	43	393	2.1	7.4	1.1	66	449	1.5
890.6	0.513	8.8	0.634	42	368	2.0	7.4	1.2	64	421	1.4
891.3	0.513	10	0.829	47	393	1.9	7.4	1.5	72	450	1.4
892.0	0.727	10	0.533	46	398	2.5	10	0.972	71	455	1.9
892.7	0.659	10	0.208	44	362	2.2	9.5	0.380	68	414	1.6
893.3	0.513	11	0.722	47	386	2.5	7.4	1.3	73	441	1.8
894.0	0.513	12	0.568	51	406	2.0	7.4	1.0	78	464	1.4
894.7	0.513	11	0.704	56	415	2.0	7.4	1.3	87	475	1.5
895.4	0.513	10	0.848	48	425	2.0	7.4	1.5	74	486	1.4
896.1	0.513	10	0.927	47	450	2.2	7.4	1.7	72	515	1.6
896.8	0.513	12	0.767	53	426	2.4	7.4	1.4	81	488	1.7
897.5	0.513	12	1.0	49	405	2.5	7.4	1.9	75	463	1.8
898.2	0.513	11	0.492	48	402	2.3	7.4	0.897	74	460	1.6
898.9	0.513	10	0.725	59	416	1.4	7.4	1.3	90	476	1.1
899.6	0.513	13	0.725	50	423	2.6	7.4	1.3	77	484	1.9
900.3	0.513	10	0.698	47	431	2.2	7.4	1.3	73	493	1.6
901.0	0.513	11	0.618	59	459	2.2	7.4	1.1	91	525	1.6
901.7	0.513	11	0.760	46	428	1.9	7.4	1.4	70	489	1.4
902.4	0.513	13	0.895	52	416	3.3	7.4	1.6	80	475	2.4
903.1	0.513	15	0.745	53	479	2.6	7.4	1.4	81	547	1.9



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
903.8	0.513	12	0.968	57	473	2.1	7.4	1.8	87	541	1.6
904.5	0.584	13	1.2	55	457	2.1	8.4	2.2	84	522	1.6
905.2	0.513	14	0.833	54	420	3.2	7.4	1.5	83	480	2.3
905.9	0.513	14	1.2	51	493	2.3	7.4	2.2	79	564	1.7
906.6	0.879	16	1.1	62	496	2.4	13	2.0	94	567	1.8
907.3	0.513	12	0.766	59	472	3.0	7.4	1.4	91	539	2.2
908.0	0.513	12	0.965	53	462	2.8	7.4	1.8	81	528	2.0
908.7	0.513	12	0.783	56	445	2.0	7.4	1.4	86	509	1.5
909.4	0.513	13	1.2	63	457	2.3	7.4	2.2	96	523	1.7
910.1	0.513	14	1.1	62	448	2.4	7.4	2.0	96	512	1.7
910.8	0.513	11	0.860	55	393	2.5	7.4	1.6	84	450	1.8
911.5	0.513	10	1.0	62	444	3.0	7.4	1.8	95	508	2.2
912.2	0.513	12	1.0	58	463	3.3	7.4	1.9	90	529	2.4
912.9	0.513	14	1.1	62	414	2.6	7.4	2.1	95	473	1.9
913.6	0.513	12	0.995	54	443	3.7	7.4	1.8	83	507	2.7
914.3	0.513	14	1.3	66	464	3.2	7.4	2.3	101	531	2.4
915.0	0.513	11	1.2	57	431	3.2	7.4	2.2	87	493	2.3
915.7	0.513	12	1.2	64	426	2.6	7.4	2.2	98	488	1.9
916.4	0.513	13	1.1	63	442	3.4	7.4	1.9	96	505	2.5
917.1	0.513	9.6	1.3	55	388	2.7	7.4	2.3	85	444	2.0
917.8	0.513	13	1.1	63	479	3.0	7.4	1.9	97	548	2.2
918.5	0.513	13	1.4	63	435	2.6	7.4	2.6	97	498	1.9
919.1	0.513	13	1.3	71	415	3.4	7.4	2.4	109	475	2.5
919.8	0.513	14	1.2	65	421	3.1	7.4	2.2	99	481	2.3
920.5	0.513	12	1.3	66	434	3.5	7.4	2.4	101	496	2.6
921.2	0.513	11	1.4	59	380	2.9	7.4	2.5	90	435	2.1
921.9	0.513	11	1.4	62	392	3.1	7.4	2.6	95	448	2.3
922.6	0.513	13	1.0	59	377	2.9	7.4	1.9	90	432	2.1
923.3	0.513	12	1.6	71	456	2.7	7.4	2.9	110	522	2.0
924.0	0.513	9.4	1.5	61	313	2.6	7.4	2.8	94	358	1.9
924.7	0.649	12	1.6	74	383	2.8	9.4	2.9	113	438	2.0
925.4	0.513	12	1.8	74	380	3.5	7.4	3.4	113	434	2.6
926.1	0.513	12	1.8	69	372	3.6	7.4	3.3	106	425	2.6
926.8	0.513	12	1.8	77	353	2.8	7.4	3.2	118	404	2.0
927.5	0.513	11	1.9	62	419	3.2	7.4	3.4	96	480	2.3
928.2	0.513	13	2.0	72	348	3.3	7.4	3.7	110	397	2.4
928.9	0.513	11	1.7	62	325	2.7	7.4	3.0	95	372	2.0
929.6	0.513	11	2.5	69	354	2.8	7.4	4.5	105	405	2.0
930.3	0.513	13	2.6	77	353	3.2	7.4	4.7	118	404	2.4
931.0	0.513	12	2.1	71	356	2.2	7.4	3.8	109	407	1.6
931.7	0.513	13	2.2	73	355	3.1	7.4	4.1	111	406	2.3
932.4	0.513	12	2.3	74	306	3.9	7.4	4.2	114	350	2.9
933.1	0.513	14	2.6	75	298	2.1	7.4	4.7	115	340	1.5
933.8	0.513	15	2.6	70	305	3.0	7.4	4.7	108	349	2.2
934.5	0.513	13	3.6	70	296	2.3	7.4	6.5	108	339	1.7
935.2	0.568	14	3.1	74	302	3.5	8.2	5.7	113	345	2.6
935.9	0.650	12	3.1	78	290	3.0	9.4	5.6	119	332	2.2
936.6	0.513	13	2.7	73	313	3.9	7.4	4.9	112	358	2.8
937.3	0.655	13	2.8	73	297	2.8	9.4	5.1	112	339	2.0
938.0	0.513	12	2.7	71	273	2.7	7.4	4.9	109	312	2.0
938.7	0.513	11	3.4	73	287	2.6	7.4	6.1	112	328	1.9
939.4	0.513	14	2.9	78	285	2.4	7.4	5.4	120	326	1.8
940.1	0.513	13	3.2	74	258	2.8	7.4	5.9	113	295	2.0
940.8	0.513	14	3.2	71	267	3.0	7.4	5.8	109	305	2.2
941.5	0.513	10	3.5	76	305	2.8	7.4	6.4	117	349	2.0
942.2	0.513	14	3.2	84	276	2.8	7.4	5.8	128	316	2.0
942.9	0.513	13	3.3	74	295	2.7	7.4	5.9	113	337	2.0
943.6	0.513	14	3.3	75	258	3.6	7.4	6.0	114	295	2.6
944.3	0.513	15	2.9	81	321	3.0	7.4	5.4	125	367	2.2
944.9	0.513	16	4.1	77	285	3.0	7.4	7.6	119	326	2.2
945.6	0.513	13	3.5	65	217	1.4	7.4	6.3	99	248	1.0
946.3	0.513	14	3.6	80	291	3.0	7.4	6.6	122	333	2.2
947.0	0.513	13	3.0	71	235	3.2	7.4	5.4	109	268	2.3
947.7	0.513	12	3.0	74	245	3.0	7.4	5.4	113	281	2.2
948.4	0.513	15	3.3	74	253	3.0	7.4	6.1	113	289	2.2
949.1	0.513	14	3.1	62	218	2.5	7.4	5.6	94	249	1.8
949.8	0.513	14	3.2	73	247	2.8	7.4	5.9	111	283	2.1
950.5	0.513	13	3.4	70	232	1.8	7.4	6.2	107	265	1.3
951.2	0.513	14	3.5	66	218	2.3	7.4	6.4	101	249	1.6
951.9	0.513	12	3.4	70	216	2.8	7.4	6.1	107	247	2.1
952.6	0.513	13	3.3	74	202	2.2	7.4	6.0	113	231	1.6
953.3	0.513	13	3.0	76	238	1.5	7.4	5.5	117	272	1.1
954.0	0.513	13	3.4	75	228	2.7	7.4	6.2	115	260	2.0
954.7	0.513	13	2.7	78	234	2.3	7.4	4.9	120	267	1.7
955.4	0.513	13	3.2	68	222	2.8	7.4	5.8	104	254	2.0
956.1	0.543	13	3.5	71	232	2.1	7.8	6.4	108	265	1.5
956.8	0.513	15	2.6	72	217	1.4	7.4	4.8	111	249	1.0
957.5	0.513	14	2.2	63	224	2.0	7.4	4.0	97	257	1.5
958.2	0.513	12	2.7	61	220	2.4	7.4	4.8	94	252	1.7
958.9	0.513	12	2.7	72	203	2.4	7.4	4.9	110	232	1.8
959.6	0.513	14	2.2	69	231	2.8	7.4	4.1	105	264	2.1



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
960.3	0.513	13	2.9	70	235	2.1	7.4	5.3	107	269	1.5
961.0	0.513	13	2.2	70	272	1.5	7.4	4.1	107	311	1.1
961.7	0.513	13	2.1	59	201	2.3	7.4	3.9	91	230	1.7
962.4	0.513	12	2.2	58	204	2.2	7.4	3.9	89	233	1.6
963.1	0.513	11	2.6	57	216	1.9	7.4	4.7	88	247	1.4
963.8	0.513	13	2.5	65	209	2.1	7.4	4.5	99	239	1.5
964.5	0.513	12	2.6	64	217	2.0	7.4	4.8	98	248	1.4
965.2	0.513	13	2.7	68	230	3.0	7.4	4.9	104	263	2.2
965.9	0.690	13	1.9	56	221	1.2	10.0	3.4	86	252	0.842
966.6	0.513	12	2.3	52	220	2.1	7.4	4.2	79	252	1.5
967.3	0.513	13	1.8	60	228	1.0	7.4	3.3	92	261	0.748
968.0	0.513	12	2.3	58	222	1.9	7.4	4.2	89	254	1.4
968.7	0.513	13	3.1	54	213	1.8	7.4	5.7	83	243	1.3
969.4	0.513	13	2.3	60	221	2.0	7.4	4.1	92	253	1.5
970.1	0.513	12	1.6	56	219	1.9	7.4	2.8	85	250	1.4
970.8	0.513	12	1.7	53	237	2.0	7.4	3.1	82	272	1.5
971.4	0.513	15	1.7	60	234	1.4	7.4	3.0	92	268	1.0
972.1	0.513	11	2.4	61	226	2.3	7.4	4.4	94	259	1.7
972.8	0.558	13	2.0	55	234	1.8	8.1	3.7	85	267	1.3
973.5	0.513	12	1.7	55	236	2.4	7.4	3.2	84	270	1.8
974.2	0.513	11	2.3	54	218	2.4	7.4	4.2	83	249	1.7
974.9	0.513	13	2.0	61	219	1.7	7.4	3.7	94	251	1.3
975.6	0.513	11	1.6	54	222	2.0	7.4	3.0	82	254	1.5
976.3	0.513	11	1.7	67	228	1.7	7.4	3.2	103	260	1.3
977.0	0.513	12	1.8	51	213	1.9	7.4	3.3	79	244	1.4
977.7	0.513	11	1.8	56	225	1.8	7.4	3.2	86	257	1.3
978.4	0.513	12	1.7	51	233	2.0	7.4	3.0	78	266	1.4
979.1	0.513	12	1.3	52	205	0.923	7.4	2.4	79	235	0.673
979.8	0.513	12	1.6	52	211	0.818	7.4	2.9	79	242	0.597
980.5	0.513	13	1.8	50	227	2.8	7.4	3.3	77	260	2.0
981.2	0.513	13	1.1	54	228	2.1	7.4	1.9	83	261	1.6
981.9	0.513	10	1.5	53	235	2.9	7.4	2.7	82	268	2.1
982.6	0.513	11	1.9	54	254	2.2	7.4	3.4	82	291	1.6
983.3	0.513	12	1.4	52	224	2.2	7.4	2.5	80	256	1.6
984.0	0.513	9.5	1.2	49	232	1.4	7.4	2.2	75	266	1.0
984.7	0.513	12	1.3	50	207	1.6	7.4	2.3	77	237	1.2
985.4	0.513	10.0	1.7	56	214	2.4	7.4	3.1	86	245	1.8
986.1	0.683	11	1.5	66	256	2.2	9.9	2.8	101	292	1.6
986.8	0.513	11	1.3	54	244	2.1	7.4	2.4	83	279	1.5
987.5	0.513	10	1.3	52	210	2.1	7.4	2.3	79	240	1.5
988.2	0.513	10	1.2	51	207	2.1	7.4	2.3	78	237	1.5
988.9	0.513	9.2	1.4	60	218	1.7	7.4	2.6	93	249	1.2
989.6	0.513	12	1.2	53	219	1.6	7.4	2.1	82	251	1.2
990.3	0.513	12	1.4	50	203	2.2	7.4	2.5	77	232	1.6
991.0	0.513	11	1.3	56	236	1.7	7.4	2.4	86	270	1.2
991.7	0.513	11	1.3	52	226	2.9	7.4	2.4	79	259	2.1
992.4	0.513	11	0.991	46	215	2.0	7.4	1.8	70	246	1.5
993.1	0.513	11	1.2	51	241	2.2	7.4	2.2	79	276	1.6
993.8	0.513	11	1.3	54	234	2.3	7.4	2.4	83	267	1.6
994.5	0.513	11	1.2	52	247	2.7	7.4	2.2	80	283	1.9
995.2	0.513	11	1.3	59	258	1.9	7.4	2.3	91	295	1.4
995.9	0.916	10	1.3	52	239	2.2	13	2.3	80	273	1.6
996.6	0.513	11	0.985	49	237	2.0	7.4	1.8	74	271	1.5
997.3	0.513	11	1.1	47	254	2.7	7.4	1.9	73	291	2.0
997.9	0.513	11	1.3	45	251	2.5	7.4	2.3	68	287	1.8
998.6	0.995	12	0.983	48	234	2.8	14	1.8	73	267	2.1
999.3	0.513	9.9	1.3	50	254	2.9	7.4	2.4	77	291	2.1
1000.0	0.513	10	0.865	41	237	2.0	7.4	1.6	62	271	1.5
1000.7	0.513	10	0.830	41	225	2.0	7.4	1.5	63	258	1.5
1001.4	0.513	12	0.929	45	231	2.5	7.4	1.7	69	264	1.8
1002.1	0.513	12	0.805	41	244	1.8	7.4	1.5	62	279	1.3
1002.8	0.513	8.6	1.3	37	247	2.8	7.4	2.3	57	283	2.1
1003.5	0.513	9.8	0.720	44	253	3.2	7.4	1.3	68	289	2.3
1004.2	0.513	8.8	1.2	37	246	2.0	7.4	2.2	57	281	1.5
1004.9	0.513	9.7	1.0	38	286	3.3	7.4	1.8	59	327	2.4
1005.6	0.513	9.3	0.914	34	228	1.5	7.4	1.7	52	261	1.1
1006.3	0.513	7.3	0.690	39	239	2.8	7.4	1.3	60	274	2.1
1007.0	0.513	11	0.741	36	267	2.2	7.4	1.4	55	305	1.6
1007.7	0.513	11	0.998	38	273	2.3	7.4	1.8	58	312	1.7
1008.4	0.513	11	1.1	38	252	2.9	7.4	2.0	58	288	2.1
1009.1	0.513	7.8	0.944	37	236	2.2	7.4	1.7	56	270	1.6
1009.8	0.602	7.4	0.929	34	266	1.9	8.7	1.7	52	304	1.4
1010.5	0.513	9.0	0.966	26	258	2.6	7.4	1.8	39	295	1.9
1011.2	0.513	8.6	0.785	31	256	1.3	7.4	1.4	47	293	0.965
1011.9	0.513	7.1	0.838	29	246	1.6	7.4	1.5	44	282	1.1
1012.6	0.513	8.3	0.886	31	274	1.9	7.4	1.6	47	313	1.4
1013.3	0.513	8.9	0.881	28	252	2.5	7.4	1.6	43	289	1.8
1014.0	0.513	7.8	0.599	28	264	1.4	7.4	1.1	43	301	1.0
1014.7	0.513	9.5	0.919	27	262	1.4	7.4	1.7	41	299	1.0
1015.4	0.513	8.2	0.783	30	301	1.5	7.4	1.4	46	344	1.1
1016.1	0.513	8.6	0.761	26	275	2.2	7.4	1.4	39	314	1.6



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Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1016.8	0.513	7.7	0.723	23	261	1.5	7.4	1.3	35	298	1.1
1017.5	0.513	8.5	0.673	22	258	1.9	7.4	1.2	34	295	1.4
1018.2	0.548	8.9	0.621	23	263	1.2	7.9	1.1	36	300	0.864
1018.9	0.513	8.8	0.603	26	275	1.9	7.4	1.1	39	314	1.4
1019.6	0.513	7.7	0.681	21	269	1.6	7.4	1.2	33	308	1.2
1020.3	0.513	8.3	0.894	22	306	0.788	7.4	1.6	34	350	0.575
1021.0	0.513	7.4	0.557	22	271	1.4	7.4	1.0	34	310	0.999
1021.7	0.513	10	0.659	19	272	1.2	7.4	1.2	30	311	0.846
1022.4	0.513	9.1	0.736	22	275	2.0	7.4	1.3	33	315	1.5
1023.1	0.513	8.4	0.585	21	294	1.5	7.4	1.1	32	337	1.1
1023.7	0.513	10	0.741	20	283	1.7	7.4	1.4	31	324	1.3
1024.4	0.513	8.0	0.658	21	282	2.0	7.4	1.2	32	323	1.5
1025.1	0.513	8.6	0.433	17	259	1.8	7.4	0.790	27	296	1.3
1025.8	0.513	8.7	0.408	20	279	2.2	7.4	0.745	30	319	1.6
1026.5	0.513	9.1	0.598	17	286	0.563	7.4	1.1	26	327	0.411
1027.2	0.513	8.8	0.598	21	294	1.5	7.4	1.1	32	337	1.1
1027.9	0.513	7.9	0.528	23	312	2.1	7.4	0.963	35	357	1.6
1028.6	0.513	8.8	0.551	21	332	1.4	7.4	1.0	32	379	0.990
1029.3	0.558	14	0.382	21	295	1.6	8.1	0.696	33	337	1.2
1030.0	0.513	6.4	0.629	19	317	2.4	7.4	1.1	29	363	1.7
1030.7	0.513	7.7	0.555	22	328	2.0	7.4	1.0	34	375	1.5
1031.4	0.513	8.3	0.571	20	259	1.6	7.4	1.0	31	296	1.2
1032.1	0.513	7.6	0.592	21	292	2.4	7.4	1.1	33	334	1.7
1032.8	0.513	7.6	0.481	21	299	1.8	7.4	0.878	33	342	1.3
1033.5	0.513	6.6	0.600	23	275	1.3	7.4	1.1	36	314	0.926
1034.2	0.513	7.1	0.470	23	306	1.4	7.4	0.857	35	350	1.1
1034.9	0.513	8.4	0.450	22	330	0.887	7.4	0.821	34	378	0.647
1035.6	0.513	7.9	0.559	19	293	2.1	7.4	1.0	30	336	1.5
1036.3	0.513	8.3	0.383	22	297	2.2	7.4	0.698	34	339	1.6
1037.0	0.513	9.5	0.600	24	303	1.2	7.4	1.1	37	347	0.887
1037.7	0.513	7.6	0.769	23	315	1.8	7.4	1.4	35	360	1.3
1038.4	0.513	8.2	0.448	23	300	2.6	7.4	0.816	36	343	1.9
1039.1	0.513	8.7	0.485	21	287	1.7	7.4	0.885	32	328	1.2
1039.8	0.513	7.3	0.595	23	280	1.2	7.4	1.1	35	320	0.881
1040.5	0.513	8.6	0.703	22	277	2.5	7.4	1.3	33	317	1.8
1041.2	0.513	9.3	0.811	23	299	1.9	7.4	1.5	35	342	1.4
1041.9	0.711	8.8	0.454	26	272	2.0	10	0.828	40	311	1.5
1042.6	0.513	8.5	0.551	28	300	2.1	7.4	1.0	42	343	1.5
1043.3	0.513	7.7	0.648	26	325	1.5	7.4	1.2	40	372	1.1
1044.0	0.513	10	0.943	24	305	2.4	7.4	1.7	37	349	1.7
1044.7	0.535	7.8	0.825	28	284	2.5	7.7	1.5	44	324	1.8
1045.4	0.513	9.4	0.505	30	296	2.1	7.4	0.921	47	339	1.5
1046.1	0.513	7.8	0.942	26	288	2.7	7.4	1.7	39	329	2.0
1046.8	0.513	7.7	0.410	34	292	2.1	7.4	0.747	52	334	1.5
1047.5	0.513	10	0.596	30	317	1.7	7.4	1.1	47	362	1.2
1048.2	0.513	6.6	0.895	33	305	2.4	7.4	1.6	51	348	1.7
1048.9	0.520	8.7	0.759	30	306	2.3	7.5	1.4	46	350	1.7
1049.6	0.513	11	0.945	32	296	2.1	7.4	1.7	49	339	1.5
1050.2	0.513	9.5	0.572	26	300	3.0	7.4	1.0	40	344	2.2
1050.9	0.513	7.7	0.886	32	289	2.0	7.4	1.6	48	330	1.5
1051.6	0.513	11	0.747	33	296	2.8	7.4	1.4	51	338	2.0
1052.3	0.513	7.7	0.918	31	270	1.6	7.4	1.7	48	308	1.2
1053.0	0.513	24	0.670	39	329	1.8	7.4	1.2	60	376	1.3
1053.7	0.513	10	0.716	32	283	1.9	7.4	1.3	50	323	1.4
1054.4	0.577	11	0.784	30	257	2.0	8.3	1.4	45	294	1.5
1055.1	0.513	9.5	0.736	30	280	1.7	7.4	1.3	47	320	1.2
1055.8	0.513	8.3	0.741	34	318	1.4	7.4	1.4	53	364	1.0
1056.5	0.612	9.1	0.760	31	267	2.9	8.8	1.4	48	306	2.1
1057.2	2.4	9.7	0.744	35	279	2.4	35	1.4	53	319	1.7
1057.9	0.569	10	0.642	34	274	2.1	8.2	1.2	51	314	1.5
1058.6	0.694	7.4	0.574	31	279	2.6	10	1.0	48	319	1.9
1059.3	0.513	11	0.894	33	289	2.6	7.4	1.6	51	330	1.9
1060.0	0.513	9.3	0.673	37	321	2.6	7.4	1.2	57	367	1.9
1060.7	0.513	12	0.978	42	308	2.2	7.4	1.8	65	352	1.6
1061.4	0.513	10.0	0.849	38	263	2.5	7.4	1.5	59	301	1.8
1062.1	0.513	9.0	0.858	41	264	2.8	7.4	1.6	63	302	2.0
1062.8	0.513	10	0.785	41	279	2.4	7.4	1.4	63	319	1.8
1063.5	0.513	12	0.880	34	269	1.8	7.4	1.6	53	307	1.3
1064.2	0.513	10	0.796	44	270	1.7	7.4	1.5	67	309	1.2
1064.9	0.513	9.5	0.590	44	263	2.7	7.4	1.1	67	300	2.0
1065.6	0.902	13	0.669	47	305	10	13	1.2	72	348	7.5
1066.3	0.513	9.2	0.631	46	292	3.1	7.4	1.2	70	334	2.2
1067.0	0.513	12	0.527	39	261	2.6	7.4	0.962	60	299	1.9
1067.7	0.527	11	0.298	44	310	2.3	7.6	0.543	67	355	1.7
1068.4	0.513	11	0.854	44	255	2.3	7.4	1.6	67	291	1.7
1069.1	0.513	11	0.640	44	259	2.4	7.4	1.2	68	296	1.8
1069.8	0.513	9.3	0.823	41	255	1.5	7.4	1.5	63	291	1.1
1070.5	0.513	9.3	0.533	47	266	2.8	7.4	0.971	71	304	2.1
1071.2	0.513	12	0.463	47	252	2.5	7.4	0.845	72	288	1.8
1071.9	0.513	11	0.908	50	293	3.1	7.4	1.7	77	335	2.3
1072.6	0.513	9.5	0.588	43	277	1.8	7.4	1.1	67	316	1.3



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.3	0.597	11	0.834	50	274	2.9	8.6	1.5	77	313	2.1
1074.0	0.756	11	0.889	46	271	2.1	11	1.6	70	310	1.5
1074.7	0.513	10	0.707	46	293	2.1	7.4	1.3	71	335	1.6
1075.4	0.822	8.4	0.945	53	263	1.9	12	1.7	81	301	1.4
1076.1	0.513	12	0.817	46	297	1.7	7.4	1.5	70	339	1.2
1076.7	0.515	11	0.838	54	276	2.2	7.4	1.5	83	315	1.6
1077.4	0.513	11	0.716	46	274	1.8	7.4	1.3	70	313	1.3
1078.1	0.692	10.0	0.682	49	257	3.7	10.0	1.2	75	294	2.7
1078.8	0.681	9.4	1.1	52	272	3.1	9.8	1.9	80	311	2.3
1079.5	0.513	11	0.869	55	259	2.5	7.4	1.6	85	297	1.8
1080.2	0.513	10.0	0.987	54	283	1.9	7.4	1.8	82	324	1.4
1080.9	0.513	12	1.0	52	252	2.4	7.4	1.9	80	288	1.8
1081.6	0.513	13	0.881	54	247	2.8	7.4	1.6	83	282	2.0
1082.3	0.513	12	0.998	57	273	3.1	7.4	1.8	88	312	2.3
1083.0	0.817	11	1.2	56	261	2.5	12	2.2	85	298	1.8
1083.7	0.566	14	1.3	62	279	3.5	8.2	2.4	95	319	2.6
1084.4	0.587	14	1.0	63	315	2.6	8.5	1.9	96	360	1.9
1085.1	0.623	12	0.922	53	260	2.6	9.0	1.7	82	298	1.9
1085.8	0.592	9.1	1.1	59	275	3.0	8.6	2.0	91	315	2.2
1086.5	0.513	14	1.2	56	259	2.8	7.4	2.1	86	296	2.1
1087.2	0.910	11	0.956	64	273	3.4	13	1.7	97	312	2.5
1087.9	0.513	12	1.2	65	255	3.9	7.4	2.2	100	291	2.8
1088.6	0.653	13	0.610	63	258	2.2	9.4	1.1	96	295	1.6
1089.3	0.719	13	1.4	63	268	2.2	10	2.6	96	306	1.6
1090.0	0.587	12	1.2	65	277	2.4	8.5	2.2	100	317	1.7
1090.7	0.513	13	1.0	61	275	4.0	7.4	1.9	94	314	3.0
1091.4	0.513	13	1.1	66	266	2.6	7.4	2.0	101	304	1.9
1092.1	0.810	14	0.645	58	315	3.2	12	1.2	89	361	2.4
1092.8	0.513	12	1.4	69	267	3.4	7.4	2.5	105	305	2.5
1093.5	0.752	14	1.6	65	270	3.2	11	3.0	100	308	2.3
1094.2	0.513	13	1.4	67	307	2.7	7.4	2.6	102	351	2.0
1094.9	0.513	12	0.697	68	258	1.7	7.4	1.3	104	295	1.3
1095.6	0.513	15	1.2	78	284	2.9	7.4	2.2	120	325	2.1
1096.3	0.513	13	1.3	75	275	3.9	7.4	2.3	114	315	2.8
1097.0	0.513	15	1.4	70	274	3.5	7.4	2.6	108	313	2.6
1097.7	0.687	16	1.4	71	306	3.4	9.9	2.6	109	350	2.5
1098.4	0.513	12	1.4	80	283	3.5	7.4	2.5	122	324	2.5
1099.1	0.513	14	1.6	71	325	3.6	7.4	2.8	109	372	2.6
1099.8	0.513	16	1.4	72	315	4.1	7.4	2.5	111	360	3.0
1100.5	0.805	16	1.5	62	306	4.0	12	2.7	95	350	2.9
1101.2	0.650	15	1.1	72	266	3.1	9.4	2.1	111	305	2.2
1101.9	0.513	15	1.5	78	301	2.7	7.4	2.8	120	344	2.0
1102.6	0.513	14	0.956	78	321	2.9	7.4	1.7	119	367	2.1
1103.2	0.513	15	1.4	70	290	2.8	7.4	2.6	108	332	2.0
1103.9	0.529	15	1.2	80	317	3.0	7.6	2.2	123	363	2.2
1104.6	0.643	13	1.3	66	284	2.4	9.3	2.4	101	324	1.8
1105.3	0.898	13	1.7	81	318	4.1	13	3.1	125	364	3.0
1106.0	0.513	13	1.9	69	309	2.7	7.4	3.5	106	353	2.0
1106.7	0.513	14	1.4	71	301	3.1	7.4	2.5	108	344	2.3
1107.4	1.2	16	1.4	78	323	3.8	17	2.6	120	370	2.7
1108.1	0.513	14	1.3	73	280	1.9	7.4	2.3	113	321	1.4
1108.8	0.533	16	1.2	70	302	3.1	7.7	2.3	108	346	2.3
1109.5	0.693	15	1.6	77	310	3.4	10	2.9	119	355	2.5
1110.2	0.513	16	1.7	80	327	2.8	7.4	3.1	122	374	2.1
1110.9	0.804	13	1.6	81	347	2.3	12	3.0	125	397	1.7
1111.6	0.519	13	1.3	77	328	4.0	7.5	2.3	119	375	3.0
1112.3	0.513	14	1.4	77	323	4.3	7.4	2.5	118	369	3.2
1113.0	0.513	15	1.8	82	368	4.3	7.4	3.4	126	421	3.2
1113.7	0.819	16	1.4	78	336	5.1	12	2.5	119	384	3.7
1114.4	0.513	14	1.4	76	307	4.7	7.4	2.5	117	351	3.4
1115.1	0.624	15	1.4	78	338	3.0	9.0	2.6	120	386	2.2
1115.8	0.513	14	1.6	78	358	2.8	7.4	3.0	119	409	2.1
1116.5	0.887	17	1.7	89	324	2.8	13	3.0	136	370	2.0
1117.2	1.0	14	1.7	76	332	3.9	15	3.0	117	380	2.9
1117.9	0.513	17	1.7	86	322	4.6	7.4	3.0	131	368	3.4
1118.6	0.513	13	1.4	75	312	3.0	7.4	2.5	115	357	2.2
1119.3	0.513	14	1.9	87	380	3.9	7.4	3.5	133	434	2.9
1120.0	0.760	14	1.1	67	304	3.2	11	1.9	103	347	2.3
1120.7	0.513	17	1.5	74	321	4.2	7.4	2.7	113	367	3.1
1121.4	0.513	15	1.6	74	294	4.0	7.4	3.0	113	337	2.9
1122.1	0.551	14	1.3	79	313	4.1	8.0	2.4	121	358	3.0
1122.8	0.513	16	2.0	85	321	3.0	7.4	3.6	131	367	2.2
1123.5	0.647	13	1.4	77	338	5.3	9.3	2.6	118	387	3.9
1124.2	0.628	13	1.8	89	378	4.8	9.1	3.3	137	432	3.5
1124.9	0.513	13	1.7	72	355	4.2	7.4	3.2	111	406	3.1
1125.6	0.513	15	1.8	80	333	4.5	7.4	3.3	123	381	3.3
1126.3	0.513	13	2.0	86	369	4.4	7.4	3.7	132	422	3.2
1127.0	0.904	16	2.1	83	388	4.4	13	3.9	127	444	3.2
1127.7	0.975	15	2.1	76	345	4.1	14	3.8	117	395	3.0
1128.4	0.717	13	1.9	88	384	4.7	10	3.4	134	439	3.4
1129.0	0.536	13	1.5	79	376	4.9	7.7	2.7	121	430	3.6



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Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1129.7	0.522	15	2.0	88	398	4.4	7.5	3.6	135	455	3.2
1130.4	1.1	13	2.2	88	357	4.6	16	4.0	135	409	3.4
1131.1	0.774	14	1.8	87	405	3.9	11	3.3	133	463	2.9
1131.8	0.513	16	1.9	90	354	5.2	7.4	3.6	137	405	3.8
1132.5	0.617	13	1.8	86	345	3.8	8.9	3.3	132	395	2.8
1133.2	1.1	12	1.7	78	361	3.1	16	3.0	119	412	2.3
1133.9	0.831	14	1.7	75	365	4.8	12	3.1	115	417	3.5
1134.6	0.513	15	2.3	70	326	3.9	7.4	4.3	107	373	2.9
1135.3	0.513	14	1.7	85	356	4.6	7.4	3.2	130	407	3.4
1136.0	1.1	17	2.5	88	388	4.8	15	4.6	136	444	3.5
1136.7	0.598	14	2.7	77	377	4.5	8.6	4.9	118	431	3.3
1137.4	0.513	13	2.3	80	360	3.7	7.4	4.2	123	411	2.7
1138.1	1.2	13	2.1	79	351	4.5	17	3.8	122	402	3.3
1138.8	0.710	12	2.3	89	406	4.5	10	4.3	137	464	3.3
1139.5	0.527	16	2.4	94	426	5.7	7.6	4.3	144	487	4.2
1140.2	1.2	14	2.3	92	392	5.7	17	4.2	142	449	4.1
1140.9	0.513	17	2.5	101	394	5.1	7.4	4.5	154	450	3.7
1141.6	0.665	16	2.1	104	434	5.4	9.6	3.8	160	496	3.9
1142.3	0.916	16	2.9	89	448	5.4	13	5.3	137	513	3.9
1143.0	0.996	18	2.8	85	383	4.6	14	5.1	130	438	3.4
1143.7	1.3	16	2.5	90	379	5.2	19	4.6	137	434	3.8
1144.4	0.896	15	2.5	88	358	5.7	13	4.6	136	409	4.1
1145.1	1.0	14	1.8	97	433	7.0	15	3.4	149	495	5.1
1145.8	1.2	15	3.0	99	439	6.7	17	5.5	152	502	4.9
1146.5	1.4	14	2.5	89	396	6.8	20	4.6	136	452	5.0
1147.2	1.1	15	3.0	98	429	6.0	17	5.4	151	491	4.4
1147.9	1.1	16	2.4	91	361	5.4	15	4.4	140	412	3.9
1148.6	1.0	15	3.0	81	452	7.8	15	5.4	124	517	5.7
1149.3	1.1	17	3.3	91	425	7.8	16	6.0	140	486	5.7
1150.0	1.0	14	3.2	84	351	7.6	15	5.7	128	401	5.5
1150.7	1.1	16	3.0	87	382	8.3	16	5.4	133	437	6.1
1151.4	0.850	13	2.5	83	346	9.1	12	4.5	127	395	6.7
1152.1	1.3	12	2.6	88	334	6.8	19	4.8	134	382	4.9
1152.8	1.0	13	2.8	90	412	9.0	15	5.1	138	472	6.6
1153.5	0.727	14	3.0	84	370	10	10	5.5	129	423	7.4
1154.2	1.2	15	2.9	92	357	11	17	5.2	141	408	7.8
1154.8	1.1	14	3.1	91	411	10	16	5.6	140	470	7.5
1155.5	0.712	14	2.8	92	363	9.4	10	5.2	140	416	6.8
1156.2	1.9	16	2.9	84	357	11	27	5.2	129	408	8.1
1156.9	1.3	13	3.7	103	406	14	18	6.8	158	465	10
1157.6	1.0	16	2.6	79	332	12	14	4.7	122	380	8.7
1158.3	0.835	12	3.1	89	334	10	12	5.6	136	382	7.7
1159.0	0.601	14	3.3	83	331	15	8.7	5.9	127	379	11
1159.7	0.785	14	3.4	83	359	14	11	6.3	127	411	9.9
1160.4	0.919	14	2.8	94	401	17	13	5.1	143	458	13
1161.1	1.1	15	3.2	98	344	18	16	5.9	150	393	13
1161.8	0.667	15	3.0	80	406	20	9.6	5.4	123	464	14
1162.5	0.892	13	3.3	75	346	17	13	6.0	115	396	12
1163.2	0.921	12	3.0	84	330	19	13	5.4	129	377	14
1163.9	0.832	14	3.3	85	375	20	12	6.0	130	429	15
1164.6	0.975	13	2.6	69	280	20	14	4.7	106	320	15
1165.3	0.657	14	3.0	81	360	29	9.5	5.5	124	412	21
1166.0	0.624	15	3.0	82	353	27	9.0	5.4	126	404	20
1166.7	0.513	16	3.2	74	304	27	7.4	5.8	113	348	20
1167.4	0.705	14	2.6	78	285	28	10	4.8	120	326	20
1168.1	0.572	15	2.8	78	314	33	8.3	5.2	119	360	24
1168.8	0.939	14	3.1	87	316	29	14	5.6	133	362	21
1169.5	0.925	13	2.7	69	305	37	13	4.9	105	349	27
1170.2	1.0	12	3.4	90	354	43	15	6.1	139	405	32
1170.9	0.551	15	2.7	83	297	40	7.9	4.8	127	340	29
1171.6	0.546	15	3.0	78	338	44	7.9	5.5	120	386	32
1172.3	0.548	17	3.1	76	314	50	7.9	5.7	116	360	36
1173.0	0.947	13	2.0	74	296	43	14	3.6	113	338	32
1173.7	0.938	15	3.2	83	311	52	14	5.9	127	355	38
1174.4	0.793	16	2.9	76	291	54	11	5.3	117	333	40
1175.1	0.859	12	3.2	79	330	56	12	5.9	121	377	41
1175.8	1.2	13	3.0	81	297	55	17	5.4	123	339	40
1176.5	0.687	13	3.1	78	276	60	9.9	5.6	120	316	44
1177.2	0.513	13	3.1	78	262	60	7.4	5.7	119	299	44
1177.9	1.2	15	2.9	74	302	60	17	5.2	113	345	44
1178.6	0.513	13	2.7	65	278	65	7.4	5.0	100	318	47
1179.3	0.611	13	2.9	77	300	69	8.8	5.3	118	343	51
1180.0	0.977	12	3.6	69	286	70	14	6.5	106	327	51
1180.7	0.513	14	2.7	80	312	73	7.4	4.8	122	357	53
1181.3	0.513	10	2.9	76	293	69	7.4	5.3	117	335	50
1182.0	0.666	12	3.0	71	284	76	9.6	5.5	109	325	55
1182.7	0.778	12	2.8	69	301	76	11	5.2	105	345	55
1183.4	0.949	11	2.9	76	349	82	14	5.2	117	399	60
1184.1	0.539	15	2.7	69	286	82	7.8	4.9	106	327	60
1184.8	0.729	11	2.5	73	303	81	11	4.6	112	347	59
1185.5	0.513	13	2.5	69	277	88	7.4	4.5	105	317	64



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Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1186.2	0.519	11	2.9	66	330	82	7.5	5.3	101	377	60
1186.9	0.541	9.9	3.4	76	299	82	7.8	6.2	116	342	60
1187.6	0.519	11	2.9	71	295	78	7.5	5.3	108	338	57
1188.3	0.513	11	2.6	67	274	71	7.4	4.7	103	313	52
1189.0	0.513	12	2.6	64	334	82	7.4	4.8	99	382	60
1189.7	0.517	11	2.3	64	289	71	7.5	4.2	98	330	52
1190.4	0.513	12	2.5	63	291	77	7.4	4.5	96	333	56
1191.1	0.518	9.9	2.2	70	325	73	7.5	4.1	107	372	53
1191.8	0.513	9.1	2.5	67	286	72	7.4	4.5	102	327	53
1192.5	0.513	10	2.2	60	311	70	7.4	4.0	92	355	51
1193.2	0.513	13	2.5	60	310	74	7.4	4.6	92	355	54
1193.9	0.513	11	2.1	56	275	64	7.4	3.8	85	314	46
1194.6	0.513	11	2.1	62	303	61	7.4	3.8	95	346	45
1195.3	0.513	12	1.6	56	296	58	7.4	2.9	86	339	43
1196.0	0.603	12	1.8	59	335	61	8.7	3.2	90	383	44
1196.7	0.513	9.7	1.9	59	340	62	7.4	3.4	90	389	45
1197.4	0.513	10	1.8	57	302	58	7.4	3.3	87	345	42
1198.1	0.513	12	1.6	54	288	53	7.4	2.9	83	329	38
1198.8	0.513	9.8	2.1	52	362	55	7.4	3.8	79	414	40
1199.5	0.513	10	1.8	52	325	51	7.4	3.2	80	371	38
1200.2	0.513	9.7	1.6	43	278	44	7.4	2.9	66	318	32
1200.9	0.513	11	1.3	50	313	40	7.4	2.4	76	358	29
1201.6	0.513	11	1.1	50	311	42	7.4	1.9	77	356	30
1202.3	0.513	11	1.1	47	291	40	7.4	2.0	73	332	29
1203.0	0.513	8.0	1.2	42	268	34	7.4	2.2	65	307	25
1203.7	0.513	11	1.1	50	307	40	7.4	2.0	76	351	29
1204.4	0.723	8.9	1.2	42	264	30	10	2.2	65	302	22
1205.1	0.513	13	0.858	46	294	28	7.4	1.6	71	336	21
1205.8	0.513	12	0.808	46	356	28	7.4	1.5	70	407	20
1206.5	0.513	11	0.849	42	288	23	7.4	1.5	65	329	17
1207.2	0.608	11	1.1	40	293	23	8.8	2.0	61	335	17
1207.8	0.513	8.8	0.937	42	328	26	7.4	1.7	65	375	19
1208.5	0.513	9.9	0.591	41	292	19	7.4	1.1	62	333	14
1209.2	0.513	9.5	0.597	42	300	19	7.4	1.1	65	343	14
1209.9	0.513	9.5	0.770	44	290	21	7.4	1.4	68	332	15
1210.6	0.513	10	0.659	38	300	16	7.4	1.2	59	343	12
1211.3	0.513	9.9	0.624	40	298	13	7.4	1.1	61	341	9.4
1212.0	0.575	11	0.501	37	288	13	8.3	0.914	57	330	9.4
1212.7	0.687	12	0.758	39	354	12	9.9	1.4	60	405	8.8
1213.4	0.513	11	0.520	41	294	8.2	7.4	0.948	63	336	6.0
1214.1	0.863	9.6	0.401	34	307	9.7	12	0.731	52	351	7.1
1214.8	0.957	10	0.532	36	313	10	14	0.970	55	358	7.6
1215.5	0.513	10	0.439	40	293	7.6	7.4	0.800	61	335	5.6
1216.2	0.513	11	0.409	37	317	6.4	7.4	0.746	56	362	4.7
1216.9	0.513	11	0.389	34	297	5.2	7.4	0.709	53	339	3.8
1217.6	0.947	12	0.561	35	298	6.1	14	1.0	54	341	4.4
1218.3	0.585	8.6	0.406	35	278	3.6	8.5	0.740	54	318	2.6
1219.0	0.513	12	0.554	34	288	5.2	7.4	1.0	52	329	3.8
1219.7	0.529	12	0.465	37	309	4.4	7.6	0.848	57	354	3.2
1220.4	0.513	9.3	0.407	38	298	4.9	7.4	0.743	58	340	3.5
1221.1	0.718	8.3	0.617	37	314	4.9	10	1.1	57	359	3.6
1221.8	0.664	11	0.733	38	302	5.6	9.6	1.3	58	346	4.1
1222.5	0.513	8.0	0.386	33	308	4.0	7.4	0.703	51	352	2.9
1223.2	0.771	12	0.419	37	320	5.8	11	0.764	57	366	4.3
1223.9	0.513	11	0.352	40	314	4.8	7.4	0.642	61	359	3.5
1224.6	0.513	8.4	0.508	32	308	3.3	7.4	0.926	49	352	2.4
1225.3	0.513	10	0.453	39	315	6.1	7.4	0.827	59	361	4.4
1226.0	0.815	11	0.530	38	341	5.8	12	0.966	59	389	4.2
1226.7	0.513	11	0.464	35	326	4.3	7.4	0.846	53	373	3.1
1227.4	0.513	9.9	0.338	40	319	4.1	7.4	0.617	61	365	3.0
1228.1	0.513	11	0.299	38	319	4.1	7.4	0.545	59	365	3.0
1228.8	0.513	12	0.370	34	317	4.0	7.4	0.675	51	363	3.0
1229.5	0.618	13	0.237	37	316	5.7	8.9	0.432	57	361	4.1
1230.2	0.731	13	0.328	35	325	3.4	11	0.598	53	372	2.5
1230.9	0.794	12	0.655	36	339	4.9	11	1.2	55	387	3.6
1231.6	0.513	14	0.473	34	335	4.9	7.4	0.863	52	383	3.6
1232.3	0.623	10	0.473	32	329	4.3	9.0	0.862	49	377	3.1
1233.0	0.687	10.0	0.523	37	313	4.4	9.9	0.954	57	357	3.2
1233.7	0.523	10	0.568	33	301	4.8	7.6	1.0	50	344	3.5
1234.3	1.1	12	0.435	38	340	4.7	15	0.794	59	388	3.4
1235.0	0.513	13	0.598	33	326	5.0	7.4	1.1	50	372	3.6
1235.7	1.2	13	0.494	32	330	4.2	17	0.900	49	377	3.1
1236.4	0.694	12	0.196	37	327	4.1	10	0.357	57	374	3.0
1237.1	1.1	12	0.670	35	311	3.1	15	1.2	54	356	2.2
1237.8	0.655	11	0.364	31	310	3.7	9.4	0.664	48	354	2.7
1238.5	0.513	10	0.611	37	330	5.4	7.4	1.1	56	377	3.9
1239.2	0.706	12	0.513	36	345	4.2	10	0.937	56	395	3.1
1239.9	0.596	11	0.653	33	309	3.2	8.6	1.2	50	354	2.3
1240.6	0.778	11	0.528	35	336	4.0	11	0.963	53	385	2.9
1241.3	0.513	11	0.321	35	333	4.6	7.4	0.586	54	380	3.4
1242.0	0.513	13	0.381	32	323	3.9	7.4	0.694	49	369	2.9



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Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1242.7	0.673	15	0.351	35	337	3.9	9.7	0.640	53	386	2.8
1243.4	0.791	14	0.587	33	344	4.5	11	1.1	50	394	3.3
1244.1	0.752	14	0.598	32	404	2.9	11	1.1	50	461	2.1
1244.8	1.0	13	0.642	31	360	4.0	15	1.2	48	411	2.9
1245.5	0.654	12	0.543	32	306	5.9	9.4	0.990	49	350	4.3
1246.2	0.625	11	0.404	33	353	3.9	9.0	0.737	50	404	2.8
1246.9	0.556	13	0.373	35	320	4.1	8.0	0.681	54	366	3.0
1247.6	0.650	14	0.451	31	331	3.1	9.4	0.822	47	378	2.2
1248.3	0.542	15	0.544	32	352	3.9	7.8	0.992	49	403	2.8
1249.0	0.546	13	0.367	32	382	3.6	7.9	0.669	48	437	2.6
1249.7	0.821	15	0.564	33	324	4.7	12	1.0	50	371	3.4
1250.4	1.1	14	0.244	27	323	3.4	16	0.446	41	369	2.5
1251.1	0.690	13	0.593	27	302	2.7	10.0	1.1	42	345	2.0
1251.8	1.1	13	0.665	34	321	3.9	16	1.2	52	367	2.8
1252.5	0.853	15	0.462	32	330	3.0	12	0.842	49	377	2.2
1253.2	0.513	14	0.487	30	358	3.9	7.4	0.888	46	409	2.8
1253.9	0.803	13	0.574	27	309	4.2	12	1.0	42	354	3.0
1254.6	0.791	16	0.514	29	311	4.1	11	0.937	45	356	3.0
1255.3	1.0	13	0.308	31	318	4.2	15	0.562	47	364	3.1
1256.0	0.701	17	0.510	34	323	4.6	10	0.930	53	369	3.3
1256.7	0.513	15	0.919	33	346	3.8	7.4	1.7	51	396	2.8
1257.4	0.513	11	0.371	26	293	3.3	7.4	0.676	40	335	2.4
1258.1	1.1	14	0.635	28	334	4.3	15	1.2	44	382	3.2
1258.8	0.541	16	0.386	28	320	3.6	7.8	0.704	42	366	2.6
1259.5	0.892	15	0.550	31	333	5.1	13	1.0	48	381	3.8
1260.1	0.923	13	0.580	29	353	5.3	13	1.1	44	404	3.9
1260.8	0.801	17	0.871	30	343	4.9	12	1.6	46	393	3.6
1261.5	0.587	15	0.753	30	325	4.5	8.5	1.4	45	372	3.3
1262.2	0.513	17	0.480	27	319	4.3	7.4	0.875	41	365	3.1
1262.9	0.798	16	0.483	24	305	3.3	12	0.880	37	348	2.4
1263.6	1.1	15	0.537	31	327	3.9	16	0.979	48	374	2.8
1264.3	1.6	15	0.586	28	326	4.8	23	1.1	43	373	3.5
1265.0	0.714	13	0.610	24	297	4.2	10	1.1	36	340	3.0
1265.7	0.859	14	0.618	28	335	4.0	12	1.1	43	383	2.9
1266.4	0.769	17	0.387	26	300	3.6	11	0.706	39	343	2.6
1267.1	0.637	14	0.292	24	353	4.5	9.2	0.533	37	403	3.2
1267.8	0.750	15	0.597	28	320	4.2	11	1.1	43	366	3.1
1268.5	0.537	15	0.628	23	309	4.4	7.8	1.1	36	354	3.2
1269.2	0.740	16	0.682	25	352	4.2	11	1.2	38	403	3.1
1269.9	1.2	16	0.752	29	341	3.5	17	1.4	45	390	2.6
1270.6	0.744	18	0.570	32	318	3.9	11	1.0	49	364	2.8
1271.3	0.689	17	0.548	24	333	3.8	9.9	1.0	37	380	2.7
1272.0	0.513	17	0.517	25	313	4.2	7.4	0.942	38	358	3.0
1272.7	1.0	18	0.726	27	315	3.7	15	1.3	42	360	2.7
1273.4	0.831	18	0.661	29	328	3.9	12	1.2	44	376	2.9
1274.1	0.606	15	0.323	24	355	5.9	8.7	0.590	37	406	4.3
1274.8	0.710	15	0.632	28	312	2.8	10	1.2	43	357	2.0
1275.5	0.795	18	0.563	26	335	5.7	11	1.0	40	383	4.1
1276.2	1.2	15	0.549	24	322	4.7	18	1.0	37	368	3.4
1276.9	0.763	20	0.690	26	315	3.7	11	1.3	40	361	2.7
1277.6	1.0	18	0.471	23	335	4.5	15	0.859	35	383	3.3
1278.3	0.853	19	0.418	26	332	4.1	12	0.762	39	380	3.0
1279.0	0.934	15	0.452	22	325	2.6	13	0.825	34	372	1.9
1279.7	0.513	17	0.635	20	373	4.6	7.4	1.2	31	427	3.4
1280.4	0.513	17	0.332	24	357	4.1	7.4	0.605	36	408	3.0
1281.1	1.1	17	0.473	23	304	3.2	16	0.862	35	348	2.3
1281.8	0.710	18	0.252	24	335	3.4	10	0.459	37	383	2.5
1282.5	0.745	18	0.593	26	327	5.9	11	1.1	41	374	4.3
1283.2	0.779	17	0.666	29	359	3.7	11	1.2	44	411	2.7
1283.9	0.977	15	0.755	27	329	3.3	14	1.4	41	377	2.4
1284.6	0.848	14	0.451	20	276	2.9	12	0.823	31	316	2.1
1285.3	0.754	19	0.576	29	326	3.8	11	1.1	44	373	2.8
1285.9	1.2	16	0.595	27	333	4.0	17	1.1	41	381	2.9
1286.6	1.0	18	0.602	28	355	4.0	15	1.1	43	406	2.9
1287.3	0.590	17	0.738	25	373	4.6	8.5	1.3	38	427	3.3
1288.0	0.513	16	0.649	23	315	3.2	7.4	1.2	35	360	2.4
1288.7	1.2	16	0.638	21	363	4.0	18	1.2	32	415	2.9
1289.4	0.513	17	0.318	25	334	2.7	7.4	0.580	39	382	2.0
1290.1	0.767	16	0.589	20	303	4.5	11	1.1	31	347	3.3
1290.8	0.804	14	0.530	24	319	4.1	12	0.967	37	364	3.0
1291.5	0.513	18	0.414	24	290	3.8	7.4	0.755	37	331	2.8
1292.2	0.891	15	0.731	26	325	3.7	13	1.3	40	371	2.7
1292.9	0.810	14	0.468	21	325	5.1	12	0.854	32	371	3.7
1293.6	0.523	17	0.351	22	338	3.7	7.5	0.640	34	387	2.7
1294.3	0.651	16	0.585	19	328	2.9	9.4	1.1	29	375	2.1
1295.0	0.973	16	0.576	21	356	2.3	14	1.1	32	408	1.7
1295.7	1.3	17	0.587	19	335	3.5	19	1.1	28	383	2.5
1296.4	0.513	15	0.530	19	317	2.3	7.4	0.966	30	363	1.7
1297.1	1.3	14	0.648	20	350	3.0	18	1.2	31	400	2.2
1297.8	0.513	17	0.613	22	346	3.8	7.4	1.1	34	396	2.8
1298.5	0.650	13	0.641	20	313	3.6	9.4	1.2	30	358	2.7



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1299.2	0.513	16	0.826	22	416	2.7	7.4	1.5	34	475	2.0
1299.9	0.705	14	0.540	21	297	3.8	10	0.986	32	340	2.8
1300.6	0.513	19	0.508	22	338	2.5	7.4	0.926	34	386	1.8
1301.3	0.884	17	0.598	19	333	3.4	13	1.1	28	381	2.5
1302.0	0.799	17	0.426	24	337	2.9	12	0.777	37	385	2.1
1302.7	1.4	15	0.560	24	378	3.2	20	1.0	37	432	2.3
1303.4	0.513	16	0.599	21	359	3.5	7.4	1.1	32	410	2.5
1304.1	0.513	13	0.631	23	346	3.9	7.4	1.2	35	395	2.8
1304.8	0.648	14	0.760	19	350	3.3	9.4	1.4	30	400	2.4
1305.5	1.2	16	0.964	21	376	4.0	17	1.8	31	430	3.0
1306.2	0.513	13	0.675	21	356	2.8	7.4	1.2	33	407	2.0
1306.9	1.2	16	0.583	24	359	2.3	17	1.1	37	410	1.6
1307.6	0.513	16	0.461	22	332	2.5	7.4	0.841	33	380	1.8
1308.3	0.876	16	0.745	20	393	3.6	13	1.4	31	449	2.6
1309.0	0.545	17	0.838	22	396	4.7	7.9	1.5	34	453	3.4
1309.7	0.513	16	0.956	16	344	3.8	7.4	1.7	25	393	2.8
1310.4	0.668	14	0.890	20	367	3.1	9.6	1.6	30	420	2.3
1311.1	0.596	13	0.921	23	348	4.2	8.6	1.7	34	398	3.0
1311.8	0.806	15	0.688	18	473	4.6	12	1.3	28	541	3.4
1312.4	0.747	16	0.854	24	364	4.0	11	1.6	37	416	2.9
1313.1	1.5	17	0.668	22	388	4.1	21	1.2	34	444	3.0
1313.8	0.530	13	0.520	25	377	2.7	7.7	0.949	38	431	2.0
1314.5	0.625	16	0.652	19	400	4.1	9.0	1.2	30	457	3.0
1315.2	0.794	14	0.817	19	371	2.5	11	1.5	29	424	1.8
1315.9	0.513	16	0.635	21	410	4.0	7.4	1.2	32	469	2.9
1316.6	0.532	15	0.964	20	418	2.7	7.7	1.8	31	478	2.0
1317.3	0.888	17	0.706	19	397	3.4	13	1.3	28	454	2.5
1318.0	0.635	15	0.941	19	382	4.0	9.2	1.7	29	437	2.9
1318.7	0.513	14	0.703	17	362	3.1	7.4	1.3	26	414	2.3
1319.4	0.797	15	0.681	22	394	3.0	12	1.2	33	451	2.2
1320.1	0.513	16	0.931	19	395	2.8	7.4	1.7	30	452	2.1
1320.8	0.513	15	0.708	18	417	3.4	7.4	1.3	28	477	2.5
1321.5	0.513	15	0.907	18	363	3.3	7.4	1.7	28	416	2.4
1322.2	0.513	16	0.858	23	400	3.1	7.4	1.6	36	457	2.2
1322.9	1.1	15	1.2	21	382	3.6	15	2.1	33	437	2.6
1323.6	1.1	16	0.690	21	359	3.3	16	1.3	32	410	2.4
1324.3	0.558	15	1.0	20	407	3.1	8.1	1.9	30	466	2.2
1325.0	0.720	15	0.846	22	384	2.8	10	1.5	34	439	2.1
1325.7	0.772	17	0.639	21	393	4.1	11	1.2	32	450	3.0
1326.4	1.1	16	0.690	19	384	2.6	16	1.3	29	439	1.9
1327.1	0.898	14	0.844	21	396	2.7	13	1.5	33	453	1.9
1327.8	0.544	17	0.907	22	423	3.5	7.9	1.7	33	483	2.6
1328.5	0.513	14	0.821	19	410	2.0	7.4	1.5	29	469	1.5
1329.2	1.0	21	1.1	18	418	2.9	14	1.9	28	478	2.2
1329.9	1.0	19	0.862	16	421	2.5	15	1.6	25	481	1.9
1330.6	0.801	16	0.834	20	391	2.6	12	1.5	30	447	1.9
1331.3	0.881	17	0.948	24	411	2.7	13	1.7	37	470	2.0
1332.0	0.686	17	0.876	20	451	2.5	9.9	1.6	31	516	1.8
1332.7	0.642	17	1.1	23	404	1.8	9.3	2.1	36	462	1.3
1333.4	0.574	18	0.887	17	391	3.0	8.3	1.6	26	448	2.2
1334.1	1.0	16	0.848	23	424	4.8	15	1.5	36	485	3.5
1334.8	1.0	17	0.853	19	404	2.8	15	1.6	30	463	2.0
1335.5	0.997	18	0.680	21	417	3.0	14	1.2	31	477	2.2
1336.2	0.969	20	0.916	20	425	2.9	14	1.7	31	485	2.1
1336.9	0.747	17	0.899	17	372	3.8	11	1.6	26	425	2.8
1337.6	1.3	20	0.808	20	393	2.6	19	1.5	31	449	1.9
1338.3	0.513	17	0.549	17	372	2.8	7.4	1.0	26	425	2.0
1339.0	0.623	16	0.901	20	362	3.5	9.0	1.6	31	414	2.6
1339.6	0.513	22	0.833	21	397	3.4	7.4	1.5	33	454	2.5
1340.3	0.554	20	1.0	20	393	4.0	8.0	1.9	31	449	2.9
1341.0	0.573	21	1.3	23	393	4.0	8.3	2.3	36	450	2.9
1341.7	1.1	23	1.1	20	369	3.5	16	2.0	31	422	2.6
1342.4	0.811	23	1.4	21	453	2.8	12	2.5	33	519	2.1
1343.1	0.590	19	1.2	17	361	2.2	8.5	2.3	26	413	1.6
1343.8	0.931	20	1.1	25	426	3.0	13	2.0	38	487	2.2
1344.5	1.5	19	0.893	21	376	2.6	22	1.6	32	430	1.9
1345.2	0.564	22	0.852	19	387	2.6	8.1	1.6	30	442	1.9
1345.9	0.513	22	0.671	21	412	2.3	7.4	1.2	33	471	1.7
1346.6	0.693	26	0.835	22	391	3.4	10.0	1.5	34	447	2.5
1347.3	0.637	24	0.987	20	375	4.3	9.2	1.8	30	429	3.1
1348.0	0.732	23	1.1	22	370	2.4	11	2.0	33	423	1.7
1348.7	0.626	23	0.616	27	380	3.2	9.0	1.1	42	435	2.4
1349.4	1.6	23	1.3	25	386	3.1	23	2.4	39	441	2.2
1350.1	0.759	23	0.915	22	325	2.6	11	1.7	33	371	1.9
1350.8	1.0	24	1.1	20	354	3.7	15	2.1	31	404	2.7
1351.5	0.513	24	1.1	19	372	3.7	7.4	2.0	29	426	2.7
1352.2	0.930	30	0.953	22	423	4.2	13	1.7	34	484	3.1
1352.9	1.6	27	0.967	22	362	3.7	23	1.8	34	414	2.7
1353.6	0.768	26	0.950	20	355	3.2	11	1.7	31	406	2.4
1354.3	0.742	25	1.2	22	402	3.2	11	2.1	33	460	2.3
1355.0	1.3	30	1.2	26	384	3.0	18	2.1	39	439	2.2



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
1355.7	0.513	25	1.2	21	377	2.6	7.4	2.2	33	431	1.9
1356.4	0.513	25	0.792	24	386	3.4	7.4	1.4	36	441	2.5
1357.1	0.590	27	1.0	22	419	4.7	8.5	1.9	33	480	3.4
1357.8	0.879	30	0.747	22	389	3.7	13	1.4	33	445	2.7
1358.5	0.733	26	1.3	24	369	2.7	11	2.4	37	422	1.9
1359.2	1.0	31	0.986	25	378	3.7	15	1.8	38	432	2.7
1359.9	0.522	25	0.922	24	392	3.9	7.5	1.7	37	448	2.8
1360.6	1.2	27	1.1	22	396	2.0	18	2.1	33	452	1.5
1361.3	0.513	27	0.927	19	379	4.9	7.4	1.7	30	434	3.6
1362.0	0.755	30	0.981	21	438	3.5	11	1.8	32	501	2.5
1362.7	0.513	30	1.1	19	387	2.7	7.4	2.0	29	443	1.9
1363.4	1.0	26	1.2	21	382	3.3	15	2.1	33	437	2.4
1364.1	0.752	29	0.928	20	407	4.1	11	1.7	31	466	3.0
1364.7	0.821	27	0.926	21	353	2.7	12	1.7	32	404	2.0
1365.4	0.693	26	1.1	20	362	3.5	10	1.9	31	414	2.5
1366.1	0.671	28	0.994	22	367	4.4	9.7	1.8	34	419	3.2
1366.8	0.986	28	1.2	21	398	3.5	14	2.2	32	455	2.5
1367.5	0.839	25	1.1	25	361	2.2	12	2.1	38	413	1.6
1368.2	0.571	24	0.833	23	369	2.0	8.2	1.5	35	422	1.5
1368.9	1.1	27	1.3	25	379	2.6	16	2.4	39	433	1.9
1369.6	0.513	29	1.1	22	384	3.3	7.4	1.9	34	439	2.4
1370.3	0.513	28	0.669	21	350	2.7	7.4	1.2	32	400	2.0
1371.0	0.881	27	0.814	20	392	2.9	13	1.5	31	449	2.1
1371.7	1.0	27	0.944	26	441	2.8	15	1.7	40	504	2.1
1372.4	1.5	26	1.1	22	405	3.3	21	2.0	33	463	2.4
1373.1	1.1	24	0.804	22	389	3.2	15	1.5	34	444	2.4
1373.8	0.513	28	1.2	22	379	3.0	7.4	2.3	34	433	2.2
1374.5	0.758	29	1.2	23	441	2.8	11	2.3	36	504	2.0
1375.2	1.3	28	1.5	19	374	4.5	19	2.7	30	428	3.3
1375.9	0.872	28	1.0	25	380	3.6	13	1.9	39	434	2.7
1376.6	0.817	27	1.2	21	349	3.0	12	2.2	33	399	2.2
1377.3	0.824	26	0.535	22	375	3.1	12	0.976	33	429	2.3
1378.0	1.2	28	0.941	21	385	3.4	18	1.7	32	440	2.5
1378.7	0.693	24	1.0	22	384	3.5	10	1.8	34	439	2.5
1379.4	1.3	25	0.991	21	394	2.7	19	1.8	33	451	1.9
1380.1	0.831	23	0.933	20	366	4.5	12	1.7	30	418	3.3
1380.8	1.2	26	1.2	23	355	4.1	17	2.3	35	405	3.0
1381.5	0.722	27	0.659	22	350	3.3	10	1.2	33	401	2.4
1382.2	0.981	25	0.828	19	394	4.5	14	1.5	29	451	3.3
1382.9	1.1	28	0.968	22	343	4.0	15	1.8	33	392	2.9
1383.6	1.0	27	0.999	23	406	3.4	15	1.8	35	464	2.5
1384.3	1.2	22	0.503	21	397	3.5	18	0.918	33	454	2.6
1385.0	0.513	22	1.3	21	343	3.1	7.4	2.4	32	392	2.3
1385.7	1.1	25	1.1	24	368	4.6	16	2.0	37	420	3.4
1386.4	1.8	25	1.1	22	345	3.1	26	1.9	34	394	2.2
1387.1	0.949	23	0.900	23	366	2.8	14	1.6	35	419	2.0
1387.8	1.1	21	1.3	19	325	3.6	16	2.4	30	372	2.7
1388.5	0.947	26	1.1	27	361	5.3	14	2.0	42	413	3.8
1389.2	0.976	22	1.0	20	331	4.9	14	1.8	30	378	3.6
1389.9	0.756	20	0.935	28	363	3.3	11	1.7	43	415	2.4
1390.6	0.760	22	0.893	25	343	3.8	11	1.6	38	392	2.8
1391.2	0.931	21	1.0	25	348	2.7	13	1.8	38	399	1.9
1391.9	1.3	21	2.5	22	355	2.7	19	4.6	34	406	2.0
1392.6	0.810	19	0.976	24	383	3.6	12	1.8	37	438	2.6
1393.3	1.3	25	1.3	24	329	3.1	19	2.3	36	377	2.3
1394.0	0.791	21	0.861	26	382	3.0	11	1.6	39	437	2.2
1394.7	0.513	22	0.875	22	333	3.0	7.4	1.6	34	380	2.2
1395.4	1.3	20	1.0	25	340	2.8	19	1.8	39	389	2.0
1396.1	0.513	20	0.708	23	305	3.0	7.4	1.3	35	349	2.2
1396.8	0.568	22	1.0	27	350	4.1	8.2	1.9	41	400	3.0
1397.5	0.678	20	1.2	24	306	2.7	9.8	2.1	37	350	2.0
1398.2	1.1	21	1.1	25	326	3.1	16	1.9	39	373	2.3
1398.9	0.797	22	0.704	26	323	3.2	12	1.3	40	369	2.3
1399.6	0.924	22	0.912	28	298	2.9	13	1.7	42	341	2.1
1400.3	0.767	22	0.998	25	338	2.9	11	1.8	38	386	2.1
1401.0	0.513	19	0.949	27	318	2.6	7.4	1.7	42	364	1.9
1401.7	1.1	24	1.1	24	320	2.7	16	2.0	37	365	2.0
1402.4	1.3	21	0.722	23	295	3.0	19	1.3	35	337	2.2
1403.1	0.854	20	1.1	28	318	3.1	12	2.1	42	364	2.3
1403.8	0.513	21	0.923	28	364	3.2	7.4	1.7	43	416	2.3
1404.5	0.741	20	0.936	28	340	3.8	11	1.7	42	389	2.8
1405.2	1.5	24	1.1	24	344	2.5	21	2.0	36	393	1.8
1405.9	1.4	21	0.942	30	345	2.7	20	1.7	46	395	1.9
1406.6	1.1	20	0.968	32	388	3.0	16	1.8	49	443	2.2
1407.3	1.2	22	0.475	29	327	4.2	17	0.866	45	374	3.0
1408.0	0.899	18	0.738	29	322	2.8	13	1.3	44	368	2.1
1408.7	0.675	21	1.0	31	310	3.3	9.7	1.9	47	354	2.4
1409.4	1.1	20	1.0	25	311	4.5	15	1.8	39	355	3.2
1410.1	0.701	19	0.918	28	318	4.2	10	1.7	43	363	3.0
1410.8	0.513	17	0.804	31	321	4.2	7.4	1.5	48	367	3.0
1411.5	1.1	18	0.816	30	327	2.9	16	1.5	46	373	2.1



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Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1412.2	0.788	21	0.992	26	311	4.9	11	1.8	40	355	3.5
1412.9	1.1	20	1.2	31	326	2.6	16	2.1	47	372	1.9
1413.6	1.4	16	0.865	27	301	3.4	20	1.6	42	345	2.5
1414.3	0.700	22	1.0	30	312	3.0	10	1.9	46	356	2.2
1415.0	0.850	21	0.561	31	314	2.9	12	1.0	48	359	2.1
1415.7	0.886	20	0.970	27	347	2.7	13	1.8	41	396	2.0
1416.4	1.1	20	0.822	32	319	3.5	16	1.5	48	365	2.6
1417.0	0.858	20	0.823	30	312	3.4	12	1.5	46	357	2.5
1417.7	0.928	20	1.1	27	329	2.7	13	2.0	41	376	2.0
1418.4	1.2	21	0.974	29	324	3.2	17	1.8	45	370	2.4
1419.1	0.802	21	0.872	30	323	2.4	12	1.6	47	369	1.7
1419.8	0.723	17	0.780	33	318	3.5	10	1.4	50	363	2.6
1420.5	0.613	19	0.926	29	308	4.0	8.9	1.7	45	352	2.9
1421.2	0.958	19	0.914	31	325	3.6	14	1.7	47	372	2.7
1421.9	0.691	18	0.790	29	328	4.1	10.0	1.4	45	375	3.0
1422.6	0.547	19	1.1	27	317	3.9	7.9	2.0	42	362	2.9
1423.3	1.0	18	0.933	29	328	2.9	15	1.7	44	376	2.1
1424.0	0.757	18	0.698	31	323	3.0	11	1.3	48	370	2.2
1424.7	0.571	19	0.857	33	323	2.5	8.2	1.6	51	369	1.8
1425.4	0.513	18	0.777	29	310	3.1	7.4	1.4	44	355	2.3
1426.1	0.594	18	0.645	33	319	3.1	8.6	1.2	50	364	2.2
1426.8	0.513	16	0.669	28	322	2.7	7.4	1.2	43	368	2.0
1427.5	0.513	15	0.664	29	338	3.1	7.4	1.2	44	387	2.3
1428.2	0.513	18	0.589	33	344	3.7	7.4	1.1	50	394	2.7
1428.9	0.513	17	0.811	29	313	3.6	7.4	1.5	44	358	2.6
1429.6	0.794	17	0.655	29	305	2.1	11	1.2	45	349	1.5
1430.3	0.538	16	0.829	29	319	2.6	7.8	1.5	44	365	1.9
1431.0	0.747	15	0.797	26	298	2.4	11	1.5	40	341	1.8
1431.7	0.936	14	0.554	35	319	4.0	14	1.0	53	365	2.9
1432.4	0.627	15	0.640	34	335	2.5	9.0	1.2	52	383	1.8
1433.1	0.513	16	0.594	29	316	3.7	7.4	1.1	45	361	2.7
1433.8	0.589	14	0.668	33	319	3.3	8.5	1.2	50	365	2.4
1434.5	0.588	14	0.754	34	305	2.8	8.5	1.4	52	349	2.1
1435.2	0.820	15	0.677	31	323	3.8	12	1.2	48	369	2.8
1435.9	0.513	13	0.812	30	303	4.1	7.4	1.5	45	346	3.0
1436.6	0.513	15	0.628	34	303	3.6	7.4	1.1	52	347	2.6
1437.3	0.955	15	0.623	28	314	3.5	14	1.1	43	359	2.5
1438.0	1.1	15	0.613	30	300	3.5	16	1.1	46	344	2.6
1438.7	0.843	16	0.523	30	320	3.3	12	0.954	47	366	2.4
1439.4	0.816	11	0.721	28	331	3.3	12	1.3	44	379	2.4
1440.1	0.518	12	0.670	26	290	2.0	7.5	1.2	40	332	1.5
1440.8	0.828	12	0.884	27	303	3.5	12	1.6	41	347	2.6
1441.5	0.852	15	0.585	35	307	3.2	12	1.1	53	351	2.3
1442.2	1.1	12	0.681	32	306	2.7	16	1.2	48	350	2.0
1442.8	0.824	13	0.583	33	301	3.0	12	1.1	51	345	2.2
1443.5	0.513	13	0.828	28	301	2.8	7.4	1.5	43	344	2.1
1444.2	0.777	13	0.663	30	301	3.5	11	1.2	46	344	2.6
1444.9	0.513	12	0.581	33	329	4.1	7.4	1.1	51	376	3.0
1445.6	1.2	13	0.701	31	348	4.9	18	1.3	48	398	3.6
1446.3	0.726	15	0.967	26	318	3.9	10	1.8	40	364	2.8
1447.0	0.513	12	0.826	28	282	3.6	7.4	1.5	44	322	2.7
1447.7	1.2	13	0.718	32	283	5.0	17	1.3	49	324	3.7
1448.4	0.575	14	0.863	32	331	7.3	8.3	1.6	50	378	5.3
1449.1	0.874	11	0.486	28	282	3.8	13	0.887	42	322	2.8
1449.8	0.813	14	0.602	34	298	4.5	12	1.1	52	341	3.3
1450.5	0.513	12	0.664	28	286	4.4	7.4	1.2	44	327	3.2
1451.2	0.764	13	0.720	34	309	5.0	11	1.3	52	353	3.6
1451.9	1.5	12	0.761	34	325	5.0	22	1.4	52	372	3.7
1452.6	0.513	10	0.722	34	296	6.2	7.4	1.3	52	339	4.5
1453.3	1.1	12	0.706	29	298	5.0	16	1.3	45	340	3.7
1454.0	1.1	12	0.636	30	319	5.3	16	1.2	46	365	3.9
1454.7	0.513	14	0.673	30	333	4.8	7.4	1.2	46	381	3.5
1455.4	0.513	13	0.727	31	323	6.6	7.4	1.3	47	369	4.8
1456.1	0.684	14	0.756	33	312	5.7	9.9	1.4	51	357	4.2
1456.8	0.549	12	0.778	36	293	6.6	7.9	1.4	55	335	4.8
1457.5	0.513	12	0.732	31	340	4.7	7.4	1.3	48	388	3.4
1458.2	0.838	11	0.667	28	309	4.6	12	1.2	43	353	3.3
1458.9	0.786	13	0.786	30	321	5.6	11	1.4	45	367	4.1
1459.6	0.513	12	0.408	32	309	4.7	7.4	0.743	48	353	3.4
1460.3	0.513	9.8	0.457	31	323	4.8	7.4	0.833	47	369	3.5
1461.0	1.0	14	0.513	29	297	6.5	15	0.936	44	339	4.7
1461.7	0.513	12	0.607	28	298	5.0	7.4	1.1	42	341	3.7
1462.4	0.513	12	0.532	30	325	4.4	7.4	0.969	46	372	3.2
1463.1	0.996	13	0.725	32	316	4.8	14	1.3	49	361	3.5
1463.8	0.519	11	0.628	36	289	4.7	7.5	1.1	55	331	3.4
1464.5	1.0	12	0.595	30	318	3.5	15	1.1	47	364	2.5
1465.2	0.921	12	0.733	32	340	3.7	13	1.3	49	388	2.7
1465.9	0.513	12	0.584	33	329	3.8	7.4	1.1	50	376	2.8
1466.6	0.562	11	0.913	30	296	3.7	8.1	1.7	46	339	2.7
1467.3	0.513	11	0.541	33	302	3.1	7.4	0.987	50	346	2.2
1468.0	0.668	13	0.692	34	311	3.7	9.6	1.3	53	356	2.7



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1468.7	0.950	12	0.483	36	352	3.6	14	0.881	54	403	2.7
1469.4	0.909	13	0.701	31	294	3.2	13	1.3	47	337	2.3
1470.0	0.815	11	0.566	30	272	2.9	12	1.0	46	311	2.1
1470.7	0.916	12	0.685	34	315	3.5	13	1.2	51	360	2.6
1471.4	0.750	12	0.556	34	295	2.3	11	1.0	52	337	1.7
1472.1	0.652	13	0.563	33	306	3.1	9.4	1.0	51	349	2.2
1472.8	0.513	13	0.602	36	291	3.0	7.4	1.1	55	333	2.2
1473.5	0.513	13	0.485	26	314	4.3	7.4	0.885	40	359	3.1
1474.2	0.830	12	0.533	26	304	3.1	12	0.973	40	348	2.3
1474.9	0.513	12	0.579	30	271	3.2	7.4	1.1	47	310	2.3
1475.6	0.802	14	0.682	32	297	4.6	12	1.2	48	339	3.3
1476.3	1.4	12	0.386	36	342	4.5	20	0.703	56	391	3.3
1477.0	0.513	12	0.496	34	294	2.7	7.4	0.905	51	336	1.9
1477.7	0.928	14	0.431	32	315	4.1	13	0.786	49	360	3.0
1478.4	0.672	13	0.673	35	336	2.7	9.7	1.2	53	385	1.9
1479.1	0.698	11	0.731	34	279	3.1	10	1.3	52	319	2.3
1479.8	0.757	13	0.650	40	316	3.5	11	1.2	61	362	2.5
1480.5	0.667	12	0.508	34	303	2.9	9.6	0.926	52	347	2.1
1481.2	0.788	14	0.766	30	303	3.4	11	1.4	46	347	2.5
1481.9	0.689	13	0.440	36	302	2.6	9.9	0.802	55	345	1.9
1482.6	0.664	14	0.620	32	293	3.0	9.6	1.1	48	336	2.2
1483.3	0.684	12	0.393	33	287	2.7	9.9	0.717	50	328	2.0
1484.0	0.680	14	0.727	35	308	4.0	9.8	1.3	54	352	2.9
1484.7	0.513	13	0.559	34	292	3.3	7.4	1.0	52	334	2.4
1485.4	0.562	13	0.681	34	294	3.1	8.1	1.2	52	336	2.3
1486.1	0.513	12	0.638	31	314	3.6	7.4	1.2	47	359	2.7
1486.8	0.513	13	0.325	33	322	3.9	7.4	0.592	51	368	2.8
1487.5	0.735	12	0.757	35	293	3.6	11	1.4	54	335	2.6
1488.2	0.513	14	0.311	33	314	4.3	7.4	0.567	50	359	3.1
1488.9	0.801	13	0.707	34	303	4.5	12	1.3	53	346	3.3
1489.6	0.513	11	0.702	35	304	3.2	7.4	1.3	54	347	2.3
1490.3	0.941	13	0.461	31	300	3.8	14	0.840	47	343	2.8
1491.0	0.611	12	0.280	28	295	2.4	8.8	0.511	43	338	1.8
1491.7	0.872	11	0.494	35	312	3.4	13	0.900	54	357	2.5
1492.4	0.699	12	0.468	33	280	2.9	10	0.853	51	320	2.1
1493.1	0.854	12	0.540	32	302	4.5	12	0.985	49	346	3.3
1493.8	0.513	10	0.810	34	279	3.9	7.4	1.5	52	319	2.9
1494.5	0.628	11	0.452	36	331	2.9	9.1	0.825	56	378	2.1
1495.2	0.513	12	0.530	34	289	2.7	7.4	0.967	51	331	2.0
1495.9	0.711	14	0.712	34	302	3.9	10	1.3	52	345	2.8
1496.5	0.513	9.8	0.467	31	279	3.5	7.4	0.851	47	319	2.6
1497.2	0.513	12	0.566	37	302	3.1	7.4	1.0	57	345	2.2
1497.9	0.513	12	0.344	35	299	4.3	7.4	0.627	53	342	3.1
1498.6	0.666	11	0.425	34	273	3.4	9.6	0.776	52	312	2.5
1499.3	0.513	12	0.548	37	272	3.8	7.4	1.000	56	311	2.8
1500.0	0.616	11	0.491	32	298	4.6	8.9	0.895	49	341	3.4
1500.7	0.513	12	0.288	32	286	4.6	7.4	0.525	50	327	3.4
1501.4	0.804	12	0.593	32	281	7.4	12	1.1	50	322	5.4
1502.1	0.831	11	0.480	34	283	7.4	12	0.876	53	323	5.4
1502.8	0.913	15	0.656	33	296	7.4	13	1.2	50	338	5.4
1503.5	0.513	8.8	0.470	32	296	7.7	7.4	0.857	49	338	5.6
1504.2	0.513	13	0.469	33	320	9.4	7.4	0.856	51	366	6.8
1504.9	0.513	10	0.560	35	287	10	7.4	1.0	53	328	7.6
1505.6	0.702	9.4	0.579	31	277	14	10	1.1	48	317	10
1506.3	0.513	13	0.955	34	318	13	7.4	1.7	52	363	9.4
1507.0	0.513	11	0.746	29	260	16	7.4	1.4	44	298	12
1507.7	0.513	12	0.841	41	313	19	7.4	1.5	63	358	14
1508.4	0.856	14	0.891	37	288	20	12	1.6	57	329	14
1509.1	0.513	12	0.882	41	317	25	7.4	1.6	63	363	18
1509.8	0.628	11	1.0	27	303	21	9.1	1.9	41	346	15
1510.5	0.659	10	0.885	37	320	26	9.5	1.6	56	366	19
1511.2	0.590	12	1.3	35	325	35	8.5	2.5	54	371	26
1511.9	0.759	14	0.848	39	302	40	11	1.5	60	345	29
1512.6	0.699	12	1.2	39	274	33	10	2.2	59	313	24
1513.3	0.513	11	1.1	33	292	36	7.4	2.0	51	334	26
1514.0	0.891	10	1.0	33	249	35	13	1.8	51	285	25
1514.7	0.664	11	1.1	44	344	44	9.6	2.0	67	393	32
1515.4	0.809	13	1.1	40	277	40	12	1.9	62	317	29
1516.1	0.917	12	1.5	42	306	45	13	2.7	65	350	33
1516.8	0.513	13	1.8	41	294	50	7.4	3.4	63	336	37
1517.5	0.513	13	1.6	40	300	53	7.4	2.9	61	342	39
1518.2	0.513	12	1.4	43	285	48	7.4	2.6	67	326	35
1518.9	0.799	13	1.2	50	306	60	12	2.1	77	350	44
1519.6	0.562	11	2.1	44	291	46	8.1	3.7	68	333	34
1520.3	1.1	11	1.9	49	275	58	15	3.4	75	315	42
1521.0	0.513	12	2.0	49	270	56	7.4	3.7	74	309	41
1521.7	1.1	15	2.3	45	303	55	15	4.1	69	346	40
1522.4	0.513	13	2.1	48	278	67	7.4	3.8	73	318	49
1523.0	0.521	11	1.5	42	289	57	7.5	2.8	64	330	42
1523.7	0.694	14	1.8	44	321	53	10	3.3	67	367	39
1524.4	0.769	13	2.2	47	267	58	11	4.1	72	305	42



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Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1525.1	0.639	12	2.0	50	278	61	9.2	3.7	77	318	44
1525.8	0.744	12	2.3	52	297	62	11	4.1	79	339	45
1526.5	0.513	12	2.0	52	310	80	7.4	3.7	79	354	59
1527.2	0.513	12	2.1	53	316	69	7.4	3.9	81	361	51
1527.9	0.583	16	2.3	58	280	71	8.4	4.2	88	320	52
1528.6	1.3	13	2.5	47	289	68	19	4.6	72	331	50
1529.3	0.850	12	2.0	53	291	71	12	3.7	81	332	52
1530.0	0.570	13	1.7	54	258	69	8.2	3.2	83	295	51
1530.7	0.798	13	2.7	57	309	77	12	4.9	87	353	56
1531.4	0.513	14	2.6	55	273	77	7.4	4.8	85	312	56
1532.1	0.626	14	2.6	53	296	70	9.0	4.7	81	338	51
1532.8	0.759	15	2.6	52	283	69	11	4.7	80	323	51
1533.5	0.513	14	2.9	58	269	72	7.4	5.2	88	308	52
1534.2	1.0	15	2.1	59	304	76	15	3.9	90	347	55
1534.9	0.593	13	2.9	61	313	78	8.6	5.2	94	358	57
1535.6	0.513	17	2.7	53	333	73	7.4	4.9	81	381	53
1536.3	0.513	16	2.7	64	326	72	7.4	4.9	98	373	52
1537.0	0.921	16	3.4	73	318	76	13	6.2	112	363	56
1537.7	0.762	15	2.7	65	259	77	11	5.0	99	296	56
1538.4	0.541	17	3.3	62	320	74	7.8	6.0	95	366	54
1539.1	0.837	16	3.4	75	280	76	12	6.1	116	320	55
1539.8	0.546	17	2.9	65	315	76	7.9	5.2	100	360	56
1540.5	0.563	19	3.2	75	339	82	8.1	5.9	115	388	60
1541.2	0.513	21	3.0	70	271	67	7.4	5.4	107	310	49
1541.9	0.619	17	3.5	71	302	79	8.9	6.3	108	346	58
1542.6	0.513	16	3.6	61	264	71	7.4	6.5	94	301	52
1543.3	0.513	18	3.3	63	309	72	7.4	6.0	97	353	52
1544.0	0.839	23	2.9	69	300	64	12	5.4	106	344	46
1544.7	0.635	23	3.9	77	361	72	9.2	7.1	119	413	52
1545.4	1.0	22	3.1	64	316	57	15	5.7	98	361	42
1546.1	0.552	25	3.7	63	314	37	8.0	6.8	96	359	27
1546.8	1.0	26	3.5	70	358	40	15	6.4	108	410	29
1547.5	0.618	22	3.7	61	298	35	8.9	6.8	93	341	25
1548.2	0.606	21	3.8	59	313	26	8.8	6.9	90	358	19
1548.8	0.662	21	3.8	58	350	26	9.6	7.0	88	400	19
1549.5	0.654	24	3.6	65	303	29	9.4	6.6	99	347	21
1550.2	0.829	27	3.3	61	313	27	12	6.1	93	358	20
1550.9	0.955	22	3.2	66	331	21	14	5.9	101	378	15
1551.6	0.976	23	3.2	57	283	21	14	5.9	87	324	15
1552.3	1.2	23	4.0	68	387	27	18	7.3	104	443	19
1553.0	1.2	24	3.6	62	360	32	17	6.5	95	412	23
1553.7	1.3	23	2.6	66	355	23	19	4.8	101	406	16
1554.4	1.1	22	3.0	57	356	19	16	5.4	88	408	14
1555.1	0.577	21	3.3	67	374	20	8.3	6.0	102	427	15
1555.8	1.6	24	3.5	59	377	22	24	6.4	90	431	16
1556.5	0.581	26	2.9	60	380	15	8.4	5.3	92	434	11
1557.2	1.2	27	3.1	64	336	17	18	5.7	99	384	13
1557.9	1.2	22	2.5	67	395	17	17	4.6	102	452	13
1558.6	1.4	26	2.9	62	381	18	21	5.3	95	435	13
1559.3	1.0	26	3.1	59	339	16	15	5.7	90	388	12
1560.0	0.914	21	3.2	65	346	19	13	5.7	99	395	14
1560.7	0.928	22	3.0	57	382	17	13	5.4	87	437	13
1561.4	1.4	22	2.8	51	310	13	20	5.1	78	355	9.4
1562.1	0.919	26	3.2	57	302	13	13	5.8	88	345	9.2
1562.8	0.598	24	2.4	62	347	13	8.6	4.4	96	396	9.4
1563.5	0.848	21	2.6	65	327	13	12	4.8	99	374	9.2
1564.2	0.847	21	2.7	60	325	12	12	4.9	92	372	8.7
1564.9	1.0	23	2.8	68	395	11	15	5.0	105	452	7.9
1565.6	1.1	22	2.9	51	303	10	16	5.3	78	347	7.6
1566.3	1.0	22	2.9	63	390	11	15	5.3	97	446	8.4
1567.0	1.2	27	2.6	70	343	13	18	4.8	107	393	9.7
1567.7	1.0	22	2.9	68	355	9.8	14	5.4	104	406	7.1
1568.4	0.773	24	3.3	68	378	9.6	11	6.0	104	432	7.0
1569.1	1.1	21	2.9	66	365	12	16	5.3	101	417	8.5
1569.8	0.762	22	2.9	68	319	8.3	11	5.3	104	364	6.0
1570.5	1.3	22	2.9	69	337	8.9	19	5.2	106	385	6.5
1571.2	0.895	23	3.0	67	323	7.3	13	5.5	103	369	5.3
1571.9	1.8	22	3.2	65	337	6.8	26	5.8	99	385	4.9
1572.6	0.585	21	2.6	57	308	7.9	8.4	4.7	88	353	5.8
1573.3	0.807	24	3.0	71	395	8.2	12	5.4	108	452	6.0
1574.0	0.513	20	2.6	58	289	8.1	7.4	4.8	89	330	5.9
1574.7	0.914	20	2.6	69	355	6.2	13	4.8	106	406	4.5
1575.3	0.845	19	2.9	67	334	6.4	12	5.2	103	382	4.7
1576.0	1.4	20	3.2	69	333	5.2	20	5.9	106	381	3.8
1576.7	0.817	21	2.5	69	324	4.3	12	4.6	106	370	3.2
1577.4	1.3	22	3.5	84	366	8.4	18	6.4	129	418	6.1
1578.1	1.2	24	2.8	71	362	6.0	18	5.2	109	414	4.4
1578.8	1.1	23	3.2	65	336	8.4	15	5.9	100	384	6.2
1579.5	0.937	25	2.5	66	368	8.0	14	4.6	101	421	5.8
1580.2	1.5	22	3.2	66	376	5.9	22	5.9	101	430	4.3
1580.9	0.513	21	2.2	67	358	5.9	7.4	4.0	102	410	4.3



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1581.6	0.827	20	1.9	56	374	5.2	12	3.5	86	428	3.8
1582.3	0.603	19	2.4	53	352	5.2	8.7	4.3	81	403	3.8
1583.0	0.553	20	2.5	67	351	5.7	8.0	4.5	102	401	4.2
1583.7	0.752	23	2.3	60	341	5.5	11	4.2	92	391	4.0
1584.4	0.576	17	2.5	54	343	5.1	8.3	4.5	82	392	3.7
1585.1	1.1	24	2.4	60	335	3.6	16	4.4	92	383	2.6
1585.8	0.525	17	2.5	52	339	5.0	7.6	4.5	80	388	3.7
1586.5	0.882	17	2.2	56	303	4.8	13	4.1	85	347	3.5
1587.2	0.515	17	2.0	63	311	4.2	7.4	3.6	96	356	3.1
1587.9	0.750	17	1.9	53	332	3.9	11	3.5	82	380	2.8
1588.6	0.839	20	2.0	53	327	4.2	12	3.6	82	374	3.1
1589.3	0.769	21	2.8	61	347	5.7	11	5.1	93	397	4.1
1590.0	0.893	23	1.8	53	332	4.7	13	3.2	82	380	3.4
1590.7	0.513	17	1.9	55	317	4.6	7.4	3.4	84	363	3.3
1591.4	0.763	16	2.1	54	340	5.7	11	3.8	83	389	4.2
1592.1	0.870	17	1.9	44	357	5.7	13	3.4	68	408	4.2
1592.8	0.763	17	1.8	49	356	5.0	11	3.3	75	407	3.6
1593.5	0.513	16	1.6	45	315	3.5	7.4	3.0	68	360	2.6
1594.2	0.689	16	1.7	41	299	2.4	9.9	3.2	63	342	1.8
1594.9	0.513	17	1.6	46	311	4.7	7.4	3.0	70	356	3.5
1595.6	1.2	18	1.5	45	321	4.0	17	2.7	69	367	2.9
1596.3	0.513	18	1.7	46	273	4.1	7.4	3.1	71	312	3.0
1597.0	0.513	19	1.5	49	319	3.0	7.4	2.7	74	365	2.2
1597.7	0.666	19	1.6	42	327	4.8	9.6	3.0	64	374	3.5
1598.4	0.633	18	1.2	39	329	2.7	9.1	2.3	60	376	2.0
1599.1	0.519	20	2.1	46	338	5.2	7.5	3.8	71	387	3.8
1599.8	0.653	21	2.0	51	333	4.8	9.4	3.6	78	381	3.5
1600.5	0.545	17	1.7	39	241	3.1	7.9	3.1	60	275	2.3
1601.1	1.0	17	1.5	44	296	4.4	15	2.7	67	338	3.2
1601.8	0.950	19	1.2	45	275	3.4	14	2.3	70	314	2.5
1602.5	0.513	17	1.3	43	282	3.7	7.4	2.4	66	322	2.7
1603.2	1.1	19	1.3	46	304	4.4	15	2.3	70	347	3.2
1603.9	0.513	20	1.2	45	278	3.3	7.4	2.2	69	318	2.4
1604.6	0.602	16	1.5	49	338	3.3	8.7	2.8	75	386	2.4
1605.3	0.773	19	2.0	49	296	3.3	11	3.7	75	339	2.4
1606.0	0.513	17	1.7	41	275	3.0	7.4	3.0	64	315	2.2
1606.7	0.530	23	1.2	48	296	3.7	7.7	2.2	74	339	2.7
1607.4	0.513	17	1.2	39	291	3.5	7.4	2.2	60	333	2.6
1608.1	0.513	17	0.902	49	299	5.4	7.4	1.6	75	342	4.0
1608.8	0.568	18	1.3	43	272	3.6	8.2	2.4	66	311	2.7
1609.5	0.801	18	1.6	44	251	3.1	12	2.9	68	287	2.3
1610.2	0.513	18	1.1	44	331	4.4	7.4	2.1	67	378	3.2
1610.9	0.809	18	1.3	45	267	2.3	12	2.5	69	306	1.7
1611.6	0.788	18	0.950	34	289	2.7	11	1.7	52	331	1.9
1612.3	0.513	19	1.1	38	298	3.8	7.4	2.1	59	341	2.8
1613.0	0.513	20	1.6	48	296	2.5	7.4	3.0	73	339	1.8
1613.7	0.513	17	1.5	36	286	3.7	7.4	2.7	56	327	2.7
1614.4	0.799	19	1.2	37	261	3.3	12	2.2	57	299	2.4
1615.1	0.513	18	1.1	37	275	3.4	7.4	1.9	56	314	2.5
1615.8	0.801	17	0.966	30	306	2.1	12	1.8	46	350	1.5
1616.5	1.3	23	0.572	31	284	2.7	19	1.0	47	325	2.0
1617.2	0.581	19	0.823	30	259	2.0	8.4	1.5	46	296	1.5
1617.9	0.513	18	1.1	31	265	3.5	7.4	2.0	48	302	2.5
1618.6	0.877	15	1.2	26	268	3.0	13	2.1	40	307	2.2
1619.3	0.513	16	0.886	28	254	3.2	7.4	1.6	44	291	2.3
1620.0	0.651	16	0.876	25	242	2.5	9.4	1.6	38	276	1.8
1620.7	0.513	19	1.3	30	263	2.8	7.4	2.5	46	301	2.0
1621.4	0.513	15	0.867	32	265	2.5	7.4	1.6	49	303	1.8
1622.1	0.545	11	1.1	25	254	2.4	7.9	2.0	39	290	1.8
1622.8	0.773	14	0.592	25	259	3.1	11	1.1	39	296	2.3
1623.5	0.725	15	0.783	27	258	2.5	10	1.4	41	295	1.9
1624.2	0.513	15	0.545	28	283	2.8	7.4	0.995	43	323	2.1
1624.9	0.513	17	0.839	25	254	2.5	7.4	1.5	38	290	1.8
1625.6	0.513	12	0.992	26	281	2.7	7.4	1.8	39	321	1.9
1626.3	0.513	14	0.900	26	291	4.1	7.4	1.6	39	333	3.0
1627.0	0.513	18	1.2	27	275	2.2	7.4	2.2	42	314	1.6
1627.6	0.513	14	1.2	24	254	3.5	7.4	2.2	36	290	2.5
1628.3	0.513	14	0.802	22	312	2.8	7.4	1.5	34	357	2.0
1629.0	0.513	15	0.884	21	258	2.6	7.4	1.6	32	295	1.9
1629.7	0.513	13	0.997	22	263	2.2	7.4	1.8	33	301	1.6
1630.4	0.513	13	0.906	20	260	1.6	7.4	1.7	30	298	1.2
1631.1	0.513	14	1.1	22	285	1.8	7.4	2.0	33	326	1.3
1631.8	0.578	11	0.819	19	272	1.6	8.3	1.5	29	311	1.2
1632.5	0.513	14	0.754	20	275	2.6	7.4	1.4	31	315	1.9
1633.2	0.513	11	0.672	19	234	2.9	7.4	1.2	29	268	2.1
1633.9	0.513	13	0.859	20	264	2.5	7.4	1.6	31	302	1.8
1634.6	0.513	12	1.2	19	260	2.9	7.4	2.1	30	297	2.1
1635.3	0.513	11	0.830	20	278	2.7	7.4	1.5	30	318	2.0
1636.0	0.513	12	0.639	16	272	2.1	7.4	1.2	25	310	1.5
1636.7	0.513	12	0.941	16	281	1.7	7.4	1.7	24	321	1.3
1637.4	0.513	11	0.718	15	252	2.1	7.4	1.3	23	289	1.5



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Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1638.1	0.771	11	1.0	16	251	2.8	11	1.9	24	287	2.0
1638.8	0.676	12	0.862	15	283	2.8	9.8	1.6	24	324	2.0
1639.5	0.513	11	1.0	16	301	1.8	7.4	1.9	24	345	1.3
1640.2	0.513	9.6	0.751	16	281	1.9	7.4	1.4	24	322	1.4
1640.9	0.513	10	0.430	14	266	1.8	7.4	0.784	21	304	1.3
1641.6	0.513	9.0	0.586	11	249	1.5	7.4	1.1	17	284	1.1
1642.3	0.513	8.8	0.545	15	281	1.9	7.4	0.994	22	322	1.4
1643.0	0.513	11	0.696	12	273	2.5	7.4	1.3	19	313	1.8
1643.7	0.513	12	0.547	16	289	2.4	7.4	0.998	24	330	1.8
1644.4	0.513	10	0.954	14	276	2.6	7.4	1.7	22	316	1.9
1645.1	0.513	12	0.623	14	307	1.5	7.4	1.1	22	351	1.1
1645.8	0.585	8.6	0.795	12	280	2.2	8.4	1.5	19	320	1.6
1646.5	0.513	11	0.840	11	268	1.4	7.4	1.5	18	307	1.0
1647.2	0.513	9.0	0.722	10	302	2.1	7.4	1.3	16	345	1.5
1647.9	0.513	8.0	0.661	12	258	1.7	7.4	1.2	18	295	1.2
1648.6	0.513	9.2	0.633	12	265	1.7	7.4	1.2	19	303	1.2
1649.3	0.513	10	0.632	13	257	2.2	7.4	1.2	20	294	1.6
1650.0	0.513	9.4	0.672	13	310	2.3	7.4	1.2	21	354	1.7
1650.7	0.513	9.4	0.679	13	255	1.5	7.4	1.2	20	292	1.1
1651.4	0.513	9.3	0.864	11	272	1.8	7.4	1.6	17	311	1.3
1652.1	0.513	7.6	0.498	11	289	1.5	7.4	0.908	17	331	1.1
1652.8	0.513	7.7	0.618	13	256	1.5	7.4	1.1	20	293	1.1
1653.5	0.513	9.1	0.592	13	266	1.7	7.4	1.1	20	305	1.2
1654.2	0.513	9.3	0.815	13	272	1.8	7.4	1.5	20	311	1.3
1654.8	0.513	9.1	0.810	11	261	1.7	7.4	1.5	17	298	1.3
1655.5	0.550	8.9	0.779	11	298	1.9	7.9	1.4	16	340	1.4
1656.2	0.513	9.9	0.598	11	269	1.5	7.4	1.1	17	307	1.1
1656.9	0.513	8.6	0.655	10	263	1.7	7.4	1.2	16	301	1.3
1657.6	0.513	8.4	0.707	11	271	1.8	7.4	1.3	16	310	1.3
1658.3	0.513	8.9	0.719	13	253	2.3	7.4	1.3	20	289	1.7
1659.0	0.559	9.7	0.584	8.8	264	1.0	8.1	1.1	13	302	0.749
1659.7	1.0	8.9	0.588	9.3	274	1.6	15	1.1	14	314	1.2
1660.4	0.513	8.5	0.537	14	266	1.6	7.4	0.980	21	305	1.2
1661.1	0.513	9.5	0.795	12	263	2.3	7.4	1.4	19	301	1.7
1661.8	0.541	8.4	0.588	10	257	0.994	7.8	1.1	16	293	0.725
1662.5	0.551	8.7	0.735	12	261	2.0	8.0	1.3	19	299	1.5
1663.2	0.513	10.0	0.947	12	264	1.2	7.4	1.7	18	302	0.871
1663.9	0.513	10	0.605	13	263	1.8	7.4	1.1	21	301	1.3
1664.6	0.513	11	0.939	11	275	1.3	7.4	1.7	17	314	0.984
1665.3	0.513	9.7	0.653	11	268	2.0	7.4	1.2	17	307	1.4
1666.0	0.523	9.4	0.980	11	271	1.4	7.6	1.8	16	310	1.1
1666.7	0.513	9.7	0.828	12	277	1.5	7.4	1.5	18	317	1.1
1667.4	0.513	9.4	0.981	14	261	1.2	7.4	1.8	21	299	0.842
1668.1	0.513	9.7	0.988	14	265	0.990	7.4	1.8	21	303	0.722
1668.8	0.513	9.2	1.0	11	246	1.9	7.4	1.8	17	281	1.4
1669.5	0.513	8.2	0.563	13	243	0.760	7.4	1.0	20	278	0.555
1670.2	0.513	9.9	0.928	13	246	1.7	7.4	1.7	20	281	1.3
1670.9	0.513	11	0.812	12	230	1.7	7.4	1.5	19	263	1.2
1671.6	0.513	7.7	0.835	16	267	1.4	7.4	1.5	25	306	1.0
1672.3	0.513	8.8	0.641	11	250	1.4	7.4	1.2	17	286	1.0
1673.0	0.513	9.1	0.454	11	238	1.4	7.4	0.828	17	272	1.0
1673.7	0.584	11	0.815	15	242	1.3	8.4	1.5	23	277	0.920
1674.4	0.513	8.0	0.865	15	273	1.8	7.4	1.6	23	313	1.3
1675.1	0.513	8.9	0.485	16	253	2.3	7.4	0.884	24	290	1.7
1675.8	0.513	8.4	0.929	10	246	1.2	7.4	1.7	16	282	0.854
1676.5	0.513	8.4	1.1	13	245	1.2	7.4	2.0	19	280	0.872
1677.2	0.513	10	0.928	14	233	1.4	7.4	1.7	21	267	0.995
1677.9	0.513	10	0.887	11	241	2.4	7.4	1.6	17	276	1.8
1678.6	0.513	9.6	1.4	13	247	1.1	7.4	2.5	21	283	0.798
1679.3	0.513	8.1	0.656	12	228	2.9	7.4	1.2	19	261	2.1
1679.9	0.513	10	0.735	14	286	2.0	7.4	1.3	22	327	1.4
1680.6	0.513	8.0	0.839	15	222	2.5	7.4	1.5	23	254	1.8
1681.3	0.684	9.1	1.2	13	264	1.5	9.9	2.1	20	302	1.1
1682.0	0.513	11	0.795	15	254	1.6	7.4	1.5	23	290	1.1
1682.7	0.513	10.0	0.885	14	228	2.0	7.4	1.6	22	260	1.5
1683.4	0.513	9.1	0.839	15	244	1.8	7.4	1.5	24	279	1.3
1684.1	0.513	9.9	0.871	13	226	2.8	7.4	1.6	20	259	2.1
1684.8	0.513	8.3	1.1	15	226	1.7	7.4	2.0	23	259	1.2
1685.5	0.513	8.3	0.985	15	244	1.9	7.4	1.8	24	279	1.4
1686.2	0.513	12	0.762	15	237	2.6	7.4	1.4	22	271	1.9
1686.9	0.513	11	0.991	13	220	2.5	7.4	1.8	19	251	1.8
1687.6	0.513	11	0.715	15	225	2.8	7.4	1.3	23	257	2.1
1688.3	0.513	9.5	0.848	17	208	2.3	7.4	1.5	26	237	1.7
1689.0	0.513	13	1.3	17	238	2.7	7.4	2.5	26	273	2.0
1689.7	0.513	10	0.883	20	233	2.2	7.4	1.6	31	267	1.6
1690.4	0.513	11	0.813	21	237	2.6	7.4	1.5	32	272	1.9
1691.1	0.513	12	0.750	20	210	2.1	7.4	1.4	31	240	1.6
1691.8	0.513	12	0.652	19	222	2.3	7.4	1.2	29	254	1.6
1692.5	0.513	12	1.3	20	213	2.0	7.4	2.4	31	244	1.5
1693.2	0.552	12	0.956	21	203	2.1	8.0	1.7	32	232	1.5
1693.9	0.513	13	0.924	22	239	2.0	7.4	1.7	33	273	1.5



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
1694.6	0.513	12	0.728	25	246	1.8	7.4	1.3	38	281	1.3
1695.3	0.513	9.1	0.955	20	203	2.3	7.4	1.7	31	232	1.7
1696.0	0.513	12	1.1	22	224	1.9	7.4	2.1	34	256	1.4
1696.7	0.513	14	1.1	24	230	2.4	7.4	2.0	37	263	1.8
1697.4	0.513	11	1.1	22	218	3.1	7.4	2.0	33	249	2.3
1698.1	0.619	11	1.5	19	223	2.5	8.9	2.7	28	255	1.8
1698.8	0.513	11	1.3	26	214	3.5	7.4	2.4	40	245	2.5
1699.5	0.513	12	1.3	29	239	2.2	7.4	2.3	44	274	1.6
1700.2	0.513	14	0.971	26	216	1.8	7.4	1.8	39	247	1.3
1700.9	0.682	12	0.940	25	219	2.8	9.8	1.7	39	250	2.0
1701.6	0.767	9.6	1.1	31	231	3.4	11	2.0	47	264	2.5
1702.3	0.513	16	0.934	26	207	1.9	7.4	1.7	40	237	1.4
1703.0	0.513	12	1.2	31	234	2.5	7.4	2.2	48	268	1.8
1703.7	0.513	11	0.965	24	202	1.7	7.4	1.8	36	231	1.3
1704.4	0.513	14	1.5	30	223	2.2	7.4	2.8	46	255	1.6
1705.1	0.753	13	1.1	28	208	3.4	11	2.0	43	238	2.5
1705.8	0.513	14	1.2	29	186	1.6	7.4	2.2	44	213	1.2
1706.5	0.591	15	1.5	36	211	2.4	8.5	2.8	55	241	1.7
1707.1	0.767	14	1.4	29	251	2.8	11	2.6	44	287	2.0
1707.8	0.513	13	1.3	37	277	2.5	7.4	2.3	56	316	1.8
1708.5	0.568	14	1.9	33	211	2.3	8.2	3.5	50	242	1.7
1709.2	0.593	16	1.6	37	213	1.8	8.6	3.0	57	244	1.3
1709.9	0.575	18	1.3	34	243	3.4	8.3	2.4	53	278	2.5
1710.6	0.513	17	1.5	34	212	1.4	7.4	2.8	52	242	0.996
1711.3	0.513	16	1.4	34	273	2.8	7.4	2.6	52	312	2.0
1712.0	0.513	14	1.8	34	220	3.2	7.4	3.3	51	251	2.3
1712.7	0.513	15	2.1	32	216	3.3	7.4	3.8	49	247	2.4
1713.4	0.518	16	1.5	33	218	3.9	7.5	2.7	50	249	2.9
1714.1	0.513	15	1.6	30	249	2.4	7.4	2.9	45	284	1.8
1714.8	0.513	16	1.9	36	224	2.3	7.4	3.4	55	256	1.7
1715.5	0.513	14	1.7	36	217	1.8	7.4	3.0	55	249	1.3
1716.2	0.513	16	2.0	34	207	1.8	7.4	3.7	52	237	1.3
1716.9	0.513	14	1.6	31	209	2.5	7.4	3.0	48	239	1.9
1717.6	0.513	12	1.8	39	215	1.8	7.4	3.4	59	246	1.3
1718.3	0.513	14	2.1	34	209	2.6	7.4	3.8	53	239	1.9
1719.0	0.513	15	2.1	28	222	1.9	7.4	3.9	43	253	1.4
1719.7	0.513	18	2.5	30	212	3.1	7.4	4.6	46	242	2.2
1720.4	0.546	15	2.3	38	231	3.2	7.9	4.1	58	264	2.3
1721.1	0.513	17	2.6	34	221	2.6	7.4	4.8	52	253	1.9
1721.8	0.513	12	2.1	31	230	2.1	7.4	3.9	47	264	1.5
1722.5	0.513	16	1.9	32	211	1.6	7.4	3.4	49	241	1.2
1723.2	0.513	16	2.5	34	246	2.1	7.4	4.5	52	282	1.5
1723.9	0.513	14	2.7	34	200	2.3	7.4	5.0	52	229	1.7
1724.6	0.561	16	2.6	36	216	3.8	8.1	4.8	56	246	2.8
1725.3	0.513	16	2.2	36	228	1.7	7.4	4.1	55	261	1.3
1726.0	0.513	16	2.7	41	212	3.2	7.4	4.8	63	242	2.4
1726.7	0.513	14	2.4	34	221	3.1	7.4	4.3	53	253	2.3
1727.4	0.513	17	2.6	35	224	2.2	7.4	4.7	53	256	1.6
1728.1	0.513	16	2.5	35	212	2.5	7.4	4.5	53	243	1.9
1728.8	0.721	17	2.8	43	222	1.9	10	5.1	66	254	1.4
1729.5	0.513	17	2.2	35	204	2.0	7.4	4.1	54	234	1.5
1730.2	0.513	15	2.6	39	198	2.4	7.4	4.7	61	226	1.8
1730.9	0.513	15	2.6	33	245	2.2	7.4	4.7	50	280	1.6
1731.6	0.513	15	2.7	34	220	2.4	7.4	5.0	53	251	1.8
1732.3	0.513	16	3.0	34	248	2.8	7.4	5.5	52	284	2.0
1732.9	0.513	16	2.5	36	242	3.6	7.4	4.6	55	276	2.6
1733.6	0.513	14	2.9	39	224	3.3	7.4	5.3	59	256	2.4
1734.3	0.513	16	2.6	41	264	1.6	7.4	4.7	62	302	1.2
1735.0	0.513	14	2.6	38	224	2.2	7.4	4.8	59	256	1.6
1735.7	0.513	18	2.4	37	227	2.3	7.4	4.3	57	260	1.7
1736.4	0.513	15	2.3	33	246	2.5	7.4	4.2	51	281	1.8
1737.1	0.513	16	2.7	35	211	2.1	7.4	4.9	53	241	1.6
1737.8	0.513	15	2.1	37	211	2.0	7.4	3.8	56	242	1.5
1738.5	0.513	13	2.5	34	216	1.7	7.4	4.6	53	246	1.3
1739.2	0.513	17	2.7	40	224	2.7	7.4	4.9	61	256	1.9
1739.9	0.513	17	2.9	34	218	2.1	7.4	5.4	53	250	1.5
1740.6	0.513	16	2.6	41	232	2.3	7.4	4.7	63	266	1.7
1741.3	0.513	15	2.8	41	218	1.7	7.4	5.0	63	250	1.3
1742.0	0.513	16	2.9	39	225	3.1	7.4	5.3	60	257	2.3
1742.7	0.513	16	2.6	39	224	1.9	7.4	4.7	60	256	1.4
1743.4	0.513	16	2.5	39	228	2.9	7.4	4.5	60	260	2.1
1744.1	0.513	16	2.0	39	214	2.2	7.4	3.6	60	245	1.6
1744.8	0.513	18	2.5	41	221	1.9	7.4	4.6	63	253	1.4
1745.5	0.513	16	2.3	37	228	1.8	7.4	4.2	57	261	1.3
1746.2	0.513	19	2.6	40	222	2.2	7.4	4.8	61	253	1.6
1746.9	0.513	17	2.0	43	230	1.6	7.4	3.7	66	263	1.2
1747.6	0.533	16	2.9	36	196	2.0	7.7	5.3	56	224	1.4
1748.3	0.513	15	3.0	40	239	2.9	7.4	5.5	62	273	2.1
1749.0	0.513	18	2.3	41	269	2.5	7.4	4.2	63	308	1.8
1749.7	0.513	18	2.0	41	259	2.1	7.4	3.6	63	296	1.5
1750.4	0.569	17	2.7	40	218	2.5	8.2	5.0	61	249	1.8



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1751.1	0.615	18	2.9	45	254	3.3	8.9	5.2	69	290	2.4
1751.8	0.513	15	2.5	44	244	3.1	7.4	4.5	67	280	2.3
1752.5	0.513	17	2.3	42	261	2.8	7.4	4.1	64	298	2.1
1753.2	0.513	20	3.4	46	275	2.2	7.4	6.2	71	315	1.6
1753.9	0.513	20	2.7	53	255	1.8	7.4	4.9	82	291	1.3
1754.6	0.513	17	2.6	43	206	1.7	7.4	4.7	66	235	1.3
1755.3	0.513	17	3.2	49	295	3.1	7.4	5.7	75	337	2.3
1756.0	0.513	21	2.2	51	226	2.5	7.4	4.0	78	258	1.8
1756.7	0.513	17	2.4	44	214	2.1	7.4	4.4	67	245	1.5
1757.4	0.513	16	2.2	50	214	1.1	7.4	4.0	76	245	0.795
1758.1	0.513	17	3.4	50	238	1.7	7.4	6.2	77	272	1.3
1758.7	0.566	18	2.5	42	233	2.5	8.2	4.6	65	266	1.9
1759.4	0.513	15	2.7	52	236	3.8	7.4	4.9	80	270	2.8
1760.1	0.513	20	3.1	49	228	2.5	7.4	5.6	75	261	1.8
1760.8	0.513	18	3.3	49	232	2.6	7.4	6.0	74	265	1.9
1761.5	0.513	18	2.8	54	270	2.7	7.4	5.0	82	309	2.0
1762.2	0.513	21	3.2	53	249	2.9	7.4	5.8	81	285	2.1
1762.9	0.513	17	2.5	50	241	3.4	7.4	4.6	76	275	2.4
1763.6	0.513	19	3.0	55	256	1.6	7.4	5.4	84	293	1.2
1764.3	0.785	16	2.7	47	253	2.3	11	4.9	72	289	1.7
1765.0	0.513	15	2.6	55	227	3.4	7.4	4.8	84	259	2.5
1765.7	0.513	15	2.9	46	248	2.9	7.4	5.3	71	283	2.1
1766.4	0.513	18	2.7	44	235	2.0	7.4	4.9	68	268	1.5
1767.1	0.513	19	2.9	49	237	1.5	7.4	5.3	75	271	1.1
1767.8	0.524	19	2.2	50	274	1.8	7.6	4.1	77	313	1.3
1768.5	0.513	21	2.1	51	260	2.8	7.4	3.7	78	297	2.0
1769.2	0.513	17	2.7	50	261	3.0	7.4	5.0	76	299	2.2
1769.9	0.513	19	2.8	51	253	1.9	7.4	5.1	78	290	1.4
1770.6	0.513	19	2.9	51	280	2.7	7.4	5.2	78	320	2.0
1771.3	0.513	22	2.6	49	281	2.3	7.4	4.8	75	322	1.7
1772.0	0.513	17	2.7	54	290	2.6	7.4	4.9	82	332	1.9
1772.7	0.513	17	3.0	46	263	3.3	7.4	5.4	71	301	2.4
1773.4	0.513	16	2.7	54	271	2.0	7.4	4.9	83	310	1.5
1774.1	0.513	16	3.5	61	340	2.8	7.4	6.3	93	389	2.0
1774.8	0.513	15	2.9	58	302	3.3	7.4	5.3	88	345	2.4
1775.5	0.513	15	3.1	57	262	1.8	7.4	5.6	87	300	1.3
1776.2	0.590	17	3.1	49	301	2.5	8.5	5.7	75	345	1.8
1776.9	0.528	16	2.5	54	309	1.8	7.6	4.5	82	353	1.3
1777.6	0.513	16	2.6	55	311	3.1	7.4	4.8	84	355	2.2
1778.3	0.513	18	2.4	47	284	3.1	7.4	4.4	71	325	2.3
1779.0	0.513	15	2.4	41	327	2.7	7.4	4.4	63	374	2.0
1779.7	0.567	14	2.3	49	351	3.2	8.2	4.1	76	401	2.4
1780.4	0.547	15	2.2	43	331	2.3	7.9	4.1	67	378	1.7
1781.1	0.513	19	2.1	52	325	2.2	7.4	3.9	80	371	1.6
1781.8	0.589	15	2.3	48	322	2.4	8.5	4.2	73	368	1.7
1782.5	0.628	13	2.4	40	324	1.7	9.1	4.4	62	370	1.2
1783.2	0.513	13	1.8	40	298	2.4	7.4	3.2	61	341	1.8
1783.9	0.513	14	1.8	38	337	1.7	7.4	3.3	58	385	1.3
1784.6	0.558	15	1.9	39	369	2.0	8.1	3.4	59	422	1.4
1785.2	0.513	13	2.1	29	340	1.5	7.4	3.8	44	389	1.1
1785.9	0.513	13	1.3	31	343	1.6	7.4	2.4	48	392	1.2
1786.6	0.513	13	1.6	26	355	1.3	7.4	2.9	40	406	0.948
1787.3	0.644	13	1.5	23	388	3.1	9.3	2.7	35	443	2.3
1788.0	0.513	13	1.5	35	363	1.4	7.4	2.8	54	416	1.0
1788.7	0.513	13	1.2	21	353	3.3	7.4	2.2	33	403	2.4
1789.4	0.513	11	0.936	24	359	2.3	7.4	1.7	37	411	1.7
1790.1	0.513	13	1.0	20	380	2.0	7.4	1.9	30	434	1.4
1790.8	0.513	11	0.861	21	417	1.9	7.4	1.6	32	477	1.4
1791.5	0.513	12	0.760	22	356	1.2	7.4	1.4	34	407	0.882
1792.2	0.513	13	0.888	18	409	1.4	7.4	1.6	27	467	1.1
1792.9	0.513	13	1.0	18	396	1.5	7.4	1.9	27	453	1.1
1793.6	0.513	12	0.746	15	400	2.8	7.4	1.4	23	457	2.0
1794.3	0.513	11	0.692	19	341	1.5	7.4	1.3	29	390	1.1
1795.0	0.513	11	0.655	16	330	1.7	7.4	1.2	25	378	1.3
1795.7	0.513	10	0.608	22	348	1.8	7.4	1.1	34	397	1.3
1796.4	0.513	13	0.486	18	377	2.0	7.4	0.886	28	431	1.5
1797.1	0.513	9.4	0.692	18	366	1.7	7.4	1.3	27	418	1.3
1797.8	0.513	12	0.690	19	389	1.8	7.4	1.3	29	445	1.3
1798.5	0.513	11	0.709	18	366	1.9	7.4	1.3	27	418	1.4
1799.2	0.605	9.8	0.707	17	362	2.0	8.7	1.3	27	414	1.5
1799.9	0.513	11	0.227	20	349	1.6	7.4	0.414	31	399	1.2
1800.6	0.513	11	0.795	17	368	1.3	7.4	1.4	27	421	0.929
1801.3	0.513	9.6	0.876	17	372	1.5	7.4	1.6	27	426	1.1
1802.0	0.513	13	0.617	16	372	1.3	7.4	1.1	24	425	0.913
1802.7	0.785	12	0.670	17	370	1.9	11	1.2	25	423	1.4
1803.4	0.513	12	0.772	21	423	2.4	7.4	1.4	33	484	1.8
1804.1	0.513	9.7	0.564	18	345	1.8	7.4	1.0	28	395	1.3
1804.8	0.513	9.1	0.664	21	464	2.0	7.4	1.2	33	530	1.4
1805.5	0.513	10	0.324	19	368	2.2	7.4	0.591	29	420	1.6
1806.2	0.513	11	0.461	19	345	1.7	7.4	0.840	29	394	1.2
1806.9	0.513	14	0.686	19	327	2.1	7.4	1.3	29	374	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1807.6	0.605	11	0.436	19	371	1.4	8.7	0.795	29	424	1.0
1808.3	0.513	8.8	0.627	18	303	1.8	7.4	1.1	28	347	1.3
1809.0	0.513	10	0.553	21	361	1.5	7.4	1.0	33	413	1.1
1809.7	0.513	11	0.683	24	360	2.3	7.4	1.2	37	412	1.7
1810.4	0.513	9.1	0.600	18	364	1.2	7.4	1.1	27	416	0.855
1811.1	0.513	11	0.677	22	398	1.5	7.4	1.2	34	455	1.1
1811.7	0.543	9.7	0.635	17	369	1.8	7.8	1.2	26	422	1.3
1812.4	0.626	12	0.615	18	346	2.3	9.0	1.1	28	396	1.7
1813.1	0.513	12	0.457	18	374	2.0	7.4	0.834	27	427	1.5
1813.8	0.513	11	0.470	19	380	1.1	7.4	0.857	30	434	0.788
1814.5	0.513	10	0.622	17	327	1.7	7.4	1.1	27	374	1.2
1815.2	0.543	13	0.365	16	385	1.1	7.8	0.666	24	440	0.800
1815.9	0.926	12	0.690	19	405	2.2	13	1.3	28	463	1.6
1816.6	0.513	12	0.487	13	338	1.4	7.4	0.887	21	386	1.0
1817.3	0.513	12	0.521	16	386	1.6	7.4	0.950	24	442	1.2
1818.0	0.513	11	0.583	14	365	0.854	7.4	1.1	22	418	0.623
1818.7	0.513	9.3	0.391	15	344	2.6	7.4	0.713	23	394	1.9
1819.4	0.513	9.7	0.424	16	368	1.4	7.4	0.774	24	420	1.1
1820.1	0.513	9.9	0.433	14	315	2.0	7.4	0.790	22	360	1.5
1820.8	0.634	7.5	0.548	13	329	1.9	9.1	0.999	20	376	1.4
1821.5	0.513	9.9	0.597	14	363	1.9	7.4	1.1	21	415	1.4
1822.2	0.572	10	0.479	12	408	2.2	8.3	0.874	18	466	1.6
1822.9	0.513	11	0.428	13	328	1.2	7.4	0.781	20	376	0.848
1823.6	0.513	10	0.424	13	347	1.8	7.4	0.773	20	397	1.3
1824.3	0.513	8.9	0.327	11	312	1.9	7.4	0.596	18	357	1.4
1825.0	0.513	8.0	0.440	9.5	315	1.7	7.4	0.803	15	360	1.2
1825.7	0.513	11	0.625	10	379	1.1	7.4	1.1	16	433	0.770
1826.4	0.513	9.8	0.229	9.0	315	1.9	7.4	0.419	14	360	1.4
1827.1	0.513	7.7	0.685	8.4	317	1.1	7.4	1.2	13	362	0.800
1827.8	0.513	10	0.644	9.2	331	2.2	7.4	1.2	14	379	1.6
1828.5	0.513	9.5	0.480	7.8	377	1.4	7.4	0.875	12	431	1.0
1829.2	0.555	10	0.166	7.7	323	1.4	8.0	0.303	12	369	1.0
1829.9	0.951	11	0.164	9.3	320	1.2	14	0.300	14	366	0.884
1830.6	0.557	8.9	0.318	9.0	308	1.4	8.0	0.580	14	352	1.0
1831.3	0.513	9.7	0.329	7.7	319	2.4	7.4	0.599	12	365	1.7
1832.0	0.513	9.3	0.435	8.7	305	1.4	7.4	0.794	13	349	1.0
1832.7	0.513	8.1	0.424	7.7	286	1.1	7.4	0.773	12	327	0.814
1833.4	0.513	8.3	0.427	9.3	370	1.4	7.4	0.779	14	424	1.0
1834.1	0.513	10.0	0.410	8.9	286	0.944	7.4	0.747	14	327	0.689
1834.8	0.513	8.4	0.278	7.4	345	2.1	7.4	0.507	11	394	1.6
1835.5	0.642	12	0.357	9.7	345	1.4	9.3	0.651	15	395	0.997
1836.2	0.513	10	0.311	7.8	281	1.2	7.4	0.568	12	321	0.860
1836.9	0.513	10	0.377	7.6	298	1.7	7.4	0.687	12	341	1.3
1837.6	0.513	9.1	0.448	8.2	294	1.0	7.4	0.817	13	336	0.751
1838.2	0.513	9.9	0.512	9.9	315	1.8	7.4	0.934	15	360	1.3
1838.9	0.513	9.7	0.360	10	287	0.688	7.4	0.656	16	328	0.502
1839.6	0.513	11	0.403	7.8	266	0.837	7.4	0.736	12	305	0.610
1840.3	0.513	8.8	0.644	8.1	250	1.1	7.4	1.2	12	285	0.784
1841.0	0.513	9.6	0.668	8.7	268	0.643	7.4	1.2	13	307	0.469
1841.7	0.513	8.9	0.459	9.5	263	1.5	7.4	0.837	15	301	1.1
1842.4	0.655	12	0.500	9.8	278	1.6	9.5	0.913	15	318	1.2
1843.1	0.513	12	0.443	11	266	1.6	7.4	0.808	17	305	1.1
1843.8	0.513	11	0.759	11	273	1.2	7.4	1.4	18	313	0.906
1844.5	0.513	11	0.571	11	279	1.6	7.4	1.0	16	319	1.2
1845.2	0.513	10	0.682	10	246	1.4	7.4	1.2	16	281	1.0
1845.9	0.513	26	0.510	11	292	1.9	7.4	0.930	17	334	1.4
1846.6	0.695	13	0.839	12	263	1.8	10	1.5	19	301	1.3
1847.3	0.513	13	0.888	9.7	256	0.696	7.4	1.6	15	293	0.508
1848.0	0.513	10	0.773	13	293	1.8	7.4	1.4	20	335	1.3
1848.7	0.513	13	1.1	14	240	1.3	7.4	2.0	22	275	0.921
1849.4	0.513	14	0.660	14	308	1.7	7.4	1.2	22	353	1.2
1850.1	0.513	14	1.3	15	248	1.3	7.4	2.3	23	283	0.983
1850.8	0.513	13	1.4	15	267	1.4	7.4	2.6	24	305	1.0
1851.5	0.521	14	1.5	17	293	1.6	7.5	2.8	26	335	1.2
1852.2	0.513	15	1.7	20	269	1.6	7.4	3.0	31	308	1.2
1852.9	0.513	14	1.2	17	248	3.0	7.4	2.1	27	284	2.2
1853.6	0.513	15	1.5	23	244	2.2	7.4	2.7	35	279	1.6
1854.3	0.513	17	1.6	20	234	2.7	7.4	2.9	30	268	1.9
1855.0	0.513	15	2.1	18	241	2.3	7.4	3.9	27	275	1.7
1855.7	0.513	13	2.2	20	241	1.8	7.4	4.0	31	275	1.3
1856.4	0.513	14	1.6	21	228	1.9	7.4	2.9	33	261	1.4
1857.1	0.513	15	2.6	23	242	1.6	7.4	4.7	35	276	1.2
1857.8	0.513	13	2.3	25	251	1.7	7.4	4.2	39	287	1.3
1858.5	0.513	14	2.0	21	263	2.9	7.4	3.7	32	300	2.1
1859.2	0.513	16	2.3	24	267	2.9	7.4	4.1	37	305	2.1
1859.9	0.597	13	2.7	27	244	2.4	8.6	5.0	41	280	1.7
1860.6	0.513	14	2.3	23	257	2.9	7.4	4.1	36	294	2.1
1861.3	0.513	15	3.0	22	257	2.7	7.4	5.4	33	294	2.0
1862.0	0.513	17	2.8	27	310	2.8	7.4	5.1	41	355	2.0
1862.7	0.513	13	2.1	24	277	3.0	7.4	3.9	37	317	2.2
1863.4	0.513	14	2.9	29	282	2.6	7.4	5.3	44	322	1.9



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
1864.0	0.513	14	2.4	30	282	2.0	7.4	4.3	45	322	1.5
1864.7	0.513	15	2.9	23	267	2.5	7.4	5.3	36	305	1.9
1865.4	0.756	15	2.8	33	290	2.6	11	5.1	50	332	1.9
1866.1	0.513	16	3.4	29	319	3.2	7.4	6.3	45	365	2.3
1866.8	0.722	14	3.4	27	300	1.8	10	6.2	41	344	1.3
1867.5	0.513	15	3.0	31	308	4.3	7.4	5.5	48	352	3.2
1868.2	0.513	15	3.0	24	312	2.7	7.4	5.4	37	357	2.0
1868.9	0.513	15	3.4	28	317	2.1	7.4	6.2	43	362	1.5
1869.6	0.513	15	3.0	30	357	3.7	7.4	5.4	47	408	2.7
1870.3	0.513	13	3.1	30	319	2.6	7.4	5.7	46	364	1.9
1871.0	0.513	15	3.5	28	321	2.8	7.4	6.4	43	367	2.1
1871.7	0.513	13	3.7	29	369	3.4	7.4	6.8	44	422	2.5
1872.4	0.513	16	3.2	28	353	2.1	7.4	5.9	43	404	1.5
1873.1	0.513	16	3.3	31	313	2.6	7.4	6.0	47	358	1.9
1873.8	0.513	14	3.1	27	344	3.3	7.4	5.6	41	394	2.4
1874.5	0.513	14	2.8	28	371	2.6	7.4	5.2	43	424	1.9
1875.2	0.707	13	3.0	31	343	3.1	10	5.5	48	392	2.2
1875.9	0.513	16	3.2	32	396	3.9	7.4	5.8	49	453	2.8
1876.6	0.513	14	2.9	30	361	2.3	7.4	5.3	46	413	1.7
1877.3	0.513	14	2.7	25	347	3.3	7.4	4.9	38	397	2.4
1878.0	0.513	15	3.0	30	399	2.6	7.4	5.5	46	456	1.9
1878.7	0.513	17	3.0	35	377	3.4	7.4	5.4	54	431	2.5
1879.4	0.714	16	2.8	28	399	2.9	10	5.1	42	457	2.1
1880.1	0.513	15	2.7	30	400	3.4	7.4	5.0	47	457	2.5
1880.8	0.513	14	3.1	31	422	1.5	7.4	5.7	47	483	1.1
1881.5	0.513	15	3.0	33	388	4.1	7.4	5.5	51	444	3.0
1882.2	0.513	14	2.9	28	415	3.0	7.4	5.3	44	475	2.2
1882.9	0.513	16	2.7	31	413	3.5	7.4	4.9	48	472	2.5
1883.6	0.513	13	2.7	29	453	3.7	7.4	4.9	44	518	2.7
1884.3	0.513	15	2.9	30	404	3.0	7.4	5.2	46	462	2.2
1885.0	0.513	16	3.2	36	451	3.1	7.4	5.9	56	516	2.2
1885.7	0.513	16	2.6	30	448	2.6	7.4	4.8	45	512	1.9
1886.4	0.513	15	2.7	32	417	1.5	7.4	5.0	49	477	1.1
1887.1	0.513	14	2.7	33	416	2.9	7.4	5.0	50	476	2.1
1887.8	0.513	14	1.9	32	425	3.7	7.4	3.4	49	486	2.7
1888.5	0.513	15	2.5	35	464	3.2	7.4	4.5	54	530	2.4
1889.2	0.513	13	2.9	33	404	3.3	7.4	5.2	51	462	2.4
1889.9	0.513	14	2.2	42	439	3.2	7.4	3.9	64	502	2.3
1890.5	0.513	15	2.0	30	429	2.6	7.4	3.7	45	491	1.9
1891.2	0.513	13	2.5	36	424	2.8	7.4	4.5	55	485	2.0
1891.9	0.513	14	2.7	33	431	2.4	7.4	4.8	50	492	1.8
1892.6	0.513	15	2.2	30	446	2.8	7.4	3.9	46	509	2.0
1893.3	0.513	15	2.3	30	446	2.9	7.4	4.2	46	510	2.1
1894.0	0.513	16	2.1	35	436	2.2	7.4	3.8	54	499	1.6
1894.7	0.513	16	1.7	32	455	3.0	7.4	3.0	49	520	2.2
1895.4	0.513	16	1.8	30	497	2.9	7.4	3.2	46	568	2.1
1896.1	0.612	15	1.9	25	463	2.2	8.8	3.4	39	530	1.6
1896.8	0.513	16	2.0	25	408	2.1	7.4	3.6	38	467	1.6
1897.5	0.513	14	1.8	27	437	2.1	7.4	3.3	42	499	1.5
1898.2	0.513	15	2.0	25	404	2.8	7.4	3.7	39	462	2.1
1898.9	0.513	14	1.9	23	442	3.2	7.4	3.4	35	505	2.3
1899.6	0.513	15	1.6	28	426	1.7	7.4	2.9	43	487	1.2
1900.3	0.513	14	1.7	31	423	3.0	7.4	3.1	47	484	2.2
1901.0	0.513	14	1.9	23	442	3.2	7.4	3.5	36	505	2.3
1901.7	0.513	15	1.1	22	387	1.8	7.4	2.0	34	442	1.3
1902.4	0.513	15	1.2	21	393	1.4	7.4	2.2	33	450	1.0
1903.1	0.513	16	1.7	24	417	1.6	7.4	3.1	36	476	1.2
1903.8	0.513	14	1.2	19	402	1.9	7.4	2.1	30	460	1.4
1904.5	0.513	16	1.4	22	433	1.7	7.4	2.6	34	495	1.2
1905.2	0.513	15	1.7	19	415	1.7	7.4	3.2	29	475	1.2
1905.9	0.513	15	1.3	22	454	2.4	7.4	2.3	34	519	1.7
1906.6	0.513	13	1.1	19	416	1.5	7.4	2.0	29	476	1.1
1907.3	0.513	13	0.844	20	379	1.1	7.4	1.5	31	434	0.835
1908.0	0.513	14	0.794	20	379	1.6	7.4	1.4	31	433	1.1
1908.7	0.513	14	1.4	19	426	1.9	7.4	2.5	29	487	1.4
1909.4	0.513	13	1.1	16	359	1.3	7.4	2.0	24	410	0.959
1910.1	0.513	15	1.0	18	445	1.2	7.4	1.9	27	509	0.900
1910.8	0.513	13	0.986	15	337	1.8	7.4	1.8	24	385	1.3
1911.5	0.513	13	0.803	18	404	1.1	7.4	1.5	28	462	0.835
1912.2	0.513	14	0.729	15	342	1.7	7.4	1.3	24	391	1.2
1912.9	0.513	13	0.809	15	351	1.5	7.4	1.5	23	401	1.1
1913.6	0.513	14	1.1	16	399	2.2	7.4	2.0	24	456	1.6
1914.3	0.738	13	0.889	16	359	0.669	11	1.6	24	411	0.488
1915.0	0.513	14	0.736	17	418	2.1	7.4	1.3	26	478	1.5
1915.7	0.557	14	0.605	11	365	1.5	8.0	1.1	16	417	1.1
1916.4	0.513	14	1.2	15	360	2.1	7.4	2.1	24	412	1.5
1917.1	0.513	13	0.843	16	346	1.5	7.4	1.5	25	395	1.1
1917.7	0.513	15	0.678	18	386	1.5	7.4	1.2	28	441	1.1
1918.4	0.513	13	0.726	12	361	1.5	7.4	1.3	19	413	1.1
1919.1	0.513	13	0.525	15	361	1.4	7.4	0.958	23	413	1.0
1919.8	0.723	13	0.555	12	359	1.5	10	1.0	19	410	1.1



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1920.5	0.513	12	0.551	12	386	1.5	7.4	1.0	18	442	1.1
1921.2	0.513	13	0.751	11	334	1.4	7.4	1.4	17	382	1.0
1921.9	0.651	12	0.808	12	356	1.1	9.4	1.5	19	407	0.794
1922.6	0.513	12	0.708	11	341	0.876	7.4	1.3	17	390	0.639
1923.3	0.513	14	0.629	12	344	0.851	7.4	1.1	18	393	0.621
1924.0	0.592	10	0.449	12	352	0.984	8.5	0.819	18	403	0.718
1924.7	0.513	13	0.549	11	355	1.1	7.4	1.0	17	406	0.806
1925.4	0.513	14	0.487	8.8	329	1.1	7.4	0.889	14	376	0.817
1926.1	0.513	14	0.623	10	363	1.7	7.4	1.1	16	415	1.2
1926.8	0.513	12	0.600	11	331	1.2	7.4	1.1	16	378	0.888
1927.5	0.513	13	0.535	9.1	312	1.4	7.4	0.976	14	357	1.0
1928.2	0.573	11	0.521	7.5	329	1.3	8.3	0.949	12	376	0.973
1928.9	0.513	12	0.591	10	346	1.4	7.4	1.1	16	395	1.0
1929.6	0.627	12	0.287	15	321	0.729	9.0	0.524	23	368	0.532
1930.3	0.770	12	0.298	7.9	359	1.5	11	0.543	12	410	1.1
1931.0	0.513	13	0.262	11	387	1.3	7.4	0.477	17	443	0.980
1931.7	0.513	11	0.393	7.4	303	1.7	7.4	0.716	11	347	1.3
1932.4	0.513	11	0.396	7.1	306	0.867	7.4	0.723	11	350	0.633
1933.1	0.513	12	0.357	11	329	1.2	7.4	0.651	17	376	0.853
1933.8	0.513	10	0.371	8.3	350	0.405	7.4	0.677	13	400	0.295
1934.5	0.513	12	0.384	7.5	347	0.629	7.4	0.700	12	397	0.459
1935.2	0.718	13	0.594	5.8	365	1.5	10	1.1	8.9	417	1.1
1935.9	0.513	12	0.356	8.2	305	1.2	7.4	0.649	13	349	0.852
1936.6	0.513	12	0.429	7.2	310	0.890	7.4	0.782	11	354	0.649
1937.3	0.513	11	0.374	7.9	343	1.7	7.4	0.682	12	392	1.3
1938.0	0.513	11	0.398	6.0	347	1.8	7.4	0.726	9.2	397	1.3
1938.7	0.513	12	0.284	5.7	338	1.1	7.4	0.518	8.7	386	0.826
1939.4	0.513	11	0.286	6.4	304	1.6	7.4	0.521	9.8	348	1.2
1940.1	0.513	10	0.406	5.9	317	1.3	7.4	0.741	9.1	362	0.938
1940.8	0.513	9.5	0.251	5.2	309	1.5	7.4	0.458	8.0	353	1.1
1941.5	0.513	11	0.564	6.3	331	0.968	7.4	1.0	9.7	379	0.706
1942.2	0.513	9.0	0.447	4.1	351	1.5	7.4	0.816	6.3	401	1.1
1942.9	0.513	12	0.420	7.1	346	1.1	7.4	0.766	11	395	0.820
1943.6	0.513	9.9	0.296	4.6	318	0.694	7.4	0.540	7.0	363	0.506
1944.2	0.513	6.9	0.437	5.2	357	1.3	7.4	0.797	7.9	408	0.956
1944.9	0.513	10	0.582	4.9	341	1.5	7.4	1.1	7.5	390	1.1
1945.6	0.513	11	0.295	5.3	304	1.1	7.4	0.538	8.1	347	0.793
1946.3	0.570	9.2	0.582	5.5	336	1.2	8.2	1.1	8.4	385	0.898
1947.0	0.513	8.6	0.430	7.2	323	1.5	7.4	0.784	11	369	1.1
1947.7	0.513	8.6	0.555	5.5	318	2.0	7.4	1.0	8.4	363	1.5
1948.4	0.513	9.3	0.583	3.5	342	0.854	7.4	1.1	5.4	391	0.623
1949.1	0.513	10.0	0.444	6.0	296	1.6	7.4	0.809	9.2	338	1.1
1949.8	0.513	10	0.355	4.2	290	1.6	7.4	0.648	6.5	331	1.1
1950.5	0.513	8.4	0.443	4.0	311	1.8	7.4	0.808	6.1	356	1.3
1951.2	0.513	10	0.344	4.9	303	1.0	7.4	0.627	7.5	346	0.730
1951.9	0.513	9.1	0.568	3.5	286	1.4	7.4	1.0	5.3	327	1.0
1952.6	0.513	8.9	0.431	4.3	279	1.5	7.4	0.786	6.6	319	1.1
1953.3	0.513	8.3	0.394	4.0	283	1.8	7.4	0.718	6.2	324	1.3
1954.0	0.513	9.1	0.538	3.9	281	0.661	7.4	0.981	5.9	321	0.482
1954.7	0.513	11	0.601	3.6	301	1.9	7.4	1.1	5.6	344	1.4
1955.4	0.513	10	0.737	3.7	293	1.3	7.4	1.3	5.6	335	0.933
1956.1	0.513	7.3	0.462	4.1	268	1.5	7.4	0.842	6.2	306	1.1
1956.8	0.513	9.2	0.606	2.2	282	1.5	7.4	1.1	3.4	323	1.1
1957.5	0.525	8.8	0.331	4.3	278	1.3	7.6	0.603	6.6	317	0.984
1958.2	0.513	8.9	0.643	3.6	284	1.6	7.4	1.2	5.6	325	1.1
1958.9	0.513	8.3	0.561	3.9	264	1.5	7.4	1.0	5.9	302	1.1
1959.6	0.513	7.2	0.498	2.0	277	1.5	7.4	0.908	3.1	317	1.1
1960.3	0.513	9.7	0.408	3.2	278	1.6	7.4	0.744	4.9	318	1.2
1961.0	0.513	8.1	0.440	3.6	278	1.7	7.4	0.802	5.6	317	1.3
1961.7	0.513	9.0	0.625	3.5	281	1.5	7.4	1.1	5.4	321	1.1
1962.4	0.513	8.4	0.599	4.4	272	1.9	7.4	1.1	6.8	311	1.4
1963.1	0.513	9.1	0.671	3.1	274	1.4	7.4	1.2	4.8	313	1.0
1963.8	0.513	9.1	0.600	3.0	301	1.7	7.4	1.1	4.6	344	1.2
1964.5	0.876	9.5	0.653	3.4	294	1.5	13	1.2	5.2	336	1.1
1965.2	0.513	7.2	0.566	2.9	279	1.5	7.4	1.0	4.5	319	1.1
1965.9	0.513	8.2	0.695	3.9	276	1.5	7.4	1.3	6.0	316	1.1
1966.6	0.513	7.9	0.684	2.8	273	2.1	7.4	1.2	4.3	313	1.5
1967.3	0.513	9.0	0.592	1.6	246	0.807	7.4	1.1	2.5	282	0.589
1968.0	0.841	9.5	0.600	4.7	274	1.5	12	1.1	7.2	314	1.1
1968.7	0.513	7.9	0.582	3.1	269	1.4	7.4	1.1	4.8	307	1.0
1969.4	0.513	8.8	0.707	2.5	269	0.702	7.4	1.3	3.8	308	0.513
1970.1	0.513	7.5	0.882	3.8	285	2.0	7.4	1.6	5.8	326	1.5
1970.7	0.513	8.5	0.435	2.0	280	2.1	7.4	0.793	3.1	321	1.5
1971.4	0.513	9.3	0.490	2.8	268	1.6	7.4	0.894	4.2	306	1.2
1972.1	0.767	9.4	0.946	2.0	311	1.8	11	1.7	3.1	356	1.3
1972.8	0.513	9.7	0.629	2.7	280	1.6	7.4	1.1	4.1	321	1.2
1973.5	0.705	9.4	0.895	4.4	272	2.6	10	1.6	6.8	311	1.9
1974.2	0.513	9.6	0.890	2.3	319	2.0	7.4	1.6	3.6	364	1.5
1974.9	0.513	9.6	0.743	3.4	283	1.6	7.4	1.4	5.3	324	1.2
1975.6	0.513	8.8	0.689	4.5	268	1.8	7.4	1.3	6.9	307	1.3
1976.3	0.513	7.9	1.0	2.9	303	2.1	7.4	1.9	4.4	347	1.5



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1977.0	0.513	9.2	0.746	3.2	317	2.0	7.4	1.4	4.9	363	1.5
1977.7	0.513	8.8	1.0	3.1	290	1.9	7.4	1.8	4.7	332	1.4
1978.4	0.513	9.8	0.784	3.5	322	1.6	7.4	1.4	5.4	368	1.2
1979.1	0.513	8.4	1.1	4.0	244	1.4	7.4	2.1	6.2	279	1.0
1979.8	0.513	9.1	0.969	2.4	274	1.9	7.4	1.8	3.7	314	1.4
1980.5	0.513	8.9	1.1	4.2	298	1.0	7.4	2.0	6.4	340	0.766
1981.2	0.513	10	0.980	2.8	271	1.6	7.4	1.8	4.2	310	1.1
1981.9	0.513	11	1.1	3.4	280	2.0	7.4	2.1	5.3	320	1.5
1982.6	0.513	10	0.943	3.9	281	1.5	7.4	1.7	6.0	321	1.1
1983.3	0.513	9.4	0.908	4.5	279	2.1	7.4	1.7	6.9	319	1.6
1984.0	0.513	8.6	1.2	4.3	284	1.7	7.4	2.2	6.6	325	1.2
1984.7	0.513	9.8	0.844	4.3	263	1.4	7.4	1.5	6.6	301	1.0
1985.4	0.850	11	1.1	3.9	269	1.4	12	2.0	6.0	308	1.1
1986.1	0.534	7.7	1.4	5.1	258	1.1	7.7	2.6	7.9	295	0.786
1986.8	0.513	11	1.1	5.6	271	1.4	7.4	1.9	8.6	310	1.0
1987.5	0.513	9.9	1.0	4.2	272	1.8	7.4	1.9	6.4	311	1.3
1988.2	0.513	10	1.1	6.1	298	0.994	7.4	2.0	9.4	341	0.725
1988.9	0.513	11	1.4	6.0	264	0.932	7.4	2.6	9.1	302	0.680
1989.6	0.513	10	1.4	4.5	251	1.3	7.4	2.5	7.0	286	0.953
1990.3	0.513	12	1.3	5.5	292	1.6	7.4	2.4	8.4	334	1.2
1991.0	0.513	9.8	1.9	5.4	299	1.1	7.4	3.5	8.2	341	0.804
1991.7	0.513	11	1.1	6.1	283	0.542	7.4	1.9	9.4	323	0.395
1992.4	0.513	9.7	1.6	5.7	251	1.1	7.4	2.8	8.7	287	0.809
1993.1	0.513	11	1.3	6.0	296	1.1	7.4	2.4	9.1	338	0.812
1993.8	0.513	11	0.953	7.3	267	1.4	7.4	1.7	11	305	1.0
1994.5	0.890	12	1.3	11	326	1.1	13	2.3	17	372	0.784
1995.2	0.655	12	1.3	7.9	275	0.995	9.5	2.4	12	314	0.726
1995.8	0.513	11	1.4	6.7	305	0.990	7.4	2.6	10	349	0.722
1996.5	0.565	11	1.6	6.8	299	0.310	8.2	2.8	10	342	0.226
1997.2	0.513	9.6	1.4	6.6	273	0.205	7.4	2.5	10	312	0.149
1997.9	0.513	9.9	1.5	5.7	275	0.806	7.4	2.7	8.7	315	0.588
1998.6	0.513	9.8	1.5	7.6	279	0.528	7.4	2.7	12	319	0.385
1999.3	0.513	10	1.4	6.3	267	0.515	7.4	2.5	9.7	305	0.376
2000.0	0.513	9.6	1.3	8.0	293	1.3	7.4	2.5	12	335	0.965
2000.7	0.513	11	1.3	9.5	320	1.4	7.4	2.3	15	366	1.0
2001.4	0.513	10	0.995	7.8	273	0.816	7.4	1.8	12	312	0.595
2002.1	0.513	9.5	1.1	10	284	0.320	7.4	2.0	15	324	0.233
2002.8	0.513	8.3	1.2	6.6	296	0.958	7.4	2.2	10	339	0.699
2003.5	0.513	9.9	1.2	8.4	318	0.654	7.4	2.3	13	364	0.477
2004.2	0.641	11	0.906	9.7	292	1.5	9.3	1.7	15	334	1.1
2004.9	0.604	8.5	1.1	8.2	271	0.702	8.7	2.0	13	310	0.512
2005.6	0.513	12	0.856	7.6	286	0.595	7.4	1.6	12	327	0.434
2006.3	0.513	10	0.782	7.6	243	0.957	7.4	1.4	12	278	0.698
2007.0	0.513	9.4	1.1	8.0	273	0.808	7.4	2.1	12	312	0.590
2007.7	0.513	9.5	1.2	9.7	270	0.315	7.4	2.1	15	309	0.230
2008.4	0.513	7.6	1.1	9.7	260	0.725	7.4	1.9	15	297	0.529
2009.1	0.513	10	0.944	8.6	272	0.640	7.4	1.7	13	311	0.467
2009.8	0.513	8.9	0.709	6.8	278	0.704	7.4	1.3	10	317	0.514
2010.5	0.517	8.7	1.2	7.9	296	0.741	7.5	2.1	12	338	0.540
2011.2	0.513	10.0	1.1	7.6	272	0.636	7.4	2.0	12	312	0.464
2011.9	0.513	9.4	0.607	7.7	235	0.666	7.4	1.1	12	268	0.486
2012.6	0.539	8.8	0.763	6.7	245	0.395	7.8	1.4	10	280	0.288
2013.3	0.513	8.8	0.578	8.1	276	0.658	7.4	1.1	12	315	0.480
2014.0	0.513	9.7	0.763	7.4	270	0.746	7.4	1.4	11	308	0.545
2014.7	0.513	9.2	0.756	7.0	242	0.587	7.4	1.4	11	277	0.428
2015.4	0.513	8.9	1.0	8.9	317	0.632	7.4	1.8	14	363	0.461
2016.1	0.554	9.4	0.854	7.5	275	1.2	8.0	1.6	12	314	0.890
2016.8	0.631	7.9	0.870	5.0	245	1.2	9.1	1.6	7.7	280	0.840
2017.5	0.513	9.7	0.817	7.8	269	1.1	7.4	1.5	12	307	0.795
2018.2	0.513	8.5	0.887	7.4	270	0.801	7.4	1.6	11	309	0.585
2018.9	0.513	8.7	0.583	5.2	222	0.824	7.4	1.1	7.9	254	0.601
2019.6	0.513	12	0.615	5.5	265	0.540	7.4	1.1	8.5	302	0.394
2020.3	0.570	8.8	0.690	6.3	253	1.0	8.2	1.3	9.6	290	0.763
2021.0	0.513	7.9	0.570	5.6	271	0.652	7.4	1.0	8.5	310	0.476
2021.6	0.513	11	0.569	6.3	256	0.977	7.4	1.0	9.6	292	0.713
2022.3	0.513	9.0	0.742	6.3	245	0.510	7.4	1.4	9.6	281	0.372
2023.0	0.513	8.4	0.546	4.2	253	0.999	7.4	0.996	6.5	289	0.729
2023.7	0.513	9.2	0.592	5.8	243	0.578	7.4	1.1	8.9	278	0.421
2024.4	0.513	11	0.518	4.2	241	0.826	7.4	0.944	6.5	276	0.602
2025.1	0.525	9.1	0.733	4.5	248	0.752	7.6	1.3	7.0	283	0.549
2025.8	0.513	8.5	0.645	3.2	246	0.735	7.4	1.2	5.0	281	0.536
2026.5	0.667	9.3	0.576	3.5	240	1.0	9.6	1.1	5.4	274	0.739
2027.2	0.714	9.9	0.691	4.2	268	1.1	10	1.3	6.4	307	0.792
2027.9	0.513	9.1	0.770	4.6	236	0.872	7.4	1.4	7.0	270	0.636
2028.6	0.513	9.1	0.335	4.7	253	0.549	7.4	0.611	7.2	289	0.400
2029.3	0.513	9.8	0.605	4.7	224	1.5	7.4	1.1	7.3	256	1.1
2030.0	0.693	9.3	0.399	2.7	243	0.873	10	0.727	4.2	278	0.637
2030.7	0.513	7.2	0.717	3.8	256	1.3	7.4	1.3	5.8	293	0.966
2031.4	0.513	11	0.426	5.0	286	1.2	7.4	0.777	7.7	328	0.908
2032.1	0.513	9.0	0.600	3.4	248	1.0	7.4	1.1	5.2	284	0.740
2032.8	0.513	11	0.386	3.2	277	0.595	7.4	0.704	4.9	316	0.434



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2033.5	0.562	9.3	0.471	2.1	273	1.0	8.1	0.858	3.3	312	0.752
2034.2	0.513	9.1	0.531	5.7	259	0.582	7.4	0.968	8.8	297	0.425
2034.9	0.513	9.8	0.447	3.6	238	1.0	7.4	0.815	5.5	272	0.752
2035.6	0.513	7.6	0.496	2.9	271	1.0	7.4	0.904	4.5	310	0.760
2036.3	0.513	8.2	0.326	2.3	236	1.0	7.4	0.595	3.6	269	0.762
2037.0	0.513	7.8	0.522	2.9	257	0.416	7.4	0.952	4.5	293	0.303
2037.7	0.556	9.7	0.282	3.7	278	1.3	8.0	0.514	5.6	317	0.969
2038.4	0.513	10	0.252	4.2	241	0.597	7.4	0.460	6.5	276	0.436
2039.1	0.734	9.3	0.306	2.2	270	0.718	11	0.558	3.4	309	0.524
2039.8	0.513	9.6	0.420	1.8	261	1.1	7.4	0.767	2.7	298	0.807
2040.5	0.513	8.5	0.474	3.9	275	0.991	7.4	0.865	6.0	314	0.723
2041.2	0.513	8.7	0.374	2.4	340	0.714	7.4	0.681	3.6	389	0.521
2041.9	0.513	9.1	0.236	2.8	254	1.3	7.4	0.431	4.2	291	0.954
2042.6	0.513	8.9	0.409	2.7	289	1.1	7.4	0.746	4.1	331	0.798
2043.3	0.605	9.0	0.316	3.2	233	0.551	8.7	0.576	4.9	266	0.402
2044.0	0.513	8.3	0.238	1.9	252	1.3	7.4	0.434	2.8	288	0.978
2044.7	0.513	9.1	0.370	2.5	251	1.1	7.4	0.675	3.8	287	0.812
2045.4	0.513	9.8	0.226	1.5	255	1.4	7.4	0.413	2.4	291	1.0
2046.1	0.513	7.5	0.228	2.0	258	1.4	7.4	0.415	3.0	295	1.0
2046.8	0.513	9.2	0.445	2.4	239	0.924	7.4	0.812	3.6	273	0.674
2047.4	0.513	8.4	0.437	1.6	263	2.3	7.4	0.796	2.4	301	1.7
2048.1	0.513	9.6	0.421	3.2	261	1.0	7.4	0.769	4.8	299	0.748
2048.8	0.513	9.5	0.404	1.6	235	1.3	7.4	0.737	2.5	268	0.933
2049.5	0.554	8.8	0.418	3.1	282	1.5	8.0	0.762	4.8	322	1.1
2050.2	0.513	10	0.346	3.8	235	1.1	7.4	0.631	5.7	268	0.827
2050.9	0.513	10	0.666	1.4	265	1.5	7.4	1.2	2.1	303	1.1
2051.6	0.513	8.5	0.655	3.8	250	1.2	7.4	1.2	5.9	286	0.870
2052.3	0.513	8.5	0.414	2.6	250	1.6	7.4	0.755	3.9	286	1.2
2053.0	0.513	8.9	0.687	1.6	229	1.2	7.4	1.3	2.5	262	0.909
2053.7	0.513	8.5	0.609	2.9	272	0.957	7.4	1.1	4.5	311	0.698
2054.4	0.603	10	0.796	1.7	256	0.902	8.7	1.5	2.6	293	0.658
2055.1	0.513	8.3	0.678	3.0	250	0.926	7.4	1.2	4.7	285	0.676
2055.8	0.597	7.5	0.587	2.8	267	1.4	8.6	1.1	4.3	305	1.0
2056.5	0.513	9.7	1.1	1.9	283	1.2	7.4	2.0	2.9	324	0.865
2057.2	0.513	8.9	0.545	2.1	242	1.8	7.4	0.994	3.3	277	1.3
2057.9	0.513	7.8	0.630	3.3	251	1.4	7.4	1.1	5.1	287	1.0
2058.6	0.513	9.1	0.782	1.9	230	1.5	7.4	1.4	2.9	263	1.1
2059.3	0.513	7.4	0.617	2.2	223	0.905	7.4	1.1	3.4	255	0.660
2060.0	0.513	7.3	0.508	1.7	232	1.2	7.4	0.926	2.6	266	0.882
2060.7	0.513	8.8	0.822	3.4	234	1.0	7.4	1.5	5.1	268	0.733
2061.4	0.513	8.9	0.635	2.0	237	1.4	7.4	1.2	3.0	271	1.1
2062.1	0.659	10	0.954	2.8	233	1.0	9.5	1.7	4.3	266	0.730
2062.8	0.513	7.7	0.915	3.7	224	1.0	7.4	1.7	5.7	256	0.754
2063.5	0.513	8.3	1.1	4.6	244	1.3	7.4	2.0	7.0	279	0.921
2064.2	0.513	7.8	1.1	3.3	255	1.4	7.4	2.1	5.0	292	1.1
2064.9	0.513	8.9	0.866	3.5	235	0.904	7.4	1.6	5.3	268	0.659
2065.6	0.513	7.4	1.4	3.7	252	0.852	7.4	2.5	5.7	288	0.622
2066.3	0.513	8.1	0.996	5.3	231	1.4	7.4	1.8	8.2	264	1.0
2067.0	0.513	8.6	0.857	5.5	230	0.322	7.4	1.6	8.5	263	0.235
2067.7	0.513	8.3	1.3	3.8	264	1.4	7.4	2.4	5.9	301	1.0
2068.4	0.513	8.4	1.3	4.1	251	1.2	7.4	2.4	6.3	287	0.909
2069.1	1.0	9.2	1.2	6.1	234	0.915	15	2.2	9.4	268	0.667
2069.8	0.513	7.8	1.1	4.0	218	1.1	7.4	2.1	6.1	250	0.801
2070.5	0.513	6.7	1.3	7.4	274	1.2	7.4	2.3	11	313	0.885
2071.2	0.513	8.5	1.2	6.9	220	0.959	7.4	2.1	11	252	0.700
2071.9	0.513	8.6	0.840	7.7	224	0.877	7.4	1.5	12	257	0.640
2072.6	0.513	8.8	0.991	6.4	219	0.936	7.4	1.8	9.8	250	0.683
2073.3	0.600	6.6	1.1	7.9	219	0.997	8.7	2.0	12	250	0.727
2074.0	0.513	12	1.1	9.6	240	1.4	7.4	2.0	15	274	1.1
2074.6	0.513	10	1.4	8.2	215	0.919	7.4	2.6	13	245	0.671
2075.3	0.513	7.0	1.3	10.0	226	1.3	7.4	2.4	15	258	0.960
2076.0	0.513	11	1.4	9.0	224	0.588	7.4	2.5	14	256	0.429
2076.7	0.513	8.4	1.3	9.2	216	1.1	7.4	2.3	14	247	0.790
2077.4	0.513	8.7	1.2	11	227	0.853	7.4	2.2	17	260	0.623
2078.1	0.759	11	1.0	11	250	1.9	11	1.9	17	286	1.4
2078.8	0.513	8.7	1.3	11	217	0.698	7.4	2.4	17	248	0.510
2079.5	0.513	8.4	1.3	8.9	215	0.850	7.4	2.3	14	246	0.620
2080.2	0.513	10	1.6	14	250	1.1	7.4	3.0	22	286	0.839
2080.9	0.513	8.8	1.1	11	225	1.1	7.4	2.1	17	257	0.773
2081.6	0.513	8.3	1.6	14	242	0.928	7.4	2.9	21	277	0.677
2082.3	0.513	10	1.1	15	220	0.682	7.4	1.9	23	252	0.497
2083.0	0.513	9.6	1.6	13	230	0.750	7.4	2.8	20	263	0.547
2083.7	0.513	10	1.6	17	255	0.216	7.4	2.9	26	292	0.157
2084.4	0.513	9.3	1.2	14	217	0.731	7.4	2.2	21	249	0.533
2085.1	0.513	8.9	1.4	15	222	0.838	7.4	2.6	23	253	0.612
2085.8	0.513	9.2	0.991	15	231	0.983	7.4	1.8	23	264	0.717
2086.5	0.513	7.7	1.5	14	237	0.520	7.4	2.7	22	271	0.380
2087.2	0.513	8.8	1.2	16	219	0.505	7.4	2.2	24	251	0.369
2087.9	0.513	8.8	1.1	18	214	0.675	7.4	2.0	27	245	0.492
2088.6	0.513	10	1.3	17	265	0.931	7.4	2.3	26	303	0.679
2089.3	0.513	10	1.5	20	250	0.321	7.4	2.8	31	286	0.234



Minnow Environmental  
Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2090.0	0.513	9.2	1.3	17	243	0.839	7.4	2.3	26	278	0.612
2090.7	0.513	10	1.1	19	210	0.612	7.4	2.0	29	240	0.447
2091.4	0.513	7.5	1.0	16	229	0.502	7.4	1.9	24	262	0.366
2092.1	0.513	8.1	1.2	18	219	0.824	7.4	2.2	28	251	0.601
2092.8	0.513	8.4	1.3	16	238	0.864	7.4	2.3	24	272	0.631
2093.5	0.513	7.8	1.0	18	246	0.771	7.4	1.9	28	281	0.563
2094.2	0.513	13	1.3	16	216	0.501	7.4	2.4	25	247	0.365
2094.9	0.513	9.3	1.1	19	240	0.783	7.4	2.1	30	274	0.571
2095.6	0.693	11	1.3	19	214	0.387	10	2.3	29	244	0.282
2096.3	0.513	8.4	1.3	20	209	0.348	7.4	2.4	31	239	0.254
2097.0	0.513	10	1.3	18	250	0.507	7.4	2.4	28	286	0.370
2097.7	0.513	8.7	1.1	21	226	0.871	7.4	1.9	32	258	0.636
2098.4	0.513	8.6	1.1	17	232	0.280	7.4	1.9	26	266	0.204
2099.1	0.513	9.0	1.0	20	239	0.784	7.4	1.9	30	273	0.572
2099.8	0.513	8.0	0.860	21	253	1.1	7.4	1.6	32	289	0.800
2100.5	0.513	11	0.828	21	232	0.937	7.4	1.5	32	265	0.684
2101.1	0.513	11	0.793	19	227	0.598	7.4	1.4	29	260	0.436
2101.8	0.786	8.4	0.856	20	221	0.305	11	1.6	30	253	0.222
2102.5	0.513	8.8	0.851	19	221	0.520	7.4	1.6	29	253	0.379
2103.2	0.675	9.2	0.884	21	226	0.204	9.7	1.6	33	258	0.149
2103.9	0.513	8.6	0.438	19	233	0.908	7.4	0.798	29	267	0.663
2104.6	0.513	12	0.924	18	226	0.873	7.4	1.7	28	258	0.637
2105.3	0.513	9.1	0.795	20	225	0.583	7.4	1.5	31	257	0.425
2106.0	0.513	8.5	0.835	17	223	0.736	7.4	1.5	27	255	0.537
2106.7	0.513	9.2	0.641	19	263	0.402	7.4	1.2	29	301	0.293
2107.4	0.513	9.4	0.816	15	221	0.398	7.4	1.5	23	253	0.291
2108.1	0.513	10.0	0.522	17	226	1.1	7.4	0.952	26	258	0.799
2108.8	0.513	8.1	0.728	16	223	1.0	7.4	1.3	25	256	0.757
2109.5	0.513	9.9	0.739	15	232	1.0	7.4	1.3	22	266	0.765
2110.2	0.513	8.8	0.813	15	229	1.3	7.4	1.5	23	262	0.971
2110.9	0.513	9.5	0.610	18	225	0.515	7.4	1.1	28	258	0.376
2111.6	0.513	7.7	0.545	14	224	0.415	7.4	0.993	21	256	0.303
2112.3	0.513	11	0.439	13	223	1.7	7.4	0.800	21	255	1.2
2113.0	0.513	9.6	0.695	15	239	1.1	7.4	1.3	23	274	0.768
2113.7	0.513	10	0.586	16	262	1.5	7.4	1.1	24	299	1.1
2114.4	0.513	9.7	0.850	15	226	0.911	7.4	1.6	24	258	0.665
2115.1	0.513	9.5	0.439	13	236	0.303	7.4	0.801	21	270	0.221
2115.8	0.699	8.8	0.468	11	223	0.683	10	0.853	17	255	0.499
2116.5	0.513	8.6	0.660	11	254	1.2	7.4	1.2	17	290	0.848
2117.2	0.513	11	0.563	12	212	0.952	7.4	1.0	18	243	0.695
2117.9	0.513	9.7	0.582	12	244	0.392	7.4	1.1	18	280	0.286
2118.6	0.513	9.3	0.439	15	225	1.2	7.4	0.801	22	257	0.843
2119.3	0.513	8.7	0.579	11	235	0.978	7.4	1.1	17	269	0.714
2120.0	0.621	11	0.611	10	225	1.2	9.0	1.1	16	257	0.904
2120.7	0.513	8.6	0.696	10	231	1.1	7.4	1.3	16	265	0.793
2121.4	0.513	10	0.280	9.3	219	1.2	7.4	0.511	14	250	0.890
2122.1	0.513	9.4	0.383	10	225	1.1	7.4	0.698	16	258	0.790
2122.8	0.527	11	0.659	9.0	229	0.676	7.6	1.2	14	261	0.493
2123.5	0.513	11	0.533	8.7	229	0.915	7.4	0.972	13	262	0.668
2124.2	0.693	11	0.480	9.1	220	0.947	10.0	0.876	14	251	0.691
2124.9	0.513	11	0.470	9.2	233	1.2	7.4	0.858	14	266	0.903
2125.6	0.513	11	0.492	9.4	225	1.3	7.4	0.897	14	258	0.974
2126.3	0.513	9.2	0.398	7.7	236	0.871	7.4	0.726	12	270	0.635
2126.9	0.513	9.1	0.506	7.6	227	0.740	7.4	0.922	12	260	0.540
2127.6	0.559	9.9	0.571	6.2	223	0.837	8.1	1.0	9.5	255	0.610
2128.3	0.799	14	0.744	6.3	213	0.771	12	1.4	9.6	243	0.562
2129.0	0.513	8.3	0.378	5.1	260	1.4	7.4	0.688	7.9	297	1.1
2129.7	0.513	10	0.719	6.9	237	0.918	7.4	1.3	11	271	0.670
2130.4	0.513	11	0.289	5.5	223	0.838	7.4	0.527	8.4	255	0.611
2131.1	0.513	9.5	0.624	7.0	224	0.843	7.4	1.1	11	256	0.615
2131.8	0.513	7.9	0.353	5.9	236	0.719	7.4	0.644	9.1	270	0.525
2132.5	0.513	7.7	0.790	5.2	262	0.818	7.4	1.4	8.0	300	0.597
2133.2	0.513	10	0.542	6.0	237	1.0	7.4	0.989	9.1	271	0.755
2133.9	0.513	8.3	0.621	6.0	230	1.5	7.4	1.1	9.2	263	1.1
2134.6	0.513	8.8	0.475	5.5	226	1.4	7.4	0.866	8.4	258	0.987
2135.3	0.513	10	0.433	5.3	232	1.8	7.4	0.789	8.0	265	1.3
2136.0	0.513	8.6	0.440	6.5	241	1.8	7.4	0.802	9.9	275	1.3
2136.7	0.513	9.2	0.474	5.6	246	0.436	7.4	0.865	8.6	282	0.318
2137.4	0.513	11	0.437	5.5	240	0.908	7.4	0.798	8.5	275	0.662
2138.1	0.545	8.0	0.547	6.1	228	1.5	7.9	0.997	9.4	261	1.1
2138.8	0.513	10	0.708	8.8	240	2.5	7.4	1.3	13	274	1.8
2139.5	0.513	7.6	0.471	7.3	232	1.7	7.4	0.859	11	265	1.2
2140.2	0.513	8.9	0.703	4.9	247	1.8	7.4	1.3	7.4	282	1.3
2140.9	0.542	9.3	0.431	6.6	233	1.3	7.8	0.787	10	267	0.944
2141.6	0.513	8.1	0.706	7.0	219	0.801	7.4	1.3	11	250	0.584
2142.3	0.513	7.8	0.455	8.2	222	1.6	7.4	0.830	13	254	1.2
2143.0	0.513	9.4	1.2	6.4	247	1.6	7.4	2.1	9.8	282	1.1
2143.7	0.513	9.0	0.843	8.4	222	2.4	7.4	1.5	13	254	1.7
2144.4	0.513	8.5	0.666	7.4	231	1.5	7.4	1.2	11	264	1.1
2145.1	0.513	10	0.891	10	225	1.5	7.4	1.6	16	257	1.1
2145.8	0.513	8.8	0.842	6.6	217	1.1	7.4	1.5	10	248	0.793



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Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2146.5	0.513	9.6	1.1	9.1	261	1.4	7.4	2.1	14	299	0.997
2147.2	0.513	10	1.3	9.8	221	2.1	7.4	2.4	15	253	1.5
2147.9	0.513	8.6	1.2	9.6	253	1.0	7.4	2.2	15	289	0.749
2148.6	0.513	10	1.3	10	241	1.4	7.4	2.3	15	276	1.0
2149.3	0.513	8.4	1.1	12	229	1.5	7.4	1.9	19	262	1.1
2150.0	0.513	9.7	1.7	14	242	1.4	7.4	3.0	22	277	0.995
2150.7	0.513	9.3	1.4	13	219	1.7	7.4	2.5	20	250	1.2
2151.4	0.513	8.3	1.5	15	216	1.6	7.4	2.6	23	247	1.1
2152.0	0.513	8.9	1.1	15	253	1.1	7.4	1.9	23	290	0.814
2152.7	0.615	8.5	1.0	17	236	1.7	8.9	1.9	26	270	1.3
2153.4	0.513	11	1.7	16	234	1.6	7.4	3.1	24	268	1.1
2154.1	0.534	9.4	1.5	18	235	1.4	7.7	2.7	27	268	1.0
2154.8	0.513	8.5	1.2	16	222	0.680	7.4	2.2	24	254	0.496
2155.5	0.513	8.8	1.3	18	226	1.1	7.4	2.4	27	258	0.815
2156.2	0.513	9.9	1.1	16	229	1.1	7.4	2.1	24	262	0.801
2156.9	0.513	9.0	1.3	16	220	1.7	7.4	2.3	25	252	1.2
2157.6	0.513	9.4	1.0	20	215	0.582	7.4	1.9	30	246	0.424
2158.3	0.513	8.6	1.2	20	216	2.3	7.4	2.1	30	247	1.6
2159.0	0.513	9.4	1.3	22	230	1.5	7.4	2.4	33	263	1.1
2159.7	0.513	8.5	1.1	18	246	0.876	7.4	2.1	27	281	0.639
2160.4	0.513	10	1.4	19	215	0.846	7.4	2.6	30	245	0.617
2161.1	0.536	10	1.5	22	217	1.1	7.7	2.8	33	248	0.789
2161.8	0.513	8.6	0.913	23	227	0.928	7.4	1.7	35	260	0.677
2162.5	0.513	8.2	1.1	24	223	0.186	7.4	2.0	36	255	0.136
2163.2	0.513	14	1.7	23	232	1.2	7.4	3.0	35	266	0.876
2163.9	0.983	9.8	1.3	23	216	1.3	14	2.3	36	247	0.952
2164.6	0.513	9.2	1.8	27	214	0.551	7.4	3.2	41	245	0.402
2165.3	0.513	7.9	1.5	24	226	0.678	7.4	2.8	36	258	0.495
2166.0	0.513	8.9	1.4	29	235	1.0	7.4	2.6	45	268	0.737
2166.7	0.513	11	1.3	27	231	0.207	7.4	2.4	41	264	0.151
2167.4	0.513	10	1.8	30	224	1.0	7.4	3.3	46	256	0.754
2168.1	0.513	8.9	1.3	27	238	0.295	7.4	2.4	41	272	0.215
2168.8	0.513	8.9	1.5	29	240	0.292	7.4	2.7	44	275	0.213
2169.5	0.513	10	1.3	30	234	0.733	7.4	2.4	46	268	0.535
2170.2	0.513	12	1.4	33	224	0.633	7.4	2.6	50	256	0.462
2170.9	0.513	11	1.3	29	239	0.408	7.4	2.4	44	274	0.297
2171.6	0.513	9.5	1.4	33	211	0.465	7.4	2.6	50	241	0.340
2172.3	0.513	10.0	1.6	31	245	0.900	7.4	2.9	47	280	0.657
2173.0	0.513	9.5	1.5	32	247	0.388	7.4	2.8	48	282	0.283
2173.7	0.513	10	1.4	37	252	1.2	7.4	2.5	57	288	0.844
2174.4	0.567	8.9	1.5	34	226	0.565	8.2	2.8	52	258	0.412
2175.1	0.513	10	1.5	32	223	1.2	7.4	2.7	49	255	0.874
2175.8	0.513	10	1.3	31	223	0.737	7.4	2.4	48	255	0.538
2176.5	0.513	11	1.2	37	222	0.214	7.4	2.1	57	254	0.156
2177.2	0.713	8.8	1.3	33	222	0.540	10	2.3	50	254	0.394
2177.9	0.513	10	1.5	32	222	0.744	7.4	2.7	48	254	0.543
2178.5	0.513	8.6	1.0	36	246	0.319	7.4	1.9	54	281	0.233
2179.2	0.513	8.6	1.2	34	232	0.730	7.4	2.2	52	265	0.532
2179.9	0.513	12	1.4	32	223	0.617	7.4	2.6	49	255	0.450
2180.6	0.517	11	1.0	37	220	0.741	7.5	1.8	57	252	0.541
2181.3	0.521	9.7	0.872	38	224	0.853	7.5	1.6	58	256	0.622
2182.0	0.513	12	1.1	34	232	0.859	7.4	2.1	52	266	0.627
2182.7	0.513	11	0.732	34	219	0.935	7.4	1.3	53	251	0.682
2183.4	0.513	10	0.799	35	230	0.620	7.4	1.5	54	263	0.452
2184.1	0.513	11	0.778	35	214	0.622	7.4	1.4	53	244	0.454
2184.8	0.513	13	0.920	33	232	0.532	7.4	1.7	51	265	0.388
2185.5	0.513	10	0.563	36	223	0.644	7.4	1.0	55	255	0.470
2186.2	0.513	11	1.0	32	231	0.943	7.4	1.9	49	264	0.688
2186.9	0.734	11	0.306	36	218	0.615	11	0.558	55	249	0.449
2187.6	0.513	12	0.696	36	210	0.845	7.4	1.3	56	241	0.616
2188.3	0.513	9.8	0.583	30	202	0.473	7.4	1.1	46	231	0.345
2189.0	0.513	12	0.744	32	231	1.6	7.4	1.4	48	265	1.2
2189.7	0.513	12	1.0	28	231	0.501	7.4	1.8	43	264	0.365
2190.4	0.513	12	0.735	31	218	0.981	7.4	1.3	47	249	0.716
2191.1	0.513	10	0.440	32	236	0.405	7.4	0.803	49	269	0.296
2191.8	0.513	11	0.552	28	226	0.678	7.4	1.0	43	258	0.495
2192.5	0.513	13	0.666	31	229	1.1	7.4	1.2	47	262	0.811
2193.2	0.513	12	0.639	28	209	0.843	7.4	1.2	42	238	0.615
2193.9	0.513	9.5	0.873	28	238	1.6	7.4	1.6	43	272	1.2
2194.6	0.831	12	0.299	30	210	0.701	12	0.545	46	240	0.512
2195.3	0.513	11	0.696	24	218	1.1	7.4	1.3	38	250	0.793
2196.0	0.513	10	0.658	26	226	1.1	7.4	1.2	40	259	0.801
2196.7	0.513	10	0.709	21	222	0.936	7.4	1.3	33	254	0.683
2197.4	0.513	9.1	0.574	18	191	1.0	7.4	1.0	27	218	0.762
2198.1	0.513	11	0.722	18	233	1.2	7.4	1.3	27	267	0.843
2198.8	0.513	9.7	0.595	24	250	1.1	7.4	1.1	37	286	0.807
2199.5	0.513	10	0.707	18	279	0.903	7.4	1.3	28	319	0.658
2200.2	0.513	10	0.890	21	251	1.6	7.4	1.6	31	287	1.2
2200.9	0.513	8.9	0.508	14	221	0.929	7.4	0.926	21	253	0.678
2201.6	0.513	9.6	0.725	16	245	1.5	7.4	1.3	25	281	1.1
2202.3	0.604	10	0.662	20	263	1.8	8.7	1.2	31	300	1.3



Minnow Environmental  
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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2203.0	0.605	11	0.686	16	253	1.5	8.7	1.3	25	290	1.1
2203.7	0.513	9.2	0.601	18	252	2.0	7.4	1.1	27	288	1.4
2204.3	0.753	9.2	0.579	15	231	1.3	11	1.1	23	264	0.929
2205.0	0.513	11	0.487	19	236	1.7	7.4	0.888	28	270	1.2
2205.7	0.650	12	0.696	16	244	1.8	9.4	1.3	24	279	1.3
2206.4	0.513	11	0.596	19	244	1.6	7.4	1.1	29	279	1.2
2207.1	0.513	11	0.622	20	268	2.0	7.4	1.1	30	306	1.5
2207.8	0.533	12	0.623	16	240	2.2	7.7	1.1	25	274	1.6
2208.5	0.513	11	0.836	16	325	2.4	7.4	1.5	24	372	1.7
2209.2	0.583	11	0.764	16	244	1.5	8.4	1.4	24	279	1.1
2209.9	0.513	12	0.710	16	260	1.9	7.4	1.3	24	298	1.4
2210.6	0.513	11	0.605	20	256	1.9	7.4	1.1	30	293	1.4
2211.3	0.513	11	0.516	15	238	1.7	7.4	0.940	23	272	1.2
2212.0	0.513	10	0.771	17	256	0.582	7.4	1.4	25	293	0.424
2212.7	0.513	12	0.839	16	242	1.8	7.4	1.5	25	277	1.3
2213.4	0.513	11	0.639	20	259	1.5	7.4	1.2	31	296	1.1
2214.1	0.513	14	1.0	19	262	2.5	7.4	1.9	29	300	1.8
2214.8	0.513	10	0.772	16	275	1.4	7.4	1.4	24	314	1.0
2215.5	0.513	11	0.910	19	264	1.5	7.4	1.7	29	301	1.1
2216.2	0.513	9.7	0.810	23	264	1.4	7.4	1.5	36	302	1.0
2216.9	0.513	12	1.1	22	250	1.4	7.4	2.0	33	286	0.995
2217.6	0.513	9.6	1.3	20	241	1.4	7.4	2.3	31	276	1.0
2218.3	0.513	9.5	0.928	18	288	2.2	7.4	1.7	28	330	1.6
2219.0	0.513	9.9	0.740	21	274	2.4	7.4	1.3	32	314	1.8
2219.7	0.513	9.5	0.966	22	262	2.3	7.4	1.8	34	300	1.7
2220.4	0.513	11	0.744	28	302	2.4	7.4	1.4	43	346	1.7
2221.1	0.513	11	0.898	26	271	2.0	7.4	1.6	40	310	1.4
2221.8	0.513	12	0.991	23	260	2.8	7.4	1.8	35	297	2.1
2222.5	0.513	10	1.4	26	275	1.4	7.4	2.5	39	315	0.988
2223.2	0.513	15	1.2	32	281	2.6	7.4	2.1	49	321	1.9
2223.9	0.513	10	1.2	27	277	1.7	7.4	2.1	41	317	1.2
2224.6	0.513	11	1.1	25	253	1.6	7.4	1.9	38	289	1.2
2225.3	0.513	9.6	1.2	26	242	1.8	7.4	2.2	40	276	1.3
2226.0	0.513	11	1.1	29	269	2.5	7.4	2.0	44	308	1.8
2226.7	0.818	12	1.3	32	252	2.0	12	2.3	48	288	1.4
2227.4	0.513	12	1.4	35	306	2.3	7.4	2.6	54	350	1.7
2228.1	0.513	11	1.1	33	295	2.2	7.4	2.0	50	337	1.6
2228.8	0.513	14	1.4	33	258	1.6	7.4	2.5	51	295	1.2
2229.5	0.513	12	1.1	37	275	2.1	7.4	2.0	56	314	1.5
2230.2	0.513	12	1.5	35	264	1.5	7.4	2.7	54	302	1.1
2230.8	0.513	11	1.2	38	265	1.3	7.4	2.2	59	303	0.974
2231.5	0.513	12	1.4	32	274	2.3	7.4	2.5	49	314	1.6
2232.2	0.513	10	1.5	35	282	1.1	7.4	2.7	54	322	0.831
2232.9	0.513	13	1.5	39	299	0.943	7.4	2.7	60	342	0.688
2233.6	0.513	12	1.6	37	280	1.4	7.4	2.9	57	320	1.1
2234.3	0.513	14	1.6	36	254	1.6	7.4	2.9	55	290	1.1
2235.0	0.513	11	1.5	37	261	1.2	7.4	2.8	56	299	0.879
2235.7	0.534	12	1.2	36	269	2.2	7.7	2.1	55	308	1.6
2236.4	0.631	16	1.3	44	276	1.5	9.1	2.4	67	316	1.1
2237.1	0.513	11	1.8	44	287	0.849	7.4	3.2	68	328	0.619
2237.8	0.513	9.5	1.5	38	229	1.6	7.4	2.7	58	261	1.1
2238.5	0.513	10	1.4	41	298	1.5	7.4	2.5	62	340	1.1
2239.2	0.513	12	0.981	45	265	0.962	7.4	1.8	69	304	0.702
2239.9	0.513	13	1.3	44	274	1.2	7.4	2.4	67	313	0.863
2240.6	0.513	13	1.3	42	260	1.4	7.4	2.4	64	297	0.986
2241.3	0.513	12	1.3	45	254	1.6	7.4	2.4	69	291	1.2
2242.0	0.513	12	1.2	44	270	1.4	7.4	2.2	68	308	1.1
2242.7	0.513	12	1.2	43	262	1.2	7.4	2.1	66	300	0.867
2243.4	0.513	11	1.0	43	258	1.3	7.4	1.9	65	295	0.930
2244.1	0.513	8.9	1.1	44	266	0.777	7.4	2.0	67	304	0.567
2244.8	0.513	11	1.2	46	291	1.0	7.4	2.2	71	333	0.745
2245.5	0.513	12	1.6	55	281	1.3	7.4	2.8	84	321	0.929
2246.2	0.513	13	1.3	49	260	1.1	7.4	2.4	75	298	0.804
2246.9	0.513	12	1.5	51	259	1.8	7.4	2.7	78	296	1.3
2247.6	0.568	12	1.3	51	281	1.9	8.2	2.3	78	322	1.4
2248.3	0.513	9.9	1.0	44	261	0.815	7.4	1.9	68	298	0.594
2249.0	0.513	11	1.3	46	238	0.762	7.4	2.4	70	273	0.556
2249.7	0.513	12	1.6	52	274	1.4	7.4	3.0	80	313	1.0
2250.4	0.513	12	1.3	47	268	0.860	7.4	2.3	72	307	0.627
2251.1	0.564	10	1.6	55	304	1.3	8.1	2.9	84	347	0.959
2251.8	0.513	11	1.5	45	257	1.8	7.4	2.7	69	294	1.3
2252.5	0.513	11	1.3	45	252	1.4	7.4	2.4	69	288	1.0
2253.2	0.513	11	1.4	46	300	1.5	7.4	2.6	71	344	1.1
2253.9	0.513	12	1.7	52	326	0.669	7.4	3.1	79	373	0.488
2254.6	0.513	11	1.2	48	312	1.3	7.4	2.2	73	357	0.973
2255.3	0.513	11	1.3	41	278	1.3	7.4	2.4	63	318	0.953
2256.0	0.513	10	2.7	45	274	1.0	7.4	4.9	69	313	0.752
2256.7	0.513	11	1.6	44	288	1.1	7.4	2.8	68	330	0.772
2257.3	0.513	11	1.5	48	281	1.3	7.4	2.7	73	322	0.931
2258.0	0.513	8.1	1.4	40	298	1.4	7.4	2.5	62	341	1.0
2258.7	0.513	11	1.2	38	264	1.6	7.4	2.3	59	302	1.2



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2259.4	0.513	9.8	1.5	34	265	0.989	7.4	2.8	52	303	0.722
2260.1	0.513	13	1.8	40	265	1.3	7.4	3.3	62	304	0.956
2260.8	0.513	12	1.9	40	263	1.0	7.4	3.5	61	300	0.740
2261.5	0.513	11	1.6	39	254	1.4	7.4	3.0	60	290	0.997
2262.2	0.513	10	2.2	35	267	1.7	7.4	4.0	53	305	1.2
2262.9	0.513	12	2.2	38	271	1.7	7.4	4.0	58	310	1.2
2263.6	0.513	12	1.5	36	267	0.801	7.4	2.8	55	305	0.585
2264.3	0.513	13	1.6	40	272	1.7	7.4	2.8	62	311	1.2
2265.0	0.514	9.2	1.5	39	269	2.0	7.4	2.7	60	307	1.5
2265.7	0.513	14	1.9	35	284	1.4	7.4	3.4	54	325	1.0
2266.4	0.513	9.4	1.9	32	255	1.6	7.4	3.4	49	291	1.2
2267.1	0.513	13	1.8	34	271	1.2	7.4	3.3	52	310	0.844
2267.8	0.513	11	1.6	31	265	1.3	7.4	2.9	48	304	0.928
2268.5	0.513	12	1.2	30	280	1.7	7.4	2.2	46	321	1.3
2269.2	0.513	12	1.6	31	285	2.0	7.4	3.0	48	326	1.5
2269.9	0.513	10	1.8	32	275	1.0	7.4	3.3	49	314	0.730
2270.6	0.513	11	1.6	32	263	2.3	7.4	2.9	49	301	1.7
2271.3	0.513	9.3	1.7	26	301	2.2	7.4	3.2	41	345	1.6
2272.0	0.653	12	2.0	30	320	1.6	9.4	3.7	46	366	1.2
2272.7	0.513	12	1.1	33	307	1.5	7.4	2.0	50	351	1.1
2273.4	0.513	10	1.6	26	263	0.976	7.4	3.0	40	301	0.712
2274.1	0.513	10	1.3	27	297	1.4	7.4	2.4	42	340	0.986
2274.8	0.513	12	1.4	27	269	1.3	7.4	2.6	42	307	0.951
2275.5	0.513	11	1.4	27	283	0.865	7.4	2.6	41	324	0.631
2276.2	0.513	12	1.3	30	258	1.2	7.4	2.3	45	295	0.855
2276.9	0.513	11	1.8	25	265	1.8	7.4	3.2	38	303	1.3
2277.6	0.513	11	1.7	29	301	2.5	7.4	3.2	45	344	1.8
2278.3	0.513	13	1.5	29	279	1.9	7.4	2.6	44	319	1.4
2279.0	0.513	9.3	1.2	27	274	1.9	7.4	2.3	41	313	1.4
2279.7	0.513	15	1.2	28	264	1.9	7.4	2.2	43	302	1.4
2280.4	0.513	9.5	0.876	28	304	0.428	7.4	1.6	43	348	0.312
2281.1	0.513	12	0.964	23	306	1.6	7.4	1.8	36	350	1.1
2281.8	0.639	13	1.1	27	305	0.956	9.2	2.0	42	349	0.697
2282.5	0.513	15	1.2	34	276	1.7	7.4	2.2	52	316	1.2
2283.1	0.513	14	1.2	26	270	1.4	7.4	2.2	40	309	1.0
2283.8	0.513	12	1.2	28	279	1.4	7.4	2.1	43	319	1.0
2284.5	0.513	15	1.2	27	288	1.5	7.4	2.1	41	329	1.1
2285.2	0.513	12	1.3	24	307	1.5	7.4	2.4	37	351	1.1
2285.9	0.513	15	1.4	28	274	1.5	7.4	2.6	43	313	1.1
2286.6	0.513	11	1.8	26	320	2.6	7.4	3.3	40	366	1.9
2287.3	0.513	10	0.947	31	269	2.4	7.4	1.7	47	307	1.7
2288.0	0.513	11	1.5	33	297	1.5	7.4	2.7	51	340	1.1
2288.7	0.513	14	1.4	32	289	1.4	7.4	2.6	49	331	1.0
2289.4	0.600	13	1.1	31	291	1.7	8.7	2.0	48	333	1.2
2290.1	0.513	13	1.4	29	285	1.8	7.4	2.5	44	326	1.3
2290.8	0.513	13	1.8	33	280	1.2	7.4	3.3	50	320	0.880
2291.5	0.513	11	1.6	32	299	1.8	7.4	3.0	49	342	1.3
2292.2	0.513	12	1.3	33	300	1.6	7.4	2.4	50	343	1.1
2292.9	0.513	12	1.5	33	284	1.8	7.4	2.8	50	324	1.3
2293.6	0.513	14	1.4	40	291	2.0	7.4	2.6	61	333	1.5
2294.3	0.513	12	1.5	33	289	2.7	7.4	2.8	51	330	2.0
2295.0	0.513	13	1.2	35	301	2.1	7.4	2.2	53	344	1.5
2295.7	0.513	13	1.8	35	299	1.8	7.4	3.2	54	342	1.3
2296.4	0.513	11	1.6	38	275	1.5	7.4	2.9	59	314	1.1
2297.1	0.513	12	1.5	37	296	2.6	7.4	2.7	57	339	1.9
2297.8	0.513	11	1.6	40	313	1.5	7.4	2.9	61	357	1.1
2298.5	0.513	12	1.9	39	291	2.1	7.4	3.4	59	332	1.5
2299.2	0.513	12	1.4	40	293	1.6	7.4	2.6	62	335	1.2
2299.9	0.513	12	1.5	41	302	2.1	7.4	2.7	63	345	1.5
2300.6	0.513	14	1.8	36	281	1.4	7.4	3.2	56	321	0.987
2301.3	0.513	11	1.3	45	294	1.2	7.4	2.4	69	337	0.877
2302.0	0.513	12	1.5	39	351	1.6	7.4	2.7	59	401	1.2
2302.7	0.513	12	1.5	41	300	1.4	7.4	2.8	63	344	1.0
2303.4	0.513	14	1.9	43	270	0.778	7.4	3.5	65	308	0.568
2304.1	0.513	12	1.6	45	293	1.2	7.4	3.0	69	335	0.847
2304.8	0.513	15	1.4	47	299	0.906	7.4	2.5	72	342	0.661
2305.5	0.513	11	1.4	41	340	0.776	7.4	2.6	63	388	0.566
2306.2	0.737	12	1.5	44	258	1.1	11	2.8	67	295	0.767
2306.9	0.513	13	1.5	45	279	1.3	7.4	2.8	68	320	0.976
2307.6	0.513	13	1.7	52	301	1.7	7.4	3.2	80	344	1.2
2308.3	0.513	12	1.2	45	270	1.4	7.4	2.3	69	309	1.0
2309.0	0.513	12	1.5	49	288	1.3	7.4	2.7	75	330	0.971
2309.6	0.513	13	1.9	44	295	1.3	7.4	3.5	67	338	0.939
2310.3	0.513	12	1.7	46	277	1.1	7.4	3.0	70	316	0.803
2311.0	0.513	11	1.2	41	304	0.762	7.4	2.2	63	348	0.556
2311.7	0.513	15	1.7	49	282	0.614	7.4	3.1	74	323	0.448
2312.4	0.513	15	1.5	45	274	1.2	7.4	2.8	69	313	0.854
2313.1	0.571	12	1.7	54	308	0.838	8.2	3.1	82	352	0.611
2313.8	0.513	13	1.2	55	286	1.1	7.4	2.1	84	328	0.796
2314.5	0.513	13	1.8	49	262	0.572	7.4	3.3	75	300	0.417
2315.2	0.513	12	2.1	53	285	1.3	7.4	3.8	81	326	0.915



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2315.9	0.513	13	1.6	53	279	1.2	7.4	3.0	82	319	0.872
2316.6	0.513	13	1.4	58	285	1.5	7.4	2.5	89	326	1.1
2317.3	0.513	14	1.6	49	276	1.3	7.4	2.9	76	316	0.917
2318.0	0.513	12	1.6	49	310	0.650	7.4	2.9	76	354	0.474
2318.7	0.513	14	1.6	53	286	1.2	7.4	2.9	81	327	0.868
2319.4	0.513	13	1.4	55	262	1.3	7.4	2.6	84	300	0.941
2320.1	0.513	12	1.6	50	274	0.751	7.4	2.9	76	314	0.548
2320.8	0.820	12	1.5	49	321	0.743	12	2.7	75	367	0.542
2321.5	0.513	12	1.7	49	298	1.7	7.4	3.1	75	341	1.3
2322.2	0.513	15	2.0	59	258	0.647	7.4	3.7	91	295	0.472
2322.9	0.513	14	1.5	53	277	0.929	7.4	2.8	81	316	0.678
2323.6	0.513	12	1.5	61	295	1.1	7.4	2.7	94	337	0.767
2324.3	0.714	15	1.8	60	263	0.799	10	3.3	92	300	0.583
2325.0	0.513	12	1.4	61	262	0.781	7.4	2.6	93	299	0.570
2325.7	0.513	14	1.5	55	272	1.1	7.4	2.8	84	311	0.805
2326.4	0.513	12	1.4	55	265	1.6	7.4	2.6	84	303	1.2
2327.1	0.513	11	1.6	49	286	0.876	7.4	3.0	75	327	0.639
2327.8	0.513	15	1.4	56	261	0.692	7.4	2.6	85	298	0.505
2328.5	0.552	13	1.5	51	290	1.8	8.0	2.8	79	331	1.3
2329.2	0.513	15	1.3	53	287	1.1	7.4	2.4	81	329	0.835
2329.9	0.513	14	1.3	52	261	1.0	7.4	2.4	80	299	0.733
2330.6	0.513	13	1.4	56	265	1.0	7.4	2.5	86	303	0.745
2331.3	0.513	13	1.4	51	290	1.3	7.4	2.6	79	331	0.958
2332.0	0.513	15	1.9	57	297	1.2	7.4	3.4	88	339	0.891
2332.7	0.559	14	1.6	57	273	1.4	8.1	3.0	87	312	1.0
2333.4	0.513	14	1.1	47	278	1.5	7.4	2.0	72	318	1.1
2334.1	0.513	14	1.5	49	270	1.0	7.4	2.7	75	309	0.764
2334.8	0.513	11	1.4	50	252	1.1	7.4	2.6	77	288	0.783
2335.5	0.513	11	0.950	45	228	1.4	7.4	1.7	69	261	1.0
2336.1	0.567	15	1.5	48	269	0.624	8.2	2.7	74	308	0.455
2336.8	0.513	12	1.2	46	265	1.2	7.4	2.2	70	303	0.877
2337.5	0.513	12	1.2	46	270	0.668	7.4	2.2	71	309	0.487
2338.2	0.513	12	1.2	44	265	1.0	7.4	2.1	67	303	0.740
2338.9	0.513	16	1.2	52	330	1.1	7.4	2.2	79	377	0.813
2339.6	0.513	11	1.4	44	248	1.6	7.4	2.6	67	284	1.2
2340.3	0.513	11	1.1	44	221	0.912	7.4	2.0	67	253	0.666
2341.0	0.513	11	1.2	41	242	1.1	7.4	2.2	62	277	0.797
2341.7	0.513	12	1.5	50	271	1.1	7.4	2.7	76	310	0.807
2342.4	0.513	14	1.5	53	258	0.595	7.4	2.8	81	295	0.434
2343.1	0.513	14	1.6	46	277	1.3	7.4	2.9	70	317	0.943
2343.8	0.513	12	1.1	48	266	0.798	7.4	1.9	74	304	0.582
2344.5	0.813	11	1.3	43	262	1.7	12	2.3	66	300	1.2
2345.2	0.513	12	1.4	43	268	1.1	7.4	2.6	65	307	0.815
2345.9	0.513	13	1.2	46	288	0.600	7.4	2.3	71	330	0.438
2346.6	0.513	11	1.4	37	247	0.760	7.4	2.6	57	283	0.554
2347.3	0.513	11	1.1	40	243	0.560	7.4	2.0	61	278	0.409
2348.0	0.513	12	0.826	45	289	0.519	7.4	1.5	69	330	0.378
2348.7	0.513	14	1.3	44	256	1.1	7.4	2.4	67	293	0.824
2349.4	0.513	13	1.3	41	258	0.813	7.4	2.4	62	295	0.594
2350.1	0.513	10	1.1	42	265	0.700	7.4	2.0	65	303	0.511
2350.8	0.513	11	1.2	42	256	0.769	7.4	2.1	65	293	0.561
2351.5	0.513	12	0.929	41	258	1.0	7.4	1.7	62	295	0.747
2352.2	0.513	13	1.1	39	297	1.2	7.4	2.0	60	339	0.848
2352.9	0.513	14	0.977	35	244	1.1	7.4	1.8	53	279	0.838
2353.6	0.513	10	1.0	34	243	0.709	7.4	1.9	51	278	0.517
2354.3	0.513	12	1.5	37	290	1.5	7.4	2.8	57	331	1.1
2355.0	0.513	14	1.5	37	297	1.2	7.4	2.7	57	340	0.853
2355.7	0.513	11	1.2	37	274	0.386	7.4	2.1	57	314	0.282
2356.4	0.513	11	1.2	34	264	0.885	7.4	2.1	53	301	0.646
2357.1	0.513	12	1.3	39	272	1.1	7.4	2.3	59	311	0.773
2357.8	0.513	12	0.924	30	290	1.1	7.4	1.7	46	332	0.811
2358.5	0.513	13	56	38	279	1.8	7.4	102	58	319	1.3
2359.2	0.513	14332	1.0	33	254	1.1	7.4	1.9	51	291	0.768
2359.9	0.513	11	0.729	37	279	1.1	7.4	1.3	57	319	0.824
2360.6	0.513	11	0.910	35	262	1.4	7.4	1.7	53	300	0.999
2361.3	0.513	11	1.1	34	330	0.875	7.4	2.0	51	377	0.638
2361.9	0.513	12	0.998	30	291	1.2	7.4	1.8	45	333	0.856
2362.6	0.513	10	0.848	29	299	0.983	7.4	1.5	45	342	0.717
2363.3	0.513	11	0.928	20	264	1.3	7.4	1.7	31	302	0.974
2364.0	0.513	11	0.988	23	280	0.757	7.4	1.8	35	320	0.553
2364.7	0.513	12	1.1	24	315	1.2	7.4	2.1	37	361	0.848
2365.4	0.783	13	1.2	23	299	2.0	11	2.3	36	342	1.5
2366.1	0.513	11	0.797	23	271	1.5	7.4	1.5	36	310	1.1
2366.8	0.513	9.3	1.1	19	295	1.8	7.4	2.0	29	338	1.3
2367.5	0.513	10	0.867	21	262	1.5	7.4	1.6	31	299	1.1
2368.2	0.513	8.1	0.902	21	308	1.1	7.4	1.6	32	352	0.798
2368.9	0.539	12	0.964	18	307	2.0	7.8	1.8	27	351	1.4
2369.6	0.513	11	1.1	22	289	1.6	7.4	1.9	34	330	1.1
2370.3	0.513	8.2	0.770	16	241	1.1	7.4	1.4	25	276	0.781
2371.0	0.513	10	0.885	16	278	1.6	7.4	1.6	24	318	1.1
2371.7	0.513	10	0.891	17	252	1.4	7.4	1.6	25	288	1.000



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2372.4	0.513	11	0.851	18	287	1.7	7.4	1.6	27	328	1.3
2373.1	0.513	13	0.782	20	301	1.8	7.4	1.4	31	345	1.3
2373.8	0.513	9.8	1.1	22	287	1.7	7.4	2.0	34	328	1.2
2374.5	0.518	12	1.1	24	287	2.0	7.5	2.0	36	328	1.5
2375.2	0.513	11	1.3	25	316	1.2	7.4	2.4	38	361	0.871
2375.9	0.513	11	0.985	20	288	1.8	7.4	1.8	31	329	1.3
2376.6	0.513	11	1.1	19	305	1.7	7.4	2.0	30	349	1.2
2377.3	0.513	12	1.3	19	274	2.2	7.4	2.4	29	313	1.6
2378.0	0.513	12	1.2	22	288	1.9	7.4	2.1	34	330	1.4
2378.7	0.513	10	1.4	20	286	1.7	7.4	2.5	30	327	1.3
2379.4	0.513	12	1.3	26	294	2.1	7.4	2.4	40	336	1.5
2380.1	0.513	11	1.4	25	277	1.1	7.4	2.6	38	317	0.810
2380.8	0.606	11	1.6	23	282	1.1	8.7	3.0	36	323	0.806
2381.5	0.606	12	1.4	25	264	1.9	8.7	2.5	38	302	1.4
2382.2	0.529	11	1.4	24	281	1.6	7.6	2.5	37	321	1.1
2382.9	0.513	10	1.4	25	275	1.3	7.4	2.5	39	314	0.922
2383.6	0.513	13	1.7	28	288	2.4	7.4	3.1	42	329	1.7
2384.3	0.513	12	1.6	27	292	2.2	7.4	3.0	41	333	1.6
2385.0	0.513	12	1.6	31	336	1.5	7.4	3.0	48	384	1.1
2385.7	0.513	12	1.5	32	291	1.5	7.4	2.7	48	333	1.1
2386.4	0.513	13	1.3	31	292	1.9	7.4	2.3	47	334	1.4
2387.1	0.513	13	1.6	36	299	1.2	7.4	2.9	55	342	0.871
2387.8	0.513	13	1.4	31	296	0.939	7.4	2.6	48	339	0.685
2388.4	0.513	14	1.4	37	281	1.6	7.4	2.5	56	321	1.2
2389.1	0.513	13	1.3	37	282	1.5	7.4	2.4	56	322	1.1
2389.8	0.513	12	1.3	33	276	1.2	7.4	2.4	50	316	0.849
2390.5	0.513	12	1.6	32	281	0.957	7.4	3.0	48	321	0.698
2391.2	0.513	14	1.7	35	280	0.889	7.4	3.1	53	320	0.648
2391.9	0.513	14	1.3	36	294	0.826	7.4	2.4	55	337	0.603
2392.6	0.513	12	1.0	40	285	1.2	7.4	1.9	61	325	0.859
2393.3	0.513	11	1.5	43	291	0.671	7.4	2.7	65	333	0.490
2394.0	0.513	12	1.6	35	295	0.614	7.4	2.9	53	337	0.448
2394.7	0.513	14	1.5	37	290	1.8	7.4	2.7	56	331	1.3
2395.4	0.615	13	1.3	39	308	1.2	8.9	2.4	60	353	0.895
2396.1	0.513	13	1.3	39	265	1.3	7.4	2.3	60	303	0.940
2396.8	0.513	14	1.4	41	294	0.590	7.4	2.6	63	337	0.430
2397.5	0.513	13	1.6	34	293	1.0	7.4	2.9	52	335	0.735
2398.2	0.513	12	1.2	42	277	1.0	7.4	2.2	65	317	0.732
2398.9	0.513	12	1.4	43	300	2.1	7.4	2.6	67	343	1.5
2399.6	0.513	13	1.1	38	280	0.692	7.4	2.1	58	321	0.505
2400.3	0.513	12	1.4	42	258	0.777	7.4	2.5	64	295	0.567
2401.0	0.513	13	1.4	45	298	0.941	7.4	2.5	69	341	0.686
2401.7	0.513	13	1.4	40	278	1.0	7.4	2.6	61	317	0.757
2402.4	0.513	14	1.1	38	280	1.0	7.4	2.0	58	320	0.739
2403.1	0.513	13	1.5	38	296	1.2	7.4	2.8	59	338	0.901
2403.8	0.513	12	1.5	43	319	1.4	7.4	2.7	65	365	1.0
2404.5	0.513	13	1.2	38	300	0.810	7.4	2.3	58	343	0.591
2405.2	0.513	14	1.1	39	271	1.3	7.4	2.0	60	310	0.977
2405.9	0.513	12	1.1	44	331	1.0	7.4	2.1	68	378	0.760
2406.6	0.855	14	1.2	34	292	1.2	12	2.2	53	334	0.845
2407.3	0.513	11	1.3	32	272	1.2	7.4	2.5	48	311	0.909
2408.0	0.900	15	1.3	34	307	1.2	13	2.3	53	351	0.907
2408.7	0.513	11	1.4	36	310	0.640	7.4	2.6	55	354	0.467
2409.4	0.513	14	1.1	32	332	1.1	7.4	2.0	50	380	0.806
2410.1	0.720	12	1.3	33	301	1.5	10	2.5	50	344	1.1
2410.8	0.620	11	1.4	30	284	0.721	9.0	2.6	45	324	0.526
2411.5	0.513	14	1.3	28	296	0.748	7.4	2.3	43	339	0.546
2412.2	0.513	13	1.3	29	315	1.9	7.4	2.3	44	360	1.4
2412.9	0.513	12	1.3	33	340	1.6	7.4	2.4	50	389	1.1
2413.6	0.513	10	1.1	24	267	1.2	7.4	2.1	37	305	0.856
2414.2	0.513	13	1.4	29	315	2.0	7.4	2.6	45	360	1.4
2414.9	0.854	14	1.3	29	338	1.8	12	2.3	45	387	1.3
2415.6	0.535	14	0.914	32	327	2.1	7.7	1.7	48	374	1.5
2416.3	0.576	9.9	0.912	25	323	1.6	8.3	1.7	39	370	1.2
2417.0	0.513	12	1.4	24	337	0.854	7.4	2.5	37	385	0.623
2417.7	0.733	13	1.0	24	316	1.1	11	1.9	37	361	0.822
2418.4	0.513	12	1.2	25	325	2.3	7.4	2.1	38	372	1.7
2419.1	0.513	13	1.1	31	343	1.4	7.4	2.0	47	393	1.0
2419.8	0.884	12	1.1	25	361	1.6	13	2.1	38	413	1.2
2420.5	0.820	10	0.966	22	370	1.9	12	1.8	34	423	1.4
2421.2	1.1	11	0.653	29	430	1.7	15	1.2	45	491	1.2
2421.9	0.869	13	0.975	30	370	1.8	13	1.8	47	423	1.3
2422.6	1.1	13	1.1	30	364	1.3	17	2.0	46	416	0.980
2423.3	0.691	12	0.787	27	347	2.6	10.0	1.4	42	397	1.9
2424.0	0.549	11	1.1	25	408	1.8	7.9	2.0	38	467	1.3
2424.7	1.1	14	1.0	31	414	1.9	15	1.9	48	473	1.4
2425.4	1.2	13	0.822	30	383	2.1	18	1.5	46	438	1.5
2426.1	0.987	13	1.0	35	411	1.7	14	1.8	53	470	1.2
2426.8	0.949	11	1.1	31	427	1.7	14	1.9	48	488	1.2
2427.5	0.757	15	1.2	30	450	1.9	11	2.2	46	515	1.4
2428.2	0.898	15	0.966	34	415	2.4	13	1.8	52	474	1.8



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2428.9	1.3	13	1.2	36	508	2.0	19	2.1	55	581	1.5
2429.6	1.6	13	1.0	37	451	1.6	23	1.9	57	516	1.2
2430.3	1.8	11	1.2	34	433	2.3	26	2.2	52	495	1.7
2431.0	1.6	12	0.861	36	470	2.0	23	1.6	55	537	1.5
2431.7	0.925	13	1.4	38	484	2.4	13	2.6	58	553	1.8
2432.4	1.4	15	1.5	43	528	1.2	20	2.8	66	603	0.888
2433.1	1.7	14	1.3	44	527	1.6	24	2.4	67	603	1.2
2433.8	2.0	13	1.6	46	504	2.0	29	2.9	70	576	1.4
2434.5	2.0	17	1.5	42	524	0.848	28	2.8	64	600	0.618
2435.2	2.5	13	1.3	40	508	2.0	36	2.3	61	581	1.4
2435.9	2.1	14	1.5	40	547	2.6	30	2.8	61	626	1.9
2436.6	2.5	16	1.3	46	707	1.4	36	2.3	71	809	1.0
2437.3	2.0	13	1.8	44	696	1.9	29	3.3	67	796	1.4
2438.0	2.5	14	1.7	48	680	2.1	36	3.1	74	777	1.6
2438.7	2.3	15	1.5	48	709	2.0	33	2.7	74	811	1.4
2439.4	2.4	13	1.7	40	713	1.6	34	3.1	62	815	1.2
2440.1	2.1	15	2.0	48	692	2.0	30	3.6	74	791	1.4
2440.7	2.0	12	1.3	45	686	2.3	29	2.4	69	785	1.7
2441.4	2.6	17	2.0	47	776	2.0	38	3.7	72	887	1.5
2442.1	1.9	14	2.1	57	891	1.7	27	3.9	87	1019	1.3
2442.8	1.9	17	1.7	49	844	2.5	27	3.0	76	966	1.8
2443.5	3.1	17	1.5	61	872	2.5	45	2.7	94	997	1.9
2444.2	2.1	16	2.1	59	922	2.4	30	3.8	91	1054	1.8
2444.9	2.8	18	2.1	50	920	2.0	41	3.7	76	1052	1.4
2445.6	2.5	16	2.2	55	937	2.2	36	3.9	85	1072	1.6
2446.3	3.0	16	1.9	52	923	1.4	43	3.4	80	1056	1.1
2447.0	2.7	16	1.8	54	928	1.6	38	3.4	83	1061	1.2
2447.7	2.2	17	2.1	56	917	1.2	32	3.8	86	1049	0.870
2448.4	2.6	16	1.9	55	977	2.0	37	3.5	84	1117	1.4
2449.1	3.3	18	2.1	64	1064	2.4	47	3.9	98	1216	1.8
2449.8	3.1	16	2.0	60	991	2.1	45	3.7	92	1133	1.5
2450.5	3.2	15	2.6	59	1028	1.5	46	4.7	91	1175	1.1
2451.2	2.5	16	2.9	59	1033	1.6	36	5.2	90	1181	1.2
2451.9	2.1	18	2.8	62	1206	2.1	30	5.0	95	1379	1.5
2452.6	2.2	15	2.5	65	1102	1.7	31	4.6	100	1261	1.2
2453.3	3.3	15	2.4	64	1090	1.6	48	4.4	98	1246	1.1
2454.0	2.5	16	2.4	61	1095	1.6	37	4.4	93	1252	1.2
2454.7	2.8	15	2.3	68	1173	3.3	40	4.2	104	1342	2.4
2455.4	2.1	17	2.6	68	1254	2.1	30	4.7	105	1434	1.5
2456.1	2.3	14	2.0	62	1170	2.1	33	3.6	95	1338	1.5
2456.8	3.0	14	2.1	61	1250	2.0	43	3.9	94	1430	1.5
2457.5	3.0	15	2.3	63	1072	1.9	43	4.3	97	1226	1.4
2458.2	3.5	16	2.6	62	1139	1.7	51	4.7	95	1302	1.2
2458.9	2.5	17	2.7	67	1232	3.0	35	4.9	102	1409	2.2
2459.6	3.4	15	3.1	71	1261	3.4	49	5.7	108	1442	2.5
2460.3	2.2	20	2.6	75	1197	1.8	32	4.7	115	1369	1.3
2461.0	3.0	15	2.8	65	1402	0.973	44	5.1	99	1603	0.710
2461.7	3.2	17	3.2	80	1460	3.4	46	5.9	123	1670	2.5
2462.4	3.1	15	2.7	76	1238	2.1	45	5.0	116	1416	1.5
2463.1	2.1	14	3.1	71	1380	1.6	30	5.6	108	1578	1.2
2463.8	1.9	15	3.1	76	1450	2.6	28	5.7	117	1659	1.9
2464.5	2.8	16	2.9	76	1387	2.5	40	5.4	116	1586	1.8
2465.2	2.6	16	3.0	79	1660	2.5	38	5.5	120	1898	1.8
2465.9	2.5	17	3.2	77	1500	2.5	36	5.8	118	1715	1.8
2466.5	3.1	17	3.5	72	1590	2.9	45	6.3	111	1818	2.1
2467.2	3.0	14	3.5	75	1658	1.9	43	6.5	115	1896	1.4
2467.9	2.7	15	3.8	84	1653	3.1	39	7.0	129	1891	2.2
2468.6	2.7	14	3.5	82	1495	2.2	40	6.4	125	1709	1.6
2469.3	3.0	15	3.4	86	1812	2.0	43	6.2	131	2072	1.5
2470.0	1.9	14	3.9	77	1750	3.4	28	7.2	119	2001	2.5
2470.7	3.0	13	3.9	78	1723	2.1	43	7.1	120	1970	1.5
2471.4	3.4	13	4.0	80	1711	2.1	49	7.2	123	1957	1.6
2472.1	2.9	16	3.6	89	1725	2.5	42	6.6	137	1972	1.8
2472.8	2.7	13	3.8	85	1684	2.4	40	7.0	130	1926	1.8
2473.5	2.9	13	3.4	77	1791	1.8	42	6.2	119	2049	1.3
2474.2	2.4	14	3.1	81	1886	1.8	34	5.6	125	2157	1.3
2474.9	2.5	12	4.0	89	2035	2.8	36	7.3	136	2327	2.0
2475.6	2.8	23	4.1	90	1792	3.2	41	7.5	138	2049	2.4
2476.3	1.9	14	4.3	74	1762	2.5	28	7.8	114	2015	1.8
2477.0	3.0	14	4.1	82	1924	2.6	43	7.5	126	2200	1.9
2477.7	2.8	13	4.2	97	1938	3.0	41	7.6	149	2216	2.2
2478.4	2.7	13	3.5	87	1917	1.1	38	6.5	133	2192	0.807
2479.1	2.7	15	4.3	87	1958	2.2	39	7.9	133	2239	1.6
2479.8	2.3	14	4.4	80	1837	2.1	33	8.0	123	2101	1.5
2480.5	2.7	12	3.5	91	1923	2.2	39	6.4	139	2199	1.6
2481.2	2.3	14	4.2	89	2224	2.9	33	7.7	137	2543	2.1
2481.9	2.5	14	4.4	94	2006	2.0	37	8.0	143	2294	1.5
2482.6	2.9	13	4.8	98	2157	2.1	42	8.7	150	2467	1.5
2483.3	2.5	14	5.2	94	2032	1.9	36	9.5	144	2324	1.4
2484.0	2.4	14	4.5	89	2311	2.5	35	8.1	137	2642	1.8
2484.7	3.2	14	5.4	94	1941	2.5	46	9.9	144	2219	1.8



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
2485.4	2.8	15	4.6	96	2156	1.8	41	8.3	147	2466	1.3
2486.1	3.3	16	5.8	94	2185	2.5	48	11	145	2498	1.8
2486.8	2.0	16	4.7	91	2111	2.7	28	8.6	139	2414	2.0
2487.5	3.0	14	4.6	106	2242	2.8	43	8.4	163	2564	2.0
2488.2	1.9	13	4.5	92	2122	3.9	28	8.1	140	2427	2.8
2488.9	1.5	16	5.3	93	2122	3.1	22	9.7	143	2426	2.2
2489.6	1.8	14	5.2	95	2091	2.5	26	9.5	145	2391	1.8
2490.3	2.1	13	4.7	78	2459	2.4	30	8.6	120	2812	1.8
2491.0	2.1	11	5.5	94	2186	1.5	31	10	145	2500	1.1
2491.7	3.1	14	4.9	103	2312	2.3	44	9.0	158	2644	1.7
2492.3	1.8	11	4.9	89	2134	2.9	26	9.0	136	2440	2.1
2493.0	2.6	13	5.6	87	2323	3.3	37	10	133	2656	2.4
2493.7	2.8	14	5.7	91	2242	2.2	41	10	139	2564	1.6
2494.4	2.6	12	5.1	94	2171	2.7	38	9.2	145	2483	1.9
2495.1	2.4	14	5.6	85	2015	1.9	35	10	131	2304	1.4
2495.8	1.9	11	5.5	83	2151	1.8	27	10	127	2460	1.3
2496.5	3.0	14	5.0	90	2156	1.9	43	9.0	137	2465	1.4
2497.2	2.5	13	5.0	82	2218	2.4	36	9.1	126	2536	1.7
2497.9	1.6	13	4.7	88	2163	2.8	22	8.5	135	2474	2.0
2498.6	1.6	13	4.5	96	2095	3.3	23	8.2	147	2396	2.4
2499.3	1.7	11	5.2	82	2244	2.5	25	9.5	125	2566	1.8
2500.0	1.9	14	5.5	81	2190	1.9	28	10	124	2504	1.4
2500.7	1.4	12	4.7	81	2002	2.4	20	8.5	124	2290	1.7
2501.4	1.9	14	5.4	76	1971	2.3	28	9.9	116	2254	1.7
2502.1	1.4	15	4.1	82	2056	2.8	21	7.4	125	2352	2.0
2502.8	1.1	15	4.3	74	2042	2.7	16	7.9	113	2335	1.9
2503.5	2.3	11	4.4	78	2000	2.5	33	8.0	120	2288	1.8
2504.2	2.3	15	4.3	81	2072	3.6	33	7.9	123	2370	2.7
2504.9	1.6	14	4.3	78	1937	2.9	23	7.9	119	2215	2.1
2505.6	1.6	15	4.1	74	1934	2.4	23	7.4	113	2211	1.7
2506.3	0.893	15	3.6	68	1713	2.5	13	6.5	104	1959	1.8
2507.0	1.2	14	4.0	79	1954	2.4	17	7.3	121	2235	1.7
2507.7	1.6	17	3.3	70	1710	2.3	23	6.1	108	1956	1.7
2508.4	1.2	16	3.6	73	1703	2.8	17	6.6	112	1947	2.0
2509.1	1.1	14	3.6	60	1728	4.1	16	6.6	91	1976	3.0
2509.8	0.615	13	3.8	63	1556	2.8	8.9	7.0	97	1779	2.0
2510.5	1.3	15	3.7	68	1728	3.0	18	6.7	105	1976	2.2
2511.2	1.2	18	3.7	62	1736	2.6	17	6.7	95	1985	1.9
2511.9	1.1	15	3.6	61	1559	3.6	16	6.6	94	1783	2.6
2512.6	0.829	15	2.6	61	1446	2.8	12	4.8	93	1653	2.1
2513.3	1.3	16	2.4	57	1332	4.1	19	4.4	88	1523	3.0
2514.0	0.707	16	2.6	60	1450	3.3	10	4.7	92	1658	2.4
2514.7	0.676	17	2.5	56	1378	3.7	9.8	4.6	85	1575	2.7
2515.4	0.513	17	2.7	54	1577	3.4	7.4	4.9	84	1804	2.5
2516.1	1.1	17	2.6	53	1362	4.1	16	4.8	82	1557	3.0
2516.8	0.910	14	3.1	52	1371	3.4	13	5.6	80	1567	2.5
2517.5	0.513	17	2.3	51	1331	4.2	7.4	4.1	78	1522	3.0
2518.2	0.513	15	2.4	58	1262	3.5	7.4	4.4	89	1444	2.5
2518.8	0.513	18	2.0	53	1214	4.5	7.4	3.7	81	1388	3.3
2519.5	0.887	19	1.7	50	1221	3.0	13	3.2	77	1396	2.2
2520.2	0.657	14	2.2	50	1122	3.6	9.5	4.1	77	1283	2.6
2520.9	0.644	19	1.8	45	1061	4.1	9.3	3.3	70	1213	3.0
2521.6	0.513	20	2.6	45	1096	3.4	7.4	4.8	68	1254	2.5
2522.3	0.513	16	1.7	44	980	4.3	7.4	3.0	68	1121	3.1
2523.0	0.513	17	1.6	42	935	3.3	7.4	2.9	65	1069	2.4
2523.7	0.513	17	1.5	47	908	4.3	7.4	2.7	72	1038	3.1
2524.4	0.746	17	1.6	42	865	4.6	11	3.0	64	989	3.4
2525.1	0.513	17	1.9	50	903	4.1	7.4	3.4	77	1033	3.0
2525.8	0.513	17	0.963	37	800	3.8	7.4	1.8	57	915	2.8
2526.5	0.513	19	1.4	41	826	3.4	7.4	2.6	62	945	2.5
2527.2	0.513	17	1.3	46	879	3.9	7.4	2.3	70	1005	2.8
2527.9	0.513	20	1.4	45	816	3.2	7.4	2.6	68	933	2.4
2528.6	0.513	18	1.4	42	717	3.8	7.4	2.5	64	820	2.8
2529.3	0.513	21	1.8	41	783	3.9	7.4	3.2	62	895	2.8
2530.0	0.513	20	1.4	40	767	3.8	7.4	2.6	61	877	2.8
2530.7	0.513	21	1.4	37	703	2.5	7.4	2.6	57	803	1.8
2531.4	0.513	18	1.0	37	709	3.0	7.4	1.9	56	811	2.2
2532.1	0.513	17	1.6	39	770	3.1	7.4	2.9	60	881	2.3
2532.8	0.513	21	1.1	42	786	3.6	7.4	2.1	64	898	2.6
2533.5	0.622	17	1.5	37	702	3.5	9.0	2.8	57	803	2.6
2534.2	1.0	18	1.4	38	735	3.8	15	2.5	58	840	2.8
2534.9	0.650	19	1.4	33	722	2.8	9.4	2.5	51	826	2.1
2535.6	0.513	16	1.6	38	676	2.5	7.4	2.9	58	773	1.8
2536.3	0.538	16	1.3	33	687	2.9	7.8	2.3	50	785	2.1
2537.0	0.513	18	1.3	37	798	3.6	7.4	2.3	57	913	2.6
2537.7	0.967	18	1.1	38	765	2.4	14	2.0	58	875	1.7
2538.4	0.519	17	1.0	31	637	2.2	7.5	1.9	48	728	1.6
2539.1	0.976	20	1.3	33	809	2.5	14	2.3	50	925	1.8
2539.8	0.639	17	1.5	37	763	2.4	9.2	2.6	57	873	1.8
2540.5	0.703	18	1.2	30	717	2.9	10	2.1	46	820	2.1
2541.2	0.805	17	1.1	25	633	3.2	12	2.0	39	724	2.3



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Sample ID: 016

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
2541.9	0.567	17	1.4	28	700	1.9	8.2	2.6	43	800	1.4
2542.6	0.513	17	1.4	27	793	2.8	7.4	2.6	42	907	2.1
2543.3	0.741	19	1.5	33	772	2.9	11	2.8	51	883	2.1
2544.0	0.686	17	1.6	23	814	2.3	9.9	2.8	36	931	1.7
2544.6	1.4	18	1.1	27	791	1.9	20	2.0	42	905	1.4
2545.3	0.875	16	1.1	27	761	3.1	13	2.0	41	870	2.2
2546.0	1.2	19	1.0	26	812	2.6	17	1.9	39	929	1.9
2546.7	0.985	14	1.4	23	792	1.9	14	2.5	36	905	1.4
2547.4	1.2	17	0.883	23	746	2.9	17	1.6	36	853	2.1
2548.1	1.3	14	1.1	20	736	2.0	19	2.1	30	841	1.4
2548.8	1.4	15	1.2	20	740	2.0	20	2.2	31	846	1.5
2549.5	1.4	13	1.1	19	792	2.0	20	2.0	28	906	1.5
2550.2	0.864	14	1.3	17	799	2.8	12	2.3	26	914	2.1
2550.9	1.2	15	1.2	18	757	2.6	18	2.2	27	865	1.9
2551.6	1.8	13	1.0	14	859	2.5	26	1.8	21	983	1.8
2552.3	1.1	14	1.1	16	824	3.0	16	2.1	25	942	2.2
2553.0	1.7	16	1.1	16	791	2.1	24	2.0	24	904	1.6
2553.7	1.7	14	0.821	13	792	2.9	24	1.5	19	906	2.1
2554.4	2.0	16	0.949	15	797	2.4	29	1.7	23	911	1.7
2555.1	2.4	14	1.2	12	781	2.6	34	2.2	18	893	1.9
2555.8	2.0	14	0.959	11	748	1.3	29	1.7	17	856	0.969
2556.5	1.7	11	1.1	13	793	2.5	24	2.0	20	907	1.8
2557.2	2.3	13	1.6	11	822	3.0	33	2.9	18	940	2.2
2557.9	2.1	13	1.4	11	832	1.6	30	2.6	16	951	1.2
2558.6	3.2	13	1.5	13	885	3.8	46	2.7	20	1013	2.7
2559.3	2.6	12	1.4	14	857	2.2	38	2.5	21	980	1.6
2560.0	3.0	12	2.0	16	922	1.7	44	3.7	24	1054	1.3
2560.7	3.0	12	1.8	13	904	2.2	43	3.3	21	1034	1.6
2561.4	4.1	14	1.9	14	1006	2.3	60	3.4	22	1150	1.7
2562.1	3.3	11	1.6	11	834	2.7	48	2.9	17	954	2.0
2562.8	5.1	14	2.3	14	1009	2.5	73	4.2	22	1154	1.9
2563.5	3.9	12	2.3	13	970	3.3	57	4.2	20	1109	2.4
2564.2	3.7	13	2.6	14	922	2.0	54	4.7	21	1055	1.5
2564.9	4.6	13	2.8	16	970	2.0	67	5.1	24	1109	1.4
2565.6	4.0	11	2.5	17	1155	2.5	58	4.6	26	1320	1.8
2566.3	3.7	11	2.7	16	980	2.6	53	4.8	25	1121	1.9
2567.0	4.2	14	3.2	15	1024	2.7	60	5.9	22	1171	1.9
2567.7	4.6	13	4.0	20	1109	2.5	67	7.2	31	1268	1.8
2568.4	4.6	12	3.4	19	1141	2.7	66	6.2	28	1304	1.9
2569.1	5.2	10.0	3.5	20	1377	3.9	74	6.3	31	1574	2.9
2569.8	5.7	12	5.1	20	1304	3.0	82	9.3	30	1491	2.2
2570.5	5.9	12	4.0	18	1262	3.1	86	7.3	27	1443	2.2
2571.1	5.7	13	4.8	22	1343	3.2	82	8.8	33	1536	2.3
2571.8	5.3	11	6.1	22	1384	2.3	77	11	34	1582	1.6
2572.5	5.6	12	5.0	20	1455	3.4	80	9.2	31	1664	2.5
2573.2	5.6	12	5.7	25	1591	3.7	81	10	38	1819	2.7
2573.9	5.4	15	5.5	23	1494	4.6	78	10	35	1708	3.3
2574.6	5.6	13	6.5	28	1454	2.3	81	12	43	1663	1.7
2575.3	4.8	9.8	5.1	23	1586	2.1	69	9.3	36	1814	1.5
2576.0	4.1	12	5.6	23	1548	2.9	59	10	36	1770	2.1
2576.7	4.3	12	6.0	27	1621	2.9	62	11	41	1854	2.1
2577.4	4.5	13	6.0	33	1635	3.6	65	11	50	1869	2.6
2578.1	3.7	13	5.3	31	1576	2.3	53	9.7	47	1802	1.7
2578.8	3.3	15	6.6	35	1681	3.2	48	12	54	1922	2.3
2579.5	4.3	17	6.8	31	1622	4.2	63	12	47	1855	3.0
2580.2	4.4	14	7.1	35	1789	4.0	64	13	53	2046	2.9
2580.9	3.4	14	6.1	32	1882	3.5	49	11	49	2152	2.5
2581.6	3.0	14	6.3	32	1753	1.7	43	12	49	2005	1.2
2582.3	3.0	17	7.4	32	1795	3.0	43	14	50	2052	2.2
2583.0	3.1	15	6.6	33	1869	3.9	45	12	51	2137	2.8
2583.7	2.6	15	6.2	36	1946	1.9	37	11	56	2226	1.4
2584.4	2.1	15	6.1	43	1795	4.2	30	11	66	2053	3.1
2585.1	1.9	15	6.1	35	1816	2.9	28	11	54	2076	2.1
2585.8	2.6	14	5.9	41	1803	2.8	37	11	63	2061	2.0
2586.5	2.4	14	6.0	36	2012	2.6	34	11	55	2301	1.9
2587.2	2.5	16	5.9	37	1910	3.7	36	11	57	2184	2.7
2587.9	2.1	18	6.6	37	1831	2.3	30	12	57	2094	1.7
2588.6	2.5	15	4.6	29	1789	3.0	37	8.3	44	2046	2.2
2589.3	1.9	15	5.0	36	1762	2.8	27	9.2	56	2014	2.1
2590.0	1.8	17	4.6	44	1912	2.3	26	8.5	68	2186	1.7
2590.7	1.2	17	4.5	35	1772	2.4	18	8.2	53	2026	1.8
2591.4	1.4	18	4.5	35	1859	1.7	20	8.2	53	2125	1.3
2592.1	1.6	16	4.6	35	1852	2.2	23	8.4	54	2117	1.6
2592.8	1.4	17	3.5	34	1773	2.5	21	6.4	52	2028	1.8
2593.5	1.8	17	4.1	36	1811	1.6	26	7.5	55	2071	1.1
2594.2	0.942	16	4.5	33	1842	2.9	14	8.2	51	2106	2.1
2594.9	1.5	15	4.0	31	1776	2.5	21	7.3	48	2031	1.8
2595.6	1.1	15	3.9	36	1908	2.1	16	7.1	55	2182	1.5
2596.3	1.2	17	3.9	33	1706	2.5	18	7.1	50	1951	1.8
2597.0	0.962	16	3.4	31	2025	2.2	14	6.3	47	2316	1.6
2597.6	1.1	16	3.5	34	1691	1.5	15	6.4	52	1934	1.1



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Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2598.3	0.814	16	3.4	32	1820	2.0	12	6.1	49	2081	1.5
2599.0	0.833	18	3.8	35	1731	1.6	12	6.9	54	1979	1.2
2599.7	0.513	19	3.5	39	1883	1.2	7.4	6.4	60	2154	0.890
2600.4	0.699	21	3.4	33	1690	1.7	10	6.2	51	1933	1.2
2601.1	0.513	17	3.2	31	1732	1.7	7.4	5.9	47	1980	1.3
2601.8	0.513	16	2.9	28	1488	1.2	7.4	5.4	42	1702	0.883
2602.5	0.888	18	2.7	30	1680	1.8	13	5.0	46	1921	1.3
2603.2	0.698	17	2.6	31	1612	1.7	10	4.7	48	1844	1.2
2603.9	0.786	16	2.1	28	1603	1.4	11	3.8	43	1833	1.0
2604.6	0.665	16	2.6	23	1507	2.0	9.6	4.8	35	1723	1.5
2605.3	0.674	20	3.0	30	1703	1.5	9.7	5.4	46	1947	1.1
2606.0	0.513	17	2.0	32	1703	1.5	7.4	3.7	48	1948	1.1
2606.7	0.594	18	2.4	28	1579	1.3	8.6	4.4	43	1805	0.936
2607.4	0.601	19	1.9	24	1486	2.7	8.7	3.5	37	1700	2.0
2608.1	0.513	19	2.5	30	1539	1.7	7.4	4.5	45	1760	1.2
2608.8	0.513	17	2.1	22	1407	2.6	7.4	3.8	34	1609	1.9
2609.5	0.543	20	1.8	26	1406	2.1	7.8	3.2	40	1607	1.5
2610.2	0.516	21	1.9	29	1479	2.4	7.5	3.4	44	1691	1.8
2610.9	0.513	17	1.8	20	1302	1.4	7.4	3.2	31	1489	1.0
2611.6	0.513	20	1.7	19	1372	1.8	7.4	3.2	29	1569	1.3
2612.3	0.513	18	1.3	18	1181	1.5	7.4	2.4	28	1350	1.1
2613.0	0.513	20	2.2	22	1351	2.0	7.4	3.9	34	1545	1.4
2613.7	0.513	17	1.4	21	1203	0.643	7.4	2.5	31	1376	0.469
2614.4	0.562	22	0.982	21	1414	1.8	8.1	1.8	33	1616	1.3
2615.1	1.0	17	1.8	26	1497	2.2	15	3.4	39	1712	1.6
2615.8	0.513	17	0.924	22	1261	1.9	7.4	1.7	34	1442	1.4
2616.5	0.839	17	1.3	18	1208	2.2	12	2.3	27	1381	1.6
2617.2	0.548	19	1.7	20	1230	1.3	7.9	3.2	30	1406	0.954
2617.9	0.770	15	1.2	16	1146	2.1	11	2.3	25	1310	1.6
2618.6	1.1	16	1.4	16	1552	1.6	16	2.6	25	1775	1.2
2619.3	0.804	18	1.0	14	1129	0.971	12	1.9	22	1291	0.708
2620.0	1.0	16	1.1	15	1221	0.951	14	2.0	23	1396	0.694
2620.7	0.583	15	1.1	15	1136	1.4	8.4	2.1	22	1299	0.990
2621.4	1.2	17	0.759	14	1272	1.9	18	1.4	22	1455	1.4
2622.1	1.0	15	0.800	15	1075	2.0	15	1.5	23	1230	1.5
2622.8	1.6	14	0.606	14	1138	2.1	23	1.1	22	1302	1.5
2623.5	1.3	16	0.990	14	1474	1.2	18	1.8	22	1685	0.900
2624.1	0.752	17	0.488	12	1049	1.5	11	0.891	18	1199	1.1
2624.8	0.540	13	0.490	11	1073	1.6	7.8	0.894	17	1227	1.2
2625.5	1.2	15	0.494	10	927	1.7	18	0.902	16	1060	1.3
2626.2	0.836	16	0.644	9.4	1012	1.4	12	1.2	14	1158	1.0
2626.9	0.617	14	0.793	12	1058	2.7	8.9	1.4	18	1210	1.9
2627.6	0.813	14	0.647	10	1177	2.6	12	1.2	16	1346	1.9
2628.3	0.592	13	0.671	8.9	1046	1.9	8.5	1.2	14	1196	1.4
2629.0	0.513	13	0.622	9.3	1078	1.4	7.4	1.1	14	1233	1.0
2629.7	0.513	11	0.398	8.0	1021	1.4	7.4	0.727	12	1167	0.990
2630.4	0.754	15	0.556	8.0	1025	1.3	11	1.0	12	1172	0.927
2631.1	0.876	13	0.592	9.5	950	1.9	13	1.1	15	1086	1.4
2631.8	0.949	14	0.777	7.6	1007	1.9	14	1.4	12	1152	1.4
2632.5	0.836	12	0.388	8.4	1033	1.5	12	0.708	13	1182	1.1
2633.2	0.816	13	0.399	7.7	1104	1.6	12	0.729	12	1263	1.1
2633.9	1.2	12	0.433	8.1	1028	2.0	18	0.789	12	1176	1.5
2634.6	1.3	12	0.295	7.6	1041	1.4	18	0.539	12	1190	1.0
2635.3	0.839	11	0.386	6.3	966	1.4	12	0.704	9.6	1105	1.0
2636.0	0.773	13	0.480	6.5	1128	1.6	11	0.875	10	1290	1.2
2636.7	0.552	12	0.714	6.6	1098	1.8	8.0	1.3	10	1256	1.3
2637.4	0.513	11	0.372	6.5	932	1.5	7.4	0.679	9.9	1066	1.1
2638.1	0.971	14	0.284	7.2	1100	1.3	14	0.518	11	1257	0.978
2638.8	0.603	10	0.548	5.1	1041	1.5	8.7	0.999	7.9	1190	1.1
2639.5	0.957	12	0.440	8.4	1042	1.5	14	0.803	13	1192	1.1
2640.2	0.513	12	0.639	6.9	989	1.1	7.4	1.2	11	1131	0.777
2640.9	0.516	11	0.219	7.4	1156	1.1	7.5	0.399	11	1322	0.830
2641.6	0.513	11	0.429	6.3	925	1.2	7.4	0.783	9.7	1058	0.875
2642.3	0.513	12	0.362	5.7	998	1.8	7.4	0.660	8.7	1141	1.3
2643.0	0.513	13	0.325	5.2	1074	1.8	7.4	0.592	8.0	1228	1.3
2643.7	0.877	9.9	0.278	6.8	931	1.5	13	0.507	10	1064	1.1
2644.4	0.739	11	0.286	7.2	964	1.3	11	0.521	11	1102	0.979
2645.1	0.513	11	0.269	7.0	957	1.3	7.4	0.491	11	1095	0.919
2645.8	0.903	12	0.480	5.5	1082	1.9	13	0.876	8.5	1238	1.4
2646.5	1.5	11	0.262	8.5	1108	1.9	22	0.478	13	1267	1.4
2647.2	0.513	14	0.565	6.6	1119	1.8	7.4	1.0	10	1280	1.3
2647.9	0.962	11	0.416	7.1	1152	2.1	14	0.758	11	1317	1.5
2648.6	1.8	13	0.382	7.7	1075	1.6	26	0.696	12	1229	1.2
2649.3	0.862	10	0.232	7.5	1050	1.8	12	0.422	11	1200	1.3
2649.9	0.513	12	0.329	7.7	1066	2.0	7.4	0.601	12	1220	1.5
2650.6	0.797	14	0.569	9.7	1040	1.7	12	1.0	15	1189	1.3
2651.3	1.3	14	0.496	5.8	1121	1.5	18	0.905	8.9	1281	1.1
2652.0	1.1	13	0.550	6.4	1198	1.6	16	1.0	9.8	1370	1.2
2652.7	1.4	11	0.696	6.4	1243	2.1	21	1.3	9.9	1421	1.5
2653.4	2.0	13	0.431	6.6	1172	1.3	28	0.787	10	1340	0.943
2654.1	1.8	11	0.397	9.2	1133	2.2	27	0.724	14	1296	1.6



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
2654.8	1.4	11	0.573	8.9	1371	1.8	20	1.0	14	1568	1.3
2655.5	1.5	12	0.713	7.0	1307	3.2	22	1.3	11	1495	2.4
2656.2	1.4	14	0.795	9.2	1334	2.2	20	1.4	14	1525	1.6
2656.9	1.7	13	0.635	9.9	1329	2.8	24	1.2	15	1520	2.0
2657.6	1.8	11	0.811	9.9	1317	3.9	25	1.5	15	1506	2.8
2658.3	1.9	11	0.930	10	1346	3.2	27	1.7	16	1539	2.3
2659.0	2.0	13	0.971	9.8	1420	4.2	28	1.8	15	1624	3.1
2659.7	1.7	12	1.1	12	1459	4.4	25	2.0	19	1668	3.2
2660.4	1.4	13	0.889	8.0	1315	3.7	20	1.6	12	1504	2.7
2661.1	1.3	14	0.910	13	1425	7.1	19	1.7	21	1629	5.1
2661.8	1.0	14	1.1	11	1435	4.6	15	2.0	17	1641	3.3
2662.5	1.6	11	1.1	10	1518	6.1	23	2.0	16	1736	4.5
2663.2	1.2	13	1.2	11	1587	5.0	17	2.1	17	1815	3.6
2663.9	1.0	15	1.1	12	1454	5.2	15	2.0	19	1663	3.8
2664.6	1.2	13	1.2	14	1685	6.5	17	2.2	22	1927	4.8
2665.3	1.6	14	1.4	12	1607	7.7	23	2.6	18	1838	5.6
2666.0	0.990	12	1.4	11	1606	6.1	14	2.6	17	1836	4.4
2666.7	1.7	13	1.6	12	1626	6.3	24	2.8	18	1859	4.6
2667.4	1.1	14	1.3	13	1528	6.5	16	2.4	20	1747	4.8
2668.1	0.654	17	1.2	13	1642	5.0	9.4	2.3	20	1878	3.6
2668.8	1.4	13	1.1	17	1631	5.8	20	1.9	25	1865	4.2
2669.5	1.1	14	1.4	10	1429	5.8	16	2.6	16	1634	4.2
2670.2	1.4	13	1.4	13	1597	6.3	21	2.6	20	1826	4.6
2670.9	0.538	14	1.7	12	1494	5.1	7.8	3.1	19	1708	3.7
2671.6	0.945	11	1.2	12	1549	4.2	14	2.2	18	1771	3.1
2672.3	0.513	13	1.5	7.7	1604	5.8	7.4	2.8	12	1834	4.3
2673.0	0.513	15	1.5	13	1624	6.1	7.4	2.7	20	1857	4.4
2673.7	0.513	13	1.3	10	1419	4.2	7.4	2.4	16	1623	3.1
2674.4	0.513	15	1.3	12	1586	4.4	7.4	2.4	19	1814	3.2
2675.1	0.720	13	1.5	11	1630	4.3	10	2.7	17	1864	3.2
2675.7	0.513	14	1.4	12	1523	3.8	7.4	2.5	18	1741	2.8
2676.4	0.513	13	1.8	13	1463	2.4	7.4	3.2	20	1673	1.8
2677.1	0.513	15	1.8	15	1524	4.6	7.4	3.3	23	1742	3.3
2677.8	0.513	12	1.7	12	1377	3.5	7.4	3.2	19	1575	2.6
2678.5	0.513	13	1.4	13	1418	2.3	7.4	2.6	20	1622	1.7
2679.2	0.537	9.9	1.7	13	1357	3.1	7.8	3.1	19	1552	2.3
2679.9	0.746	14	1.4	12	1341	3.4	11	2.5	18	1534	2.5
2680.6	0.744	13	1.4	12	1259	2.4	11	2.6	19	1440	1.8
2681.3	0.627	13	1.1	14	1355	3.2	9.0	2.0	21	1550	2.4
2682.0	0.513	13	1.4	12	1319	3.5	7.4	2.6	19	1509	2.5
2682.7	0.513	13	1.4	14	1150	2.7	7.4	2.6	21	1315	2.0
2683.4	0.513	14	1.5	15	1195	2.6	7.4	2.7	23	1367	1.9
2684.1	0.513	13	1.2	12	1082	3.0	7.4	2.3	19	1237	2.2
2684.8	0.513	13	1.1	12	1022	2.0	7.4	2.0	18	1169	1.5
2685.5	0.513	13	1.3	11	1077	2.2	7.4	2.3	17	1232	1.6
2686.2	0.513	14	0.881	11	1035	2.0	7.4	1.6	17	1184	1.5
2686.9	0.513	13	1.1	13	1064	1.6	7.4	2.0	20	1216	1.2
2687.6	0.513	14	0.808	11	1001	3.1	7.4	1.5	18	1145	2.3
2688.3	0.513	15	1.1	11	978	2.2	7.4	1.9	16	1118	1.6
2689.0	0.513	16	1.1	13	949	1.2	7.4	2.0	20	1085	0.861
2689.7	0.513	16	0.980	10	921	2.4	7.4	1.8	16	1053	1.7
2690.4	0.612	15	0.907	9.4	945	2.4	8.8	1.7	14	1081	1.8
2691.1	0.513	16	0.761	12	961	2.3	7.4	1.4	18	1099	1.7
2691.8	0.513	15	0.799	8.9	928	1.9	7.4	1.5	14	1062	1.4
2692.5	0.678	14	0.839	11	915	2.6	9.8	1.5	17	1047	1.9
2693.2	0.513	17	0.795	11	876	2.0	7.4	1.4	17	1002	1.5
2693.9	0.513	13	0.496	11	863	2.4	7.4	0.904	16	986	1.7
2694.6	0.811	15	0.424	9.3	870	2.1	12	0.774	14	995	1.5
2695.3	0.513	13	0.739	14	848	2.9	7.4	1.3	21	970	2.1
2696.0	0.513	16	0.714	13	866	1.8	7.4	1.3	19	990	1.3
2696.7	0.810	16	0.556	9.9	829	2.2	12	1.0	15	948	1.6
2697.4	0.563	13	0.638	10	818	1.1	8.1	1.2	16	936	0.820
2698.1	0.513	11	0.618	7.6	810	1.6	7.4	1.1	12	926	1.2
2698.8	0.513	14	0.483	8.1	871	1.8	7.4	0.881	12	996	1.3
2699.5	0.824	15	0.656	7.9	785	2.1	12	1.2	12	897	1.6
2700.2	0.513	16	0.704	8.4	752	1.6	7.4	1.3	13	860	1.1
2700.9	0.513	13	0.479	8.6	749	1.1	7.4	0.874	13	857	0.801
2701.5	0.513	13	0.373	8.7	772	1.8	7.4	0.680	13	883	1.3
2702.2	0.523	16	0.438	8.1	800	1.1	7.5	0.798	12	914	0.770
2702.9	0.513	14	0.472	8.2	828	2.2	7.4	0.860	13	946	1.6
2703.6	0.531	14	0.335	6.7	732	1.9	7.7	0.611	10	837	1.4
2704.3	0.513	13	0.397	4.9	780	1.6	7.4	0.724	7.6	892	1.2
2705.0	0.777	11	0.491	6.0	735	2.2	11	0.896	9.2	841	1.6
2705.7	0.595	12	0.295	4.3	832	1.5	8.6	0.538	6.6	951	1.1
2706.4	0.513	15	0.448	4.5	923	1.9	7.4	0.817	6.9	1055	1.4
2707.1	0.513	16	0.210	4.6	841	1.7	7.4	0.382	7.1	962	1.3
2707.8	0.513	13	0.108	5.7	795	1.6	7.4	0.197	8.8	909	1.2
2708.5	0.513	11	0.170	4.8	767	1.3	7.4	0.310	7.4	877	0.938
2709.2	0.513	14	0.403	4.4	842	2.0	7.4	0.734	6.7	963	1.4
2709.9	0.513	12	0.302	3.6	749	1.6	7.4	0.551	5.5	857	1.2
2710.6	0.513	13	0.218	3.2	758	1.3	7.4	0.398	4.8	867	0.966



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2711.3	0.513	11	0.139	4.2	807	1.8	7.4	0.254	6.4	922	1.3
2712.0	0.715	12	0.095	2.4	894	1.4	10	0.174	3.7	1022	1.0
2712.7	0.513	9.7	0.286	3.4	777	1.5	7.4	0.521	5.3	889	1.1
2713.4	0.513	9.8	0.166	3.1	721	2.0	7.4	0.302	4.7	824	1.4
2714.1	0.513	11	0.070	2.7	753	1.5	7.4	0.127	4.2	862	1.1
2714.8	0.702	9.1	0.058	2.2	749	1.4	10	0.105	3.4	857	0.996
2715.5	0.521	9.3	0.156	3.6	810	0.956	7.5	0.284	5.4	927	0.697
2716.2	0.547	11	0.128	3.3	766	1.6	7.9	0.233	5.0	875	1.2
2716.9	0.513	8.9	0.159	2.5	745	1.2	7.4	0.290	3.9	852	0.875
2717.6	0.513	9.3	0.129	2.2	761	1.6	7.4	0.235	3.4	870	1.1
2718.3	0.690	9.3	0.070	4.1	874	2.5	10.0	0.128	6.2	999	1.8
2719.0	0.513	12	0.388	2.8	830	2.0	7.4	0.708	4.3	949	1.4
2719.7	1.0	9.1	0.066	1.3	734	1.5	15	0.121	2.0	839	1.1
2720.4	0.513	9.5	0.087	1.9	725	1.6	7.4	0.159	2.9	829	1.1
2721.1	0.598	9.0	0.107	3.5	719	1.7	8.6	0.195	5.3	823	1.3
2721.8	0.901	8.1	0.058	3.2	773	1.8	13	0.105	4.9	884	1.3
2722.5	0.975	9.9	0.115	3.0	759	1.5	14	0.210	4.6	868	1.1
2723.2	1.6	9.0	0.409	1.5	794	1.6	23	0.745	2.4	909	1.2
2723.9	0.836	8.6	0.058	2.6	790	1.9	12	0.105	4.0	904	1.4
2724.6	0.577	9.1	0.200	5.3	736	1.6	8.3	0.364	8.1	842	1.2
2725.3	1.4	7.2	0.234	5.2	724	1.0	20	0.427	8.0	828	0.743
2726.0	2.4	9.2	0.315	3.3	840	2.0	34	0.575	5.0	961	1.4
2726.7	2.9	8.1	0.437	4.8	880	1.6	42	0.797	7.3	1007	1.2
2727.4	3.1	8.0	0.576	6.5	791	1.3	44	1.1	9.9	905	0.958
2728.0	3.1	9.3	0.606	5.1	925	2.0	44	1.1	7.8	1058	1.5
2728.7	3.5	9.9	0.733	4.7	962	1.4	51	1.3	7.2	1100	1.0
2729.4	4.3	11	1.1	8.1	1058	1.8	62	1.9	12	1210	1.3
2730.1	4.5	8.7	1.1	5.3	1002	2.4	65	2.0	8.1	1145	1.7
2730.8	4.3	8.1	1.3	5.4	1182	2.6	62	2.4	8.3	1352	1.9
2731.5	4.7	9.2	1.8	4.4	1209	2.6	67	3.3	6.7	1383	1.9
2732.2	3.0	9.7	1.4	6.8	1182	1.8	44	2.5	10	1352	1.3
2732.9	3.6	10.0	1.5	6.9	1139	1.7	52	2.8	11	1303	1.3
2733.6	3.1	11	1.6	9.1	1292	2.1	45	3.0	14	1478	1.5
2734.3	2.8	10	1.6	7.7	1467	1.6	40	3.0	12	1678	1.2
2735.0	3.3	12	2.3	9.1	1496	3.0	48	4.2	14	1710	2.2
2735.7	3.1	11	2.4	9.4	1497	2.0	44	4.3	14	1711	1.5
2736.4	3.7	10	2.2	7.4	1469	2.0	54	4.0	11	1679	1.5
2737.1	2.9	10	2.3	6.6	1589	2.1	41	4.1	10	1818	1.5
2737.8	2.8	11	2.5	9.2	1463	2.0	41	4.5	14	1673	1.5
2738.5	3.2	14	3.2	13	1887	2.3	47	5.8	21	2158	1.7
2739.2	2.6	14	3.7	10	1946	2.2	37	6.8	16	2226	1.6
2739.9	2.6	11	3.1	12	1774	2.4	38	5.6	18	2028	1.8
2740.6	2.1	11	3.4	13	1908	2.1	30	6.3	21	2182	1.5
2741.3	3.0	11	3.1	10	1687	2.2	43	5.6	16	1929	1.6
2742.0	2.1	13	3.9	10	2004	2.6	30	7.1	16	2292	1.9
2742.7	1.9	13	4.2	14	1734	2.2	28	7.6	21	1983	1.6
2743.4	2.3	14	3.3	12	1895	1.8	34	6.1	18	2167	1.3
2744.1	2.8	14	3.2	13	2094	1.5	40	5.8	21	2395	1.1
2744.8	1.3	15	3.1	10.0	1798	2.2	19	5.7	15	2056	1.6
2745.5	1.8	15	3.7	16	2007	2.3	27	6.8	24	2295	1.7
2746.2	0.840	14	3.3	16	2057	2.4	12	6.1	25	2352	1.8
2746.9	1.4	13	3.5	14	1994	2.5	20	6.5	21	2280	1.8
2747.6	1.4	13	2.8	13	1977	2.9	20	5.1	20	2260	2.1
2748.3	1.2	13	3.6	15	2088	2.9	17	6.6	23	2388	2.1
2749.0	0.589	13	3.8	16	2141	3.5	8.5	6.9	24	2448	2.6
2749.7	0.781	15	3.4	15	1946	2.2	11	6.2	23	2226	1.6
2750.4	1.6	12	3.5	12	2099	2.4	22	6.4	19	2400	1.7
2751.1	0.513	14	3.4	14	2002	2.1	7.4	6.1	22	2290	1.5
2751.8	0.513	14	3.5	13	2119	4.0	7.4	6.3	20	2423	2.9
2752.5	1.1	12	3.1	14	1865	1.8	16	5.6	21	2133	1.3
2753.2	0.513	15	2.8	15	1855	3.3	7.4	5.1	23	2121	2.4
2753.9	0.776	13	2.4	11	1753	2.3	11	4.3	17	2005	1.7
2754.5	0.550	12	3.0	11	1972	1.9	7.9	5.5	17	2255	1.4
2755.2	0.514	13	3.5	13	1853	3.5	7.4	6.3	20	2119	2.6
2755.9	0.513	13	2.8	9.8	1702	2.9	7.4	5.0	15	1946	2.1
2756.6	0.513	15	2.3	13	1925	3.2	7.4	4.2	21	2201	2.3
2757.3	0.513	14	2.2	13	1840	3.1	7.4	4.1	20	2104	2.3
2758.0	0.513	10	2.7	13	1940	2.2	7.4	5.0	19	2219	1.6
2758.7	0.513	13	2.6	12	1923	2.8	7.4	4.8	19	2199	2.0
2759.4	1.0	13	2.4	11	1838	4.0	15	4.3	17	2102	3.0
2760.1	0.513	12	2.2	11	1861	2.4	7.4	4.1	17	2128	1.8
2760.8	0.513	11	1.8	11	1823	3.8	7.4	3.4	17	2085	2.7
2761.5	0.513	14	1.9	11	1614	2.5	7.4	3.5	17	1846	1.8
2762.2	0.513	13	1.8	12	1551	2.8	7.4	3.3	19	1774	2.0
2762.9	0.513	15	1.7	9.8	1714	2.8	7.4	3.1	15	1960	2.0
2763.6	0.513	15	1.5	13	1709	3.2	7.4	2.7	20	1955	2.4
2764.3	0.513	13	1.7	12	1552	1.2	7.4	3.1	19	1775	0.870
2765.0	0.560	13	1.6	7.7	1511	2.3	8.1	3.0	12	1728	1.7
2765.7	0.513	14	1.7	13	1541	2.2	7.4	3.2	20	1762	1.6
2766.4	0.572	13	1.4	11	1391	1.7	8.3	2.6	17	1591	1.2
2767.1	0.513	11	1.4	9.5	1426	1.9	7.4	2.5	15	1630	1.4



Minnow Environmental  
Sample ID: 016

Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2767.8	0.513	12	1.3	8.1	1378	1.6	7.4	2.3	12	1575	1.1
2768.5	0.648	14	1.5	6.2	1399	1.3	9.3	2.8	9.4	1600	0.933
2769.2	0.513	14	1.1	9.2	1384	2.3	7.4	2.0	14	1583	1.7
2769.9	0.513	13	0.953	10.0	1386	2.7	7.4	1.7	15	1585	1.9
2770.6	0.513	13	1.1	8.2	1134	1.7	7.4	2.0	13	1297	1.2
2771.3	0.513	11	1.2	8.7	1147	1.6	7.4	2.1	13	1312	1.2
2772.0	0.513	15	1.0	7.6	1338	1.3	7.4	1.8	12	1530	0.960
2772.7	0.513	13	0.942	9.3	1220	0.810	7.4	1.7	14	1395	0.591
2773.4	0.590	12	1.0	7.9	1021	1.2	8.5	1.9	12	1167	0.859
2774.1	0.513	12	0.902	7.2	1124	2.2	7.4	1.6	11	1285	1.6
2774.8	0.685	12	0.827	5.8	1055	1.1	9.9	1.5	8.8	1206	0.769
2775.5	0.513	14	0.620	8.1	1043	1.8	7.4	1.1	12	1193	1.3
2776.2	0.524	12	0.721	8.6	974	1.8	7.6	1.3	13	1114	1.3
2776.9	0.513	11	0.689	6.9	1013	1.5	7.4	1.3	11	1158	1.1
2777.6	0.513	11	0.813	7.4	976	1.5	7.4	1.5	11	1116	1.1
2778.3	0.513	12	0.562	6.0	882	1.2	7.4	1.0	9.2	1009	0.902
2779.0	0.513	14	0.616	5.7	965	1.7	7.4	1.1	8.8	1104	1.2
2779.7	0.513	14	0.356	7.7	943	1.2	7.4	0.649	12	1078	0.907
2780.3	0.513	13	0.548	5.3	882	0.770	7.4	1.000	8.1	1008	0.562
2781.0	0.522	12	0.286	4.7	966	1.4	7.5	0.521	7.1	1105	1.0
2781.7	0.672	14	0.534	6.2	1030	0.751	9.7	0.975	9.6	1178	0.548
2782.4	0.513	14	0.352	5.6	978	1.7	7.4	0.642	8.5	1118	1.3
2783.1	0.513	12	0.621	6.4	992	1.5	7.4	1.1	9.7	1134	1.1
2783.8	0.513	10	0.438	5.4	997	1.3	7.4	0.800	8.3	1140	0.936
2784.5	0.813	12	0.425	4.6	965	1.4	12	0.776	7.1	1104	1.0
2785.2	0.819	13	0.429	3.3	924	1.2	12	0.782	5.1	1056	0.866
2785.9	0.513	12	0.675	4.9	944	1.6	7.4	1.2	7.5	1080	1.2
2786.6	0.513	11	0.666	2.8	996	1.6	7.4	1.2	4.2	1139	1.1
2787.3	0.513	11	0.362	3.0	957	1.3	7.4	0.661	4.6	1094	0.952
2788.0	0.753	9.5	0.577	3.8	913	1.6	11	1.1	5.7	1044	1.1
2788.7	0.986	13	0.539	4.7	1021	1.3	14	0.984	7.2	1167	0.936
2789.4	0.659	11	0.366	5.8	1032	1.3	9.5	0.668	8.8	1180	0.949
2790.1	0.514	11	0.281	2.9	988	0.943	7.4	0.513	4.4	1130	0.688
2790.8	0.874	12	0.339	2.5	926	1.2	13	0.618	3.9	1059	0.865
2791.5	0.661	13	0.296	5.1	1014	1.3	9.5	0.541	7.8	1160	0.944
2792.2	0.513	12	0.335	3.9	973	1.7	7.4	0.611	5.9	1112	1.2
2792.9	0.513	13	0.253	2.6	882	1.5	7.4	0.462	4.0	1009	1.1
2793.6	0.563	9.5	0.258	2.8	954	1.1	8.1	0.471	4.2	1091	0.820
2794.3	0.603	11	0.542	4.0	992	1.4	8.7	0.988	6.1	1135	1.0
2795.0	0.513	11	0.372	2.7	955	1.9	7.4	0.679	4.1	1092	1.4
2795.7	0.513	11	0.335	1.7	1030	1.8	7.4	0.610	2.7	1178	1.3
2796.4	0.955	10	0.699	2.7	885	1.5	14	1.3	4.1	1012	1.1
2797.1	0.731	11	0.496	2.8	998	1.7	11	0.904	4.3	1142	1.2
2797.8	0.513	11	0.365	2.1	979	2.2	7.4	0.666	3.1	1120	1.6
2798.5	0.513	10	0.356	4.0	1075	1.1	7.4	0.649	6.1	1229	0.831
2799.2	0.513	13	0.453	2.3	988	1.0	7.4	0.826	3.5	1130	0.762
2799.9	0.513	12	0.371	2.4	962	1.3	7.4	0.676	3.8	1100	0.975
2800.6	0.513	12	0.337	1.7	967	1.1	7.4	0.614	2.5	1106	0.805
2801.3	0.513	9.8	0.610	2.7	1116	1.0	7.4	1.1	4.2	1276	0.742
2802.0	0.513	12	0.519	2.7	1080	2.3	7.4	0.946	4.1	1235	1.7
2802.7	0.513	10	0.058	1.7	1007	1.4	7.4	0.105	2.6	1152	1.0
2803.4	1.1	8.3	0.335	2.6	1146	1.3	16	0.611	4.0	1311	0.926
2804.1	0.576	11	0.307	2.5	1208	2.0	8.3	0.560	3.8	1381	1.5
2804.8	0.541	11	0.309	1.6	1071	0.899	7.8	0.563	2.5	1225	0.656
2805.5	1.1	12	0.290	2.5	1184	1.7	16	0.529	3.8	1354	1.2
2806.2	0.703	11	0.626	2.0	1154	0.983	10	1.1	3.1	1320	0.717
2806.8	0.665	9.9	0.802	2.4	1111	1.6	9.6	1.5	3.7	1270	1.2
2807.5	0.723	11	0.470	2.4	1178	1.7	10	0.856	3.7	1347	1.2
2808.2	0.513	10	0.449	2.1	1325	1.8	7.4	0.818	3.3	1515	1.3
2808.9	0.935	11	0.520	2.7	1272	2.4	14	0.949	4.1	1455	1.7
2809.6	0.564	11	0.917	2.4	1411	1.7	8.1	1.7	3.7	1613	1.2
2810.3	0.678	9.2	0.369	2.2	1400	1.0	9.8	0.672	3.4	1601	0.761
2811.0	0.513	8.9	0.704	1.5	1400	1.6	7.4	1.3	2.3	1601	1.2
2811.7	0.705	11	0.716	2.9	1478	1.8	10	1.3	4.5	1690	1.3
2812.4	0.513	12	0.621	2.9	1422	1.8	7.4	1.1	4.4	1626	1.3
2813.1	0.513	12	0.570	2.1	1408	1.9	7.4	1.0	3.2	1610	1.4
2813.8	0.633	10	0.763	1.8	1415	1.7	9.1	1.4	2.8	1618	1.2
2814.5	0.513	12	0.547	1.6	1390	2.1	7.4	0.997	2.5	1589	1.6
2815.2	0.513	13	0.680	2.4	1457	2.7	7.4	1.2	3.6	1666	2.0
2815.9	0.513	12	0.939	3.1	1514	2.9	7.4	1.7	4.8	1731	2.1
2816.6	0.641	9.6	0.642	3.1	1509	2.4	9.3	1.2	4.8	1726	1.8
2817.3	0.513	12	0.678	1.6	1579	1.8	7.4	1.2	2.5	1805	1.3
2818.0	0.829	12	0.723	2.6	1598	3.3	12	1.3	4.1	1827	2.4
2818.7	0.513	11	0.802	2.6	1670	3.7	7.4	1.5	4.0	1909	2.7
2819.4	0.513	12	0.847	2.1	1711	3.3	7.4	1.5	3.2	1957	2.4
2820.1	0.513	13	1.5	2.6	1714	3.5	7.4	2.7	4.1	1961	2.6
2820.8	0.513	11	1.2	2.5	1786	3.4	7.4	2.2	3.8	2042	2.5
2821.5	0.713	11	1.0	3.4	1928	2.9	10	1.9	5.3	2205	2.1
2822.2	0.513	16	0.980	3.5	1920	3.1	7.4	1.8	5.4	2195	2.2
2822.9	0.616	14	0.698	5.4	2067	3.3	8.9	1.3	8.2	2364	2.4
2823.6	0.513	11	1.0	3.3	1728	3.1	7.4	1.9	5.0	1976	2.3



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Parameter DL (ppm) Length (µm)	7Li 0.513	24Mg 0.149	55Mn 0.058	66Zn 0.611	88Sr 0.004	137Ba 0.009	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2824.3	0.513	11	1.6	2.0	1655	3.0	7.4	2.9	3.0	1893	2.2
2825.0	0.536	14	1.4	3.8	1766	3.5	7.7	2.6	5.8	2020	2.6
2825.7	0.513	14	1.3	3.0	1819	2.4	7.4	2.3	4.7	2080	1.7
2826.4	0.513	12	0.994	5.0	1782	3.0	7.4	1.8	7.6	2038	2.2
2827.1	0.513	13	1.3	1.9	1745	2.5	7.4	2.3	2.8	1996	1.8
2827.8	0.513	12	0.697	3.0	1677	2.2	7.4	1.3	4.5	1917	1.6
2828.5	0.513	14	1.2	3.3	1740	4.2	7.4	2.2	5.0	1990	3.1
2829.2	0.513	14	1.1	2.8	1451	3.3	7.4	2.1	4.2	1659	2.4
2829.9	0.513	16	1.1	3.0	1492	2.8	7.4	2.0	4.7	1706	2.0
2830.6	0.513	15	1.0	2.0	1439	2.5	7.4	1.9	3.1	1646	1.8
2831.3	0.513	17	1.1	2.1	1448	2.0	7.4	2.0	3.2	1656	1.5
2832.0	0.513	16	0.932	3.5	1455	1.8	7.4	1.7	5.3	1664	1.3
2832.7	0.513	23	0.716	1.7	1370	1.5	7.4	1.3	2.6	1567	1.1
2833.3	0.513	15	1.0	1.6	1142	2.0	7.4	1.9	2.4	1305	1.4
2834.0	0.513	20	0.741	1.9	1248	2.8	7.4	1.4	2.9	1427	2.0
2834.7	0.513	22	0.894	1.9	1190	1.9	7.4	1.6	2.9	1360	1.4
2835.4	0.513	23	0.586	1.8	1150	3.1	7.4	1.1	2.8	1315	2.2
2836.1	0.513	27	0.636	3.3	1077	1.7	7.4	1.2	5.1	1231	1.3
2836.8	0.513	27	0.548	2.6	1130	2.2	7.4	1.000	4.0	1292	1.6
2837.5	0.513	26	0.850	2.5	1101	1.5	7.4	1.5	3.9	1260	1.1
2838.2	0.513	33	0.490	2.3	1068	1.9	7.4	0.894	3.5	1221	1.4
2838.9	0.513	30	0.507	2.9	972	1.1	7.4	0.925	4.4	1111	0.781
2839.6	0.513	37	0.281	1.9	1070	1.1	7.4	0.513	3.0	1224	0.826
2840.3	0.513	36	0.374	2.2	1145	1.4	7.4	0.683	3.4	1309	1.0
2841.0	0.513	40	0.418	1.2	966	0.872	7.4	0.762	1.9	1105	0.636
2841.7	0.691	42	0.550	2.9	924	1.8	10.0	1.0	4.4	1056	1.3
2842.4	0.513	44	0.502	1.4	996	1.6	7.4	0.915	2.1	1138	1.2
2843.1	0.513	41	0.304	2.3	998	1.6	7.4	0.554	3.5	1141	1.1
2843.8	0.513	225	0.323	1.7	921	2.0	7.4	0.590	2.6	1053	1.5
2844.5	0.513	53	0.375	1.5	845	1.6	7.4	0.683	2.4	966	1.1
2845.2	0.513	53	0.445	2.1	820	1.4	7.4	0.812	3.3	938	1.0
2845.9	0.513	62	0.200	1.8	903	1.7	7.4	0.365	2.8	1033	1.3
2846.6	0.513	59	0.314	1.6	750	0.963	7.4	0.572	2.4	858	0.703
2847.3	0.513	66	0.327	2.1	878	1.3	7.4	0.596	3.3	1004	0.928
2848.0	0.513	74	0.271	2.3	865	1.6	7.4	0.494	3.5	990	1.1
2848.7	0.513	69	0.228	0.696	801	1.6	7.4	0.416	1.1	916	1.2
2849.4	0.513	82	0.392	1.4	1007	1.5	7.4	0.715	2.2	1151	1.1
2850.1	0.513	73	0.341	2.2	844	1.3	7.4	0.623	3.4	965	0.970
2850.8	0.513	76	0.531	2.8	904	2.5	7.4	0.968	4.2	1033	1.8
2851.5	0.651	88	0.333	1.9	944	2.5	9.4	0.607	2.9	1079	1.8
2852.2	0.513	76	0.289	1.6	896	1.4	7.4	0.527	2.5	1024	1.0
2852.9	0.513	94	0.477	1.9	880	2.0	7.4	0.870	2.9	1006	1.5
2853.6	0.513	91	0.298	1.1	886	2.1	7.4	0.543	1.7	1013	1.5
2854.3	0.513	109	0.543	1.9	764	0.972	7.4	0.990	3.0	874	0.710
2855.0	0.513	100	0.727	1.1	892	1.1	7.4	1.3	1.7	1020	0.778
2855.7	0.513	122	2.1	1.7	791	2.1	7.4	3.7	2.6	904	1.5
2856.4	0.676	189	8.1	4.5	854	2.6	9.8	15	6.8	977	1.9
2857.1	0.513	195	6.0	2.2	977	1.9	7.4	11	3.4	1118	1.4
2857.8	0.513	199	3.0	2.8	817	0.923	7.4	5.4	4.3	934	0.674
2858.5	0.535	253	2.2	4.0	904	2.6	7.7	4.1	6.2	1034	1.9
2859.1	0.979	162	1.5	3.8	1066	1.8	14	2.7	5.8	1219	1.3
2859.8	0.513	159	0.824	3.9	787	1.5	7.4	1.5	5.9	900	1.1
2860.5	0.513	184	1.0	3.7	887	2.4	7.4	1.9	5.6	1015	1.8
2861.2	0.513	117	0.629	2.7	596	0.646	7.4	1.1	4.2	682	0.471
2861.9	1.2	118	1.3	0.611	725	1.6	18	2.3	0.936	830	1.2
2862.6	0.513	129	0.429	1.1	893	1.4	7.4	0.782	1.7	1021	1.1
2863.3	0.576	124	0.609	4.0	849	0.660	8.3	1.1	6.1	971	0.481
2864.0	0.513	107	0.571	0.611	752	1.9	7.4	1.0	0.936	860	1.4
2864.7	0.513	126	0.758	4.5	936	2.2	7.4	1.4	7.0	1070	1.6
2865.4	0.513	132	0.789	3.6	695	1.5	7.4	1.4	5.5	794	1.1
2866.1	0.513	107	0.303	3.6	687	2.2	7.4	0.553	5.5	785	1.6
2866.8	1.4	134	0.058	1.1	840	1.9	20	0.105	1.7	960	1.4
2867.5	0.513	112	0.205	0.611	727	1.4	7.4	0.373	0.936	831	1.0
2868.2	1.1	131	0.751	5.1	904	1.4	17	1.4	7.9	1034	1.1
2868.9	0.513	168	0.492	2.2	813	0.831	7.4	0.898	3.4	929	0.606
2869.6	0.601	141	0.573	2.7	1017	2.9	8.7	1.0	4.1	1163	2.1
2870.3	1.1	141	0.217	3.9	1090	3.0	16	0.395	6.0	1246	2.2
2871.0	0.975	151	1.1	0.611	729	0.949	14	2.0	0.936	833	0.692
2871.7	0.513	111	0.188	2.5	651	1.1	7.4	0.342	3.8	744	0.817
2872.4	1.0	204	0.372	3.4	741	1.0	15	0.678	5.1	847	0.742
2873.1	2.0	114	0.058	6.1	900	1.0	28	0.105	9.4	1029	0.762
2873.8	0.513	108	0.456	4.4	773	0.951	7.4	0.831	6.7	884	0.694
2874.5	2.1	114	0.397	7.2	979	3.2	30	0.724	11	1119	2.3
2875.2	1.8	98	1.1	5.3	672	2.0	25	2.0	8.1	768	1.5
2875.9	0.513	78	1.1	12	632	1.8	7.4	2.1	18	723	1.3
2876.6	0.513	74	1.7	0.611	605	1.3	7.4	3.0	0.936	691	0.951
2877.3	0.513	124	0.780	18	1798	0.009	7.4	1.4	28	2056	0.006
2878.0	0.513	130	0.058	5.1	1031	0.947	7.4	0.105	7.8	1179	0.691
2878.7	0.720	94	0.577	1.2	1510	3.2	10	1.1	1.8	1027	2.3
2879.4	0.675	64	0.709	1.1	895	3.0	9.7	1.3	1.7	1724	2.2
2880.1	3.7	84	0.721	14	781	0.009	54	1.3	22	893	0.006



Minnow Environmental  
Sample ID: 016

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.513	0.149	0.058	0.611	0.004	0.009					
Length (µm)											
2880.8	0.513	132	0.886	18	722	0.009	7.4	1.6	28	826	0.006
2881.5	0.513	101	1.5	0.611	841	1.1	7.4	2.8	0.936	962	0.790
2882.2	0.838	87	1.5	13	832	1.8	12	2.7	20	952	1.3
2882.9	0.751	68	0.789	12	722	2.5	11	1.4	18	826	1.8
2883.6	6.8	80	0.751	5.4	811	3.1	98	1.4	8.4	928	2.3
2884.3	0.513	97	0.729	7.9	1268	4.0	7.4	1.3	12	1450	2.9
2884.9	1.0	74	0.806	1.6	953	1.1	15	1.5	2.5	1089	0.799
2885.6	0.513	93	0.627	6.6	1304	1.2	7.4	1.1	10	1491	0.901
2886.3	0.513	59	0.387	11	514	0.009	7.4	0.705	17	588	0.006
2887.0	0.513	101	0.929	10	908	0.009	7.4	1.7	15	1038	0.006
2887.7	1.4	81	0.918	2.6	711	2.9	21	1.7	4.0	813	2.1
2888.4	1.8	81	2.6	15	867	0.009	27	4.7	22	992	0.006
2889.1	2.9	96	0.058	0.611	832	2.2	41	0.105	0.936	952	1.6
2889.8	1.4	59	0.058	10.0	414	0.009	20	0.105	15	473	0.006



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
0.4	4.5	214	4.0	6.6	1217	2.1	65	7.3	10	1392	1.5
1.0	0.393	227	6.9	19	720	0.003	5.7	13	30	824	0.002
1.7	3.9	259	5.6	23	789	1.8	56	10	35	903	1.3
2.4	0.393	207	3.4	10	411	5.5	5.7	6.2	15	470	4.0
3.1	0.393	253	3.6	2.4	510	6.3	5.7	6.6	3.7	584	4.6
3.8	4.3	144	1.7	6.7	436	5.4	62	3.1	10	498	4.0
4.5	0.393	148	1.8	4.2	284	0.769	5.7	3.2	6.5	325	0.561
5.2	0.393	131	1.0	12	366	3.6	5.7	1.9	18	418	2.6
5.9	0.393	203	2.6	9.4	538	3.2	5.7	4.8	14	615	2.3
6.6	2.1	155	2.2	11	529	5.2	30	4.1	17	605	3.8
7.3	0.393	146	1.3	24	525	2.3	5.7	2.3	37	600	1.6
8.0	2.1	170	2.1	6.8	506	2.0	31	3.7	10	578	1.4
8.7	3.6	169	1.4	12	536	4.1	52	2.6	18	613	3.0
9.4	0.393	125	0.803	9.7	524	0.688	5.7	1.5	15	599	0.502
10.1	0.393	150	1.3	5.5	527	0.805	5.7	2.4	8.4	602	0.587
10.8	1.1	152	0.670	13	449	1.2	16	1.2	20	514	0.885
11.5	1.9	165	1.6	7.2	518	3.1	27	3.0	11	592	2.3
12.2	1.7	94	1.3	3.1	359	0.286	25	2.4	4.8	411	0.209
12.9	0.476	103	0.784	8.6	447	1.2	6.9	1.4	13	511	0.893
13.6	0.421	121	1.1	4.4	457	1.6	6.1	2.0	6.8	522	1.2
14.3	1.0	129	1.2	1.2	445	0.003	15	2.2	1.8	509	0.002
15.0	0.642	146	0.891	3.3	540	2.2	9.3	1.6	5.0	618	1.6
15.7	0.687	141	0.403	3.5	445	1.7	9.9	0.735	5.3	508	1.2
16.4	1.4	110	0.519	5.7	465	1.4	21	0.946	8.7	532	1.0
17.1	0.889	111	0.468	6.6	474	1.8	13	0.853	10	542	1.3
17.8	1.5	113	0.792	5.4	440	1.5	21	1.4	8.3	504	1.1
18.5	1.3	137	1.1	6.6	672	0.890	19	2.0	10	768	0.649
19.2	0.404	137	0.447	4.4	525	0.958	5.8	0.816	6.7	600	0.699
19.9	0.677	104	0.339	7.9	570	1.1	9.8	0.618	12	651	0.787
20.6	1.5	117	0.492	3.3	560	0.882	22	0.897	5.1	640	0.643
21.3	0.475	133	1.0	5.7	595	1.3	6.9	1.9	8.8	681	0.913
22.0	1.3	139	0.775	3.9	563	0.447	19	1.4	6.0	643	0.326
22.7	2.2	129	0.497	8.3	603	1.6	32	0.906	13	690	1.1
23.4	0.961	88	0.278	4.1	476	1.2	14	0.506	6.4	544	0.859
24.1	1.0	104	0.648	3.2	463	1.1	15	1.2	4.9	530	0.799
24.8	0.758	128	0.648	5.4	683	1.6	11	1.2	8.3	781	1.2
25.5	1.7	125	0.851	2.3	521	1.5	25	1.6	3.5	596	1.1
26.1	0.990	122	0.591	7.1	553	1.8	14	1.1	11	632	1.3
26.8	1.1	81	0.242	4.8	617	1.4	16	0.442	7.3	705	0.987
27.5	0.393	95	0.553	5.8	641	0.794	5.7	1.0	9.0	733	0.579
28.2	0.796	108	0.079	7.1	659	2.2	11	0.144	11	754	1.6
28.9	0.393	80	0.528	5.9	529	1.1	5.7	0.963	9.1	605	0.835
29.6	1.5	109	0.143	3.1	705	0.757	22	0.261	4.7	806	0.552
30.3	0.816	93	0.182	2.6	586	0.452	12	0.332	4.1	671	0.330
31.0	0.471	96	0.409	2.2	662	0.733	6.8	0.745	3.4	757	0.535
31.7	0.393	103	0.764	6.7	556	1.1	5.7	1.4	10	636	0.807
32.4	0.967	91	0.417	2.4	768	1.2	14	0.760	3.7	878	0.911
33.1	0.427	83	0.194	3.9	672	0.964	6.2	0.354	6.0	769	0.703
33.8	0.393	90	0.240	3.3	729	1.4	5.7	0.437	5.1	834	1.1
34.5	0.725	94	0.348	3.2	764	1.9	10	0.635	4.9	873	1.4
35.2	1.1	78	0.344	2.4	617	1.1	15	0.628	3.7	706	0.833
35.9	2.1	83	0.313	4.5	686	0.665	30	0.571	6.8	784	0.485
36.6	1.2	88	0.337	4.5	706	0.959	18	0.615	6.9	808	0.700
37.3	0.447	86	0.356	4.8	687	2.2	6.4	0.650	7.4	786	1.6
38.0	1.2	85	0.576	4.9	695	1.3	17	1.1	7.5	794	0.966
38.7	0.753	84	0.326	9.5	716	0.773	11	0.595	14	818	0.564
39.4	0.641	89	0.754	1.6	634	1.1	9.3	1.4	2.5	725	0.769
40.1	0.393	82	0.352	5.3	752	2.1	5.7	0.643	8.2	860	1.5
40.8	0.393	76	0.765	6.2	627	1.0	5.7	1.4	9.4	717	0.751
41.5	0.788	62	0.473	5.2	656	1.6	11	0.863	7.9	751	1.1
42.2	0.393	75	0.385	4.2	660	1.6	5.7	0.702	6.4	755	1.1
42.9	0.767	75	0.258	3.0	682	1.5	11	0.470	4.5	779	1.1
43.6	1.1	70	0.504	2.9	749	1.3	15	0.920	4.5	857	0.977
44.3	0.915	70	0.199	4.3	738	1.4	13	0.363	6.6	843	1.0
45.0	0.921	65	0.142	4.8	654	1.2	13	0.259	7.3	748	0.868
45.7	1.5	63	0.155	3.6	639	1.5	21	0.283	5.5	731	1.1
46.4	0.934	67	0.322	4.4	720	1.4	13	0.588	6.8	824	1.0
47.1	0.393	78	0.243	3.6	725	1.4	5.7	0.443	5.5	829	0.987
47.8	0.584	65	0.108	3.3	655	1.5	8.4	0.197	5.1	749	1.1
48.5	0.396	60	0.270	5.0	705	2.0	5.7	0.492	7.7	807	1.5
49.2	1.3	51	0.211	2.9	756	0.599	18	0.384	4.5	864	0.437
49.9	0.822	79	0.245	4.3	954	1.3	12	0.447	6.7	1091	0.932
50.6	0.394	50	0.296	3.3	655	1.0	5.7	0.540	5.0	749	0.733
51.3	0.500	46	0.319	4.5	588	0.922	7.2	0.583	7.0	672	0.673
52.0	1.4	66	0.198	4.6	672	1.7	20	0.361	7.1	769	1.2
52.6	0.393	42	0.374	5.2	724	1.2	5.7	0.682	7.9	828	0.866
53.3	0.609	46	0.284	5.3	683	0.612	8.8	0.518	8.1	781	0.446
54.0	1.2	46	0.396	4.4	803	1.2	17	0.722	6.8	919	0.885
54.7	0.781	45	0.354	4.8	737	1.5	11	0.646	7.3	843	1.1
55.4	1.1	48	0.313	4.8	722	1.9	15	0.571	7.3	826	1.4
56.1	0.639	46	0.496	5.6	758	1.4	9.2	0.905	8.6	867	0.988



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
56.8	1.5	49	0.381	6.8	791	1.7	22	0.694	10	905	1.2
57.5	0.650	45	0.728	6.5	705	2.8	9.4	1.3	9.9	807	2.0
58.2	0.393	48	0.418	6.4	856	0.807	5.7	0.762	9.9	979	0.589
58.9	1.1	44	0.388	6.6	713	1.2	16	0.708	10	816	0.844
59.6	1.4	43	0.283	7.2	731	1.6	20	0.517	11	836	1.2
60.3	0.815	47	0.345	6.0	734	0.897	12	0.630	9.1	839	0.654
61.0	0.600	46	0.280	4.7	799	1.8	8.7	0.511	7.2	914	1.3
61.7	0.978	46	0.210	7.3	758	1.1	14	0.383	11	867	0.798
62.4	0.857	39	0.274	6.9	706	1.7	12	0.499	11	807	1.2
63.1	1.1	47	0.403	7.7	698	0.974	16	0.735	12	798	0.710
63.8	1.9	38	0.402	11	830	2.9	28	0.732	17	949	2.1
64.5	0.703	46	0.411	11	752	1.1	10	0.750	16	859	0.797
65.2	0.525	32	0.445	11	742	1.6	7.6	0.812	16	848	1.2
65.9	0.871	36	0.367	11	790	2.3	13	0.670	17	903	1.7
66.6	0.863	34	0.427	9.6	776	1.5	12	0.778	15	887	1.1
67.3	0.712	37	0.462	12	801	2.2	10	0.843	18	916	1.6
68.0	0.764	36	0.281	12	827	1.4	11	0.513	19	946	1.0
68.7	0.584	31	0.427	14	781	1.3	8.4	0.779	21	894	0.927
69.4	1.4	33	0.531	14	886	2.3	20	0.968	21	1014	1.7
70.1	0.672	27	0.586	13	812	1.0	9.7	1.1	20	929	0.762
70.8	1.1	27	0.295	15	770	2.1	15	0.538	22	881	1.5
71.5	0.547	26	0.736	13	819	2.1	7.9	1.3	20	936	1.5
72.2	0.776	31	0.756	15	904	1.5	11	1.4	24	1034	1.1
72.9	0.911	27	0.760	11	859	1.8	13	1.4	17	982	1.3
73.6	0.987	27	0.779	16	811	2.3	14	1.4	25	927	1.7
74.3	1.1	26	0.680	17	851	1.8	15	1.2	25	973	1.3
75.0	0.408	22	0.797	16	1041	1.9	5.9	1.5	25	1190	1.4
75.7	0.545	23	0.522	15	951	1.7	7.9	0.952	23	1088	1.3
76.4	0.831	26	0.867	20	860	1.0	12	1.6	31	983	0.764
77.1	0.707	24	0.572	17	1014	1.8	10	1.0	26	1160	1.3
77.8	0.725	23	0.870	15	858	2.0	10	1.6	23	981	1.4
78.5	0.838	21	0.826	12	919	1.5	12	1.5	19	1051	1.1
79.1	0.823	20	0.815	17	1118	2.0	12	1.5	27	1218	1.4
79.8	0.794	24	1.2	20	1158	3.3	11	2.1	30	1324	2.4
80.5	0.393	22	0.987	18	1032	3.1	5.7	1.8	28	1180	2.3
81.2	0.606	22	0.950	17	1246	2.7	8.7	1.7	26	1425	2.0
81.9	0.586	20	1.1	19	1090	3.1	8.5	2.1	29	1247	2.2
82.6	0.584	20	1.5	21	1204	3.0	8.4	2.8	32	1377	2.2
83.3	0.393	23	0.958	21	1217	2.4	5.7	1.7	32	1392	1.8
84.0	0.697	20	1.4	24	1253	3.0	10	2.6	37	1433	2.2
84.7	0.393	23	1.2	23	1207	3.0	5.7	2.2	35	1380	2.2
85.4	1.0	25	1.7	21	1507	2.3	14	3.2	32	1723	1.7
86.1	0.393	21	1.6	19	1328	2.9	5.7	2.9	30	1519	2.1
86.8	0.552	20	1.1	19	1134	2.3	8.0	2.0	29	1296	1.7
87.5	0.737	18	2.2	23	1226	2.5	11	4.1	35	1402	1.8
88.2	0.942	22	1.1	19	1343	2.7	14	2.0	29	1536	1.9
88.9	0.393	20	1.8	20	1407	2.7	5.7	3.2	31	1609	1.9
89.6	0.857	20	1.9	20	1475	2.7	12	3.5	31	1686	2.0
90.3	0.748	22	1.7	26	1288	2.7	11	3.1	40	1472	2.0
91.0	1.1	19	2.0	24	1307	2.2	16	3.6	36	1495	1.6
91.7	0.910	21	2.0	26	1476	2.6	13	3.7	39	1688	1.9
92.4	0.906	21	1.5	21	1581	4.5	13	2.8	32	1808	3.3
93.1	0.674	20	1.9	26	1551	3.9	9.7	3.4	39	1773	2.8
93.8	0.804	21	2.2	31	1583	3.9	12	4.0	47	1811	2.9
94.5	0.581	23	1.5	27	1625	2.8	8.4	2.8	41	1859	2.1
95.2	1.1	17	1.8	21	1329	4.0	15	3.2	32	1520	2.9
95.9	1.2	18	2.5	22	1564	3.4	18	4.5	34	1789	2.5
96.6	1.5	20	1.7	25	1591	4.7	22	3.1	38	1820	3.4
97.3	1.3	24	2.1	30	1424	4.2	19	3.8	46	1628	3.1
98.0	1.9	22	2.2	23	1586	1.8	28	4.0	35	1814	1.3
98.7	1.2	21	2.1	23	1502	3.1	17	3.7	35	1717	2.2
99.4	1.8	23	2.7	26	1737	4.3	26	5.0	40	1986	3.1
100.1	2.1	23	2.5	26	1595	3.7	30	4.5	39	1824	2.7
100.8	1.1	20	2.6	25	1412	3.5	15	4.7	39	1614	2.6
101.5	2.1	20	2.3	24	1506	3.4	30	4.2	37	1722	2.4
102.2	2.6	19	2.6	26	1542	3.7	37	4.7	41	1763	2.7
102.9	1.6	21	2.7	24	1572	3.1	23	5.0	36	1798	2.2
103.6	3.2	20	2.7	30	1617	3.0	46	5.0	47	1849	2.2
104.3	2.8	21	2.7	26	1589	2.8	40	5.0	40	1817	2.0
105.0	2.2	17	2.8	27	1429	2.1	31	5.1	41	1634	1.5
105.6	2.9	20	2.4	26	1562	3.3	41	4.3	40	1786	2.4
106.3	2.9	20	2.3	30	1690	4.1	42	4.1	46	1933	3.0
107.0	3.3	20	2.7	27	1454	3.2	48	4.9	41	1662	2.4
107.7	3.9	20	2.9	30	1512	4.0	57	5.3	46	1729	2.9
108.4	3.3	18	2.3	23	1312	2.6	47	4.2	36	1501	1.9
109.1	3.5	18	3.0	24	1407	2.8	51	5.4	37	1609	2.0
109.8	4.5	21	2.7	29	1480	3.7	66	4.9	45	1693	2.7
110.5	4.1	17	2.2	22	1378	3.1	59	4.1	33	1576	2.3
111.2	4.0	16	2.2	21	1422	4.4	58	4.1	32	1626	3.2
111.9	4.1	17	3.0	22	1303	3.7	59	5.5	34	1491	2.7
112.6	4.3	17	2.5	26	1454	3.2	61	4.7	40	1663	2.3



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.3	4.4	16	1.8	22	1390	3.6	64	3.3	33	1590	2.6
114.0	3.6	16	1.7	25	1283	3.0	52	3.1	38	1467	2.2
114.7	4.7	14	2.1	23	1290	3.1	67	3.9	35	1476	2.3
115.4	3.2	16	2.0	19	1284	3.0	46	3.6	29	1468	2.2
116.1	3.4	19	2.4	27	1400	3.0	49	4.5	41	1601	2.2
116.8	4.2	15	1.8	23	1246	1.9	61	3.3	35	1425	1.4
117.5	3.4	14	1.6	22	1189	3.0	49	2.9	34	1359	2.2
118.2	2.4	15	1.9	21	1190	2.5	35	3.5	32	1360	1.9
118.9	3.9	13	2.2	23	1259	3.4	56	4.0	35	1440	2.4
119.6	2.4	15	1.7	16	1062	2.0	35	3.1	24	1214	1.4
120.3	3.4	14	1.8	21	1115	2.7	49	3.2	32	1275	1.9
121.0	3.0	15	1.5	18	1076	2.8	44	2.8	27	1231	2.1
121.7	2.3	14	1.3	18	1212	2.8	34	2.4	28	1386	2.0
122.4	2.6	14	0.897	20	1110	2.2	37	1.6	30	1270	1.6
123.1	2.5	15	1.3	18	1157	2.1	36	2.4	28	1323	1.6
123.8	3.3	16	1.1	19	1128	2.0	48	1.9	29	1290	1.5
124.5	2.5	12	1.2	17	1213	2.1	37	2.3	27	1387	1.5
125.2	2.3	15	1.2	15	1145	2.2	33	2.1	24	1310	1.6
125.9	1.9	13	1.2	17	1137	2.6	28	2.2	27	1300	1.9
126.6	2.5	14	1.1	15	1204	1.7	36	1.9	23	1377	1.2
127.3	2.1	12	1.1	15	934	1.7	30	1.9	23	1068	1.2
128.0	2.0	11	1.2	15	1159	2.4	29	2.2	23	1326	1.8
128.7	1.6	11	0.875	14	1087	1.9	23	1.6	21	1243	1.4
129.4	2.0	14	1.4	16	1221	3.1	29	2.6	25	1396	2.3
130.1	2.6	12	0.710	15	1081	2.0	37	1.3	23	1237	1.5
130.8	2.1	9.8	0.565	17	1089	1.9	31	1.0	27	1245	1.4
131.5	2.1	11	1.1	12	1061	1.5	30	1.9	18	1213	1.1
132.1	2.5	11	0.956	13	1038	2.2	36	1.7	21	1186	1.6
132.8	2.2	11	1.0	14	1101	2.8	31	1.9	21	1259	2.0
133.5	2.0	12	0.830	12	1095	2.3	29	1.5	19	1252	1.7
134.2	2.3	12	0.847	14	1022	1.8	32	1.5	22	1169	1.3
134.9	1.9	12	1.1	17	1061	2.5	27	2.0	25	1213	1.8
135.6	1.5	12	1.3	14	1069	2.2	22	2.4	22	1222	1.6
136.3	1.8	11	1.2	18	1063	2.3	26	2.3	28	1215	1.7
137.0	2.8	14	0.609	14	1014	2.5	41	1.1	21	1159	1.8
137.7	1.8	14	1.1	13	968	0.933	27	2.0	20	1107	0.681
138.4	1.4	13	0.753	15	974	1.6	20	1.4	23	1114	1.2
139.1	2.9	13	1.1	11	1021	2.9	42	2.0	17	1167	2.1
139.8	1.4	14	0.731	19	984	3.0	20	1.3	29	1125	2.2
140.5	1.4	11	0.811	14	967	1.2	20	1.5	22	1106	0.866
141.2	2.0	9.0	0.792	12	907	2.1	28	1.4	19	1038	1.5
141.9	2.1	11	0.898	14	928	1.6	30	1.6	21	1061	1.2
142.6	2.3	13	0.998	19	1121	2.0	33	1.8	30	1282	1.5
143.3	1.4	13	0.775	15	880	1.6	21	1.4	23	1007	1.2
144.0	1.9	12	0.886	14	903	2.9	28	1.6	22	1033	2.1
144.7	1.6	12	0.526	13	951	1.7	24	0.959	20	1087	1.2
145.4	1.7	10	0.574	12	940	1.7	24	1.0	19	1074	1.2
146.1	1.3	12	0.850	16	877	1.4	19	1.6	24	1003	1.0
146.8	1.5	12	0.686	14	932	1.5	22	1.3	21	1065	1.1
147.5	1.2	12	0.734	12	865	1.1	18	1.3	18	989	0.782
148.2	1.5	10	0.578	13	771	1.4	22	1.1	20	882	0.989
148.9	1.1	11	0.779	12	859	2.8	17	1.4	18	982	2.0
149.6	2.0	13	0.787	15	850	1.7	29	1.4	22	972	1.3
150.3	1.6	9.5	0.584	13	833	2.2	23	1.1	20	953	1.6
151.0	1.5	11	0.343	11	795	1.1	22	0.625	17	910	0.785
151.7	0.966	11	0.614	12	791	1.5	14	1.1	18	904	1.1
152.4	1.2	14	0.377	12	886	1.9	17	0.687	19	1013	1.4
153.1	1.8	15	0.579	15	804	1.3	25	1.1	23	919	0.923
153.8	1.7	11	0.509	11	809	1.7	24	0.929	17	925	1.2
154.5	1.2	12	0.628	12	794	1.2	18	1.1	19	907	0.900
155.2	0.918	13	0.253	13	866	1.5	13	0.462	20	990	1.1
155.9	0.568	12	0.738	13	745	1.0	8.2	1.3	19	852	0.764
156.6	0.393	14	0.511	14	854	1.5	5.7	0.931	21	977	1.1
157.3	0.956	12	0.480	13	753	1.7	14	0.875	19	861	1.3
157.9	0.717	12	0.368	15	805	1.1	10	0.671	23	920	0.822
158.6	0.928	11	0.582	15	818	1.6	13	1.1	23	935	1.2
159.3	1.7	14	0.690	17	910	2.3	24	1.3	26	1041	1.7
160.0	0.537	13	0.567	14	851	2.7	7.8	1.0	21	973	2.0
160.7	0.895	12	0.334	16	786	1.8	13	0.609	25	899	1.3
161.4	2.1	12	0.474	15	905	1.6	30	0.864	23	1035	1.2
162.1	1.5	12	0.722	15	849	1.6	21	1.3	23	970	1.2
162.8	0.501	16	0.529	14	813	2.6	7.2	0.965	21	929	1.9
163.5	1.5	14	0.430	14	762	1.7	22	0.784	22	871	1.2
164.2	0.736	12	0.433	14	753	2.3	11	0.791	22	862	1.7
164.9	0.606	12	0.658	16	908	1.4	8.8	1.2	24	1039	1.0
165.6	1.1	14	0.899	15	829	2.5	16	1.6	23	948	1.8
166.3	1.3	13	0.345	16	734	2.3	19	0.630	24	839	1.7
167.0	0.875	12	0.482	14	696	2.3	13	0.879	22	796	1.7
167.7	0.393	15	0.327	13	711	2.6	5.7	0.597	20	813	1.9
168.4	0.902	11	0.453	16	714	2.0	13	0.826	24	816	1.4
169.1	1.1	14	0.469	17	808	3.0	15	0.855	26	924	2.2



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
169.8	1.5	13	0.616	19	789	1.7	21	1.1	30	903	1.3
170.5	1.4	15	0.839	16	778	1.8	20	1.5	24	890	1.3
171.2	0.393	14	0.487	16	830	2.5	5.7	0.888	25	949	1.8
171.9	1.1	15	0.704	18	742	2.5	16	1.3	28	849	1.8
172.6	0.613	18	0.791	18	863	1.7	8.8	1.4	28	987	1.2
173.3	0.796	15	0.645	20	726	2.4	11	1.2	31	830	1.8
174.0	0.790	15	0.559	14	805	2.0	11	1.0	22	921	1.5
174.7	0.763	15	0.660	15	790	1.3	11	1.2	23	904	0.953
175.4	0.419	16	0.445	18	830	1.6	6.0	0.812	27	949	1.2
176.1	0.790	15	0.531	20	848	1.9	11	0.968	31	969	1.4
176.8	1.1	16	0.745	21	807	2.5	15	1.4	33	923	1.8
177.5	1.1	15	0.758	20	938	2.6	15	1.4	30	1072	1.9
178.2	0.787	16	0.542	16	835	2.0	11	0.989	24	955	1.5
178.9	0.971	18	0.977	17	838	2.2	14	1.8	26	958	1.6
179.6	1.0	16	0.790	20	924	2.3	15	1.4	31	1056	1.7
180.3	1.1	14	0.576	19	729	1.9	15	1.0	29	834	1.4
181.0	0.574	15	1.0	20	829	2.0	8.3	1.9	31	948	1.5
181.7	1.4	17	1.0	18	878	2.3	20	1.8	27	1004	1.7
182.4	1.2	19	0.886	25	935	3.7	18	1.6	38	1069	2.7
183.1	0.920	17	1.1	22	861	2.3	13	2.1	34	984	1.7
183.7	0.520	17	0.871	19	830	1.5	7.5	1.6	30	949	1.1
184.4	1.0	16	0.924	28	966	3.1	15	1.7	43	1104	2.3
185.1	0.393	17	0.864	21	956	3.4	5.7	1.6	32	1094	2.5
185.8	0.789	21	1.0	25	957	2.1	11	1.9	38	1094	1.5
186.5	0.723	14	0.924	21	794	1.9	10	1.7	33	908	1.4
187.2	1.4	15	0.904	17	902	1.6	20	1.6	26	1031	1.2
187.9	1.0	20	1.2	19	1019	2.4	15	2.1	29	1165	1.7
188.6	0.624	18	1.1	24	974	3.0	9.0	2.1	37	1114	2.2
189.3	0.719	16	1.2	25	877	2.7	10	2.1	38	1002	2.0
190.0	0.733	19	1.1	19	911	2.7	11	2.0	30	1042	2.0
190.7	0.619	13	0.975	23	921	1.6	8.9	1.8	35	1053	1.1
191.4	0.710	15	0.908	18	894	3.0	10	1.7	27	1022	2.2
192.1	0.911	17	1.0	28	986	2.3	13	1.9	42	1127	1.7
192.8	0.712	16	1.3	24	945	2.7	10	2.3	37	1080	2.0
193.5	0.897	16	0.765	23	954	1.7	13	1.4	35	1091	1.3
194.2	0.849	15	1.2	20	943	2.1	12	2.1	31	1078	1.5
194.9	0.915	15	1.2	25	990	2.0	13	2.2	38	1132	1.5
195.6	0.393	17	1.2	25	1143	2.5	5.7	2.3	38	1307	1.8
196.3	1.2	20	1.1	27	1053	3.2	18	2.0	42	1204	2.4
197.0	1.4	18	1.5	27	1033	1.4	20	2.7	41	1182	1.0
197.7	0.655	17	1.6	20	1008	3.8	9.5	2.9	31	1153	2.8
198.4	1.0	17	1.4	28	1180	3.2	15	2.6	43	1350	2.4
199.1	0.644	18	1.6	29	1200	4.0	9.3	2.9	45	1372	2.9
199.8	0.541	20	1.5	30	1112	2.9	7.8	2.7	45	1271	2.1
200.5	0.448	17	1.3	23	1046	2.2	6.5	2.4	35	1196	1.6
201.2	0.684	16	1.4	23	1170	1.5	9.9	2.6	36	1338	1.1
201.9	1.6	15	2.0	27	1259	4.1	23	3.7	42	1439	3.0
202.6	1.1	18	2.2	32	1148	2.4	15	3.9	50	1313	1.7
203.3	0.615	19	1.5	29	1148	3.3	8.9	2.7	45	1313	2.4
204.0	0.852	17	1.6	27	1138	2.3	12	3.0	41	1302	1.7
204.7	1.2	19	1.9	23	1158	2.9	17	3.4	36	1324	2.1
205.4	0.643	18	1.9	34	1315	3.9	9.3	3.5	52	1504	2.9
206.1	1.1	17	1.8	26	1094	2.8	16	3.2	39	1251	2.1
206.8	1.3	20	1.9	31	1244	3.9	19	3.5	48	1423	2.8
207.5	0.493	17	1.7	28	1255	3.2	7.1	3.2	43	1436	2.3
208.2	0.713	17	1.9	29	1290	2.7	10	3.5	45	1475	2.0
208.9	1.1	20	2.2	36	1355	3.1	16	3.9	55	1549	2.3
209.6	1.2	19	2.4	37	1286	3.7	18	4.4	56	1471	2.7
210.2	0.903	18	2.4	29	1208	3.1	13	4.3	45	1382	2.3
210.9	1.5	19	2.4	29	1349	2.5	21	4.3	45	1543	1.8
211.6	1.5	21	2.4	31	1530	2.4	21	4.5	47	1749	1.8
212.3	1.6	22	2.6	39	1464	3.2	24	4.7	59	1675	2.3
213.0	1.7	21	2.3	35	1495	2.9	25	4.1	53	1709	2.1
213.7	0.723	22	2.2	32	1288	3.0	10	4.1	49	1473	2.2
214.4	1.9	20	2.9	35	1535	2.3	27	5.3	53	1755	1.6
215.1	1.2	20	2.7	32	1449	2.8	18	4.9	49	1657	2.1
215.8	2.2	19	2.7	35	1367	3.5	31	4.8	54	1563	2.5
216.5	1.8	22	2.9	35	1441	2.9	26	5.2	54	1647	2.1
217.2	2.0	17	3.0	34	1430	3.4	29	5.5	52	1636	2.5
217.9	2.5	18	3.4	31	1509	3.3	37	6.3	47	1726	2.4
218.6	3.1	18	3.3	36	1636	3.1	45	6.1	56	1871	2.3
219.3	2.2	21	3.6	43	1741	3.0	32	6.6	65	1991	2.2
220.0	1.7	20	3.2	37	1595	3.5	24	5.8	57	1823	2.5
220.7	2.9	19	3.2	33	1607	2.9	41	5.8	51	1837	2.1
221.4	2.0	20	3.9	40	1666	4.4	29	7.1	61	1905	3.2
222.1	3.2	22	3.8	38	1744	3.5	46	6.9	59	1995	2.5
222.8	3.2	21	4.5	39	1439	2.2	46	8.2	60	1645	1.6
223.5	2.4	18	3.6	33	1483	2.8	34	6.6	51	1696	2.0
224.2	3.9	20	3.6	42	1689	3.3	56	6.5	64	1931	2.4
224.9	3.3	21	3.6	39	1460	2.2	48	6.6	59	1670	1.6
225.6	4.1	23	4.1	46	1680	4.4	59	7.4	71	1921	3.2



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.3	3.4	19	3.7	41	1470	2.2	49	6.7	63	1681	1.6
227.0	3.1	19	4.0	37	1735	2.7	44	7.2	56	1984	2.0
227.7	3.2	16	4.1	30	1434	2.6	46	7.4	45	1640	1.9
228.4	4.3	16	4.0	38	1557	2.3	62	7.3	58	1780	1.7
229.1	3.0	22	3.9	37	1591	3.0	44	7.2	57	1819	2.2
229.8	3.8	20	3.2	40	1678	3.0	55	5.9	61	1919	2.2
230.5	3.8	16	3.4	34	1412	2.0	54	6.1	52	1615	1.5
231.2	3.1	17	4.0	35	1572	2.5	44	7.3	53	1798	1.8
231.9	4.0	18	3.7	39	1787	3.3	58	6.7	60	2043	2.4
232.6	3.6	22	4.0	47	1697	3.3	52	7.2	72	1940	2.4
233.3	3.4	16	3.9	38	1391	2.2	49	7.1	58	1591	1.6
234.0	3.8	17	3.6	32	1711	2.6	55	6.5	49	1956	1.9
234.7	4.1	20	4.3	39	1533	2.6	59	7.8	59	1753	1.9
235.4	5.2	21	5.8	47	1892	4.0	76	11	72	2164	2.9
236.0	3.3	20	4.9	36	1512	3.0	48	8.9	55	1729	2.2
236.7	3.9	18	4.2	36	1723	3.1	57	7.7	56	1970	2.3
237.4	5.9	16	3.6	37	1616	2.4	86	6.6	57	1848	1.7
238.1	5.4	18	4.9	39	1652	2.9	77	8.9	60	1889	2.1
238.8	7.3	18	4.1	41	1472	2.4	105	7.5	63	1683	1.8
239.5	5.5	17	4.3	42	1592	2.6	79	7.8	65	1820	1.9
240.2	5.0	15	4.1	33	1368	2.5	73	7.5	50	1564	1.9
240.9	4.9	14	3.9	33	1478	3.4	71	7.2	50	1690	2.5
241.6	7.3	17	5.2	33	1618	3.8	106	9.5	51	1850	2.8
242.3	5.0	17	3.8	31	1331	2.4	71	6.9	47	1523	1.8
243.0	6.1	19	4.4	38	1681	3.3	89	8.1	58	1922	2.4
243.7	6.1	16	3.7	34	1516	3.2	88	6.8	52	1734	2.3
244.4	6.7	17	3.9	28	1534	2.0	96	7.2	44	1754	1.5
245.1	5.4	17	4.3	28	1290	2.6	77	7.9	43	1475	1.9
245.8	6.0	18	3.9	35	1311	3.4	87	7.0	53	1499	2.5
246.5	5.7	15	3.5	36	1367	2.5	82	6.4	55	1564	1.8
247.2	6.5	15	3.7	28	1553	2.1	94	6.7	43	1776	1.5
247.9	6.2	16	3.5	28	1389	2.6	90	6.5	42	1588	1.9
248.6	9.3	16	4.2	29	1425	2.2	134	7.7	45	1630	1.6
249.3	6.2	16	4.2	31	1255	4.2	90	7.7	48	1435	3.1
250.0	6.0	15	3.5	29	1345	2.1	86	6.3	44	1538	1.5
250.7	7.8	14	3.1	30	1264	1.7	113	5.6	45	1446	1.3
251.4	7.2	15	3.8	28	1431	2.5	104	6.9	43	1637	1.9
252.1	6.2	17	3.3	28	1271	2.3	89	6.0	43	1453	1.7
252.8	5.0	17	2.6	27	1153	2.1	73	4.7	41	1318	1.6
253.5	5.6	12	2.1	26	1332	1.8	82	3.8	40	1523	1.3
254.2	5.6	13	2.8	23	1225	1.9	81	5.2	35	1401	1.4
254.9	5.5	14	3.4	25	1341	2.9	79	6.2	39	1533	2.1
255.6	5.4	15	2.1	23	1125	2.6	78	3.8	35	1287	1.9
256.3	4.6	12	2.4	23	992	2.4	67	4.4	35	1134	1.7
257.0	5.0	10	2.0	15	991	1.3	72	3.7	23	1133	0.957
257.7	5.1	12	1.5	20	1019	1.9	74	2.7	30	1166	1.4
258.4	4.8	13	2.4	25	1190	3.1	69	4.3	38	1360	2.3
259.1	4.4	12	1.6	21	1002	2.5	64	3.0	32	1146	1.8
259.8	3.8	13	1.6	20	997	1.1	55	2.9	31	1140	0.833
260.5	4.1	10	1.6	16	1074	1.9	59	2.9	25	1228	1.4
261.2	4.5	14	1.5	17	988	2.0	66	2.8	26	1129	1.5
261.8	4.0	12	1.5	21	1089	1.5	58	2.8	33	1245	1.1
262.5	3.4	11	1.1	16	933	1.8	49	2.0	24	1067	1.3
263.2	3.8	12	1.2	14	915	1.5	55	2.2	22	1046	1.1
263.9	2.9	9.4	1.3	14	978	1.8	42	2.4	22	1119	1.3
264.6	2.8	12	1.0	19	923	1.3	40	1.9	29	1056	0.951
265.3	3.7	12	0.917	19	1057	2.5	53	1.7	29	1209	1.9
266.0	2.7	9.8	0.706	13	882	2.3	39	1.3	19	1008	1.7
266.7	3.2	9.6	1.1	14	1107	1.9	46	2.0	22	1266	1.4
267.4	2.9	11	0.993	12	880	1.0	42	1.8	19	1006	0.730
268.1	3.0	10	0.866	12	1014	1.5	43	1.6	18	1160	1.1
268.8	2.6	12	0.732	17	999	1.5	37	1.3	25	1143	1.1
269.5	2.4	12	1.2	13	955	2.3	35	2.2	20	1092	1.7
270.2	1.7	11	0.635	9.2	930	1.5	25	1.2	14	1063	1.1
270.9	2.3	11	0.906	16	992	2.1	34	1.7	24	1135	1.5
271.6	2.3	11	0.763	14	1047	0.787	34	1.4	21	1197	0.574
272.3	1.7	13	0.415	9.2	827	1.1	25	0.756	14	945	0.816
273.0	2.3	11	0.515	12	880	1.1	33	0.940	18	1007	0.821
273.7	1.8	12	0.423	11	898	2.1	26	0.772	17	1027	1.5
274.4	1.5	10.0	0.701	13	1020	1.3	22	1.3	20	1166	0.980
275.1	1.9	15	0.631	15	965	1.7	27	1.2	23	1104	1.2
275.8	1.5	14	0.762	15	871	2.1	22	1.4	24	996	1.5
276.5	0.744	12	0.561	19	856	1.6	11	1.0	29	978	1.2
277.2	0.964	13	0.760	14	963	1.9	14	1.4	21	1101	1.4
277.9	1.3	16	0.669	14	944	1.3	18	1.2	22	1080	0.957
278.6	0.837	17	0.655	16	963	2.3	12	1.2	24	1101	1.6
279.3	0.538	13	0.617	16	827	1.7	7.8	1.1	25	946	1.2
280.0	1.1	11	0.609	13	968	1.5	16	1.1	20	1107	1.1
280.7	0.879	13	0.491	14	948	1.4	13	0.895	22	1084	1.0
281.4	1.4	15	0.455	18	841	2.3	20	0.830	28	962	1.7
282.1	1.2	16	0.552	18	939	1.1	18	1.0	27	1073	0.774



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
282.8	0.856	13	0.403	17	812	2.8	12	0.734	27	928	2.0
283.5	1.2	12	0.575	17	909	2.3	17	1.0	26	1039	1.7
284.2	1.1	15	0.843	21	1013	1.2	15	1.5	32	1158	0.878
284.9	1.0	18	0.786	17	935	2.5	15	1.4	27	1069	1.8
285.6	1.1	16	0.389	22	873	2.6	16	0.709	33	998	1.9
286.3	0.393	16	0.520	23	1043	1.6	5.7	0.949	35	1192	1.2
287.0	0.791	14	0.804	19	971	2.0	11	1.5	29	1111	1.5
287.7	0.961	15	0.780	15	1039	2.5	14	1.4	23	1188	1.8
288.3	0.872	16	1.0	22	1035	2.1	13	1.9	33	1184	1.5
289.0	0.697	17	0.564	19	994	1.8	10	1.0	30	1137	1.3
289.7	0.393	17	1.1	24	1069	1.9	5.7	2.1	38	1223	1.4
290.4	0.575	14	0.743	17	1037	1.7	8.3	1.4	27	1186	1.2
291.1	1.2	17	0.931	23	1021	2.0	18	1.7	35	1168	1.5
291.8	0.560	20	1.1	27	1140	3.6	8.1	2.0	42	1304	2.6
292.5	1.3	17	0.706	25	1134	1.5	18	1.3	38	1297	1.1
293.2	1.0	14	0.882	21	962	2.2	15	1.6	32	1100	1.6
293.9	0.485	14	0.832	18	1041	2.1	7.0	1.5	28	1191	1.5
294.6	1.3	19	1.1	23	1111	3.9	18	2.0	35	1271	2.8
295.3	0.907	18	0.899	25	1215	3.6	13	1.6	39	1390	2.7
296.0	1.3	18	1.0	22	1145	2.2	18	1.9	33	1310	1.6
296.7	0.704	14	0.822	24	1050	1.9	10	1.5	37	1200	1.4
297.4	1.4	17	0.962	26	1170	1.9	21	1.8	40	1337	1.4
298.1	0.629	20	0.864	33	1339	2.7	9.1	1.6	51	1532	2.0
298.8	0.856	17	1.0	32	1237	2.5	12	1.8	50	1414	1.8
299.5	0.656	17	0.957	25	1129	1.8	9.5	1.7	38	1291	1.3
300.2	1.1	16	1.0	27	1272	2.5	16	1.8	41	1455	1.8
300.9	0.752	19	1.0	29	1364	2.2	11	1.9	44	1560	1.6
301.6	0.838	17	0.896	32	1318	3.1	12	1.6	49	1507	2.2
302.3	0.422	17	0.736	34	1314	3.0	6.1	1.3	52	1502	2.2
303.0	0.393	17	1.2	30	1296	2.9	5.7	2.2	45	1482	2.1
303.7	0.940	15	1.2	26	1423	2.1	14	2.1	40	1627	1.5
304.4	0.849	17	1.3	30	1431	3.3	12	2.4	47	1637	2.4
305.1	0.833	16	1.0	35	1430	3.9	12	1.9	54	1635	2.9
305.8	0.547	16	1.1	29	1279	2.8	7.9	2.0	45	1463	2.1
306.5	0.699	17	1.4	30	1538	2.7	10	2.5	47	1758	1.9
307.2	0.974	15	1.5	27	1393	2.5	14	2.8	42	1593	1.8
307.9	0.730	16	1.3	34	1663	3.0	11	2.4	52	1902	2.2
308.6	0.393	19	1.3	36	1293	2.8	5.7	2.4	55	1479	2.0
309.3	0.810	15	1.1	38	1461	3.2	12	2.0	59	1671	2.3
310.0	0.766	16	1.1	36	1526	2.6	11	2.0	56	1745	1.9
310.7	0.755	14	0.945	30	1531	2.5	11	1.7	45	1750	1.8
311.4	0.745	20	1.3	36	1534	2.9	11	2.4	55	1754	2.2
312.1	1.4	17	0.958	29	1294	2.8	21	1.7	44	1480	2.1
312.8	0.856	15	1.2	36	1478	1.6	12	2.2	55	1690	1.1
313.5	0.575	15	1.5	28	1307	2.6	8.3	2.7	43	1494	1.9
314.2	1.4	17	1.4	34	1530	3.1	20	2.5	51	1750	2.2
314.9	0.905	16	1.5	36	1532	3.2	13	2.8	55	1752	2.3
315.5	0.800	18	1.4	39	1410	3.8	12	2.6	60	1613	2.8
316.2	0.737	14	1.1	34	1495	2.5	11	2.0	52	1710	1.8
316.9	1.7	16	0.897	26	1508	1.9	24	1.6	39	1724	1.4
317.6	2.5	17	1.5	37	1689	4.3	35	2.7	57	1931	3.1
318.3	2.3	17	1.3	33	1439	2.4	33	2.4	51	1645	1.8
319.0	1.5	16	1.1	33	1411	3.1	22	2.1	50	1614	2.2
319.7	1.6	14	1.2	32	1463	3.5	23	2.3	50	1673	2.5
320.4	2.2	13	1.1	27	1470	2.2	32	2.0	42	1681	1.6
321.1	2.5	16	1.7	36	1607	3.4	37	3.2	55	1838	2.5
321.8	2.2	16	1.3	38	1347	3.7	32	2.4	58	1540	2.7
322.5	1.6	17	1.5	34	1343	2.4	24	2.8	53	1536	1.8
323.2	2.1	14	1.1	34	1364	2.6	31	2.0	52	1560	1.9
323.9	2.7	15	1.7	29	1386	2.6	39	3.1	45	1585	1.9
324.6	2.6	16	1.6	35	1422	3.1	37	2.9	53	1626	2.3
325.3	2.2	17	1.3	32	1233	3.1	32	2.3	50	1410	2.2
326.0	1.5	16	1.0	29	1348	2.2	22	1.9	45	1541	1.6
326.7	1.2	14	1.1	24	1238	2.5	18	2.0	37	1416	1.8
327.4	1.7	13	1.1	25	1245	2.5	25	1.9	39	1423	1.8
328.1	1.6	18	0.765	25	1113	2.7	23	1.4	39	1272	2.0
328.8	1.1	13	0.963	29	1002	2.5	16	1.8	45	1146	1.8
329.5	1.3	13	0.674	24	1155	2.6	19	1.2	37	1321	1.9
330.2	1.3	11	1.1	21	1152	2.5	19	2.1	32	1317	1.8
330.9	1.7	12	0.774	23	1217	2.6	24	1.4	35	1392	1.9
331.6	1.2	14	0.967	23	1048	1.6	17	1.8	35	1199	1.1
332.3	1.2	14	0.762	23	1051	1.8	18	1.4	35	1202	1.3
333.0	1.6	8.5	0.705	17	894	2.5	22	1.3	26	1022	1.8
333.7	1.3	13	0.614	23	1239	3.1	19	1.1	35	1417	2.3
334.4	1.1	13	0.699	22	1153	2.6	16	1.3	33	1319	1.9
335.1	1.0	13	0.768	18	987	2.4	15	1.4	28	1129	1.8
335.8	1.4	11	0.554	18	1003	1.7	21	1.0	27	1147	1.3
336.5	1.3	11	0.717	18	1057	2.2	19	1.3	27	1209	1.6
337.2	1.1	9.6	0.655	20	946	1.7	16	1.2	30	1082	1.2
337.9	1.3	13	0.564	18	1016	1.9	19	1.0	28	1162	1.4
338.6	1.4	13	0.568	19	939	1.6	20	1.0	29	1074	1.1



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.3	1.0	11	0.480	19	956	2.1	14	0.875	29	1093	1.5
340.0	0.720	9.3	0.306	19	942	1.2	10	0.558	29	1077	0.895
340.7	1.7	11	0.512	19	1155	2.4	25	0.933	28	1321	1.8
341.4	0.804	11	0.555	14	1107	3.4	12	1.0	21	1266	2.5
342.0	1.6	10	0.421	15	967	1.4	23	0.768	23	1106	1.1
342.7	1.2	9.9	0.408	14	1024	1.8	18	0.745	21	1171	1.3
343.4	0.899	10	0.426	11	1077	2.2	13	0.777	17	1231	1.6
344.1	0.985	12	0.727	16	994	1.9	14	1.3	25	1137	1.4
344.8	0.805	11	0.318	17	899	2.1	12	0.580	26	1028	1.5
345.5	0.676	8.4	0.242	15	995	1.3	9.8	0.441	23	1137	0.982
346.2	0.652	7.8	0.548	10	897	1.7	9.4	0.999	16	1026	1.2
346.9	0.571	9.5	0.365	14	1061	0.948	8.2	0.666	22	1213	0.692
347.6	1.3	12	0.540	14	1031	2.2	19	0.985	22	1179	1.6
348.3	0.743	8.5	0.174	14	920	1.4	11	0.318	21	1052	0.996
349.0	0.482	9.0	0.454	12	1001	1.5	7.0	0.829	18	1145	1.1
349.7	0.509	6.9	0.453	8.1	1006	1.4	7.4	0.826	12	1150	1.0
350.4	0.462	10	0.347	12	956	1.3	6.7	0.633	18	1094	0.938
351.1	0.868	14	0.392	14	971	1.7	13	0.714	22	1110	1.2
351.8	0.768	9.4	0.440	13	835	1.4	11	0.802	19	955	1.0
352.5	0.624	11	0.433	14	1092	1.7	9.0	0.790	22	1249	1.2
353.2	0.610	12	0.377	11	1016	1.2	8.8	0.687	17	1162	0.894
353.9	0.883	11	0.301	13	1090	1.7	13	0.548	20	1247	1.3
354.6	1.1	14	0.579	21	1015	1.8	16	1.1	32	1161	1.3
355.3	0.628	13	0.323	19	1040	1.0	9.1	0.589	29	1190	0.761
356.0	0.766	14	0.529	15	951	0.804	11	0.966	23	1088	0.586
356.7	0.846	14	0.592	17	1107	1.3	12	1.1	25	1266	0.981
357.4	1.3	16	0.537	17	1115	1.6	19	0.979	25	1275	1.2
358.1	0.946	15	0.424	22	998	2.4	14	0.774	33	1141	1.7
358.8	1.5	17	1.1	21	1023	1.9	22	2.0	32	1170	1.4
359.5	0.424	14	0.696	16	921	1.7	6.1	1.3	25	1054	1.3
360.2	0.608	17	0.575	14	956	1.2	8.8	1.0	22	1094	0.883
360.9	1.2	18	0.618	20	927	2.3	17	1.1	30	1060	1.7
361.6	0.393	16	0.887	14	836	2.1	5.7	1.6	21	956	1.5
362.3	0.875	14	0.646	18	934	1.1	13	1.2	27	1068	0.825
363.0	1.1	15	0.688	15	956	2.7	16	1.3	23	1093	2.0
363.7	0.853	17	0.596	20	957	1.5	12	1.1	31	1095	1.1
364.4	0.483	20	0.843	27	955	2.2	7.0	1.5	41	1092	1.6
365.1	0.411	17	0.724	22	990	2.0	5.9	1.3	34	1132	1.4
365.8	0.755	15	0.573	23	808	1.4	11	1.0	35	924	1.0
366.5	0.753	17	0.993	24	984	1.4	11	1.8	37	1125	1.0
367.2	1.0	14	0.834	25	951	2.1	15	1.5	38	1087	1.5
367.8	0.594	17	0.726	25	912	2.1	8.6	1.3	38	1043	1.5
368.5	1.7	19	0.623	34	1044	3.1	24	1.1	51	1194	2.2
369.2	0.896	16	0.770	23	886	1.5	13	1.4	35	1013	1.1
369.9	0.598	15	0.906	28	1051	2.6	8.6	1.7	43	1202	1.9
370.6	1.2	16	0.892	24	950	2.7	18	1.6	37	1087	2.0
371.3	0.730	22	1.0	26	895	3.1	11	1.9	39	1023	2.2
372.0	0.816	19	0.598	26	942	2.3	12	1.1	41	1077	1.7
372.7	0.727	15	0.689	23	926	2.6	10	1.3	35	1059	1.9
373.4	0.826	14	0.710	25	884	2.6	12	1.3	38	1011	1.9
374.1	1.1	19	0.913	29	973	2.4	16	1.7	45	1112	1.8
374.8	0.600	19	0.733	29	986	2.9	8.7	1.3	45	1128	2.1
375.5	0.834	16	0.653	31	875	1.2	12	1.2	47	1000	0.893
376.2	0.421	17	1.1	26	955	2.5	6.1	2.0	40	1093	1.8
376.9	0.393	17	0.795	28	968	2.6	5.7	1.5	43	1107	1.9
377.6	0.604	21	0.692	29	933	3.2	8.7	1.3	45	1067	2.4
378.3	0.393	18	1.0	30	827	1.9	5.7	1.8	46	946	1.4
379.0	0.805	17	0.896	34	927	3.4	12	1.6	52	1060	2.5
379.7	0.430	17	0.929	29	1042	2.8	6.2	1.7	44	1191	2.0
380.4	1.0	18	1.0	36	978	2.6	15	1.9	55	1118	1.9
381.1	1.1	22	1.2	32	876	3.6	15	2.2	49	1001	2.6
381.8	0.628	18	1.3	36	893	3.4	9.1	2.4	55	1021	2.5
382.5	1.0	15	0.989	31	899	3.6	15	1.8	48	1028	2.6
383.2	0.398	14	1.2	30	995	3.8	5.7	2.3	46	1138	2.8
383.9	0.393	17	0.998	32	1037	2.8	5.7	1.8	49	1186	2.0
384.6	0.595	18	1.0	37	976	1.6	8.6	1.9	56	1116	1.2
385.3	0.393	18	1.2	40	917	3.3	5.7	2.2	62	1048	2.4
386.0	0.527	17	1.1	31	958	3.3	7.6	2.0	47	1096	2.4
386.7	0.393	20	1.6	32	1086	2.9	5.7	3.0	49	1242	2.1
387.4	0.860	21	1.2	38	1037	3.5	12	2.1	58	1186	2.6
388.1	0.486	19	1.4	38	988	3.1	7.0	2.6	58	1129	2.3
388.8	0.569	18	1.3	37	1060	2.8	8.2	2.4	56	1212	2.1
389.5	0.393	15	1.1	38	1024	2.8	5.7	2.1	58	1171	2.1
390.2	0.910	19	1.8	40	1065	3.9	13	3.3	61	1218	2.8
390.9	0.577	21	1.7	42	1027	3.6	8.3	3.0	64	1174	2.6
391.6	0.393	19	1.5	44	1106	2.6	5.7	2.8	67	1265	1.9
392.3	0.437	19	0.877	41	1236	2.9	6.3	1.6	63	1413	2.1
393.0	0.857	17	1.5	40	1004	2.3	12	2.8	62	1148	1.7
393.6	0.491	20	2.0	45	1209	2.5	7.1	3.6	69	1382	1.8
394.3	0.455	21	1.5	45	1121	2.4	6.6	2.8	69	1282	1.8
395.0	0.393	18	1.3	40	1061	2.2	5.7	2.4	61	1213	1.6



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
395.7	0.393	17	1.4	33	991	2.6	5.7	2.5	50	1133	1.9
396.4	0.476	17	1.4	39	1072	2.2	6.9	2.5	60	1226	1.6
397.1	0.393	19	1.7	36	1068	3.6	5.7	3.0	56	1222	2.6
397.8	0.691	19	1.9	54	1183	2.4	10.0	3.4	82	1353	1.8
398.5	0.393	21	1.7	45	1331	3.3	5.7	3.1	68	1522	2.4
399.2	0.393	14	2.1	36	1194	3.9	5.7	3.8	56	1365	2.8
399.9	0.493	17	2.0	38	1318	3.9	7.1	3.6	58	1507	2.9
400.6	0.435	21	2.1	41	1277	3.2	6.3	3.9	63	1461	2.4
401.3	0.509	21	2.0	48	1230	2.9	7.4	3.6	73	1407	2.1
402.0	0.393	17	1.9	48	1333	1.7	5.7	3.5	73	1525	1.3
402.7	0.717	17	2.3	38	1376	2.8	10	4.1	58	1573	2.0
403.4	0.393	17	2.5	44	1430	3.7	5.7	4.5	67	1636	2.7
404.1	0.393	22	2.5	50	1586	3.3	5.7	4.5	77	1814	2.4
404.8	1.0	18	1.6	45	1402	1.6	15	2.9	69	1604	1.2
405.5	0.393	17	2.3	42	1490	2.4	5.7	4.3	65	1704	1.8
406.2	0.596	16	2.4	41	1570	3.4	8.6	4.3	63	1796	2.5
406.9	0.472	19	2.6	46	1893	2.4	6.8	4.7	70	2165	1.8
407.6	0.610	21	2.5	50	1536	3.6	8.8	4.6	77	1757	2.7
408.3	0.518	21	2.4	50	1647	2.6	7.5	4.3	77	1884	1.9
409.0	0.393	16	2.4	43	1736	2.5	5.7	4.4	67	1985	1.8
409.7	0.627	19	2.3	40	1722	2.7	9.1	4.2	62	1969	2.0
410.4	0.393	20	3.2	52	2010	4.4	5.7	5.8	79	2298	3.2
411.1	0.521	18	3.1	61	1908	3.6	7.5	5.7	94	2182	2.7
411.8	0.401	19	3.1	48	1737	2.6	5.8	5.6	74	1987	1.9
412.5	0.799	17	2.8	51	1880	2.5	12	5.1	77	2150	1.8
413.2	0.393	18	2.7	45	1869	2.7	5.7	5.0	69	2138	2.0
413.9	1.1	21	3.4	55	2204	1.9	16	6.1	84	2520	1.4
414.6	0.705	21	2.5	51	1864	3.8	10	4.5	78	2132	2.8
415.3	0.517	19	2.9	56	1728	2.2	7.5	5.2	86	1976	1.6
416.0	0.768	18	2.4	49	2023	1.9	11	4.5	75	2313	1.4
416.7	0.393	18	2.8	55	1938	2.5	5.7	5.0	84	2216	1.9
417.4	0.904	21	2.8	55	1928	2.5	13	5.1	84	2205	1.8
418.1	0.496	23	3.1	63	1917	2.8	7.2	5.6	97	2193	2.0
418.8	0.703	22	2.9	53	1978	2.0	10	5.2	82	2261	1.5
419.5	1.2	17	2.9	43	1816	1.8	17	5.3	66	2076	1.3
420.2	0.880	23	3.3	54	2089	3.0	13	6.0	82	2388	2.2
420.8	0.880	23	3.4	59	1931	2.7	13	6.3	90	2209	2.0
421.5	0.602	19	2.9	49	1833	2.0	8.7	5.3	74	2097	1.5
422.2	0.602	20	2.8	54	1979	2.8	8.7	5.2	83	2263	2.0
422.9	0.883	20	3.3	50	2279	1.9	13	6.0	77	2606	1.4
423.6	0.962	22	3.5	49	2135	2.8	14	6.4	75	2441	2.1
424.3	0.723	21	3.6	64	2123	3.4	10	6.6	98	2427	2.5
425.0	1.0	21	4.0	70	2333	2.3	15	7.4	107	2667	1.7
425.7	0.470	14	3.8	51	1822	1.5	6.8	7.0	78	2083	1.1
426.4	0.723	23	4.5	60	2237	3.1	10	8.2	92	2558	2.2
427.1	0.681	19	4.3	48	1980	2.2	9.8	7.9	73	2264	1.6
427.8	0.992	17	3.9	69	2242	4.4	14	7.2	105	2564	3.2
428.5	1.3	20	3.6	59	2113	2.2	19	6.6	91	2416	1.6
429.2	0.785	18	3.7	59	2098	3.1	11	6.7	91	2399	2.2
429.9	0.856	23	5.2	59	2254	3.3	12	9.5	90	2578	2.4
430.6	1.6	21	3.9	66	2146	4.3	23	7.0	101	2454	3.2
431.3	0.655	23	4.4	62	1950	3.1	9.5	8.0	96	2229	2.3
432.0	1.2	20	3.9	67	2067	3.2	17	7.0	102	2364	2.3
432.7	1.3	22	4.3	60	2034	2.7	19	7.8	92	2326	2.0
433.4	1.7	23	4.6	67	2339	2.7	24	8.4	103	2675	2.0
434.1	2.0	25	4.1	76	2202	2.9	28	7.5	116	2518	2.1
434.8	1.8	23	4.1	63	2053	2.6	27	7.4	97	2347	1.9
435.5	1.3	19	4.6	53	1956	2.4	19	8.3	81	2236	1.8
436.2	2.8	19	5.7	67	2272	4.0	41	10	102	2598	2.9
436.9	3.1	24	6.0	69	2479	3.3	45	11	106	2835	2.4
437.6	3.0	19	5.0	73	2119	2.6	43	9.2	112	2423	1.9
438.3	2.1	20	5.3	73	2085	1.7	31	9.6	112	2384	1.2
439.0	2.5	18	6.0	63	2025	3.4	36	11	96	2316	2.5
439.7	3.6	20	7.2	62	2252	4.1	53	13	96	2575	3.0
440.4	4.2	23	7.7	75	2340	3.6	60	14	114	2676	2.6
441.1	3.6	23	6.2	85	2223	3.9	52	11	130	2542	2.9
441.8	4.3	24	7.1	75	2175	3.0	62	13	115	2487	2.2
442.5	3.6	20	6.9	62	2145	2.9	52	12	96	2452	2.2
443.2	4.2	20	8.3	70	2155	3.9	60	15	107	2465	2.9
443.9	3.6	26	7.9	68	2013	3.3	52	14	103	2301	2.4
444.6	2.7	23	7.6	76	2121	3.3	39	14	116	2426	2.4
445.3	3.8	19	7.5	65	2201	3.6	55	14	100	2516	2.6
446.0	5.3	25	7.8	65	2258	3.3	76	14	99	2583	2.4
446.6	4.1	25	9.2	75	2349	4.0	59	17	115	2686	2.9
447.3	3.3	25	7.2	77	2285	3.8	48	13	118	2613	2.8
448.0	3.2	26	6.8	81	2192	3.7	47	12	124	2507	2.7
448.7	3.3	19	7.1	61	2006	2.9	48	13	93	2294	2.1
449.4	3.1	24	8.9	75	2343	4.0	45	16	115	2680	3.0
450.1	4.2	25	8.1	81	2458	4.7	61	15	124	2810	3.4
450.8	3.7	29	7.6	81	2139	2.9	53	14	124	2446	2.1
451.5	4.1	22	6.6	76	1955	3.3	60	12	116	2235	2.4



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
452.2	3.4	20	7.1	72	2035	2.8	50	13	111	2327	2.1
452.9	4.5	24	8.3	69	2300	4.1	65	15	106	2630	3.0
453.6	4.2	25	8.9	86	2576	3.0	61	16	132	2945	2.2
454.3	3.9	29	8.3	82	1991	3.3	57	15	126	2276	2.4
455.0	3.8	24	8.2	72	2313	2.8	56	15	110	2645	2.1
455.7	4.3	22	9.4	70	1858	2.6	62	17	107	2124	1.9
456.4	4.4	25	9.2	73	2198	3.1	64	17	112	2514	2.2
457.1	5.0	29	12	82	2328	4.2	72	21	126	2662	3.1
457.8	5.3	26	8.5	83	1997	4.3	77	16	127	2283	3.2
458.5	3.9	21	8.7	77	2248	3.1	56	16	118	2570	2.3
459.2	5.6	20	9.5	67	2178	2.4	81	17	103	2490	1.8
459.9	5.3	27	10.0	75	2431	4.5	77	18	116	2780	3.3
460.6	5.2	24	10	76	2165	3.4	74	18	117	2476	2.5
461.3	4.7	26	8.0	79	2125	3.8	69	15	120	2430	2.8
462.0	5.3	26	10.0	77	2333	4.1	77	18	117	2668	3.0
462.7	4.9	25	13	74	2364	3.5	71	25	114	2703	2.6
463.4	6.2	29	11	77	2708	4.0	90	20	118	3097	2.9
464.1	6.0	28	11	88	2031	3.9	87	20	136	2322	2.9
464.8	5.6	24	9.2	69	2030	2.7	82	17	106	2322	2.0
465.5	4.8	30	9.2	67	2196	3.1	69	17	103	2512	2.3
466.2	5.1	27	9.7	67	2094	3.4	73	18	102	2394	2.5
466.9	5.1	33	10	74	2316	3.3	73	19	114	2648	2.4
467.6	5.1	25	9.4	70	2094	4.0	73	17	107	2395	2.9
468.3	4.5	26	9.5	71	2016	3.0	65	17	108	2305	2.2
469.0	5.6	23	9.7	62	2137	4.1	81	18	95	2443	3.0
469.7	5.7	23	10	70	2189	1.9	82	19	108	2503	1.4
470.4	6.2	30	11	78	2042	4.3	89	20	120	2335	3.2
471.1	5.8	27	8.5	78	1991	3.2	84	15	119	2276	2.3
471.8	3.7	24	9.0	67	1914	3.3	54	16	102	2189	2.4
472.4	4.8	24	8.7	52	1963	2.7	70	16	80	2245	2.0
473.1	4.5	23	11	66	2079	4.0	65	20	102	2378	2.9
473.8	5.6	31	11	71	2184	5.0	81	20	110	2498	3.6
474.5	3.9	26	9.5	75	2105	2.7	56	17	115	2407	2.0
475.2	4.2	22	10	63	1877	2.1	61	18	96	2146	1.5
475.9	5.6	24	11	63	2119	3.2	81	20	97	2423	2.4
476.6	4.0	26	10	60	1848	3.9	58	19	91	2113	2.8
477.3	5.0	29	9.6	67	2063	4.3	72	18	102	2359	3.1
478.0	5.7	26	9.3	58	1805	2.0	82	17	89	2064	1.4
478.7	5.4	24	8.7	74	2076	3.0	78	16	113	2374	2.2
479.4	6.0	26	9.7	64	2002	3.6	87	18	98	2289	2.6
480.1	5.8	28	11	67	2288	4.3	83	20	103	2616	3.1
480.8	6.3	30	9.6	69	1814	3.8	91	17	106	2074	2.7
481.5	5.5	24	8.1	59	1897	2.9	79	15	90	2170	2.1
482.2	5.6	24	9.2	57	1994	2.7	81	17	88	2280	2.0
482.9	5.7	26	9.9	61	1957	4.5	82	18	94	2238	3.3
483.6	5.9	26	7.9	50	1688	4.3	85	14	77	1931	3.1
484.3	4.0	30	8.2	62	1866	3.9	58	15	95	2134	2.9
485.0	4.6	22	7.2	56	1832	3.0	66	13	86	2095	2.2
485.7	5.5	23	8.3	48	1834	5.0	79	15	74	2097	3.7
486.4	7.6	28	9.4	61	1891	4.8	109	17	93	2163	3.5
487.1	6.6	27	9.2	60	1769	3.7	95	17	93	2022	2.7
487.8	5.5	25	8.0	52	1725	3.0	79	15	80	1972	2.2
488.5	7.0	24	8.2	41	1767	3.4	101	15	63	2020	2.5
489.2	7.7	21	8.1	40	1765	4.1	112	15	61	2018	3.0
489.9	7.9	30	9.2	51	2079	4.7	114	17	78	2378	3.5
490.6	7.1	26	8.3	57	1630	3.3	102	15	87	1864	2.4
491.3	7.9	24	8.3	51	1587	3.1	114	15	79	1815	2.3
492.0	7.7	23	7.7	42	1593	2.9	111	14	65	1821	2.1
492.7	9.7	24	7.2	44	1580	4.2	140	13	68	1807	3.1
493.4	12	27	7.8	50	1624	4.6	171	14	77	1857	3.4
494.1	7.9	26	7.1	53	1377	2.7	114	13	82	1574	2.0
494.8	7.7	20	4.8	44	1419	3.3	110	8.8	68	1622	2.4
495.5	8.5	23	6.3	42	1407	3.5	122	12	65	1609	2.6
496.2	9.3	23	6.6	47	1363	2.1	134	12	71	1559	1.5
496.9	8.9	24	7.1	48	1435	3.8	129	13	73	1641	2.8
497.6	9.5	24	5.9	46	1297	3.4	138	11	70	1483	2.5
498.2	7.8	18	5.7	41	1247	2.9	112	10	64	1426	2.1
498.9	8.4	20	5.9	31	1246	2.2	122	11	47	1424	1.6
499.6	9.1	24	5.8	45	1508	3.6	132	11	68	1724	2.6
500.3	7.2	27	5.6	46	1307	3.3	104	10	70	1495	2.4
501.0	7.0	22	4.4	39	1197	2.3	102	8.0	60	1369	1.7
501.7	6.9	19	4.0	41	1164	2.9	100	7.3	63	1331	2.1
502.4	6.6	23	4.5	35	1337	2.9	95	8.3	54	1529	2.1
503.1	6.9	23	3.7	33	1124	2.9	99	6.8	50	1285	2.1
503.8	5.3	22	3.3	30	1019	2.7	77	6.0	45	1166	1.9
504.5	4.8	21	3.0	33	1055	2.4	69	5.4	51	1207	1.7
505.2	5.7	21	3.1	29	1028	1.5	82	5.6	45	1175	1.1
505.9	6.0	21	3.4	31	1100	1.9	87	6.2	48	1258	1.4
506.6	4.4	21	2.3	31	982	3.8	64	4.3	48	1123	2.8
507.3	3.5	19	2.2	28	1037	3.5	51	4.0	43	1186	2.5
508.0	3.3	20	2.8	27	963	1.5	48	5.1	42	1102	1.1



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.7	3.4	18	2.0	28	1169	1.8	49	3.7	43	1337	1.3
509.4	3.8	20	2.5	24	1054	2.5	55	4.5	36	1205	1.8
510.1	4.1	21	2.4	28	1112	3.2	60	4.3	43	1272	2.4
510.8	2.4	23	1.9	28	929	2.4	34	3.5	43	1063	1.7
511.5	2.7	16	1.9	20	911	2.8	40	3.4	31	1042	2.1
512.2	3.8	19	2.0	23	1147	2.5	55	3.7	35	1311	1.8
512.9	4.0	21	2.0	23	1008	3.0	57	3.7	36	1152	2.2
513.6	2.9	19	2.0	27	1027	3.5	41	3.6	41	1175	2.5
514.3	2.4	19	1.8	24	988	0.847	34	3.3	36	1130	0.618
515.0	3.0	15	1.5	15	831	1.9	43	2.8	23	950	1.4
515.7	3.3	18	1.5	18	917	1.7	48	2.8	27	1048	1.3
516.4	3.1	19	1.8	22	1067	2.5	45	3.2	33	1220	1.8
517.1	2.4	19	1.4	20	954	2.3	35	2.5	31	1091	1.7
517.8	2.1	15	1.3	23	910	2.1	31	2.4	35	1041	1.5
518.5	2.6	15	1.2	18	961	2.0	38	2.2	27	1099	1.4
519.2	1.9	17	1.3	19	975	1.9	28	2.4	29	1115	1.4
519.9	3.3	18	1.4	24	936	1.5	47	2.5	37	1070	1.1
520.6	1.9	17	1.3	29	930	1.2	28	2.4	44	1063	0.878
521.3	1.9	14	1.2	22	890	3.0	27	2.2	34	1018	2.2
522.0	3.3	20	1.2	26	1178	2.5	48	2.2	40	1347	1.8
522.7	2.5	19	1.3	24	917	2.3	37	2.4	36	1049	1.6
523.4	2.1	16	0.933	24	900	1.8	31	1.7	36	1029	1.3
524.0	1.3	15	0.815	26	863	2.4	19	1.5	41	986	1.7
524.7	1.6	15	1.1	24	853	2.1	23	2.0	37	976	1.5
525.4	0.893	15	1.5	23	956	2.3	13	2.8	36	1093	1.7
526.1	2.0	17	1.4	24	969	2.3	29	2.6	36	1108	1.7
526.8	1.4	21	1.2	30	910	2.4	20	2.2	46	1040	1.7
527.5	1.4	17	1.1	28	825	3.0	20	1.9	43	943	2.2
528.2	0.929	14	1.4	23	805	1.8	13	2.5	36	920	1.3
528.9	1.7	19	1.6	26	1018	2.3	24	2.9	40	1164	1.7
529.6	1.4	20	1.5	31	837	2.6	20	2.7	47	957	1.9
530.3	1.3	20	1.5	36	957	4.1	18	2.8	56	1094	3.0
531.0	1.3	17	1.3	28	788	3.0	18	2.4	43	901	2.2
531.7	0.737	17	1.2	29	836	2.9	11	2.1	44	956	2.1
532.4	1.7	19	1.7	30	1113	2.7	25	3.1	46	1273	1.9
533.1	1.3	20	1.4	36	959	2.1	19	2.6	55	1096	1.6
533.8	0.488	16	1.5	34	824	2.8	7.0	2.7	53	942	2.0
534.5	0.918	17	1.3	33	935	2.9	13	2.4	50	1070	2.1
535.2	1.6	16	1.6	27	821	2.6	23	2.8	42	939	1.9
535.9	1.4	17	1.6	38	1087	2.0	20	3.0	58	1242	1.4
536.6	1.3	18	1.3	31	826	3.3	18	2.3	47	944	2.4
537.3	0.927	20	1.2	37	847	2.5	13	2.1	56	969	1.8
538.0	0.672	17	1.1	32	971	3.2	9.7	2.1	49	1111	2.4
538.7	1.3	19	1.6	32	905	2.1	18	2.9	49	1034	1.5
539.4	0.761	20	1.8	42	915	4.1	11	3.2	64	1046	3.0
540.1	1.1	20	1.3	46	882	3.6	15	2.4	71	1009	2.6
540.8	0.802	17	0.981	40	923	3.4	12	1.8	61	1055	2.5
541.5	0.651	16	1.5	34	920	1.9	9.4	2.7	52	1052	1.4
542.2	0.767	16	1.2	38	891	3.5	11	2.2	58	1018	2.5
542.9	1.4	21	1.3	48	907	4.6	20	2.4	74	1037	3.3
543.6	0.614	18	1.3	43	901	4.1	8.9	2.3	66	1030	3.0
544.3	0.393	18	1.1	39	789	2.3	5.7	2.0	59	902	1.7
545.0	1.3	17	1.5	37	995	2.2	19	2.6	57	1138	1.6
545.7	1.0	22	1.7	41	938	3.6	15	3.2	63	1073	2.6
546.4	1.3	26	1.8	53	991	3.0	18	3.3	82	1134	2.2
547.1	0.393	26	1.3	45	969	2.4	5.7	2.4	68	1108	1.8
547.8	0.662	17	0.873	47	999	2.7	9.6	1.6	71	1143	2.0
548.5	0.892	19	1.5	36	954	4.3	13	2.7	55	1090	3.1
549.2	1.0	20	1.6	44	944	3.6	15	3.0	67	1079	2.6
549.9	0.449	24	1.6	46	1040	3.3	6.5	2.9	71	1189	2.4
550.5	0.798	19	1.2	36	787	1.9	12	2.1	55	900	1.4
551.2	0.677	17	0.957	43	1063	3.0	9.8	1.7	66	1216	2.2
551.9	0.444	19	1.6	42	1044	4.2	6.4	2.9	64	1194	3.1
552.6	0.622	18	1.8	46	1074	4.7	9.0	3.3	71	1229	3.4
553.3	0.393	19	1.4	57	1149	4.2	5.7	2.6	88	1314	3.0
554.0	0.472	16	1.4	45	1025	1.8	6.8	2.6	68	1172	1.3
554.7	1.1	17	2.0	44	1037	2.9	16	3.6	68	1186	2.1
555.4	1.1	20	1.9	50	1096	3.2	15	3.4	77	1253	2.3
556.1	0.598	21	2.0	59	1320	3.3	8.6	3.6	90	1509	2.4
556.8	0.393	18	1.6	50	1020	3.0	5.7	2.9	77	1166	2.2
557.5	0.515	17	1.7	51	1158	2.9	7.4	3.1	78	1324	2.1
558.2	0.538	14	1.6	46	1074	2.7	7.8	2.9	71	1228	2.0
558.9	0.393	21	2.5	55	1287	2.5	5.7	4.6	85	1472	1.8
559.6	0.912	21	2.2	56	1266	2.9	13	4.1	87	1447	2.1
560.3	0.892	22	1.9	53	1155	2.8	13	3.5	81	1321	2.1
561.0	1.0	16	2.2	46	1244	2.6	15	4.0	71	1423	1.9
561.7	0.744	18	2.2	38	1162	2.9	11	3.9	59	1329	2.1
562.4	0.393	19	2.6	51	1408	2.2	5.7	4.8	78	1611	1.6
563.1	0.393	21	3.0	57	1242	2.8	5.7	5.5	88	1420	2.1
563.8	0.407	18	2.8	51	1417	2.5	5.9	5.0	79	1620	1.9
564.5	0.393	15	2.2	60	1405	3.0	5.7	4.1	93	1606	2.2



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
565.2	1.2	21	3.8	59	1420	2.4	17	6.9	91	1624	1.8
565.9	1.0	22	3.7	64	2002	2.9	15	6.8	97	2290	2.1
566.6	0.527	19	2.6	69	1612	1.1	7.6	4.8	106	1844	0.790
567.3	0.845	17	3.0	61	1694	2.7	12	5.4	94	1937	2.0
568.0	1.2	18	3.4	64	1978	2.2	17	6.2	98	2262	1.6
568.7	0.868	19	3.2	61	2053	3.3	13	5.8	94	2348	2.4
569.4	1.9	20	3.9	68	1929	3.3	27	7.2	105	2206	2.4
570.1	1.1	23	3.3	59	1578	2.1	16	6.1	90	1805	1.5
570.8	1.9	19	3.5	61	1649	2.9	28	6.3	94	1886	2.1
571.5	1.9	21	3.8	52	1834	2.1	28	6.9	79	2098	1.5
572.2	2.1	26	4.0	67	2014	2.6	31	7.2	103	2303	1.9
572.9	1.5	26	3.5	64	1644	3.5	22	6.3	98	1880	2.6
573.6	1.1	24	3.0	70	1643	2.9	15	5.4	108	1878	2.1
574.3	1.7	22	3.4	61	1718	2.1	25	6.1	93	1965	1.5
575.0	2.1	20	3.3	56	1918	2.2	30	6.0	86	2194	1.6
575.7	2.3	29	4.2	66	2072	2.3	34	7.7	102	2370	1.7
576.4	1.5	22	3.6	68	2008	2.3	22	6.5	105	2296	1.7
577.0	2.9	21	3.3	70	2036	2.0	42	6.1	107	2328	1.5
577.7	2.5	21	3.6	56	1985	2.1	35	6.5	86	2269	1.6
578.4	2.6	20	3.6	64	1889	2.1	37	6.5	98	2160	1.6
579.1	3.0	24	4.9	59	1969	2.3	43	8.9	90	2252	1.7
579.8	2.8	26	3.6	73	1850	2.2	40	6.5	111	2115	1.6
580.5	2.2	19	4.0	66	1876	2.9	31	7.2	101	2145	2.1
581.2	1.8	20	3.5	61	1807	1.6	26	6.4	93	2066	1.2
581.9	3.5	26	4.0	57	2195	2.6	51	7.3	87	2510	1.9
582.6	3.2	26	4.8	77	2220	2.5	47	8.8	118	2539	1.8
583.3	3.6	22	3.1	90	2191	2.4	51	5.7	137	2505	1.8
584.0	2.1	20	4.5	53	1598	2.1	31	8.2	82	1827	1.5
584.7	1.7	18	4.2	66	2188	2.4	25	7.7	101	2502	1.8
585.4	4.4	25	4.6	70	2181	2.2	63	8.4	107	2494	1.6
586.1	3.4	22	3.9	83	2036	2.6	49	7.2	127	2328	1.9
586.8	2.2	22	4.1	71	2099	2.7	32	7.4	109	2400	2.0
587.5	4.7	19	3.6	64	1881	1.3	67	6.5	99	2150	0.973
588.2	3.4	17	4.3	63	2041	1.7	50	7.8	96	2334	1.2
588.9	5.3	25	4.9	79	2581	3.3	76	9.0	121	2952	2.4
589.6	4.5	24	3.6	85	2071	1.1	65	6.5	130	2368	0.775
590.3	3.8	21	4.4	73	2026	2.6	55	8.0	112	2317	1.9
591.0	3.3	19	4.5	74	2060	2.3	47	8.3	113	2356	1.7
591.7	4.5	22	4.7	67	2265	1.7	65	8.5	103	2590	1.3
592.4	5.5	25	5.2	74	2201	2.6	80	9.4	113	2517	1.9
593.1	6.4	26	5.5	87	2206	2.7	93	10.0	133	2522	2.0
593.8	4.2	19	4.5	75	2215	1.5	61	8.2	114	2533	1.1
594.5	4.9	25	5.3	87	2277	1.6	71	9.6	134	2604	1.2
595.2	5.0	21	5.2	71	2188	2.8	73	9.5	109	2502	2.1
595.9	5.2	28	5.7	90	2472	2.7	75	10	137	2826	2.0
596.6	5.8	23	4.2	75	1956	1.5	84	7.7	116	2237	1.1
597.3	5.0	21	5.3	79	2216	2.0	73	9.7	121	2534	1.4
598.0	4.0	18	4.6	68	2059	2.3	58	8.4	104	2355	1.7
598.7	5.7	24	5.7	76	2257	1.7	83	10	117	2581	1.3
599.4	5.2	23	5.7	93	2301	2.6	75	10	143	2632	1.9
600.1	5.0	23	4.9	83	2034	2.4	72	8.9	127	2326	1.8
600.8	3.5	19	4.6	80	2126	1.7	50	8.4	123	2432	1.2
601.5	5.1	19	4.4	61	1870	1.1	73	8.0	93	2139	0.791
602.2	4.3	21	5.3	80	2512	2.3	63	9.7	122	2872	1.7
602.8	5.0	24	4.8	92	2129	2.8	73	8.8	141	2434	2.1
603.5	4.9	20	5.2	82	2141	1.9	70	9.5	125	2448	1.4
604.2	3.0	17	4.7	64	1929	2.2	43	8.6	99	2205	1.6
604.9	4.9	21	5.1	74	2234	1.4	70	9.3	113	2554	0.991
605.6	5.1	29	5.1	89	2085	2.2	73	9.3	137	2384	1.6
606.3	4.5	25	4.8	85	2012	2.1	65	8.8	130	2300	1.6
607.0	3.9	22	4.6	78	1944	2.5	57	8.5	120	2223	1.8
607.7	4.4	22	4.8	79	2051	2.2	64	8.7	121	2345	1.6
608.4	4.9	23	4.9	81	2284	2.0	70	8.9	124	2612	1.5
609.1	4.5	28	5.3	86	2074	2.7	65	9.6	131	2371	1.9
609.8	4.2	28	4.5	89	2077	1.7	61	8.1	137	2375	1.2
610.5	3.6	20	4.4	87	2034	1.7	52	8.1	134	2326	1.2
611.2	5.5	19	5.3	82	2197	2.5	79	9.8	125	2513	1.8
611.9	5.3	23	4.6	86	2452	2.6	77	8.4	132	2804	1.9
612.6	5.7	23	5.3	88	2110	1.8	83	9.6	134	2413	1.3
613.3	5.7	24	4.7	89	1937	2.1	82	8.5	136	2215	1.6
614.0	6.2	21	5.2	80	1813	1.9	89	9.5	123	2073	1.4
614.7	5.2	20	5.0	82	2306	2.3	74	9.1	125	2637	1.7
615.4	5.0	24	6.4	90	2209	2.3	72	12	138	2526	1.7
616.1	7.0	25	5.2	88	1955	3.7	101	9.6	135	2235	2.7
616.8	5.9	22	4.6	97	2130	2.6	85	8.4	148	2436	1.9
617.5	4.6	25	5.1	73	2023	3.6	67	9.3	112	2313	2.6
618.2	4.9	28	4.9	75	2293	3.7	70	8.9	115	2622	2.7
618.9	6.9	27	5.3	79	1880	1.7	100	9.6	121	2149	1.3
619.6	4.7	27	5.2	75	1715	1.8	68	9.4	115	1961	1.3
620.3	5.6	27	4.9	98	2074	2.0	80	8.8	150	2371	1.5
621.0	5.5	23	5.2	78	2304	2.6	79	9.6	120	2635	1.9



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.7	6.3	21	5.0	87	2200	3.3	90	9.1	133	2515	2.4
622.4	5.6	25	5.6	92	2095	3.6	80	10	141	2395	2.6
623.1	6.5	23	5.1	101	2166	2.7	93	9.2	155	2477	2.0
623.8	4.9	22	4.7	85	1984	2.6	71	8.5	130	2268	1.9
624.5	6.5	21	5.1	80	2231	2.3	94	9.4	123	2551	1.7
625.2	5.5	24	5.0	73	1804	2.9	79	9.1	113	2063	2.1
625.9	6.2	28	5.0	87	2258	3.0	90	9.2	133	2582	2.2
626.6	5.1	24	4.3	77	1825	2.4	73	7.9	118	2086	1.8
627.3	5.0	21	4.4	86	1869	1.8	72	8.1	132	2137	1.3
628.0	5.7	22	5.1	67	1744	2.5	82	9.3	103	1994	1.8
628.7	6.4	24	4.7	72	1852	1.8	93	8.6	110	2117	1.3
629.4	7.6	27	5.9	98	2266	2.8	110	11	150	2591	2.0
630.0	6.9	25	4.7	91	2096	2.0	100	8.5	140	2396	1.4
630.7	6.1	23	5.8	83	1821	3.1	88	11	127	2082	2.2
631.4	8.1	24	4.5	82	2251	2.8	117	8.2	126	2574	2.0
632.1	6.9	24	5.2	74	2113	3.7	99	9.5	113	2416	2.7
632.8	5.2	24	5.2	101	2335	2.5	76	9.4	155	2670	1.8
633.5	7.0	27	5.0	67	1705	2.2	101	9.1	103	1950	1.6
634.2	7.5	22	5.6	82	2193	1.8	109	10	126	2508	1.3
634.9	6.1	25	4.7	72	2126	3.0	88	8.6	110	2431	2.2
635.6	8.0	29	6.0	95	2039	2.4	116	11	145	2331	1.7
636.3	6.6	21	4.4	85	1895	3.0	95	7.9	130	2167	2.2
637.0	6.7	25	4.8	91	2018	3.2	97	8.8	139	2308	2.3
637.7	6.1	25	5.2	78	1871	1.6	88	9.5	119	2140	1.2
638.4	7.7	27	5.3	93	2733	2.9	111	9.7	142	3126	2.1
639.1	8.3	26	4.5	77	1898	2.0	119	8.2	118	2171	1.5
639.8	5.9	27	4.5	87	2014	2.7	86	8.2	133	2304	2.0
640.5	5.8	25	4.8	77	2019	2.2	84	8.8	118	2309	1.6
641.2	5.2	23	4.8	68	2066	2.7	75	8.7	104	2362	2.0
641.9	5.0	29	4.6	83	2141	2.7	72	8.3	128	2448	2.0
642.6	6.3	31	5.0	78	1771	2.5	91	9.2	119	2025	1.8
643.3	5.1	25	5.0	82	1952	2.4	73	9.0	126	2232	1.7
644.0	6.5	25	4.2	72	1932	3.7	94	7.7	111	2209	2.7
644.7	6.3	25	4.3	76	1815	1.6	91	7.9	116	2075	1.2
645.4	5.3	26	5.5	86	2223	2.7	77	10.0	131	2542	2.0
646.1	7.2	24	4.7	88	1832	2.4	105	8.6	135	2095	1.7
646.8	7.2	19	3.8	78	1977	3.7	103	6.9	119	2261	2.7
647.5	5.9	25	4.4	77	2305	4.3	85	8.0	118	2636	3.1
648.2	7.6	30	5.1	88	2300	3.2	109	9.4	135	2630	2.4
648.9	5.5	27	4.2	75	1808	2.5	79	7.6	115	2067	1.8
649.6	5.2	26	4.2	74	1664	3.0	75	7.6	114	1903	2.2
650.3	5.4	26	4.7	82	2032	3.1	78	8.7	126	2324	2.3
651.0	5.7	24	4.5	66	1894	3.5	82	8.3	101	2166	2.6
651.7	6.2	24	5.0	73	1955	4.0	90	9.1	112	2236	2.9
652.4	6.5	32	4.1	82	1674	3.0	93	7.5	126	1915	2.2
653.1	5.6	29	4.0	78	1937	3.8	81	7.3	120	2215	2.8
653.8	3.9	27	3.7	65	1855	3.0	56	6.8	100	2121	2.2
654.5	4.4	27	3.8	70	1828	2.1	64	7.0	108	2090	1.5
655.2	4.6	32	4.0	67	1718	2.6	67	7.2	103	1964	1.9
655.8	6.0	31	4.6	86	1852	3.3	87	8.4	132	2118	2.4
656.5	5.0	36	4.2	82	1863	2.9	72	7.6	125	2131	2.1
657.2	4.3	27	4.0	62	1824	3.1	62	7.3	95	2086	2.3
657.9	4.6	25	4.6	65	1861	3.3	66	8.4	100	2128	2.4
658.6	5.7	31	4.6	73	1927	3.3	82	8.5	112	2203	2.4
659.3	4.5	33	3.8	72	1790	3.1	65	7.0	110	2047	2.2
660.0	4.3	33	3.8	79	1946	2.7	62	7.0	120	2226	1.9
660.7	5.2	25	4.1	55	1598	2.4	74	7.5	85	1827	1.8
661.4	5.4	29	4.2	78	1990	2.8	78	7.7	119	2275	2.0
662.1	4.7	28	3.9	80	1876	3.7	68	7.2	123	2145	2.7
662.8	5.6	31	4.0	79	1780	2.8	81	7.3	122	2036	2.0
663.5	5.2	30	4.1	74	1622	2.5	76	7.5	114	1854	1.8
664.2	3.4	29	4.1	65	1816	2.9	50	7.5	99	2076	2.1
664.9	5.7	27	4.2	66	1745	1.9	83	7.6	102	1995	1.4
665.6	6.2	33	4.7	78	1958	3.6	90	8.5	120	2239	2.6
666.3	4.1	28	3.3	78	1696	3.2	60	6.1	120	1939	2.3
667.0	3.5	24	4.0	70	1780	3.1	51	7.2	108	2036	2.3
667.7	3.7	24	5.0	61	1883	2.3	53	9.2	93	2153	1.7
668.4	5.6	25	4.0	73	1781	2.2	80	7.3	112	2037	1.6
669.1	4.3	26	4.4	83	1856	4.1	62	8.0	127	2122	3.0
669.8	5.4	28	4.2	81	1746	3.1	79	7.7	125	1997	2.3
670.5	4.2	19	3.8	69	1785	2.1	61	7.0	106	2041	1.5
671.2	4.4	23	4.1	63	1640	2.2	64	7.6	97	1875	1.6
671.9	6.0	28	4.8	72	1895	3.9	86	8.8	110	2167	2.9
672.6	3.0	22	3.6	70	1479	2.8	43	6.6	108	1691	2.0
673.3	4.2	18	3.9	71	1714	2.0	61	7.1	109	1959	1.5
674.0	4.5	22	4.3	69	1669	2.4	65	7.9	106	1909	1.7
674.7	4.0	24	4.3	69	1851	3.7	58	7.9	106	2116	2.7
675.4	6.0	22	4.4	69	1528	2.3	86	8.0	106	1747	1.7
676.1	4.7	24	3.5	77	1592	2.3	68	6.5	117	1820	1.7
676.8	5.1	21	3.7	68	1957	1.8	73	6.7	104	2238	1.3
677.5	5.1	24	3.9	57	1491	2.4	74	7.1	88	1705	1.7



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
678.2	5.4	21	4.5	67	1722	2.5	78	8.3	102	1969	1.8
678.9	4.9	24	3.1	70	1417	2.4	71	5.6	107	1621	1.8
679.6	3.8	23	3.6	64	1582	2.1	54	6.7	99	1809	1.5
680.3	4.6	21	4.1	67	1537	2.6	67	7.5	103	1757	1.9
681.0	4.0	24	3.2	68	1660	2.4	58	5.8	103	1898	1.8
681.7	4.8	22	4.1	66	1716	4.4	70	7.6	101	1962	3.2
682.4	3.6	24	3.1	71	1427	2.6	52	5.7	108	1632	1.9
683.0	4.6	22	2.5	61	1208	2.2	67	4.6	93	1382	1.6
683.7	3.6	19	3.8	56	1429	0.893	51	6.9	85	1635	0.652
684.4	4.0	23	3.1	55	1484	3.0	58	5.7	84	1697	2.2
685.1	4.5	27	3.2	55	1410	2.5	65	5.9	85	1612	1.8
685.8	3.8	25	3.5	73	1482	3.5	54	6.4	112	1694	2.6
686.5	3.9	24	3.3	67	1531	3.1	56	6.0	102	1751	2.3
687.2	2.2	26	3.0	57	1475	2.0	31	5.4	87	1687	1.5
687.9	4.2	26	3.7	60	1489	1.9	61	6.7	92	1703	1.4
688.6	4.3	34	3.6	58	1415	2.0	62	6.6	90	1618	1.5
689.3	2.8	28	3.7	69	1429	1.7	40	6.7	106	1634	1.2
690.0	4.8	34	2.7	67	1672	2.6	69	4.9	103	1912	1.9
690.7	3.3	27	3.6	59	1558	3.1	48	6.5	90	1781	2.3
691.4	3.0	31	2.8	60	1414	2.2	43	5.2	92	1617	1.6
692.1	4.0	30	2.9	66	1383	2.2	57	5.2	101	1581	1.6
692.8	3.3	30	2.9	64	1458	2.8	47	5.3	98	1668	2.0
693.5	3.7	32	2.8	58	1590	3.0	53	5.0	88	1818	2.2
694.2	3.4	35	3.3	59	1383	2.5	49	6.1	90	1582	1.8
694.9	3.9	35	3.7	60	1530	2.8	56	6.8	91	1750	2.0
695.6	3.4	34	2.5	63	1310	3.6	49	4.6	97	1497	2.6
696.3	3.4	35	3.0	54	1283	2.5	49	5.5	83	1467	1.9
697.0	3.2	30	3.2	54	1185	1.9	46	5.8	82	1355	1.4
697.7	3.3	33	3.2	56	1648	4.3	48	5.9	86	1884	3.1
698.4	3.0	37	3.4	62	1465	2.1	44	6.1	95	1676	1.5
699.1	3.3	41	2.7	58	1226	2.9	47	4.9	89	1402	2.1
699.8	1.9	41	2.5	53	1397	1.1	27	4.6	81	1598	0.803
700.5	2.2	39	3.2	46	1435	2.4	32	5.9	71	1641	1.8
701.2	2.2	40	3.3	51	1241	1.9	32	6.0	78	1419	1.4
701.9	2.2	36	2.8	60	1486	1.9	32	5.1	92	1699	1.4
702.6	2.9	35	3.3	53	1337	1.6	42	6.1	81	1529	1.2
703.3	2.1	29	3.1	47	1334	2.0	31	5.6	73	1526	1.5
704.0	2.8	28	3.0	46	1413	2.6	41	5.5	70	1616	1.9
704.7	3.2	36	3.0	48	1300	1.7	47	5.4	74	1486	1.3
705.4	3.5	37	2.9	61	1374	2.3	50	5.3	93	1571	1.7
706.1	2.8	30	2.6	47	1333	2.6	40	4.7	72	1525	1.9
706.8	2.3	29	2.8	50	1177	2.5	33	5.2	77	1346	1.8
707.5	2.3	31	2.7	52	1129	1.3	34	4.9	79	1291	0.931
708.2	3.6	30	2.6	55	1324	2.1	52	4.8	84	1514	1.5
708.8	2.8	33	2.7	55	1237	2.8	40	5.0	85	1415	2.1
709.5	2.6	33	2.5	49	1161	2.6	37	4.6	75	1328	1.9
710.2	2.4	28	2.4	48	1331	1.7	35	4.3	73	1522	1.2
710.9	2.3	33	2.7	49	1309	2.9	33	4.9	76	1497	2.1
711.6	3.1	37	2.7	52	1296	1.8	45	4.9	80	1482	1.3
712.3	3.0	33	2.2	53	1168	2.8	44	4.0	81	1335	2.0
713.0	2.3	29	2.6	50	1180	2.0	34	4.8	76	1350	1.4
713.7	2.6	27	2.3	47	1279	1.7	37	4.1	72	1463	1.2
714.4	2.5	29	3.1	52	1450	3.6	37	5.6	79	1658	2.6
715.1	2.8	35	2.9	45	1206	2.6	40	5.3	68	1379	1.9
715.8	2.3	29	2.1	49	1318	1.6	33	3.9	76	1507	1.2
716.5	2.3	24	2.1	45	920	1.3	33	3.8	69	1053	0.970
717.2	2.0	28	2.7	47	1084	0.673	28	5.0	72	1239	0.491
717.9	2.5	27	2.2	43	1153	1.8	37	4.0	65	1318	1.3
718.6	2.5	29	2.2	53	1056	1.4	35	4.1	81	1208	1.1
719.3	1.5	31	2.4	42	994	2.7	22	4.4	65	1137	2.0
720.0	1.8	24	2.2	48	984	3.2	27	4.0	74	1126	2.3
720.7	1.4	24	2.0	46	936	2.5	20	3.7	70	1070	1.8
721.4	2.7	25	2.6	53	1182	1.9	38	4.8	82	1352	1.4
722.1	2.8	25	2.4	57	1139	2.6	41	4.3	87	1303	1.9
722.8	1.8	23	1.8	40	907	1.4	26	3.3	61	1037	0.991
723.5	1.7	24	2.1	44	1046	2.7	25	3.9	67	1197	2.0
724.2	2.0	28	2.5	49	1081	2.1	29	4.5	75	1236	1.5
724.9	2.5	29	2.9	57	1133	2.8	37	5.4	87	1296	2.1
725.6	2.7	22	2.0	56	890	1.7	39	3.6	86	1018	1.3
726.3	2.4	21	1.9	49	1064	1.7	34	3.4	75	1216	1.2
727.0	3.3	23	2.3	52	980	1.5	48	4.2	80	1121	1.1
727.7	2.1	20	1.8	43	750	1.4	31	3.3	66	858	1.0
728.4	2.2	23	1.7	41	891	1.5	32	3.2	63	1019	1.1
729.1	2.0	23	2.0	52	889	1.8	29	3.6	80	1017	1.3
729.8	2.7	25	1.7	44	898	2.6	39	3.1	68	1027	1.9
730.5	2.5	21	1.8	45	952	2.2	37	3.3	68	1089	1.6
731.2	2.6	25	1.9	44	910	2.1	37	3.5	67	1040	1.5
731.9	1.5	24	1.8	45	839	1.7	22	3.3	69	959	1.3
732.6	2.0	21	2.0	48	778	1.3	29	3.7	74	889	0.975
733.3	1.7	21	2.2	41	848	2.3	24	4.0	63	970	1.7
734.0	2.6	24	2.0	53	877	1.7	38	3.7	80	1003	1.2



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
734.6	2.4	24	2.5	48	902	1.3	35	4.6	74	1032	0.919
735.3	2.2	23	2.3	50	790	2.1	31	4.2	76	903	1.6
736.0	2.5	21	1.8	46	618	1.5	35	3.2	70	706	1.1
736.7	1.9	20	1.6	42	739	1.1	28	3.0	64	845	0.830
737.4	1.8	24	1.9	44	709	1.4	26	3.5	68	810	1.0
738.1	0.905	23	2.2	53	705	2.1	13	3.9	81	807	1.6
738.8	1.3	21	2.1	45	698	2.1	19	3.8	69	798	1.5
739.5	1.2	19	1.5	38	575	1.7	17	2.7	59	657	1.2
740.2	1.3	20	1.7	39	709	0.734	18	3.2	60	811	0.535
740.9	1.2	21	2.1	39	543	1.1	18	3.8	60	621	0.809
741.6	1.3	21	2.0	46	605	2.5	19	3.6	71	692	1.8
742.3	1.2	19	1.3	43	512	1.4	18	2.3	66	586	1.0
743.0	1.0	19	1.8	38	535	0.675	15	3.3	58	612	0.493
743.7	1.1	21	1.8	40	604	2.5	16	3.3	62	691	1.8
744.4	1.1	24	1.8	45	606	1.6	16	3.3	68	693	1.2
745.1	2.0	20	1.9	45	557	2.7	30	3.5	69	637	2.0
745.8	0.913	24	1.9	40	477	1.4	13	3.5	62	545	1.0
746.5	0.829	18	1.5	35	396	0.804	12	2.7	54	453	0.586
747.2	0.864	18	1.5	36	455	2.0	12	2.7	55	520	1.5
747.9	0.954	22	1.9	39	469	2.0	14	3.4	60	536	1.4
748.6	0.777	22	1.7	43	455	1.1	11	3.2	66	521	0.817
749.3	1.1	17	2.0	35	467	1.6	16	3.7	54	534	1.1
750.0	1.1	19	2.0	37	452	1.4	16	3.6	56	517	1.0
750.7	0.479	16	2.2	39	436	1.7	6.9	4.0	60	499	1.2
751.4	0.745	19	2.2	37	382	2.3	11	4.0	57	437	1.7
752.1	0.922	18	1.6	36	438	1.9	13	2.8	55	501	1.4
752.8	1.2	16	1.9	34	388	2.3	17	3.5	53	434	1.7
753.5	0.727	18	2.0	33	640	3.1	10	3.7	51	732	2.3
754.2	1.5	18	1.9	39	468	2.0	22	3.4	60	535	1.4
754.9	1.5	18	1.8	37	455	1.6	22	3.3	57	520	1.2
755.6	0.744	17	2.0	39	420	1.7	11	3.6	60	480	1.2
756.3	1.4	15	2.0	30	350	0.609	21	3.6	47	401	0.444
757.0	0.650	16	1.9	29	357	2.0	9.4	3.4	45	408	1.5
757.7	1.2	20	1.9	30	367	2.2	18	3.5	46	420	1.6
758.4	1.2	19	1.6	30	333	2.7	17	3.0	46	381	2.0
759.1	0.581	18	1.8	31	330	1.9	8.4	3.3	48	377	1.4
759.8	0.986	12	1.5	25	347	1.5	14	2.7	38	397	1.1
760.5	0.928	18	1.7	28	411	1.8	13	3.1	43	470	1.3
761.1	1.0	16	1.6	29	343	1.4	14	2.9	44	392	1.0
761.8	0.393	19	1.2	33	385	2.2	5.7	2.2	50	440	1.6
762.5	0.573	14	1.2	27	395	1.7	8.3	2.2	42	451	1.2
763.2	0.596	14	1.4	27	345	1.8	8.6	2.5	41	394	1.3
763.9	1.7	17	1.8	30	341	1.3	25	3.3	45	390	0.969
764.6	0.920	16	1.3	30	362	2.2	13	2.4	47	414	1.6
765.3	0.423	16	1.7	40	362	2.0	6.1	3.0	61	414	1.5
766.0	0.970	16	1.2	31	310	2.0	14	2.2	48	355	1.5
766.7	1.7	15	1.7	32	396	1.2	24	3.2	49	453	0.879
767.4	0.722	18	1.8	34	357	2.0	10	3.2	52	408	1.5
768.1	1.0	17	1.2	29	297	2.0	15	2.1	44	339	1.4
768.8	0.785	15	1.4	28	291	2.0	11	2.6	44	333	1.5
769.5	0.737	15	1.9	34	371	2.6	11	3.4	52	425	1.9
770.2	0.480	15	1.6	30	307	1.4	6.9	2.9	46	351	1.0
770.9	0.674	16	1.8	36	302	2.3	9.7	3.3	55	346	1.7
771.6	1.4	14	1.8	34	336	2.3	20	3.4	53	385	1.7
772.3	1.0	16	1.8	36	317	2.3	15	3.2	56	363	1.7
773.0	0.509	13	2.0	33	326	1.4	7.3	3.7	51	373	0.991
773.7	0.393	17	1.7	34	340	2.0	5.7	3.1	53	389	1.4
774.4	0.500	16	1.5	36	333	2.3	7.2	2.7	55	381	1.6
775.1	1.0	17	2.0	43	346	1.9	15	3.7	66	396	1.4
775.8	0.776	17	1.2	37	330	2.0	11	2.3	56	377	1.4
776.5	0.755	15	1.8	37	305	1.2	11	3.4	57	349	0.844
777.2	1.3	21	1.8	42	317	1.1	19	3.3	65	362	0.791
777.9	0.747	15	1.7	42	301	1.6	11	3.1	65	345	1.2
778.6	0.554	18	1.6	48	332	1.9	8.0	2.8	73	380	1.4
779.3	0.775	16	1.5	40	315	0.986	11	2.8	62	361	0.719
780.0	0.723	18	1.6	51	360	1.7	10	2.8	78	412	1.2
780.7	0.408	20	1.8	47	386	1.8	5.9	3.4	72	442	1.3
781.4	1.3	18	1.5	50	325	1.7	18	2.7	77	372	1.3
782.1	0.497	17	1.3	44	362	1.3	7.2	2.4	67	414	0.968
782.8	0.744	17	1.2	38	263	1.1	11	2.1	58	300	0.796
783.5	0.393	17	1.4	47	334	1.4	5.7	2.6	72	382	0.987
784.2	0.792	19	1.4	42	352	1.6	11	2.6	65	402	1.1
784.9	0.395	18	1.9	44	378	1.7	5.7	3.4	67	432	1.2
785.6	0.752	16	1.3	36	292	1.6	11	2.3	55	334	1.2
786.3	0.985	17	1.4	46	354	1.4	14	2.6	71	405	1.0
787.0	0.395	15	1.5	37	289	1.3	5.7	2.6	57	330	0.934
787.6	0.393	23	1.5	45	363	1.4	5.7	2.8	69	416	1.0
788.3	0.578	16	1.8	51	332	1.1	8.3	3.3	78	380	0.780
789.0	0.450	16	1.3	51	319	1.5	6.5	2.4	78	365	1.1
789.7	0.697	19	1.6	44	404	2.0	10	3.0	68	462	1.4
790.4	1.1	15	1.5	42	295	1.5	15	2.8	64	338	1.1



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
791.1	0.483	18	1.4	44	334	1.3	7.0	2.6	67	382	0.979
791.8	0.709	19	1.1	44	315	1.1	10	2.0	67	360	0.804
792.5	1.2	14	1.3	42	299	0.969	18	2.4	65	341	0.707
793.2	1.9	14	1.6	47	340	1.7	27	2.9	72	388	1.3
793.9	0.527	17	1.6	47	339	1.8	7.6	2.9	73	388	1.3
794.6	0.975	19	1.4	47	336	1.1	14	2.6	71	384	0.822
795.3	1.0	18	1.3	43	324	1.5	15	2.4	66	371	1.1
796.0	0.665	16	1.4	44	309	0.376	9.6	2.6	67	354	0.274
796.7	0.871	16	1.7	40	322	1.3	13	3.0	62	368	0.917
797.4	0.393	18	1.6	54	325	1.8	5.7	3.0	82	372	1.3
798.1	0.660	18	1.8	50	323	1.8	9.5	3.3	77	369	1.3
798.8	0.744	16	1.0	49	320	1.5	11	1.9	75	366	1.1
799.5	0.495	15	1.5	46	284	1.9	7.1	2.7	70	325	1.4
800.2	0.393	16	1.5	49	354	1.5	5.7	2.8	76	404	1.1
800.9	1.3	18	1.4	49	359	1.9	18	2.5	75	410	1.4
801.6	0.393	18	1.7	51	304	1.5	5.7	3.1	78	347	1.1
802.3	1.3	13	1.9	46	311	1.0	19	3.6	70	355	0.733
803.0	0.929	18	2.0	50	328	0.532	13	3.6	76	375	0.388
803.7	0.548	13	1.5	40	299	1.8	7.9	2.8	61	342	1.3
804.4	0.393	19	2.1	49	303	1.0	5.7	3.8	74	347	0.739
805.1	1.0	17	1.5	56	337	0.617	15	2.8	85	385	0.450
805.8	0.417	17	1.6	53	308	0.869	6.0	2.8	82	352	0.634
806.5	0.393	13	1.7	46	345	1.3	5.7	3.2	71	394	0.940
807.2	0.401	16	2.1	49	332	1.4	5.8	3.9	75	379	1.0
807.9	0.400	17	1.8	48	307	0.532	5.8	3.3	73	351	0.388
808.6	0.699	13	1.7	52	317	1.1	10	3.1	80	362	0.781
809.3	0.983	18	1.5	55	380	1.6	14	2.7	85	434	1.1
810.0	0.424	15	1.9	53	432	1.9	6.1	3.4	81	494	1.4
810.7	0.713	15	1.6	54	327	1.4	10	2.9	82	374	1.0
811.4	0.406	17	1.6	49	328	1.6	5.9	3.0	75	375	1.2
812.1	0.717	17	1.3	51	326	1.2	10	2.5	78	373	0.882
812.8	0.682	11	1.8	44	323	1.5	9.8	3.3	67	369	1.1
813.4	0.693	15	2.0	46	316	1.3	10	3.6	70	361	0.930
814.1	0.445	19	1.3	53	400	1.9	6.4	2.5	81	457	1.4
814.8	0.745	18	1.5	51	376	2.2	11	2.7	78	430	1.6
815.5	0.393	18	1.7	52	347	1.2	5.7	3.0	80	397	0.882
816.2	0.637	17	1.5	49	344	2.1	9.2	2.7	75	393	1.5
816.9	0.603	17	1.5	41	391	1.9	8.7	2.7	63	447	1.4
817.6	0.494	16	1.3	42	327	2.3	7.1	2.4	65	374	1.7
818.3	0.853	18	1.1	45	342	1.6	12	2.1	69	391	1.1
819.0	1.3	15	1.1	41	309	1.4	18	2.1	63	353	1.0
819.7	0.393	16	1.5	36	372	2.1	5.7	2.8	55	425	1.5
820.4	0.873	15	1.6	35	318	1.4	13	3.0	53	363	1.0
821.1	0.834	18	1.4	35	397	1.5	12	2.6	54	454	1.1
821.8	0.393	15	1.4	45	334	1.9	5.7	2.6	69	381	1.4
822.5	0.393	13	1.4	40	312	1.2	5.7	2.5	61	357	0.864
823.2	0.947	16	1.6	36	399	2.5	14	2.9	56	456	1.9
823.9	1.1	17	1.8	36	329	1.8	16	3.4	55	376	1.3
824.6	0.983	17	1.4	36	317	1.7	14	2.5	55	363	1.2
825.3	0.393	14	0.991	34	298	1.5	5.7	1.8	51	340	1.1
826.0	1.1	13	1.5	32	294	1.6	17	2.8	49	336	1.2
826.7	0.625	14	1.8	33	445	2.9	9.0	3.2	51	508	2.1
827.4	0.492	18	1.5	37	364	2.2	7.1	2.7	56	416	1.6
828.1	0.393	18	1.4	35	345	3.0	5.7	2.6	53	395	2.2
828.8	0.697	18	1.1	27	384	1.5	10	2.0	41	439	1.1
829.5	0.984	18	1.3	37	386	3.5	14	2.4	56	441	2.5
830.2	0.393	17	1.3	31	337	2.3	5.7	2.4	47	385	1.6
830.9	0.393	15	1.1	26	348	2.7	5.7	2.0	40	398	2.0
831.6	0.678	14	1.1	30	323	2.4	9.8	2.1	46	370	1.7
832.3	1.1	14	1.4	29	315	1.6	16	2.5	44	360	1.2
833.0	0.403	15	1.4	25	376	2.7	5.8	2.6	38	430	2.0
833.7	0.675	19	1.8	29	337	1.7	9.7	3.2	44	386	1.2
834.4	0.910	15	1.3	32	344	3.1	13	2.4	49	393	2.3
835.1	0.910	16	1.1	30	327	2.8	13	1.9	47	374	2.0
835.8	0.393	13	1.4	22	294	2.3	5.7	2.5	33	337	1.7
836.5	0.393	15	1.5	29	381	2.5	5.7	2.7	45	436	1.8
837.2	1.2	17	1.2	22	363	2.9	17	2.2	34	415	2.1
837.9	0.685	15	1.4	38	352	2.6	9.9	2.5	58	402	1.9
838.6	0.393	17	1.5	36	328	2.2	5.7	2.7	54	375	1.6
839.3	1.0	19	1.1	35	329	2.0	14	2.0	53	376	1.5
839.9	1.1	18	1.1	29	304	1.1	16	2.0	45	347	0.836
840.6	1.3	18	1.4	31	327	1.8	18	2.5	47	374	1.3
841.3	0.393	19	1.2	39	307	1.5	5.7	2.2	59	352	1.1
842.0	0.843	19	1.5	33	290	1.9	12	2.7	51	332	1.4
842.7	0.992	17	1.2	34	334	1.9	14	2.2	52	381	1.4
843.4	0.732	17	1.5	30	303	1.2	11	2.8	46	346	0.910
844.1	0.676	18	1.2	42	316	1.0	9.8	2.1	64	361	0.744
844.8	1.3	18	1.3	37	281	1.2	18	2.4	56	322	0.851
845.5	0.401	16	1.2	44	320	1.2	5.8	2.3	67	366	0.855
846.2	0.734	17	1.4	44	267	1.2	11	2.5	67	305	0.907
846.9	1.1	18	1.3	40	330	3.6	15	2.3	61	377	2.6



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
847.6	1.2	18	1.1	45	296	1.4	17	1.9	68	339	1.1
848.3	1.2	17	1.1	49	293	1.6	18	1.9	74	335	1.2
849.0	0.393	18	0.659	47	261	1.2	5.7	1.2	72	299	0.857
849.7	0.806	16	1.1	48	323	1.0	12	2.0	73	369	0.748
850.4	1.2	20	1.4	50	358	1.6	17	2.5	77	409	1.2
851.1	0.509	20	1.000	46	298	1.7	7.3	1.8	71	341	1.2
851.8	1.5	17	0.939	47	277	1.2	22	1.7	72	317	0.860
852.5	0.834	16	1.1	43	270	1.4	12	2.1	65	309	1.0
853.2	0.675	18	1.4	46	274	0.477	9.7	2.6	70	314	0.348
853.9	0.912	17	1.3	51	294	2.7	13	2.4	79	337	2.0
854.6	1.4	17	1.1	52	259	1.6	20	2.0	80	296	1.2
855.3	0.555	18	1.1	53	296	0.922	8.0	2.0	80	338	0.672
856.0	0.971	16	1.2	53	334	0.523	14	2.2	81	382	0.382
856.7	0.677	16	1.7	57	311	1.0	9.8	3.2	87	356	0.744
857.4	0.622	16	1.1	62	301	1.5	9.0	2.0	95	344	1.1
858.1	0.642	16	1.4	60	293	0.645	9.3	2.5	92	336	0.471
858.8	0.393	12	1.1	43	237	1.1	5.7	1.9	65	271	0.816
859.5	1.2	16	1.5	59	292	1.7	17	2.8	90	334	1.2
860.2	0.636	20	1.1	61	310	2.1	9.2	1.9	93	354	1.5
860.9	1.2	18	1.4	57	296	0.931	17	2.5	88	339	0.679
861.6	0.948	16	0.964	52	283	1.1	14	1.8	79	324	0.792
862.3	0.667	15	1.3	61	372	1.3	9.6	2.5	93	425	0.978
863.0	0.461	17	1.3	48	331	1.5	6.7	2.3	73	379	1.1
863.7	0.946	17	1.3	50	273	1.7	14	2.3	77	312	1.3
864.4	1.3	17	1.2	57	280	0.768	19	2.3	87	320	0.560
865.1	0.393	16	1.8	51	314	0.952	5.7	3.3	78	359	0.695
865.7	0.709	14	1.7	55	294	1.1	10	3.1	84	337	0.793
866.4	0.948	14	1.3	48	388	1.4	14	2.5	74	444	1.0
867.1	0.550	15	1.1	43	247	0.609	7.9	1.9	66	283	0.444
867.8	0.499	15	1.1	38	244	0.923	7.2	2.0	58	279	0.673
868.5	0.509	16	1.1	42	286	0.837	7.4	2.0	64	327	0.611
869.2	0.624	16	1.3	43	308	1.7	9.0	2.3	65	352	1.3
869.9	0.865	11	1.4	40	309	1.2	12	2.6	62	353	0.867
870.6	0.808	17	0.885	51	262	0.799	12	1.6	79	299	0.583
871.3	0.430	16	1.5	41	308	1.9	6.2	2.7	63	352	1.4
872.0	1.1	13	1.0	51	253	1.1	15	1.9	78	290	0.813
872.7	0.663	13	1.2	38	344	1.8	9.6	2.2	58	394	1.3
873.4	1.7	16	1.4	44	308	1.8	24	2.6	68	353	1.3
874.1	0.822	17	1.3	40	271	2.0	12	2.5	61	310	1.5
874.8	0.676	12	1.3	39	276	2.4	9.8	2.4	59	315	1.7
875.5	0.692	10	1.4	40	297	1.9	10.0	2.5	62	340	1.4
876.2	0.659	12	1.2	33	218	1.2	9.5	2.2	51	249	0.883
876.9	0.699	11	1.6	39	300	2.5	10	2.9	59	343	1.8
877.6	0.943	13	1.6	41	259	1.8	14	3.0	63	296	1.3
878.3	0.393	12	1.3	36	315	1.6	5.7	2.4	56	361	1.2
879.0	1.1	13	1.5	31	279	1.0	16	2.7	48	320	0.758
879.7	1.0	12	1.8	35	314	2.0	15	3.3	54	359	1.4
880.4	0.393	11	1.8	29	292	2.0	5.7	3.4	44	334	1.5
881.1	0.751	11	1.4	33	270	3.4	11	2.5	51	309	2.5
881.8	0.476	11	2.1	33	303	2.1	6.9	3.9	50	347	1.5
882.5	1.4	9.6	1.7	25	258	1.7	20	3.1	39	295	1.3
883.2	0.641	12	1.9	29	276	1.6	9.3	3.4	44	315	1.2
883.9	0.566	11	2.2	27	302	2.2	8.2	4.0	42	345	1.6
884.6	0.553	10	2.3	29	266	1.6	8.0	4.1	44	305	1.2
885.3	0.393	10	1.8	24	251	1.7	5.7	3.3	36	287	1.2
886.0	0.685	10	2.0	24	306	1.5	9.9	3.6	36	350	1.1
886.7	0.393	13	2.3	23	279	2.5	5.7	4.3	36	319	1.9
887.4	0.819	9.8	1.9	25	270	2.1	12	3.5	39	309	1.5
888.1	0.683	8.7	1.7	26	224	1.3	9.9	3.2	40	256	0.915
888.8	0.925	8.7	1.7	22	269	2.4	13	3.0	33	308	1.7
889.5	0.447	9.6	1.8	21	256	1.9	6.5	3.3	31	293	1.4
890.2	0.702	9.9	2.2	22	330	3.1	10	4.0	34	378	2.3
890.9	1.0	13	1.7	23	284	1.9	15	3.1	35	325	1.4
891.6	0.611	11	2.1	24	244	1.7	8.8	3.9	36	279	1.2
892.2	0.738	11	1.3	18	261	2.3	11	2.4	27	298	1.6
892.9	0.446	8.3	1.5	18	260	2.5	6.4	2.8	27	297	1.8
893.6	1.0	11	2.1	19	275	2.3	15	3.8	29	314	1.7
894.3	0.911	11	2.0	16	252	1.3	13	3.6	24	289	0.974
895.0	0.541	9.3	1.1	16	240	2.7	7.8	1.9	24	274	1.9
895.7	0.393	11	1.7	20	324	2.0	5.7	3.1	30	371	1.4
896.4	0.393	9.3	1.5	17	253	1.6	5.7	2.7	26	289	1.1
897.1	0.769	11	1.7	17	319	2.0	11	3.0	26	365	1.5
897.8	0.830	13	1.7	18	261	2.2	12	3.1	28	298	1.6
898.5	0.843	9.0	1.5	12	248	1.3	12	2.7	19	284	0.927
899.2	1.4	9.7	1.2	13	282	1.4	20	2.2	19	323	0.998
899.9	0.393	9.6	1.4	16	249	2.3	5.7	2.5	25	285	1.7
900.6	0.805	11	1.0	16	248	0.528	12	1.8	25	284	0.385
901.3	0.687	8.6	1.3	14	237	1.3	9.9	2.3	21	271	0.919
902.0	0.393	12	1.2	12	272	1.8	5.7	2.2	18	311	1.3
902.7	0.836	11	1.1	13	274	1.1	12	2.1	20	314	0.788
903.4	0.914	9.9	1.1	13	197	1.8	13	2.1	20	226	1.3



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
904.1	0.631	10	1.7	17	262	1.5	9.1	3.0	26	300	1.1
904.8	0.402	10	1.1	19	282	1.4	5.8	1.9	29	323	1.0
905.5	0.837	8.5	1.2	15	268	1.1	12	2.1	23	307	0.821
906.2	0.704	9.8	1.5	14	275	1.6	10	2.7	21	315	1.2
906.9	0.845	12	1.2	16	258	0.886	12	2.2	24	295	0.646
907.6	0.438	10	1.5	16	229	1.8	6.3	2.8	25	262	1.3
908.3	1.4	11	1.2	17	235	1.9	20	2.2	26	268	1.4
909.0	0.530	9.4	0.957	15	253	1.1	7.7	1.7	23	289	0.785
909.7	0.542	14	0.956	18	288	1.2	7.8	1.7	28	330	0.876
910.4	0.829	11	1.3	19	254	2.3	12	2.3	30	291	1.7
911.1	0.393	12	1.2	18	281	2.2	5.7	2.1	28	321	1.6
911.8	0.641	10	0.822	16	239	1.1	9.3	1.5	24	274	0.797
912.5	0.596	10	0.893	16	247	1.3	8.6	1.6	25	283	0.933
913.2	0.842	12	1.0	18	224	1.5	12	1.9	28	256	1.1
913.9	0.659	12	0.852	19	247	0.909	9.5	1.6	28	282	0.663
914.6	0.800	11	0.538	18	237	1.5	12	0.980	28	271	1.1
915.3	0.737	9.9	0.800	14	243	1.5	11	1.5	21	278	1.1
916.0	1.0	12	0.962	18	253	1.3	15	1.8	27	290	0.960
916.7	1.2	11	1.1	19	282	1.5	17	2.0	29	322	1.1
917.4	0.611	14	0.678	19	225	1.0	8.8	1.2	30	258	0.747
918.0	0.393	12	0.648	18	256	1.5	5.7	1.2	27	292	1.1
918.7	0.393	10	0.833	19	253	1.5	5.7	1.5	29	289	1.1
919.4	0.916	11	0.666	23	267	1.2	13	1.2	36	305	0.898
920.1	0.924	11	0.468	20	239	1.1	13	0.853	31	273	0.824
920.8	0.822	13	1.0	17	225	0.703	12	1.9	26	257	0.513
921.5	1.1	11	0.765	20	237	0.915	15	1.4	31	272	0.667
922.2	0.788	12	0.914	19	273	1.8	11	1.7	29	312	1.3
922.9	0.980	13	0.750	26	243	1.7	14	1.4	40	278	1.2
923.6	0.667	12	0.658	20	208	1.6	9.6	1.2	31	238	1.1
924.3	1.5	12	0.795	21	237	1.1	22	1.5	32	271	0.795
925.0	0.393	9.5	0.881	14	232	1.2	5.7	1.6	22	265	0.847
925.7	0.586	12	0.362	22	288	1.1	8.5	0.660	34	329	0.787
926.4	1.8	12	0.740	21	269	1.4	26	1.3	32	307	1.0
927.1	1.2	12	0.493	18	253	1.4	17	0.899	28	289	1.0
927.8	2.0	12	0.673	26	289	1.8	28	1.2	39	330	1.3
928.5	0.715	10	0.895	20	241	0.699	10	1.6	31	276	0.510
929.2	0.848	11	0.749	20	219	1.3	12	1.4	30	251	0.932
929.9	1.1	11	0.595	22	253	1.2	16	1.1	34	290	0.911
930.6	0.849	12	0.781	27	228	1.3	12	1.4	42	260	0.984
931.3	0.885	12	0.502	23	237	0.572	13	0.916	36	271	0.417
932.0	1.2	12	1.1	23	332	1.7	17	2.0	35	379	1.2
932.7	0.876	11	0.881	22	252	1.2	13	1.6	34	288	0.895
933.4	0.793	16	0.641	27	265	1.6	11	1.2	42	303	1.1
934.1	1.1	16	0.892	29	262	1.4	16	1.6	44	300	1.1
934.8	0.819	13	0.889	29	260	1.6	12	1.6	45	297	1.2
935.5	0.629	11	0.489	23	271	1.5	9.1	0.891	36	310	1.1
936.2	0.826	12	0.913	25	306	0.758	12	1.7	38	349	0.553
936.9	1.2	11	0.638	28	260	1.4	18	1.2	43	298	1.0
937.6	0.706	10	0.909	28	240	0.799	10	1.7	43	275	0.583
938.3	1.0	11	0.917	24	239	0.750	15	1.7	37	274	0.547
939.0	0.393	12	0.817	22	270	1.6	5.7	1.5	34	309	1.2
939.7	0.546	11	0.818	25	252	0.784	7.9	1.5	39	288	0.572
940.4	1.7	13	1.1	32	277	1.6	24	2.1	49	316	1.1
941.1	0.807	13	0.963	29	268	0.846	12	1.8	45	307	0.617
941.8	0.571	9.0	0.828	21	205	1.1	8.2	1.5	32	235	0.768
942.5	1.1	14	0.862	26	253	0.432	16	1.6	40	290	0.315
943.2	0.728	14	0.972	31	315	1.6	11	1.8	48	360	1.2
943.8	1.3	10	0.561	27	249	1.4	19	1.0	42	284	1.0
944.5	0.800	15	1.0	31	257	1.1	12	1.9	48	294	0.785
945.2	0.712	9.5	0.698	20	197	0.920	10	1.3	31	226	0.671
945.9	0.537	14	0.702	25	254	0.991	7.8	1.3	38	291	0.723
946.6	0.619	11	1.4	33	223	1.5	8.9	2.5	51	255	1.1
947.3	1.0	10	0.622	27	231	1.5	15	1.1	41	264	1.1
948.0	1.0	12	1.0	29	268	0.906	15	1.9	45	306	0.661
948.7	0.969	11	0.856	23	290	1.1	14	1.6	36	332	0.837
949.4	1.4	10	0.730	26	247	0.776	21	1.3	39	282	0.566
950.1	0.576	12	1.0	23	271	1.5	8.3	1.9	36	309	1.1
950.8	0.575	9.7	0.630	18	179	1.2	8.3	1.1	28	205	0.889
951.5	0.393	10	0.933	28	237	1.5	5.7	1.7	44	271	1.1
952.2	0.838	6.0	1.2	23	199	1.3	12	2.2	36	227	0.921
952.9	0.614	10	1.0	25	256	1.8	8.9	1.9	38	292	1.3
953.6	0.934	11	0.911	27	254	1.5	13	1.7	42	291	1.1
954.3	0.900	12	0.938	25	242	0.824	13	1.7	39	276	0.601
955.0	0.946	9.7	1.1	23	220	0.819	14	2.1	36	251	0.598
955.7	0.393	9.9	1.1	22	229	0.834	5.7	2.0	34	262	0.608
956.4	0.848	13	1.2	21	232	1.4	12	2.2	32	265	0.991
957.1	0.901	12	1.3	27	240	1.9	13	2.3	41	275	1.4
957.8	0.757	12	1.5	23	229	0.893	11	2.8	36	262	0.652
958.5	0.891	9.6	1.1	19	231	1.1	13	2.1	29	264	0.813
959.2	0.512	11	1.0	20	300	1.9	7.4	1.8	30	343	1.4
959.9	0.756	12	1.2	23	269	1.3	11	2.2	36	308	0.940



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.6	1.1	12	1.5	22	214	1.4	16	2.7	34	245	1.0
961.3	0.453	13	2.2	21	253	1.7	6.5	4.1	32	290	1.2
962.0	1.0	11	1.5	20	261	1.5	15	2.8	30	298	1.1
962.7	0.876	13	1.3	18	234	1.5	13	2.4	27	267	1.1
963.4	0.666	12	1.7	21	291	1.7	9.6	3.0	32	333	1.3
964.1	0.565	13	1.0	22	265	1.6	8.2	1.9	34	303	1.1
964.8	0.743	10	1.1	21	256	1.7	11	2.0	33	293	1.2
965.5	0.631	11	1.2	20	248	1.3	9.1	2.2	31	284	0.917
966.2	1.1	10	0.921	17	227	1.3	15	1.7	26	259	0.985
966.9	0.578	11	0.827	19	250	1.5	8.4	1.5	29	286	1.1
967.6	0.803	12	0.941	17	216	1.7	12	1.7	26	247	1.2
968.3	0.465	11	1.3	17	228	0.859	6.7	2.5	26	261	0.627
969.0	0.722	13	1.0	17	233	0.970	10	1.9	26	267	0.708
969.7	0.805	14	1.2	22	251	1.1	12	2.1	34	287	0.770
970.3	0.489	12	0.870	21	233	1.2	7.1	1.6	32	266	0.880
971.0	0.405	8.6	1.2	16	262	1.9	5.8	2.3	25	300	1.4
971.7	0.393	7.9	0.967	14	245	1.4	5.7	1.8	22	280	0.994
972.4	1.1	15	0.907	21	270	1.9	15	1.7	33	308	1.4
973.1	0.393	12	1.3	18	256	1.4	5.7	2.4	28	292	0.990
973.8	0.725	13	0.863	18	245	1.5	10	1.6	28	280	1.1
974.5	0.468	12	0.688	13	204	0.863	6.8	1.3	20	234	0.629
975.2	0.687	13	0.864	19	278	1.2	9.9	1.6	29	318	0.845
975.9	0.580	13	1.1	19	238	2.0	8.4	2.0	30	272	1.5
976.6	0.847	14	1.2	17	243	2.0	12	2.2	26	278	1.5
977.3	0.634	13	0.823	16	272	1.6	9.1	1.5	24	311	1.2
978.0	0.393	12	0.854	13	274	1.9	5.7	1.6	19	313	1.4
978.7	0.548	12	0.688	10	218	1.3	7.9	1.3	16	249	0.980
979.4	0.886	14	1.1	16	292	1.9	13	2.0	25	334	1.4
980.1	0.706	16	1.2	18	245	2.4	10	2.2	27	280	1.7
980.8	0.399	13	0.926	15	231	1.3	5.8	1.7	23	265	0.945
981.5	0.706	10	1.0	16	241	0.998	10	1.9	25	275	0.728
982.2	0.887	13	0.848	17	284	2.5	13	1.5	25	325	1.8
982.9	0.648	17	0.939	18	256	2.2	9.4	1.7	27	292	1.6
983.6	0.715	14	0.948	16	288	2.1	10	1.7	25	329	1.5
984.3	1.6	13	0.823	16	232	1.4	23	1.5	24	265	1.1
985.0	0.702	11	0.926	15	240	1.4	10	1.7	23	274	1.0
985.7	0.393	11	0.898	16	272	2.1	5.7	1.6	24	311	1.6
986.4	0.656	15	0.653	16	270	2.2	9.5	1.2	24	309	1.6
987.1	0.445	14	0.893	17	258	1.1	6.4	1.6	27	295	0.828
987.8	0.802	15	1.1	14	230	1.3	12	2.0	21	263	0.929
988.5	0.425	11	0.785	15	258	1.1	6.1	1.4	23	295	0.790
989.2	0.522	13	0.921	15	227	0.964	7.5	1.7	23	260	0.703
989.9	0.924	14	0.978	20	256	1.6	13	1.8	31	293	1.2
990.6	0.626	12	1.1	18	233	1.5	9.0	2.0	27	266	1.1
991.3	0.774	13	0.878	17	250	1.8	11	1.6	26	286	1.3
992.0	0.645	11	0.933	16	261	1.6	9.3	1.7	25	298	1.1
992.7	0.492	12	0.888	16	233	1.2	7.1	1.6	25	266	0.861
993.4	0.889	16	0.817	19	316	2.6	13	1.5	29	361	1.9
994.1	1.1	17	1.1	20	289	2.0	16	2.0	31	330	1.5
994.8	0.771	12	0.964	14	228	1.4	11	1.8	22	261	1.0
995.5	0.494	12	0.969	14	253	1.1	7.1	1.8	22	289	0.814
996.2	1.4	14	1.2	17	296	1.9	20	2.3	26	338	1.4
996.8	0.574	12	0.940	21	282	2.1	8.3	1.7	32	323	1.5
997.5	0.597	11	0.730	16	207	1.3	8.6	1.3	24	237	0.923
998.2	1.0	13	1.3	18	278	1.3	15	2.4	27	318	0.924
998.9	0.890	13	0.700	14	257	1.1	13	1.3	21	293	0.769
999.6	0.611	9.7	0.875	18	247	1.7	8.8	1.6	28	282	1.2
1000.3	0.801	15	1.1	16	225	1.5	12	1.9	25	257	1.1
1001.0	0.695	14	0.894	14	229	1.2	10	1.6	22	262	0.859
1001.7	0.614	12	0.814	16	274	1.6	8.9	1.5	24	313	1.2
1002.4	0.570	12	0.611	14	258	1.0	8.2	1.1	22	295	0.766
1003.1	1.1	16	1.2	14	223	1.7	16	2.1	21	255	1.2
1003.8	0.393	12	0.726	17	236	1.8	5.7	1.3	27	270	1.3
1004.5	0.690	15	1.1	18	287	1.7	10.0	1.9	28	328	1.2
1005.2	0.393	11	0.915	12	250	2.1	5.7	1.7	18	285	1.5
1005.9	0.772	15	1.1	16	271	1.6	11	2.0	25	310	1.2
1006.6	0.745	13	0.745	18	229	1.2	11	1.4	28	262	0.845
1007.3	1.3	15	0.604	18	220	0.915	19	1.1	28	252	0.667
1008.0	0.606	11	0.720	17	224	1.2	8.8	1.3	26	256	0.881
1008.7	0.698	11	0.609	14	251	1.8	10	1.1	22	287	1.3
1009.4	0.530	12	0.991	18	301	1.4	7.6	1.8	27	345	1.0
1010.1	0.702	12	0.543	22	248	0.861	10	0.990	33	284	0.628
1010.8	0.780	13	0.581	20	237	1.1	11	1.1	31	271	0.804
1011.5	0.898	11	0.843	20	240	1.4	13	1.5	30	274	1.1
1012.2	1.6	10	0.760	24	288	0.888	24	1.4	36	329	0.648
1012.9	0.852	13	0.732	17	230	1.1	12	1.3	26	263	0.804
1013.6	0.704	12	0.590	18	205	1.3	10	1.1	27	235	0.942
1014.3	0.565	12	0.691	17	299	0.757	8.2	1.3	26	342	0.552
1015.0	0.411	11	0.713	15	246	1.3	5.9	1.3	23	281	0.925
1015.7	0.393	15	0.830	18	265	0.624	5.7	1.5	28	303	0.455
1016.4	0.393	14	0.745	19	248	2.0	5.7	1.4	29	283	1.5



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1017.1	0.572	13	0.652	21	233	1.2	8.3	1.2	33	266	0.847
1017.8	1.2	11	0.887	18	235	1.4	17	1.6	28	269	0.992
1018.5	1.1	13	0.631	18	274	1.4	15	1.2	27	314	1.0
1019.2	0.846	12	0.685	22	241	1.6	12	1.2	33	276	1.1
1019.9	0.651	12	0.593	21	214	1.9	9.4	1.1	33	245	1.4
1020.6	0.832	12	0.811	18	220	0.915	12	1.5	28	252	0.668
1021.3	0.777	11	0.836	18	235	1.0	11	1.5	27	268	0.743
1022.0	0.869	13	0.871	22	279	1.3	13	1.6	33	319	0.929
1022.7	0.957	12	1.1	22	242	0.721	14	2.1	34	277	0.526
1023.3	0.878	13	0.598	21	225	1.2	13	1.1	32	257	0.881
1024.0	0.627	12	0.788	20	230	1.5	9.1	1.4	31	263	1.1
1024.7	0.446	8.8	0.648	18	224	1.2	6.4	1.2	28	256	0.868
1025.4	0.683	11	0.945	19	261	0.772	9.9	1.7	29	298	0.563
1026.1	0.393	14	1.0	19	306	1.6	5.7	1.8	30	350	1.2
1026.8	0.846	14	0.685	24	249	1.8	12	1.2	36	284	1.3
1027.5	0.842	11	0.805	20	211	1.1	12	1.5	31	242	0.794
1028.2	0.519	10	0.674	18	224	0.957	7.5	1.2	28	256	0.698
1028.9	1.1	11	0.747	21	242	0.613	15	1.4	32	277	0.448
1029.6	0.419	12	0.796	21	209	1.6	6.0	1.5	32	239	1.2
1030.3	0.876	13	0.782	23	222	1.1	13	1.4	36	254	0.781
1031.0	0.393	11	0.735	16	225	1.5	5.7	1.3	25	257	1.1
1031.7	1.1	11	0.653	19	256	1.9	16	1.2	29	292	1.4
1032.4	0.393	12	0.794	21	276	1.6	5.7	1.4	33	315	1.2
1033.1	0.424	15	0.562	21	216	1.3	6.1	1.0	32	246	0.932
1033.8	0.819	11	0.857	25	223	1.3	12	1.6	39	255	0.940
1034.5	0.588	11	0.674	21	265	1.4	8.5	1.2	33	303	1.0
1035.2	0.559	12	0.939	20	257	0.928	8.1	1.7	30	293	0.677
1035.9	1.2	13	1.1	20	291	1.3	18	2.0	30	333	0.957
1036.6	0.969	13	0.758	18	299	0.829	14	1.4	28	342	0.605
1037.3	0.487	11	0.753	20	238	0.800	7.0	1.4	30	272	0.584
1038.0	0.432	15	0.888	15	231	1.2	6.2	1.6	22	264	0.875
1038.7	0.512	9.5	1.1	19	254	1.3	7.4	2.0	30	290	0.920
1039.4	0.568	15	1.1	19	239	1.7	8.2	2.0	29	273	1.2
1040.1	0.973	13	0.914	21	228	1.0	14	1.7	33	261	0.731
1040.8	0.943	11	0.696	22	251	0.914	14	1.3	33	287	0.667
1041.5	0.393	13	0.949	19	227	0.915	5.7	1.7	29	259	0.668
1042.2	0.832	15	1.1	16	229	1.1	12	2.0	25	261	0.796
1042.9	0.879	16	1.2	25	291	1.8	13	2.2	38	333	1.3
1043.6	0.393	13	0.844	18	209	1.0	5.7	1.5	28	239	0.730
1044.3	0.393	11	0.946	14	243	1.1	5.7	1.7	22	278	0.819
1045.0	0.393	13	0.739	17	234	0.626	5.7	1.3	26	268	0.457
1045.7	0.393	13	0.923	18	247	1.3	5.7	1.7	28	282	0.985
1046.4	0.489	13	0.853	19	244	0.907	7.1	1.6	29	279	0.662
1047.1	0.437	14	1.1	19	232	0.912	6.3	2.1	29	266	0.665
1047.8	0.591	13	1.4	12	226	1.3	8.5	2.6	18	259	0.925
1048.5	0.613	9.1	0.842	16	231	0.513	8.9	1.5	25	264	0.375
1049.2	0.685	13	1.1	14	232	1.3	9.9	2.0	21	265	0.919
1049.8	0.787	13	1.0	18	208	1.3	11	1.8	28	238	0.978
1050.5	0.393	11	0.939	17	282	1.4	5.7	1.7	25	322	1.0
1051.2	0.443	12	0.888	15	196	0.923	6.4	1.6	22	224	0.673
1051.9	0.829	15	1.0	16	342	1.4	12	1.8	24	391	1.0
1052.6	0.393	13	1.1	17	241	0.985	5.7	2.1	27	276	0.719
1053.3	0.393	12	0.686	14	205	0.902	5.7	1.3	22	234	0.658
1054.0	0.393	11	0.998	17	256	0.899	5.7	1.8	26	293	0.656
1054.7	0.393	12	1.1	14	272	1.6	5.7	2.1	21	311	1.1
1055.4	0.393	11	0.730	16	248	1.8	5.7	1.3	25	284	1.3
1056.1	0.762	12	1.1	18	268	1.8	11	2.1	27	306	1.3
1056.8	0.805	12	0.652	12	189	1.3	12	1.2	18	217	0.941
1057.5	1.1	13	1.0	17	275	1.7	15	1.9	26	315	1.3
1058.2	0.419	13	0.950	13	233	1.7	6.1	1.7	20	266	1.2
1058.9	1.0	12	1.3	12	268	1.2	15	2.4	18	306	0.870
1059.6	0.399	11	1.3	13	217	0.847	5.8	2.3	20	248	0.618
1060.3	0.817	12	0.865	13	209	1.5	12	1.6	20	239	1.1
1061.0	0.393	9.9	1.0	12	215	1.1	5.7	1.9	19	246	0.834
1061.7	0.404	10	0.937	9.7	270	1.4	5.8	1.7	15	309	1.0
1062.4	0.547	11	1.1	13	248	0.706	7.9	2.0	20	284	0.515
1063.1	0.911	12	1.3	13	240	1.6	13	2.3	21	275	1.1
1063.8	0.759	11	1.4	12	219	1.1	11	2.6	19	250	0.783
1064.5	0.451	10	1.3	12	210	1.8	6.5	2.4	18	240	1.3
1065.2	0.709	10	1.1	14	277	1.4	10	2.0	22	316	1.0
1065.9	0.633	12	1.2	16	280	0.701	9.1	2.1	24	320	0.512
1066.6	0.490	9.9	1.0	12	189	0.543	7.1	1.9	19	216	0.396
1067.3	0.393	9.5	1.0	11	197	0.933	5.7	1.9	16	225	0.681
1068.0	0.424	9.5	0.939	13	253	1.4	6.1	1.7	21	289	1.0
1068.7	0.456	13	1.1	12	278	1.8	6.6	2.0	18	318	1.3
1069.4	0.462	9.9	1.2	14	244	1.5	6.7	2.2	21	279	1.1
1070.1	0.701	10.0	0.947	12	213	1.5	10	1.7	19	244	1.1
1070.8	0.393	10	0.729	8.3	268	1.6	5.7	1.3	13	306	1.1
1071.5	0.393	11	1.0	11	224	1.2	5.7	1.9	17	257	0.896
1072.2	0.393	11	1.1	11	220	2.1	5.7	2.1	16	252	1.5
1072.9	0.828	12	1.1	12	239	1.8	12	2.1	19	274	1.3



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Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.6	0.504	13	0.888	10.0	259	1.6	7.3	1.6	15	297	1.2
1074.3	0.393	11	0.989	8.2	265	1.6	5.7	1.8	13	302	1.2
1075.0	0.393	11	0.779	9.3	211	1.2	5.7	1.4	14	242	0.876
1075.6	0.765	11	1.4	9.0	266	1.8	11	2.6	14	304	1.3
1076.3	0.744	10	1.1	8.2	217	1.7	11	1.9	13	248	1.2
1077.0	0.393	13	1.3	8.3	241	1.5	5.7	2.5	13	276	1.1
1077.7	0.908	10	0.799	6.4	219	1.6	13	1.5	9.8	251	1.1
1078.4	0.551	13	0.801	12	291	1.7	8.0	1.5	19	332	1.2
1079.1	0.617	10	1.2	10	204	0.946	8.9	2.1	15	234	0.690
1079.8	0.529	11	0.916	11	248	1.4	7.6	1.7	17	284	1.0
1080.5	0.904	12	0.930	8.3	227	1.4	13	1.7	13	259	0.994
1081.2	1.0	13	1.2	7.6	249	0.993	15	2.2	12	284	0.724
1081.9	0.393	8.4	1.3	8.0	254	1.9	5.7	2.4	12	291	1.4
1082.6	0.393	11	0.906	7.8	215	1.3	5.7	1.7	12	246	0.920
1083.3	0.591	11	0.991	10	233	1.1	8.5	1.8	16	266	0.794
1084.0	0.757	9.9	1.1	7.8	250	1.5	11	2.0	12	285	1.1
1084.7	1.2	11	1.1	10	268	2.7	18	1.9	15	306	1.9
1085.4	0.393	13	1.1	8.7	266	1.8	5.7	1.9	13	304	1.3
1086.1	0.393	8.3	0.922	6.6	237	1.8	5.7	1.7	10	271	1.3
1086.8	0.393	10	0.604	7.2	247	1.9	5.7	1.1	11	282	1.4
1087.5	0.438	7.5	0.800	6.1	249	1.6	6.3	1.5	9.3	285	1.2
1088.2	0.393	11	0.764	6.2	269	1.4	5.7	1.4	9.5	307	1.0
1088.9	0.538	11	0.657	6.9	211	2.2	7.8	1.2	11	241	1.6
1089.6	1.2	9.2	1.1	5.9	303	2.5	17	2.0	9.1	346	1.8
1090.3	0.393	10	0.917	4.8	227	1.9	5.7	1.7	7.4	260	1.4
1091.0	0.393	9.6	0.675	4.5	243	2.0	5.7	1.2	6.8	278	1.4
1091.7	0.393	13	0.889	4.9	262	1.8	5.7	1.6	7.5	299	1.3
1092.4	0.630	13	1.0	5.3	341	1.7	9.1	1.9	8.1	390	1.3
1093.1	0.395	11	0.766	7.5	259	1.3	5.7	1.4	12	297	0.918
1093.8	0.560	12	0.748	6.3	212	1.4	8.1	1.4	9.7	243	1.0
1094.5	0.577	9.9	0.575	4.4	271	2.0	8.3	1.0	6.7	310	1.5
1095.2	0.393	11	1.1	5.9	259	2.1	5.7	2.0	9.1	296	1.5
1095.9	0.415	10.0	0.615	4.2	206	1.6	6.0	1.1	6.5	235	1.2
1096.6	0.393	12	0.728	7.0	245	2.1	5.7	1.3	11	281	1.5
1097.3	0.516	13	0.760	4.6	243	2.4	7.5	1.4	7.0	278	1.7
1098.0	0.511	9.8	0.799	4.4	286	1.8	7.4	1.5	6.8	327	1.3
1098.7	0.530	13	0.549	7.1	269	2.2	7.6	1.0	11	308	1.6
1099.4	0.505	11	1.2	7.6	268	2.5	7.3	2.1	12	306	1.8
1100.1	0.393	11	0.727	6.2	292	1.7	5.7	1.3	9.5	333	1.3
1100.8	0.495	12	0.853	5.0	239	2.2	7.2	1.6	7.6	273	1.6
1101.4	0.685	11	0.925	4.9	307	2.8	9.9	1.7	7.5	351	2.0
1102.1	0.878	14	0.614	5.4	291	1.3	13	1.1	8.3	333	0.939
1102.8	0.868	12	0.751	5.9	288	1.9	13	1.4	9.1	329	1.4
1103.5	0.525	11	0.602	6.0	225	1.3	7.6	1.1	9.1	258	0.962
1104.2	0.665	11	0.643	6.2	261	2.1	9.6	1.2	9.6	298	1.5
1104.9	0.393	11	0.606	6.6	315	3.6	5.7	1.1	10	361	2.6
1105.6	0.570	12	0.555	6.2	279	1.9	8.2	1.0	9.4	319	1.4
1106.3	0.607	13	0.717	4.2	263	1.7	8.8	1.3	6.4	300	1.2
1107.0	0.393	11	0.823	6.0	310	1.1	5.7	1.5	9.2	355	0.805
1107.7	1.1	10	0.721	5.3	246	2.0	15	1.3	8.1	282	1.5
1108.4	0.393	13	1.2	5.0	267	2.0	5.7	2.2	7.7	305	1.5
1109.1	0.393	11	0.873	8.4	235	1.2	5.7	1.6	13	269	0.906
1109.8	0.393	11	0.631	7.9	226	1.3	5.7	1.2	12	258	0.970
1110.5	0.393	11	0.504	6.1	253	1.3	5.7	0.919	9.4	290	0.947
1111.2	0.401	11	0.731	4.4	241	1.6	5.8	1.3	6.8	276	1.2
1111.9	0.459	12	0.969	8.2	281	2.0	6.6	1.8	13	321	1.5
1112.6	0.393	14	1.0	7.1	252	1.9	5.7	1.8	11	288	1.4
1113.3	0.980	13	0.794	9.5	321	1.6	14	1.4	15	367	1.1
1114.0	0.480	11	0.653	6.8	239	1.4	6.9	1.2	10	274	1.0
1114.7	0.572	10	1.3	8.8	260	2.8	8.3	2.4	14	297	2.1
1115.4	0.393	13	0.823	8.1	243	3.1	5.7	1.5	12	278	2.3
1116.1	0.393	11	0.761	7.1	210	2.2	5.7	1.4	11	240	1.6
1116.8	0.393	11	1.0	6.2	218	2.1	5.7	1.9	9.4	250	1.5
1117.5	1.0	10	0.836	8.9	234	2.3	14	1.5	14	267	1.7
1118.2	0.393	13	1.2	8.6	288	1.5	5.7	2.1	13	330	1.1
1118.9	0.393	12	0.842	10	274	2.2	5.7	1.5	15	313	1.6
1119.6	1.1	13	0.771	10	260	1.7	16	1.4	16	298	1.3
1120.3	0.467	12	0.852	12	272	1.1	6.7	1.6	18	311	0.769
1121.0	0.668	11	0.783	9.9	212	1.8	9.6	1.4	15	243	1.3
1121.7	0.639	11	0.737	11	282	2.2	9.2	1.3	16	322	1.6
1122.4	0.569	13	1.2	11	278	1.2	8.2	2.2	17	318	0.904
1123.1	0.393	13	0.986	13	274	2.2	5.7	1.8	21	314	1.6
1123.8	0.927	11	0.858	9.5	225	2.3	13	1.6	15	257	1.6
1124.5	0.866	9.7	0.681	11	242	1.4	12	1.2	16	277	1.0
1125.2	0.738	15	1.4	10	257	2.3	11	2.5	16	294	1.7
1125.9	0.576	15	0.871	12	245	2.1	8.3	1.6	19	281	1.5
1126.6	0.442	10	0.863	13	279	1.5	6.4	1.6	20	319	1.1
1127.3	0.896	15	0.973	12	261	1.5	13	1.8	19	299	1.1
1127.9	0.393	14	1.2	12	297	2.0	5.7	2.2	19	339	1.5
1128.6	0.393	12	1.3	12	273	1.8	5.7	2.4	18	312	1.3
1129.3	0.712	13	1.2	12	229	2.0	10	2.1	19	262	1.4



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1130.0	1.2	9.9	0.851	14	213	1.9	17	1.6	22	244	1.4
1130.7	0.718	13	1.1	13	257	1.4	10	2.0	20	294	1.0
1131.4	0.771	13	1.6	16	333	2.5	11	2.8	24	381	1.8
1132.1	0.668	14	1.2	19	258	1.1	9.6	2.2	29	295	0.821
1132.8	0.393	15	1.4	15	255	2.1	5.7	2.5	24	292	1.5
1133.5	0.609	12	1.4	13	236	1.2	8.8	2.6	20	270	0.893
1134.2	0.393	9.6	1.4	12	264	2.9	5.7	2.5	18	302	2.1
1134.9	0.689	12	1.3	12	293	2.9	10.0	2.4	19	335	2.1
1135.6	0.898	15	1.3	13	230	1.6	13	2.3	20	263	1.2
1136.3	0.757	13	1.2	14	251	2.3	11	2.1	21	287	1.7
1137.0	0.393	11	1.2	11	238	1.5	5.7	2.2	17	272	1.1
1137.7	0.771	14	1.2	15	303	2.1	11	2.3	22	346	1.5
1138.4	0.493	14	1.0	11	245	1.3	7.1	1.8	17	280	0.961
1139.1	0.725	12	1.3	12	239	2.0	10	2.5	18	273	1.5
1139.8	0.393	12	1.1	11	235	1.0	5.7	2.1	16	268	0.735
1140.5	0.588	13	1.1	14	277	2.6	8.5	2.0	22	317	1.9
1141.2	0.393	13	0.986	11	249	1.3	5.7	1.8	17	285	0.963
1141.9	0.522	13	1.0	12	279	2.6	7.5	1.9	19	319	1.9
1142.6	1.3	15	1.1	13	286	1.3	18	2.0	20	327	0.954
1143.3	0.393	11	0.905	11	243	1.9	5.7	1.6	16	278	1.4
1144.0	0.615	14	1.1	10	232	2.8	8.9	2.0	15	265	2.1
1144.7	0.694	14	1.4	8.7	244	1.7	10	2.5	13	279	1.2
1145.4	0.584	18	0.884	11	266	2.6	8.4	1.6	17	304	1.9
1146.1	0.393	14	1.0	12	233	1.8	5.7	1.9	18	267	1.3
1146.8	0.647	13	0.949	12	292	1.9	9.3	1.7	19	333	1.4
1147.5	0.613	13	1.5	12	268	2.4	8.9	2.8	19	307	1.7
1148.2	0.417	16	1.3	11	257	2.6	6.0	2.3	17	294	1.9
1148.9	0.393	17	1.1	13	287	1.6	5.7	2.0	20	328	1.1
1149.6	0.697	12	1.4	11	252	2.6	10	2.6	17	288	1.9
1150.3	0.931	14	1.2	15	277	1.7	13	2.1	23	317	1.2
1151.0	1.4	13	1.3	12	287	2.3	20	2.4	18	329	1.7
1151.7	0.683	13	1.4	9.4	268	2.2	9.9	2.6	14	307	1.6
1152.4	0.531	16	1.0	14	252	1.9	7.7	1.8	21	288	1.4
1153.1	1.3	13	1.4	11	216	1.9	18	2.5	16	247	1.4
1153.7	0.810	14	1.3	11	222	1.3	12	2.5	17	254	0.939
1154.4	0.393	13	1.2	9.9	287	1.7	5.7	2.1	15	328	1.3
1155.1	0.805	14	1.1	11	245	2.2	12	2.0	17	281	1.6
1155.8	0.393	17	1.0	13	245	3.4	5.7	1.9	20	281	2.5
1156.5	0.478	13	1.4	10	249	1.3	6.9	2.6	16	284	0.931
1157.2	0.467	14	1.1	8.9	233	2.6	6.7	2.0	14	266	1.9
1157.9	0.448	12	1.0	9.8	236	2.1	6.5	1.9	15	270	1.5
1158.6	0.447	15	1.4	13	240	2.3	6.5	2.6	20	274	1.7
1159.3	1.3	13	1.1	9.6	246	1.8	18	2.0	15	282	1.3
1160.0	0.393	15	1.1	10	272	3.0	5.7	2.1	16	311	2.2
1160.7	0.977	14	1.0	8.2	240	1.6	14	1.9	13	274	1.2
1161.4	0.393	13	1.4	9.7	278	1.8	5.7	2.5	15	318	1.3
1162.1	0.988	14	1.1	8.6	243	2.7	14	2.1	13	278	1.9
1162.8	0.393	13	1.1	12	244	3.8	5.7	2.0	19	279	2.8
1163.5	0.407	13	1.4	11	285	2.5	5.9	2.6	16	326	1.8
1164.2	0.789	17	1.5	11	257	2.3	11	2.8	16	294	1.7
1164.9	0.442	13	1.2	10	244	2.9	6.4	2.2	16	279	2.1
1165.6	0.930	15	0.970	9.6	268	2.7	13	1.8	15	306	1.9
1166.3	0.553	14	0.998	13	267	2.3	8.0	1.8	20	306	1.7
1167.0	0.393	13	1.3	7.8	279	2.2	5.7	2.3	12	319	1.6
1167.7	1.3	14	0.993	9.8	253	3.0	19	1.8	15	289	2.2
1168.4	0.393	15	0.797	9.4	267	2.5	5.7	1.5	14	305	1.8
1169.1	1.1	15	1.4	11	247	3.9	15	2.5	16	282	2.9
1169.8	0.393	15	1.0	13	251	2.6	5.7	1.9	19	288	1.9
1170.5	0.672	14	0.951	9.9	241	2.6	9.7	1.7	15	276	1.9
1171.2	0.397	13	1.0	9.2	245	2.3	5.7	1.9	14	281	1.7
1171.9	0.981	16	1.8	12	269	3.4	14	3.3	18	308	2.5
1172.6	0.393	13	0.855	9.0	224	2.5	5.7	1.6	14	256	1.8
1173.3	0.889	14	1.1	9.4	255	1.3	13	2.0	14	292	0.965
1174.0	0.480	15	1.3	7.8	286	2.3	6.9	2.3	12	327	1.7
1174.7	0.393	14	1.2	10.0	244	3.1	5.7	2.2	15	280	2.3
1175.4	0.393	17	1.1	11	283	2.3	5.7	2.1	17	323	1.6
1176.1	0.393	13	0.910	6.8	202	2.5	5.7	1.7	10	231	1.8
1176.8	0.680	11	1.0	5.5	206	1.9	9.8	1.9	8.5	236	1.4
1177.5	0.393	8.9	1.3	6.6	235	1.6	5.7	2.4	10	269	1.2
1178.2	0.543	14	1.1	8.9	237	2.3	7.8	2.1	14	271	1.7
1178.9	0.398	15	1.2	12	261	3.1	5.7	2.3	18	299	2.2
1179.5	0.393	14	0.792	9.7	287	2.5	5.7	1.4	15	328	1.8
1180.2	0.646	12	1.1	9.1	227	3.2	9.3	2.0	14	260	2.3
1180.9	0.705	13	0.935	8.3	327	3.4	10	1.7	13	374	2.4
1181.6	0.393	16	1.0	13	274	4.3	5.7	1.9	19	313	3.2
1182.3	0.393	14	1.0	7.1	269	2.1	5.7	1.8	11	308	1.5
1183.0	0.393	17	0.981	8.3	233	3.0	5.7	1.8	13	267	2.2
1183.7	0.393	15	1.1	6.6	304	2.9	5.7	2.0	10	348	2.1
1184.4	0.393	12	0.837	7.3	314	4.2	5.7	1.5	11	360	3.1
1185.1	0.393	14	0.763	7.5	255	3.5	5.7	1.4	11	292	2.5
1185.8	0.393	14	0.947	8.3	297	3.1	5.7	1.7	13	340	2.3



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1186.5	0.393	14	1.5	9.3	330	4.2	5.7	2.7	14	378	3.0
1187.2	1.0	14	1.3	7.1	290	3.3	15	2.4	11	331	2.4
1187.9	0.393	13	0.894	6.1	233	3.5	5.7	1.6	9.3	267	2.5
1188.6	1.0	15	0.916	12	303	3.4	15	1.7	18	347	2.5
1189.3	0.429	12	1.1	8.9	299	2.4	6.2	2.0	14	341	1.7
1190.0	0.647	12	1.0	6.3	278	3.5	9.3	1.9	9.7	318	2.5
1190.7	0.587	13	0.918	6.7	270	3.8	8.5	1.7	10	309	2.8
1191.4	1.2	12	0.936	9.9	248	3.4	17	1.7	15	284	2.5
1192.1	0.835	14	0.799	8.3	278	3.3	12	1.5	13	318	2.4
1192.8	0.393	11	0.943	6.4	277	3.4	5.7	1.7	9.8	317	2.5
1193.5	0.743	13	0.832	7.4	309	3.2	11	1.5	11	353	2.3
1194.2	0.424	13	1.0	5.0	244	3.4	6.1	1.8	7.6	279	2.5
1194.9	0.393	15	0.833	9.0	265	5.0	5.7	1.5	14	303	3.7
1195.6	0.815	13	0.683	6.9	226	2.8	12	1.2	11	259	2.0
1196.3	0.393	14	0.743	7.8	288	2.4	5.7	1.4	12	329	1.8
1197.0	0.725	15	1.0	9.1	263	2.6	10	1.8	14	301	1.9
1197.7	0.670	16	0.680	8.6	246	2.9	9.7	1.2	13	281	2.1
1198.4	0.448	18	0.869	7.4	282	3.4	6.5	1.6	11	322	2.5
1199.1	0.610	13	0.669	8.1	316	3.5	8.8	1.2	12	362	2.5
1199.8	0.437	12	0.671	7.4	260	4.6	6.3	1.2	11	298	3.3
1200.5	0.547	12	0.783	7.2	233	1.9	7.9	1.4	11	267	1.4
1201.2	0.799	14	0.926	9.6	326	4.3	12	1.7	15	373	3.1
1201.9	0.393	15	0.842	8.4	308	4.0	5.7	1.5	13	352	2.9
1202.6	0.393	13	1.1	9.6	274	2.5	5.7	2.0	15	314	1.9
1203.3	0.502	13	0.698	6.0	252	4.3	7.3	1.3	9.2	288	3.1
1204.0	0.393	12	0.668	7.3	301	5.5	5.7	1.2	11	345	4.0
1204.7	0.539	14	0.809	9.4	253	5.1	7.8	1.5	14	289	3.7
1205.3	0.435	13	0.609	10	285	4.2	6.3	1.1	15	326	3.0
1206.0	1.2	13	0.848	8.8	271	3.8	18	1.5	14	310	2.8
1206.7	0.393	15	0.699	11	278	3.6	5.7	1.3	16	317	2.7
1207.4	0.393	13	0.826	11	291	5.3	5.7	1.5	17	332	3.9
1208.1	0.393	14	0.670	9.8	269	3.7	5.7	1.2	15	307	2.7
1208.8	0.878	11	0.468	7.7	271	4.5	13	0.854	12	310	3.3
1209.5	0.393	10	0.583	9.1	285	5.6	5.7	1.1	14	326	4.1
1210.2	0.969	15	0.891	13	304	6.0	14	1.6	21	347	4.4
1210.9	0.393	12	0.816	7.0	252	4.0	5.7	1.5	11	288	2.9
1211.6	0.732	15	0.591	8.9	313	4.6	11	1.1	14	357	3.4
1212.3	0.464	14	0.761	9.5	277	3.6	6.7	1.4	15	317	2.6
1213.0	0.776	11	0.648	7.6	273	6.1	11	1.2	12	312	4.5
1213.7	0.763	14	0.640	11	318	6.6	11	1.2	17	364	4.8
1214.4	0.531	15	0.871	8.7	280	8.2	7.7	1.6	13	320	6.0
1215.1	0.393	15	0.731	11	247	8.0	5.7	1.3	16	283	5.8
1215.8	1.3	13	0.944	10	274	6.3	18	1.7	16	313	4.6
1216.5	1.2	17	0.662	8.7	278	7.6	17	1.2	13	318	5.6
1217.2	0.936	14	0.468	8.9	320	7.0	14	0.853	14	365	5.1
1217.9	0.836	14	0.998	13	303	8.0	12	1.8	21	347	5.8
1218.6	0.496	13	0.528	9.6	278	8.2	7.2	0.962	15	318	6.0
1219.3	0.394	11	0.646	10	266	6.6	5.7	1.2	16	305	4.8
1220.0	0.393	12	0.907	10	285	7.8	5.7	1.7	15	326	5.7
1220.7	1.1	14	0.974	10	255	9.1	16	1.8	16	291	6.6
1221.4	0.881	15	1.0	11	296	8.9	13	1.9	17	339	6.5
1222.1	0.393	16	0.982	12	271	10	5.7	1.8	19	310	7.6
1222.8	0.393	13	0.700	10	241	7.8	5.7	1.3	15	276	5.7
1223.5	0.787	15	1.0	15	289	7.3	11	1.9	23	331	5.4
1224.2	0.926	14	1.2	10	267	9.7	13	2.2	16	305	7.1
1224.9	0.412	15	0.784	9.4	241	11	6.0	1.4	14	275	8.2
1225.6	0.665	16	0.856	11	239	6.9	9.6	1.6	17	274	5.0
1226.3	1.5	15	1.1	13	257	11	22	1.9	19	294	8.3
1227.0	0.393	15	1.2	14	302	11	5.7	2.3	22	346	8.0
1227.7	0.763	14	0.911	16	264	12	11	1.7	25	302	8.5
1228.4	0.423	12	1.0	15	299	10	6.1	1.9	22	342	7.3
1229.1	0.960	15	0.753	12	299	9.1	14	1.4	19	342	6.7
1229.8	1.2	14	1.1	13	284	10	17	2.0	21	325	7.4
1230.5	0.677	14	1.1	13	254	7.4	9.8	2.1	19	290	5.4
1231.2	0.614	15	0.774	15	241	5.0	8.9	1.4	23	275	3.7
1231.8	0.393	15	0.647	17	273	9.5	5.7	1.2	26	313	6.9
1232.5	0.615	12	1.1	14	230	8.2	8.9	1.9	22	263	6.0
1233.2	0.874	14	0.636	13	248	7.2	13	1.2	20	284	5.2
1233.9	1.2	16	1.2	18	261	8.4	17	2.3	27	298	6.1
1234.6	0.395	13	1.1	15	249	7.3	5.7	2.0	23	285	5.3
1235.3	0.512	15	0.436	17	237	6.4	7.4	0.795	26	271	4.7
1236.0	0.393	14	1.1	13	247	7.9	5.7	1.9	21	283	5.7
1236.7	0.962	13	1.2	16	292	8.5	14	2.1	24	334	6.2
1237.4	0.870	18	1.0	15	298	6.8	13	1.9	23	341	5.0
1238.1	0.480	17	1.1	17	249	7.7	6.9	2.1	26	285	5.6
1238.8	0.781	15	0.931	17	246	9.6	11	1.7	26	281	7.0
1239.5	0.438	11	1.0	20	294	8.1	6.3	1.9	31	336	5.9
1240.2	0.397	14	1.3	19	266	9.7	5.7	2.4	29	304	7.1
1240.9	0.852	16	0.933	21	260	11	12	1.7	33	298	7.9
1241.6	0.694	14	1.1	22	249	8.4	10	2.0	34	285	6.1
1242.3	0.764	18	0.911	18	262	5.6	11	1.7	28	300	4.1



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Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1243.0	0.539	14	1.4	16	268	8.6	7.8	2.5	25	307	6.3
1243.7	0.497	13	0.976	14	287	9.2	7.2	1.8	21	328	6.7
1244.4	0.648	14	1.0	20	260	9.8	9.4	1.9	30	297	7.2
1245.1	1.0	16	0.818	20	248	8.9	15	1.5	31	284	6.5
1245.8	0.393	14	1.4	27	274	8.6	5.7	2.5	41	313	6.3
1246.5	0.723	15	1.1	19	253	8.8	10	2.1	29	289	6.4
1247.2	0.683	15	1.3	28	276	9.7	9.9	2.4	43	315	7.1
1247.9	1.1	16	1.6	26	287	11	15	3.0	40	329	8.2
1248.6	0.478	17	0.984	23	252	9.1	6.9	1.8	36	288	6.6
1249.3	1.1	12	0.793	15	190	6.6	16	1.4	23	218	4.8
1250.0	1.0	16	1.0	19	257	8.2	14	1.9	29	294	5.9
1250.7	0.393	19	1.0	17	280	6.6	5.7	1.9	26	320	4.8
1251.4	0.490	17	1.1	23	218	9.4	7.1	2.0	36	250	6.8
1252.1	0.573	18	1.1	26	269	6.7	8.3	2.0	40	307	4.9
1252.8	0.604	17	1.0	20	232	6.8	8.7	1.8	31	265	4.9
1253.5	0.473	19	0.949	26	243	9.0	6.8	1.7	40	278	6.6
1254.2	1.0	15	1.2	25	275	8.2	15	2.2	38	315	6.0
1254.9	0.917	16	1.3	31	277	7.7	13	2.3	48	317	5.6
1255.6	0.660	15	1.2	24	254	8.1	9.5	2.1	37	291	5.9
1256.3	0.853	17	1.7	25	240	6.9	12	3.1	38	274	5.0
1257.0	1.7	21	1.4	25	287	8.2	24	2.5	39	328	6.0
1257.6	0.737	21	1.3	26	281	7.7	11	2.4	40	321	5.6
1258.3	0.476	18	1.3	28	243	7.2	6.9	2.4	43	278	5.2
1259.0	0.760	15	1.2	23	244	7.0	11	2.3	36	279	5.1
1259.7	0.849	18	1.1	27	270	7.0	12	2.0	41	308	5.1
1260.4	0.803	21	1.9	31	249	8.9	12	3.4	48	284	6.5
1261.1	0.905	21	1.5	34	236	7.0	13	2.8	52	270	5.1
1261.8	0.412	22	1.6	29	210	5.6	5.9	3.0	44	240	4.1
1262.5	0.393	18	1.0	26	200	5.9	5.7	1.9	40	229	4.3
1263.2	1.2	19	1.2	25	228	6.4	17	2.3	38	261	4.7
1263.9	0.393	21	1.5	32	262	8.8	5.7	2.8	49	300	6.4
1264.6	0.793	21	1.5	30	271	7.4	11	2.7	47	310	5.4
1265.3	1.1	21	1.9	37	274	7.9	16	3.5	56	314	5.7
1266.0	0.926	19	1.8	33	234	6.1	13	3.3	50	268	4.4
1266.7	0.490	18	1.4	22	238	6.2	7.1	2.6	33	272	4.6
1267.4	0.393	18	1.9	33	233	6.9	5.7	3.4	50	267	5.1
1268.1	0.617	19	1.6	38	267	7.7	8.9	3.0	59	305	5.6
1268.8	0.626	20	1.7	31	283	5.2	9.0	3.2	48	323	3.8
1269.5	0.989	16	1.7	28	224	7.3	14	3.0	42	256	5.4
1270.2	0.540	22	1.7	27	239	7.8	7.8	3.1	42	273	5.7
1270.9	0.393	19	1.7	30	237	5.0	5.7	3.1	46	271	3.7
1271.6	0.478	22	1.7	36	222	6.4	6.9	3.2	55	253	4.7
1272.3	0.563	20	1.4	39	277	6.2	8.1	2.6	60	317	4.6
1273.0	0.693	20	1.9	33	223	6.2	10	3.4	50	255	4.5
1273.7	0.753	20	1.5	38	224	5.2	11	2.7	58	256	3.8
1274.4	0.994	20	1.8	33	228	5.9	14	3.3	51	261	4.3
1275.1	1.2	21	1.4	47	239	5.1	17	2.5	72	273	3.7
1275.8	0.393	18	2.2	33	264	7.0	5.7	4.1	50	302	5.1
1276.5	0.486	18	2.2	35	246	6.1	7.0	4.0	54	282	4.4
1277.2	1.0	21	1.7	35	235	4.6	15	3.1	53	269	3.4
1277.9	0.393	20	1.6	34	203	6.4	5.7	2.9	52	232	4.6
1278.6	0.993	20	1.7	34	218	6.5	14	3.2	51	250	4.7
1279.3	0.858	19	1.8	27	225	5.6	12	3.3	41	258	4.1
1280.0	0.567	21	1.7	31	241	5.5	8.2	3.2	47	275	4.0
1280.7	0.598	22	2.2	33	278	5.9	8.6	4.0	51	318	4.3
1281.4	0.896	23	2.2	34	236	3.4	13	3.9	52	270	2.5
1282.1	0.393	23	1.4	37	221	5.1	5.7	2.6	56	253	3.7
1282.8	0.526	22	2.3	36	246	4.6	7.6	4.1	55	281	3.3
1283.5	0.393	17	1.9	31	239	4.7	5.7	3.4	48	274	3.5
1284.1	0.393	20	2.2	40	264	6.9	5.7	4.0	61	302	5.0
1284.8	0.641	22	2.6	42	255	5.5	9.3	4.7	64	292	4.0
1285.5	0.450	20	2.1	46	220	5.9	6.5	3.8	70	252	4.3
1286.2	0.497	18	1.8	28	202	5.0	7.2	3.3	43	231	3.6
1286.9	0.676	20	2.4	35	231	5.2	9.8	4.5	54	264	3.8
1287.6	0.393	22	1.9	36	203	3.6	5.7	3.5	55	233	2.6
1288.3	0.806	20	1.8	43	214	4.5	12	3.2	66	244	3.3
1289.0	0.622	18	1.7	33	222	5.0	9.0	3.1	51	253	3.6
1289.7	0.393	23	1.9	33	261	4.8	5.7	3.5	50	299	3.5
1290.4	0.393	18	1.6	32	188	4.8	5.7	2.9	49	215	3.5
1291.1	0.393	23	2.3	42	229	5.4	5.7	4.2	65	262	3.9
1291.8	0.992	21	1.7	38	206	5.8	14	3.1	58	236	4.3
1292.5	0.690	22	2.1	37	199	3.4	10.0	3.8	57	228	2.5
1293.2	0.393	24	1.7	35	208	6.0	5.7	3.2	54	238	4.4
1293.9	0.393	23	2.2	34	232	5.2	5.7	4.1	53	266	3.8
1294.6	0.974	26	2.0	41	238	5.5	14	3.7	63	272	4.0
1295.3	0.393	24	2.0	46	250	6.2	5.7	3.7	71	286	4.5
1296.0	0.393	20	1.9	37	248	5.2	5.7	3.5	57	284	3.8
1296.7	0.827	22	2.0	38	236	5.2	12	3.7	58	270	3.8
1297.4	1.0	26	1.9	35	246	5.6	15	3.5	54	282	4.1
1298.1	0.644	25	2.0	37	217	3.8	9.3	3.6	56	248	2.8
1298.8	0.843	24	2.1	37	225	5.5	12	3.9	56	258	4.0



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1299.5	0.601	22	1.8	32	223	5.9	8.7	3.3	49	255	4.3
1300.2	0.393	21	1.9	32	246	4.9	5.7	3.4	49	281	3.6
1300.9	0.483	25	1.9	38	230	5.3	7.0	3.5	58	263	3.9
1301.6	1.000	28	2.3	33	232	5.7	14	4.2	51	265	4.1
1302.3	0.569	23	2.2	34	212	3.9	8.2	4.0	53	242	2.9
1303.0	0.916	20	2.0	33	220	4.4	13	3.7	51	252	3.2
1303.7	0.393	23	2.5	36	244	4.6	5.7	4.5	55	279	3.3
1304.4	0.578	31	2.2	35	235	5.6	8.3	4.0	54	269	4.1
1305.1	0.742	22	1.8	32	189	5.1	11	3.3	49	217	3.7
1305.8	0.393	21	1.8	32	216	4.7	5.7	3.4	50	247	3.4
1306.5	0.457	21	1.9	28	223	4.9	6.6	3.4	43	255	3.6
1307.2	0.763	26	2.0	38	265	4.0	11	3.7	59	303	2.9
1307.9	0.500	24	1.6	35	216	4.3	7.2	2.9	53	247	3.2
1308.6	0.783	29	1.6	36	258	3.6	11	3.0	55	295	2.6
1309.3	0.679	21	1.9	30	218	4.6	9.8	3.5	45	249	3.3
1310.0	0.684	23	1.8	30	248	4.3	9.9	3.3	46	284	3.1
1310.6	1.1	28	1.8	34	230	5.2	16	3.3	52	263	3.8
1311.3	0.393	21	1.6	29	206	4.1	5.7	2.9	45	236	3.0
1312.0	0.393	22	1.7	29	233	4.7	5.7	3.0	45	266	3.4
1312.7	0.393	20	1.8	28	213	3.8	5.7	3.3	42	243	2.8
1313.4	0.689	23	1.6	25	251	4.6	9.9	2.9	39	287	3.3
1314.1	0.691	27	2.2	31	248	7.4	10.0	3.9	48	283	5.4
1314.8	0.393	26	1.7	32	229	5.5	5.7	3.0	49	262	4.0
1315.5	0.393	22	1.6	34	260	6.3	5.7	2.9	53	297	4.6
1316.2	0.811	22	1.9	25	238	4.8	12	3.4	39	272	3.5
1316.9	0.393	23	1.7	35	308	6.5	5.7	3.2	53	352	4.7
1317.6	0.498	26	1.8	31	216	5.5	7.2	3.3	48	247	4.0
1318.3	0.518	25	1.2	29	214	5.0	7.5	2.2	44	244	3.6
1319.0	0.393	20	1.6	28	214	5.4	5.7	2.8	44	245	3.9
1319.7	0.393	22	1.5	29	293	6.2	5.7	2.7	44	335	4.6
1320.4	0.393	26	1.6	27	248	7.1	5.7	3.0	42	283	5.2
1321.1	0.393	25	1.8	39	265	7.5	5.7	3.3	60	304	5.4
1321.8	0.636	23	1.4	22	217	3.7	9.2	2.5	34	248	2.7
1322.5	0.706	21	1.5	24	246	5.2	10	2.8	37	281	3.8
1323.2	0.596	26	2.1	25	272	5.9	8.6	3.9	38	311	4.3
1323.9	0.393	30	1.6	30	268	5.6	5.7	2.9	46	307	4.1
1324.6	1.1	25	1.5	36	233	5.3	15	2.8	55	267	3.9
1325.3	0.470	24	1.5	27	217	6.1	6.8	2.8	41	248	4.4
1326.0	0.608	19	1.5	29	213	5.6	8.8	2.8	44	244	4.1
1326.7	0.608	21	1.7	27	248	6.3	8.8	3.0	42	284	4.6
1327.4	0.905	28	1.5	27	251	5.9	13	2.7	42	287	4.3
1328.1	0.699	25	1.2	29	235	6.0	10	2.1	45	268	4.3
1328.8	0.711	21	1.8	30	231	5.3	10	3.3	45	264	3.9
1329.5	0.508	21	1.4	23	223	7.0	7.3	2.5	35	255	5.1
1330.2	0.502	24	2.1	29	265	6.6	7.2	3.8	45	303	4.8
1330.9	0.393	24	1.5	31	256	8.0	5.7	2.7	47	292	5.9
1331.6	0.628	26	1.7	33	234	7.5	9.1	3.1	50	268	5.4
1332.3	0.393	22	1.7	24	258	6.5	5.7	3.1	37	295	4.7
1333.0	0.700	19	1.2	25	259	8.5	10	2.3	39	297	6.2
1333.7	0.393	24	1.7	32	271	8.8	5.7	3.0	49	310	6.5
1334.4	0.427	25	1.4	31	242	7.8	6.2	2.6	48	277	5.7
1335.1	0.393	23	2.0	26	237	8.3	5.7	3.6	39	271	6.0
1335.8	0.393	23	1.6	32	252	8.0	5.7	2.9	49	288	5.8
1336.4	0.393	26	1.5	29	253	7.4	5.7	2.8	44	289	5.4
1337.1	0.515	28	1.8	27	249	7.8	7.4	3.3	41	284	5.7
1337.8	0.955	26	1.7	27	252	8.1	14	3.2	41	288	5.9
1338.5	0.775	25	1.3	26	231	4.6	11	2.4	40	264	3.4
1339.2	0.393	19	1.4	25	228	5.5	5.7	2.5	39	261	4.0
1339.9	1.1	22	1.9	36	296	6.8	16	3.4	55	338	4.9
1340.6	0.471	24	1.8	28	234	6.7	6.8	3.2	44	267	4.9
1341.3	0.393	26	1.3	35	223	6.4	5.7	2.5	54	255	4.6
1342.0	0.393	23	1.5	29	243	5.4	5.7	2.7	45	277	3.9
1342.7	0.393	21	1.7	26	268	7.7	5.7	3.2	39	306	5.6
1343.4	0.470	23	1.7	27	259	6.3	6.8	3.0	42	296	4.6
1344.1	0.402	29	1.8	35	238	6.5	5.8	3.3	54	272	4.7
1344.8	0.814	22	1.6	30	229	4.5	12	3.0	46	262	3.3
1345.5	0.393	21	2.1	32	243	6.1	5.7	3.7	49	278	4.5
1346.2	0.714	21	1.4	27	238	6.1	10	2.6	42	272	4.4
1346.9	0.664	24	1.6	32	296	6.2	9.6	2.9	50	339	4.5
1347.6	0.564	26	2.0	34	293	5.3	8.1	3.6	52	336	3.9
1348.3	0.489	20	1.8	30	223	6.3	7.1	3.3	46	255	4.6
1349.0	0.521	22	1.9	31	256	7.7	7.5	3.5	48	293	5.6
1349.7	0.393	22	1.9	29	234	6.9	5.7	3.5	45	267	5.0
1350.4	0.606	24	2.2	34	266	8.0	8.8	4.0	52	305	5.9
1351.1	0.877	26	2.1	36	254	6.9	13	3.9	55	291	5.1
1351.8	0.487	20	1.5	30	223	6.2	7.0	2.8	46	255	4.5
1352.5	0.982	22	1.9	30	235	6.6	14	3.5	45	269	4.8
1353.2	0.636	22	1.7	30	226	5.8	9.2	3.2	46	258	4.2
1353.9	0.415	27	1.6	38	253	9.0	6.0	2.8	59	289	6.6
1354.6	0.393	23	1.6	30	218	8.0	5.7	2.9	47	250	5.8
1355.3	0.393	20	1.8	32	226	8.1	5.7	3.3	50	259	5.9



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Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1356.0	0.902	22	1.9	28	254	9.7	13	3.5	43	291	7.1
1356.7	0.477	21	1.8	29	244	8.5	6.9	3.3	44	279	6.2
1357.4	0.779	23	1.8	35	233	7.5	11	3.3	54	266	5.4
1358.1	0.393	23	2.2	31	238	9.2	5.7	3.9	48	272	6.7
1358.8	0.393	19	1.7	32	234	8.5	5.7	3.1	49	268	6.2
1359.5	0.393	21	2.1	33	283	12	5.7	3.7	51	323	8.8
1360.2	0.393	22	2.1	34	250	12	5.7	3.9	52	286	8.8
1360.9	0.393	25	2.0	32	249	12	5.7	3.6	50	285	8.5
1361.5	0.939	22	1.5	34	222	11	14	2.7	52	254	8.4
1362.2	0.696	22	1.8	35	252	11	10	3.3	53	288	8.0
1362.9	0.479	20	1.7	26	288	11	6.9	3.0	40	329	8.0
1363.6	0.399	28	2.2	34	246	10	5.8	4.0	52	281	7.5
1364.3	0.393	25	2.0	36	239	12	5.7	3.7	56	274	8.6
1365.0	0.393	24	1.7	39	290	14	5.7	3.2	60	331	10
1365.7	0.393	31	2.0	34	276	14	5.7	3.6	52	316	10
1366.4	1.2	25	2.2	32	266	17	17	4.0	49	304	12
1367.1	1.6	30	1.5	35	250	14	23	2.7	54	286	10
1367.8	0.780	28	2.1	34	263	16	11	3.8	52	301	12
1368.5	0.780	28	1.7	33	266	13	11	3.2	50	305	9.5
1369.2	0.393	26	2.4	33	298	16	5.7	4.4	51	340	12
1369.9	0.526	31	2.5	33	247	13	7.6	4.6	50	283	9.6
1370.6	0.757	29	2.2	30	240	12	11	4.1	46	275	8.7
1371.3	0.548	23	1.9	30	268	13	7.9	3.5	46	307	9.7
1372.0	0.698	22	1.9	33	262	11	10	3.4	51	299	8.0
1372.7	0.422	21	1.8	26	249	13	6.1	3.3	39	285	9.8
1373.4	0.656	26	2.1	31	256	14	9.5	3.8	47	293	10
1374.1	0.935	29	1.8	35	263	13	14	3.4	54	300	9.5
1374.8	1.0	36	1.8	31	268	14	15	3.2	48	306	10
1375.5	0.393	30	2.0	31	284	15	5.7	3.7	48	325	11
1376.2	0.393	31	2.2	30	316	16	5.7	4.1	47	361	12
1376.9	0.402	28	1.7	31	269	17	5.8	3.2	47	308	12
1377.6	0.665	29	2.0	30	235	12	9.6	3.6	46	269	8.8
1378.3	0.658	26	1.8	37	273	14	9.5	3.3	57	312	10
1379.0	0.557	23	1.8	25	223	11	8.0	3.4	39	255	8.4
1379.7	0.393	27	1.4	29	291	13	5.7	2.5	45	333	9.7
1380.4	0.604	24	2.0	35	317	16	8.7	3.6	54	363	12
1381.1	0.988	24	2.1	35	263	15	14	3.9	53	300	11
1381.8	0.768	24	1.6	35	309	16	11	2.9	54	353	12
1382.5	0.776	25	1.6	24	259	14	11	2.9	37	296	10
1383.2	0.393	27	2.1	31	297	13	5.7	3.8	48	339	9.4
1383.9	0.704	25	2.1	33	253	15	10	3.9	51	289	11
1384.6	0.671	25	1.6	28	252	12	9.7	3.0	43	288	8.4
1385.3	0.393	20	1.6	27	250	12	5.7	2.9	42	286	8.6
1386.0	0.883	22	1.4	32	318	17	13	2.6	49	364	13
1386.7	0.488	27	2.1	34	277	15	7.0	3.8	53	317	11
1387.4	0.409	25	1.7	31	290	15	5.9	3.1	47	331	11
1388.0	0.547	24	1.3	28	278	13	7.9	2.4	43	318	9.3
1388.7	0.769	22	1.3	25	233	11	11	2.4	39	267	8.4
1389.4	0.597	23	1.9	35	296	18	8.6	3.4	53	338	13
1390.1	0.631	24	2.0	33	294	15	9.1	3.7	51	336	11
1390.8	0.950	24	1.4	30	272	17	14	2.6	46	311	13
1391.5	0.462	26	1.3	30	259	13	6.7	2.4	46	296	9.8
1392.2	0.537	19	1.4	27	258	11	7.8	2.5	41	295	8.3
1392.9	0.393	21	1.4	25	269	12	5.7	2.6	38	307	9.0
1393.6	0.492	24	1.7	32	280	13	7.1	3.0	49	320	9.2
1394.3	0.393	23	1.6	26	316	16	5.7	3.0	39	362	11
1395.0	0.968	22	1.4	28	279	16	14	2.6	43	319	11
1395.7	0.393	21	1.6	27	289	13	5.7	2.9	41	330	9.4
1396.4	1.2	21	2.0	28	293	15	18	3.6	43	335	11
1397.1	0.826	25	2.1	28	273	15	12	3.8	43	312	11
1397.8	0.637	21	1.4	30	301	15	9.2	2.6	46	344	11
1398.5	0.599	20	1.5	25	316	13	8.7	2.8	39	361	9.8
1399.2	0.478	22	1.5	25	313	10	6.9	2.8	38	357	7.5
1399.9	0.609	25	1.6	27	275	17	8.8	3.0	41	315	12
1400.6	0.814	23	1.4	36	294	17	12	2.5	56	336	12
1401.3	0.813	24	1.5	34	269	14	12	2.8	53	308	10
1402.0	0.675	25	1.5	35	283	16	9.8	2.8	54	323	12
1402.7	0.900	25	1.9	31	327	13	13	3.5	47	374	9.8
1403.4	0.611	25	1.8	31	321	19	8.8	3.2	48	367	14
1404.1	0.764	24	1.7	36	281	17	11	3.1	55	321	13
1404.8	0.393	23	1.4	33	312	12	5.7	2.6	50	356	8.8
1405.5	0.649	22	1.5	30	284	13	9.4	2.7	45	325	9.8
1406.2	0.682	30	2.0	35	323	18	9.8	3.7	53	369	13
1406.9	0.744	29	1.8	35	343	20	11	3.3	54	392	15
1407.6	0.556	25	1.7	34	308	17	8.0	3.1	52	353	12
1408.3	0.393	24	2.0	39	324	17	5.7	3.6	60	371	12
1409.0	1.0	24	1.8	29	322	19	15	3.4	45	368	14
1409.7	1.0	24	1.8	36	324	16	15	3.2	56	370	12
1410.4	0.407	32	1.6	33	294	17	5.9	2.9	50	336	13
1411.1	0.782	25	1.5	39	284	14	11	2.8	59	325	11
1411.8	0.442	25	1.6	37	311	13	6.4	3.0	57	356	9.2



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Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1412.5	0.393	22	1.6	44	293	17	5.7	2.8	67	335	13
1413.2	1.0	26	2.1	34	315	19	15	3.8	51	360	14
1413.9	0.393	25	1.7	38	296	19	5.7	3.1	59	338	14
1414.5	0.393	23	1.6	41	319	18	5.7	3.0	63	365	13
1415.2	0.443	21	1.8	36	305	21	6.4	3.2	55	349	15
1415.9	0.765	22	1.6	36	287	16	11	3.0	55	328	12
1416.6	0.393	29	2.0	35	329	20	5.7	3.6	53	376	15
1417.3	0.804	29	1.8	41	310	25	12	3.4	63	354	18
1418.0	0.934	22	1.3	40	302	21	13	2.3	62	346	15
1418.7	0.434	20	1.7	26	243	22	6.3	3.1	39	277	16
1419.4	0.393	19	1.7	32	313	23	5.7	3.1	49	358	17
1420.1	0.393	23	1.7	37	271	24	5.7	3.0	57	310	17
1420.8	0.555	23	1.5	35	292	26	8.0	2.8	54	333	19
1421.5	0.548	18	1.4	37	303	23	7.9	2.5	57	346	17
1422.2	0.797	17	1.7	36	284	22	12	3.2	55	324	16
1422.9	0.393	16	1.9	32	287	24	5.7	3.4	48	328	17
1423.6	0.719	19	1.9	32	288	23	10	3.5	49	330	17
1424.3	0.565	21	1.7	38	309	29	8.2	3.0	59	353	21
1425.0	0.393	20	1.5	39	334	22	5.7	2.7	60	382	16
1425.7	0.548	16	1.5	33	259	20	7.9	2.8	50	296	14
1426.4	0.717	21	1.6	33	303	27	10	3.0	51	346	20
1427.1	0.559	17	1.8	32	287	27	8.1	3.3	49	328	19
1427.8	0.866	18	1.8	33	265	29	13	3.3	51	303	21
1428.5	0.725	17	2.0	33	299	26	10	3.7	50	341	19
1429.2	0.847	19	1.6	28	271	27	12	2.8	42	309	20
1429.9	0.651	19	2.1	40	320	31	9.4	3.9	61	365	22
1430.6	0.393	18	2.0	32	307	24	5.7	3.7	49	352	17
1431.3	0.712	21	1.8	38	296	31	10	3.2	58	338	22
1432.0	0.393	19	1.7	32	298	26	5.7	3.1	49	341	19
1432.7	0.393	17	1.5	32	282	26	5.7	2.7	49	322	19
1433.4	0.643	21	1.7	41	345	29	9.3	3.2	62	395	21
1434.1	0.770	22	2.3	42	281	25	11	4.2	64	321	18
1434.8	0.566	19	1.4	38	302	22	8.2	2.6	58	345	16
1435.5	0.439	20	2.1	36	296	21	6.3	3.8	55	339	15
1436.2	0.414	20	2.4	42	335	24	6.0	4.3	64	383	17
1436.9	0.578	20	2.3	41	307	24	8.3	4.1	63	351	18
1437.6	0.393	20	2.4	43	308	23	5.7	4.4	65	353	17
1438.3	0.393	21	1.8	40	295	22	5.7	3.3	61	337	16
1439.0	0.850	16	2.0	33	257	18	12	3.6	50	293	13
1439.7	0.650	20	2.0	37	332	20	9.4	3.7	57	379	15
1440.3	1.3	23	2.0	41	299	24	18	3.7	62	342	17
1441.0	0.393	21	1.9	46	303	19	5.7	3.5	70	347	14
1441.7	0.776	20	2.4	48	285	20	11	4.3	74	326	14
1442.4	0.398	19	2.2	45	321	23	5.8	4.0	69	367	17
1443.1	0.393	18	2.1	44	309	22	5.7	3.8	68	353	16
1443.8	0.776	22	2.4	47	313	19	11	4.3	72	358	14
1444.5	0.442	20	2.0	44	259	15	6.4	3.6	67	296	11
1445.2	0.915	19	1.7	44	302	15	13	3.1	67	345	11
1445.9	0.761	20	2.1	51	295	18	11	3.9	79	337	13
1446.6	0.589	23	2.6	55	331	21	8.5	4.7	84	379	15
1447.3	0.698	22	1.9	53	310	15	10	3.4	82	355	11
1448.0	0.655	21	2.1	51	293	19	9.5	3.8	77	335	14
1448.7	0.466	20	2.0	48	291	16	6.7	3.6	74	332	12
1449.4	1.4	20	2.2	46	303	14	20	4.0	71	347	10
1450.1	0.421	21	1.8	55	331	15	6.1	3.3	84	378	11
1450.8	0.496	23	2.1	55	296	16	7.2	3.9	85	339	12
1451.5	0.553	18	2.1	52	299	12	8.0	3.7	80	342	8.7
1452.2	0.393	19	2.3	48	298	12	5.7	4.3	73	341	9.0
1452.9	0.481	19	2.2	49	270	14	6.9	4.0	75	308	9.9
1453.6	0.393	22	2.4	54	276	12	5.7	4.4	83	316	9.1
1454.3	0.549	26	2.2	63	315	13	7.9	4.0	97	360	9.8
1455.0	0.624	20	2.2	54	274	10	9.0	4.0	83	313	7.3
1455.7	0.561	23	1.9	54	289	12	8.1	3.5	83	330	8.8
1456.4	0.528	23	2.9	54	309	11	7.6	5.4	83	353	8.2
1457.1	0.893	22	2.3	52	303	15	13	4.2	80	347	11
1457.8	0.902	22	2.3	57	255	15	13	4.1	87	292	11
1458.5	0.748	20	2.3	52	272	9.0	11	4.3	80	311	6.6
1459.2	0.882	22	2.3	57	326	12	13	4.2	87	373	8.7
1459.9	0.821	26	3.0	57	350	10.0	12	5.4	87	400	7.3
1460.6	0.580	23	2.8	57	284	8.7	8.4	5.1	88	325	6.3
1461.3	0.539	23	2.5	59	297	9.7	7.8	4.6	90	340	7.0
1462.0	0.713	23	2.6	63	304	8.3	10	4.7	97	348	6.1
1462.7	0.843	21	2.1	62	335	6.8	12	3.9	94	383	5.0
1463.4	1.3	23	2.1	58	307	7.3	19	3.8	89	351	5.3
1464.1	0.964	22	2.5	58	306	7.3	14	4.5	89	350	5.3
1464.8	0.576	21	2.1	54	284	7.7	8.3	3.8	82	324	5.6
1465.5	0.813	25	2.2	56	284	5.9	12	4.0	86	325	4.3
1466.2	0.419	23	2.2	60	277	5.0	6.0	3.9	91	317	3.6
1466.9	0.781	26	2.4	58	331	7.0	11	4.4	89	378	5.1
1467.5	0.831	24	2.7	58	313	6.3	12	4.9	89	358	4.6
1468.2	0.539	24	2.2	57	304	6.7	7.8	4.0	87	348	4.9



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Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1468.9	0.393	29	2.6	59	372	7.2	5.7	4.7	90	426	5.3
1469.6	0.768	28	2.7	58	326	9.2	11	4.9	89	372	6.7
1470.3	0.707	27	2.9	69	287	8.9	10	5.3	105	328	6.5
1471.0	0.910	22	1.9	60	281	7.1	13	3.4	91	321	5.2
1471.7	0.742	24	3.0	63	313	6.7	11	5.5	97	358	4.9
1472.4	0.711	19	2.1	56	274	5.5	10	3.9	85	314	4.0
1473.1	0.710	25	2.3	52	307	4.5	10	4.1	80	351	3.3
1473.8	0.569	27	2.7	67	308	6.0	8.2	4.9	103	352	4.4
1474.5	0.990	24	2.6	59	290	5.1	14	4.8	90	332	3.8
1475.2	1.4	26	2.0	53	291	5.3	20	3.7	81	333	3.9
1475.9	0.648	23	2.3	55	332	4.9	9.4	4.3	84	380	3.6
1476.6	0.945	27	2.6	69	350	5.3	14	4.7	106	400	3.9
1477.3	0.873	23	2.3	61	303	6.1	13	4.3	93	346	4.4
1478.0	0.790	21	2.3	50	234	4.3	11	4.3	76	268	3.2
1478.7	0.653	23	2.5	49	280	5.8	9.4	4.6	75	320	4.2
1479.4	1.1	28	2.7	63	315	3.7	15	4.8	97	361	2.7
1480.1	1.2	28	2.2	54	300	5.1	17	4.0	83	343	3.8
1480.8	0.592	27	2.6	65	288	4.4	8.5	4.8	99	330	3.2
1481.5	0.413	22	2.2	48	258	4.5	6.0	3.9	73	295	3.3
1482.2	0.765	24	2.5	56	306	4.5	11	4.6	86	350	3.3
1482.9	0.631	29	1.8	56	309	4.0	9.1	3.3	86	353	2.9
1483.6	0.786	25	2.3	58	278	3.6	11	4.2	89	318	2.6
1484.3	0.816	25	2.4	64	298	3.6	12	4.4	98	340	2.6
1485.0	1.3	24	2.8	52	308	3.4	19	5.2	80	352	2.5
1485.7	0.948	23	2.2	50	285	3.6	14	4.1	76	326	2.6
1486.4	1.1	22	2.7	56	332	4.7	16	4.9	86	379	3.4
1487.1	1.2	26	2.5	54	289	4.0	17	4.6	83	330	2.9
1487.8	0.944	23	2.1	46	300	4.4	14	3.9	70	343	3.2
1488.5	0.493	23	2.0	48	287	2.8	7.1	3.6	74	328	2.1
1489.2	0.584	21	2.7	53	290	4.0	8.4	4.8	81	332	2.9
1489.9	1.3	24	2.7	63	297	3.5	19	5.0	96	340	2.6
1490.6	0.885	23	1.8	54	268	4.2	13	3.2	82	306	3.1
1491.3	1.2	22	2.1	51	309	3.4	17	3.8	79	354	2.5
1492.0	0.656	21	2.4	49	299	3.8	9.5	4.3	75	342	2.8
1492.7	0.846	25	2.5	46	309	5.6	12	4.6	70	354	4.1
1493.3	1.5	25	2.1	56	302	4.1	22	3.8	86	346	3.0
1494.0	0.704	20	2.4	47	297	2.6	10	4.3	72	340	1.9
1494.7	0.879	21	2.4	53	343	3.7	13	4.3	81	392	2.7
1495.4	1.1	20	2.2	52	298	2.4	16	3.9	80	340	1.8
1496.1	1.3	22	2.3	49	276	3.8	18	4.1	74	316	2.8
1496.8	0.625	23	2.1	48	293	2.6	9.0	3.8	74	336	1.9
1497.5	0.613	22	2.6	51	288	2.4	8.9	4.7	78	329	1.8
1498.2	0.680	18	2.3	53	267	2.9	9.8	4.3	82	306	2.1
1498.9	0.649	20	2.6	51	322	4.1	9.4	4.7	78	368	3.0
1499.6	0.972	24	2.8	53	299	4.1	14	5.0	82	341	3.0
1500.3	0.703	19	2.5	52	265	3.4	10	4.6	79	303	2.5
1501.0	1.1	18	2.0	45	272	3.4	16	3.7	69	311	2.5
1501.7	1.2	18	2.3	47	279	3.6	18	4.1	71	319	2.6
1502.4	0.394	20	2.4	48	347	3.5	5.7	4.4	73	397	2.5
1503.1	0.897	17	2.0	47	264	3.6	13	3.7	73	301	2.6
1503.8	0.393	20	2.5	54	279	3.2	5.7	4.5	83	319	2.3
1504.5	0.650	18	1.8	46	296	3.5	9.4	3.3	70	339	2.5
1505.2	1.5	18	2.1	50	320	2.9	22	3.9	77	366	2.1
1505.9	1.4	18	2.4	44	281	2.8	21	4.4	67	321	2.1
1506.6	0.393	20	1.5	42	270	3.2	5.7	2.8	64	308	2.3
1507.3	0.736	16	1.9	42	276	3.0	11	3.4	64	316	2.2
1508.0	0.708	15	1.9	43	331	3.9	10	3.5	65	378	2.8
1508.7	0.393	17	2.1	47	244	2.8	5.7	3.8	72	279	2.0
1509.4	1.1	18	2.5	38	265	4.2	16	4.5	58	303	3.0
1510.1	0.835	16	2.3	43	236	2.8	12	4.1	66	269	2.0
1510.8	0.739	17	2.1	43	269	1.9	11	3.8	66	308	1.4
1511.5	0.393	16	1.8	41	303	4.1	5.7	3.2	63	346	3.0
1512.2	0.576	18	2.4	45	277	4.0	8.3	4.4	69	317	2.9
1512.9	0.774	17	1.7	51	303	3.8	11	3.1	78	347	2.8
1513.6	0.430	16	2.1	41	253	2.7	6.2	3.9	63	290	2.0
1514.3	1.5	14	2.0	36	254	2.7	21	3.6	55	290	2.0
1515.0	0.920	15	1.9	41	288	3.4	13	3.5	63	329	2.5
1515.7	1.4	17	2.1	40	267	3.5	21	3.9	61	305	2.6
1516.4	1.1	19	2.0	47	293	3.4	15	3.6	72	335	2.5
1517.1	0.452	16	2.0	48	267	2.3	6.5	3.6	74	306	1.7
1517.8	1.2	15	1.8	45	263	4.0	17	3.3	69	301	2.9
1518.5	0.432	16	2.5	34	262	3.3	6.2	4.6	53	299	2.4
1519.2	0.932	22	1.7	40	261	3.1	13	3.1	61	298	2.3
1519.9	0.821	16	1.5	47	244	2.9	12	2.8	72	279	2.1
1520.5	0.719	14	1.8	37	258	1.9	10	3.2	57	295	1.4
1521.2	0.744	17	2.1	38	310	2.4	11	3.9	58	355	1.8
1521.9	1.1	13	1.7	40	266	2.5	15	3.0	61	304	1.8
1522.6	0.403	17	1.8	43	284	3.1	5.8	3.3	65	324	2.3
1523.3	0.696	16	1.9	39	267	2.3	10	3.5	59	305	1.7
1524.0	0.708	16	1.9	35	259	2.8	10	3.4	53	296	2.0
1524.7	0.639	15	1.8	37	268	2.7	9.2	3.3	57	306	2.0



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Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1525.4	0.907	13	2.0	39	264	2.2	13	3.6	60	302	1.6
1526.1	0.903	17	1.9	40	271	3.3	13	3.4	62	310	2.4
1526.8	0.393	15	1.6	40	279	3.5	5.7	2.9	61	319	2.5
1527.5	1.3	12	1.8	28	257	2.7	19	3.3	43	293	2.0
1528.2	0.690	11	2.5	32	250	2.0	10.0	4.6	49	285	1.5
1528.9	0.670	16	1.6	39	272	2.9	9.7	2.8	61	311	2.1
1529.6	1.1	17	1.8	38	313	2.1	15	3.3	58	358	1.6
1530.3	0.704	14	1.5	35	256	1.7	10	2.8	54	293	1.2
1531.0	1.7	13	1.8	36	265	2.8	25	3.3	56	303	2.0
1531.7	1.2	13	1.7	37	253	2.6	18	3.0	56	289	1.9
1532.4	0.934	19	1.9	37	311	2.6	13	3.5	57	356	1.9
1533.1	0.996	15	1.5	40	258	2.6	14	2.8	61	295	1.9
1533.8	0.901	15	1.5	33	246	2.2	13	2.7	50	282	1.6
1534.5	1.1	15	1.6	33	308	2.5	15	2.9	51	352	1.8
1535.2	1.3	16	1.5	32	258	2.5	18	2.7	49	295	1.9
1535.9	0.904	17	2.3	37	289	2.1	13	4.2	57	331	1.6
1536.6	1.1	16	0.944	35	272	3.0	16	1.7	54	311	2.2
1537.3	0.682	15	1.9	40	289	2.6	9.8	3.4	61	330	1.9
1538.0	0.982	12	1.4	31	318	2.1	14	2.5	47	363	1.6
1538.7	0.739	14	1.5	34	335	3.7	11	2.8	53	383	2.7
1539.4	0.857	13	0.947	34	239	3.1	12	1.7	52	273	2.3
1540.1	1.5	14	1.0	29	249	1.7	21	1.8	44	285	1.3
1540.8	0.706	12	1.4	27	267	1.5	10	2.6	41	305	1.1
1541.5	0.741	16	1.7	32	292	2.6	11	3.0	49	334	1.9
1542.2	0.614	13	1.1	30	245	2.2	8.9	2.1	45	280	1.6
1542.9	0.789	15	1.3	36	276	1.8	11	2.4	55	316	1.3
1543.6	0.507	14	1.1	31	258	2.2	7.3	2.1	48	295	1.6
1544.3	0.799	13	1.4	26	235	1.6	12	2.5	40	269	1.1
1545.0	1.0	15	1.5	31	306	2.4	15	2.8	47	350	1.8
1545.7	1.4	16	1.5	35	276	2.3	20	2.7	53	315	1.7
1546.3	0.767	12	1.3	33	252	1.2	11	2.4	50	288	0.870
1547.0	0.611	11	1.1	28	251	2.0	8.8	2.0	43	287	1.5
1547.7	0.503	12	1.1	31	263	1.4	7.3	2.1	47	301	1.1
1548.4	0.481	14	1.3	33	276	2.8	6.9	2.4	50	316	2.0
1549.1	1.2	14	0.844	36	298	2.6	18	1.5	55	341	1.9
1549.8	0.930	14	1.5	28	252	1.9	13	2.8	44	288	1.4
1550.5	0.393	14	1.5	28	282	1.2	5.7	2.7	43	322	0.912
1551.2	1.2	15	1.2	31	287	2.8	18	2.1	47	328	2.0
1551.9	1.1	16	1.2	32	300	2.1	15	2.3	50	344	1.5
1552.6	1.2	12	0.730	34	255	1.4	18	1.3	52	291	1.1
1553.3	0.393	13	0.983	30	330	1.3	5.7	1.8	47	378	0.969
1554.0	0.393	15	0.939	28	254	1.4	5.7	1.7	44	291	1.0
1554.7	0.895	15	1.0	33	278	3.0	13	1.9	50	318	2.2
1555.4	0.393	12	0.987	32	296	3.1	5.7	1.8	49	338	2.2
1556.1	0.393	13	0.893	29	234	1.6	5.7	1.6	45	268	1.1
1556.8	1.2	13	0.981	26	256	1.8	18	1.8	40	293	1.3
1557.5	1.0	12	0.940	25	286	1.4	15	1.7	39	327	1.0
1558.2	0.393	10	1.1	25	236	1.4	5.7	2.0	38	270	1.0
1558.9	0.596	14	1.1	31	284	1.1	8.6	1.9	47	325	0.802
1559.6	0.568	12	0.741	34	307	1.9	8.2	1.4	52	351	1.4
1560.3	0.393	13	0.868	30	248	2.2	5.7	1.6	46	283	1.6
1561.0	0.642	12	0.955	35	327	1.7	9.3	1.7	54	374	1.3
1561.7	0.475	14	0.953	33	298	1.5	6.9	1.7	51	341	1.1
1562.4	0.393	13	0.737	30	251	1.6	5.7	1.3	46	287	1.1
1563.1	0.581	13	1.2	29	308	2.1	8.4	2.2	45	352	1.6
1563.8	0.798	8.9	0.756	25	226	0.487	12	1.4	38	259	0.356
1564.5	1.1	13	0.824	32	258	1.8	16	1.5	48	295	1.3
1565.2	0.699	12	1.1	30	273	2.1	10	2.0	46	312	1.5
1565.9	0.401	10	0.850	28	259	0.959	5.8	1.6	42	297	0.700
1566.6	1.1	13	0.825	31	265	1.3	16	1.5	47	303	0.981
1567.3	0.500	10	0.750	29	273	1.3	7.2	1.4	44	313	0.974
1568.0	0.404	11	0.662	25	290	1.8	5.8	1.2	39	332	1.3
1568.7	0.633	14	0.655	31	287	2.3	9.1	1.2	47	328	1.7
1569.4	0.393	12	1.0	29	252	1.7	5.7	1.9	45	288	1.3
1570.1	0.971	14	0.787	31	274	2.0	14	1.4	48	313	1.4
1570.8	0.393	15	0.537	29	310	2.0	5.7	0.980	45	354	1.5
1571.5	0.393	15	0.779	29	261	1.4	5.7	1.4	44	298	0.996
1572.1	0.804	15	1.2	35	283	2.6	12	2.1	54	323	1.9
1572.8	0.393	13	0.892	38	290	2.4	5.7	1.6	58	332	1.8
1573.5	0.492	14	0.885	32	315	1.4	7.1	1.6	49	360	0.999
1574.2	0.393	13	0.652	26	272	1.6	5.7	1.2	40	311	1.2
1574.9	1.1	13	0.546	28	287	1.7	16	0.996	43	328	1.2
1575.6	0.601	15	0.709	31	246	0.886	8.7	1.3	48	282	0.647
1576.3	0.529	12	0.523	30	240	1.1	7.6	0.954	46	275	0.792
1577.0	0.404	13	0.759	32	302	1.5	5.8	1.4	49	345	1.1
1577.7	1.3	13	0.797	31	287	2.5	18	1.5	48	328	1.8
1578.4	0.896	14	0.454	27	256	1.6	13	0.827	42	293	1.2
1579.1	0.795	12	0.690	29	243	2.0	11	1.3	44	278	1.4
1579.8	0.587	16	0.571	31	241	1.8	8.5	1.0	48	275	1.3
1580.5	0.393	13	0.469	27	270	1.6	5.7	0.856	42	309	1.2
1581.2	0.424	12	0.696	29	345	2.3	6.1	1.3	44	394	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1581.9	0.557	16	0.739	36	343	1.9	8.0	1.3	56	392	1.4
1582.6	0.568	12	0.825	33	259	1.4	8.2	1.5	50	297	1.0
1583.3	0.879	14	0.542	29	250	1.2	13	0.988	44	285	0.862
1584.0	0.621	14	0.630	31	277	1.1	9.0	1.1	48	317	0.836
1584.7	0.393	15	0.720	34	291	2.3	5.7	1.3	52	333	1.7
1585.4	1.0	15	1.1	34	324	2.0	15	2.0	52	371	1.5
1586.1	0.393	14	0.645	28	227	2.0	5.7	1.2	43	260	1.4
1586.8	0.581	14	0.403	28	267	1.7	8.4	0.735	43	306	1.2
1587.5	1.2	14	0.635	25	258	1.4	17	1.2	39	295	1.0
1588.2	0.914	16	0.788	29	263	2.6	13	1.4	45	301	1.9
1588.9	0.795	17	0.820	32	325	1.0	11	1.5	49	372	0.737
1589.6	0.783	12	0.564	37	305	1.0	11	1.0	56	348	0.749
1590.3	0.917	16	0.660	24	250	1.0	13	1.2	36	286	0.748
1591.0	0.518	14	0.633	25	233	1.7	7.5	1.2	39	266	1.3
1591.7	0.393	15	0.596	35	286	2.3	5.7	1.1	54	327	1.7
1592.4	0.475	17	0.629	30	258	1.8	6.8	1.1	46	295	1.3
1593.1	0.393	13	0.531	35	311	1.2	5.7	0.969	54	355	0.885
1593.8	0.895	15	0.679	26	248	1.6	13	1.2	39	283	1.2
1594.5	0.700	16	0.644	30	290	1.5	10	1.2	46	331	1.1
1595.2	0.563	17	0.384	29	256	2.1	8.1	0.700	45	292	1.5
1595.9	0.695	19	0.681	27	230	2.0	10	1.2	42	263	1.5
1596.6	1.1	15	0.724	34	286	1.9	15	1.3	51	327	1.4
1597.3	0.630	14	0.984	29	277	1.7	9.1	1.8	44	317	1.2
1597.9	0.393	14	0.576	29	294	1.1	5.7	1.0	45	336	0.833
1598.6	0.565	16	0.847	36	292	2.3	8.2	1.5	55	334	1.7
1599.3	0.393	17	0.589	33	277	0.857	5.7	1.1	51	317	0.626
1600.0	0.644	16	0.422	28	262	2.0	9.3	0.770	42	300	1.5
1600.7	0.393	20	1.1	25	272	2.0	5.7	1.9	38	312	1.5
1601.4	1.6	17	0.402	29	265	1.9	22	0.733	45	303	1.4
1602.1	0.736	16	0.431	28	268	2.5	11	0.786	43	306	1.8
1602.8	0.792	16	0.893	29	289	1.5	11	1.6	44	331	1.1
1603.5	0.393	18	0.752	28	285	1.4	5.7	1.4	43	326	1.0
1604.2	1.4	18	0.703	29	321	1.8	21	1.3	45	367	1.3
1604.9	1.2	23	0.919	27	263	2.6	17	1.7	42	300	1.9
1605.6	0.747	18	0.629	33	263	1.8	11	1.1	51	300	1.3
1606.3	0.665	17	0.812	30	265	1.9	9.6	1.5	46	303	1.4
1607.0	0.931	16	0.777	25	241	1.8	13	1.4	39	276	1.3
1607.7	0.632	17	0.558	29	262	2.6	9.1	1.0	44	300	1.9
1608.4	1.4	21	0.469	28	285	1.8	21	0.856	43	326	1.3
1609.1	0.602	20	0.735	33	277	1.9	8.7	1.3	51	316	1.4
1609.8	0.907	17	1.2	32	268	1.4	13	2.1	50	306	1.1
1610.5	0.678	14	0.743	24	240	1.6	9.8	1.4	37	274	1.2
1611.2	0.564	22	0.820	25	262	2.7	8.1	1.5	39	299	1.9
1611.9	0.553	22	0.752	29	261	1.9	8.0	1.4	45	298	1.4
1612.6	0.393	21	0.587	33	283	2.1	5.7	1.1	50	324	1.5
1613.3	0.393	17	0.936	34	260	2.4	5.7	1.7	52	297	1.7
1614.0	0.590	19	0.845	30	284	1.7	8.5	1.5	45	325	1.3
1614.7	0.705	18	0.702	32	334	3.2	10	1.3	49	382	2.3
1615.4	1.5	21	0.685	26	252	2.2	21	1.2	40	288	1.6
1616.1	0.526	17	0.765	29	275	1.2	7.6	1.4	44	314	0.868
1616.8	0.779	19	0.854	27	280	1.3	11	1.6	42	320	0.964
1617.5	1.6	18	0.684	24	294	2.1	24	1.2	37	336	1.5
1618.2	0.962	18	0.829	28	279	1.1	14	1.5	44	319	0.804
1618.9	0.789	22	0.713	26	283	2.1	11	1.3	40	324	1.5
1619.6	0.794	21	0.431	29	307	2.6	11	0.786	44	351	1.9
1620.3	0.758	21	0.744	28	289	1.4	11	1.4	43	331	1.0
1621.0	0.905	20	0.686	24	271	1.8	13	1.3	37	310	1.3
1621.7	1.3	18	1.1	30	279	1.7	18	1.9	46	320	1.3
1622.4	0.812	20	0.864	33	305	1.5	12	1.6	51	349	1.1
1623.1	0.549	21	0.534	27	299	1.4	7.9	0.974	42	341	1.0
1623.8	0.488	19	0.877	31	287	1.9	7.0	1.6	47	328	1.4
1624.4	0.438	23	0.823	25	282	2.2	6.3	1.5	39	322	1.6
1625.1	0.784	24	0.709	30	287	1.7	11	1.3	46	328	1.2
1625.8	0.442	20	0.701	28	286	1.9	6.4	1.3	43	327	1.4
1626.5	1.3	21	0.943	29	308	1.4	19	1.7	45	352	1.0
1627.2	1.1	21	0.802	24	310	1.6	15	1.5	36	355	1.1
1627.9	0.475	24	0.555	30	288	1.9	6.9	1.0	46	330	1.4
1628.6	1.2	25	0.597	28	300	2.2	17	1.1	43	343	1.6
1629.3	0.770	24	0.819	28	305	1.1	11	1.5	43	349	0.794
1630.0	1.3	20	0.838	25	273	1.9	18	1.5	39	312	1.4
1630.7	0.835	22	1.0	28	352	2.0	12	1.9	44	403	1.5
1631.4	0.435	25	1.1	31	332	2.2	6.3	2.0	48	380	1.6
1632.1	0.526	24	1.2	29	314	2.6	7.6	2.1	45	359	1.9
1632.8	0.700	24	0.678	25	292	2.4	10	1.2	38	333	1.7
1633.5	0.770	20	0.708	27	309	2.7	11	1.3	41	354	2.0
1634.2	0.665	24	1.1	24	366	2.8	9.6	2.0	37	419	2.1
1634.9	1.2	23	0.694	26	287	2.0	18	1.3	40	328	1.5
1635.6	0.393	22	0.651	27	302	2.8	5.7	1.2	41	345	2.1
1636.3	0.776	24	0.769	24	287	2.0	11	1.4	37	328	1.4
1637.0	1.1	23	0.791	26	294	1.6	15	1.4	39	337	1.1
1637.7	0.545	25	0.915	26	370	1.7	7.9	1.7	41	423	1.2



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Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1638.4	0.393	24	0.874	29	337	3.0	5.7	1.6	45	385	2.2
1639.1	1.1	26	0.952	20	270	3.1	15	1.7	31	309	2.3
1639.8	1.2	24	1.2	29	339	2.4	17	2.1	44	387	1.7
1640.5	1.0	19	1.1	21	287	2.3	15	1.9	32	328	1.7
1641.2	0.963	23	0.781	23	323	3.3	14	1.4	36	369	2.4
1641.9	1.4	25	0.760	25	300	2.3	21	1.4	38	344	1.7
1642.6	0.864	26	1.3	26	319	2.5	12	2.3	39	365	1.8
1643.3	1.5	22	1.1	24	341	2.6	21	2.0	37	390	1.9
1644.0	0.952	23	1.0	24	354	3.4	14	1.9	37	405	2.5
1644.7	1.5	25	0.872	28	343	2.8	22	1.6	43	392	2.1
1645.4	0.903	26	0.965	27	327	2.5	13	1.8	42	374	1.8
1646.1	0.816	21	0.851	28	338	3.7	12	1.6	43	386	2.7
1646.8	0.919	26	1.2	25	356	3.4	13	2.1	38	408	2.5
1647.5	0.558	22	0.999	21	329	2.2	8.1	1.8	33	376	1.6
1648.2	1.9	25	1.3	25	359	3.1	28	2.3	39	410	2.2
1648.9	0.638	23	0.882	23	284	3.5	9.2	1.6	36	325	2.6
1649.6	0.899	23	1.0	25	337	2.4	13	1.8	38	385	1.8
1650.3	0.809	21	1.2	21	387	2.4	12	2.3	32	443	1.8
1650.9	1.3	25	1.4	22	348	1.8	18	2.6	33	398	1.3
1651.6	0.894	26	1.3	22	408	2.4	13	2.4	33	467	1.8
1652.3	1.2	23	1.2	19	332	2.4	18	2.2	29	380	1.8
1653.0	0.749	22	1.0	22	330	2.8	11	1.8	33	377	2.1
1653.7	0.656	24	0.938	23	356	3.1	9.5	1.7	36	407	2.3
1654.4	1.2	20	1.1	20	312	1.8	17	2.1	31	356	1.3
1655.1	0.517	27	1.3	23	375	3.8	7.5	2.3	35	428	2.8
1655.8	1.5	23	0.929	22	312	1.4	21	1.7	34	357	1.0
1656.5	0.464	22	1.5	21	334	2.0	6.7	2.7	33	382	1.5
1657.2	1.2	25	1.3	22	356	2.3	18	2.4	34	408	1.7
1657.9	1.2	23	0.867	19	336	2.0	18	1.6	29	385	1.4
1658.6	1.3	27	1.3	22	379	3.7	19	2.3	34	433	2.7
1659.3	0.956	25	1.4	26	383	1.9	14	2.5	41	438	1.4
1660.0	0.955	26	1.6	22	404	1.8	14	2.9	33	462	1.3
1660.7	1.2	22	1.7	20	392	2.6	18	3.2	30	448	1.9
1661.4	1.4	27	1.3	22	383	3.0	20	2.3	34	438	2.2
1662.1	0.906	28	1.5	23	411	1.5	13	2.8	35	470	1.1
1662.8	2.4	23	1.2	24	458	2.1	34	2.2	37	523	1.5
1663.5	1.5	24	1.6	24	384	2.7	22	2.8	37	439	2.0
1664.2	1.4	26	1.7	22	379	2.7	20	3.1	33	433	2.0
1664.9	1.5	29	1.4	21	364	2.3	21	2.6	33	416	1.7
1665.6	0.990	24	1.7	26	403	1.7	14	3.1	40	461	1.2
1666.3	0.671	21	1.1	19	369	1.5	9.7	2.0	29	423	1.1
1667.0	0.393	22	1.2	16	365	2.3	5.7	2.1	25	417	1.6
1667.7	1.2	28	1.4	26	476	3.9	17	2.6	40	544	2.8
1668.4	1.1	29	1.6	23	384	2.1	16	3.0	36	440	1.5
1669.1	1.1	25	1.2	23	441	1.4	16	2.2	35	504	0.987
1669.8	0.785	22	1.9	16	404	1.6	11	3.5	25	462	1.2
1670.5	1.0	28	1.9	18	372	2.2	15	3.4	27	425	1.6
1671.2	0.720	29	1.8	21	427	2.0	10	3.3	32	489	1.4
1671.9	1.4	27	1.5	21	355	2.7	20	2.7	32	407	2.0
1672.6	0.582	27	1.9	23	468	2.7	8.4	3.4	35	535	2.0
1673.3	0.819	28	1.4	15	420	2.6	12	2.6	23	481	1.9
1674.0	1.6	32	1.6	19	371	3.1	22	2.9	29	424	2.3
1674.7	1.7	34	1.7	21	429	3.3	25	3.2	33	491	2.4
1675.4	0.706	30	1.7	17	325	1.8	10	3.0	26	371	1.3
1676.1	1.4	29	1.4	19	431	3.3	20	2.5	29	492	2.4
1676.7	0.818	24	1.8	13	323	1.9	12	3.2	21	370	1.4
1677.4	1.5	28	1.8	19	427	2.9	21	3.2	29	488	2.1
1678.1	0.437	39	1.4	20	413	2.9	6.3	2.5	31	472	2.1
1678.8	0.797	33	1.4	16	402	1.6	12	2.6	25	460	1.1
1679.5	0.860	32	1.7	18	397	0.886	12	3.1	28	454	0.647
1680.2	0.514	31	2.1	17	428	3.5	7.4	3.8	25	490	2.5
1680.9	0.523	25	2.2	16	462	2.4	7.6	4.0	25	529	1.8
1681.6	1.8	42	2.2	19	388	2.5	26	4.1	30	443	1.9
1682.3	0.707	35	1.9	20	433	2.0	10	3.5	31	496	1.4
1683.0	0.774	32	2.0	17	404	2.4	11	3.6	26	462	1.8
1683.7	1.4	33	2.3	18	454	3.7	21	4.2	28	519	2.7
1684.4	1.7	36	2.2	19	474	2.7	25	4.1	29	542	2.0
1685.1	0.758	34	2.0	17	459	2.4	11	3.7	26	525	1.7
1685.8	1.3	36	1.5	16	373	2.2	19	2.7	25	427	1.6
1686.5	1.4	36	2.1	19	515	3.3	20	3.8	30	589	2.4
1687.2	1.5	30	2.3	20	468	2.0	21	4.2	31	535	1.5
1687.9	1.0	34	2.3	19	434	2.1	15	4.1	29	496	1.5
1688.6	0.923	36	2.0	19	438	1.9	13	3.6	30	501	1.4
1689.3	0.755	38	1.8	19	409	2.2	11	3.3	29	468	1.6
1690.0	1.0	32	1.8	16	384	3.1	15	3.3	24	440	2.3
1690.7	1.7	36	2.2	16	461	2.2	24	4.0	24	528	1.6
1691.4	1.1	40	2.3	20	443	3.0	16	4.3	31	507	2.2
1692.1	0.684	38	2.0	22	379	2.9	9.9	3.6	33	434	2.1
1692.8	1.7	40	2.8	21	488	3.1	24	5.1	32	558	2.3
1693.5	1.1	41	2.8	19	428	2.8	16	5.1	28	489	2.1
1694.2	1.1	41	2.5	17	430	2.3	15	4.5	26	492	1.7



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1694.9	0.673	38	2.2	22	437	3.2	9.7	4.0	34	500	2.3
1695.6	1.2	36	2.5	18	412	3.0	18	4.6	28	472	2.2
1696.3	1.2	35	2.4	15	382	2.3	18	4.4	23	437	1.7
1697.0	1.5	37	2.7	19	448	2.0	22	5.0	30	513	1.5
1697.7	0.802	34	2.6	20	401	1.6	12	4.8	30	458	1.2
1698.4	1.2	39	2.4	15	406	1.3	17	4.4	23	464	0.936
1699.1	1.6	30	2.1	17	443	2.8	23	3.8	26	507	2.0
1699.8	0.670	32	2.5	15	405	2.3	9.7	4.6	24	463	1.6
1700.5	1.4	28	2.7	16	467	2.2	21	4.8	24	534	1.6
1701.2	0.821	32	2.5	19	427	2.2	12	4.5	29	488	1.6
1701.9	0.965	31	2.3	19	368	2.2	14	4.1	30	421	1.6
1702.5	1.4	31	2.3	18	422	1.7	21	4.3	28	483	1.2
1703.2	0.930	34	2.8	20	427	2.5	13	5.0	31	488	1.8
1703.9	0.754	37	3.2	20	441	2.8	11	5.8	30	505	2.0
1704.6	1.4	31	2.8	18	446	2.4	21	5.2	28	510	1.7
1705.3	0.881	30	2.8	18	437	2.7	13	5.2	28	500	1.9
1706.0	0.744	27	2.2	17	383	2.2	11	4.0	26	438	1.6
1706.7	1.1	25	2.3	17	504	1.9	16	4.1	26	577	1.4
1707.4	1.3	29	2.5	17	426	2.5	18	4.6	26	487	1.8
1708.1	1.0	37	2.9	20	421	2.5	15	5.3	31	482	1.8
1708.8	1.3	28	2.3	14	365	1.7	19	4.2	21	417	1.2
1709.5	0.393	29	2.4	16	443	2.8	5.7	4.4	24	506	2.1
1710.2	1.4	30	2.6	21	460	1.4	20	4.8	32	526	1.0
1710.9	1.3	31	3.0	19	400	2.5	18	5.5	29	457	1.8
1711.6	1.2	29	2.3	20	396	1.1	18	4.2	30	453	0.774
1712.3	0.977	25	2.2	18	430	2.6	14	4.0	28	492	1.9
1713.0	1.8	31	2.3	18	417	1.6	25	4.2	27	477	1.2
1713.7	1.2	31	2.5	17	407	2.3	18	4.5	26	466	1.7
1714.4	0.944	26	2.4	15	378	2.7	14	4.3	23	432	1.9
1715.1	1.1	31	2.2	17	400	1.5	16	4.0	26	457	1.1
1715.8	1.1	23	2.2	15	420	1.3	16	4.0	24	480	0.919
1716.5	1.0	23	2.1	12	412	1.3	15	3.9	19	472	0.958
1717.2	1.3	20	3.0	15	412	1.6	18	5.4	23	471	1.1
1717.9	1.1	25	2.2	12	318	1.6	16	4.1	18	364	1.2
1718.6	0.754	23	2.3	13	488	2.4	11	4.2	20	558	1.8
1719.3	1.1	23	2.4	12	431	1.8	16	4.3	19	493	1.3
1720.0	1.1	22	2.6	17	368	2.1	16	4.8	26	421	1.5
1720.7	0.771	24	2.1	13	439	0.945	11	3.9	20	501	0.690
1721.4	1.0	25	2.3	16	394	2.3	15	4.3	24	451	1.7
1722.1	1.0	21	2.0	13	369	1.5	15	3.7	20	422	1.1
1722.8	1.1	19	2.0	11	357	1.5	16	3.6	17	408	1.1
1723.5	2.0	27	1.9	12	388	1.9	29	3.5	18	444	1.4
1724.2	0.791	42	2.0	13	446	1.5	11	3.7	20	510	1.1
1724.9	0.549	22	1.9	17	421	2.1	7.9	3.4	26	482	1.6
1725.6	1.4	23	2.0	18	435	1.5	21	3.6	28	497	1.1
1726.3	0.850	22	1.7	16	401	3.0	12	3.0	25	458	2.2
1727.0	1.5	22	1.4	18	494	2.4	21	2.6	27	565	1.7
1727.7	0.742	23	2.0	17	383	3.3	11	3.6	26	438	2.4
1728.4	0.613	24	1.3	21	391	2.7	8.9	2.3	32	447	2.0
1729.0	0.718	25	1.8	16	393	1.1	10	3.2	24	449	0.814
1729.7	0.700	24	1.7	14	375	2.4	10	3.1	22	429	1.7
1730.4	1.1	28	1.9	12	415	3.0	16	3.4	19	475	2.2
1731.1	1.4	22	1.5	17	379	2.2	20	2.8	25	433	1.6
1731.8	1.1	24	1.1	19	407	1.8	15	2.1	29	466	1.3
1732.5	0.814	23	1.9	15	394	2.8	12	3.4	23	451	2.0
1733.2	1.0	23	1.6	18	425	2.6	15	2.9	28	486	1.9
1733.9	0.563	27	1.5	24	401	2.1	8.1	2.8	36	458	1.5
1734.6	1.0	27	1.5	24	473	1.8	15	2.7	37	541	1.3
1735.3	0.583	25	1.4	20	370	2.5	8.4	2.5	31	424	1.8
1736.0	1.1	25	1.3	17	357	1.6	16	2.3	27	408	1.2
1736.7	0.690	23	1.3	18	354	3.4	10.0	2.5	27	405	2.5
1737.4	0.863	23	1.3	18	346	2.8	12	2.4	27	395	2.1
1738.1	1.1	24	1.3	22	371	2.4	15	2.4	33	424	1.7
1738.8	0.793	27	1.2	17	360	1.8	11	2.1	26	411	1.3
1739.5	0.393	23	1.4	18	389	1.4	5.7	2.5	28	445	1.0
1740.2	0.538	29	1.4	16	390	1.8	7.8	2.6	25	447	1.3
1740.9	1.0	28	1.5	22	430	5.0	15	2.7	34	492	3.6
1741.6	0.868	47	1.1	22	355	2.4	13	2.0	33	406	1.7
1742.3	1.5	26	1.1	17	398	1.7	22	2.1	26	455	1.2
1743.0	0.599	26	1.3	18	342	3.5	8.7	2.3	28	391	2.5
1743.7	0.678	31	1.2	18	392	3.0	9.8	2.1	28	448	2.2
1744.4	1.2	30	1.2	19	298	2.2	17	2.1	30	341	1.6
1745.1	0.993	24	1.2	21	341	2.8	14	2.3	32	390	2.1
1745.8	0.982	32	1.2	21	360	2.4	14	2.2	33	412	1.7
1746.5	0.788	29	1.2	25	349	2.2	11	2.3	39	399	1.6
1747.2	1.0	31	1.5	27	369	2.3	15	2.7	42	422	1.6
1747.9	0.393	29	1.3	20	338	3.1	5.7	2.4	31	387	2.3
1748.6	1.4	33	1.6	26	373	2.9	20	3.0	39	427	2.1
1749.3	0.618	30	1.5	17	326	2.2	8.9	2.7	26	373	1.6
1750.0	0.393	30	1.6	24	403	3.3	5.7	2.9	36	461	2.4
1750.7	1.2	29	1.1	26	434	3.8	17	2.0	40	496	2.8



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1751.4	0.750	29	1.4	22	349	3.0	11	2.5	34	399	2.2
1752.1	1.1	28	1.3	22	378	2.9	16	2.4	33	432	2.1
1752.8	0.614	27	1.3	21	350	2.5	8.9	2.4	33	401	1.8
1753.5	0.901	26	0.986	23	370	2.6	13	1.8	35	424	1.9
1754.2	0.812	31	1.3	28	342	3.8	12	2.3	42	391	2.8
1754.8	0.936	28	1.1	26	320	2.3	14	2.0	40	366	1.7
1755.5	0.925	25	1.5	25	377	2.6	13	2.7	38	431	1.9
1756.2	0.706	28	1.3	21	330	2.3	10	2.4	33	377	1.7
1756.9	1.2	31	1.4	25	362	3.1	17	2.5	38	414	2.3
1757.6	0.607	27	1.1	25	297	2.8	8.8	2.1	38	340	2.0
1758.3	0.393	26	1.1	26	285	3.1	5.7	1.9	40	326	2.2
1759.0	0.711	31	1.1	26	341	2.1	10	2.0	41	390	1.5
1759.7	0.630	25	1.5	23	353	3.2	9.1	2.8	36	403	2.3
1760.4	0.658	30	1.2	24	309	3.3	9.5	2.1	36	353	2.4
1761.1	1.0	29	1.2	30	338	2.9	15	2.2	45	387	2.1
1761.8	0.468	26	0.792	28	326	2.3	6.8	1.4	43	373	1.7
1762.5	0.998	25	0.984	24	324	3.0	14	1.8	37	370	2.2
1763.2	0.393	27	0.659	27	315	3.2	5.7	1.2	41	360	2.3
1763.9	1.3	32	1.2	24	307	2.9	18	2.2	36	351	2.1
1764.6	0.574	23	0.941	26	289	2.5	8.3	1.7	40	331	1.9
1765.3	1.1	27	1.6	28	303	2.5	16	2.8	44	346	1.8
1766.0	0.974	24	1.0	25	279	2.9	14	1.9	39	318	2.1
1766.7	0.996	28	1.2	27	282	3.2	14	2.1	42	322	2.4
1767.4	0.950	28	1.3	29	318	3.7	14	2.5	45	364	2.7
1768.1	0.533	27	1.1	30	326	2.6	7.7	2.0	45	373	1.9
1768.8	0.553	23	0.860	25	299	1.6	8.0	1.6	38	342	1.2
1769.5	0.393	28	1.0	32	375	4.1	5.7	1.9	49	429	3.0
1770.2	0.521	23	1.2	32	325	3.9	7.5	2.2	48	372	2.8
1770.9	0.648	27	0.891	28	316	3.5	9.4	1.6	42	362	2.5
1771.6	0.896	27	1.0	36	303	1.8	13	1.9	55	347	1.3
1772.3	0.486	21	0.819	27	308	2.7	7.0	1.5	41	353	2.0
1773.0	0.644	25	1.1	31	310	2.2	9.3	2.1	48	355	1.6
1773.7	1.1	24	0.918	31	327	2.9	15	1.7	48	374	2.1
1774.4	0.861	22	1.2	30	326	1.5	12	2.1	46	372	1.1
1775.1	1.1	24	0.929	33	276	2.2	16	1.7	51	316	1.6
1775.8	0.939	21	0.990	32	298	2.3	14	1.8	49	341	1.7
1776.5	0.573	22	1.3	32	314	2.2	8.3	2.5	49	359	1.6
1777.2	0.830	25	1.2	32	296	1.6	12	2.2	49	339	1.2
1777.9	1.4	27	1.3	35	297	3.1	20	2.4	54	340	2.3
1778.6	1.3	26	1.1	35	325	2.6	18	2.0	53	372	1.9
1779.3	0.743	19	1.1	35	315	1.5	11	2.1	54	360	1.1
1780.0	0.489	24	1.2	33	297	1.8	7.1	2.3	50	340	1.3
1780.7	0.410	23	1.7	39	309	2.7	5.9	3.2	60	353	2.0
1781.3	0.723	27	1.2	35	290	1.8	10	2.1	53	332	1.3
1782.0	0.815	22	1.2	35	331	2.6	12	2.2	54	378	1.9
1782.7	0.809	22	1.1	38	315	2.2	12	2.0	58	360	1.6
1783.4	0.775	20	1.2	32	284	1.9	11	2.3	49	324	1.4
1784.1	1.3	22	1.1	35	299	2.1	19	2.0	54	342	1.5
1784.8	0.393	21	1.0	34	273	0.953	5.7	1.9	53	312	0.695
1785.5	1.0	21	1.1	34	304	3.3	15	2.1	52	348	2.4
1786.2	0.451	16	1.0	30	307	1.8	6.5	1.8	46	351	1.3
1786.9	0.950	23	1.3	40	303	2.4	14	2.4	61	346	1.7
1787.6	0.487	26	1.3	35	275	1.7	7.0	2.4	54	315	1.2
1788.3	0.393	20	1.3	26	241	3.0	5.7	2.4	40	276	2.2
1789.0	0.433	20	1.3	35	301	1.6	6.3	2.3	53	345	1.2
1789.7	0.948	19	1.3	31	290	1.5	14	2.3	47	332	1.1
1790.4	1.3	19	1.2	43	315	1.3	19	2.2	65	360	0.968
1791.1	0.803	18	0.777	37	257	3.2	12	1.4	56	293	2.3
1791.8	0.475	14	0.977	37	281	2.2	6.9	1.8	57	321	1.6
1792.5	1.3	16	0.989	36	289	1.7	18	1.8	56	330	1.3
1793.2	1.3	19	1.4	34	326	1.9	19	2.6	52	373	1.4
1793.9	0.393	18	0.883	35	283	2.0	5.7	1.6	53	324	1.5
1794.6	0.605	18	0.852	42	339	2.5	8.7	1.6	64	387	1.8
1795.3	1.2	18	0.972	34	294	3.6	18	1.8	53	336	2.6
1796.0	0.552	17	0.827	31	278	1.8	8.0	1.5	47	318	1.3
1796.7	0.608	19	1.2	36	299	2.4	8.8	2.2	55	342	1.7
1797.4	0.678	15	1.1	32	265	1.6	9.8	2.1	50	303	1.1
1798.1	0.800	17	0.813	33	244	2.1	12	1.5	50	279	1.5
1798.8	0.393	13	1.1	32	239	2.4	5.7	2.1	50	274	1.7
1799.5	0.538	16	1.2	31	358	2.4	7.8	2.2	48	409	1.7
1800.2	0.544	15	1.2	36	301	2.1	7.8	2.2	55	345	1.6
1800.9	0.626	15	0.718	28	279	1.8	9.0	1.3	43	319	1.3
1801.6	1.2	15	0.913	34	278	1.2	18	1.7	52	318	0.870
1802.3	0.405	15	1.5	33	264	2.2	5.8	2.7	50	302	1.6
1803.0	1.2	20	0.721	32	312	2.7	17	1.3	49	357	1.9
1803.7	0.556	18	1.3	40	316	2.7	8.0	2.4	61	361	2.0
1804.4	0.454	15	0.934	36	238	1.6	6.6	1.7	55	272	1.2
1805.1	1.1	15	1.1	33	267	2.1	16	2.1	50	305	1.5
1805.8	0.393	13	1.3	35	278	2.2	5.7	2.4	54	318	1.6
1806.5	0.960	12	1.1	40	285	2.1	14	2.0	61	326	1.5
1807.2	1.4	14	1.5	38	270	2.1	20	2.8	58	309	1.5



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1807.8	0.825	12	1.1	46	293	2.6	12	2.1	71	335	1.9
1808.5	0.622	12	1.3	29	253	1.7	9.0	2.4	45	290	1.3
1809.2	1.1	14	1.6	38	318	2.9	16	2.9	58	364	2.1
1809.9	1.2	14	0.942	40	264	2.4	17	1.7	62	302	1.8
1810.6	0.930	16	1.9	42	265	3.3	13	3.4	64	303	2.4
1811.3	0.959	13	1.3	44	286	2.7	14	2.4	68	327	2.0
1812.0	1.0	13	1.5	37	285	1.6	15	2.7	57	326	1.2
1812.7	0.501	15	1.6	37	318	2.6	7.2	3.0	56	363	1.9
1813.4	0.899	15	1.5	38	348	2.4	13	2.7	59	398	1.7
1814.1	1.1	16	1.5	46	297	3.4	16	2.7	70	339	2.5
1814.8	0.420	13	1.4	34	312	1.7	6.1	2.5	53	357	1.2
1815.5	0.764	15	1.7	33	297	1.2	11	3.2	51	339	0.855
1816.2	0.881	15	1.6	38	355	2.2	13	2.9	59	406	1.6
1816.9	1.1	17	1.0	37	275	2.3	16	1.8	57	315	1.7
1817.6	0.658	14	1.8	50	335	2.1	9.5	3.2	76	383	1.5
1818.3	0.755	12	1.6	37	251	2.2	11	2.9	57	287	1.6
1819.0	0.393	11	1.6	34	261	2.5	5.7	2.9	53	298	1.8
1819.7	0.586	15	1.7	37	275	2.7	8.5	3.1	57	314	2.0
1820.4	0.957	13	1.9	48	296	2.3	14	3.5	73	339	1.6
1821.1	0.708	14	1.7	47	320	2.9	10	3.1	72	366	2.1
1821.8	1.2	13	1.7	45	318	2.5	17	3.2	69	363	1.8
1822.5	1.7	12	1.6	34	305	2.0	24	2.9	53	349	1.5
1823.2	0.724	15	2.0	43	314	4.0	10	3.6	66	359	2.9
1823.9	1.2	16	1.8	46	329	4.1	17	3.3	70	376	3.0
1824.6	0.956	14	1.7	47	299	3.0	14	3.1	71	342	2.2
1825.3	0.738	13	2.2	48	334	1.9	11	4.0	74	382	1.4
1826.0	1.0	14	2.0	44	315	2.8	15	3.6	68	360	2.1
1826.7	0.500	12	2.3	46	282	2.7	7.2	4.2	70	322	2.0
1827.4	1.1	14	2.1	54	285	2.5	15	3.9	83	326	1.8
1828.1	1.0	13	1.8	45	303	2.9	15	3.2	70	346	2.1
1828.8	1.5	14	1.7	49	291	1.9	21	3.2	75	332	1.4
1829.5	1.8	17	2.3	44	290	2.5	25	4.2	67	332	1.9
1830.2	1.2	14	2.4	52	324	2.4	17	4.4	79	370	1.8
1830.9	1.3	16	2.2	59	308	3.5	19	4.0	91	352	2.5
1831.6	1.0	17	1.9	53	295	1.7	15	3.4	80	337	1.2
1832.3	1.2	14	1.8	49	309	2.2	17	3.3	75	354	1.6
1833.0	1.1	14	2.4	51	279	2.0	15	4.5	79	318	1.5
1833.7	1.0	18	1.8	46	275	3.5	15	3.2	71	315	2.6
1834.3	0.593	17	2.2	57	322	3.6	8.6	4.0	87	369	2.6
1835.0	0.904	15	2.5	61	287	2.4	13	4.5	94	329	1.8
1835.7	0.421	12	2.1	52	314	2.2	6.1	3.9	80	359	1.6
1836.4	0.708	14	2.7	57	295	2.6	10	4.8	87	337	1.9
1837.1	1.7	19	2.3	55	332	3.3	25	4.2	84	380	2.4
1837.8	1.5	18	2.3	63	309	2.8	22	4.1	97	354	2.0
1838.5	0.451	19	2.3	58	281	2.8	6.5	4.2	89	322	2.0
1839.2	0.606	16	2.1	50	281	2.6	8.8	3.9	76	321	1.9
1839.9	1.1	19	2.7	63	353	2.0	16	4.9	97	403	1.5
1840.6	0.998	19	2.5	61	322	2.9	14	4.6	93	368	2.1
1841.3	1.1	17	2.3	60	339	3.0	16	4.2	93	388	2.2
1842.0	0.799	17	3.0	57	291	3.7	12	5.5	87	332	2.7
1842.7	1.2	17	2.2	55	286	2.9	18	4.0	84	327	2.1
1843.4	0.776	20	3.1	60	289	3.3	11	5.7	92	330	2.4
1844.1	0.846	19	2.4	58	257	2.9	12	4.3	89	294	2.1
1844.8	0.521	18	3.0	66	277	2.5	7.5	5.5	102	316	1.8
1845.5	0.729	17	1.9	51	266	3.0	11	3.4	79	304	2.2
1846.2	0.849	17	2.5	53	265	2.9	12	4.6	81	303	2.1
1846.9	0.816	18	2.1	60	277	3.9	12	3.8	92	317	2.8
1847.6	1.2	20	2.4	70	269	5.2	17	4.4	108	308	3.8
1848.3	1.1	21	2.3	62	280	2.1	15	4.2	95	320	1.5
1849.0	1.1	18	3.0	68	332	4.8	15	5.5	104	379	3.5
1849.7	0.709	18	2.7	55	307	4.4	10	5.0	84	351	3.2
1850.4	0.861	22	3.2	74	288	3.5	12	5.9	113	330	2.6
1851.1	0.853	18	2.5	70	307	3.6	12	4.6	107	351	2.7
1851.8	0.674	18	2.4	62	288	4.0	9.7	4.4	95	329	2.9
1852.5	0.906	21	2.8	59	319	2.8	13	5.1	91	365	2.0
1853.2	1.6	19	2.0	65	320	3.1	23	3.7	100	366	2.3
1853.9	1.3	23	2.6	82	348	5.2	19	4.7	125	398	3.8
1854.6	1.1	21	2.6	75	322	3.3	15	4.7	114	368	2.4
1855.3	0.717	19	2.6	71	317	3.5	10	4.7	109	363	2.6
1856.0	0.790	19	3.0	62	363	5.0	11	5.5	95	416	3.6
1856.7	1.1	23	2.5	65	327	4.4	15	4.5	100	373	3.2
1857.4	1.2	20	2.5	80	321	4.1	18	4.6	123	367	3.0
1858.1	0.878	16	2.3	74	318	4.9	13	4.2	113	363	3.6
1858.8	0.894	20	2.5	56	311	3.7	13	4.5	86	355	2.7
1859.5	0.516	20	2.7	68	345	3.5	7.5	5.0	105	395	2.6
1860.1	1.6	23	2.8	72	322	3.3	23	5.1	111	368	2.4
1860.8	0.586	19	2.5	68	305	3.9	8.5	4.6	105	349	2.8
1861.5	0.709	22	2.6	61	285	3.6	10	4.8	93	326	2.6
1862.2	0.660	18	2.9	66	282	3.6	9.5	5.3	102	323	2.7
1862.9	0.739	19	2.8	66	318	3.3	11	5.2	101	363	2.4
1863.6	0.460	23	2.2	72	329	4.1	6.6	4.0	111	376	3.0



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1864.3	0.487	20	2.7	71	313	5.5	7.0	4.9	109	358	4.0
1865.0	1.1	19	2.4	66	292	4.3	16	4.4	102	334	3.1
1865.7	0.671	22	2.2	65	327	5.8	9.7	4.0	99	374	4.2
1866.4	0.393	21	2.2	73	315	5.3	5.7	4.1	113	360	3.9
1867.1	1.0	26	3.0	73	357	6.4	15	5.5	111	408	4.7
1867.8	0.629	23	2.4	68	325	6.2	9.1	4.5	104	372	4.5
1868.5	0.559	23	2.3	54	294	6.0	8.1	4.2	83	336	4.4
1869.2	0.414	23	3.0	71	376	10	6.0	5.5	108	430	7.3
1869.9	0.474	27	2.7	79	380	6.6	6.8	5.0	121	434	4.8
1870.6	0.393	23	2.5	71	325	7.8	5.7	4.6	109	371	5.7
1871.3	0.534	18	2.3	80	370	8.9	7.7	4.1	122	423	6.5
1872.0	0.525	19	2.1	57	297	11	7.6	3.7	88	340	8.3
1872.7	1.4	23	2.0	64	311	10	20	3.7	98	356	7.4
1873.4	0.599	22	2.3	76	326	12	8.7	4.2	117	373	9.0
1874.1	0.815	21	2.0	78	347	13	12	3.6	119	397	9.2
1874.8	1.0	21	2.1	65	329	12	15	3.8	99	376	8.5
1875.5	0.668	21	2.0	63	268	14	9.6	3.6	96	306	9.8
1876.2	0.742	18	1.5	62	266	12	11	2.7	95	304	9.1
1876.9	0.676	24	2.3	65	298	17	9.8	4.2	100	340	12
1877.6	0.393	19	2.7	67	328	13	5.7	5.0	102	376	9.7
1878.3	0.701	24	2.2	61	329	17	10	4.0	94	376	13
1879.0	0.721	22	2.7	71	374	18	10	5.0	109	427	13
1879.7	0.761	23	2.7	73	376	24	11	4.9	111	430	17
1880.4	0.543	29	2.5	65	327	18	7.8	4.5	100	374	13
1881.1	0.864	26	2.3	70	320	22	12	4.3	108	366	16
1881.8	0.393	21	3.0	64	355	19	5.7	5.4	98	406	14
1882.5	0.393	20	2.6	64	275	21	5.7	4.7	98	315	15
1883.2	0.643	26	2.6	60	315	22	9.3	4.8	92	360	16
1883.9	0.450	22	1.9	63	292	23	6.5	3.5	96	334	17
1884.6	0.485	20	2.4	61	301	22	7.0	4.4	93	345	16
1885.3	0.625	20	1.9	56	272	19	9.0	3.4	86	311	14
1885.9	0.393	24	2.3	75	390	28	5.7	4.3	115	445	20
1886.6	0.661	22	2.4	61	323	22	9.5	4.3	93	370	16
1887.3	0.465	21	2.2	68	293	25	6.7	4.0	104	335	18
1888.0	0.393	21	2.2	61	308	20	5.7	4.1	94	352	15
1888.7	0.393	22	2.3	62	312	22	5.7	4.1	95	356	16
1889.4	0.393	24	3.0	62	318	23	5.7	5.5	96	363	17
1890.1	0.913	22	2.5	60	360	23	13	4.6	92	412	16
1890.8	1.3	17	2.3	59	313	22	19	4.2	90	358	16
1891.5	0.708	20	2.2	57	377	24	10	4.0	88	431	17
1892.2	0.965	20	2.4	57	344	21	14	4.3	88	393	15
1892.9	0.519	23	1.8	68	337	24	7.5	3.3	104	385	18
1893.6	0.685	24	1.9	57	298	22	9.9	3.5	88	341	16
1894.3	0.870	19	2.4	64	324	24	13	4.4	98	370	17
1895.0	0.983	18	2.2	64	304	23	14	3.9	98	347	16
1895.7	1.3	21	2.6	63	340	26	19	4.8	97	389	19
1896.4	0.970	26	2.0	63	381	23	14	3.6	97	435	17
1897.1	0.971	20	1.8	53	275	21	14	3.3	81	314	15
1897.8	0.964	20	1.5	48	316	19	14	2.7	74	362	14
1898.5	0.410	17	1.5	50	290	20	5.9	2.7	76	331	15
1899.2	0.651	19	2.3	55	305	27	9.4	4.2	85	348	19
1899.9	1.1	21	6.8	57	301	24	16	12	87	344	17
1900.6	0.738	19	1.9	65	326	26	11	3.4	100	373	19
1901.3	0.523	19	1.8	55	399	23	7.5	3.3	84	456	17
1902.0	0.636	21	2.4	54	347	28	9.2	4.4	83	397	21
1902.7	1.1	23	2.0	53	327	26	16	3.6	82	374	19
1903.4	0.612	23	2.0	61	355	27	8.8	3.6	94	406	20
1904.1	0.716	20	1.4	48	273	18	10	2.5	73	312	13
1904.8	0.393	18	1.5	46	253	21	5.7	2.7	70	289	15
1905.5	0.707	20	1.7	50	289	22	10	3.1	76	331	16
1906.2	0.758	21	1.9	57	303	24	11	3.4	88	347	18
1906.9	0.393	18	1.4	58	283	18	5.7	2.6	89	324	13
1907.6	0.930	17	1.9	52	345	24	13	3.4	80	394	18
1908.3	0.439	14	1.8	49	263	20	6.3	3.2	75	300	14
1909.0	0.393	18	1.7	50	312	22	5.7	3.0	76	356	16
1909.7	0.470	21	1.6	60	275	25	6.8	2.8	92	315	18
1910.4	0.393	20	1.8	43	258	16	5.7	3.3	66	295	11
1911.1	0.393	14	1.3	46	276	18	5.7	2.3	70	316	13
1911.7	0.783	16	1.8	35	283	17	11	3.2	54	324	12
1912.4	1.0	16	1.6	47	289	23	15	3.0	72	330	17
1913.1	0.758	18	1.8	45	294	20	11	3.3	70	336	14
1913.8	0.893	16	1.3	48	352	20	13	2.3	74	402	15
1914.5	0.420	13	1.3	43	367	22	6.1	2.3	66	420	16
1915.2	0.843	14	1.1	39	252	21	12	2.0	60	288	15
1915.9	0.450	16	1.5	42	373	24	6.5	2.8	64	426	17
1916.6	0.564	13	1.2	43	271	18	8.1	2.2	66	309	13
1917.3	0.801	15	1.1	36	336	18	12	1.9	55	384	13
1918.0	0.810	13	1.3	32	316	14	12	2.4	50	361	10
1918.7	1.6	15	1.2	36	301	19	23	2.2	54	344	14
1919.4	0.393	13	1.4	35	289	18	5.7	2.6	53	330	13
1920.1	0.393	14	1.1	41	291	19	5.7	2.1	64	333	14



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1920.8	0.639	12	0.805	30	282	17	9.2	1.5	47	322	12
1921.5	0.531	15	1.0	33	292	19	7.7	1.9	51	334	14
1922.2	0.393	14	1.0	38	307	18	5.7	1.9	58	351	13
1922.9	1.1	13	1.0	35	266	14	16	1.9	53	304	10
1923.6	0.631	13	0.981	38	330	17	9.1	1.8	58	378	12
1924.3	0.451	11	0.786	33	308	14	6.5	1.4	50	352	10
1925.0	0.928	14	1.1	31	353	15	13	1.9	47	403	11
1925.7	0.867	15	0.958	35	278	14	13	1.7	53	318	10
1926.4	0.784	13	1.0	41	314	17	11	1.8	63	359	13
1927.1	1.9	15	0.600	31	274	12	28	1.1	47	314	9.1
1927.8	0.393	12	0.556	25	276	11	5.7	1.0	39	316	7.9
1928.5	0.829	17	0.882	35	342	17	12	1.6	54	391	12
1929.2	0.797	14	1.1	32	306	13	12	2.0	50	350	9.3
1929.9	0.415	15	0.829	36	303	11	6.0	1.5	55	346	8.0
1930.6	0.559	12	0.683	36	349	13	8.1	1.2	54	400	9.6
1931.3	1.6	14	0.481	32	311	13	23	0.877	50	356	9.2
1932.0	0.828	14	0.643	31	340	13	12	1.2	47	389	9.6
1932.7	0.930	14	0.925	29	253	8.6	13	1.7	45	289	6.3
1933.4	0.448	13	0.870	42	305	13	6.5	1.6	64	348	9.7
1934.1	0.611	13	0.632	32	307	9.1	8.8	1.2	50	351	6.6
1934.8	1.4	13	0.986	33	292	12	20	1.8	51	334	8.9
1935.5	0.569	16	0.906	30	295	10	8.2	1.7	46	337	7.5
1936.2	0.702	16	0.885	32	301	10	10	1.6	50	344	7.6
1936.9	0.658	12	0.904	33	279	10	9.5	1.6	50	318	7.5
1937.6	0.605	14	0.538	32	276	7.9	8.7	0.981	49	316	5.8
1938.2	0.614	14	1.2	31	377	12	8.9	2.2	48	431	8.5
1938.9	0.393	17	0.801	34	326	11	5.7	1.5	52	373	7.7
1939.6	0.847	14	0.761	40	295	8.9	12	1.4	62	337	6.5
1940.3	0.699	14	0.540	29	259	7.5	10	0.985	44	297	5.5
1941.0	0.591	12	0.820	33	308	8.5	8.5	1.5	50	353	6.2
1941.7	0.393	16	1.1	36	314	8.2	5.7	2.1	55	360	6.0
1942.4	0.393	16	0.972	27	246	7.2	5.7	1.8	42	281	5.3
1943.1	0.393	14	1.1	38	265	8.9	5.7	2.1	57	303	6.5
1943.8	0.393	13	1.5	34	287	7.5	5.7	2.7	52	328	5.5
1944.5	0.728	13	0.890	30	274	7.3	11	1.6	45	313	5.3
1945.2	0.511	12	1.1	34	264	6.0	7.4	2.0	53	302	4.4
1945.9	0.963	16	1.5	34	308	8.5	14	2.7	53	353	6.2
1946.6	0.636	18	0.989	47	276	8.7	9.2	1.8	73	315	6.3
1947.3	0.510	16	0.970	36	272	8.8	7.4	1.8	55	311	6.4
1948.0	0.393	15	1.1	39	257	6.4	5.7	2.1	59	293	4.7
1948.7	0.990	14	1.6	39	281	6.9	14	2.9	60	322	5.1
1949.4	1.1	17	1.4	39	277	7.5	16	2.5	60	317	5.4
1950.1	0.393	15	1.5	43	271	8.9	5.7	2.7	65	310	6.5
1950.8	0.393	14	1.1	34	276	8.6	5.7	1.9	52	315	6.3
1951.5	1.2	16	1.4	35	272	6.5	17	2.5	54	311	4.8
1952.2	0.631	15	1.7	47	312	6.2	9.1	3.1	72	357	4.5
1952.9	0.462	16	1.8	47	290	5.5	6.7	3.2	72	331	4.0
1953.6	0.648	16	1.6	50	310	5.2	9.4	2.9	77	355	3.8
1954.3	0.393	16	1.8	45	250	5.9	5.7	3.3	69	286	4.3
1955.0	0.575	17	1.2	41	254	7.0	8.3	2.2	64	290	5.1
1955.7	0.935	18	1.5	47	251	5.5	14	2.7	72	287	4.0
1956.4	0.472	20	1.4	50	258	6.6	6.8	2.6	77	295	4.8
1957.1	0.393	18	1.5	45	268	5.7	5.7	2.8	69	307	4.2
1957.8	0.438	15	1.3	49	219	5.1	6.3	2.3	75	250	3.7
1958.5	0.393	15	1.6	54	253	4.2	5.7	2.9	83	289	3.1
1959.2	0.393	17	1.9	47	234	5.8	5.7	3.4	72	268	4.2
1959.9	0.393	18	1.5	49	273	6.4	5.7	2.8	75	313	4.6
1960.6	0.458	18	1.8	48	216	4.3	6.6	3.2	74	247	3.2
1961.3	0.393	14	1.6	49	269	5.3	5.7	2.9	76	308	3.9
1962.0	0.393	18	1.8	49	226	4.9	5.7	3.2	75	259	3.6
1962.7	0.393	18	1.6	60	275	5.4	5.7	2.9	91	314	3.9
1963.4	0.393	20	1.5	52	217	5.2	5.7	2.6	80	248	3.8
1964.0	0.393	17	1.4	51	202	4.0	5.7	2.6	78	231	2.9
1964.7	0.586	15	1.5	50	232	3.6	8.5	2.7	76	265	2.6
1965.4	0.393	15	2.0	52	268	6.0	5.7	3.7	80	307	4.4
1966.1	0.576	18	2.0	47	252	4.2	8.3	3.6	72	288	3.1
1966.8	0.393	20	1.8	58	269	6.1	5.7	3.3	89	307	4.4
1967.5	0.712	18	1.6	57	224	5.9	10	2.9	87	256	4.3
1968.2	0.393	17	1.9	49	231	4.7	5.7	3.5	75	265	3.4
1968.9	0.393	16	1.8	49	231	5.4	5.7	3.2	75	264	3.9
1969.6	0.460	19	1.8	48	230	5.1	6.6	3.2	74	263	3.7
1970.3	0.393	19	2.1	53	243	4.2	5.7	3.8	81	278	3.0
1971.0	0.393	18	1.7	53	249	4.9	5.7	3.0	81	285	3.6
1971.7	0.638	18	1.8	55	245	4.8	9.2	3.3	85	280	3.5
1972.4	0.722	20	2.3	63	274	3.6	10	4.2	97	314	2.6
1973.1	0.795	21	1.7	56	235	6.3	11	3.0	86	268	4.6
1973.8	0.393	21	1.5	53	214	4.3	5.7	2.7	81	245	3.1
1974.5	0.925	18	1.4	54	278	4.3	13	2.6	82	318	3.1
1975.2	0.508	19	1.6	49	238	5.4	7.3	2.9	76	272	4.0
1975.9	0.553	19	1.8	59	240	5.8	8.0	3.3	90	275	4.2
1976.6	1.4	20	1.9	68	239	4.8	20	3.4	104	274	3.5



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1977.3	0.393	20	2.0	61	231	5.4	5.7	3.6	94	264	3.9
1978.0	0.802	17	1.6	53	223	4.7	12	2.9	81	255	3.4
1978.7	0.720	18	1.5	60	229	3.8	10	2.7	92	262	2.8
1979.4	0.580	18	1.6	57	221	4.5	8.4	2.9	88	253	3.3
1980.1	0.817	20	1.9	59	238	5.5	12	3.5	91	273	4.0
1980.8	0.725	17	1.9	68	241	4.5	10	3.4	105	275	3.3
1981.5	0.393	18	2.1	54	243	3.8	5.7	3.8	82	278	2.8
1982.2	0.625	21	2.3	58	263	5.3	9.0	4.2	89	300	3.8
1982.9	0.827	22	1.5	64	210	3.5	12	2.7	98	240	2.6
1983.6	0.393	19	1.6	55	219	4.1	5.7	2.9	84	251	3.0
1984.3	0.393	17	1.4	62	220	3.4	5.7	2.6	95	251	2.5
1985.0	0.706	17	2.4	61	232	3.9	10	4.3	93	265	2.8
1985.7	0.554	23	1.9	70	242	6.0	8.0	3.5	107	277	4.4
1986.4	0.564	18	1.9	66	212	4.8	8.1	3.4	101	242	3.5
1987.1	0.393	19	1.9	55	213	3.2	5.7	3.4	85	243	2.3
1987.8	0.583	17	1.9	52	210	3.7	8.4	3.4	79	240	2.7
1988.5	0.926	20	1.7	56	233	6.1	13	3.1	86	267	4.5
1989.2	0.480	20	1.9	70	244	5.7	6.9	3.5	108	279	4.1
1989.9	0.393	19	1.8	63	198	2.9	5.7	3.3	97	226	2.1
1990.5	0.557	20	1.4	56	249	4.3	8.0	2.6	86	285	3.1
1991.2	0.867	17	1.6	53	189	4.1	13	3.0	80	217	3.0
1991.9	0.393	24	2.4	73	228	4.8	5.7	4.3	112	260	3.5
1992.6	0.463	21	1.8	65	237	4.9	6.7	3.2	100	271	3.6
1993.3	0.817	20	1.4	64	233	4.0	12	2.5	98	267	2.9
1994.0	0.538	17	1.5	69	215	5.6	7.8	2.8	106	246	4.1
1994.7	0.878	18	1.5	53	254	3.9	13	2.7	81	290	2.8
1995.4	0.619	17	1.9	62	259	3.9	8.9	3.4	95	297	2.9
1996.1	1.2	18	1.7	62	238	4.3	17	3.0	95	273	3.1
1996.8	0.495	15	1.8	58	209	3.2	7.1	3.2	89	239	2.3
1997.5	0.774	16	1.4	55	206	4.3	11	2.5	84	236	3.1
1998.2	0.738	16	1.7	57	199	4.9	11	3.0	88	227	3.6
1998.9	0.467	19	1.6	60	222	8.3	6.7	2.9	93	253	6.1
1999.6	0.920	18	1.6	67	273	4.6	13	2.8	103	312	3.4
2000.3	0.546	16	1.4	70	229	5.8	7.9	2.5	107	261	4.3
2001.0	0.860	18	1.8	62	266	5.0	12	3.3	95	305	3.6
2001.7	0.480	18	1.9	65	235	6.5	6.9	3.5	100	268	4.8
2002.4	1.1	18	1.6	56	218	9.2	17	3.0	85	249	6.7
2003.1	0.430	20	1.5	54	230	6.5	6.2	2.8	82	263	4.7
2003.8	0.606	18	1.7	56	256	4.1	8.7	3.1	86	293	3.0
2004.5	0.721	15	1.4	58	237	8.2	10	2.6	89	271	5.9
2005.2	0.808	19	1.9	70	260	6.8	12	3.5	107	297	4.9
2005.9	0.714	20	1.6	57	249	8.9	10	2.9	88	285	6.5
2006.6	0.778	20	1.4	56	222	6.7	11	2.5	85	254	4.9
2007.3	0.393	16	1.4	50	212	7.6	5.7	2.5	77	243	5.5
2008.0	0.701	16	1.3	49	285	7.6	10	2.3	75	326	5.6
2008.7	0.408	19	1.5	54	279	11	5.9	2.7	83	319	7.8
2009.4	0.797	20	1.5	56	215	9.5	12	2.7	85	246	7.0
2010.1	0.944	19	1.5	55	277	7.7	14	2.8	84	317	5.6
2010.8	0.873	17	1.6	53	257	9.7	13	2.8	81	294	7.1
2011.5	0.485	18	1.6	53	265	8.0	7.0	2.9	82	303	5.8
2012.2	0.773	17	1.7	49	211	9.6	11	3.0	75	241	7.0
2012.9	0.960	18	1.4	65	242	7.4	14	2.5	100	277	5.4
2013.6	0.393	18	1.8	66	279	10	5.7	3.2	102	319	7.6
2014.3	0.881	18	1.6	53	229	8.7	13	3.0	80	261	6.3
2015.0	0.799	20	1.5	54	301	11	12	2.8	83	344	7.8
2015.7	0.735	17	1.3	59	286	10	11	2.4	90	328	7.3
2016.3	0.554	18	1.3	51	241	6.8	8.0	2.3	78	275	5.0
2017.0	0.613	16	1.1	39	223	6.4	8.8	2.0	60	255	4.7
2017.7	0.836	13	1.3	46	258	7.1	12	2.4	71	295	5.1
2018.4	0.567	18	1.4	52	290	10	8.2	2.5	80	332	7.5
2019.1	0.933	17	1.4	53	252	7.3	13	2.5	82	288	5.3
2019.8	0.477	14	1.2	45	281	7.2	6.9	2.2	69	321	5.2
2020.5	0.393	15	1.3	53	262	6.8	5.7	2.4	81	299	5.0
2021.2	0.863	20	1.5	45	291	8.8	12	2.7	69	332	6.4
2021.9	0.559	17	1.6	50	249	8.5	8.1	2.9	77	285	6.2
2022.6	0.680	16	0.855	51	269	9.0	9.8	1.6	77	308	6.5
2023.3	0.771	17	1.4	50	246	9.1	11	2.5	76	281	6.6
2024.0	0.810	16	1.2	44	242	9.3	12	2.1	67	277	6.8
2024.7	0.977	18	1.4	47	271	10	14	2.6	72	310	7.6
2025.4	0.711	18	1.3	53	301	9.7	10	2.3	81	344	7.1
2026.1	0.393	20	1.3	53	269	7.9	5.7	2.3	82	307	5.8
2026.8	0.533	16	1.3	48	263	8.4	7.7	2.4	74	301	6.2
2027.5	0.894	19	1.3	44	265	8.3	13	2.3	68	303	6.1
2028.2	0.563	15	1.4	42	236	9.9	8.1	2.5	65	270	7.2
2028.9	0.393	17	1.4	47	282	8.5	5.7	2.5	72	323	6.2
2029.6	0.601	16	1.1	50	291	8.6	8.7	2.0	76	333	6.3
2030.3	1.3	17	1.2	53	252	10	18	2.2	81	289	7.6
2031.0	0.593	16	1.4	50	261	9.5	8.6	2.5	76	299	7.0
2031.7	1.5	16	1.4	48	305	12	22	2.6	74	349	8.5
2032.4	0.758	20	1.3	41	243	9.4	11	2.4	64	278	6.9
2033.1	0.393	18	1.5	44	229	11	5.7	2.7	68	262	7.7



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Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2033.8	0.908	16	1.3	45	277	9.2	13	2.5	69	316	6.7
2034.5	0.637	18	1.1	49	262	8.3	9.2	2.1	75	300	6.1
2035.2	0.660	18	0.853	40	243	7.9	9.5	1.6	62	278	5.8
2035.9	0.393	20	1.3	43	227	6.5	5.7	2.3	66	260	4.8
2036.6	1.2	16	1.1	39	238	7.5	18	1.9	59	273	5.5
2037.3	0.393	17	1.1	51	273	8.0	5.7	2.0	78	312	5.9
2038.0	0.393	18	1.5	43	295	11	5.7	2.8	66	337	7.8
2038.7	0.994	17	0.908	45	255	9.2	14	1.7	68	292	6.7
2039.4	0.825	19	1.3	56	347	8.7	12	2.4	86	397	6.4
2040.1	0.446	15	1.4	45	269	7.4	6.4	2.6	68	308	5.4
2040.8	1.1	15	1.2	49	264	11	16	2.2	75	302	7.9
2041.5	0.521	16	1.1	41	239	9.8	7.5	2.0	62	274	7.2
2042.2	0.835	19	1.2	48	288	9.6	12	2.3	74	329	7.0
2042.8	0.693	15	1.3	48	275	9.5	10	2.5	73	314	6.9
2043.5	1.3	16	1.4	45	290	9.7	18	2.5	70	331	7.1
2044.2	1.2	14	0.959	34	270	7.2	17	1.7	53	309	5.3
2044.9	0.598	18	1.1	43	268	9.5	8.6	2.0	66	306	6.9
2045.6	0.718	18	0.952	39	288	8.7	10	1.7	60	329	6.3
2046.3	0.473	15	0.973	41	302	8.8	6.8	1.8	63	345	6.4
2047.0	0.556	17	0.680	40	284	7.8	8.0	1.2	61	324	5.7
2047.7	0.683	16	1.2	38	245	10	9.9	2.2	58	280	7.6
2048.4	0.393	16	1.1	41	252	8.5	5.7	2.0	63	288	6.2
2049.1	0.393	14	1.2	40	266	7.6	5.7	2.2	61	304	5.6
2049.8	0.579	14	0.973	32	245	7.3	8.4	1.8	50	280	5.3
2050.5	0.517	15	1.0	33	282	9.4	7.5	1.9	51	322	6.8
2051.2	0.907	15	1.2	44	285	7.1	13	2.2	68	326	5.2
2051.9	1.1	18	1.1	43	296	11	16	2.0	65	338	7.7
2052.6	0.611	16	1.2	40	308	8.1	8.8	2.2	61	352	5.9
2053.3	0.847	14	0.982	39	355	8.7	12	1.8	60	406	6.4
2054.0	1.3	15	0.900	36	308	8.5	19	1.6	55	352	6.2
2054.7	0.705	13	1.2	33	256	11	10	2.2	51	292	7.9
2055.4	0.595	17	1.3	40	262	9.4	8.6	2.3	61	299	6.9
2056.1	0.464	14	0.761	36	270	8.6	6.7	1.4	55	309	6.3
2056.8	1.1	11	0.906	29	257	6.7	15	1.7	45	294	4.9
2057.5	0.838	12	0.830	29	279	7.2	12	1.5	44	319	5.3
2058.2	0.917	14	1.1	29	246	6.0	13	2.0	44	281	4.4
2058.9	0.584	16	0.982	36	243	9.5	8.4	1.8	55	278	6.9
2059.6	0.604	11	0.823	28	224	7.1	8.7	1.5	42	256	5.2
2060.3	0.393	12	0.683	25	256	6.0	5.7	1.2	38	292	4.4
2061.0	1.1	14	1.2	33	282	9.2	15	2.2	51	323	6.7
2061.7	0.742	15	1.1	33	347	8.0	11	1.9	50	397	5.8
2062.4	0.555	16	0.884	35	274	7.5	8.0	1.6	54	313	5.5
2063.1	0.718	13	0.810	29	250	6.0	10	1.5	44	286	4.4
2063.8	0.945	14	0.818	31	268	6.5	14	1.5	47	307	4.7
2064.5	0.514	14	0.762	29	308	8.8	7.4	1.4	45	353	6.4
2065.2	0.655	13	0.850	28	259	7.1	9.5	1.6	43	296	5.2
2065.9	0.396	12	0.871	39	325	5.8	5.7	1.6	59	372	4.2
2066.6	0.661	13	1.1	29	289	7.6	9.5	2.1	45	331	5.5
2067.3	0.393	14	0.476	30	293	7.5	5.7	0.868	46	335	5.5
2068.0	0.617	14	0.661	26	279	7.7	8.9	1.2	40	320	5.6
2068.6	1.2	14	1.0	32	329	6.8	17	1.8	49	377	5.0
2069.3	0.393	11	1.2	26	235	6.1	5.7	2.2	40	269	4.5
2070.0	0.413	11	0.825	26	305	7.2	6.0	1.5	40	348	5.3
2070.7	0.674	11	0.591	25	272	6.0	9.7	1.1	38	311	4.4
2071.4	1.1	14	0.621	25	266	6.9	16	1.1	38	304	5.0
2072.1	0.994	14	0.677	26	296	6.3	14	1.2	39	339	4.6
2072.8	0.393	13	0.871	22	244	3.8	5.7	1.6	34	279	2.8
2073.5	0.710	13	1.5	23	269	5.7	10	2.7	35	308	4.2
2074.2	0.735	10	0.665	25	254	4.5	11	1.2	39	291	3.3
2074.9	0.393	13	0.842	32	259	6.3	5.7	1.5	49	296	4.6
2075.6	0.460	9.4	0.681	26	274	5.6	6.6	1.2	39	313	4.1
2076.3	0.534	13	0.677	24	265	3.8	7.7	1.2	37	303	2.8
2077.0	0.393	9.0	0.694	27	259	6.1	5.7	1.3	42	296	4.4
2077.7	0.393	12	0.889	27	298	6.4	5.7	1.6	41	341	4.7
2078.4	0.439	16	0.983	26	322	5.4	6.3	1.8	40	368	3.9
2079.1	0.638	14	0.806	28	341	6.0	9.2	1.5	43	390	4.4
2079.8	0.393	11	0.616	23	299	4.9	5.7	1.1	35	342	3.6
2080.5	0.941	9.8	0.568	24	267	5.6	14	1.0	37	305	4.1
2081.2	0.567	13	1.0	25	286	4.1	8.2	1.8	38	327	3.0
2081.9	1.3	13	0.498	24	267	5.0	19	0.909	37	305	3.7
2082.6	1.1	14	0.584	23	286	5.0	16	1.1	35	327	3.6
2083.3	0.393	11	0.664	19	270	5.3	5.7	1.2	29	309	3.8
2084.0	0.393	14	0.867	22	284	3.2	5.7	1.6	34	324	2.4
2084.7	0.393	12	0.513	26	320	5.9	5.7	0.935	40	366	4.3
2085.4	0.393	11	0.811	24	276	3.2	5.7	1.5	37	316	2.3
2086.1	0.393	13	0.462	24	291	5.1	5.7	0.843	37	333	3.7
2086.8	0.968	12	0.837	22	332	5.2	14	1.5	34	380	3.8
2087.5	0.393	11	0.555	24	275	4.5	5.7	1.0	36	315	3.3
2088.2	0.808	13	0.473	24	313	4.8	12	0.863	36	357	3.5
2088.9	0.393	10	0.401	21	266	3.8	5.7	0.731	33	304	2.8
2089.6	0.393	10	0.656	19	269	4.0	5.7	1.2	30	308	2.9



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2090.3	0.527	13	1.1	22	319	4.4	7.6	1.9	34	365	3.2
2091.0	0.393	13	0.631	24	309	5.6	5.7	1.2	37	353	4.1
2091.7	0.816	15	0.732	20	239	3.4	12	1.3	31	274	2.5
2092.4	1.0	11	0.755	22	299	2.6	15	1.4	34	342	1.9
2093.1	0.777	16	0.896	23	295	5.8	11	1.6	36	338	4.3
2093.8	0.696	13	0.610	21	303	4.3	10	1.1	33	346	3.1
2094.4	0.867	14	0.845	23	285	4.0	13	1.5	35	326	2.9
2095.1	1.0	12	0.968	25	308	3.8	15	1.8	38	352	2.8
2095.8	0.638	12	0.673	30	315	3.8	9.2	1.2	46	360	2.7
2096.5	0.393	11	0.664	23	283	4.9	5.7	1.2	36	324	3.6
2097.2	0.633	11	0.641	21	281	3.6	9.1	1.2	33	322	2.6
2097.9	0.393	12	0.735	24	284	3.2	5.7	1.3	37	325	2.3
2098.6	0.393	11	0.634	21	238	3.9	5.7	1.2	32	272	2.8
2099.3	0.393	11	0.621	21	293	3.8	5.7	1.1	32	335	2.8
2100.0	0.393	10	0.464	21	349	4.8	5.7	0.847	32	399	3.5
2100.7	0.631	14	0.745	25	283	4.2	9.1	1.4	39	323	3.1
2101.4	0.540	14	0.828	22	303	4.3	7.8	1.5	34	347	3.1
2102.1	0.475	14	0.828	27	281	3.5	6.9	1.5	42	321	2.6
2102.8	0.393	15	0.875	22	281	3.9	5.7	1.6	34	322	2.9
2103.5	0.393	11	1.1	18	261	2.8	5.7	2.0	28	299	2.0
2104.2	0.598	14	0.631	26	310	3.4	8.6	1.2	40	355	2.5
2104.9	0.547	16	1.2	28	286	4.0	7.9	2.2	43	327	3.0
2105.6	0.393	13	0.698	32	319	4.3	5.7	1.3	49	364	3.1
2106.3	0.393	13	0.961	23	307	3.3	5.7	1.8	35	351	2.4
2107.0	0.979	12	0.996	21	239	3.1	14	1.8	32	274	2.3
2107.7	0.393	13	0.763	25	310	4.3	5.7	1.4	39	355	3.2
2108.4	0.558	15	0.630	29	259	3.7	8.1	1.1	45	296	2.7
2109.1	0.393	12	1.1	28	276	3.7	5.7	1.9	43	315	2.7
2109.8	1.2	12	1.2	26	296	2.6	17	2.2	40	339	1.9
2110.5	0.693	14	1.3	34	277	3.1	10	2.3	52	316	2.3
2111.2	0.393	14	1.0	22	273	4.0	5.7	1.9	34	312	2.9
2111.9	0.774	12	1.3	27	257	2.6	11	2.4	41	294	1.9
2112.6	0.393	13	0.645	25	282	2.3	5.7	1.2	38	323	1.7
2113.3	0.393	12	0.759	28	266	2.9	5.7	1.4	43	304	2.1
2114.0	0.556	16	1.2	26	290	2.2	8.0	2.3	40	332	1.6
2114.7	1.1	14	0.932	29	254	4.2	17	1.7	45	291	3.1
2115.4	0.393	14	0.964	26	267	2.9	5.7	1.8	40	305	2.1
2116.1	0.670	13	0.920	33	293	1.7	9.7	1.7	51	335	1.2
2116.8	0.763	12	0.843	26	300	2.6	11	1.5	40	344	1.9
2117.5	0.393	14	1.3	20	252	1.6	5.7	2.3	31	288	1.1
2118.2	0.704	17	1.2	29	331	2.6	10	2.2	44	379	1.9
2118.9	0.430	14	1.2	31	313	3.0	6.2	2.3	48	358	2.2
2119.6	0.393	12	1.0	24	266	2.4	5.7	1.9	36	305	1.8
2120.3	0.393	13	0.897	30	270	2.5	5.7	1.6	46	308	1.8
2120.9	0.393	13	0.828	27	256	2.1	5.7	1.5	41	293	1.5
2121.6	0.476	15	1.3	33	289	3.1	6.9	2.4	51	330	2.3
2122.3	0.733	13	0.947	37	292	3.0	11	1.7	56	334	2.2
2123.0	0.560	14	0.988	23	256	3.0	8.1	1.8	36	293	2.2
2123.7	0.798	13	0.929	25	301	2.4	12	1.7	38	345	1.8
2124.4	1.1	14	0.998	31	276	1.6	15	1.8	47	316	1.2
2125.1	0.865	16	1.1	31	342	2.2	12	2.1	48	391	1.6
2125.8	0.518	15	0.849	32	273	2.3	7.5	1.5	49	312	1.7
2126.5	0.648	13	0.988	32	276	2.3	9.3	1.8	49	316	1.7
2127.2	0.979	13	1.0	29	235	2.5	14	1.9	44	268	1.8
2127.9	0.393	14	1.1	31	246	2.0	5.7	2.1	48	282	1.5
2128.6	0.879	13	1.2	26	251	2.3	13	2.1	40	287	1.7
2129.3	0.677	15	1.2	38	294	2.8	9.8	2.2	58	337	2.1
2130.0	0.810	13	0.918	29	266	2.1	12	1.7	44	305	1.5
2130.7	0.853	12	1.1	24	285	1.9	12	1.9	36	326	1.4
2131.4	0.714	12	1.1	31	238	2.1	10	2.0	47	272	1.5
2132.1	0.500	14	0.888	32	260	2.6	7.2	1.6	50	298	1.9
2132.8	0.605	14	1.2	30	262	2.7	8.7	2.2	46	299	2.0
2133.5	0.602	13	1.1	25	248	2.7	8.7	2.0	38	284	2.0
2134.2	1.0	14	0.993	27	279	3.1	15	1.8	41	320	2.2
2134.9	0.393	15	1.2	35	262	3.2	5.7	2.2	53	300	2.3
2135.6	0.626	16	0.837	28	272	2.9	9.0	1.5	42	311	2.1
2136.3	0.393	13	0.913	30	251	2.4	5.7	1.7	46	287	1.7
2137.0	0.958	17	1.6	29	289	3.7	14	2.9	45	330	2.7
2137.7	0.857	15	1.4	31	287	1.9	12	2.5	47	328	1.4
2138.4	0.803	15	0.982	28	250	2.1	12	1.8	43	286	1.5
2139.1	0.693	15	1.2	27	256	1.9	10	2.2	42	293	1.4
2139.8	0.393	13	1.0	29	292	2.6	5.7	1.8	44	334	1.9
2140.5	0.393	17	0.880	29	271	3.4	5.7	1.6	44	310	2.5
2141.2	0.894	13	0.986	30	266	2.2	13	1.8	46	304	1.6
2141.9	0.393	15	0.910	29	252	1.6	5.7	1.7	45	288	1.2
2142.6	0.646	13	0.857	24	240	2.2	9.3	1.6	36	275	1.6
2143.3	0.648	14	0.949	29	272	2.6	9.4	1.7	44	311	1.9
2144.0	0.519	15	1.2	27	248	2.8	7.5	2.2	42	284	2.0
2144.7	0.476	14	1.1	36	334	2.0	6.9	1.9	56	382	1.4
2145.4	0.630	13	1.2	31	283	1.8	9.1	2.1	47	323	1.3
2146.1	0.750	15	0.813	31	273	1.5	11	1.5	47	312	1.1



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2146.7	0.393	14	1.1	30	242	2.1	5.7	2.0	47	276	1.6
2147.4	0.419	14	1.0	27	265	2.1	6.0	1.9	42	303	1.5
2148.1	0.393	15	0.851	29	245	2.1	5.7	1.6	45	280	1.5
2148.8	0.393	17	1.1	31	324	2.8	5.7	2.0	47	370	2.0
2149.5	0.725	12	0.888	18	235	1.7	10	1.6	27	268	1.2
2150.2	0.393	11	0.646	26	263	1.9	5.7	1.2	40	301	1.4
2150.9	0.563	15	0.844	27	299	3.5	8.1	1.5	41	342	2.5
2151.6	0.393	14	0.839	24	269	2.3	5.7	1.5	36	308	1.7
2152.3	0.455	14	0.992	25	283	2.4	6.6	1.8	38	324	1.8
2153.0	0.393	13	0.636	25	263	2.4	5.7	1.2	39	301	1.7
2153.7	0.393	13	0.932	25	298	2.8	5.7	1.7	38	340	2.1
2154.4	0.393	13	0.896	24	247	3.5	5.7	1.6	37	283	2.5
2155.1	0.393	14	0.642	21	257	1.7	5.7	1.2	31	294	1.3
2155.8	0.551	12	1.2	22	298	2.5	7.9	2.1	33	341	1.8
2156.5	0.497	16	1.3	23	294	3.0	7.2	2.4	36	337	2.2
2157.2	0.865	15	0.987	20	256	2.4	12	1.8	31	293	1.8
2157.9	0.805	12	1.2	21	309	2.0	12	2.2	32	354	1.4
2158.6	0.485	13	0.390	25	250	2.7	7.0	0.711	38	286	2.0
2159.3	0.393	14	1.0	25	281	2.6	5.7	1.9	38	321	1.9
2160.0	0.425	13	0.926	20	302	2.0	6.1	1.7	30	345	1.5
2160.7	0.393	14	1.1	22	310	2.6	5.7	1.9	34	355	1.9
2161.4	0.662	13	1.4	27	330	2.0	9.6	2.5	42	377	1.4
2162.1	0.514	13	0.771	22	278	1.9	7.4	1.4	33	318	1.4
2162.8	0.465	9.9	0.633	23	248	1.5	6.7	1.2	36	283	1.1
2163.5	0.766	12	0.566	23	302	2.7	11	1.0	34	345	2.0
2164.2	0.605	14	0.588	21	281	3.9	8.7	1.1	32	321	2.9
2164.9	0.494	15	0.784	22	260	1.5	7.1	1.4	34	298	1.1
2165.6	0.619	12	0.782	18	276	2.2	8.9	1.4	27	316	1.6
2166.3	0.393	11	1.1	18	320	2.0	5.7	2.0	27	366	1.4
2167.0	0.794	11	0.869	21	260	1.9	11	1.6	32	298	1.4
2167.7	0.393	12	0.433	21	244	2.0	5.7	0.790	32	279	1.4
2168.4	0.393	10	0.727	23	257	2.6	5.7	1.3	36	293	1.9
2169.1	0.548	13	0.754	19	312	2.4	7.9	1.4	30	357	1.8
2169.8	0.413	11	0.529	18	255	1.8	6.0	0.965	28	291	1.3
2170.5	0.537	13	0.767	21	357	3.0	7.7	1.4	32	409	2.2
2171.2	0.393	10	0.732	22	306	2.5	5.7	1.3	34	350	1.8
2171.9	0.754	11	0.585	21	233	2.3	11	1.1	33	267	1.7
2172.6	0.393	11	0.743	17	222	1.4	5.7	1.4	26	254	1.0
2173.2	0.393	12	0.616	20	289	2.6	5.7	1.1	31	331	1.9
2173.9	0.459	11	0.808	17	292	3.3	6.6	1.5	27	334	2.4
2174.6	0.603	10	0.737	19	286	2.6	8.7	1.3	29	327	1.9
2175.3	0.393	11	0.490	19	274	2.5	5.7	0.894	29	313	1.8
2176.0	0.777	12	0.603	13	267	1.9	11	1.1	20	305	1.4
2176.7	1.0	12	0.457	24	318	2.6	15	0.834	37	363	1.9
2177.4	0.930	13	0.727	18	253	1.4	13	1.3	28	289	0.995
2178.1	0.868	11	0.453	20	283	1.8	13	0.825	31	324	1.3
2178.8	0.587	9.2	0.527	18	298	3.1	8.5	0.961	28	341	2.3
2179.5	0.758	9.7	0.658	15	248	1.8	11	1.2	23	283	1.3
2180.2	0.393	13	1.0	17	273	2.2	5.7	1.8	25	312	1.6
2180.9	0.393	14	0.904	21	311	2.7	5.7	1.6	32	356	2.0
2181.6	0.742	10	1.0	19	288	2.2	11	1.9	29	329	1.6
2182.3	0.600	10.0	0.558	20	284	2.1	8.7	1.0	30	325	1.5
2183.0	0.916	10	0.716	16	285	2.8	13	1.3	25	326	2.0
2183.7	0.393	11	1.1	18	307	2.4	5.7	1.9	27	351	1.7
2184.4	0.621	14	0.759	16	362	2.2	9.0	1.4	24	414	1.6
2185.1	0.627	11	0.505	14	232	2.4	9.0	0.922	21	265	1.8
2185.8	0.393	8.4	0.773	16	226	2.0	5.7	1.4	24	258	1.5
2186.5	0.723	13	0.939	20	285	2.7	10	1.7	30	326	1.9
2187.2	0.459	12	1.1	16	334	2.3	6.6	2.0	24	382	1.7
2187.9	0.393	11	0.618	19	326	2.3	5.7	1.1	29	373	1.7
2188.6	0.393	8.6	0.449	18	282	1.5	5.7	0.819	28	322	1.1
2189.3	0.687	11	0.934	17	247	2.2	9.9	1.7	26	282	1.6
2190.0	0.393	11	0.950	20	334	2.6	5.7	1.7	31	382	1.9
2190.7	0.440	12	0.696	18	249	1.3	6.4	1.3	28	284	0.939
2191.4	0.511	11	0.865	20	300	1.4	7.4	1.6	31	343	1.0
2192.1	0.509	12	0.461	20	306	2.5	7.3	0.841	31	350	1.8
2192.8	1.1	10	0.475	19	267	2.1	16	0.866	29	305	1.5
2193.5	0.393	10	0.773	20	245	2.1	5.7	1.4	31	280	1.5
2194.2	0.748	12	0.992	17	261	1.4	11	1.8	25	299	1.0
2194.9	0.616	13	0.676	19	254	1.3	8.9	1.2	29	291	0.912
2195.6	0.393	9.8	0.818	22	264	1.7	5.7	1.5	33	302	1.3
2196.3	0.393	11	0.771	20	215	1.2	5.7	1.4	31	246	0.865
2197.0	0.493	10	0.990	20	261	1.9	7.1	1.8	30	298	1.4
2197.7	1.3	13	0.825	24	293	1.8	19	1.5	36	335	1.3
2198.4	0.393	9.9	0.862	21	282	0.801	5.7	1.6	32	323	0.585
2199.0	0.393	10.0	0.756	26	299	2.1	5.7	1.4	40	342	1.5
2199.7	0.393	13	0.631	20	315	2.0	5.7	1.2	30	360	1.5
2200.4	0.393	11	0.975	19	279	2.3	5.7	1.8	29	319	1.6
2201.1	0.393	10	0.770	20	250	2.2	5.7	1.4	31	286	1.6
2201.8	0.574	9.3	0.726	28	248	1.8	8.3	1.3	43	284	1.3
2202.5	0.498	11	1.2	25	314	2.2	7.2	2.2	38	359	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2203.2	0.393	11	0.835	22	249	1.9	5.7	1.5	34	284	1.4
2203.9	0.393	14	0.629	23	252	2.1	5.7	1.1	35	289	1.5
2204.6	0.728	10	1.1	27	258	1.1	11	1.9	41	295	0.826
2205.3	0.652	11	0.774	26	259	1.5	9.4	1.4	39	296	1.1
2206.0	0.416	11	0.783	23	267	2.5	6.0	1.4	35	305	1.9
2206.7	0.795	13	0.972	26	332	1.2	11	1.8	40	380	0.901
2207.4	0.775	13	1.0	24	237	1.3	11	1.8	37	271	0.968
2208.1	1.2	13	0.841	30	257	1.5	18	1.5	46	293	1.1
2208.8	0.542	11	0.612	30	321	1.9	7.8	1.1	45	367	1.4
2209.5	0.393	11	0.660	23	269	1.3	5.7	1.2	36	308	0.936
2210.2	0.783	16	0.957	21	287	1.9	11	1.7	32	328	1.4
2210.9	0.393	12	0.766	28	234	1.7	5.7	1.4	42	267	1.2
2211.6	0.393	9.9	0.952	23	250	2.3	5.7	1.7	36	286	1.6
2212.3	0.407	11	0.604	19	233	1.5	5.9	1.1	29	267	1.1
2213.0	0.393	11	0.845	26	277	0.635	5.7	1.5	40	317	0.463
2213.7	0.393	12	0.998	24	229	2.2	5.7	1.8	37	262	1.6
2214.4	0.861	12	1.0	28	265	1.5	12	1.8	43	303	1.1
2215.1	0.847	13	1.0	22	230	1.4	12	1.9	34	264	1.1
2215.8	0.727	11	1.1	30	256	1.2	10	2.0	46	293	0.904
2216.5	0.490	13	1.2	30	294	0.805	7.1	2.1	46	336	0.587
2217.2	0.929	13	0.753	25	244	1.1	13	1.4	38	279	0.827
2217.9	0.757	15	1.0	26	235	2.1	11	1.9	40	269	1.6
2218.6	0.393	11	1.0	27	271	0.972	5.7	1.9	41	310	0.709
2219.3	1.1	13	1.1	26	259	0.912	15	2.0	39	296	0.665
2220.0	1.5	13	0.920	20	260	1.7	21	1.7	31	297	1.3
2220.7	0.393	14	0.883	29	250	1.8	5.7	1.6	44	285	1.3
2221.4	0.604	13	0.789	31	267	0.892	8.7	1.4	47	305	0.651
2222.1	0.654	15	1.1	25	242	1.4	9.4	2.0	38	277	1.0
2222.8	0.935	13	0.854	27	217	1.6	13	1.6	41	249	1.2
2223.5	0.960	12	0.671	29	301	1.2	14	1.2	45	344	0.856
2224.2	1.0	16	0.685	33	259	1.6	15	1.2	51	296	1.1
2224.9	0.393	13	0.969	30	272	1.4	5.7	1.8	46	311	1.0
2225.5	0.703	12	0.689	28	287	0.754	10	1.3	43	329	0.550
2226.2	1.1	12	0.811	29	313	1.3	15	1.5	45	358	0.983
2226.9	0.737	14	0.784	23	233	1.7	11	1.4	36	266	1.2
2227.6	0.393	13	0.743	29	261	2.2	5.7	1.4	45	298	1.6
2228.3	0.917	13	0.824	30	275	1.2	13	1.5	46	315	0.877
2229.0	0.393	13	0.634	27	259	1.4	5.7	1.2	42	296	1.0
2229.7	0.393	13	0.908	24	282	1.2	5.7	1.7	36	323	0.865
2230.4	0.665	11	0.762	26	230	1.9	9.6	1.4	39	263	1.4
2231.1	0.488	14	0.825	25	259	1.8	7.0	1.5	39	296	1.3
2231.8	0.677	14	0.827	27	263	1.6	9.8	1.5	41	301	1.2
2232.5	0.393	10	0.825	24	256	1.7	5.7	1.5	37	293	1.2
2233.2	0.681	11	0.729	26	262	1.3	9.8	1.3	40	299	0.915
2233.9	0.755	12	0.682	27	286	1.8	11	1.2	41	326	1.3
2234.6	0.393	13	1.0	27	260	1.3	5.7	1.8	41	297	0.967
2235.3	0.622	11	0.869	20	261	1.2	9.0	1.6	31	298	0.905
2236.0	1.2	13	0.883	21	258	1.9	18	1.6	33	295	1.4
2236.7	0.753	12	0.921	20	239	0.986	11	1.7	31	273	0.720
2237.4	0.658	13	0.623	25	231	1.3	9.5	1.1	39	264	0.957
2238.1	0.393	14	0.871	30	227	1.9	5.7	1.6	46	260	1.4
2238.8	0.628	13	0.637	22	279	1.3	9.1	1.2	34	319	0.983
2239.5	0.588	14	0.694	31	262	2.3	8.5	1.3	47	300	1.7
2240.2	0.973	14	0.864	25	268	1.3	14	1.6	39	307	0.976
2240.9	0.792	15	0.594	21	270	0.726	11	1.1	32	308	0.530
2241.6	0.393	12	1.3	21	236	2.1	5.7	2.3	33	270	1.6
2242.3	0.754	12	0.513	24	299	1.6	11	0.936	37	342	1.2
2243.0	0.716	11	0.495	21	219	1.3	10	0.903	33	250	0.959
2243.7	0.997	13	0.954	22	245	1.3	14	1.7	34	281	0.940
2244.4	0.738	13	0.785	21	252	2.3	11	1.4	32	289	1.7
2245.1	0.434	11	0.712	20	262	1.5	6.3	1.3	30	299	1.1
2245.8	0.620	10	0.805	19	239	2.5	8.9	1.5	29	273	1.8
2246.5	0.393	10	0.643	22	244	1.4	5.7	1.2	34	279	0.987
2247.2	0.545	14	0.742	24	265	1.6	7.9	1.4	37	303	1.1
2247.9	0.393	9.8	0.621	26	251	2.1	5.7	1.1	39	287	1.6
2248.6	0.393	10	0.803	23	270	1.5	5.7	1.5	36	309	1.1
2249.3	0.947	13	0.538	20	263	1.1	14	0.980	31	301	0.819
2250.0	0.394	12	0.952	24	264	1.8	5.7	1.7	37	302	1.3
2250.7	0.824	11	0.795	18	209	2.1	12	1.4	28	239	1.5
2251.3	0.922	14	0.699	21	250	1.8	13	1.3	32	286	1.3
2252.0	0.568	11	0.773	19	244	1.9	8.2	1.4	29	279	1.4
2252.7	0.393	11	0.826	17	253	1.6	5.7	1.5	27	289	1.2
2253.4	0.393	11	0.947	24	256	2.0	5.7	1.7	36	293	1.5
2254.1	0.393	9.5	0.953	27	307	1.0	5.7	1.7	42	351	0.742
2254.8	0.423	12	1.0	21	261	1.8	6.1	1.9	32	298	1.3
2255.5	0.550	8.5	0.900	14	259	2.1	7.9	1.6	22	296	1.5
2256.2	0.948	12	0.842	17	250	1.6	14	1.5	26	286	1.2
2256.9	1.1	10	1.2	21	292	2.2	16	2.1	31	334	1.6
2257.6	0.557	9.7	1.2	17	236	1.5	8.0	2.2	26	270	1.1
2258.3	0.393	9.0	0.605	16	265	1.2	5.7	1.1	24	303	0.891
2259.0	0.487	12	0.912	17	235	1.2	7.0	1.7	26	269	0.877



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2259.7	0.620	12	1.2	18	258	1.7	8.9	2.1	28	296	1.3
2260.4	0.448	11	0.708	17	305	1.3	6.5	1.3	26	349	0.956
2261.1	0.393	12	1.2	20	230	1.7	5.7	2.2	31	263	1.3
2261.8	0.650	10	1.2	21	275	2.1	9.4	2.2	32	315	1.5
2262.5	0.748	8.2	1.0	17	273	1.6	11	1.9	27	312	1.2
2263.2	0.549	9.9	1.8	17	324	1.4	7.9	3.2	26	370	1.0
2263.9	0.393	9.3	1.1	21	285	2.5	5.7	2.0	32	326	1.8
2264.6	0.626	11	0.908	15	236	1.8	9.0	1.7	23	270	1.3
2265.3	0.513	9.3	0.864	20	236	1.7	7.4	1.6	31	270	1.2
2266.0	0.700	11	1.1	23	265	1.5	10	2.0	35	303	1.1
2266.7	0.985	11	1.5	19	265	2.0	14	2.7	30	303	1.5
2267.4	0.698	9.9	0.998	20	285	1.4	10	1.8	31	326	1.0
2268.1	0.517	11	1.2	17	290	1.4	7.5	2.2	26	331	1.0
2268.8	0.393	9.8	1.1	21	283	2.2	5.7	2.0	33	324	1.6
2269.5	0.393	9.6	0.997	16	225	1.1	5.7	1.8	25	257	0.817
2270.2	0.608	11	1.0	18	288	2.8	8.8	1.9	28	329	2.0
2270.9	0.609	10	1.2	23	265	1.3	8.8	2.2	35	303	0.984
2271.6	0.393	11	1.2	28	319	1.9	5.7	2.1	42	365	1.4
2272.3	0.435	9.7	0.894	17	248	1.3	6.3	1.6	26	284	0.955
2273.0	0.594	9.4	1.0	18	293	2.0	8.6	1.9	28	336	1.5
2273.7	0.393	12	1.3	23	272	1.1	5.7	2.3	35	311	0.786
2274.4	0.505	12	1.4	22	255	1.3	7.3	2.6	34	291	0.983
2275.1	0.427	10	1.2	23	257	1.6	6.2	2.2	36	294	1.2
2275.8	0.867	8.7	0.998	19	256	1.4	13	1.8	29	293	1.0
2276.5	0.393	10	0.905	20	225	1.5	5.7	1.7	30	258	1.1
2277.1	0.697	9.3	0.925	20	260	0.748	10	1.7	31	297	0.546
2277.8	0.875	9.3	0.853	22	273	1.9	13	1.6	34	312	1.4
2278.5	0.393	9.2	0.932	16	237	0.699	5.7	1.7	24	272	0.510
2279.2	1.1	10	1.1	18	247	1.4	16	1.9	28	282	1.0
2279.9	0.770	10	1.2	14	237	1.5	11	2.1	22	271	1.1
2280.6	0.393	11	1.2	22	259	2.3	5.7	2.2	34	296	1.7
2281.3	0.921	9.2	0.971	24	295	0.893	13	1.8	37	338	0.652
2282.0	0.747	10	1.1	21	240	1.3	11	2.0	32	274	0.929
2282.7	0.847	10	0.992	21	257	1.1	12	1.8	32	294	0.778
2283.4	0.681	11	1.2	22	256	1.6	9.8	2.1	33	293	1.1
2284.1	0.856	11	0.859	22	246	0.837	12	1.6	34	281	0.611
2284.8	0.923	8.2	0.791	20	227	0.844	13	1.4	30	260	0.616
2285.5	0.393	9.0	0.985	20	249	0.886	5.7	1.8	31	285	0.646
2286.2	0.710	9.6	0.890	19	231	2.5	10	1.6	29	264	1.8
2286.9	0.393	11	1.0	22	302	2.1	5.7	1.9	34	345	1.5
2287.6	0.393	10	0.941	20	255	0.635	5.7	1.7	31	292	0.464
2288.3	0.781	8.5	0.771	19	268	0.819	11	1.4	30	306	0.598
2289.0	0.425	11	1.0	20	308	1.8	6.1	1.8	30	353	1.3
2289.7	0.519	9.6	0.537	19	225	0.782	7.5	0.978	29	257	0.571
2290.4	1.1	11	0.623	24	256	1.7	15	1.1	36	293	1.2
2291.1	0.393	13	1.2	23	261	1.2	5.7	2.2	35	298	0.912
2291.8	0.393	8.6	0.701	20	238	1.3	5.7	1.3	31	272	0.940
2292.5	0.728	13	0.815	24	235	0.781	11	1.5	36	269	0.570
2293.2	0.393	9.6	0.680	23	254	1.2	5.7	1.2	35	290	0.885
2293.9	0.670	12	0.564	19	229	0.719	9.7	1.0	29	262	0.524
2294.6	0.743	9.0	1.2	20	233	0.735	11	2.3	31	266	0.536
2295.3	0.960	10	0.902	20	261	1.5	14	1.6	31	299	1.1
2296.0	0.751	12	0.727	20	267	2.0	11	1.3	30	305	1.5
2296.7	1.0	10	0.710	20	236	1.8	15	1.3	31	270	1.3
2297.4	0.456	9.7	0.853	21	217	1.0	6.6	1.6	32	249	0.752
2298.1	0.435	11	0.896	16	248	1.4	6.3	1.6	25	283	1.0
2298.8	0.914	10	0.882	20	268	1.6	13	1.6	30	306	1.1
2299.5	0.568	10	0.766	22	255	0.629	8.2	1.4	33	292	0.459
2300.2	0.681	9.5	0.810	20	312	0.940	9.8	1.5	31	356	0.686
2300.9	0.649	9.1	0.695	21	264	1.5	9.4	1.3	32	302	1.1
2301.6	0.393	9.0	0.787	21	231	0.913	5.7	1.4	32	264	0.666
2302.3	0.728	9.0	0.977	15	229	1.4	11	1.8	23	262	1.0
2302.9	1.0	9.1	0.816	20	288	1.5	15	1.5	31	329	1.1
2303.6	0.393	12	1.2	22	253	1.1	5.7	2.3	33	289	0.828
2304.3	0.529	10	0.745	20	271	1.5	7.6	1.4	31	310	1.1
2305.0	0.597	8.5	0.581	17	265	1.3	8.6	1.1	27	303	0.964
2305.7	0.498	9.2	0.478	16	291	1.4	7.2	0.872	25	333	1.0
2306.4	1.0	10	0.972	21	266	0.829	15	1.8	32	304	0.605
2307.1	1.0	8.5	0.528	18	243	1.1	15	0.963	28	278	0.800
2307.8	0.393	10	1.1	23	262	0.932	5.7	2.0	35	299	0.680
2308.5	0.967	9.3	0.808	23	265	2.0	14	1.5	35	303	1.5
2309.2	0.489	8.7	1.1	19	278	1.8	7.1	1.9	29	318	1.3
2309.9	0.455	9.3	0.699	18	217	1.2	6.6	1.3	27	248	0.847
2310.6	0.393	8.2	0.767	15	248	1.5	5.7	1.4	22	283	1.1
2311.3	0.809	8.6	0.966	17	233	0.955	12	1.8	26	266	0.697
2312.0	0.393	8.8	0.834	16	258	0.968	5.7	1.5	24	295	0.706
2312.7	0.684	11	0.706	16	295	0.916	9.9	1.3	25	338	0.668
2313.4	0.477	10	0.782	19	233	1.7	6.9	1.4	29	266	1.2
2314.1	0.658	9.9	0.577	15	261	0.504	9.5	1.1	23	299	0.368
2314.8	0.528	7.7	0.890	20	240	0.868	7.6	1.6	31	275	0.634
2315.5	0.393	9.3	0.886	18	265	1.6	5.7	1.6	27	303	1.2



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2316.2	0.672	9.4	0.618	17	267	1.2	9.7	1.1	26	305	0.902
2316.9	0.653	10	0.527	19	232	1.4	9.4	0.961	29	265	1.0
2317.6	0.691	7.4	0.606	17	256	1.5	10.0	1.1	27	293	1.1
2318.3	1.3	8.0	0.814	19	292	1.1	19	1.5	30	334	0.780
2319.0	1.8	10	1.0	18	308	2.9	26	1.8	28	352	2.1
2319.7	0.990	9.6	0.981	18	261	1.9	14	1.8	28	299	1.4
2320.4	0.393	8.7	1.2	18	277	1.3	5.7	2.1	28	316	0.979
2321.1	0.876	8.0	1.3	14	270	1.6	13	2.3	22	309	1.2
2321.8	0.617	9.6	1.2	15	250	1.9	8.9	2.1	22	286	1.4
2322.5	1.1	6.9	0.992	13	234	0.544	15	1.8	20	268	0.397
2323.2	0.590	9.6	0.819	19	234	1.1	8.5	1.5	29	268	0.794
2323.9	1.4	10	1.0	15	266	1.2	20	1.9	24	304	0.886
2324.6	1.2	9.1	1.1	18	242	1.4	17	2.0	28	277	1.0
2325.3	0.393	9.0	0.909	17	263	2.2	5.7	1.7	27	301	1.6
2326.0	1.4	8.9	1.0	14	283	1.9	20	1.8	22	324	1.4
2326.7	0.393	7.9	0.844	12	228	2.2	5.7	1.5	19	260	1.6
2327.4	0.393	7.4	1.1	18	247	1.9	5.7	2.1	27	282	1.4
2328.1	1.1	8.2	0.897	13	250	1.2	16	1.6	20	286	0.877
2328.7	0.393	8.3	1.1	19	281	1.8	5.7	2.0	28	321	1.3
2329.4	0.393	7.2	0.838	19	254	1.6	5.7	1.5	28	291	1.2
2330.1	0.393	11	1.0	19	258	1.7	5.7	1.9	29	295	1.2
2330.8	1.2	8.9	1.5	19	278	1.2	17	2.7	29	318	0.840
2331.5	0.837	7.4	1.3	18	256	1.8	12	2.5	28	293	1.3
2332.2	0.860	9.3	1.4	14	260	1.4	12	2.5	21	298	0.987
2332.9	1.2	9.2	0.993	17	234	1.4	17	1.8	26	268	1.0
2333.6	1.1	9.2	1.1	18	260	1.6	16	2.1	27	298	1.2
2334.3	0.395	7.3	0.979	16	227	1.4	5.7	1.8	24	260	0.995
2335.0	1.2	7.6	1.1	17	257	1.6	17	1.9	26	294	1.2
2335.7	0.812	7.1	0.897	15	294	2.4	12	1.6	23	336	1.8
2336.4	0.644	9.9	1.6	18	267	2.3	9.3	2.9	27	306	1.7
2337.1	0.906	9.1	1.3	18	298	1.2	13	2.3	27	341	0.888
2337.8	0.410	8.8	1.5	15	250	1.3	5.9	2.7	22	286	0.953
2338.5	0.393	9.5	1.2	20	295	1.1	5.7	2.2	31	338	0.793
2339.2	0.457	8.6	1.3	20	304	1.2	6.6	2.3	31	348	0.849
2339.9	1.3	8.7	1.5	16	273	2.5	19	2.7	24	312	1.9
2340.6	0.862	9.5	1.3	15	252	2.0	12	2.4	23	289	1.4
2341.3	0.393	8.1	1.2	14	250	1.3	5.7	2.1	21	286	0.982
2342.0	1.0	6.9	1.4	15	250	2.3	14	2.5	23	286	1.7
2342.7	1.1	8.3	1.4	20	265	1.3	15	2.5	30	303	0.921
2343.4	0.481	8.9	1.2	19	261	1.4	6.9	2.2	28	299	1.1
2344.1	0.562	9.0	1.4	17	273	1.6	8.1	2.6	26	312	1.2
2344.8	0.872	6.4	1.2	19	281	1.7	13	2.3	30	321	1.2
2345.5	0.512	9.4	1.1	17	318	1.1	7.4	1.9	27	364	0.779
2346.2	1.2	8.7	1.0	19	260	1.6	17	1.9	29	297	1.1
2346.9	0.393	9.8	1.4	15	263	1.4	5.7	2.6	23	301	0.989
2347.6	0.393	10	1.4	17	279	1.3	5.7	2.5	26	319	0.953
2348.3	0.710	8.8	1.2	21	228	1.6	10	2.1	32	261	1.2
2349.0	0.427	10	1.3	20	263	1.6	6.2	2.3	30	301	1.2
2349.7	0.393	8.7	1.5	24	298	1.6	5.7	2.8	37	341	1.2
2350.4	0.393	9.6	0.922	22	257	1.3	5.7	1.7	33	294	0.957
2351.1	0.393	9.2	1.4	21	316	1.9	5.7	2.5	31	362	1.4
2351.8	0.393	9.9	1.1	21	312	1.7	5.7	2.0	33	356	1.3
2352.5	0.393	11	1.1	23	288	2.3	5.7	2.0	35	330	1.7
2353.2	0.493	9.6	0.886	19	247	2.6	7.1	1.6	29	283	1.9
2353.9	0.755	8.9	1.7	18	271	2.0	11	3.1	27	309	1.5
2354.5	0.393	8.2	1.7	24	317	1.1	5.7	3.1	37	363	0.818
2355.2	0.577	10	1.1	21	275	1.8	8.3	2.1	32	315	1.3
2355.9	0.833	11	1.2	26	269	1.9	12	2.1	40	308	1.4
2356.6	0.566	6.9	1.2	23	259	1.5	8.2	2.2	36	296	1.1
2357.3	0.839	11	1.2	21	261	1.3	12	2.2	32	299	0.981
2358.0	0.518	8.2	1.3	21	273	2.0	7.5	2.4	32	312	1.5
2358.7	0.709	9.9	1.4	25	243	0.902	10	2.6	39	278	0.658
2359.4	0.517	13	1.1	24	260	1.7	7.5	2.0	36	297	1.2
2360.1	0.488	11	0.959	24	246	1.3	7.0	1.7	37	282	0.951
2360.8	0.393	10	1.5	24	257	1.0	5.7	2.8	37	293	0.765
2361.5	0.394	9.5	1.4	20	292	1.2	5.7	2.6	30	334	0.841
2362.2	0.847	11	1.3	26	292	1.9	12	2.4	40	334	1.4
2362.9	0.581	9.5	1.7	30	305	1.2	8.4	3.0	46	349	0.870
2363.6	0.803	9.9	0.921	23	218	1.0	12	1.7	35	250	0.738
2364.3	0.393	9.3	1.4	29	271	0.773	5.7	2.5	44	310	0.564
2365.0	0.775	11	1.5	24	309	1.9	11	2.8	36	353	1.4
2365.7	0.427	8.5	1.2	28	260	0.791	6.2	2.2	43	298	0.577
2366.4	0.794	12	0.743	32	259	0.786	11	1.4	48	297	0.573
2367.1	0.679	14	1.3	35	310	1.1	9.8	2.4	53	354	0.830
2367.8	0.671	12	1.4	28	280	0.720	9.7	2.6	42	320	0.525
2368.5	0.787	11	1.3	25	240	1.3	11	2.3	39	274	0.912
2369.2	0.503	12	1.5	33	254	1.4	7.3	2.7	50	290	1.1
2369.9	0.870	9.8	1.2	33	317	1.7	13	2.2	50	362	1.2
2370.6	0.517	12	1.5	25	303	0.850	7.5	2.7	38	347	0.620
2371.3	0.393	9.0	1.2	26	259	1.1	5.7	2.2	39	297	0.781
2372.0	0.588	11	1.2	27	292	0.966	8.5	2.3	42	334	0.705



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2372.7	0.393	13	1.4	36	292	1.4	5.7	2.5	55	334	1.0
2373.4	0.414	9.4	1.3	30	286	1.3	6.0	2.3	47	327	0.962
2374.1	0.506	9.0	1.0	31	302	1.1	7.3	1.9	48	346	0.835
2374.8	0.526	12	1.4	22	279	1.4	7.6	2.5	34	319	0.992
2375.5	0.841	12	1.7	24	305	1.4	12	3.1	37	349	1.0
2376.2	1.0	12	0.908	30	273	1.2	15	1.7	45	312	0.873
2376.9	0.673	11	1.4	28	272	1.2	9.7	2.6	43	311	0.902
2377.6	0.438	11	1.3	30	308	1.0	6.3	2.3	46	352	0.741
2378.3	0.911	12	1.4	25	293	1.3	13	2.5	38	335	0.913
2379.0	0.621	13	1.6	32	281	1.1	9.0	3.0	48	321	0.834
2379.7	0.632	13	1.2	28	309	1.2	9.1	2.1	43	353	0.848
2380.3	0.393	11	1.4	27	256	1.4	5.7	2.6	42	293	0.995
2381.0	0.393	13	1.5	31	360	1.2	5.7	2.8	47	412	0.906
2381.7	0.683	10	1.0	28	282	1.6	9.9	1.9	43	322	1.1
2382.4	0.901	11	0.978	33	285	1.3	13	1.8	50	326	0.964
2383.1	0.393	11	1.1	30	267	1.1	5.7	2.0	46	305	0.812
2383.8	0.471	13	1.2	25	295	1.7	6.8	2.2	39	337	1.3
2384.5	0.567	11	1.0	27	313	1.9	8.2	1.9	41	357	1.4
2385.2	1.0	11	0.690	26	237	0.917	14	1.3	40	271	0.669
2385.9	0.500	14	1.3	31	300	0.821	7.2	2.3	47	343	0.599
2386.6	0.670	12	1.0	26	307	1.7	9.7	1.8	40	351	1.3
2387.3	0.640	11	0.916	25	263	1.5	9.2	1.7	38	301	1.1
2388.0	0.588	11	1.3	24	286	0.689	8.5	2.4	36	327	0.503
2388.7	0.847	9.3	1.1	29	271	0.873	12	2.0	44	310	0.637
2389.4	0.393	14	1.4	33	319	2.2	5.7	2.6	50	364	1.6
2390.1	0.545	10	1.1	22	254	1.2	7.9	2.1	34	290	0.865
2390.8	0.393	10	1.1	27	291	1.1	5.7	2.1	41	332	0.831
2391.5	0.485	11	1.3	23	279	1.4	7.0	2.4	36	320	1.0
2392.2	1.1	11	1.2	25	309	1.8	16	2.2	38	353	1.3
2392.9	1.0	10.0	1.5	25	262	1.5	15	2.7	39	300	1.1
2393.6	0.458	14	1.1	27	320	1.5	6.6	2.0	41	366	1.1
2394.3	1.4	11	1.2	26	319	1.8	21	2.2	40	365	1.3
2395.0	0.843	10	1.2	23	330	1.1	12	2.2	36	378	0.774
2395.7	0.654	12	1.2	25	285	1.9	9.4	2.2	39	326	1.4
2396.4	0.393	15	1.1	27	307	1.2	5.7	1.9	42	352	0.899
2397.1	0.563	12	1.1	24	312	1.2	8.1	2.1	36	357	0.910
2397.8	0.393	8.9	1.4	20	252	0.933	5.7	2.5	30	288	0.681
2398.5	0.672	11	1.1	23	294	1.3	9.7	2.0	36	336	0.985
2399.2	0.825	9.5	1.0	22	284	0.850	12	1.8	34	325	0.620
2399.9	0.501	11	0.890	23	281	1.3	7.2	1.6	35	321	0.975
2400.6	0.675	9.0	0.825	23	278	0.724	9.7	1.5	35	317	0.528
2401.3	0.843	8.8	1.1	17	264	1.4	12	2.0	25	302	0.993
2402.0	0.599	11	0.891	19	289	1.6	8.6	1.6	29	330	1.2
2402.7	0.932	10	0.996	19	297	1.2	13	1.8	30	339	0.857
2403.4	0.393	13	1.3	23	335	0.629	5.7	2.3	35	383	0.459
2404.1	0.393	10	0.878	22	302	1.3	5.7	1.6	34	346	0.914
2404.8	0.773	9.9	0.694	25	289	1.7	11	1.3	38	331	1.3
2405.5	0.865	11	0.879	25	327	1.7	12	1.6	38	373	1.2
2406.2	0.890	12	0.770	18	329	1.9	13	1.4	27	376	1.3
2406.8	0.710	9.7	0.778	18	290	1.2	10	1.4	27	332	0.878
2407.5	0.590	7.6	1.1	18	351	2.0	8.5	1.9	27	402	1.4
2408.2	0.393	9.4	0.916	17	350	1.6	5.7	1.7	27	400	1.2
2408.9	0.855	8.9	0.995	21	313	1.8	12	1.8	32	357	1.3
2409.6	0.393	9.6	0.638	16	275	1.8	5.7	1.2	24	315	1.3
2410.3	0.617	11	0.856	15	335	1.7	8.9	1.6	23	383	1.2
2411.0	1.0	9.3	0.864	17	285	1.3	15	1.6	26	326	0.972
2411.7	0.651	8.5	0.693	11	270	1.2	9.4	1.3	17	309	0.873
2412.4	0.393	8.0	0.900	14	308	1.8	5.7	1.6	22	352	1.3
2413.1	0.754	9.3	1.3	15	315	1.6	11	2.3	23	360	1.2
2413.8	0.998	8.7	0.832	13	302	1.5	14	1.5	21	346	1.1
2414.5	0.393	11	1.0	13	281	1.7	5.7	1.8	19	321	1.3
2415.2	0.393	8.1	0.894	15	274	1.4	5.7	1.6	22	314	1.0
2415.9	1.0	9.5	1.0	17	319	1.8	15	1.9	27	364	1.3
2416.6	0.393	7.2	0.701	15	264	1.6	5.7	1.3	23	302	1.2
2417.3	0.393	8.1	1.0	10	243	1.8	5.7	1.8	16	278	1.3
2418.0	0.856	11	1.2	15	300	1.9	12	2.1	23	343	1.4
2418.7	0.481	11	1.2	15	313	2.1	6.9	2.2	23	358	1.5
2419.4	0.393	12	0.786	15	271	1.9	5.7	1.4	22	310	1.4
2420.1	0.393	10	0.805	14	251	1.7	5.7	1.5	21	287	1.2
2420.8	0.689	8.2	0.937	13	306	1.6	9.9	1.7	20	350	1.2
2421.5	0.399	9.3	1.2	16	335	1.9	5.8	2.2	24	383	1.4
2422.2	1.5	10	1.5	14	306	1.5	21	2.7	22	350	1.1
2422.9	0.393	9.6	0.836	18	339	2.3	5.7	1.5	27	388	1.7
2423.6	1.2	10	0.623	16	333	2.3	17	1.1	24	381	1.7
2424.3	0.565	9.7	1.1	16	315	1.6	8.2	1.9	24	360	1.1
2425.0	0.991	8.1	0.690	20	300	1.8	14	1.3	31	343	1.3
2425.7	0.661	11	0.908	19	364	1.5	9.5	1.7	29	416	1.1
2426.4	0.440	12	1.0	20	296	0.935	6.4	1.9	30	338	0.683
2427.1	0.393	10	1.1	15	300	1.4	5.7	1.9	23	344	1.1
2427.8	0.560	9.4	1.3	16	312	1.3	8.1	2.3	25	357	0.980
2428.5	0.904	11	0.896	14	332	2.0	13	1.6	21	379	1.4



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2429.2	0.596	10	1.000	15	305	2.1	8.6	1.8	23	349	1.5
2429.9	0.432	10	1.0	18	308	1.2	6.2	1.9	28	352	0.906
2430.6	0.393	11	1.1	18	290	1.4	5.7	2.0	28	332	1.0
2431.3	0.447	10	0.850	16	274	2.3	6.5	1.5	25	314	1.7
2432.0	0.696	13	1.3	22	308	1.7	10	2.3	34	352	1.3
2432.6	0.393	10	1.2	19	359	1.5	5.7	2.2	30	410	1.1
2433.3	0.393	10	1.2	19	348	2.1	5.7	2.2	29	398	1.5
2434.0	0.393	11	0.972	19	286	2.2	5.7	1.8	29	327	1.6
2434.7	0.758	10.0	1.2	21	308	1.8	11	2.1	32	352	1.3
2435.4	0.444	12	0.984	22	358	1.9	6.4	1.8	33	409	1.4
2436.1	0.393	10	1.3	19	320	0.854	5.7	2.4	30	366	0.623
2436.8	0.402	14	1.2	21	347	0.962	5.8	2.2	32	397	0.702
2437.5	0.830	9.6	1.3	16	290	1.3	12	2.3	25	332	0.971
2438.2	0.447	13	1.1	22	334	1.3	6.5	2.0	34	381	0.938
2438.9	0.853	13	1.3	26	343	1.3	12	2.4	40	392	0.938
2439.6	0.393	11	1.2	23	372	1.8	5.7	2.1	35	426	1.3
2440.3	0.569	14	1.3	23	327	1.2	8.2	2.3	36	374	0.904
2441.0	0.393	11	1.4	18	290	0.902	5.7	2.5	28	332	0.658
2441.7	0.643	14	1.3	25	319	1.7	9.3	2.5	39	364	1.3
2442.4	0.910	12	1.1	31	329	1.6	13	2.0	47	376	1.1
2443.1	0.560	14	1.2	24	345	1.0	8.1	2.3	36	394	0.753
2443.8	0.445	14	1.6	28	345	1.8	6.4	2.9	43	394	1.3
2444.5	0.393	12	0.964	24	305	0.829	5.7	1.8	37	348	0.605
2445.2	0.706	12	1.6	24	331	1.2	10	2.9	37	379	0.874
2445.9	0.640	14	1.5	21	290	1.3	9.2	2.8	33	331	0.923
2446.6	0.403	13	1.5	25	270	1.0	5.8	2.7	38	309	0.749
2447.3	0.538	12	1.6	23	308	0.993	7.8	2.8	36	353	0.724
2448.0	0.393	14	1.0	28	320	1.6	5.7	1.9	43	366	1.2
2448.7	0.408	13	1.3	26	281	1.4	5.9	2.4	39	321	1.0
2449.4	0.458	10	1.4	19	273	1.4	6.6	2.6	30	312	0.986
2450.1	0.393	14	1.2	23	270	1.2	5.7	2.2	36	309	0.880
2450.8	0.393	13	1.6	25	306	0.714	5.7	2.8	39	350	0.521
2451.5	0.444	12	1.7	28	346	0.823	6.4	3.1	43	396	0.600
2452.2	0.399	15	1.7	28	322	1.4	5.8	3.1	43	368	1.0
2452.9	0.558	16	1.6	29	298	0.824	8.1	2.9	45	340	0.601
2453.6	0.393	12	1.7	27	338	0.627	5.7	3.0	42	386	0.458
2454.3	0.400	11	1.3	20	296	1.3	5.8	2.4	31	338	0.947
2455.0	0.393	13	1.1	25	327	1.2	5.7	2.0	39	374	0.875
2455.7	0.583	9.7	1.4	24	288	0.894	8.4	2.5	36	329	0.652
2456.4	0.697	13	1.3	25	288	1.8	10	2.4	38	330	1.3
2457.1	0.781	12	1.2	31	286	1.1	11	2.1	48	327	0.835
2457.8	0.393	14	1.1	24	335	1.2	5.7	2.1	36	383	0.899
2458.5	0.688	11	1.1	24	348	1.1	9.9	2.0	37	398	0.780
2459.1	0.393	12	1.1	23	302	1.3	5.7	2.0	36	346	0.956
2459.8	0.393	14	1.8	28	296	1.2	5.7	3.2	44	338	0.910
2460.5	0.393	12	1.2	26	361	1.4	5.7	2.2	40	413	1.0
2461.2	0.393	11	1.4	27	318	1.4	5.7	2.5	41	363	1.0
2461.9	0.393	13	1.2	20	330	1.1	5.7	2.1	30	378	0.782
2462.6	0.393	11	0.884	22	300	0.948	5.7	1.6	34	343	0.691
2463.3	0.665	13	0.750	24	319	1.6	9.6	1.4	36	365	1.2
2464.0	0.393	11	0.907	17	260	0.906	5.7	1.7	26	297	0.661
2464.7	0.393	11	0.862	20	317	1.1	5.7	1.6	30	363	0.779
2465.4	0.393	12	1.1	25	324	1.3	5.7	1.9	39	370	0.935
2466.1	0.738	13	1.0	23	290	1.4	11	1.9	35	331	0.991
2466.8	0.393	11	0.874	22	277	1.3	5.7	1.6	34	317	0.958
2467.5	0.516	11	0.781	19	320	0.952	7.4	1.4	30	365	0.694
2468.2	0.772	12	0.902	20	313	0.943	11	1.6	30	358	0.688
2468.9	0.393	10	0.973	19	264	0.624	5.7	1.8	29	301	0.455
2469.6	0.393	11	0.749	16	256	0.939	5.7	1.4	24	292	0.685
2470.3	0.428	9.0	0.702	16	292	1.1	6.2	1.3	25	334	0.796
2471.0	0.393	12	0.982	19	349	1.3	5.7	1.8	30	399	0.921
2471.7	0.393	8.8	0.985	16	309	1.4	5.7	1.8	24	354	1.0
2472.4	0.469	13	0.965	20	309	2.3	6.8	1.8	30	354	1.7
2473.1	0.612	9.5	0.854	20	275	1.6	8.8	1.6	31	314	1.2
2473.8	0.393	12	0.791	22	332	1.4	5.7	1.4	33	380	0.997
2474.5	0.440	10.0	0.803	14	303	1.4	6.4	1.5	21	347	1.1
2475.2	0.393	11	0.911	15	256	0.652	5.7	1.7	23	293	0.476
2475.9	0.532	11	0.849	19	290	1.9	7.7	1.5	29	332	1.4
2476.6	0.393	11	0.917	11	306	1.2	5.7	1.7	18	350	0.910
2477.3	0.393	8.7	0.840	16	304	2.4	5.7	1.5	25	348	1.8
2478.0	0.443	10	1.1	16	281	1.6	6.4	2.0	25	321	1.2
2478.7	0.753	10	1.3	14	292	1.6	11	2.3	21	333	1.1
2479.4	0.393	12	0.717	16	335	1.7	5.7	1.3	25	383	1.2
2480.1	0.449	12	0.778	15	294	1.5	6.5	1.4	23	336	1.1
2480.8	0.393	11	1.1	13	277	1.8	5.7	2.1	20	316	1.3
2481.5	0.496	11	1.2	13	332	2.1	7.2	2.2	21	380	1.5
2482.2	0.625	8.8	0.937	15	276	1.9	9.0	1.7	24	315	1.4
2482.9	0.393	13	0.965	15	307	2.1	5.7	1.8	24	351	1.5
2483.6	0.730	11	1.1	18	298	1.4	11	2.0	27	341	1.0
2484.3	0.393	10	0.978	14	292	1.6	5.7	1.8	21	334	1.2
2485.0	0.417	12	0.902	18	312	1.5	6.0	1.6	27	357	1.1



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2485.6	0.393	9.8	1.1	19	293	0.505	5.7	2.0	29	335	0.368
2486.3	0.393	11	1.1	19	308	1.4	5.7	2.1	29	352	1.1
2487.0	0.544	7.8	0.748	16	280	1.5	7.9	1.4	24	320	1.1
2487.7	0.468	8.4	1.3	19	306	1.9	6.8	2.4	29	350	1.4
2488.4	0.394	11	1.3	17	336	1.6	5.7	2.3	26	384	1.1
2489.1	0.393	12	1.3	17	322	1.7	5.7	2.4	26	368	1.3
2489.8	0.393	12	0.973	16	256	1.4	5.7	1.8	25	293	1.0
2490.5	0.393	10	1.0	14	290	1.2	5.7	1.9	22	332	0.899
2491.2	0.771	13	0.968	16	327	2.3	11	1.8	25	374	1.7
2491.9	0.393	10	1.1	15	307	1.8	5.7	2.1	23	351	1.3
2492.6	0.393	9.5	1.2	15	246	1.6	5.7	2.1	23	281	1.2
2493.3	0.770	9.9	0.942	17	300	1.5	11	1.7	26	343	1.1
2494.0	0.393	9.2	1.4	15	300	1.4	5.7	2.5	23	343	1.1
2494.7	1.0	11	1.1	19	288	1.7	15	2.0	29	329	1.3
2495.4	0.393	9.9	1.2	13	303	1.7	5.7	2.1	21	347	1.2
2496.1	0.393	12	1.2	20	308	1.2	5.7	2.3	31	352	0.860
2496.8	0.393	9.6	0.842	20	285	1.6	5.7	1.5	30	326	1.2
2497.5	0.841	9.9	1.0	16	291	1.1	12	1.9	25	333	0.825
2498.2	0.593	11	0.680	15	286	1.5	8.6	1.2	24	327	1.1
2498.9	0.415	11	0.875	17	269	2.5	6.0	1.6	26	307	1.8
2499.6	0.393	9.8	1.1	15	246	1.8	5.7	2.0	23	282	1.3
2500.3	0.393	11	0.882	13	237	1.4	5.7	1.6	20	271	1.0
2501.0	0.393	10.0	1.6	17	313	1.2	5.7	2.9	26	358	0.910
2501.7	0.771	12	1.0	20	330	1.2	11	1.9	31	377	0.874
2502.4	0.393	10	1.0	15	262	1.6	5.7	1.9	22	299	1.2
2503.1	0.729	12	1.1	19	290	2.4	11	2.0	30	332	1.7
2503.8	0.393	13	1.3	15	311	0.986	5.7	2.5	23	356	0.720
2504.5	0.460	12	0.925	15	297	1.4	6.6	1.7	22	340	1.0
2505.2	0.393	12	1.1	16	283	0.859	5.7	2.1	24	324	0.627
2505.9	0.393	11	0.720	20	285	1.3	5.7	1.3	30	325	0.948
2506.6	0.421	12	1.4	16	308	0.976	6.1	2.5	25	352	0.712
2507.3	0.694	10.0	1.0	20	305	1.3	10	1.8	31	349	0.930
2508.0	0.597	12	1.2	21	305	1.2	8.6	2.2	32	348	0.875
2508.7	0.969	12	1.5	20	297	1.0	14	2.7	30	339	0.761
2509.4	0.393	11	1.3	19	267	0.909	5.7	2.4	29	306	0.663
2510.1	0.394	11	0.836	17	286	1.0	5.7	1.5	25	327	0.764
2510.8	0.552	12	1.2	21	291	0.917	8.0	2.2	32	333	0.669
2511.5	0.449	12	0.878	25	291	1.8	6.5	1.6	38	333	1.3
2512.1	0.393	13	1.4	23	290	0.619	5.7	2.5	35	332	0.452
2512.8	0.662	13	1.2	21	286	1.9	9.6	2.1	33	327	1.4
2513.5	0.393	11	1.1	20	278	1.3	5.7	2.0	30	318	0.913
2514.2	0.834	11	1.3	17	327	1.3	12	2.4	26	373	0.967
2514.9	0.514	13	1.5	19	349	0.528	7.4	2.7	29	399	0.385
2515.6	0.586	12	1.1	24	296	1.8	8.5	2.1	36	338	1.3
2516.3	0.549	12	0.858	16	263	1.5	7.9	1.6	25	301	1.1
2517.0	0.393	11	0.761	21	309	1.2	5.7	1.4	32	353	0.859
2517.7	0.393	14	1.0	21	301	0.527	5.7	1.8	32	344	0.385
2518.4	0.393	14	1.4	16	256	0.899	5.7	2.5	25	292	0.656
2519.1	0.399	12	0.917	19	306	1.2	5.8	1.7	30	350	0.851
2519.8	0.590	12	0.854	18	290	1.7	8.5	1.6	28	331	1.2
2520.5	0.832	11	0.846	15	257	2.0	12	1.5	24	294	1.5
2521.2	0.393	10	0.808	17	294	1.1	5.7	1.5	26	336	0.837
2521.9	0.393	13	0.978	20	290	0.920	5.7	1.8	30	332	0.672
2522.6	0.393	14	0.769	21	278	1.8	5.7	1.4	32	318	1.3
2523.3	0.844	11	0.898	18	234	0.944	12	1.6	28	267	0.689
2524.0	0.653	12	1.1	19	291	1.6	9.4	2.0	29	332	1.2
2524.7	0.628	15	0.846	16	329	1.4	9.1	1.5	25	377	1.0
2525.4	0.628	13	0.673	22	270	0.842	9.1	1.2	33	308	0.614
2526.1	0.393	13	1.1	22	296	1.9	5.7	2.0	34	338	1.4
2526.8	0.510	10.0	1.0	16	318	0.837	7.4	1.8	25	364	0.611
2527.5	0.549	12	1.1	19	328	0.811	7.9	1.9	30	375	0.591
2528.2	0.595	14	0.827	21	311	0.989	8.6	1.5	32	356	0.721
2528.9	0.618	12	1.1	19	288	1.4	8.9	2.0	29	330	1.1
2529.6	0.839	11	1.3	21	265	0.990	12	2.5	32	302	0.722
2530.3	0.521	11	1.0	18	290	0.963	7.5	1.9	27	331	0.702
2531.0	0.393	12	1.3	19	293	1.6	5.7	2.4	28	335	1.2
2531.7	0.561	12	1.5	20	282	1.2	8.1	2.7	30	322	0.907
2532.4	0.393	12	0.955	17	243	1.6	5.7	1.7	26	278	1.2
2533.1	0.393	10.0	1.1	18	279	1.7	5.7	1.9	28	319	1.2
2533.8	0.571	10	1.2	19	299	2.1	8.2	2.3	29	342	1.5
2534.5	0.545	13	0.575	19	306	1.2	7.9	1.0	29	350	0.880
2535.2	0.393	14	1.1	20	314	1.6	5.7	2.0	31	359	1.1
2535.9	0.393	11	0.619	20	255	1.9	5.7	1.1	31	292	1.4
2536.6	0.476	11	1.1	21	306	1.2	6.9	2.0	32	350	0.885
2537.3	0.412	13	0.898	20	291	1.9	5.9	1.6	30	333	1.4
2538.0	0.393	13	0.815	19	318	0.946	5.7	1.5	29	363	0.690
2538.7	0.492	13	0.669	18	286	0.808	7.1	1.2	28	327	0.589
2539.3	0.657	10.0	0.720	19	282	0.557	9.5	1.3	29	322	0.406
2540.0	0.797	9.4	0.666	15	293	1.1	12	1.2	23	335	0.799
2540.7	0.761	13	0.931	19	323	0.646	11	1.7	29	369	0.471
2541.4	0.550	13	1.2	20	256	0.812	7.9	2.2	31	292	0.592



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2542.1	1.1	12	0.912	19	306	2.2	16	1.7	28	350	1.6
2542.8	0.414	13	0.928	15	307	1.4	6.0	1.7	23	351	1.0
2543.5	1.4	11	0.732	20	328	0.621	20	1.3	31	376	0.453
2544.2	0.393	11	0.835	16	334	0.868	5.7	1.5	25	382	0.633
2544.9	0.471	13	0.662	16	250	1.3	6.8	1.2	24	286	0.917
2545.6	0.393	11	0.749	18	250	1.0	5.7	1.4	28	285	0.733
2546.3	0.799	9.0	0.647	21	305	1.6	12	1.2	33	349	1.1
2547.0	0.393	11	0.782	20	326	0.504	5.7	1.4	30	373	0.368
2547.7	0.393	11	1.4	17	320	1.9	5.7	2.5	26	366	1.4
2548.4	0.393	12	0.612	19	336	1.7	5.7	1.1	29	384	1.2
2549.1	0.474	12	0.909	14	247	0.390	6.8	1.7	22	282	0.284
2549.8	0.651	12	1.2	19	304	1.9	9.4	2.2	30	348	1.4
2550.5	0.601	11	0.939	15	282	1.5	8.7	1.7	22	322	1.1
2551.2	0.393	11	0.704	17	303	1.4	5.7	1.3	26	347	1.0
2551.9	0.525	11	1.0	20	273	0.539	7.6	1.8	30	312	0.393
2552.6	0.393	11	1.0	19	299	1.1	5.7	1.8	30	341	0.824
2553.3	0.393	9.1	1.1	16	297	0.989	5.7	2.1	24	339	0.721
2554.0	0.735	9.9	0.711	19	280	1.6	11	1.3	29	320	1.1
2554.7	0.471	10	0.838	19	298	1.3	6.8	1.5	29	341	0.918
2555.4	0.610	11	0.809	21	257	1.8	8.8	1.5	32	294	1.3
2556.1	0.928	9.6	0.604	15	247	1.3	13	1.1	22	282	0.964
2556.8	0.393	10	0.767	16	291	1.7	5.7	1.4	24	332	1.2
2557.5	0.393	9.4	0.805	12	302	1.0	5.7	1.5	18	345	0.736
2558.2	0.393	9.8	0.781	20	268	1.7	5.7	1.4	30	307	1.2
2558.9	0.436	11	0.373	16	287	2.3	6.3	0.680	25	329	1.7
2559.6	0.971	8.3	0.748	15	261	0.710	14	1.4	23	299	0.518
2560.3	0.393	8.7	0.810	16	306	1.1	5.7	1.5	24	350	0.819
2561.0	0.393	7.7	0.718	16	292	0.913	5.7	1.3	24	334	0.666
2561.7	0.393	13	0.802	15	277	1.2	5.7	1.5	23	317	0.855
2562.4	0.510	12	0.836	22	296	1.3	7.4	1.5	34	339	0.917
2563.1	0.393	9.1	0.744	16	266	0.746	5.7	1.4	24	304	0.544
2563.8	0.760	11	1.1	19	310	1.1	11	2.1	29	354	0.784
2564.5	1.4	11	0.895	18	302	1.7	20	1.6	27	346	1.2
2565.1	0.613	11	0.981	21	361	1.0	8.8	1.8	32	413	0.749
2565.8	0.393	12	0.782	20	296	0.831	5.7	1.4	31	338	0.606
2566.5	0.509	11	0.787	17	326	0.836	7.3	1.4	26	373	0.610
2567.2	0.978	12	0.900	22	357	1.3	14	1.6	34	408	0.960
2567.9	0.393	12	1.0	20	267	1.0	5.7	1.8	31	305	0.751
2568.6	0.415	11	0.606	20	293	2.0	6.0	1.1	31	335	1.4
2569.3	0.393	9.9	0.755	18	324	0.747	5.7	1.4	27	370	0.545
2570.0	0.710	8.4	0.794	17	345	0.761	10	1.4	27	394	0.555
2570.7	0.932	12	1.0	15	284	0.960	13	1.9	23	325	0.701
2571.4	0.393	11	0.755	17	255	0.828	5.7	1.4	25	292	0.604
2572.1	0.394	12	1.0	20	316	0.733	5.7	1.9	31	362	0.535
2572.8	0.690	11	0.701	17	244	0.452	10.0	1.3	26	279	0.330
2573.5	0.393	18	0.911	17	293	0.648	5.7	1.7	25	335	0.473
2574.2	0.579	13	0.949	19	319	0.714	8.4	1.7	28	365	0.521
2574.9	0.707	13	0.571	17	280	1.4	10	1.0	26	320	1.0
2575.6	0.460	10	0.826	20	287	0.853	6.6	1.5	30	328	0.622
2576.3	0.952	10	1.2	19	289	0.465	14	2.2	29	331	0.340
2577.0	0.631	12	0.628	16	283	1.1	9.1	1.1	25	323	0.770
2577.7	0.579	12	0.842	18	312	0.833	8.4	1.5	27	357	0.608
2578.4	0.393	9.4	0.776	18	300	1.4	5.7	1.4	28	343	1.0
2579.1	0.393	14	0.912	21	323	0.727	5.7	1.7	32	369	0.530
2579.8	0.617	11	0.985	17	307	1.0	8.9	1.8	26	351	0.747
2580.5	1.0	12	0.805	17	340	1.5	15	1.5	26	389	1.1
2581.2	0.539	13	0.742	20	300	0.874	7.8	1.4	31	343	0.637
2581.9	0.393	11	0.734	22	270	0.750	5.7	1.3	33	309	0.547
2582.6	0.783	11	1.0	18	257	0.774	11	1.9	28	294	0.565
2583.3	0.643	12	0.786	15	312	1.4	9.3	1.4	23	357	1.0
2584.0	0.485	11	1.0	17	323	1.1	7.0	1.9	26	369	0.821
2584.7	0.393	12	0.972	20	328	1.2	5.7	1.8	30	376	0.864
2585.4	0.949	10	0.795	18	295	1.2	14	1.4	28	338	0.847
2586.1	0.751	9.6	0.710	18	316	1.3	11	1.3	28	361	0.923
2586.8	0.767	11	0.816	18	299	0.758	11	1.5	28	341	0.553
2587.5	0.825	10	0.896	17	299	1.2	12	1.6	26	342	0.883
2588.2	1.2	12	0.649	20	376	1.6	18	1.2	31	430	1.2
2588.9	0.677	11	1.1	25	308	0.415	9.8	2.0	38	353	0.303
2589.6	0.393	11	1.1	19	353	1.8	5.7	2.0	29	403	1.3
2590.2	0.393	9.7	0.838	13	266	1.3	5.7	1.5	20	304	0.969
2590.9	0.900	12	0.835	19	323	0.944	13	1.5	28	370	0.689
2591.6	0.393	9.3	1.3	18	310	1.5	5.7	2.3	28	355	1.1
2592.3	0.735	9.2	0.946	21	316	0.727	11	1.7	32	361	0.531
2593.0	1.4	9.9	1.2	17	308	0.719	20	2.2	25	352	0.525
2593.7	0.723	11	1.0	19	407	1.6	10	1.9	29	466	1.1
2594.4	0.851	12	1.1	27	392	1.4	12	2.1	41	448	1.1
2595.1	1.5	10	1.2	21	388	0.836	22	2.1	32	443	0.610
2595.8	1.2	9.5	1.2	21	353	1.1	18	2.3	32	403	0.829
2596.5	1.5	11	1.3	14	405	0.997	21	2.3	21	463	0.728
2597.2	1.5	9.0	1.1	21	361	1.0	22	2.1	32	413	0.747
2597.9	1.8	9.6	1.0	24	449	1.1	27	1.9	36	514	0.814



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
2598.6	1.3	12	1.1	25	486	1.0	18	2.0	39	555	0.762
2599.3	1.4	12	1.9	20	520	0.722	20	3.5	31	595	0.527
2600.0	1.8	11	1.1	20	564	1.4	26	2.1	30	645	1.0
2600.7	1.5	11	1.0	22	432	2.2	22	1.9	34	494	1.6
2601.4	1.1	9.4	1.4	26	489	1.8	16	2.6	40	560	1.3
2602.1	1.0	9.6	0.839	23	476	2.4	15	1.5	35	544	1.7
2602.8	1.0	12	1.3	24	450	1.3	15	2.3	36	515	0.928
2603.5	1.9	11	1.6	21	565	1.3	27	3.0	32	646	0.946
2604.2	2.8	13	1.0	24	506	1.7	40	1.9	37	579	1.3
2604.9	2.1	11	1.1	24	613	0.864	31	2.1	37	700	0.630
2605.6	1.3	11	1.6	22	470	0.935	18	2.9	33	538	0.682
2606.3	2.1	9.8	1.5	22	521	1.0	30	2.8	33	596	0.739
2607.0	1.6	11	1.9	24	606	2.4	24	3.4	36	693	1.8
2607.7	2.2	12	1.8	27	654	1.8	32	3.2	42	748	1.3
2608.4	2.3	13	1.6	27	841	1.0	34	2.9	42	962	0.759
2609.1	2.7	12	1.5	29	804	2.0	39	2.7	44	919	1.4
2609.8	3.2	12	1.6	22	668	1.7	46	2.8	34	763	1.3
2610.5	2.6	12	1.8	24	717	1.4	37	3.3	37	820	1.0
2611.2	2.0	13	2.5	26	664	1.4	29	4.6	40	760	0.995
2611.9	2.7	11	2.2	29	731	1.4	39	3.9	44	836	0.994
2612.6	2.4	12	1.9	23	746	0.948	35	3.4	36	853	0.691
2613.3	2.6	11	2.1	27	727	1.4	38	3.8	41	831	1.0
2614.0	3.8	11	1.9	28	787	1.3	55	3.5	43	900	0.957
2614.7	2.5	13	1.8	30	745	1.8	36	3.3	46	852	1.3
2615.4	2.0	13	1.8	30	772	1.0	29	3.2	46	883	0.763
2616.1	3.2	11	2.2	31	791	0.605	46	4.1	47	905	0.441
2616.7	3.2	14	1.8	27	920	1.8	46	3.3	42	1052	1.3
2617.4	4.0	11	2.3	27	976	2.4	57	4.2	42	1116	1.7
2618.1	3.6	14	2.5	29	1180	1.2	52	4.6	45	1350	0.854
2618.8	3.5	13	2.7	32	968	2.3	51	4.9	49	1107	1.7
2619.5	4.2	11	2.5	30	931	1.9	60	4.5	46	1065	1.4
2620.2	2.8	11	2.5	34	1007	1.5	40	4.5	52	1152	1.1
2620.9	3.0	11	2.6	38	1170	1.3	43	4.7	59	1338	0.957
2621.6	4.5	14	2.4	36	1019	1.4	66	4.3	55	1165	1.0
2622.3	4.0	11	2.2	26	1042	0.817	58	4.1	39	1192	0.596
2623.0	4.0	9.8	2.7	36	1042	0.986	58	4.8	55	1192	0.719
2623.7	5.0	12	2.7	32	1179	1.7	73	4.9	50	1348	1.2
2624.4	4.6	14	2.7	35	1240	2.5	66	5.0	54	1418	1.8
2625.1	4.6	14	2.3	38	1015	2.0	66	4.3	58	1160	1.5
2625.8	4.1	14	3.3	30	1192	2.0	59	6.0	46	1363	1.4
2626.5	4.8	12	3.1	34	1247	1.6	69	5.7	53	1426	1.2
2627.2	4.7	12	3.1	30	1092	1.9	68	5.7	46	1248	1.4
2627.9	3.6	16	2.8	39	1269	2.7	51	5.2	60	1451	2.0
2628.6	4.3	12	2.7	37	1173	1.2	62	4.9	56	1342	0.899
2629.3	3.9	11	3.1	37	1392	2.2	57	5.7	57	1591	1.6
2630.0	4.2	12	3.1	31	1321	1.2	61	5.7	48	1510	0.891
2630.7	4.3	13	2.8	35	1273	1.9	62	5.1	53	1456	1.4
2631.4	3.8	13	2.9	41	1459	2.4	54	5.3	63	1669	1.8
2632.1	3.5	14	3.0	39	1354	1.9	51	5.5	60	1548	1.4
2632.8	4.5	13	3.4	35	1329	2.1	64	6.2	53	1520	1.5
2633.5	4.4	12	3.0	38	1416	0.873	64	5.5	58	1619	0.637
2634.2	5.1	15	4.0	45	1388	1.3	73	7.3	69	1587	0.956
2634.9	5.3	13	3.5	36	1395	1.5	77	6.3	55	1595	1.1
2635.6	4.5	15	3.3	41	1402	1.6	64	6.1	63	1603	1.2
2636.3	4.3	10	3.5	35	1406	2.2	62	6.3	54	1608	1.6
2637.0	4.4	12	3.0	37	1629	2.0	63	5.5	56	1862	1.4
2637.7	3.5	14	3.8	40	1442	2.4	51	6.9	61	1649	1.7
2638.4	3.8	19	4.6	51	1772	1.5	54	8.4	79	2026	1.1
2639.1	6.0	13	3.0	37	1407	2.0	86	5.5	57	1609	1.4
2639.8	4.8	15	3.4	35	1590	2.0	69	6.2	54	1818	1.5
2640.5	7.0	15	4.5	43	1756	2.4	101	8.1	66	2008	1.7
2641.2	4.1	17	3.6	48	1675	1.4	60	6.6	73	1916	1.1
2641.9	4.9	13	3.6	43	1529	1.7	70	6.6	65	1749	1.3
2642.6	5.0	13	3.4	41	1716	1.7	72	6.2	63	1962	1.2
2643.2	5.6	13	3.9	41	1813	1.5	81	7.2	62	2074	1.1
2643.9	4.3	17	4.0	47	1941	2.4	62	7.4	72	2220	1.7
2644.6	4.7	16	3.8	39	1705	2.9	67	6.9	60	1950	2.1
2645.3	4.2	15	3.2	50	1677	1.9	61	5.8	76	1918	1.4
2646.0	5.0	16	4.3	41	1776	2.3	72	7.8	63	2031	1.7
2646.7	4.6	16	3.6	45	1829	2.3	66	6.6	69	2091	1.7
2647.4	5.3	16	3.6	44	1638	1.5	77	6.6	67	1873	1.1
2648.1	4.3	14	3.4	46	1721	2.1	62	6.2	71	1968	1.5
2648.8	3.2	15	3.2	42	1547	1.6	46	5.8	65	1770	1.1
2649.5	4.5	15	3.6	45	1630	1.3	65	6.6	68	1864	0.973
2650.2	3.5	13	4.4	41	1731	2.1	51	8.1	63	1979	1.5
2650.9	4.0	17	4.1	45	1672	1.8	58	7.6	69	1912	1.3
2651.6	4.2	16	3.8	49	1783	2.2	61	6.9	76	2038	1.6
2652.3	4.2	18	3.3	45	1585	2.7	60	6.0	69	1813	2.0
2653.0	3.5	16	3.4	43	1678	1.8	50	6.2	65	1919	1.3
2653.7	4.6	15	3.4	46	1689	2.0	66	6.2	70	1931	1.5
2654.4	4.1	17	3.5	42	1651	2.1	60	6.4	64	1887	1.5



Minnow Environmental  
Sample ID: 017

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2655.1	3.9	17	3.6	52	1792	2.8	56	6.6	80	2050	2.0
2655.8	3.5	15	4.0	44	1660	2.4	51	7.3	68	1898	1.7
2656.5	3.8	14	3.3	37	1540	1.8	54	5.9	56	1761	1.3
2657.2	3.1	16	3.5	40	1625	3.6	45	6.4	62	1858	2.6
2657.9	3.3	19	3.7	48	1792	2.2	48	6.8	73	2049	1.6
2658.6	2.9	18	3.2	43	1536	2.4	42	5.9	66	1757	1.7
2659.3	3.5	17	4.2	41	1677	2.0	50	7.6	63	1918	1.5
2660.0	3.3	15	3.6	41	1673	3.0	48	6.6	64	1914	2.2
2660.7	3.9	17	3.3	45	1709	3.0	57	6.1	69	1954	2.2
2661.4	4.2	16	2.9	47	1634	2.5	60	5.3	72	1868	1.8
2662.1	3.2	16	2.7	42	1553	1.5	46	4.9	65	1776	1.1
2662.8	3.5	16	3.1	39	1529	1.9	51	5.6	59	1749	1.4
2663.5	4.1	16	3.2	40	1428	2.0	58	5.9	61	1633	1.4
2664.2	3.3	17	3.1	40	1476	2.2	47	5.7	61	1688	1.6
2664.9	3.2	20	2.8	38	1398	2.1	46	5.1	58	1599	1.5
2665.6	3.2	15	2.2	35	1557	2.4	46	4.0	53	1780	1.7
2666.3	3.3	16	3.2	39	1625	1.5	47	5.8	59	1859	1.1
2667.0	3.0	15	3.0	35	1534	2.9	44	5.5	54	1754	2.1
2667.7	3.5	18	2.9	46	1541	2.1	51	5.3	71	1762	1.6
2668.4	3.1	17	3.2	45	1481	1.8	45	5.8	68	1694	1.3
2669.1	2.4	14	2.5	30	1382	1.5	34	4.5	46	1580	1.1
2669.8	2.1	17	3.4	38	1519	2.4	30	6.2	58	1737	1.8
2670.4	1.7	19	2.7	36	1325	1.6	25	4.8	55	1515	1.1
2671.1	2.4	18	2.6	40	1550	1.3	35	4.7	61	1773	0.930
2671.8	1.6	18	2.1	31	1460	1.6	24	3.7	48	1670	1.2
2672.5	1.9	19	2.4	33	1365	2.6	28	4.4	51	1561	1.9
2673.2	2.3	17	2.5	34	1591	1.9	33	4.5	52	1820	1.4
2673.9	1.9	17	2.0	35	1345	1.7	27	3.6	53	1538	1.2
2674.6	2.0	15	2.1	33	1335	3.3	28	3.8	51	1527	2.4
2675.3	2.0	15	1.8	31	1130	1.3	28	3.3	47	1292	0.958
2676.0	2.1	18	1.8	30	1267	2.2	30	3.3	47	1449	1.6
2676.7	2.0	15	2.7	27	1225	2.6	29	5.0	41	1401	1.9
2677.4	1.6	16	2.3	34	1263	2.0	23	4.2	52	1444	1.4
2678.1	1.1	17	1.7	28	1228	1.7	15	3.0	44	1405	1.2
2678.8	1.7	14	1.5	29	1210	1.4	25	2.8	45	1384	1.0
2679.5	1.4	13	1.9	22	1202	1.9	20	3.5	34	1375	1.4
2680.2	0.823	13	2.3	28	1102	1.7	12	4.1	42	1260	1.3
2680.9	2.1	16	1.7	28	1186	3.1	31	3.1	42	1357	2.2
2681.6	1.4	15	1.3	31	1180	1.8	20	2.4	48	1349	1.3
2682.3	0.604	15	1.6	24	1141	2.2	8.7	3.0	37	1304	1.6
2683.0	1.5	10	2.0	21	1021	1.9	22	3.7	32	1168	1.4
2683.7	1.2	16	1.3	23	1324	0.891	17	2.4	36	1514	0.650
2684.4	1.4	14	1.3	24	984	2.4	20	2.3	36	1125	1.7
2685.1	0.971	13	1.2	22	1028	2.0	14	2.2	34	1176	1.5
2685.8	1.3	13	1.2	21	1115	1.6	18	2.2	32	1275	1.2
2686.5	1.4	15	1.3	23	1141	2.2	21	2.3	36	1305	1.6
2687.2	1.3	20	1.3	27	1172	2.8	18	2.4	41	1340	2.1
2687.9	1.5	16	1.1	26	1077	2.4	21	2.1	40	1231	1.8
2688.6	1.2	15	1.3	23	976	2.2	18	2.3	36	1116	1.6
2689.3	1.6	12	1.4	19	893	1.7	24	2.6	29	1021	1.2
2690.0	2.1	14	0.996	17	945	1.1	30	1.8	26	1080	0.776
2690.7	2.1	13	1.2	22	998	1.2	31	2.2	34	1141	0.891
2691.4	2.0	17	1.5	21	1021	2.7	29	2.8	33	1168	2.0
2692.1	1.7	13	1.2	21	1132	1.8	25	2.2	32	1295	1.3
2692.8	2.6	13	1.4	17	1008	1.7	38	2.5	27	1152	1.3
2693.5	2.7	15	1.4	21	858	2.5	39	2.5	32	981	1.8
2694.2	1.8	18	1.8	19	1052	2.5	25	3.3	29	1203	1.8
2694.9	3.2	15	1.3	21	955	2.1	47	2.4	32	1092	1.5
2695.6	2.7	15	1.7	19	1036	1.2	39	3.2	29	1184	0.878
2696.3	2.8	12	1.7	21	990	2.7	40	3.1	31	1132	2.0
2697.0	2.2	12	1.4	19	907	3.2	32	2.6	29	1037	2.3
2697.6	3.1	15	1.7	19	1262	2.3	44	3.1	29	1443	1.7
2698.3	4.6	15	2.1	22	1066	3.1	66	3.8	34	1219	2.3
2699.0	2.9	14	1.7	18	977	1.3	41	3.2	28	1117	0.927
2699.7	2.0	12	1.8	21	1092	2.6	29	3.2	33	1248	1.9
2700.4	3.3	15	2.7	23	1024	2.9	48	5.0	35	1170	2.2
2701.1	5.3	13	1.7	16	987	1.6	76	3.2	24	1129	1.1
2701.8	2.6	14	1.5	23	1041	2.8	38	2.8	35	1190	2.0
2702.5	3.1	14	1.7	17	1042	2.9	45	3.1	27	1191	2.1
2703.2	4.4	18	2.3	21	1102	3.0	63	4.3	32	1260	2.2
2703.9	3.4	13	2.4	19	1005	3.2	49	4.4	30	1150	2.4
2704.6	2.9	13	2.4	23	1094	2.6	42	4.4	36	1250	1.9
2705.3	3.5	12	2.3	20	1061	1.6	51	4.2	31	1213	1.2
2706.0	3.6	12	2.5	18	1020	1.6	51	4.5	28	1166	1.1
2706.7	3.5	12	2.0	16	1143	1.1	51	3.7	24	1307	0.794
2707.4	3.6	14	2.5	23	1076	2.1	52	4.6	35	1231	1.6
2708.1	3.9	15	2.2	19	1044	1.9	56	4.0	29	1194	1.4
2708.8	2.7	13	2.2	25	1276	2.4	39	4.0	38	1459	1.8
2709.5	3.5	13	2.5	18	1234	2.1	51	4.5	27	1411	1.5
2710.2	2.4	13	2.5	23	1180	3.3	34	4.6	35	1349	2.4
2710.9	2.9	15	2.1	23	1226	2.0	41	3.8	36	1402	1.5



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2711.6	3.6	16	1.9	27	1184	1.1	53	3.5	41	1354	0.829
2712.3	2.7	13	2.6	20	1293	2.0	39	4.7	30	1479	1.4
2713.0	2.8	16	2.4	27	1237	1.4	41	4.3	41	1414	1.0
2713.7	2.2	16	2.3	23	1184	2.3	32	4.2	35	1354	1.6
2714.4	2.6	16	2.1	27	1141	1.9	37	3.9	41	1305	1.4
2715.1	2.2	15	2.5	25	1227	1.4	32	4.6	38	1403	0.985
2715.8	3.2	16	2.3	20	1181	2.0	46	4.2	31	1351	1.5
2716.5	3.2	16	2.3	25	1320	2.9	47	4.2	39	1510	2.1
2717.2	3.7	16	2.3	22	1094	2.4	54	4.2	33	1251	1.7
2717.9	2.5	17	2.4	25	1178	2.0	36	4.4	38	1347	1.5
2718.6	3.4	14	2.5	30	1335	1.7	49	4.5	46	1527	1.2
2719.3	3.8	16	3.0	19	1212	2.4	55	5.5	29	1386	1.8
2720.0	3.5	16	2.8	22	1140	1.1	50	5.2	34	1304	0.777
2720.7	2.4	19	2.7	22	1184	3.1	34	5.0	34	1354	2.3
2721.4	3.1	16	2.5	27	1158	2.7	45	4.6	41	1324	2.0
2722.1	2.6	15	2.5	21	1179	2.2	38	4.5	32	1348	1.6
2722.8	3.5	16	2.9	23	1147	2.4	51	5.2	36	1311	1.8
2723.4	3.8	15	3.1	26	1271	2.1	54	5.6	40	1454	1.5
2724.1	3.0	19	2.7	23	1189	3.8	44	5.0	36	1360	2.8
2724.8	3.2	14	2.6	22	1220	1.8	47	4.7	34	1396	1.3
2725.5	3.2	15	2.4	26	1213	2.3	46	4.4	39	1387	1.7
2726.2	3.5	17	3.5	21	1152	1.7	50	6.5	33	1317	1.3
2726.9	2.9	16	3.3	23	1125	2.4	42	6.0	36	1287	1.8
2727.6	3.8	17	2.3	23	1261	2.4	54	4.1	35	1442	1.8
2728.3	2.9	15	2.6	26	1286	1.8	42	4.7	39	1471	1.3
2729.0	3.2	16	2.6	23	1148	1.7	46	4.7	36	1312	1.2
2729.7	4.2	20	3.5	27	1361	2.8	61	6.4	42	1557	2.1
2730.4	3.0	18	3.3	25	1205	1.9	44	6.0	38	1377	1.4
2731.1	2.1	16	2.4	23	1135	2.2	31	4.3	36	1298	1.6
2731.8	3.0	18	3.1	29	1259	2.1	44	5.7	45	1440	1.6
2732.5	2.9	17	3.0	26	1283	1.7	42	5.5	40	1467	1.3
2733.2	2.8	18	3.6	32	1409	2.5	40	6.5	49	1612	1.8
2733.9	2.9	20	3.4	29	1332	2.1	42	6.2	44	1523	1.5
2734.6	2.9	17	3.7	29	1389	2.3	43	6.7	45	1589	1.7
2735.3	3.0	15	3.7	32	1242	1.4	43	6.8	50	1420	1.0
2736.0	3.3	16	3.5	27	1384	3.3	47	6.4	42	1583	2.4
2736.7	2.5	17	4.1	33	1428	2.5	36	7.4	50	1633	1.8
2737.4	2.7	19	2.8	34	1445	2.1	39	5.1	53	1653	1.5
2738.1	2.6	18	3.2	25	1350	2.9	37	5.8	38	1544	2.1
2738.8	2.2	14	3.3	28	1359	2.2	31	6.0	43	1554	1.6
2739.5	2.4	19	3.2	33	1506	3.3	35	5.7	50	1722	2.4
2740.2	3.1	18	3.6	35	1375	2.5	45	6.5	53	1573	1.8
2740.9	2.2	16	3.4	33	1360	1.5	32	6.2	51	1555	1.1
2741.6	2.2	16	3.5	30	1514	2.7	32	6.3	47	1731	1.9
2742.3	2.4	17	2.8	26	1367	2.2	34	5.2	40	1563	1.6
2743.0	1.9	18	3.2	33	1409	2.4	28	5.9	51	1611	1.7
2743.7	1.9	17	2.3	32	1397	2.8	28	4.2	49	1598	2.0
2744.4	2.8	14	3.2	28	1347	1.9	40	5.8	43	1541	1.4
2745.1	2.3	16	3.5	30	1393	2.3	34	6.3	46	1593	1.7
2745.8	2.6	17	3.1	26	1478	2.2	38	5.7	39	1691	1.6
2746.5	2.0	20	3.1	29	1677	2.6	29	5.7	45	1917	1.9
2747.2	0.867	16	2.8	32	1459	1.7	13	5.2	50	1668	1.2
2747.9	1.1	14	2.0	27	1479	1.6	15	3.7	41	1691	1.2
2748.6	2.0	15	2.1	27	1280	2.3	30	3.9	41	1463	1.7
2749.2	1.4	17	2.3	29	1297	2.3	21	4.1	44	1483	1.7
2749.9	1.9	17	2.8	29	1392	3.5	28	5.2	45	1591	2.6
2750.6	1.7	15	2.1	26	1505	2.1	25	3.9	40	1721	1.5
2751.3	1.8	15	2.1	27	1301	2.2	25	3.8	41	1488	1.6
2752.0	1.1	9.9	2.1	24	1148	1.4	17	3.7	37	1313	1.0
2752.7	1.2	18	2.2	25	1293	2.9	17	3.9	39	1478	2.1
2753.4	2.0	16	2.0	23	1244	2.9	29	3.7	36	1422	2.1
2754.1	1.4	12	1.8	24	1266	1.2	19	3.2	37	1447	0.857
2754.8	0.606	14	1.6	23	1356	1.8	8.7	2.9	35	1550	1.3
2755.5	0.933	15	1.5	22	1291	1.6	13	2.8	34	1476	1.2
2756.2	1.6	16	1.7	25	1401	1.9	23	3.1	38	1602	1.4
2756.9	1.1	15	1.5	26	1387	1.1	16	2.7	40	1586	0.824
2757.6	1.1	13	1.4	22	1197	1.9	16	2.5	34	1368	1.4
2758.3	0.894	15	1.1	22	1535	2.1	13	2.0	34	1755	1.6
2759.0	1.4	15	1.3	24	1327	2.2	20	2.4	37	1518	1.6
2759.7	0.830	17	1.4	26	1367	1.9	12	2.6	40	1563	1.4
2760.4	1.9	15	1.2	24	1228	2.2	27	2.2	37	1405	1.6
2761.1	1.5	12	1.4	21	1258	1.8	21	2.6	33	1439	1.3
2761.8	0.757	12	0.882	19	1327	2.2	11	1.6	29	1518	1.6
2762.5	0.786	16	0.962	23	1468	2.5	11	1.8	35	1679	1.8
2763.2	0.895	16	1.0	21	1236	2.1	13	1.9	33	1414	1.5
2763.9	0.881	13	0.896	19	1222	2.5	13	1.6	29	1397	1.8
2764.6	1.5	14	1.0	20	1226	2.4	21	1.8	31	1402	1.7
2765.3	1.4	14	1.0	21	1259	1.4	20	1.9	32	1439	1.0
2766.0	0.985	13	0.770	17	1117	1.3	14	1.4	26	1277	0.966
2766.7	0.801	14	1.3	22	1182	2.7	12	2.4	34	1352	2.0
2767.4	0.989	14	0.929	19	1258	1.4	14	1.7	30	1439	0.991



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
2768.1	1.1	11	0.880	19	1253	3.2	15	1.6	30	1432	2.3
2768.8	0.984	17	1.0	19	1259	3.1	14	1.9	29	1439	2.2
2769.5	1.4	14	1.0	24	1214	1.9	20	1.9	37	1389	1.4
2770.2	1.1	15	0.940	20	1229	2.1	16	1.7	31	1405	1.5
2770.9	1.2	14	0.955	21	1353	2.2	17	1.7	33	1547	1.6
2771.6	0.804	11	0.651	19	1263	2.6	12	1.2	29	1444	1.9
2772.3	1.3	13	0.866	20	1204	2.1	18	1.6	30	1377	1.5
2773.0	1.1	13	0.651	17	1065	2.0	15	1.2	26	1218	1.5
2773.7	0.537	12	1.1	22	1318	1.9	7.8	2.0	34	1507	1.4
2774.4	1.1	12	0.836	20	1169	1.5	15	1.5	30	1337	1.1
2775.0	1.3	11	0.691	17	1230	2.3	19	1.3	26	1406	1.7
2775.7	1.2	13	0.640	20	1388	1.5	18	1.2	30	1587	1.1
2776.4	1.2	13	0.988	22	1243	2.1	17	1.8	34	1421	1.5
2777.1	1.4	13	0.730	22	1190	1.4	20	1.3	34	1360	1.0
2777.8	0.868	11	0.704	17	1103	2.2	13	1.3	26	1262	1.6
2778.5	1.2	14	0.799	20	1139	1.7	17	1.5	30	1302	1.2
2779.2	1.5	15	0.877	25	1333	2.3	22	1.6	39	1524	1.7
2779.9	0.468	15	0.816	21	1309	2.7	6.8	1.5	32	1497	2.0
2780.6	1.5	14	0.977	20	1114	1.3	22	1.8	31	1274	0.948
2781.3	0.732	13	0.452	16	1241	2.2	11	0.824	25	1420	1.6
2782.0	1.4	15	0.776	20	1489	1.6	21	1.4	31	1703	1.2
2782.7	0.866	14	0.702	18	1122	2.5	13	1.3	28	1283	1.8
2783.4	1.5	13	0.976	19	1187	2.6	21	1.8	29	1358	1.9
2784.1	0.790	12	0.733	19	1287	2.2	11	1.3	30	1472	1.6
2784.8	1.7	12	0.790	22	1250	1.6	24	1.4	34	1429	1.1
2785.5	0.657	13	1.2	20	1121	2.8	9.5	2.1	31	1282	2.0
2786.2	0.781	14	1.1	19	1283	2.8	11	2.0	30	1467	2.0
2786.9	0.609	14	0.745	21	1201	3.3	8.8	1.4	33	1374	2.4
2787.6	1.2	13	0.765	19	1263	1.7	17	1.4	29	1445	1.2
2788.3	1.1	15	0.912	16	1133	1.7	15	1.7	25	1296	1.3
2789.0	0.822	12	1.0	16	1147	2.3	12	1.8	24	1311	1.7
2789.7	0.808	12	0.473	16	1117	1.8	12	0.862	25	1278	1.3
2790.4	0.715	13	0.751	20	1250	1.5	10	1.4	30	1430	1.1
2791.1	0.741	11	0.386	17	1169	1.8	11	0.705	26	1337	1.3
2791.8	0.987	14	0.968	18	1172	2.3	14	1.8	27	1340	1.7
2792.5	1.3	11	0.719	22	1191	2.1	19	1.3	34	1362	1.6
2793.2	0.802	14	1.2	20	1210	1.7	12	2.1	30	1383	1.3
2793.9	1.4	14	0.679	18	1130	1.5	20	1.2	27	1292	1.1
2794.6	0.441	9.7	0.803	15	1168	2.2	6.4	1.5	23	1336	1.6
2795.3	1.2	12	0.717	21	1247	2.0	18	1.3	31	1426	1.5
2796.0	1.2	12	0.969	21	1154	2.0	17	1.8	32	1320	1.4
2796.7	1.1	12	0.635	19	1147	2.2	16	1.2	29	1311	1.6
2797.4	0.663	15	0.810	23	1213	2.0	9.6	1.5	35	1387	1.5
2798.1	0.926	11	1.1	16	1186	2.2	13	2.0	25	1356	1.6
2798.8	0.667	14	1.1	18	1211	1.5	9.6	2.0	27	1384	1.1
2799.5	1.9	15	0.977	18	1203	2.1	27	1.8	28	1376	1.6
2800.2	0.712	15	0.674	19	1259	2.6	10	1.2	29	1440	1.9
2800.9	1.4	14	0.797	17	1163	1.4	20	1.5	26	1330	1.0
2801.5	1.5	13	1.2	20	1126	1.6	21	2.2	30	1287	1.1
2802.2	1.4	12	0.935	14	1186	2.4	20	1.7	21	1357	1.8
2802.9	1.7	14	0.915	25	1197	1.7	24	1.7	39	1369	1.2
2803.6	1.3	14	0.714	21	1090	2.1	19	1.3	32	1247	1.5
2804.3	2.4	13	1.3	15	1036	2.1	34	2.3	23	1184	1.5
2805.0	2.3	14	0.907	13	1181	2.3	33	1.7	20	1351	1.7
2805.7	2.4	12	1.4	17	1092	1.9	34	2.5	25	1249	1.4
2806.4	1.7	13	1.3	17	1200	2.8	24	2.3	26	1372	2.0
2807.1	2.1	15	1.3	23	1267	1.8	31	2.3	36	1448	1.3
2807.8	2.1	14	1.3	18	1066	1.6	30	2.4	27	1219	1.2
2808.5	1.7	10	1.2	16	1092	1.6	25	2.2	24	1248	1.2
2809.2	3.3	13	1.8	21	1276	2.6	47	3.2	32	1459	1.9
2809.9	1.3	13	1.3	25	1058	2.7	18	2.3	38	1210	1.9
2810.6	2.8	12	0.954	22	1177	0.992	41	1.7	33	1346	0.724
2811.3	2.2	15	1.5	20	1418	3.0	32	2.7	30	1621	2.2
2812.0	2.9	11	1.3	23	1385	1.0	41	2.3	36	1584	0.745
2812.7	2.5	15	1.7	23	1313	1.9	35	3.1	35	1502	1.4
2813.4	2.1	12	1.6	26	1172	2.2	30	2.9	40	1340	1.6
2814.1	2.6	12	1.4	22	1169	2.0	38	2.6	33	1337	1.4
2814.8	2.7	10	1.5	19	1244	2.1	40	2.8	29	1422	1.5
2815.5	2.3	12	2.4	19	1154	1.8	33	4.4	30	1319	1.3
2816.2	3.8	19	1.8	21	1280	2.7	54	3.3	33	1464	1.9
2816.9	1.7	15	1.3	26	1299	2.1	25	2.4	39	1485	1.5
2817.6	3.9	13	1.7	28	1505	1.7	57	3.0	43	1721	1.2
2818.3	3.3	13	1.9	25	1301	2.8	48	3.5	39	1487	2.0
2819.0	3.4	15	1.7	30	1359	2.1	49	3.0	46	1554	1.5
2819.7	2.8	16	2.0	24	1337	2.1	41	3.7	37	1529	1.5
2820.4	2.5	13	2.0	27	1330	1.9	36	3.6	42	1521	1.4
2821.1	3.8	12	2.4	27	1382	1.2	55	4.4	41	1581	0.899
2821.8	2.4	16	2.2	22	1189	1.4	35	4.0	34	1359	1.0
2822.5	2.8	16	1.9	30	1509	2.8	41	3.4	46	1725	2.1
2823.2	3.1	17	2.3	23	1302	3.6	44	4.2	36	1488	2.6
2823.9	2.6	16	2.4	34	1421	2.2	38	4.3	51	1625	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2824.6	3.7	16	2.7	20	1338	1.3	54	4.9	31	1530	0.940
2825.3	3.1	16	2.4	25	1128	1.9	45	4.4	38	1290	1.4
2826.0	4.9	18	2.4	30	1520	2.9	70	4.4	46	1738	2.1
2826.7	4.4	17	1.9	33	1275	3.8	64	3.5	50	1458	2.8
2827.3	2.3	13	2.0	24	1187	2.6	33	3.6	37	1358	1.9
2828.0	3.3	14	2.0	26	1539	2.5	47	3.7	39	1759	1.8
2828.7	3.7	12	2.2	21	1246	1.7	54	4.1	32	1425	1.2
2829.4	3.5	15	2.4	27	1386	3.5	50	4.5	42	1585	2.5
2830.1	3.9	16	2.1	30	1386	1.4	56	3.8	46	1584	1.0
2830.8	1.8	13	1.8	23	1195	1.8	26	3.3	36	1367	1.3
2831.5	2.6	13	2.0	22	1124	2.0	37	3.6	34	1286	1.5
2832.2	2.7	16	2.1	26	1265	2.4	39	3.8	40	1447	1.8
2832.9	1.7	17	1.7	28	1126	2.6	24	3.2	44	1288	1.9
2833.6	1.7	19	1.6	25	1308	1.4	24	2.9	38	1496	1.000
2834.3	1.9	13	2.5	28	1194	2.9	27	4.6	42	1366	2.1
2835.0	1.9	19	2.0	26	1396	2.7	27	3.7	40	1597	2.0
2835.7	3.2	19	2.5	31	1316	3.1	46	4.6	47	1504	2.3
2836.4	1.5	16	1.6	26	1168	2.7	21	2.9	39	1336	2.0
2837.1	2.2	16	2.0	31	1192	2.0	31	3.7	47	1363	1.4
2837.8	2.2	16	2.3	25	1245	2.0	32	4.2	38	1424	1.5
2838.5	2.9	17	2.1	29	1336	2.9	42	3.8	44	1528	2.1
2839.2	2.8	20	1.8	29	1124	2.3	40	3.3	45	1285	1.7
2839.9	2.7	14	1.6	26	1082	2.4	39	2.9	40	1237	1.7
2840.6	3.1	15	1.6	23	1192	1.4	44	2.9	34	1363	1.0
2841.3	3.2	15	2.3	25	1196	2.0	47	4.1	39	1367	1.5
2842.0	2.5	13	1.9	25	1155	2.1	36	3.4	38	1321	1.5
2842.7	2.0	18	1.5	29	1091	2.9	29	2.8	45	1248	2.1
2843.4	3.1	16	2.0	26	1248	2.9	44	3.7	40	1427	2.1
2844.1	1.9	15	1.3	27	1162	2.5	27	2.3	42	1329	1.8
2844.8	1.6	15	1.6	28	1203	1.8	23	2.9	44	1375	1.3
2845.5	2.9	16	1.6	26	1171	2.4	42	3.0	39	1339	1.7
2846.2	1.6	17	1.6	28	1387	3.4	24	2.9	42	1586	2.5
2846.9	1.8	17	1.4	24	1076	3.0	25	2.6	37	1231	2.2
2847.6	1.7	17	1.2	25	1101	2.4	24	2.3	39	1259	1.8
2848.3	2.0	16	2.0	21	1205	2.9	29	3.7	33	1378	2.1
2849.0	2.2	16	1.8	28	1259	3.7	31	3.3	43	1440	2.7
2849.7	1.2	15	1.5	23	1121	2.3	18	2.7	35	1282	1.7
2850.4	1.1	16	1.7	26	1048	2.0	16	3.2	41	1199	1.4
2851.1	2.4	16	1.5	21	1147	2.4	35	2.7	31	1311	1.8
2851.8	1.1	14	1.7	23	1198	2.8	15	3.0	35	1370	2.0
2852.5	1.6	19	1.6	25	1164	2.7	24	2.9	39	1331	1.9
2853.1	1.5	16	1.9	24	1273	1.5	21	3.4	37	1456	1.1
2853.8	1.5	16	1.6	21	1172	2.2	22	2.8	33	1340	1.6
2854.5	1.4	14	1.6	25	1183	1.9	21	2.8	38	1353	1.4
2855.2	1.4	18	1.6	22	1092	2.3	20	3.0	33	1249	1.7
2855.9	1.8	15	1.6	24	1083	1.7	27	2.9	37	1239	1.2
2856.6	1.0	16	1.7	25	1146	2.4	15	3.1	38	1311	1.8
2857.3	1.4	14	1.5	21	909	2.5	20	2.7	32	1039	1.8
2858.0	2.6	16	1.6	22	1123	2.5	37	2.9	34	1284	1.8
2858.7	1.2	15	0.970	24	1162	1.9	18	1.8	36	1328	1.4
2859.4	2.1	13	1.6	22	986	2.4	31	3.0	34	1128	1.7
2860.1	1.8	13	1.4	22	976	1.4	26	2.5	34	1117	1.0
2860.8	1.5	15	1.8	18	892	2.6	21	3.2	28	1020	1.9
2861.5	2.0	16	1.3	21	1039	2.2	29	2.3	32	1188	1.6
2862.2	2.2	15	1.4	22	1084	2.6	31	2.6	34	1240	1.9
2862.9	1.6	14	1.5	20	961	2.5	23	2.7	30	1099	1.8
2863.6	2.1	15	1.4	25	1124	2.4	31	2.5	38	1285	1.7
2864.3	2.6	14	0.821	23	1126	2.1	38	1.5	36	1288	1.5
2865.0	2.0	17	1.4	20	1251	2.2	29	2.6	31	1430	1.6
2865.7	3.0	19	1.4	20	1194	1.8	44	2.6	30	1365	1.3
2866.4	2.0	16	1.2	25	1075	2.4	29	2.2	39	1229	1.7
2867.1	1.7	14	1.3	19	1202	2.0	25	2.3	29	1374	1.5
2867.8	1.6	14	1.4	19	1270	3.1	24	2.5	29	1453	2.3
2868.5	2.0	14	0.915	13	1103	1.5	29	1.7	20	1262	1.1
2869.2	1.8	18	1.1	17	1029	1.9	25	2.1	27	1176	1.4
2869.9	1.6	13	0.948	23	1264	2.5	23	1.7	35	1446	1.8
2870.6	1.1	14	1.6	20	1093	2.6	16	3.0	31	1250	1.9
2871.3	1.7	14	1.3	21	1092	1.4	24	2.4	31	1249	1.0
2872.0	2.7	14	1.3	19	1089	2.1	39	2.4	30	1245	1.5
2872.7	1.6	14	1.9	23	1129	1.9	23	3.5	35	1291	1.4
2873.4	1.4	16	0.805	17	1044	2.4	20	1.5	27	1194	1.7
2874.1	1.3	10	2.0	21	1136	2.1	19	3.6	33	1299	1.5
2874.8	1.8	13	1.6	22	1254	1.8	26	2.9	33	1434	1.3
2875.5	1.7	16	1.5	19	1336	2.5	24	2.7	30	1528	1.8
2876.2	2.0	13	1.3	21	1199	2.0	29	2.4	32	1371	1.4
2876.9	1.4	15	1.5	24	1343	3.0	21	2.7	36	1536	2.2
2877.6	2.0	13	1.6	18	1313	2.8	29	3.0	28	1501	2.0
2878.3	2.5	17	1.8	22	1435	2.5	36	3.3	34	1641	1.9
2879.0	2.2	17	1.6	24	1269	1.5	32	2.9	37	1452	1.1
2879.7	1.4	14	1.1	19	1254	3.3	20	2.0	28	1434	2.4
2880.3	1.6	15	1.3	17	1157	1.6	23	2.3	26	1323	1.1



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
2881.0	1.8	14	1.7	19	1453	2.8	26	3.0	30	1662	2.0
2881.7	2.2	14	1.4	22	1311	2.6	31	2.5	34	1499	1.9
2882.4	2.4	17	1.2	22	1443	2.2	35	2.2	34	1650	1.6
2883.1	1.9	18	1.7	20	1230	2.5	28	3.1	30	1406	1.8
2883.8	1.8	18	1.5	20	1217	3.0	26	2.7	31	1391	2.2
2884.5	1.4	15	1.5	18	1381	2.9	20	2.8	28	1579	2.1
2885.2	2.1	17	1.2	22	1401	3.4	30	2.3	34	1602	2.5
2885.9	1.6	16	1.1	17	1108	2.7	23	2.0	26	1267	1.9
2886.6	1.5	18	1.4	17	1176	2.9	21	2.5	26	1345	2.1
2887.3	1.8	16	1.3	19	1089	1.5	26	2.3	28	1245	1.1
2888.0	2.2	14	1.1	22	1209	2.1	32	1.9	34	1383	1.5
2888.7	3.5	18	1.1	21	1248	1.8	50	2.1	33	1428	1.3
2889.4	2.8	15	1.2	17	1064	2.8	41	2.1	26	1216	2.0
2890.1	1.4	16	0.905	14	1153	2.3	21	1.6	21	1318	1.7
2890.8	1.5	15	1.2	17	1109	2.3	22	2.2	26	1269	1.7
2891.5	2.0	16	1.1	19	1350	2.8	28	2.0	30	1543	2.0
2892.2	2.1	18	1.2	22	1184	2.6	31	2.1	34	1354	1.9
2892.9	1.1	19	1.2	20	1167	2.3	16	2.2	31	1335	1.6
2893.6	1.7	15	1.6	19	1147	3.2	25	2.9	29	1312	2.3
2894.3	1.4	16	1.5	19	1216	2.8	20	2.8	30	1391	2.1
2895.0	1.2	19	1.4	21	1222	0.996	18	2.5	32	1398	0.727
2895.7	1.8	16	1.5	16	1171	1.8	26	2.7	25	1339	1.3
2896.4	1.3	18	1.3	17	1176	0.932	18	2.4	26	1345	0.680
2897.1	2.0	18	1.8	19	1266	2.4	29	3.3	29	1447	1.8
2897.8	2.0	19	1.2	14	1098	2.8	28	2.2	22	1255	2.0
2898.5	1.5	18	1.2	18	1172	2.6	21	2.2	28	1340	1.9
2899.2	1.7	18	1.4	20	1141	2.4	25	2.5	30	1305	1.8
2899.9	1.0	17	1.4	18	1136	2.3	15	2.5	27	1299	1.7
2900.6	0.418	20	1.2	14	1135	2.6	6.0	2.1	22	1298	1.9
2901.3	1.2	18	1.3	13	982	1.3	17	2.3	21	1122	0.937
2902.0	1.2	18	1.4	16	1097	1.7	17	2.6	24	1254	1.3
2902.7	1.7	21	1.3	19	1178	1.3	25	2.4	28	1347	0.937
2903.4	1.3	17	1.4	17	1009	1.8	19	2.5	26	1154	1.3
2904.1	2.3	19	1.0	16	1014	0.838	33	1.9	25	1159	0.612
2904.8	1.5	16	1.2	19	1078	1.9	21	2.2	29	1233	1.4
2905.5	1.2	22	0.991	14	1090	2.0	17	1.8	22	1247	1.5
2906.2	0.492	24	1.2	14	988	1.3	7.1	2.2	22	1130	0.915
2906.8	1.0	24	1.5	12	950	2.3	15	2.7	19	1086	1.7
2907.5	2.6	23	1.1	15	972	2.0	37	2.0	23	1112	1.5
2908.2	1.5	28	1.3	18	987	1.8	22	2.4	28	1128	1.3
2908.9	1.3	30	0.906	16	1159	2.1	19	1.7	25	1325	1.5
2909.6	1.1	27	1.1	15	988	1.1	16	2.0	23	1130	0.821
2910.3	1.4	34	1.2	19	1036	1.2	20	2.2	29	1185	0.866
2911.0	0.924	31	1.3	17	1021	2.2	13	2.4	27	1167	1.6
2911.7	1.6	35	1.5	18	1042	2.4	23	2.8	28	1191	1.8
2912.4	1.0	33	1.4	14	884	1.4	15	2.6	21	1011	1.0
2913.1	1.1	34	1.6	15	887	2.4	17	2.9	22	1014	1.7
2913.8	0.977	33	1.1	13	912	1.4	14	2.0	20	1043	1.0
2914.5	1.1	31	1.2	9.0	880	1.5	16	2.2	14	1007	1.1
2915.2	0.976	35	1.2	15	887	1.5	14	2.3	22	1015	1.1
2915.9	0.888	38	1.5	14	987	2.4	13	2.8	22	1129	1.7
2916.6	0.809	40	0.968	10.0	791	1.9	12	1.8	15	904	1.4
2917.3	0.713	40	0.830	12	852	1.8	10	1.5	18	974	1.3
2918.0	0.722	47	1.2	12	932	1.3	10	2.2	18	1065	0.967
2918.7	0.627	39	1.2	8.9	914	1.4	9.0	2.3	14	1046	1.0
2919.4	0.402	52	0.890	10.0	799	2.0	5.8	1.6	15	914	1.5
2920.1	0.643	43	1.0	10	877	1.3	9.3	1.8	16	1003	0.934
2920.8	0.757	45	1.2	14	870	1.9	11	2.2	22	994	1.4
2921.5	0.393	40	1.0	10	814	0.934	5.7	1.9	16	931	0.682
2922.2	0.502	44	0.509	7.5	748	1.6	7.2	0.928	11	856	1.1
2922.9	0.658	46	0.930	8.9	775	1.3	9.5	1.7	14	887	0.949
2923.6	0.587	54	1.3	8.2	827	0.758	8.5	2.3	13	946	0.553
2924.3	0.768	47	0.537	9.5	721	1.6	11	0.980	14	825	1.2
2925.0	0.393	37	0.906	8.3	740	2.3	5.7	1.7	13	846	1.7
2925.7	0.393	49	0.773	9.1	791	1.8	5.7	1.4	14	905	1.3
2926.4	0.599	43	0.710	7.6	754	0.903	8.7	1.3	12	863	0.659
2927.1	0.393	43	0.672	6.8	764	1.2	5.7	1.2	10	874	0.859
2927.8	0.477	52	0.757	10.0	838	1.4	6.9	1.4	15	958	1.0
2928.5	0.393	52	0.530	8.9	709	5.9	5.7	0.966	14	811	4.3
2929.2	0.906	45	0.570	10	789	0.934	13	1.0	16	902	0.681
2929.9	0.393	48	0.336	8.2	690	0.581	5.7	0.612	13	789	0.424
2930.6	0.393	43	0.592	6.9	819	1.1	5.7	1.1	11	936	0.799
2931.3	0.397	45	0.588	7.1	626	0.827	5.7	1.1	11	715	0.604
2932.0	0.725	49	0.394	7.3	635	0.950	10	0.718	11	726	0.693
2932.6	0.830	43	0.439	5.6	609	0.798	12	0.800	8.6	696	0.583
2933.3	0.459	47	0.408	6.8	604	0.846	6.6	0.743	10	691	0.617
2934.0	0.393	45	0.406	5.4	728	0.465	5.7	0.740	8.3	833	0.339
2934.7	0.527	51	0.271	5.7	724	0.972	7.6	0.494	8.7	828	0.709
2935.4	0.473	44	0.424	5.8	654	0.874	6.8	0.773	8.9	748	0.637
2936.1	0.846	45	0.316	6.2	585	0.820	12	0.575	9.4	669	0.598
2936.8	0.558	47	0.333	4.9	689	0.617	8.1	0.608	7.6	788	0.450



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2937.5	0.393	40	0.306	6.0	624	0.884	5.7	0.559	9.2	713	0.645
2938.2	0.393	49	0.365	3.7	682	1.3	5.7	0.665	5.7	780	0.937
2938.9	0.491	39	0.436	3.1	652	0.815	7.1	0.796	4.8	745	0.594
2939.6	0.393	41	0.309	5.0	735	1.2	5.7	0.564	7.6	841	0.906
2940.3	0.393	38	0.332	5.0	550	1.2	5.7	0.606	7.6	628	0.866
2941.0	0.393	45	0.515	1.9	676	1.2	5.7	0.939	3.0	773	0.894
2941.7	0.393	47	0.490	2.9	601	1.1	5.7	0.894	4.4	687	0.816
2942.4	0.532	45	0.163	5.0	672	0.883	7.7	0.297	7.6	768	0.644
2943.1	0.393	43	0.305	2.8	494	1.1	5.7	0.556	4.2	564	0.784
2943.8	0.682	50	0.268	4.3	746	1.3	9.9	0.489	6.6	854	0.916
2944.5	0.511	49	0.603	3.4	660	1.0	7.4	1.1	5.2	755	0.756
2945.2	0.393	49	0.211	5.0	613	1.4	5.7	0.385	7.7	701	1.1
2945.9	0.592	50	0.305	3.1	658	0.546	8.6	0.556	4.7	752	0.399
2946.6	0.588	52	0.230	6.4	615	0.591	8.5	0.419	9.8	703	0.431
2947.3	0.393	49	0.371	3.6	619	1.3	5.7	0.677	5.6	708	0.954
2948.0	0.737	54	0.288	4.5	761	1.5	11	0.526	6.8	871	1.1
2948.7	1.1	54	0.554	3.5	617	0.989	16	1.0	5.4	705	0.721
2949.4	0.971	46	0.528	4.6	626	0.941	14	0.962	7.0	716	0.687
2950.1	0.393	54	0.347	6.0	575	0.428	5.7	0.632	9.2	657	0.312
2950.8	0.393	52	0.532	5.4	611	0.975	5.7	0.970	8.2	699	0.711
2951.5	0.899	57	0.383	6.3	635	0.635	13	0.698	9.6	727	0.463
2952.2	0.540	50	0.349	6.2	659	1.0	7.8	0.636	9.4	754	0.730
2952.9	1.1	47	0.230	4.1	637	0.488	15	0.420	6.3	728	0.356
2953.6	0.393	55	0.180	4.4	777	1.1	5.7	0.328	6.7	888	0.824
2954.3	0.795	47	0.147	3.4	627	0.731	11	0.268	5.3	717	0.533
2955.0	0.492	53	0.276	5.7	606	0.392	7.1	0.503	8.8	693	0.286
2955.7	0.393	59	0.574	7.2	632	1.1	5.7	1.0	11	723	0.767
2956.4	0.393	55	0.266	6.0	621	0.378	5.7	0.485	9.3	710	0.276
2957.1	0.583	47	0.324	4.3	551	0.646	8.4	0.591	6.6	630	0.471
2957.8	0.393	65	0.205	5.7	680	1.0	5.7	0.375	8.8	777	0.732
2958.4	1.5	53	0.259	2.8	629	1.3	21	0.472	4.3	719	0.984
2959.1	0.393	54	0.330	6.2	611	1.1	5.7	0.601	9.5	698	0.824
2959.8	0.393	47	0.332	4.8	710	0.648	5.7	0.605	7.4	812	0.473
2960.5	0.648	61	0.587	5.6	583	0.750	9.3	1.1	8.6	667	0.547
2961.2	0.393	53	0.275	6.0	549	0.729	5.7	0.501	9.2	628	0.532
2961.9	1.1	61	0.150	5.3	587	1.7	16	0.273	8.1	671	1.2
2962.6	0.420	74	0.440	6.5	614	1.4	6.1	0.803	10	703	1.0
2963.3	1.2	60	0.697	5.3	643	0.759	17	1.3	8.1	736	0.554
2964.0	0.393	56	0.498	3.1	524	0.431	5.7	0.908	4.7	600	0.314
2964.7	0.393	57	0.120	3.6	768	1.4	5.7	0.219	5.6	878	1.0
2965.4	0.393	52	0.230	2.8	608	0.972	5.7	0.420	4.3	695	0.709
2966.1	1.3	59	0.367	4.4	670	1.1	19	0.669	6.8	766	0.802
2966.8	0.712	50	0.485	5.3	506	0.394	10	0.884	8.1	578	0.287
2967.5	0.393	57	0.295	5.6	618	0.699	5.7	0.538	8.6	707	0.510
2968.2	0.393	60	0.602	6.6	656	0.154	5.7	1.1	10	750	0.112
2968.9	0.393	66	0.466	5.6	681	0.576	5.7	0.850	8.5	778	0.420
2969.6	0.474	51	0.145	4.0	557	0.885	6.8	0.264	6.1	637	0.646
2970.3	0.393	60	0.272	6.4	606	0.985	5.7	0.497	9.7	693	0.719
2971.0	0.393	61	0.308	6.0	548	1.0	5.7	0.562	9.3	626	0.746
2971.7	0.393	51	0.263	3.9	529	1.3	5.7	0.480	6.0	605	0.916
2972.4	0.487	54	0.525	5.5	519	0.455	7.0	0.958	8.4	593	0.332
2973.1	0.393	51	0.695	6.8	520	0.796	5.7	1.3	10	594	0.581
2973.8	0.728	63	0.394	5.4	620	0.844	11	0.719	8.3	709	0.616
2974.5	0.689	68	0.193	2.8	700	1.1	9.9	0.351	4.3	801	0.815
2975.2	0.608	65	0.596	6.5	583	1.3	8.8	1.1	9.9	667	0.943
2975.9	0.393	58	0.177	6.8	590	0.294	5.7	0.323	10	675	0.214
2976.6	0.393	56	0.432	1.9	518	0.169	5.7	0.788	2.8	593	0.123
2977.3	0.962	54	0.455	5.7	770	1.4	14	0.829	8.7	880	1.0
2978.0	0.393	70	0.416	4.0	710	0.987	5.7	0.760	6.1	812	0.720
2978.7	0.472	45	0.236	4.7	566	0.752	6.8	0.431	7.2	647	0.548
2979.4	0.393	64	0.317	8.7	537	0.574	5.7	0.579	13	614	0.418
2980.1	1.5	115	0.876	7.9	618	1.4	22	1.6	12	706	1.0
2980.8	0.393	79	0.506	10	541	0.649	5.7	0.922	15	619	0.474
2981.5	0.393	63	0.391	7.8	578	0.830	5.7	0.713	12	661	0.606
2982.2	0.522	61	0.547	4.2	716	0.784	7.5	0.997	6.5	819	0.572
2982.9	0.393	98	0.386	3.2	459	0.915	5.7	0.704	4.9	524	0.668
2983.6	0.890	92	0.947	4.2	570	0.824	13	1.7	6.4	652	0.602
2984.2	0.724	72	0.354	3.8	485	1.2	10	0.645	5.9	554	0.856
2984.9	0.414	69	0.503	7.3	439	0.589	6.0	0.918	11	502	0.430
2985.6	0.497	68	0.338	10	560	0.236	7.2	0.616	16	640	0.172
2986.3	0.393	81	0.742	5.7	552	0.799	5.7	1.4	8.8	632	0.583
2987.0	0.449	89	1.2	7.0	551	0.577	6.5	2.2	11	630	0.421
2987.7	0.393	65	0.347	6.4	549	1.3	5.7	0.632	9.9	628	0.914
2988.4	0.393	87	0.261	7.1	572	1.9	5.7	0.476	11	654	1.4
2989.1	0.393	70	0.442	8.8	491	0.469	5.7	0.805	13	561	0.342
2989.8	0.393	102	0.702	2.3	541	1.1	5.7	1.3	3.5	619	0.799
2990.5	0.537	74	0.653	8.9	539	1.5	7.8	1.2	14	616	1.1
2991.2	0.406	79	0.786	4.9	529	1.0	5.9	1.4	7.6	604	0.761
2991.9	0.393	78	0.649	8.8	393	0.003	5.7	1.2	13	450	0.002
2992.6	0.393	88	0.827	10.0	558	0.354	5.7	1.5	15	638	0.258
2993.3	0.393	107	0.941	5.0	698	1.2	5.7	1.7	7.6	798	0.881



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
2994.0	0.393	95	1.0	5.5	617	0.311	5.7	1.8	8.4	706	0.227
2994.7	0.393	68	0.383	7.2	412	0.535	5.7	0.699	11	471	0.390
2995.4	1.0	82	0.385	6.9	570	0.003	15	0.702	11	652	0.002
2996.1	0.393	87	0.079	9.1	458	1.4	5.7	0.144	14	523	1.0
2996.8	0.571	122	0.857	9.4	459	0.367	8.2	1.6	14	525	0.268
2997.5	0.393	105	0.517	9.2	435	1.7	5.7	0.942	14	497	1.2
2998.2	0.393	77	0.364	5.1	432	0.370	5.7	0.663	7.7	494	0.270
2998.9	0.393	93	0.315	8.4	438	0.416	5.7	0.574	13	501	0.304
2999.6	0.393	110	1.7	12	422	1.4	5.7	3.1	19	483	1.0
3000.3	0.393	110	0.079	8.5	502	0.962	5.7	0.144	13	574	0.702
3001.0	0.393	67	0.743	8.1	287	0.318	5.7	1.4	12	328	0.232
3001.7	0.393	89	0.229	4.7	348	0.431	5.7	0.418	7.3	398	0.315
3002.4	0.393	113	2.5	10	515	0.689	5.7	4.6	16	589	0.503
3003.1	0.393	139	2.5	7.2	712	1.3	5.7	4.6	11	814	0.949
3003.8	0.393	101	1.7	7.4	427	4.0	5.7	3.1	11	488	2.9
3004.5	0.393	129	3.6	19	572	0.820	5.7	6.5	29	654	0.598



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
0.0	0.393	4489	145	4817	1422	0.003	5.7	265	7382	1626	0.002
0.7	0.393	818	8.1	0.702	1006	0.003	5.7	15	1.1	1151	0.002
1.4	8.1	127	1.3	28	325	7.1	117	2.4	42	371	5.1
2.1	0.393	224	2.2	26	642	0.003	5.7	4.0	39	734	0.002
2.8	7.4	272	0.708	25	982	4.3	107	1.3	39	1123	3.2
3.5	2.6	200	2.5	11	622	0.003	38	4.5	18	711	0.002
4.2	0.769	191	1.4	10	601	3.4	11	2.6	16	688	2.5
4.9	0.393	123	0.931	7.5	532	2.6	5.7	1.7	12	609	1.9
5.6	0.709	139	0.711	0.708	537	4.6	10	1.3	1.1	614	3.4
6.3	0.700	147	2.0	6.7	744	2.9	10	3.6	10	851	2.1
7.0	0.788	138	0.745	8.7	511	1.3	11	1.4	13	584	0.970
7.7	0.393	90	0.447	8.1	632	2.2	5.7	0.816	12	723	1.6
8.4	0.393	96	0.828	6.9	627	1.1	5.7	1.5	11	717	0.769
9.1	0.826	112	0.516	8.8	746	1.8	12	0.941	14	853	1.3
9.8	0.393	127	0.658	0.702	561	2.2	5.7	1.2	1.1	641	1.6
10.5	0.627	101	0.695	5.3	579	2.2	9.1	1.3	8.1	663	1.6
11.2	0.393	77	0.237	1.5	541	2.1	5.7	0.432	2.4	619	1.6
11.9	0.393	68	0.868	1.9	505	0.834	5.7	1.6	2.9	577	0.609
12.6	0.393	72	0.571	2.4	568	2.0	5.7	1.0	3.7	649	1.5
13.3	0.393	72	0.703	2.6	631	1.0	5.7	1.3	4.0	722	0.735
14.0	0.536	75	0.396	2.4	572	1.7	7.7	0.723	3.7	654	1.2
14.7	0.742	64	0.570	3.6	504	0.981	11	1.0	5.6	576	0.716
15.4	0.393	67	0.320	1.5	601	1.7	5.7	0.583	2.3	687	1.2
16.0	0.393	73	0.079	4.2	583	2.0	5.7	0.144	6.4	667	1.4
16.7	0.393	81	0.164	2.4	572	1.6	5.7	0.299	3.6	654	1.2
17.4	0.393	56	0.414	3.1	520	0.736	5.7	0.754	4.7	595	0.537
18.1	0.583	46	0.274	1.7	544	0.642	8.4	0.500	2.6	622	0.468
18.8	0.487	59	0.270	1.7	646	1.4	7.0	0.493	2.6	739	1.0
19.5	0.547	62	0.079	2.9	663	0.796	7.9	0.144	4.5	758	0.581
20.2	0.393	48	0.486	3.4	522	1.2	5.7	0.887	5.3	597	0.860
20.9	0.393	36	0.406	2.9	616	0.748	5.7	0.741	4.5	704	0.545
21.6	0.393	37	0.454	1.9	640	1.4	5.7	0.828	2.9	732	1.0
22.3	0.393	42	0.139	1.4	610	0.414	5.7	0.253	2.2	697	0.302
23.0	0.393	40	0.215	3.5	530	1.0	5.7	0.391	5.4	606	0.745
23.7	0.393	37	0.362	4.2	618	0.774	5.7	0.661	6.5	707	0.565
24.4	0.533	32	0.224	1.4	582	1.1	7.7	0.408	2.1	666	0.770
25.1	0.393	38	0.079	0.702	648	2.6	5.7	0.144	1.1	741	1.9
25.8	0.393	30	0.140	2.4	557	0.681	5.7	0.255	3.7	637	0.497
26.5	0.393	29	0.164	2.1	633	1.1	5.7	0.299	3.2	723	0.820
27.2	0.393	24	0.090	2.7	635	0.919	5.7	0.163	4.2	726	0.671
27.9	0.393	32	0.146	2.8	697	1.3	5.7	0.266	4.3	797	0.952
28.6	0.393	25	0.336	3.5	702	1.1	5.7	0.612	5.3	803	0.784
29.3	0.393	29	0.079	2.6	654	0.818	5.7	0.144	4.0	748	0.597
30.0	0.393	24	0.160	1.1	712	0.770	5.7	0.292	1.8	814	0.562
30.7	0.434	21	0.079	3.3	703	0.544	6.3	0.144	5.0	804	0.397
31.4	0.732	19	0.252	2.6	738	0.827	11	0.460	4.0	844	0.604
32.1	0.536	18	0.079	2.8	785	0.826	7.7	0.144	4.3	898	0.603
32.8	0.393	21	0.149	2.1	897	1.3	5.7	0.272	3.2	1025	0.972
33.5	0.393	19	0.079	2.7	826	1.3	5.7	0.144	4.2	945	0.951
34.2	0.562	17	0.236	2.6	840	0.743	8.1	0.431	4.0	961	0.542
34.9	0.689	15	0.079	1.7	900	1.1	9.9	0.144	2.7	1030	0.812
35.6	0.393	17	0.102	3.7	781	1.9	5.7	0.186	5.7	893	1.4
36.3	0.393	16	0.079	2.4	907	0.756	5.7	0.144	3.7	1038	0.551
37.0	0.393	15	0.174	3.5	992	1.1	5.7	0.317	5.3	1135	0.785
37.7	0.393	17	0.079	2.7	870	1.5	5.7	0.144	4.1	994	1.1
38.4	0.393	17	0.110	2.0	841	1.5	5.7	0.201	3.1	961	1.1
39.1	0.393	14	0.079	2.4	994	1.1	5.7	0.144	3.7	1137	0.792
39.8	0.393	17	0.163	3.8	893	0.874	5.7	0.298	5.9	1021	0.638
40.5	0.393	16	0.134	4.0	984	1.5	5.7	0.244	6.1	1125	1.1
41.2	0.568	15	0.112	3.8	895	1.0	8.2	0.204	5.8	1024	0.732
41.9	0.393	16	0.198	3.5	811	1.1	5.7	0.361	5.4	928	0.832
42.6	0.393	16	0.151	4.9	867	0.932	5.7	0.275	7.5	992	0.680
43.2	0.393	19	0.106	5.0	954	1.6	5.7	0.193	7.7	1090	1.2
43.9	0.393	17	0.187	5.9	881	2.1	5.7	0.340	9.1	1008	1.5
44.6	0.393	18	0.080	6.0	906	0.613	5.7	0.145	9.3	1036	0.447
45.3	0.393	18	0.197	5.2	807	1.5	5.7	0.359	8.0	923	1.1
46.0	0.393	16	0.454	5.4	1050	0.885	5.7	0.828	8.3	1201	0.646
46.7	0.393	19	0.178	7.5	947	1.3	5.7	0.325	12	1083	0.929
47.4	0.393	20	0.528	8.4	1037	2.4	5.7	0.962	13	1185	1.8
48.1	0.393	20	0.229	8.2	1053	2.3	5.7	0.417	13	1204	1.6
48.8	0.393	22	0.437	7.5	1170	3.3	5.7	0.797	11	1338	2.4
49.5	0.393	22	0.523	11	1113	2.1	5.7	0.954	16	1272	1.5
50.2	0.393	19	0.569	11	1185	3.0	5.7	1.0	18	1355	2.2
50.9	0.393	17	0.765	9.3	1315	3.5	5.7	1.4	14	1504	2.6
51.6	0.393	20	0.388	12	1267	2.7	5.7	0.708	18	1448	2.0
52.3	0.393	18	0.767	12	1342	1.9	5.7	1.4	19	1535	1.4
53.0	0.393	17	0.500	9.0	1464	3.2	5.7	0.911	14	1674	2.3
53.7	0.393	18	0.697	11	1471	3.0	5.7	1.3	16	1682	2.2
54.4	0.393	16	0.696	15	1689	3.9	5.7	1.3	23	1932	2.8
55.1	0.393	19	0.749	11	1443	2.4	5.7	1.4	17	1650	1.8
55.8	0.741	18	0.927	12	1732	3.1	11	1.7	18	1980	2.3



Minnow Environmental  
Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
56.5	0.642	18	1.2	14	1814	3.6	9.3	2.1	21	2074	2.6
57.2	0.713	19	1.2	13	1970	3.9	10	2.2	20	2253	2.9
57.9	0.847	17	1.2	14	2005	4.4	12	2.2	21	2293	3.2
58.6	0.642	20	0.946	12	1801	3.1	9.3	1.7	18	2060	2.3
59.3	0.775	16	1.2	13	2118	2.8	11	2.2	20	2422	2.0
60.0	1.4	18	0.992	13	2106	3.2	20	1.8	20	2408	2.3
60.7	1.8	19	1.5	16	1889	4.2	26	2.8	25	2160	3.1
61.4	2.2	18	1.5	15	1936	2.8	32	2.7	24	2213	2.1
62.1	1.7	16	1.3	13	1928	3.1	25	2.4	20	2205	2.3
62.8	2.1	14	1.5	14	1944	3.4	30	2.8	21	2223	2.5
63.5	2.2	15	0.911	11	1738	2.1	31	1.7	17	1987	1.5
64.2	1.3	16	1.1	11	1888	3.5	18	2.0	17	2159	2.5
64.9	2.1	17	1.4	11	1711	3.1	30	2.6	16	1957	2.2
65.6	3.2	14	1.4	10	1706	2.7	46	2.6	15	1951	1.9
66.3	2.4	16	1.1	13	1573	2.4	35	1.9	20	1799	1.8
67.0	2.8	13	0.966	10	1591	2.1	41	1.8	15	1819	1.5
67.7	1.9	13	0.706	10	1416	2.3	27	1.3	16	1619	1.6
68.4	2.7	15	1.0	10	1636	3.0	40	1.9	16	1870	2.2
69.1	2.3	13	1.0	11	1516	1.8	34	1.9	17	1734	1.3
69.7	2.8	14	0.602	6.7	1211	1.9	41	1.1	10	1385	1.4
70.4	2.1	11	0.724	8.2	1201	2.1	30	1.3	13	1373	1.5
71.1	1.6	13	0.793	8.7	1138	2.0	23	1.4	13	1301	1.5
71.8	1.0	11	0.462	7.0	1042	2.0	15	0.842	11	1191	1.5
72.5	1.4	15	0.589	5.9	1123	1.6	21	1.1	9.0	1284	1.2
73.2	1.0	10	0.463	6.5	1010	0.903	15	0.844	9.9	1154	0.659
73.9	1.5	12	0.079	7.3	1048	1.6	22	0.144	11	1198	1.2
74.6	0.779	13	0.203	5.9	973	2.6	11	0.371	9.0	1113	1.9
75.3	0.552	15	0.142	5.4	956	2.1	8.0	0.260	8.3	1093	1.5
76.0	0.724	11	0.167	4.7	830	1.9	10	0.304	7.2	949	1.4
76.7	0.826	14	0.295	6.2	986	2.2	12	0.539	9.5	1128	1.6
77.4	0.774	12	0.178	4.3	939	0.636	11	0.325	6.6	1074	0.464
78.1	0.641	13	0.127	5.7	874	1.7	9.3	0.232	8.8	1000	1.2
78.8	1.0	13	0.103	4.7	945	1.2	15	0.187	7.2	1080	0.896
79.5	0.393	12	0.173	1.8	945	1.0	5.7	0.316	2.7	1081	0.752
80.2	0.393	14	0.107	2.9	853	1.2	5.7	0.195	4.5	975	0.856
80.9	0.393	15	0.085	4.7	943	0.655	5.7	0.155	7.3	1079	0.478
81.6	0.393	15	0.215	6.5	876	0.906	5.7	0.392	10.0	1002	0.661
82.3	0.542	16	0.201	6.4	1002	0.836	7.8	0.366	9.9	1146	0.610
83.0	0.590	13	0.293	6.0	896	1.1	8.5	0.535	9.3	1025	0.838
83.7	0.393	15	0.125	5.5	840	1.9	5.7	0.228	8.4	961	1.4
84.4	0.393	17	0.180	7.9	879	1.2	5.7	0.329	12	1005	0.861
85.1	0.393	16	0.118	4.5	840	0.862	5.7	0.215	7.0	960	0.629
85.8	0.393	19	0.240	8.4	898	1.0	5.7	0.437	13	1027	0.738
86.5	0.677	20	0.159	9.4	811	1.1	9.8	0.290	14	928	0.797
87.2	0.393	17	0.367	7.8	871	0.948	5.7	0.670	12	996	0.692
87.9	0.393	16	0.268	9.1	823	0.725	5.7	0.488	14	941	0.529
88.6	0.393	15	0.485	10	936	0.774	5.7	0.885	16	1070	0.564
89.3	0.439	15	0.309	12	880	2.0	6.3	0.564	19	1007	1.4
90.0	0.393	15	0.283	10	891	1.5	5.7	0.516	15	1019	1.1
90.7	0.496	15	0.602	16	867	1.7	7.2	1.1	24	991	1.3
91.4	0.393	18	0.544	13	963	0.786	5.7	0.991	21	1101	0.573
92.1	0.393	15	0.371	15	933	2.0	5.7	0.677	23	1067	1.5
92.8	0.393	16	0.583	16	1022	1.9	5.7	1.1	25	1169	1.4
93.5	0.393	17	0.638	13	1078	1.1	5.7	1.2	20	1233	0.779
94.2	0.453	17	0.628	16	1011	1.4	6.5	1.1	25	1156	0.996
94.9	0.393	17	0.401	12	996	2.2	5.7	0.731	19	1139	1.6
95.5	0.393	19	0.797	20	1305	1.7	5.7	1.5	31	1492	1.2
96.2	0.393	19	0.972	14	1235	1.7	5.7	1.8	22	1412	1.3
96.9	0.393	19	0.790	21	1472	3.0	5.7	1.4	33	1683	2.2
97.6	0.393	21	1.1	18	1800	1.8	5.7	2.0	27	2058	1.3
98.3	0.393	22	0.928	24	1392	2.1	5.7	1.7	37	1592	1.5
99.0	0.619	20	0.863	19	1837	1.7	8.9	1.6	30	2101	1.2
99.7	0.393	18	1.5	20	1733	1.9	5.7	2.7	31	1981	1.4
100.4	1.2	18	1.7	22	1870	2.5	17	3.1	33	2139	1.8
101.1	0.817	20	1.5	26	1793	1.2	12	2.7	39	2050	0.866
101.8	0.987	20	1.5	30	1885	1.5	14	2.7	46	2156	1.1
102.5	0.943	16	1.6	26	2088	1.8	14	2.9	40	2388	1.3
103.2	0.851	22	1.9	28	1707	2.6	12	3.4	43	1952	1.9
103.9	0.744	22	1.8	29	1937	1.7	11	3.3	44	2214	1.3
104.6	1.6	18	2.4	33	1914	3.0	23	4.4	50	2189	2.2
105.3	1.1	20	1.4	29	1888	1.9	15	2.5	44	2159	1.4
106.0	1.4	20	2.6	31	2319	2.8	20	4.7	47	2651	2.0
106.7	1.2	22	2.8	26	1935	2.2	18	5.0	39	2213	1.6
107.4	1.1	19	2.9	33	2056	2.2	16	5.3	50	2352	1.6
108.1	0.695	20	2.8	32	2041	2.5	10	5.1	50	2334	1.8
108.8	2.8	20	2.1	30	1909	3.2	40	3.9	46	2183	2.3
109.5	2.3	25	2.8	30	2079	2.3	33	5.1	46	2377	1.7
110.2	1.8	20	2.8	33	1946	1.8	26	5.0	51	2226	1.3
110.9	2.7	17	3.0	27	1777	1.6	39	5.4	41	2031	1.2
111.6	2.8	17	2.9	31	1897	2.0	41	5.4	47	2169	1.5
112.3	2.5	20	3.6	35	2218	3.7	36	6.6	53	2536	2.7



Minnow Environmental  
Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.0	3.7	18	3.3	33	1828	2.7	53	6.1	51	2090	2.0
113.7	2.0	17	3.3	29	1619	3.4	29	6.0	44	1851	2.5
114.4	3.0	16	3.2	30	1646	2.7	44	5.9	46	1882	2.0
115.1	2.9	15	3.8	25	1915	2.2	42	6.9	38	2190	1.6
115.8	4.2	16	3.2	27	1781	3.5	60	5.8	42	2037	2.6
116.5	3.8	18	2.9	26	1654	3.1	55	5.3	40	1891	2.3
117.2	3.9	14	3.2	23	1644	2.3	56	5.9	35	1880	1.7
117.9	4.0	16	2.8	26	1592	1.7	58	5.2	39	1820	1.2
118.6	4.3	15	2.6	23	1494	1.3	62	4.8	36	1708	0.916
119.3	4.6	13	3.0	22	1461	2.8	67	5.5	34	1671	2.1
120.0	4.5	14	2.6	23	1473	2.4	66	4.7	36	1685	1.8
120.7	4.9	15	2.2	19	1463	4.2	71	3.9	29	1673	3.1
121.4	5.0	12	2.3	16	1424	2.8	72	4.2	25	1629	2.0
122.0	3.3	11	2.4	17	1224	3.0	48	4.4	26	1399	2.2
122.7	3.5	13	2.2	17	1122	2.5	51	4.0	27	1283	1.8
123.4	3.9	17	1.9	16	1299	3.0	56	3.4	24	1485	2.2
124.1	5.3	13	1.4	13	1061	2.1	76	2.6	20	1214	1.5
124.8	4.1	12	1.3	14	1199	3.0	59	2.4	22	1371	2.2
125.5	4.6	14	1.4	13	1142	2.6	66	2.6	20	1305	1.9
126.2	3.0	11	0.885	11	1060	2.2	43	1.6	17	1212	1.6
126.9	3.3	12	1.1	13	1133	2.2	47	2.1	20	1296	1.6
127.6	4.2	14	1.2	17	1097	2.5	61	2.2	26	1255	1.9
128.3	3.2	11	0.924	11	919	2.1	46	1.7	17	1050	1.5
129.0	2.9	12	0.886	11	898	1.6	42	1.6	17	1026	1.2
129.7	2.4	12	0.525	12	833	3.2	35	0.958	19	952	2.3
130.4	2.6	13	0.614	8.6	950	1.6	38	1.1	13	1086	1.1
131.1	2.3	14	0.373	8.6	899	1.6	33	0.680	13	1028	1.2
131.8	0.998	13	0.628	11	990	1.7	14	1.1	17	1132	1.2
132.5	1.2	15	0.387	9.3	924	1.4	18	0.705	14	1057	1.1
133.2	0.880	13	0.337	8.9	979	1.6	13	0.614	14	1119	1.1
133.9	1.7	14	0.327	8.2	926	1.5	24	0.596	12	1059	1.1
134.6	1.1	13	0.175	10.0	954	1.3	16	0.319	15	1091	0.963
135.3	1.4	16	0.372	11	874	1.8	20	0.678	16	999	1.3
136.0	0.754	13	0.397	11	939	1.9	11	0.724	17	1073	1.4
136.7	0.670	17	0.334	7.3	922	1.8	9.7	0.608	11	1055	1.3
137.4	0.730	18	0.251	8.8	866	1.2	11	0.458	14	990	0.859
138.1	0.562	16	0.403	12	920	1.2	8.1	0.736	19	1052	0.903
138.8	0.393	16	0.504	9.6	959	2.3	5.7	0.918	15	1097	1.7
139.5	0.675	16	0.768	12	867	1.9	9.7	1.4	18	992	1.4
140.2	0.601	18	0.581	14	951	2.3	8.7	1.1	22	1087	1.6
140.9	0.603	18	0.433	11	967	1.9	8.7	0.791	17	1106	1.4
141.6	0.393	20	0.528	13	1127	2.4	5.7	0.962	19	1288	1.8
142.3	1.3	18	0.724	11	1196	2.4	18	1.3	16	1367	1.7
143.0	0.574	20	0.641	14	1030	2.1	8.3	1.2	21	1178	1.6
143.7	0.393	18	0.974	18	1238	2.6	5.7	1.8	28	1415	1.9
144.4	0.550	19	0.696	17	1133	1.3	7.9	1.3	26	1296	0.972
145.1	0.393	18	0.933	19	1352	2.7	5.7	1.7	29	1546	2.0
145.8	0.430	20	0.748	18	1211	2.6	6.2	1.4	28	1385	1.9
146.5	0.393	18	0.569	17	1336	1.8	5.7	1.0	25	1528	1.3
147.2	0.440	19	1.1	18	1564	4.0	6.3	2.1	27	1788	2.9
147.9	0.662	19	0.859	19	1541	4.1	9.6	1.6	29	1763	3.0
148.5	0.480	17	0.679	20	1425	3.2	6.9	1.2	30	1630	2.3
149.2	0.393	20	0.996	20	1318	2.9	5.7	1.8	30	1507	2.1
149.9	0.412	18	1.1	22	1506	3.4	5.9	1.9	33	1722	2.4
150.6	0.617	18	1.1	21	1344	3.9	8.9	2.1	33	1537	2.9
151.3	0.393	20	1.2	19	1404	4.3	5.7	2.2	30	1605	3.2
152.0	0.393	17	1.2	23	1530	2.6	5.7	2.3	36	1750	1.9
152.7	1.1	22	0.910	22	1473	3.2	17	1.7	34	1684	2.3
153.4	0.785	18	0.739	21	1371	3.7	11	1.3	33	1568	2.7
154.1	1.2	17	1.1	23	1524	2.6	17	2.1	36	1743	1.9
154.8	0.936	19	1.1	21	1357	3.2	14	2.0	32	1552	2.4
155.5	0.393	17	0.680	19	1318	2.7	5.7	1.2	29	1507	2.0
156.2	0.605	16	0.789	21	1460	1.8	8.7	1.4	33	1669	1.3
156.9	0.554	18	1.0	24	1397	1.8	8.0	1.8	37	1597	1.3
157.6	0.445	17	0.717	25	1501	1.9	6.4	1.3	38	1717	1.4
158.3	0.892	17	0.753	23	1489	2.1	13	1.4	35	1703	1.5
159.0	1.0	18	1.3	20	1301	2.2	15	2.3	31	1488	1.6
159.7	1.1	15	1.4	20	1258	1.8	16	2.5	30	1439	1.3
160.4	0.669	16	0.761	20	1301	2.4	9.7	1.4	31	1487	1.7
161.1	0.466	15	0.619	24	1339	2.7	6.7	1.1	37	1532	2.0
161.8	0.743	14	0.856	22	1296	3.0	11	1.6	34	1482	2.2
162.5	0.544	18	0.661	19	1225	2.7	7.8	1.2	29	1401	1.9
163.2	1.1	17	0.884	22	1211	2.3	16	1.6	33	1385	1.7
163.9	1.5	15	0.778	18	1297	2.1	21	1.4	28	1483	1.5
164.6	1.1	14	0.796	18	1270	2.6	16	1.5	27	1452	1.9
165.3	0.456	14	0.579	15	1174	2.5	6.6	1.1	23	1342	1.8
166.0	0.393	15	0.667	14	1029	2.5	5.7	1.2	21	1177	1.8
166.7	0.393	15	0.529	16	1114	3.2	5.7	0.965	25	1274	2.3
167.4	0.492	15	0.542	15	1195	3.5	7.1	0.988	24	1367	2.5
168.1	1.0	16	0.369	21	1191	2.7	15	0.673	32	1362	1.9
168.8	0.393	14	0.545	15	1023	2.3	5.7	0.995	23	1170	1.6



Minnow Environmental  
Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
169.5	0.393	15	0.284	16	1064	2.0	5.7	0.518	25	1216	1.5
170.2	0.393	13	0.354	14	1108	2.1	5.7	0.646	21	1267	1.5
170.9	0.393	13	0.232	12	933	1.5	5.7	0.424	19	1067	1.1
171.6	0.393	14	0.409	18	1183	1.3	5.7	0.747	27	1353	0.916
172.3	0.393	14	0.316	13	1042	2.0	5.7	0.576	20	1191	1.5
173.0	0.393	14	0.366	8.2	1107	2.3	5.7	0.667	13	1266	1.7
173.7	0.725	11	0.253	8.9	941	1.9	10	0.462	14	1076	1.4
174.3	0.546	13	0.338	9.7	1017	2.0	7.9	0.616	15	1162	1.5
175.0	0.393	11	0.418	8.9	1050	1.1	5.7	0.763	14	1201	0.822
175.7	1.3	12	0.663	7.4	1135	2.2	18	1.2	11	1298	1.6
176.4	0.393	12	0.265	9.3	1109	2.1	5.7	0.484	14	1268	1.6
177.1	0.393	13	0.392	10.0	1141	1.9	5.7	0.716	15	1305	1.4
177.8	0.595	13	0.296	6.2	968	1.6	8.6	0.540	9.6	1107	1.2
178.5	0.393	12	0.134	8.6	1124	2.0	5.7	0.244	13	1286	1.4
179.2	0.760	12	0.367	8.5	1009	1.5	11	0.670	13	1153	1.1
179.9	0.393	14	0.252	12	1124	1.5	5.7	0.460	19	1285	1.1
180.6	0.518	15	0.346	8.1	1028	1.1	7.5	0.631	12	1175	0.832
181.3	0.393	16	0.266	14	1109	2.5	5.7	0.485	21	1268	1.8
182.0	0.393	12	0.516	11	1069	1.3	5.7	0.941	17	1223	0.933
182.7	0.488	14	0.181	13	982	1.5	7.0	0.330	20	1122	1.1
183.4	0.393	18	0.432	9.4	954	1.3	5.7	0.788	14	1091	0.960
184.1	0.393	16	0.353	12	1045	1.4	5.7	0.644	18	1195	1.0
184.8	0.393	18	0.590	13	1016	2.7	5.7	1.1	20	1162	2.0
185.5	0.393	18	0.365	16	1001	1.3	5.7	0.665	25	1145	0.947
186.2	0.488	19	0.427	18	1020	2.0	7.0	0.779	27	1167	1.4
186.9	0.393	18	0.587	15	1022	1.5	5.7	1.1	23	1169	1.1
187.6	0.393	23	0.545	18	1018	2.5	5.7	0.993	28	1164	1.8
188.3	0.393	19	0.432	13	985	1.0	5.7	0.789	20	1126	0.758
189.0	0.393	21	0.440	16	1004	2.3	5.7	0.803	25	1148	1.7
189.7	0.393	23	0.791	16	891	2.8	5.7	1.4	25	1019	2.1
190.4	0.393	22	0.478	19	923	1.2	5.7	0.871	29	1056	0.906
191.1	0.393	19	0.619	20	1022	1.2	5.7	1.1	30	1169	0.865
191.8	0.393	23	0.673	22	981	3.6	5.7	1.2	33	1122	2.6
192.5	0.393	23	0.718	20	1079	2.9	5.7	1.3	30	1234	2.1
193.2	0.393	24	0.902	23	1017	2.6	5.7	1.6	36	1163	1.9
193.9	0.393	23	0.955	27	1095	2.2	5.7	1.7	42	1252	1.6
194.6	0.393	24	0.892	24	1043	2.9	5.7	1.6	37	1192	2.1
195.3	0.393	18	0.970	23	1023	1.6	5.7	1.8	35	1169	1.2
196.0	0.393	19	0.887	25	1226	3.5	5.7	1.6	38	1402	2.6
196.7	0.495	23	1.4	26	1200	3.5	7.1	2.5	40	1372	2.5
197.4	0.393	23	1.3	26	1205	1.4	5.7	2.4	40	1378	1.1
198.1	0.393	19	1.7	26	1195	2.3	5.7	3.1	40	1367	1.7
198.8	0.393	22	1.9	26	1285	3.4	5.7	3.6	40	1470	2.4
199.5	0.410	23	1.9	25	1234	2.3	5.9	3.5	39	1411	1.6
200.2	0.477	23	2.3	31	1564	1.9	6.9	4.3	48	1788	1.4
200.9	0.393	19	2.4	33	1596	1.8	5.7	4.4	51	1825	1.3
201.5	0.854	21	1.8	30	1408	2.9	12	3.4	47	1610	2.1
202.2	0.393	25	2.6	29	1519	1.9	5.7	4.7	44	1737	1.4
202.9	0.911	23	2.9	30	1370	2.5	13	5.2	45	1567	1.8
203.6	1.0	18	2.6	34	1667	3.8	15	4.7	52	1907	2.8
204.3	0.417	20	2.4	31	1523	1.5	6.0	4.4	47	1742	1.1
205.0	0.514	18	3.1	28	1643	2.7	7.4	5.6	43	1878	2.0
205.7	0.551	23	3.5	41	1918	2.7	8.0	6.5	62	2193	1.9
206.4	0.393	21	3.6	36	1817	4.2	5.7	6.5	56	2078	3.1
207.1	0.541	19	3.7	38	1740	2.3	7.8	6.7	58	1990	1.7
207.8	0.467	23	3.6	56	1760	3.3	6.7	6.6	85	2013	2.4
208.5	0.848	18	3.1	34	1539	2.3	12	5.7	51	1760	1.7
209.2	0.733	21	3.6	36	1950	2.4	11	6.6	56	2229	1.7
209.9	1.1	23	5.0	38	1896	2.6	16	9.0	58	2168	1.9
210.6	1.1	22	4.2	46	2038	2.8	16	7.6	71	2331	2.1
211.3	1.4	22	5.2	38	2155	2.4	21	9.5	58	2465	1.7
212.0	1.6	21	4.0	45	2003	3.0	23	7.3	68	2291	2.2
212.7	1.5	21	3.7	47	2167	2.6	22	6.7	73	2478	1.9
213.4	2.3	19	5.2	47	2334	3.1	34	9.4	71	2670	2.3
214.1	2.6	20	4.6	45	2185	2.7	38	8.3	69	2498	2.0
214.8	1.5	22	4.6	48	2213	3.5	22	8.4	73	2531	2.5
215.5	2.6	23	4.6	46	2198	2.6	38	8.4	70	2513	1.9
216.2	2.8	24	5.4	50	2224	3.1	40	9.9	76	2543	2.2
216.9	2.5	19	5.1	37	2038	2.7	36	9.4	57	2331	2.0
217.6	2.4	18	4.9	44	2224	3.2	34	8.9	67	2543	2.3
218.3	2.1	19	4.8	48	2135	3.2	31	8.8	73	2441	2.3
219.0	3.2	20	4.7	45	2352	2.9	46	8.6	69	2690	2.1
219.7	2.8	20	4.9	52	2123	4.7	40	9.0	80	2428	3.4
220.4	3.0	19	4.1	50	2221	2.8	44	7.5	77	2540	2.0
221.1	2.4	22	5.1	48	2308	3.9	35	9.4	73	2639	2.9
221.8	3.4	17	4.5	43	2095	4.3	49	8.3	66	2395	3.1
222.5	3.2	20	4.3	44	2335	2.6	46	7.9	68	2670	1.9
223.2	4.1	15	3.9	46	2189	2.7	59	7.1	70	2503	1.9
223.9	3.2	18	3.8	43	1995	2.6	46	7.0	66	2282	1.9
224.6	3.6	18	3.9	35	1986	2.5	51	7.0	53	2271	1.8
225.3	3.7	16	3.3	31	1805	3.2	54	5.9	48	2064	2.3



Minnow Environmental  
Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.0	4.6	19	3.6	36	1883	3.2	66	6.7	56	2153	2.3
226.7	2.9	15	4.1	37	1754	2.8	42	7.5	57	2006	2.0
227.4	4.1	17	3.2	29	1777	3.5	59	5.9	45	2032	2.6
228.0	4.3	15	3.8	29	1644	3.2	62	7.0	45	1880	2.3
228.7	6.6	16	3.3	27	1578	3.8	96	6.0	42	1805	2.8
229.4	5.0	16	3.3	28	1498	3.3	72	6.0	43	1713	2.4
230.1	3.7	14	2.9	26	1544	3.1	54	5.3	39	1766	2.3
230.8	4.3	14	3.2	23	1372	3.6	62	5.8	35	1569	2.6
231.5	4.5	13	2.7	22	1381	2.9	65	4.9	33	1579	2.1
232.2	4.2	14	2.3	21	1351	3.7	60	4.3	33	1545	2.7
232.9	3.9	12	2.4	20	1238	3.3	57	4.4	30	1415	2.4
233.6	5.4	15	2.2	20	1240	3.0	79	4.0	30	1417	2.2
234.3	4.2	13	1.7	15	982	2.2	60	3.1	23	1123	1.6
235.0	4.1	12	1.5	14	1133	2.6	59	2.8	21	1296	1.9
235.7	2.6	12	1.3	15	947	2.4	38	2.4	23	1083	1.8
236.4	3.4	11	1.0	10	1027	2.1	49	1.9	15	1175	1.6
237.1	2.8	11	1.3	12	982	3.0	40	2.3	18	1123	2.2
237.8	1.8	11	0.811	13	991	2.7	26	1.5	19	1133	2.0
238.5	2.2	13	0.636	11	1023	1.7	31	1.2	16	1170	1.2
239.2	1.2	11	0.718	11	1087	1.3	18	1.3	17	1242	0.949
239.9	2.1	10	0.445	11	1087	2.2	31	0.812	17	1244	1.6
240.6	1.7	8.3	0.439	8.1	992	2.7	24	0.801	12	1134	2.0
241.3	1.5	9.2	0.721	7.4	1069	1.1	22	1.3	11	1223	0.819
242.0	0.919	11	0.297	7.1	1121	2.0	13	0.542	11	1282	1.5
242.7	1.3	11	0.666	8.9	1089	2.1	19	1.2	14	1246	1.5
243.4	1.2	11	0.427	11	1055	1.4	17	0.779	17	1207	1.0
244.1	0.592	11	0.300	10	1124	1.6	8.5	0.548	16	1285	1.2
244.8	0.945	13	0.214	9.0	1055	1.9	14	0.391	14	1207	1.4
245.5	0.941	13	0.295	7.5	1020	1.2	14	0.538	11	1166	0.843
246.2	1.2	12	0.203	9.4	1166	2.3	18	0.371	14	1333	1.7
246.9	1.4	18	0.811	13	1154	3.2	20	1.5	20	1319	2.3
247.6	0.608	18	0.453	12	1177	2.3	8.8	0.825	18	1346	1.6
248.3	0.648	23	0.508	11	1089	3.0	9.4	0.927	16	1245	2.2
249.0	0.569	18	0.510	12	1090	3.2	8.2	0.931	18	1246	2.4
249.7	0.903	20	0.374	15	1031	2.3	13	0.683	23	1178	1.7
250.4	0.417	20	0.578	15	1086	3.1	6.0	1.1	23	1242	2.3
251.1	0.550	21	0.472	17	991	2.3	7.9	0.861	26	1134	1.7
251.8	0.393	19	0.321	18	922	1.8	5.7	0.585	28	1054	1.3
252.5	0.393	22	0.365	18	1018	2.5	5.7	0.665	28	1165	1.8
253.2	0.420	18	0.469	20	865	2.4	6.1	0.855	31	989	1.8
253.8	0.393	22	0.477	22	1057	2.2	5.7	0.870	33	1209	1.6
254.5	0.741	23	0.606	24	1133	1.9	11	1.1	37	1295	1.4
255.2	0.634	19	0.611	21	1047	2.6	9.2	1.1	33	1197	1.9
255.9	0.393	22	0.711	24	1120	2.4	5.7	1.3	37	1281	1.8
256.6	0.393	20	0.886	26	1100	2.5	5.7	1.6	40	1258	1.9
257.3	0.634	21	0.703	20	1077	2.8	9.1	1.3	31	1231	2.0
258.0	0.393	20	0.734	27	1105	3.5	5.7	1.3	42	1264	2.6
258.7	0.393	21	1.2	28	1239	2.2	5.7	2.3	42	1417	1.6
259.4	0.393	20	1.2	21	1151	4.0	5.7	2.2	33	1316	2.9
260.1	0.527	19	1.2	28	1232	2.4	7.6	2.2	42	1408	1.8
260.8	0.393	16	0.539	24	1160	2.1	5.7	0.984	38	1326	1.5
261.5	0.393	18	0.791	28	1285	3.5	5.7	1.4	44	1469	2.5
262.2	0.586	14	1.1	26	1196	2.7	8.5	2.1	39	1367	2.0
262.9	0.393	17	0.953	30	1339	2.1	5.7	1.7	46	1531	1.6
263.6	0.393	17	1.4	25	1290	1.5	5.7	2.5	39	1475	1.1
264.3	0.393	15	1.2	29	1405	1.8	5.7	2.3	44	1606	1.3
265.0	0.478	18	1.9	33	1651	2.0	6.9	3.5	51	1888	1.5
265.7	0.393	17	1.6	35	1435	2.3	5.7	2.9	53	1641	1.7
266.4	0.423	15	1.8	31	1461	2.0	6.1	3.3	48	1671	1.5
267.1	0.393	18	1.3	33	1484	2.5	5.7	2.4	50	1697	1.8
267.8	1.1	15	1.1	35	1716	1.8	16	2.0	53	1963	1.3
268.5	0.527	15	2.4	34	1708	2.1	7.6	4.3	52	1954	1.5
269.2	0.419	17	2.0	34	1768	1.3	6.0	3.7	52	2022	0.978
269.9	0.590	15	2.4	33	1821	1.0	8.5	4.3	51	2082	0.761
270.6	0.393	15	2.4	36	1962	2.8	5.7	4.4	56	2244	2.1
271.3	0.931	20	2.6	41	2067	1.5	13	4.7	62	2363	1.1
272.0	0.741	19	2.6	39	1990	1.3	11	4.7	60	2276	0.960
272.7	1.0	21	2.2	37	1928	1.1	15	4.0	57	2205	0.819
273.4	0.693	22	3.0	38	2170	1.7	10	5.4	58	2482	1.3
274.1	0.455	22	2.0	39	1855	1.7	6.6	3.6	60	2121	1.2
274.8	0.801	23	2.9	43	2065	1.8	12	5.4	66	2362	1.3
275.5	0.486	19	3.0	43	2029	1.3	7.0	5.4	65	2321	0.978
276.2	0.832	18	3.2	37	1932	2.1	12	5.8	57	2209	1.5
276.9	0.965	21	2.8	43	2068	1.8	14	5.1	65	2365	1.3
277.6	0.393	22	3.1	38	2173	2.2	5.7	5.7	58	2485	1.6
278.3	0.722	26	3.7	41	2226	1.5	10	6.8	62	2545	1.1
279.0	0.641	25	3.9	42	2191	1.1	9.3	7.2	64	2505	0.829
279.7	0.935	22	3.6	41	2015	1.2	14	6.6	63	2304	0.869
280.3	0.749	17	3.5	51	2109	1.8	11	6.4	78	2412	1.3
281.0	0.611	20	3.7	45	2043	1.8	8.8	6.8	68	2336	1.3
281.7	0.789	19	3.9	44	2167	1.9	11	7.1	67	2478	1.4



Minnow Environmental  
Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
282.4	0.624	23	3.0	41	2128	2.2	9.0	5.4	63	2433	1.6
283.1	1.1	20	2.8	43	1925	1.1	16	5.1	65	2201	0.789
283.8	1.4	23	2.8	41	2021	1.2	21	5.1	63	2311	0.907
284.5	1.3	23	3.3	49	2033	1.1	18	6.0	75	2325	0.833
285.2	0.858	19	3.1	46	2333	1.4	12	5.7	70	2667	1.0
285.9	1.5	20	2.2	57	2478	1.4	21	4.1	87	2833	1.0
286.6	1.6	21	2.2	46	1938	1.5	24	4.0	71	2216	1.1
287.3	1.1	25	2.7	47	2012	1.5	16	4.9	72	2301	1.1
288.0	1.3	19	1.9	52	2252	2.4	19	3.5	80	2575	1.7
288.7	1.2	25	2.1	51	2258	1.8	18	3.9	77	2582	1.3
289.4	2.1	22	1.5	49	2176	2.3	30	2.8	75	2488	1.7
290.1	1.4	18	1.9	54	2151	1.4	20	3.5	83	2460	1.0
290.8	2.8	21	1.9	60	2390	2.4	40	3.5	92	2734	1.8
291.5	3.1	23	1.8	55	2251	2.0	45	3.2	85	2574	1.5
292.2	3.0	22	2.1	62	2356	1.6	43	3.8	95	2694	1.2
292.9	2.4	18	2.2	50	2209	1.4	35	4.0	77	2526	0.997
293.6	2.3	20	1.2	50	2348	1.9	33	2.2	76	2685	1.4
294.3	2.4	16	2.0	57	2449	1.9	35	3.6	88	2800	1.4
295.0	3.9	18	2.0	62	2346	2.1	56	3.7	95	2682	1.6
295.7	3.0	20	2.3	52	2321	2.0	43	4.1	80	2654	1.4
296.4	2.3	21	2.0	51	2406	1.4	33	3.6	78	2752	1.0
297.1	2.2	20	1.4	52	1830	2.0	31	2.6	80	2092	1.5
297.8	4.2	17	1.9	48	1832	1.2	60	3.4	74	2095	0.879
298.5	4.4	16	1.5	45	1778	1.4	63	2.8	69	2034	0.992
299.2	3.7	20	1.8	51	1806	2.1	54	3.3	78	2065	1.5
299.9	2.3	15	1.4	52	1679	1.5	34	2.6	80	1920	1.1
300.6	3.7	16	1.8	48	1476	2.3	53	3.2	74	1688	1.7
301.3	3.8	18	1.3	46	1483	1.4	55	2.3	71	1696	1.0
302.0	4.0	18	1.6	48	1513	1.3	58	2.9	73	1730	0.939
302.7	4.0	17	1.8	51	1406	1.5	58	3.4	78	1608	1.1
303.4	3.0	17	1.6	42	1223	0.756	43	3.0	64	1399	0.552
304.1	4.5	19	1.3	37	1104	0.632	65	2.3	56	1263	0.461
304.8	2.9	15	1.6	39	1083	2.7	42	2.9	59	1238	1.9
305.5	2.6	17	1.5	33	881	1.1	37	2.8	51	1007	0.812
306.2	2.6	16	1.2	34	745	1.4	38	2.3	52	852	1.0
306.8	3.1	15	1.1	34	688	1.3	44	2.0	52	787	0.962
307.5	2.4	15	1.1	37	758	1.8	34	2.0	56	867	1.3
308.2	3.2	17	1.0	41	796	1.2	47	1.8	63	910	0.853
308.9	0.951	14	1.3	29	675	1.6	14	2.4	44	772	1.2
309.6	1.7	14	1.0	29	619	1.9	25	1.9	44	708	1.4
310.3	1.3	13	1.1	31	600	1.5	19	2.0	47	687	1.1
311.0	1.5	11	1.4	31	606	1.4	21	2.6	47	693	1.0
311.7	0.838	11	1.5	25	502	2.5	12	2.7	38	574	1.8
312.4	1.3	12	1.4	30	495	2.0	19	2.5	47	566	1.4
313.1	1.7	13	1.6	24	484	0.927	24	2.9	36	553	0.676
313.8	1.3	13	1.7	25	445	1.8	19	3.1	38	508	1.3
314.5	1.3	12	0.798	30	444	2.0	19	1.5	46	507	1.5
315.2	0.964	14	0.877	28	404	3.0	14	1.6	43	462	2.2
315.9	0.962	14	1.1	27	422	2.6	14	2.1	41	482	1.9
316.6	0.663	14	0.860	26	411	2.2	9.6	1.6	40	470	1.6
317.3	0.722	14	0.933	20	338	2.6	10	1.7	30	387	1.9
318.0	0.393	15	0.895	17	347	2.4	5.7	1.6	26	396	1.7
318.7	0.718	13	1.0	21	359	2.4	10	1.9	32	411	1.8
319.4	0.634	11	1.0	18	350	1.4	9.1	1.9	27	401	0.999
320.1	0.842	12	0.491	16	381	2.4	12	0.896	25	436	1.7
320.8	0.436	10	0.471	21	338	1.6	6.3	0.859	32	386	1.2
321.5	0.455	13	0.760	19	302	1.5	6.6	1.4	29	345	1.1
322.2	0.393	13	0.668	18	336	2.1	5.7	1.2	27	384	1.6
322.9	0.393	12	0.583	9.6	270	1.8	5.7	1.1	15	309	1.3
323.6	0.554	12	0.477	12	276	1.1	8.0	0.871	19	316	0.794
324.3	0.393	14	0.678	9.3	276	2.7	5.7	1.2	14	316	2.0
325.0	0.393	12	0.474	13	262	2.4	5.7	0.864	20	300	1.8
325.7	0.393	13	0.403	13	321	2.8	5.7	0.735	20	367	2.0
326.4	1.000	13	0.243	12	304	1.1	14	0.443	18	348	0.836
327.1	0.393	11	0.512	12	310	2.8	5.7	0.934	19	355	2.0
327.8	0.976	13	0.321	13	269	3.5	14	0.586	21	308	2.5
328.5	0.412	12	0.499	12	293	2.4	5.9	0.911	19	335	1.7
329.2	0.874	11	0.288	10	237	0.779	13	0.524	16	271	0.568
329.9	0.818	13	0.395	14	308	2.3	12	0.721	21	352	1.7
330.6	0.707	12	0.437	9.4	258	1.9	10	0.797	14	295	1.4
331.3	0.631	14	0.432	13	269	3.1	9.1	0.788	20	308	2.3
332.0	0.393	15	0.339	13	253	1.6	5.7	0.619	20	290	1.1
332.6	0.640	15	0.439	12	294	3.1	9.2	0.800	18	337	2.3
333.3	0.393	12	0.188	12	244	3.0	5.7	0.343	18	280	2.2
334.0	0.437	13	0.457	10	229	1.5	6.3	0.833	15	262	1.1
334.7	0.563	10	0.685	14	252	3.2	8.1	1.2	21	288	2.4
335.4	0.672	15	0.522	18	250	3.8	9.7	0.953	28	285	2.8
336.1	0.426	13	0.264	15	240	2.1	6.1	0.482	24	275	1.5
336.8	0.678	13	0.392	17	245	3.4	9.8	0.715	26	280	2.5
337.5	0.476	14	0.497	14	259	3.7	6.9	0.907	21	296	2.7
338.2	0.393	15	0.096	14	241	1.9	5.7	0.176	22	276	1.4



Minnow Environmental  
Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
338.9	0.393	15	0.560	16	246	3.3	5.7	1.0	25	281	2.4
339.6	0.551	13	0.451	17	258	2.4	8.0	0.822	26	296	1.8
340.3	0.393	12	0.357	16	235	3.0	5.7	0.651	25	269	2.2
341.0	0.428	12	0.716	12	264	1.5	6.2	1.3	19	301	1.1
341.7	0.398	16	0.587	20	234	3.5	5.7	1.1	31	267	2.5
342.4	0.393	14	0.333	19	236	1.5	5.7	0.607	29	270	1.1
343.1	0.393	14	0.445	17	237	2.1	5.7	0.812	26	271	1.6
343.8	0.489	12	0.538	22	238	2.2	7.1	0.982	33	273	1.6
344.5	0.400	14	0.406	21	222	2.6	5.8	0.741	32	253	1.9
345.2	0.393	12	0.227	20	219	1.3	5.7	0.414	31	250	0.931
345.9	0.393	13	0.405	18	234	2.0	5.7	0.738	27	268	1.4
346.6	0.393	14	0.615	25	295	1.6	5.7	1.1	38	337	1.2
347.3	0.393	16	0.383	23	250	1.2	5.7	0.698	35	286	0.857
348.0	0.393	13	0.604	24	232	1.6	5.7	1.1	37	265	1.1
348.7	0.393	13	0.397	23	251	1.5	5.7	0.725	36	287	1.1
349.4	0.393	12	0.388	26	247	1.5	5.7	0.707	41	282	1.1
350.1	0.393	12	0.577	22	240	0.875	5.7	1.1	34	275	0.639
350.8	0.393	14	0.616	25	260	1.6	5.7	1.1	39	297	1.2
351.5	0.393	12	0.942	25	276	1.6	5.7	1.7	39	316	1.2
352.2	0.739	12	0.739	29	258	1.2	11	1.3	44	296	0.870
352.9	0.393	12	0.732	24	256	0.945	5.7	1.3	37	293	0.690
353.6	0.393	12	0.659	25	216	0.993	5.7	1.2	39	247	0.724
354.3	0.393	12	0.738	24	254	1.2	5.7	1.3	37	290	0.843
355.0	0.393	11	1.1	26	238	1.3	5.7	2.0	40	273	0.981
355.7	0.916	11	0.565	26	220	0.700	13	1.0	40	251	0.511
356.4	0.393	13	1.2	23	262	1.1	5.7	2.2	35	299	0.787
357.1	0.393	13	0.710	20	256	0.663	5.7	1.3	30	293	0.484
357.8	0.393	13	0.754	19	235	0.851	5.7	1.4	29	269	0.621
358.5	0.393	10	0.904	25	242	1.6	5.7	1.6	38	277	1.1
359.1	0.393	14	0.846	22	274	0.985	5.7	1.5	34	314	0.718
359.8	0.440	14	0.648	22	271	1.0	6.3	1.2	33	310	0.747
360.5	0.393	13	0.743	20	223	1.4	5.7	1.4	31	255	1.0
361.2	0.449	15	0.958	24	281	1.4	6.5	1.7	37	321	1.0
361.9	0.393	15	1.0	26	281	2.0	5.7	1.8	40	321	1.5
362.6	0.393	14	0.610	26	274	2.0	5.7	1.1	40	313	1.5
363.3	0.534	15	0.942	23	265	1.8	7.7	1.7	36	303	1.3
364.0	0.393	13	0.699	20	278	2.1	5.7	1.3	31	318	1.6
364.7	0.393	15	0.849	21	267	1.7	5.7	1.5	32	306	1.3
365.4	0.411	11	1.1	22	286	1.7	5.9	1.9	34	328	1.2
366.1	0.393	12	0.753	20	273	2.4	5.7	1.4	30	313	1.8
366.8	0.393	12	0.963	21	284	1.7	5.7	1.8	32	325	1.3
367.5	0.393	10	1.4	19	269	2.4	5.7	2.5	30	307	1.7
368.2	0.561	14	1.5	21	250	2.7	8.1	2.8	32	286	2.0
368.9	0.411	12	1.4	17	253	2.3	5.9	2.5	26	289	1.7
369.6	0.481	9.6	1.3	19	273	2.1	6.9	2.4	29	313	1.5
370.3	0.393	12	1.5	22	274	1.6	5.7	2.8	33	313	1.2
371.0	0.393	13	1.5	20	293	3.2	5.7	2.8	31	335	2.3
371.7	0.393	11	1.2	17	294	2.1	5.7	2.2	25	336	1.6
372.4	0.393	11	1.0	13	238	2.9	5.7	1.9	20	272	2.1
373.1	0.393	8.9	0.947	18	234	2.6	5.7	1.7	27	268	1.9
373.8	0.393	10	0.875	17	232	3.3	5.7	1.6	26	265	2.4
374.5	0.393	13	1.1	13	262	2.5	5.7	2.1	19	300	1.8
375.2	0.522	11	0.713	12	257	2.8	7.5	1.3	18	294	2.0
375.9	0.459	12	0.765	12	243	2.9	6.6	1.4	18	278	2.1
376.6	0.393	12	0.636	13	256	3.5	5.7	1.2	20	293	2.5
377.3	0.393	14	0.680	16	241	3.1	5.7	1.2	25	275	2.2
378.0	0.393	13	0.832	11	275	2.2	5.7	1.5	17	314	1.6
378.7	0.393	11	0.595	9.7	262	4.0	5.7	1.1	15	300	2.9
379.4	0.510	13	0.619	14	285	3.7	7.4	1.1	22	326	2.7
380.1	0.393	12	0.438	13	232	3.0	5.7	0.799	20	265	2.2
380.8	0.470	13	0.278	13	301	3.4	6.8	0.507	20	344	2.5
381.5	0.393	13	0.397	10	257	3.9	5.7	0.724	15	294	2.8
382.2	0.393	10	0.468	9.2	230	3.1	5.7	0.854	14	263	2.3
382.9	0.393	14	0.663	13	285	3.9	5.7	1.2	20	326	2.8
383.6	0.393	13	0.452	8.8	238	4.3	5.7	0.824	14	272	3.1
384.3	0.393	14	0.449	12	255	4.9	5.7	0.819	18	292	3.6
384.9	0.393	14	0.548	11	263	5.5	5.7	1.0	17	301	4.0
385.6	0.393	13	0.443	13	265	3.7	5.7	0.809	21	303	2.7
386.3	0.393	14	0.321	12	258	3.8	5.7	0.585	19	295	2.8
387.0	0.393	11	0.158	9.6	265	5.9	5.7	0.288	15	303	4.3
387.7	0.393	15	0.467	13	250	4.8	5.7	0.852	21	286	3.5
388.4	0.393	13	0.689	12	248	4.0	5.7	1.3	18	283	2.9
389.1	0.393	12	0.486	14	267	6.4	5.7	0.887	21	306	4.7
389.8	0.393	10	0.419	11	239	4.1	5.7	0.764	16	274	3.0
390.5	0.540	12	0.489	14	224	6.2	7.8	0.892	21	256	4.5
391.2	0.532	12	0.593	11	235	5.9	7.7	1.1	17	269	4.3
391.9	0.393	16	0.690	15	246	5.8	5.7	1.3	22	281	4.2
392.6	0.393	11	0.361	12	230	5.8	5.7	0.659	18	263	4.2
393.3	0.393	14	0.630	14	260	5.2	5.7	1.1	21	297	3.8
394.0	0.393	14	0.842	17	226	5.4	5.7	1.5	27	259	3.9
394.7	0.428	14	0.687	16	241	4.6	6.2	1.3	25	276	3.4



Minnow Environmental  
Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
395.4	0.393	15	0.643	17	248	5.2	5.7	1.2	26	283	3.8
396.1	0.393	12	0.588	13	211	4.1	5.7	1.1	19	241	3.0
396.8	0.741	17	0.903	19	253	4.5	11	1.6	28	289	3.3
397.5	0.393	14	0.406	16	221	6.1	5.7	0.741	25	253	4.4
398.2	0.393	13	0.719	18	246	6.1	5.7	1.3	27	281	4.5
398.9	0.393	13	0.538	19	223	4.5	5.7	0.981	30	256	3.3
399.6	0.393	10	0.558	19	234	3.0	5.7	1.0	29	267	2.2
400.3	0.620	11	0.878	18	255	4.6	8.9	1.6	27	292	3.4
401.0	0.393	11	0.467	16	225	3.5	5.7	0.851	24	257	2.6
401.7	0.393	15	0.710	19	257	3.2	5.7	1.3	29	294	2.3
402.4	0.393	12	0.340	21	232	2.9	5.7	0.621	32	265	2.1
403.1	0.393	14	0.789	16	293	2.6	5.7	1.4	25	335	1.9
403.8	0.393	13	0.691	19	248	2.6	5.7	1.3	29	284	1.9
404.5	0.393	15	0.828	19	263	2.5	5.7	1.5	29	301	1.8
405.2	0.393	12	0.549	23	247	3.4	5.7	1.0	35	282	2.5
405.9	0.393	12	0.675	20	229	2.0	5.7	1.2	30	262	1.5
406.6	0.393	13	0.861	23	272	2.1	5.7	1.6	36	311	1.6
407.3	0.514	11	0.727	22	220	2.5	7.4	1.3	34	252	1.8
408.0	0.393	13	0.629	21	241	3.0	5.7	1.1	33	275	2.2
408.7	0.393	13	0.582	22	227	2.6	5.7	1.1	33	259	1.9
409.4	0.393	11	0.672	21	238	2.1	5.7	1.2	32	273	1.5
410.1	0.393	11	0.710	22	245	1.9	5.7	1.3	34	280	1.4
410.7	0.393	12	0.742	20	246	1.4	5.7	1.4	30	281	1.0
411.4	0.393	13	0.831	26	260	2.6	5.7	1.5	39	297	1.9
412.1	0.393	12	0.866	26	259	1.9	5.7	1.6	40	296	1.4
412.8	0.393	14	0.720	28	243	1.7	5.7	1.3	42	278	1.2
413.5	0.393	13	0.744	23	265	0.783	5.7	1.4	35	303	0.572
414.2	1.4	12	0.875	27	259	2.3	20	1.6	41	296	1.7
414.9	0.393	13	0.906	25	254	1.6	5.7	1.7	38	291	1.2
415.6	0.393	13	0.836	21	238	2.2	5.7	1.5	32	272	1.6
416.3	0.393	13	0.895	22	269	1.1	5.7	1.6	34	308	0.817
417.0	0.393	14	0.669	27	254	1.7	5.7	1.2	41	291	1.3
417.7	0.608	11	0.955	25	250	1.6	8.8	1.7	38	286	1.1
418.4	0.393	14	0.821	28	258	1.7	5.7	1.5	43	295	1.2
419.1	0.393	12	0.666	21	239	1.0	5.7	1.2	32	273	0.732
419.8	0.393	13	1.2	30	267	1.7	5.7	2.1	46	305	1.2
420.5	0.436	14	1.1	27	285	1.7	6.3	2.0	41	326	1.2
421.2	0.393	13	0.992	28	268	1.8	5.7	1.8	43	306	1.3
421.9	0.393	11	0.923	27	268	1.6	5.7	1.7	41	306	1.1
422.6	0.393	14	0.997	24	253	1.3	5.7	1.8	37	289	0.956
423.3	0.494	12	1.1	24	238	1.2	7.1	2.0	37	272	0.873
424.0	0.393	9.2	1.3	28	270	0.917	5.7	2.4	43	309	0.669
424.7	0.393	14	0.732	26	241	2.0	5.7	1.3	39	276	1.5
425.4	0.393	11	0.830	21	215	1.4	5.7	1.5	32	246	1.0
426.1	0.393	12	0.867	23	233	1.1	5.7	1.6	36	266	0.769
426.8	0.393	10	1.3	23	241	1.6	5.7	2.3	35	276	1.2
427.5	0.393	14	0.875	27	242	1.9	5.7	1.6	42	276	1.4
428.2	0.393	13	1.3	27	267	2.2	5.7	2.3	42	305	1.6
428.9	0.393	15	1.1	24	241	1.6	5.7	2.0	37	275	1.2
429.6	0.456	13	1.0	23	283	2.4	6.6	1.9	36	323	1.8
430.3	0.393	14	0.942	22	267	2.0	5.7	1.7	33	305	1.4
431.0	0.393	12	1.2	25	262	0.753	5.7	2.1	38	300	0.550
431.7	0.393	13	0.712	21	229	1.5	5.7	1.3	32	262	1.1
432.4	0.393	14	1.2	22	262	1.3	5.7	2.1	34	300	0.939
433.1	0.393	12	1.1	20	275	1.9	5.7	2.1	31	315	1.4
433.8	0.393	12	1.3	22	244	2.7	5.7	2.4	34	279	2.0
434.5	0.393	11	1.3	23	264	1.6	5.7	2.3	36	302	1.2
435.2	0.393	13	1.2	21	232	1.7	5.7	2.2	32	265	1.2
435.9	0.987	11	1.2	18	244	2.1	14	2.2	28	278	1.5
436.6	0.393	13	1.1	24	257	2.0	5.7	2.1	37	293	1.5
437.2	0.393	12	0.940	20	272	2.3	5.7	1.7	31	311	1.7
437.9	0.393	13	1.3	23	273	2.0	5.7	2.5	35	313	1.4
438.6	0.393	11	1.3	16	254	1.7	5.7	2.3	25	291	1.2
439.3	0.393	10	1.1	18	255	1.5	5.7	2.0	28	292	1.1
440.0	0.393	12	1.3	13	237	1.1	5.7	2.3	20	271	0.779
440.7	0.393	11	0.715	20	304	1.7	5.7	1.3	31	348	1.2
441.4	0.688	11	1.1	17	269	2.9	9.9	2.0	27	307	2.1
442.1	0.393	9.8	0.889	14	263	1.9	5.7	1.6	21	301	1.4
442.8	0.393	8.8	0.600	13	270	1.7	5.7	1.1	20	309	1.2
443.5	0.393	11	0.978	14	288	1.8	5.7	1.8	21	329	1.3
444.2	0.791	11	0.791	14	283	3.2	11	1.4	21	324	2.3
444.9	0.393	13	0.403	15	258	3.8	5.7	0.735	23	295	2.8
445.6	0.393	10	0.475	16	274	3.2	5.7	0.867	24	313	2.3
446.3	0.393	12	0.716	16	261	2.0	5.7	1.3	24	299	1.5
447.0	0.393	11	0.476	12	263	3.7	5.7	0.869	19	301	2.7
447.7	0.393	12	0.367	14	299	2.7	5.7	0.670	21	342	1.9
448.4	0.393	12	0.699	13	266	3.2	5.7	1.3	20	304	2.3
449.1	0.398	10.0	0.404	9.3	245	2.7	5.7	0.737	14	280	1.9
449.8	0.393	10	0.342	14	265	2.1	5.7	0.623	21	304	1.6
450.5	0.393	10	0.438	9.5	311	2.9	5.7	0.798	15	356	2.1
451.2	0.445	11	0.464	11	246	2.8	6.4	0.847	16	281	2.0



Minnow Environmental  
Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
451.9	0.393	12	0.349	11	240	1.8	5.7	0.637	17	274	1.3
452.6	0.393	13	0.357	9.9	268	3.0	5.7	0.651	15	306	2.2
453.3	0.393	14	0.379	8.9	252	1.9	5.7	0.692	14	289	1.4
454.0	0.393	9.2	0.308	12	254	2.9	5.7	0.562	19	290	2.1
454.7	0.700	12	0.292	13	275	2.7	10	0.533	19	314	2.0
455.4	0.393	13	0.254	9.9	239	3.2	5.7	0.463	15	273	2.3
456.1	0.393	11	0.484	12	250	2.6	5.7	0.882	19	286	1.9
456.8	0.499	14	0.507	11	249	3.3	7.2	0.925	17	285	2.4
457.5	0.393	11	0.512	14	268	3.7	5.7	0.934	21	307	2.7
458.2	0.393	13	0.670	10	267	2.8	5.7	1.2	16	305	2.0
458.9	0.445	13	0.414	10	238	2.6	6.4	0.755	16	272	1.9
459.6	0.393	14	0.597	12	259	4.2	5.7	1.1	18	296	3.1
460.3	0.395	12	0.245	15	261	4.8	5.7	0.447	23	298	3.5
461.0	0.393	14	0.679	15	245	3.7	5.7	1.2	23	280	2.7
461.7	0.414	11	0.502	17	255	2.8	6.0	0.915	27	291	2.0
462.4	0.393	11	0.470	12	230	2.9	5.7	0.857	19	263	2.1
463.0	0.393	10	0.427	15	222	3.5	5.7	0.779	23	254	2.5
463.7	0.393	14	0.588	14	272	3.4	5.7	1.1	22	311	2.5
464.4	0.450	11	0.649	19	251	3.4	6.5	1.2	29	287	2.5
465.1	0.393	13	0.669	21	268	2.5	5.7	1.2	32	307	1.8
465.8	0.609	13	0.742	20	268	2.6	8.8	1.4	31	307	1.9
466.5	0.393	15	0.505	18	254	3.3	5.7	0.921	28	291	2.4
467.2	0.393	12	0.609	25	251	2.3	5.7	1.1	38	287	1.7
467.9	0.393	12	0.761	25	332	2.5	5.7	1.4	39	380	1.8
468.6	0.393	14	0.951	27	276	3.8	5.7	1.7	42	315	2.8
469.3	0.393	14	0.901	24	214	2.7	5.7	1.6	36	245	1.9
470.0	0.393	15	0.675	26	262	2.8	5.7	1.2	40	299	2.1
470.7	0.393	15	0.514	26	251	1.6	5.7	0.938	40	287	1.2
471.4	0.393	17	0.467	30	266	2.3	5.7	0.851	46	304	1.6
472.1	0.393	14	0.463	24	275	2.0	5.7	0.844	37	314	1.5
472.8	0.393	16	0.613	29	273	1.8	5.7	1.1	44	313	1.3
473.5	0.539	16	0.602	26	267	0.950	7.8	1.1	40	306	0.693
474.2	0.393	16	0.504	28	276	2.3	5.7	0.919	42	315	1.7
474.9	0.393	13	0.788	32	247	1.3	5.7	1.4	48	282	0.972
475.6	0.393	13	0.581	30	281	0.918	5.7	1.1	47	321	0.670
476.3	0.661	14	0.382	34	236	1.6	9.5	0.697	52	270	1.2
477.0	0.393	16	1.0	30	286	2.0	5.7	1.8	46	327	1.5
477.7	0.393	14	0.594	28	268	0.938	5.7	1.1	43	306	0.685
478.4	0.393	10	0.585	29	231	1.5	5.7	1.1	45	264	1.1
479.1	0.399	13	0.484	27	237	0.600	5.8	0.883	42	271	0.438
479.8	0.393	12	0.656	34	254	0.635	5.7	1.2	52	290	0.463
480.5	0.393	13	0.428	30	270	0.859	5.7	0.780	46	308	0.627
481.2	0.393	15	0.767	39	255	1.4	5.7	1.4	60	292	1.0
481.9	0.393	13	0.651	36	295	1.2	5.7	1.2	56	338	0.897
482.6	0.393	13	0.521	33	264	0.678	5.7	0.951	50	302	0.494
483.3	0.393	17	0.705	36	263	1.3	5.7	1.3	55	301	0.948
484.0	0.393	13	0.806	33	261	0.726	5.7	1.5	51	299	0.529
484.7	0.393	14	0.990	38	285	1.0	5.7	1.8	59	326	0.749
485.4	0.393	14	0.676	37	264	0.545	5.7	1.2	56	302	0.398
486.1	0.393	11	0.806	30	259	0.415	5.7	1.5	47	296	0.303
486.8	0.393	14	0.935	34	259	0.114	5.7	1.7	52	296	0.083
487.5	0.393	11	0.727	37	302	1.1	5.7	1.3	56	345	0.826
488.2	0.393	15	0.861	38	277	0.570	5.7	1.6	59	317	0.416
488.8	0.393	14	1.2	38	256	0.596	5.7	2.2	58	293	0.435
489.5	0.393	12	0.875	33	280	1.3	5.7	1.6	51	321	0.930
490.2	0.393	13	0.884	41	289	1.4	5.7	1.6	62	330	1.1
490.9	0.393	18	1.1	43	287	0.637	5.7	2.0	65	329	0.465
491.6	0.393	14	0.978	37	251	0.463	5.7	1.8	57	287	0.338
492.3	0.393	12	1.1	34	287	0.666	5.7	2.0	52	328	0.486
493.0	0.393	12	0.794	32	316	0.671	5.7	1.4	49	361	0.490
493.7	0.393	14	1.0	35	268	0.374	5.7	1.9	53	307	0.273
494.4	0.393	13	1.3	32	284	0.943	5.7	2.3	49	325	0.688
495.1	0.393	11	1.2	38	249	0.964	5.7	2.3	58	285	0.704
495.8	0.393	12	1.2	33	259	0.730	5.7	2.1	50	296	0.533
496.5	0.393	14	1.2	41	295	1.4	5.7	2.1	63	337	0.997
497.2	0.393	12	0.985	33	266	0.838	5.7	1.8	51	304	0.611
497.9	0.393	14	0.751	40	292	1.1	5.7	1.4	61	334	0.826
498.6	0.698	14	1.1	38	260	0.866	10	2.0	57	298	0.632
499.3	0.393	13	1.3	36	301	1.5	5.7	2.4	56	344	1.1
500.0	0.393	14	1.2	33	269	0.683	5.7	2.2	51	308	0.498
500.7	0.393	12	1.0	30	306	0.581	5.7	1.8	47	350	0.424
501.4	0.393	10	1.4	26	239	1.2	5.7	2.6	41	273	0.906
502.1	0.393	12	1.4	35	298	1.2	5.7	2.5	54	341	0.895
502.8	0.393	10	1.3	31	271	1.4	5.7	2.3	47	310	1.1
503.5	0.408	13	1.6	28	227	1.1	5.9	2.9	42	259	0.779
504.2	0.393	12	1.7	31	270	1.3	5.7	3.2	48	309	0.975
504.9	0.393	11	1.6	23	247	1.7	5.7	2.9	35	282	1.3
505.6	0.393	11	1.5	27	295	1.9	5.7	2.7	42	338	1.4
506.3	0.393	9.8	1.8	24	244	1.5	5.7	3.2	37	279	1.1
507.0	0.393	13	1.9	27	252	1.2	5.7	3.5	41	288	0.898
507.7	0.393	11	1.1	29	230	1.6	5.7	1.9	44	263	1.2



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Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.4	0.393	12	1.5	28	226	1.0	5.7	2.8	42	259	0.744
509.1	0.393	10	1.6	18	239	2.4	5.7	3.0	27	273	1.8
509.8	0.393	9.9	1.6	26	243	2.2	5.7	2.9	39	278	1.6
510.5	0.632	11	1.5	21	250	2.2	9.1	2.7	33	286	1.6
511.2	0.393	12	1.7	16	234	2.9	5.7	3.1	25	267	2.1
511.9	0.393	12	1.6	20	270	3.1	5.7	2.9	31	309	2.3
512.6	0.393	14	1.0	16	237	2.3	5.7	1.9	25	271	1.7
513.3	0.393	12	1.1	19	258	2.7	5.7	2.0	29	295	1.9
514.0	0.393	13	1.1	14	268	1.9	5.7	2.1	21	307	1.4
514.7	0.393	13	1.1	14	248	1.5	5.7	2.0	21	283	1.1
515.3	0.393	12	1.6	14	246	1.1	5.7	2.9	21	281	0.771
516.0	0.393	12	0.828	15	270	2.0	5.7	1.5	24	308	1.4
516.7	0.393	14	1.0	14	253	1.4	5.7	1.9	21	290	1.1
517.4	0.393	12	0.964	14	255	1.9	5.7	1.8	22	291	1.4
518.1	0.485	10	0.809	12	254	2.7	7.0	1.5	18	291	2.0
518.8	0.393	13	0.643	12	255	2.2	5.7	1.2	18	292	1.6
519.5	0.393	11	0.427	13	238	3.3	5.7	0.779	20	272	2.4
520.2	0.533	13	0.798	14	324	1.7	7.7	1.5	22	370	1.3
520.9	0.507	11	0.364	9.9	251	1.5	7.3	0.664	15	287	1.1
521.6	0.393	12	0.491	10	263	2.1	5.7	0.896	16	301	1.5
522.3	0.393	12	0.219	11	254	2.2	5.7	0.399	16	290	1.6
523.0	0.393	11	0.471	9.8	279	2.0	5.7	0.859	15	319	1.5
523.7	0.393	11	0.395	10	291	2.0	5.7	0.721	16	332	1.5
524.4	0.393	11	0.428	10	256	2.9	5.7	0.781	16	292	2.1
525.1	0.592	13	0.300	8.9	270	1.3	8.5	0.548	14	309	0.933
525.8	0.393	12	0.348	13	252	1.9	5.7	0.634	20	288	1.4
526.5	0.411	14	0.282	11	258	1.8	5.9	0.515	17	295	1.3
527.2	0.393	13	0.320	9.5	281	1.5	5.7	0.584	15	321	1.1
527.9	0.393	11	0.185	11	247	2.1	5.7	0.337	16	283	1.5
528.6	0.393	10	0.372	14	289	1.6	5.7	0.678	22	330	1.2
529.3	0.528	13	0.405	14	279	1.3	7.6	0.739	21	319	0.933
530.0	0.393	14	0.418	9.9	246	1.5	5.7	0.762	15	281	1.1
530.7	0.419	11	0.398	15	309	1.5	6.1	0.726	24	354	1.1
531.4	0.393	10	0.318	13	202	1.1	5.7	0.579	20	231	0.812
532.1	0.393	14	0.487	16	264	1.6	5.7	0.888	25	302	1.2
532.8	0.417	14	0.643	19	297	2.1	6.0	1.2	30	339	1.5
533.5	0.393	14	0.654	20	280	1.1	5.7	1.2	30	320	0.831
534.2	0.393	14	0.478	19	294	1.5	5.7	0.873	30	337	1.1
534.9	0.688	15	0.370	20	322	1.6	9.9	0.675	30	369	1.2
535.6	0.393	15	0.320	22	291	2.4	5.7	0.583	33	333	1.7
536.3	0.393	14	0.488	23	272	1.6	5.7	0.890	35	311	1.1
537.0	0.393	13	0.648	20	228	0.523	5.7	1.2	30	261	0.381
537.7	0.393	13	0.423	20	261	1.6	5.7	0.771	31	299	1.2
538.4	0.393	15	0.381	21	286	0.701	5.7	0.695	32	327	0.512
539.1	0.393	14	0.501	23	252	1.4	5.7	0.913	35	288	0.999
539.8	0.393	15	0.573	27	294	1.4	5.7	1.0	41	336	1.0
540.5	0.393	18	0.279	25	255	1.6	5.7	0.509	39	291	1.2
541.2	0.393	16	0.287	30	286	0.729	5.7	0.523	47	327	0.532
541.8	0.393	14	0.585	27	248	1.3	5.7	1.1	41	284	0.967
542.5	0.393	13	0.432	28	292	1.9	5.7	0.787	43	334	1.4
543.2	0.393	12	0.181	28	231	1.3	5.7	0.330	43	264	0.944
543.9	0.393	13	0.370	33	267	1.0	5.7	0.675	50	305	0.745
544.6	0.393	13	0.513	35	251	1.2	5.7	0.936	54	287	0.900
545.3	0.393	14	0.315	31	246	1.1	5.7	0.574	48	281	0.800
546.0	0.393	14	0.519	32	243	2.0	5.7	0.947	49	278	1.5
546.7	0.393	15	0.431	35	290	0.990	5.7	0.787	54	331	0.722
547.4	0.393	16	0.254	35	262	1.2	5.7	0.464	54	299	0.870
548.1	0.393	12	0.399	32	236	1.8	5.7	0.728	50	269	1.3
548.8	0.393	13	0.869	34	249	1.3	5.7	1.6	53	284	0.924
549.5	0.393	13	0.598	34	257	0.904	5.7	1.1	52	294	0.659
550.2	0.393	13	0.236	36	255	1.4	5.7	0.431	55	291	1.0
550.9	0.545	13	0.711	30	242	0.856	7.9	1.3	46	276	0.625
551.6	0.393	15	0.337	38	253	0.783	5.7	0.615	59	289	0.571
552.3	0.664	11	0.543	35	257	1.1	9.6	0.990	54	294	0.772
553.0	0.444	15	0.841	33	229	1.2	6.4	1.5	50	262	0.894
553.7	0.393	12	0.742	36	250	0.782	5.7	1.4	55	286	0.570
554.4	0.393	14	0.853	38	261	0.931	5.7	1.6	58	298	0.680
555.1	0.393	15	0.732	38	243	0.881	5.7	1.3	58	278	0.643
555.8	0.393	14	0.620	40	244	0.112	5.7	1.1	61	279	0.082
556.5	0.393	13	1.0	37	225	1.2	5.7	1.8	57	258	0.902
557.2	0.393	15	0.809	37	289	1.2	5.7	1.5	57	331	0.887
557.9	0.723	12	0.832	37	232	1.7	10	1.5	56	266	1.2
558.6	0.393	14	0.670	34	229	1.4	5.7	1.2	51	262	1.0
559.3	0.495	9.9	0.774	32	237	1.6	7.1	1.4	49	271	1.2
560.0	0.547	9.7	0.617	37	234	1.2	7.9	1.1	57	268	0.861
560.7	0.393	15	0.960	36	258	1.2	5.7	1.7	55	295	0.851
561.4	0.814	14	0.917	33	228	0.892	12	1.7	50	260	0.650
562.1	0.393	14	0.862	35	262	0.685	5.7	1.6	53	300	0.500
562.8	0.393	12	0.815	40	234	0.668	5.7	1.5	61	267	0.487
563.5	0.393	14	0.765	35	259	0.618	5.7	1.4	54	296	0.451
564.2	0.393	12	0.750	36	252	1.1	5.7	1.4	55	288	0.767



Minnow Environmental  
Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
564.9	0.393	12	0.735	35	246	1.5	5.7	1.3	53	281	1.1
565.6	0.393	14	0.732	32	257	1.3	5.7	1.3	49	294	0.914
566.3	0.393	13	0.918	34	242	1.2	5.7	1.7	53	277	0.872
567.0	0.393	15	1.0	35	247	0.223	5.7	1.9	53	282	0.163
567.7	0.419	13	0.590	34	248	1.1	6.0	1.1	52	284	0.801
568.3	0.393	12	0.975	39	268	1.2	5.7	1.8	60	306	0.842
569.0	0.393	14	0.766	35	250	1.5	5.7	1.4	54	286	1.1
569.7	0.393	13	0.899	40	282	1.8	5.7	1.6	61	322	1.3
570.4	0.393	16	1.0	35	245	0.742	5.7	1.9	54	280	0.541
571.1	0.393	13	1.3	39	251	0.799	5.7	2.4	60	287	0.583
571.8	0.393	13	0.894	35	234	1.6	5.7	1.6	53	268	1.2
572.5	0.465	13	1.3	35	241	1.6	6.7	2.4	54	275	1.2
573.2	0.393	12	1.2	39	264	1.3	5.7	2.2	60	302	0.937
573.9	0.393	16	1.3	38	275	0.690	5.7	2.3	58	314	0.503
574.6	0.393	13	1.1	34	232	1.1	5.7	2.0	52	265	0.802
575.3	0.393	12	1.1	38	261	0.969	5.7	1.9	59	298	0.707
576.0	0.427	13	0.827	39	278	0.995	6.2	1.5	60	318	0.726
576.7	0.393	11	0.738	35	252	1.1	5.7	1.3	54	289	0.812
577.4	0.393	12	1.3	38	257	1.3	5.7	2.4	58	293	0.949
578.1	0.393	12	1.1	36	245	1.2	5.7	2.0	55	280	0.855
578.8	0.611	14	1.3	32	271	1.3	8.8	2.4	50	309	0.964
579.5	0.393	14	1.1	31	262	1.5	5.7	1.9	48	299	1.1
580.2	0.393	14	1.3	33	296	1.4	5.7	2.3	50	339	1.000
580.9	0.393	12	1.2	31	251	1.8	5.7	2.2	48	286	1.3
581.6	0.393	12	1.3	28	295	1.5	5.7	2.4	43	337	1.1
582.3	0.393	12	0.980	31	252	1.9	5.7	1.8	47	288	1.4
583.0	0.393	12	1.6	31	277	2.6	5.7	2.9	48	317	1.9
583.7	0.443	13	1.1	29	262	2.7	6.4	2.0	45	300	2.0
584.4	0.393	12	1.1	30	264	2.5	5.7	2.0	46	302	1.8
585.1	0.393	14	1.2	27	297	1.3	5.7	2.2	42	339	0.946
585.8	0.393	12	1.2	30	269	1.2	5.7	2.2	47	308	0.885
586.5	0.393	14	1.5	25	263	3.1	5.7	2.7	39	301	2.2
587.2	0.393	12	1.2	28	232	1.5	5.7	2.3	43	265	1.1
587.9	0.393	13	1.1	25	260	2.2	5.7	2.0	39	298	1.6
588.6	0.393	13	1.6	25	296	2.1	5.7	2.9	38	339	1.5
589.3	0.393	13	1.6	27	256	2.4	5.7	2.8	41	292	1.8
590.0	0.639	13	1.6	24	264	2.7	9.2	2.9	36	302	2.0
590.7	0.528	11	1.0	27	261	2.1	7.6	1.8	41	298	1.5
591.4	0.494	10	1.5	24	249	1.7	7.1	2.8	37	284	1.3
592.1	0.393	13	1.1	21	255	2.5	5.7	1.9	32	291	1.8
592.8	0.393	13	1.1	22	258	2.7	5.7	2.0	34	295	2.0
593.5	0.393	11	1.5	21	269	3.4	5.7	2.8	32	308	2.5
594.2	0.393	12	1.3	25	309	2.0	5.7	2.3	38	354	1.4
594.8	0.393	12	1.0	23	240	2.0	5.7	1.9	36	274	1.5
595.5	0.393	11	1.2	23	248	2.0	5.7	2.2	36	283	1.4
596.2	0.393	12	1.2	22	257	2.0	5.7	2.2	33	294	1.5
596.9	0.393	14	0.947	18	249	3.0	5.7	1.7	28	284	2.2
597.6	0.393	11	0.760	21	220	1.7	5.7	1.4	32	251	1.3
598.3	0.393	11	1.2	21	277	2.4	5.7	2.2	32	317	1.7
599.0	0.393	11	0.964	21	258	2.5	5.7	1.8	32	296	1.8
599.7	0.393	12	1.2	20	279	3.0	5.7	2.1	31	319	2.2
600.4	0.528	13	1.2	21	254	3.7	7.6	2.2	32	291	2.7
601.1	0.393	14	0.892	20	258	1.8	5.7	1.6	30	295	1.3
601.8	0.393	12	0.593	20	227	1.5	5.7	1.1	31	260	1.1
602.5	0.393	11	1.1	16	259	3.4	5.7	2.0	25	297	2.5
603.2	0.393	13	0.850	20	273	3.2	5.7	1.6	31	312	2.4
603.9	0.393	12	1.1	20	242	1.8	5.7	2.0	30	277	1.3
604.6	0.517	13	0.551	14	254	3.4	7.5	1.0	22	291	2.5
605.3	0.393	14	0.701	12	231	2.2	5.7	1.3	19	264	1.6
606.0	0.393	10	0.636	15	240	4.8	5.7	1.2	23	274	3.5
606.7	0.393	13	0.891	20	265	1.9	5.7	1.6	31	303	1.4
607.4	0.393	12	0.751	11	298	4.2	5.7	1.4	17	341	3.1
608.1	0.393	12	0.587	15	234	2.4	5.7	1.1	23	267	1.8
608.8	0.393	12	0.517	17	258	2.6	5.7	0.943	27	295	1.9
609.5	0.393	11	0.246	15	217	3.2	5.7	0.449	23	248	2.4
610.2	0.393	13	0.493	14	231	5.0	5.7	0.900	22	264	3.7
610.9	0.393	13	0.476	15	324	2.2	5.7	0.869	23	371	1.6
611.6	0.393	13	0.302	12	249	2.9	5.7	0.550	18	285	2.1
612.3	1.0	13	0.424	16	257	2.3	15	0.774	25	294	1.7
613.0	0.393	11	0.302	14	239	4.0	5.7	0.551	22	273	2.9
613.7	0.393	12	0.384	13	252	5.2	5.7	0.700	19	288	3.8
614.4	0.393	13	0.255	16	249	3.5	5.7	0.464	24	285	2.5
615.1	0.393	12	0.357	14	273	2.9	5.7	0.652	21	312	2.1
615.8	0.685	14	0.670	17	307	2.4	9.9	1.2	25	351	1.8
616.5	0.393	14	0.648	16	270	3.6	5.7	1.2	24	309	2.7
617.2	0.393	14	0.242	14	249	2.3	5.7	0.442	21	285	1.7
617.9	0.393	10	0.439	13	251	3.5	5.7	0.800	20	287	2.5
618.6	0.393	12	0.168	14	268	2.7	5.7	0.307	21	306	1.9
619.3	0.409	15	0.335	14	247	3.3	5.9	0.611	21	283	2.4
620.0	0.393	12	0.399	15	274	3.3	5.7	0.727	24	314	2.4
620.6	0.393	12	0.333	15	291	2.2	5.7	0.608	23	333	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.3	0.411	13	0.363	15	265	3.2	5.9	0.662	23	303	2.4
622.0	0.393	16	0.564	15	321	4.0	5.7	1.0	23	367	2.9
622.7	0.393	14	0.318	14	242	2.0	5.7	0.580	21	277	1.5
623.4	0.691	14	0.364	13	239	2.0	10.0	0.663	20	273	1.5
624.1	0.551	14	0.314	15	235	3.2	8.0	0.572	23	268	2.3
624.8	0.393	12	0.397	16	257	3.2	5.7	0.724	24	294	2.3
625.5	0.494	16	0.655	20	334	2.7	7.1	1.2	30	382	2.0
626.2	0.393	14	0.591	16	233	2.2	5.7	1.1	24	266	1.6
626.9	0.393	15	0.483	18	231	2.9	5.7	0.881	28	264	2.1
627.6	0.393	16	0.582	18	236	2.0	5.7	1.1	27	270	1.4
628.3	0.393	14	0.671	20	233	1.8	5.7	1.2	31	267	1.3
629.0	0.393	11	0.575	20	269	2.6	5.7	1.0	30	307	1.9
629.7	0.393	14	0.674	21	220	1.3	5.7	1.2	33	251	0.953
630.4	0.512	15	0.317	25	241	2.4	7.4	0.578	38	276	1.7
631.1	0.393	14	0.673	23	258	1.6	5.7	1.2	36	294	1.2
631.8	0.393	14	0.459	28	271	1.9	5.7	0.836	43	310	1.4
632.5	0.393	14	0.751	23	245	1.7	5.7	1.4	35	280	1.2
633.2	0.470	14	0.863	28	235	1.8	6.8	1.6	44	269	1.3
633.9	0.894	15	0.654	27	238	1.4	13	1.2	42	273	0.997
634.6	0.393	16	1.1	31	247	2.1	5.7	2.0	47	282	1.5
635.3	0.393	13	0.984	31	295	0.957	5.7	1.8	47	337	0.698
636.0	0.393	11	0.888	26	229	1.6	5.7	1.6	40	261	1.1
636.7	0.475	15	0.980	27	252	1.7	6.9	1.8	42	288	1.2
637.4	0.393	12	1.5	35	255	1.7	5.7	2.8	54	291	1.2
638.1	0.393	13	1.2	34	254	1.0	5.7	2.2	52	290	0.741
638.8	0.393	12	1.4	32	280	1.0	5.7	2.6	48	320	0.760
639.5	0.393	12	0.863	31	242	1.4	5.7	1.6	47	277	1.1
640.2	0.393	14	0.982	37	281	0.982	5.7	1.8	57	321	0.717
640.9	0.393	14	1.1	34	234	0.871	5.7	2.0	52	268	0.635
641.6	0.393	15	1.0	32	250	1.5	5.7	1.8	48	286	1.1
642.3	0.481	12	1.2	35	275	1.6	6.9	2.2	54	314	1.1
643.0	0.393	15	1.3	31	248	0.817	5.7	2.3	48	283	0.596
643.7	0.433	13	1.3	30	263	1.1	6.3	2.4	47	300	0.828
644.4	0.393	16	0.816	31	259	1.1	5.7	1.5	48	296	0.806
645.1	0.393	14	1.2	33	268	1.5	5.7	2.2	50	306	1.1
645.8	0.393	16	1.2	26	271	1.5	5.7	2.1	41	310	1.1
646.5	0.537	16	1.4	31	236	1.2	7.8	2.6	47	270	0.864
647.1	0.447	16	1.1	36	277	2.2	6.5	2.0	56	317	1.6
647.8	0.393	13	0.884	34	260	1.6	5.7	1.6	51	297	1.2
648.5	0.436	12	1.7	29	281	2.2	6.3	3.1	44	322	1.6
649.2	0.393	14	1.4	32	283	1.4	5.7	2.5	49	324	1.0
649.9	0.393	14	1.2	30	239	1.5	5.7	2.1	47	273	1.1
650.6	0.393	15	1.2	30	235	1.6	5.7	2.2	47	269	1.1
651.3	0.393	13	1.1	28	275	1.9	5.7	2.1	43	314	1.4
652.0	0.393	13	1.1	25	265	0.881	5.7	1.9	39	303	0.643
652.7	0.557	14	1.2	30	290	2.1	8.0	2.1	46	332	1.5
653.4	0.612	14	1.3	29	255	1.8	8.8	2.4	45	292	1.3
654.1	0.393	13	1.3	29	259	2.0	5.7	2.3	45	296	1.5
654.8	0.393	13	0.854	22	261	1.5	5.7	1.6	33	299	1.1
655.5	0.393	14	0.989	24	265	1.9	5.7	1.8	36	303	1.4
656.2	0.404	17	0.967	22	255	2.5	5.8	1.8	34	291	1.8
656.9	0.393	12	0.914	21	238	1.6	5.7	1.7	32	272	1.2
657.6	0.393	12	0.953	24	249	1.8	5.7	1.7	36	285	1.3
658.3	0.393	14	0.628	21	262	2.5	5.7	1.1	33	300	1.8
659.0	0.393	13	1.2	20	263	3.2	5.7	2.1	31	300	2.3
659.7	0.530	12	0.457	22	224	2.7	7.7	0.834	34	256	2.0
660.4	0.393	12	0.416	18	235	2.0	5.7	0.760	27	268	1.5
661.1	0.393	11	0.550	16	230	2.1	5.7	1.0	25	263	1.5
661.8	0.393	14	0.762	19	270	3.0	5.7	1.4	29	308	2.2
662.5	0.393	15	0.471	17	224	2.4	5.7	0.860	26	256	1.7
663.2	0.393	11	0.369	19	244	2.4	5.7	0.672	30	279	1.7
663.9	0.393	10	0.255	18	244	3.2	5.7	0.465	27	279	2.4
664.6	0.393	12	0.466	18	232	2.5	5.7	0.851	28	265	1.8
665.3	0.393	11	0.430	19	215	3.1	5.7	0.784	30	246	2.2
666.0	0.647	15	0.501	16	267	3.6	9.3	0.913	24	306	2.6
666.7	0.573	14	0.668	18	271	1.6	8.3	1.2	28	310	1.2
667.4	0.393	12	0.392	15	236	2.5	5.7	0.715	23	270	1.8
668.1	0.393	11	0.313	17	265	2.7	5.7	0.571	26	303	1.9
668.8	0.393	12	0.289	15	241	3.5	5.7	0.528	23	275	2.5
669.5	0.393	12	0.273	13	246	3.2	5.7	0.498	20	281	2.4
670.2	0.393	11	0.460	15	252	3.5	5.7	0.839	23	288	2.6
670.9	0.427	13	0.265	17	247	1.9	6.2	0.484	25	283	1.4
671.6	0.393	11	0.323	14	242	3.3	5.7	0.590	21	276	2.4
672.3	0.393	10.0	0.184	15	230	3.3	5.7	0.335	23	262	2.4
673.0	0.394	12	0.244	14	244	3.1	5.7	0.446	22	279	2.3
673.6	0.393	11	0.472	13	248	3.4	5.7	0.861	20	283	2.4
674.3	0.418	12	0.342	19	264	2.3	6.0	0.623	29	302	1.7
675.0	0.393	9.9	0.274	16	296	3.1	5.7	0.499	24	338	2.3
675.7	0.393	11	0.270	15	257	3.9	5.7	0.492	23	294	2.9
676.4	0.769	13	0.545	17	272	2.9	11	0.994	25	310	2.1
677.1	0.393	12	0.284	17	229	3.5	5.7	0.518	26	262	2.5



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
677.8	0.393	12	0.553	14	246	4.0	5.7	1.0	21	281	2.9
678.5	0.393	11	0.470	17	257	3.5	5.7	0.857	26	294	2.6
679.2	0.393	13	0.225	14	268	3.3	5.7	0.410	22	307	2.4
679.9	0.393	12	0.610	18	289	5.0	5.7	1.1	28	331	3.6
680.6	0.393	12	0.567	17	253	3.9	5.7	1.0	26	289	2.8
681.3	0.434	12	0.552	15	293	4.5	6.3	1.0	23	335	3.3
682.0	0.393	13	0.507	19	288	4.8	5.7	0.924	29	330	3.5
682.7	0.393	14	0.437	20	257	4.7	5.7	0.797	30	293	3.4
683.4	0.393	19	0.633	16	244	4.9	5.7	1.2	25	279	3.5
684.1	0.393	15	0.517	21	251	3.7	5.7	0.942	33	287	2.7
684.8	0.393	14	0.731	23	253	3.1	5.7	1.3	35	289	2.3
685.5	0.393	18	0.757	25	271	3.2	5.7	1.4	38	310	2.3
686.2	0.393	17	0.753	25	270	3.2	5.7	1.4	38	308	2.3
686.9	0.393	18	0.651	27	244	3.1	5.7	1.2	41	279	2.2
687.6	0.393	19	0.562	25	251	3.4	5.7	1.0	38	288	2.5
688.3	0.393	19	0.905	24	261	3.2	5.7	1.6	37	299	2.3
689.0	0.393	21	0.688	29	262	2.3	5.7	1.3	44	299	1.7
689.7	0.393	19	0.840	33	269	1.7	5.7	1.5	50	308	1.3
690.4	0.535	18	0.769	30	260	1.6	7.7	1.4	46	297	1.1
691.1	0.393	20	0.697	33	258	3.3	5.7	1.3	50	295	2.4
691.8	0.393	18	0.827	33	287	3.5	5.7	1.5	50	329	2.6
692.5	0.393	20	1.0	44	267	2.6	5.7	1.9	67	306	1.9
693.2	0.393	20	0.910	35	287	2.9	5.7	1.7	53	328	2.1
693.9	0.393	21	1.2	42	266	3.0	5.7	2.2	64	304	2.2
694.6	0.393	19	0.851	38	280	2.5	5.7	1.6	58	320	1.8
695.3	0.393	21	0.831	42	264	4.6	5.7	1.5	65	302	3.3
696.0	0.393	19	1.3	40	246	2.6	5.7	2.3	61	282	1.9
696.7	0.490	17	1.5	37	228	2.1	7.1	2.7	56	261	1.5
697.4	0.393	20	1.1	44	249	2.5	5.7	1.9	67	285	1.8
698.1	0.393	21	1.0	41	246	2.7	5.7	1.9	63	281	2.0
698.8	0.393	16	1.2	39	206	2.3	5.7	2.2	60	236	1.7
699.5	0.393	19	0.814	42	214	2.9	5.7	1.5	64	245	2.1
700.1	0.393	21	1.6	42	220	3.6	5.7	3.0	65	252	2.6
700.8	0.393	19	1.6	32	202	2.9	5.7	2.8	49	231	2.1
701.5	0.393	17	1.3	39	208	3.7	5.7	2.3	60	238	2.7
702.2	0.393	17	1.3	47	218	2.8	5.7	2.4	72	249	2.1
702.9	0.393	17	1.1	33	179	2.6	5.7	2.1	51	204	1.9
703.6	0.393	18	1.1	44	210	3.2	5.7	2.0	67	240	2.4
704.3	0.393	15	1.2	37	204	4.3	5.7	2.1	56	233	3.1
705.0	0.393	18	1.6	40	179	3.9	5.7	2.8	61	205	2.8
705.7	0.393	16	1.3	39	176	4.7	5.7	2.5	59	202	3.4
706.4	0.393	16	1.5	49	177	5.0	5.7	2.7	75	202	3.7
707.1	0.516	20	1.3	42	176	3.5	7.5	2.3	65	201	2.6
707.8	0.393	17	1.6	43	177	4.5	5.7	2.9	65	203	3.3
708.5	0.393	19	1.3	41	192	5.0	5.7	2.4	63	219	3.6
709.2	0.393	18	1.5	41	195	4.0	5.7	2.7	63	222	2.9
709.9	0.393	15	1.2	34	166	2.6	5.7	2.2	53	190	1.9
710.6	0.393	17	1.2	41	181	5.0	5.7	2.3	62	207	3.7
711.3	0.393	17	1.3	37	224	4.1	5.7	2.5	57	256	3.0
712.0	0.393	20	1.5	39	184	5.4	5.7	2.7	59	211	3.9
712.7	0.497	20	1.0	36	202	3.2	7.2	1.9	56	231	2.3
713.4	0.576	18	1.2	34	196	4.7	8.3	2.2	53	225	3.5
714.1	0.559	16	1.1	31	192	3.0	8.1	1.9	48	220	2.2
714.8	0.464	15	1.6	34	203	4.2	6.7	2.8	52	232	3.1
715.5	0.438	14	1.0	30	200	4.4	6.3	1.9	46	229	3.2
716.2	0.393	15	1.3	39	222	4.8	5.7	2.4	60	254	3.5
716.9	0.393	16	1.1	38	206	2.9	5.7	2.1	58	235	2.1
717.6	0.393	17	1.1	35	216	4.0	5.7	2.0	53	247	2.9
718.3	0.393	15	1.4	31	230	4.1	5.7	2.5	47	263	3.0
719.0	0.393	19	1.5	27	228	2.4	5.7	2.7	42	261	1.8
719.7	0.393	13	1.6	30	210	4.4	5.7	2.9	46	240	3.2
720.4	0.393	16	0.913	29	202	3.2	5.7	1.7	45	231	2.3
721.1	0.393	13	0.954	27	209	4.2	5.7	1.7	42	239	3.0
721.8	0.393	14	0.974	25	200	3.7	5.7	1.8	38	229	2.7
722.5	0.393	15	1.1	28	203	4.3	5.7	2.1	42	232	3.1
723.2	0.452	14	0.728	23	200	3.2	6.5	1.3	36	228	2.3
723.9	0.393	17	1.1	27	207	3.9	5.7	2.1	42	237	2.8
724.6	0.393	13	0.808	22	181	2.8	5.7	1.5	34	207	2.0
725.3	0.393	14	0.702	26	231	3.9	5.7	1.3	40	264	2.9
725.9	0.393	14	0.525	22	191	3.1	5.7	0.958	34	219	2.3
726.6	0.409	15	0.792	22	184	3.7	5.9	1.4	33	211	2.7
727.3	0.393	14	0.676	23	197	2.6	5.7	1.2	35	225	1.9
728.0	0.393	12	0.728	23	207	3.4	5.7	1.3	35	237	2.5
728.7	0.393	13	0.946	23	170	2.5	5.7	1.7	36	195	1.8
729.4	0.393	11	0.354	20	168	2.5	5.7	0.646	30	192	1.8
730.1	0.428	17	0.688	23	181	3.7	6.2	1.3	35	207	2.7
730.8	0.393	12	0.327	18	194	4.2	5.7	0.597	27	222	3.1
731.5	0.393	12	0.206	14	166	3.1	5.7	0.375	22	190	2.3
732.2	0.439	12	0.618	21	210	2.4	6.3	1.1	33	240	1.8
732.9	0.393	13	0.193	16	168	2.3	5.7	0.351	25	192	1.7
733.6	0.393	12	0.447	20	170	2.8	5.7	0.815	31	194	2.0



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
734.3	0.393	13	0.558	18	196	4.7	5.7	1.0	28	224	3.4
735.0	0.393	11	0.471	14	169	1.5	5.7	0.859	22	193	1.1
735.7	0.393	11	0.557	17	190	3.3	5.7	1.0	26	218	2.4
736.4	0.393	13	0.086	14	181	3.2	5.7	0.158	22	207	2.4
737.1	0.393	12	0.444	16	180	5.1	5.7	0.811	24	206	3.7
737.8	0.393	9.8	0.091	15	173	3.3	5.7	0.166	24	198	2.4
738.5	0.393	10	0.366	12	178	3.5	5.7	0.667	19	203	2.5
739.2	0.393	14	0.479	20	189	3.4	5.7	0.873	30	216	2.5
739.9	0.393	10	0.362	14	180	3.7	5.7	0.660	21	205	2.7
740.6	0.393	11	0.542	14	197	4.1	5.7	0.988	21	226	3.0
741.3	0.393	8.5	0.295	13	163	2.7	5.7	0.538	20	186	2.0
742.0	0.393	12	0.365	12	174	4.1	5.7	0.665	19	199	3.0
742.7	0.393	8.2	0.638	18	180	3.4	5.7	1.2	28	206	2.5
743.4	0.393	11	0.454	17	176	3.3	5.7	0.828	26	202	2.4
744.1	0.393	11	0.214	11	184	2.6	5.7	0.391	17	210	1.9
744.8	0.393	12	0.521	17	183	3.4	5.7	0.951	25	209	2.5
745.5	0.393	13	0.699	18	178	4.7	5.7	1.3	28	204	3.4
746.2	0.393	11	0.387	17	190	3.5	5.7	0.705	26	217	2.6
746.9	0.393	12	0.629	14	189	3.7	5.7	1.1	21	217	2.7
747.6	0.393	11	0.632	17	181	4.6	5.7	1.2	27	207	3.4
748.3	0.393	14	0.966	17	190	5.0	5.7	1.8	25	217	3.6
749.0	0.393	13	0.476	16	189	3.3	5.7	0.868	24	216	2.4
749.7	0.393	15	0.660	21	201	4.0	5.7	1.2	33	230	2.9
750.4	0.393	16	0.820	19	177	3.7	5.7	1.5	29	202	2.7
751.1	0.393	16	0.722	21	198	4.9	5.7	1.3	31	227	3.6
751.7	0.393	14	0.481	24	175	3.9	5.7	0.877	37	200	2.9
752.4	0.393	14	0.970	22	180	5.9	5.7	1.8	33	206	4.3
753.1	0.393	13	0.592	23	192	6.2	5.7	1.1	35	220	4.5
753.8	0.541	15	0.792	25	174	5.7	7.8	1.4	38	199	4.2
754.5	0.571	16	0.796	26	185	4.8	8.2	1.5	39	212	3.5
755.2	0.393	16	1.1	27	162	5.7	5.7	2.1	42	185	4.2
755.9	0.393	15	0.439	24	144	5.3	5.7	0.800	37	164	3.8
756.6	0.393	15	0.559	23	136	5.3	5.7	1.0	35	155	3.9
757.3	0.393	16	0.821	23	143	5.3	5.7	1.5	35	163	3.9
758.0	0.393	16	1.3	22	142	5.4	5.7	2.4	34	163	3.9
758.7	0.393	18	0.978	26	144	6.3	5.7	1.8	40	164	4.6
759.4	0.393	16	1.0	28	149	5.9	5.7	1.9	43	170	4.3
760.1	0.418	18	1.2	26	158	7.4	6.0	2.1	40	181	5.4
760.8	0.393	18	0.915	28	148	6.0	5.7	1.7	43	169	4.4
761.5	0.638	18	1.4	36	150	8.6	9.2	2.6	56	171	6.3
762.2	0.569	18	1.3	31	133	6.8	8.2	2.4	47	152	5.0
762.9	0.393	17	0.833	26	130	7.6	5.7	1.5	39	148	5.6
763.6	0.393	16	1.5	30	135	6.8	5.7	2.7	45	154	4.9
764.3	0.393	17	1.2	29	139	5.5	5.7	2.1	45	159	4.0
765.0	0.393	18	1.2	26	129	8.8	5.7	2.2	40	148	6.4
765.7	0.393	19	1.3	28	122	7.3	5.7	2.4	43	139	5.4
766.4	0.393	18	1.0	34	149	8.3	5.7	1.9	52	170	6.1
767.1	0.393	18	1.4	39	141	9.2	5.7	2.6	60	162	6.7
767.8	0.393	19	1.2	37	124	8.8	5.7	2.1	57	142	6.4
768.5	0.555	19	1.4	34	118	7.1	8.0	2.5	52	135	5.2
769.2	0.444	18	1.5	36	121	8.6	6.4	2.7	55	138	6.3
769.9	0.393	19	1.4	34	135	9.8	5.7	2.5	52	154	7.2
770.6	0.393	18	1.1	29	123	7.6	5.7	1.9	45	141	5.5
771.3	0.393	18	1.4	34	117	7.8	5.7	2.6	53	134	5.7
772.0	0.393	18	1.6	32	133	9.2	5.7	2.8	49	152	6.7
772.7	0.393	14	1.6	34	130	9.9	5.7	2.9	52	149	7.2
773.4	0.393	18	1.3	41	126	9.6	5.7	2.4	63	145	7.0
774.1	0.393	17	0.853	37	131	8.7	5.7	1.6	57	150	6.4
774.8	0.393	17	1.7	34	129	9.4	5.7	3.2	52	147	6.9
775.5	0.393	16	1.3	33	120	9.1	5.7	2.4	51	138	6.7
776.2	0.393	18	1.4	35	114	9.8	5.7	2.5	54	131	7.1
776.9	0.393	16	1.4	34	110	11	5.7	2.6	52	126	7.9
777.5	0.393	15	1.5	33	115	9.0	5.7	2.8	50	131	6.6
778.2	0.524	18	1.4	46	111	9.8	7.6	2.6	71	127	7.2
778.9	0.557	18	1.8	34	114	11	8.0	3.3	53	131	8.1
779.6	0.393	17	2.3	42	117	9.4	5.7	4.2	65	134	6.8
780.3	0.393	19	1.8	45	131	12	5.7	3.3	68	150	8.8
781.0	0.393	20	1.8	39	123	11	5.7	3.3	60	141	7.8
781.7	0.393	18	2.7	42	118	8.1	5.7	4.9	64	135	5.9
782.4	0.393	17	2.0	45	126	9.1	5.7	3.6	68	144	6.7
783.1	0.393	21	2.3	53	127	12	5.7	4.1	81	145	8.6
783.8	0.669	18	2.3	45	134	8.1	9.7	4.2	69	153	5.9
784.5	0.393	17	2.5	46	123	9.8	5.7	4.6	71	141	7.2
785.2	0.393	17	2.2	50	127	9.9	5.7	4.0	76	145	7.2
785.9	0.393	19	2.9	49	140	10	5.7	5.3	76	160	7.6
786.6	0.393	17	1.9	42	123	11	5.7	3.4	64	140	7.7
787.3	0.393	20	2.4	49	131	12	5.7	4.4	75	150	8.5
788.0	0.393	20	2.1	48	127	11	5.7	3.8	74	146	8.2
788.7	0.393	21	2.8	54	129	10	5.7	5.1	83	148	7.6
789.4	0.393	22	3.1	53	136	11	5.7	5.7	81	155	8.3
790.1	0.393	19	2.5	56	138	9.5	5.7	4.6	86	158	6.9



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
790.8	0.393	19	2.5	52	133	9.8	5.7	4.6	80	152	7.1
791.5	0.393	20	3.4	51	140	10.0	5.7	6.2	79	161	7.3
792.2	0.393	20	3.2	52	136	11	5.7	5.9	80	156	7.8
792.9	0.393	19	3.1	58	132	11	5.7	5.7	89	151	7.8
793.6	0.393	21	2.9	49	128	9.0	5.7	5.3	75	147	6.6
794.3	0.393	18	3.3	50	116	9.0	5.7	6.0	76	132	6.6
795.0	0.393	20	3.4	54	134	11	5.7	6.1	83	153	7.7
795.7	0.393	21	3.1	56	144	11	5.7	5.6	85	165	8.0
796.4	0.393	24	3.5	63	139	9.2	5.7	6.4	96	159	6.7
797.1	0.393	17	3.7	56	126	9.7	5.7	6.7	85	144	7.1
797.8	0.393	19	3.8	58	150	12	5.7	7.0	89	171	9.1
798.5	0.393	19	3.1	59	147	9.6	5.7	5.7	90	168	7.0
799.2	0.393	17	3.2	58	140	8.3	5.7	5.8	89	160	6.1
799.9	0.738	19	3.5	57	156	9.8	11	6.4	88	178	7.1
800.6	0.406	22	3.3	64	147	8.7	5.9	6.0	98	169	6.4
801.3	0.393	19	3.3	55	149	9.7	5.7	6.1	84	170	7.0
802.0	0.393	20	3.9	56	163	10	5.7	7.1	86	187	7.4
802.7	0.393	20	3.0	63	162	10	5.7	5.5	96	185	7.3
803.4	0.393	21	3.2	51	139	7.7	5.7	5.9	78	159	5.6
804.1	0.393	19	3.2	50	158	7.6	5.7	5.8	77	181	5.5
804.7	0.393	17	3.1	52	158	9.8	5.7	5.7	80	180	7.1
805.4	0.393	17	3.1	56	154	8.3	5.7	5.7	87	176	6.1
806.1	0.393	17	2.9	61	174	7.9	5.7	5.2	93	199	5.8
806.8	0.393	15	2.4	50	146	6.2	5.7	4.5	77	167	4.5
807.5	0.874	19	2.6	51	154	8.3	13	4.8	77	176	6.1
808.2	0.393	19	2.9	57	162	5.0	5.7	5.2	87	185	3.7
808.9	0.739	16	2.1	48	190	6.0	11	3.9	73	217	4.4
809.6	0.393	16	2.7	46	187	6.1	5.7	4.9	71	214	4.4
810.3	0.393	16	2.1	45	201	6.1	5.7	3.8	69	230	4.4
811.0	0.393	15	1.8	39	181	3.7	5.7	3.3	60	207	2.7
811.7	0.393	15	1.6	38	183	3.7	5.7	3.0	59	209	2.7
812.4	0.393	17	2.2	46	206	5.7	5.7	4.0	70	235	4.2
813.1	0.393	17	1.7	42	213	4.4	5.7	3.2	64	243	3.2
813.8	0.393	16	1.6	41	198	2.9	5.7	2.9	63	227	2.1
814.5	0.393	15	2.2	35	215	2.7	5.7	3.9	53	245	2.0
815.2	0.393	15	1.3	32	213	3.4	5.7	2.3	50	244	2.5
815.9	0.393	14	1.6	24	225	1.9	5.7	2.9	37	257	1.4
816.6	0.393	13	1.3	28	228	3.6	5.7	2.4	42	260	2.7
817.3	0.393	12	1.1	30	238	3.9	5.7	1.9	45	272	2.8
818.0	0.393	13	0.895	30	243	2.0	5.7	1.6	46	277	1.5
818.7	0.393	11	0.933	21	255	2.5	5.7	1.7	31	291	1.8
819.4	0.393	13	0.747	24	234	2.6	5.7	1.4	36	268	1.9
820.1	0.393	12	0.722	21	256	2.7	5.7	1.3	32	292	2.0
820.8	0.393	12	0.647	22	264	2.1	5.7	1.2	33	302	1.5
821.5	0.393	10	0.701	19	228	2.2	5.7	1.3	30	260	1.6
822.2	0.393	11	0.658	19	274	1.4	5.7	1.2	29	314	0.998
822.9	0.393	12	0.922	22	249	1.4	5.7	1.7	34	285	1.0
823.6	0.393	12	0.506	22	301	2.7	5.7	0.922	33	344	2.0
824.3	0.393	10	0.610	22	266	3.1	5.7	1.1	33	304	2.3
825.0	0.393	14	0.861	21	291	2.6	5.7	1.6	32	332	1.9
825.7	0.581	12	0.527	23	280	1.6	8.4	0.960	35	320	1.2
826.4	0.393	10	0.518	17	297	2.0	5.7	0.945	26	340	1.5
827.1	0.393	9.4	0.586	15	283	2.9	5.7	1.1	24	323	2.1
827.8	0.393	10	0.487	15	299	2.2	5.7	0.888	22	342	1.6
828.5	0.393	11	0.864	13	274	1.8	5.7	1.6	19	314	1.3
829.2	0.393	10	0.478	16	281	1.7	5.7	0.872	25	322	1.3
829.9	0.393	10	0.556	15	244	1.0	5.7	1.0	23	279	0.754
830.5	0.393	10	0.783	14	325	2.2	5.7	1.4	22	372	1.6
831.2	0.393	10	0.356	14	259	1.5	5.7	0.650	21	296	1.1
831.9	0.393	13	0.357	15	302	2.4	5.7	0.650	23	346	1.8
832.6	0.393	9.9	0.295	9.9	313	2.7	5.7	0.538	15	358	2.0
833.3	0.393	10	0.900	16	295	1.9	5.7	1.6	24	338	1.4
834.0	0.393	9.9	0.340	13	309	1.6	5.7	0.621	19	353	1.1
834.7	0.393	9.4	0.783	17	311	1.7	5.7	1.4	26	355	1.2
835.4	0.527	11	0.431	16	289	2.2	7.6	0.787	24	330	1.6
836.1	0.393	11	0.589	18	424	2.6	5.7	1.1	27	485	1.9
836.8	0.393	12	0.452	20	291	2.3	5.7	0.824	30	333	1.7
837.5	0.393	11	0.769	18	304	2.5	5.7	1.4	27	348	1.8
838.2	0.393	13	0.489	21	326	2.4	5.7	0.891	33	373	1.7
838.9	0.393	12	0.362	22	296	2.1	5.7	0.661	33	339	1.5
839.6	0.393	13	0.799	16	277	2.0	5.7	1.5	25	317	1.5
840.3	0.393	12	0.571	22	320	2.0	5.7	1.0	34	366	1.5
841.0	0.393	11	0.851	24	295	2.9	5.7	1.6	36	338	2.1
841.7	0.420	11	0.891	24	317	1.6	6.1	1.6	37	362	1.2
842.4	0.393	14	0.550	22	305	2.3	5.7	1.0	33	349	1.7
843.1	0.393	13	0.492	21	283	1.9	5.7	0.897	33	324	1.4
843.8	0.569	13	0.794	30	278	2.1	8.2	1.4	46	317	1.6
844.5	0.393	15	0.885	27	301	2.5	5.7	1.6	41	344	1.8
845.2	0.787	15	1.4	28	312	2.2	11	2.5	42	357	1.6
845.9	0.393	13	1.2	22	268	3.1	5.7	2.1	33	306	2.3
846.6	0.582	15	1.1	22	324	2.4	8.4	2.0	34	371	1.8



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
847.3	0.393	14	0.857	31	305	2.6	5.7	1.6	47	348	1.9
848.0	0.393	16	0.783	38	315	2.9	5.7	1.4	58	360	2.1
848.7	0.393	16	1.1	32	294	2.1	5.7	2.0	50	336	1.5
849.4	0.393	15	0.861	38	325	2.4	5.7	1.6	58	371	1.7
850.1	0.393	17	0.849	36	310	2.8	5.7	1.5	55	354	2.0
850.8	0.393	14	1.1	35	286	2.7	5.7	2.0	54	327	2.0
851.5	0.469	15	0.968	38	292	4.2	6.8	1.8	59	334	3.1
852.2	0.393	18	1.2	44	307	4.0	5.7	2.3	67	351	2.9
852.9	0.393	18	1.2	43	297	3.2	5.7	2.1	66	339	2.4
853.6	0.702	19	1.3	38	284	3.7	10	2.4	58	325	2.7
854.3	0.750	17	1.3	40	279	2.6	11	2.4	62	319	1.9
855.0	0.393	15	1.7	44	357	3.9	5.7	3.1	67	409	2.8
855.7	0.635	17	1.5	44	310	3.6	9.2	2.7	67	355	2.6
856.4	0.393	18	1.8	47	299	3.5	5.7	3.3	72	342	2.5
857.0	0.393	17	1.4	49	309	2.8	5.7	2.6	74	353	2.1
857.7	0.393	18	1.3	43	306	3.8	5.7	2.4	65	350	2.8
858.4	0.962	17	1.1	39	283	3.4	14	1.9	60	324	2.5
859.1	0.393	15	0.819	43	312	4.4	5.7	1.5	66	357	3.2
859.8	0.902	20	1.6	45	318	3.6	13	2.9	69	364	2.6
860.5	0.443	16	0.864	43	288	3.1	6.4	1.6	66	330	2.3
861.2	0.393	15	1.2	42	316	3.1	5.7	2.1	65	361	2.3
861.9	0.393	18	1.2	39	288	3.5	5.7	2.2	60	329	2.6
862.6	0.393	16	1.4	51	290	2.3	5.7	2.6	78	332	1.7
863.3	0.393	18	1.8	52	360	3.1	5.7	3.3	79	412	2.3
864.0	0.393	18	1.4	48	306	3.4	5.7	2.5	74	350	2.5
864.7	0.393	18	1.6	51	306	2.7	5.7	2.9	78	350	2.0
865.4	0.393	19	1.2	52	298	3.9	5.7	2.2	80	341	2.9
866.1	0.393	17	1.4	48	341	2.7	5.7	2.5	73	389	2.0
866.8	0.850	18	1.8	46	334	3.3	12	3.2	70	382	2.4
867.5	0.393	17	1.2	59	302	3.1	5.7	2.2	90	346	2.3
868.2	0.393	19	1.4	60	294	2.6	5.7	2.6	92	336	1.9
868.9	0.393	19	1.5	58	323	3.2	5.7	2.6	89	370	2.4
869.6	0.393	17	1.2	51	332	2.8	5.7	2.2	78	380	2.1
870.3	0.393	19	1.9	54	351	4.0	5.7	3.4	83	401	2.9
871.0	0.393	20	1.2	60	308	3.0	5.7	2.1	92	352	2.2
871.7	0.393	19	1.4	60	329	2.8	5.7	2.5	91	376	2.0
872.4	0.393	19	1.2	64	389	6.2	5.7	2.3	98	445	4.5
873.1	0.393	19	1.2	61	327	3.5	5.7	2.2	94	373	2.6
873.8	0.569	21	1.7	66	349	3.0	8.2	3.2	102	399	2.2
874.5	0.393	21	1.4	58	349	5.6	5.7	2.6	88	399	4.1
875.2	0.393	19	1.4	55	315	2.7	5.7	2.5	84	360	2.0
875.9	0.393	22	1.2	70	324	2.8	5.7	2.2	107	371	2.0
876.6	0.648	16	1.6	59	316	2.0	9.4	2.9	90	362	1.4
877.3	0.393	17	1.6	61	323	2.8	5.7	3.0	93	369	2.0
878.0	0.393	19	1.4	66	327	3.4	5.7	2.6	100	374	2.5
878.7	0.587	22	1.4	68	332	3.7	8.5	2.5	104	380	2.7
879.4	0.393	18	1.5	62	311	2.1	5.7	2.7	95	355	1.6
880.1	0.393	21	1.2	58	288	1.9	5.7	2.2	88	330	1.4
880.8	0.393	21	1.6	69	313	3.0	5.7	3.0	105	358	2.2
881.5	0.438	20	1.4	62	278	3.0	6.3	2.6	95	318	2.2
882.2	0.393	21	1.5	66	303	2.5	5.7	2.7	101	346	1.8
882.9	0.541	22	1.8	64	294	2.9	7.8	3.3	98	336	2.1
883.5	0.393	18	1.9	73	310	1.5	5.7	3.5	111	354	1.1
884.2	0.393	21	1.6	67	305	2.5	5.7	3.0	103	349	1.8
884.9	0.393	20	1.6	70	277	2.3	5.7	3.0	108	317	1.7
885.6	0.513	19	1.9	67	280	2.5	7.4	3.4	103	320	1.8
886.3	0.393	19	1.8	74	305	2.3	5.7	3.4	114	349	1.7
887.0	0.393	19	2.1	65	300	2.9	5.7	3.9	100	343	2.1
887.7	0.691	18	1.7	72	300	2.0	10.0	3.1	111	344	1.5
888.4	0.501	21	2.3	69	326	2.1	7.2	4.2	106	373	1.5
889.1	0.393	19	2.0	72	300	3.8	5.7	3.6	110	343	2.8
889.8	0.601	20	1.9	61	251	2.1	8.7	3.4	93	287	1.6
890.5	0.427	20	2.7	66	308	3.2	6.2	4.9	102	353	2.4
891.2	0.461	20	1.4	71	285	2.1	6.7	2.6	109	326	1.5
891.9	0.629	21	2.0	67	264	2.7	9.1	3.6	102	302	2.0
892.6	0.393	20	2.1	61	265	1.8	5.7	3.8	93	303	1.3
893.3	0.393	21	1.8	74	277	2.1	5.7	3.3	113	317	1.6
894.0	0.646	19	1.8	63	281	3.1	9.3	3.3	96	321	2.3
894.7	0.393	25	1.8	70	293	3.1	5.7	3.3	108	336	2.3
895.4	0.393	20	2.3	69	295	2.5	5.7	4.2	106	337	1.8
896.1	0.393	23	1.6	66	295	3.1	5.7	2.9	102	337	2.3
896.8	0.393	21	2.1	66	263	1.9	5.7	3.9	101	300	1.4
897.5	0.460	21	2.0	56	242	2.8	6.6	3.6	85	277	2.1
898.2	0.393	21	1.9	61	257	3.5	5.7	3.4	94	294	2.6
898.9	0.594	22	2.3	75	278	3.3	8.6	4.2	115	317	2.4
899.6	0.393	20	2.4	67	291	3.2	5.7	4.3	102	333	2.3
900.3	0.597	20	2.3	56	262	2.4	8.6	4.1	86	300	1.8
901.0	0.393	22	2.3	70	237	3.7	5.7	4.2	107	271	2.7
901.7	0.452	26	2.2	59	264	3.5	6.5	3.9	91	302	2.6
902.4	0.393	23	1.8	59	223	3.0	5.7	3.4	90	255	2.2
903.1	0.519	22	1.7	62	241	3.4	7.5	3.0	95	276	2.5



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Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
903.8	0.417	19	1.6	54	229	2.7	6.0	2.9	83	262	2.0
904.5	0.502	22	1.9	54	254	2.3	7.2	3.5	83	290	1.7
905.2	0.393	21	2.2	69	262	2.4	5.7	4.0	106	299	1.7
905.9	0.393	23	2.5	64	224	2.6	5.7	4.5	98	256	1.9
906.6	0.393	21	2.7	63	259	3.5	5.7	5.0	97	297	2.6
907.3	0.597	24	1.7	56	234	3.0	8.6	3.2	86	268	2.2
908.0	0.393	20	1.7	62	233	3.1	5.7	3.1	96	267	2.3
908.7	0.433	22	2.3	64	251	3.8	6.2	4.2	98	287	2.8
909.4	0.393	23	1.8	60	227	2.8	5.7	3.3	93	259	2.0
910.0	0.583	20	2.2	64	214	2.0	8.4	3.9	98	245	1.4
910.7	0.393	19	2.1	63	229	4.5	5.7	3.8	96	262	3.3
911.4	0.393	20	1.7	57	209	2.1	5.7	3.0	88	239	1.6
912.1	0.528	24	2.5	73	240	3.0	7.6	4.5	112	275	2.2
912.8	0.466	22	2.0	58	226	3.7	6.7	3.6	89	259	2.7
913.5	0.393	24	1.7	68	226	4.6	5.7	3.1	105	258	3.3
914.2	0.393	23	2.1	66	226	3.8	5.7	3.9	102	259	2.8
914.9	0.445	24	2.4	69	231	3.8	6.4	4.4	106	264	2.8
915.6	0.393	21	1.8	57	207	3.8	5.7	3.3	88	237	2.8
916.3	0.393	23	2.3	63	207	5.6	5.7	4.2	97	236	4.1
917.0	0.393	19	2.0	54	211	3.4	5.7	3.6	82	241	2.5
917.7	0.393	24	2.4	60	216	4.0	5.7	4.3	92	247	2.9
918.4	0.393	22	2.4	62	206	4.1	5.7	4.4	95	236	3.0
919.1	0.393	21	2.3	65	229	3.5	5.7	4.2	100	262	2.5
919.8	0.393	22	2.4	66	216	3.2	5.7	4.4	101	247	2.3
920.5	0.393	22	2.3	56	217	3.1	5.7	4.1	86	248	2.3
921.2	0.393	22	2.4	60	223	3.3	5.7	4.4	92	255	2.4
921.9	0.393	21	2.2	63	217	6.0	5.7	4.0	96	249	4.3
922.6	0.393	22	2.6	64	223	4.2	5.7	4.7	97	254	3.0
923.3	0.617	23	1.7	65	214	3.9	8.9	3.2	100	244	2.9
924.0	0.468	19	2.5	55	196	3.2	6.8	4.6	84	224	2.3
924.7	0.393	24	2.2	67	244	4.3	5.7	4.0	103	278	3.1
925.4	0.393	20	2.6	59	240	4.4	5.7	4.8	90	275	3.2
926.1	0.393	21	2.4	55	235	5.3	5.7	4.3	85	268	3.9
926.8	0.393	20	2.5	56	257	4.5	5.7	4.5	86	294	3.3
927.5	0.393	21	1.7	50	238	4.2	5.7	3.2	76	272	3.1
928.2	0.393	23	2.6	61	254	4.9	5.7	4.7	93	290	3.5
928.9	0.393	22	2.3	63	231	6.1	5.7	4.2	96	264	4.5
929.6	0.393	21	1.9	63	285	4.0	5.7	3.5	96	326	2.9
930.3	0.393	21	2.4	62	261	5.5	5.7	4.3	95	298	4.0
931.0	0.393	21	2.2	55	257	4.9	5.7	3.9	85	294	3.5
931.7	0.393	21	2.0	64	240	6.0	5.7	3.7	98	274	4.4
932.4	0.393	19	1.9	59	255	5.1	5.7	3.5	90	291	3.7
933.1	0.393	20	1.5	54	273	6.8	5.7	2.8	82	312	4.9
933.8	0.393	21	2.1	50	282	5.3	5.7	3.8	77	322	3.9
934.5	0.393	18	2.1	62	270	6.8	5.7	3.8	95	308	5.0
935.2	0.393	18	1.8	61	322	6.0	5.7	3.3	94	368	4.4
935.9	0.393	21	1.8	56	300	7.4	5.7	3.3	86	343	5.4
936.5	0.393	19	2.2	51	333	5.3	5.7	4.0	79	380	3.8
937.2	0.393	20	2.1	56	332	7.0	5.7	3.8	85	380	5.1
937.9	0.393	20	1.7	55	308	6.2	5.7	3.2	84	352	4.5
938.6	0.393	19	1.9	51	306	7.6	5.7	3.5	79	350	5.5
939.3	0.393	17	1.5	52	382	8.2	5.7	2.8	80	437	6.0
940.0	0.393	18	1.2	50	369	9.5	5.7	2.2	76	422	7.0
940.7	0.393	16	1.5	49	414	11	5.7	2.7	75	473	7.9
941.4	0.393	17	1.2	50	381	10	5.7	2.3	76	435	7.4
942.1	0.393	18	1.4	46	379	11	5.7	2.5	70	434	8.0
942.8	0.393	18	1.3	41	472	10	5.7	2.3	64	540	7.5
943.5	0.393	17	1.3	46	453	11	5.7	2.4	71	518	8.3
944.2	0.393	19	1.7	49	499	11	5.7	3.1	75	571	8.2
944.9	0.393	19	1.4	50	531	16	5.7	2.6	76	608	12
945.6	0.393	18	1.1	42	518	12	5.7	2.0	65	592	8.8
946.3	0.393	13	0.927	39	533	17	5.7	1.7	60	609	12
947.0	0.393	16	1.0	39	602	18	5.7	1.9	60	688	13
947.7	0.393	15	1.3	34	601	20	5.7	2.4	51	687	14
948.4	0.393	15	0.850	38	531	14	5.7	1.5	58	608	10
949.1	0.430	15	0.973	45	662	22	6.2	1.8	69	757	16
949.8	0.393	15	0.868	30	653	20	5.7	1.6	46	747	14
950.5	0.393	14	1.1	29	679	20	5.7	2.0	45	777	14
951.2	0.393	11	0.946	33	647	21	5.7	1.7	50	740	16
951.9	0.393	16	0.909	33	692	26	5.7	1.7	50	791	19
952.6	0.393	14	0.586	32	698	21	5.7	1.1	49	798	15
953.3	0.649	15	0.738	27	716	19	9.4	1.3	42	819	14
954.0	0.393	13	0.761	25	696	19	5.7	1.4	39	795	14
954.7	0.393	13	0.609	25	843	28	5.7	1.1	38	963	21
955.4	0.393	14	0.478	26	832	27	5.7	0.872	40	951	20
956.1	0.393	12	0.704	26	926	33	5.7	1.3	40	1059	24
956.8	0.393	14	0.585	23	888	34	5.7	1.1	35	1016	25
957.5	0.393	14	0.891	29	1000	34	5.7	1.6	45	1143	25
958.2	0.393	11	0.859	24	916	44	5.7	1.6	37	1047	32
958.9	0.393	9.5	0.864	22	825	30	5.7	1.6	34	944	22
959.6	0.393	12	0.965	22	790	29	5.7	1.8	34	903	21



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Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.3	0.393	10	0.517	22	737	29	5.7	0.943	33	843	21
961.0	0.393	12	0.673	25	655	25	5.7	1.2	39	749	18
961.7	0.784	9.2	0.458	22	681	27	11	0.835	33	778	19
962.3	0.393	10	0.534	22	593	25	5.7	0.974	34	678	18
963.0	0.393	11	0.806	24	738	26	5.7	1.5	36	844	19
963.7	0.393	13	1.1	23	659	23	5.7	2.0	36	754	17
964.4	0.393	12	0.631	27	700	26	5.7	1.2	42	801	19
965.1	0.393	13	0.615	27	564	19	5.7	1.1	41	645	14
965.8	0.393	8.9	0.620	25	593	18	5.7	1.1	38	679	13
966.5	0.393	11	0.811	23	586	19	5.7	1.5	36	670	14
967.2	0.393	12	0.655	25	583	17	5.7	1.2	38	666	13
967.9	0.393	12	0.931	25	673	19	5.7	1.7	38	770	14
968.6	0.393	11	0.865	25	538	20	5.7	1.6	39	615	14
969.3	0.393	12	0.927	27	572	20	5.7	1.7	41	654	14
970.0	0.393	11	0.905	27	540	19	5.7	1.7	42	617	14
970.7	0.393	13	0.505	30	528	20	5.7	0.922	46	604	15
971.4	0.638	11	0.828	24	481	17	9.2	1.5	37	550	12
972.1	0.679	11	0.718	24	595	19	9.8	1.3	36	681	14
972.8	0.393	13	0.941	26	543	18	5.7	1.7	39	621	13
973.5	0.393	13	1.1	25	544	23	5.7	2.0	38	622	17
974.2	0.393	14	0.586	26	537	20	5.7	1.1	40	614	15
974.9	0.393	11	0.942	27	517	22	5.7	1.7	42	592	16
975.6	0.393	13	0.675	27	492	18	5.7	1.2	42	563	13
976.3	0.393	13	0.879	31	453	16	5.7	1.6	47	518	12
977.0	0.393	13	0.705	30	416	17	5.7	1.3	45	476	12
977.7	0.393	16	0.993	32	520	19	5.7	1.8	50	595	14
978.4	0.393	13	0.840	30	456	20	5.7	1.5	45	522	15
979.1	0.393	13	1.0	31	408	19	5.7	1.9	48	467	14
979.8	0.859	14	0.628	28	378	15	12	1.1	43	432	11
980.5	0.393	13	1.4	31	534	18	5.7	2.6	48	611	13
981.2	0.393	12	0.684	37	439	18	5.7	1.2	57	502	13
981.9	0.393	12	0.826	33	374	14	5.7	1.5	51	428	9.9
982.6	0.399	15	0.850	31	391	15	5.8	1.6	47	447	11
983.3	0.393	12	0.914	34	434	15	5.7	1.7	51	496	11
984.0	0.679	14	1.6	33	373	16	9.8	2.8	51	426	12
984.7	0.393	13	0.811	32	359	13	5.7	1.5	48	410	9.4
985.4	0.589	13	1.4	39	348	15	8.5	2.6	59	398	11
986.1	0.393	13	0.757	34	386	14	5.7	1.4	52	441	10
986.8	0.393	16	0.805	40	367	17	5.7	1.5	62	419	13
987.5	0.426	16	1.3	38	381	16	6.2	2.4	58	435	12
988.2	0.489	12	1.4	34	401	16	7.1	2.5	52	459	12
988.8	0.939	14	0.902	41	428	15	14	1.6	63	490	11
989.5	0.393	14	1.4	39	353	13	5.7	2.5	60	404	9.7
990.2	0.457	16	0.969	47	355	20	6.6	1.8	72	406	14
990.9	0.567	12	1.4	39	329	14	8.2	2.5	60	376	10
991.6	0.393	16	1.6	49	359	17	5.7	2.9	76	411	12
992.3	0.393	15	1.3	43	382	18	5.7	2.4	66	437	13
993.0	0.393	17	0.963	47	420	20	5.7	1.8	72	480	14
993.7	0.393	16	1.3	43	342	16	5.7	2.4	65	391	12
994.4	0.404	15	1.2	37	350	16	5.8	2.2	57	401	12
995.1	0.393	14	1.1	43	340	13	5.7	2.0	66	389	9.8
995.8	0.393	14	1.2	45	354	17	5.7	2.3	69	405	12
996.5	0.555	13	0.971	42	300	15	8.0	1.8	65	343	11
997.2	0.393	14	1.3	47	360	18	5.7	2.3	72	412	13
997.9	0.393	13	1.4	57	286	18	5.7	2.5	87	327	13
998.6	0.393	17	1.4	48	317	17	5.7	2.5	73	363	12
999.3	0.393	17	1.4	49	312	18	5.7	2.6	74	357	13
1000.0	0.393	13	1.8	41	283	14	5.7	3.3	63	324	11
1000.7	0.393	17	1.2	50	321	14	5.7	2.3	76	367	9.9
1001.4	0.957	16	1.3	44	305	16	14	2.3	68	349	12
1002.1	0.497	16	1.6	44	309	17	7.2	3.0	68	353	12
1002.8	0.393	12	1.7	53	318	17	5.7	3.1	82	364	12
1003.5	0.393	16	1.3	51	324	15	5.7	2.4	78	371	11
1004.2	0.393	19	1.4	48	321	18	5.7	2.6	74	367	13
1004.9	0.393	16	1.8	58	346	23	5.7	3.2	88	396	17
1005.6	0.666	14	1.2	53	339	17	9.6	2.3	81	388	12
1006.3	0.393	17	1.4	50	295	15	5.7	2.6	77	338	11
1007.0	0.393	17	1.9	52	355	20	5.7	3.5	79	406	14
1007.7	0.636	15	2.0	48	332	17	9.2	3.6	74	380	13
1008.4	0.393	14	1.7	48	303	16	5.7	3.1	73	347	12
1009.1	0.393	15	1.6	63	318	18	5.7	2.9	96	363	13
1009.8	0.393	16	1.5	56	371	21	5.7	2.7	85	424	15
1010.5	0.393	16	1.4	60	334	20	5.7	2.5	91	382	14
1011.2	0.416	17	1.4	64	361	20	6.0	2.6	98	413	14
1011.9	0.393	19	1.3	57	350	19	5.7	2.4	87	401	14
1012.6	0.393	16	1.6	53	319	16	5.7	3.0	81	364	12
1013.3	0.433	15	1.5	64	336	17	6.3	2.8	98	384	12
1014.0	0.393	17	1.7	63	336	21	5.7	3.0	96	384	15
1014.7	0.473	18	1.7	61	325	21	6.8	3.1	93	371	15
1015.3	0.393	17	2.5	62	359	22	5.7	4.6	95	410	16
1016.0	0.474	16	2.1	68	352	20	6.8	3.8	105	402	14



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Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1016.7	0.756	18	2.0	59	346	21	11	3.6	91	396	16
1017.4	0.398	17	2.0	61	318	22	5.7	3.6	93	363	16
1018.1	0.393	15	1.3	54	280	19	5.7	2.4	83	321	14
1018.8	0.393	16	1.8	66	328	20	5.7	3.3	101	375	15
1019.5	0.393	17	2.0	65	348	22	5.7	3.7	99	398	16
1020.2	0.588	19	2.1	65	366	23	8.5	3.8	99	418	17
1020.9	0.784	17	2.0	70	346	22	11	3.7	108	396	16
1021.6	0.543	21	2.2	61	308	21	7.8	4.0	94	353	16
1022.3	0.393	14	2.0	68	351	24	5.7	3.6	104	401	18
1023.0	0.393	17	2.1	63	308	23	5.7	3.7	96	353	17
1023.7	0.460	16	1.6	50	284	19	6.6	2.9	77	325	14
1024.4	0.393	18	1.9	70	338	24	5.7	3.5	108	387	17
1025.1	0.393	18	2.1	66	368	27	5.7	3.8	102	420	20
1025.8	0.393	18	2.0	71	336	23	5.7	3.7	108	384	17
1026.5	0.393	16	1.9	67	359	24	5.7	3.5	102	411	17
1027.2	0.393	15	2.0	69	353	24	5.7	3.6	106	404	18
1027.9	0.438	18	1.9	65	345	23	6.3	3.5	100	395	17
1028.6	0.947	18	2.4	61	327	27	14	4.4	93	374	19
1029.3	0.393	19	2.1	62	326	24	5.7	3.9	95	373	17
1030.0	0.625	19	2.7	68	359	25	9.0	4.9	105	411	18
1030.7	0.393	19	2.7	70	373	24	5.7	4.9	107	426	18
1031.4	0.882	17	2.0	71	397	23	13	3.6	109	454	17
1032.1	0.393	17	2.0	64	313	25	5.7	3.6	99	358	18
1032.8	0.393	20	2.3	71	385	23	5.7	4.2	109	440	17
1033.5	0.393	17	2.6	73	335	21	5.7	4.7	111	383	15
1034.2	0.393	21	1.8	68	331	25	5.7	3.3	104	379	18
1034.9	0.393	19	2.2	70	325	23	5.7	4.1	107	371	17
1035.6	0.393	16	2.8	67	420	21	5.7	5.2	102	480	15
1036.3	0.453	18	2.6	69	308	21	6.5	4.8	105	352	15
1037.0	0.393	19	2.4	71	415	21	5.7	4.3	109	475	16
1037.7	0.393	19	1.8	68	327	22	5.7	3.2	104	374	16
1038.4	0.393	19	2.7	81	365	29	5.7	5.0	125	418	21
1039.1	0.393	19	1.6	76	343	18	5.7	3.0	117	392	13
1039.8	0.393	20	2.1	68	356	23	5.7	3.7	104	407	16
1040.5	0.393	20	2.4	78	315	25	5.7	4.3	120	360	18
1041.1	0.393	22	2.0	69	344	21	5.7	3.7	106	393	15
1041.8	0.393	20	2.3	70	322	23	5.7	4.1	107	368	16
1042.5	0.393	19	2.3	80	381	24	5.7	4.2	123	435	18
1043.2	1.0	18	2.1	77	345	22	15	3.9	118	394	16
1043.9	0.393	18	2.3	74	323	22	5.7	4.2	114	370	16
1044.6	0.768	21	2.0	86	371	23	11	3.7	131	424	17
1045.3	0.393	18	2.1	72	333	21	5.7	3.8	110	381	15
1046.0	0.479	19	2.5	69	338	19	6.9	4.6	105	387	14
1046.7	0.457	20	2.6	69	354	20	6.6	4.7	105	405	15
1047.4	0.393	23	2.4	77	364	25	5.7	4.3	117	417	18
1048.1	0.393	22	2.7	70	331	20	5.7	5.0	107	379	14
1048.8	0.609	19	2.5	76	329	16	8.8	4.6	117	376	12
1049.5	0.395	21	2.4	80	338	21	5.7	4.3	122	386	15
1050.2	0.538	20	2.9	73	336	21	7.8	5.3	112	384	15
1050.9	0.462	18	2.5	72	308	15	6.7	4.6	111	352	11
1051.6	0.393	18	2.1	81	369	18	5.7	3.9	124	422	13
1052.3	0.645	21	2.5	79	387	19	9.3	4.5	121	442	14
1053.0	0.439	21	2.4	77	305	18	6.3	4.3	119	348	13
1053.7	0.393	19	2.4	70	366	16	5.7	4.4	108	419	12
1054.4	0.436	20	2.0	78	332	17	6.3	3.7	119	379	13
1055.1	0.663	19	2.2	69	339	16	9.6	4.1	106	388	12
1055.8	0.563	21	1.9	81	309	18	8.1	3.5	124	353	13
1056.5	0.441	21	2.4	74	335	15	6.4	4.3	113	383	11
1057.2	0.393	22	2.2	65	342	14	5.7	4.0	99	391	11
1057.9	0.393	20	1.9	80	339	14	5.7	3.5	123	388	10.0
1058.6	0.828	21	2.2	71	305	11	12	3.9	109	349	8.4
1059.3	0.633	21	2.9	64	308	11	9.1	5.3	99	353	8.0
1060.0	0.515	22	2.2	77	312	15	7.4	4.0	119	357	11
1060.7	0.393	21	2.1	63	342	13	5.7	3.8	97	391	9.8
1061.4	0.393	20	2.3	75	321	12	5.7	4.2	115	367	9.0
1062.1	0.393	21	2.3	73	293	11	5.7	4.1	112	335	7.9
1062.8	0.393	24	2.5	76	312	10	5.7	4.6	116	357	7.6
1063.5	0.457	21	2.2	68	292	11	6.6	4.0	104	334	8.0
1064.2	0.393	22	2.0	66	285	12	5.7	3.7	102	326	8.5
1064.9	0.393	19	2.2	71	279	9.5	5.7	4.0	108	319	6.9
1065.6	0.466	24	2.4	65	279	14	6.7	4.3	99	319	10.0
1066.3	0.393	22	2.0	65	289	11	5.7	3.7	100	331	7.8
1067.0	0.393	22	2.3	69	331	8.6	5.7	4.3	106	379	6.3
1067.6	0.393	22	2.2	67	263	9.7	5.7	4.0	102	300	7.1
1068.3	0.393	22	1.5	80	328	13	5.7	2.7	122	375	9.2
1069.0	0.665	21	1.9	70	296	9.9	9.6	3.5	107	339	7.2
1069.7	0.393	23	1.8	64	298	9.1	5.7	3.3	98	340	6.6
1070.4	0.393	21	1.9	72	295	7.0	5.7	3.5	110	337	5.1
1071.1	0.526	27	2.0	60	280	9.2	7.6	3.6	92	321	6.2
1071.8	0.393	24	2.1	65	290	7.2	5.7	3.9	100	332	5.7
1072.5	0.503	20	1.8	71	278	7.8	7.3	3.3	109	318	5.7



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.2	0.393	22	2.2	64	277	7.1	5.7	4.0	98	316	5.2
1073.9	0.393	24	2.3	70	284	9.2	5.7	4.2	107	324	6.7
1074.6	0.550	22	2.3	65	260	7.2	7.9	4.2	99	298	5.3
1075.3	0.680	21	1.7	67	271	5.4	9.8	3.1	102	310	3.9
1076.0	0.393	19	2.3	62	266	7.2	5.7	4.3	95	304	5.2
1076.7	0.462	21	1.8	63	283	9.8	6.7	3.4	97	324	7.2
1077.4	0.457	21	1.3	65	254	6.3	6.6	2.4	100	290	4.6
1078.1	0.518	24	2.2	59	239	7.1	7.5	4.0	90	274	5.2
1078.8	0.393	21	2.0	51	260	7.2	5.7	3.7	78	298	5.3
1079.5	0.393	17	1.8	64	224	6.4	5.7	3.4	97	257	4.7
1080.2	0.393	23	2.1	59	256	5.7	5.7	3.8	91	292	4.1
1080.9	0.453	20	2.1	58	249	8.3	6.5	3.8	88	284	6.1
1081.6	0.608	22	1.6	57	260	8.0	8.8	3.0	87	297	5.8
1082.3	0.600	26	2.0	63	231	6.1	8.7	3.7	97	264	4.5
1083.0	0.420	24	1.8	59	252	9.3	6.1	3.2	91	288	6.8
1083.7	0.393	20	2.0	59	249	8.7	5.7	3.6	90	284	6.3
1084.4	0.393	20	1.8	60	228	6.1	5.7	3.2	93	261	4.4
1085.1	0.393	19	1.3	56	208	7.0	5.7	2.5	86	238	5.1
1085.8	0.393	20	1.5	63	247	7.2	5.7	2.8	96	283	5.3
1086.5	0.393	22	2.0	59	219	6.8	5.7	3.6	90	251	4.9
1087.2	0.398	19	1.9	55	207	7.1	5.7	3.4	84	237	5.2
1087.9	0.563	21	1.6	66	233	6.8	8.1	2.8	102	266	5.0
1088.6	0.508	20	1.6	62	228	6.8	7.3	2.9	95	261	5.0
1089.3	0.393	18	1.5	52	218	10	5.7	2.7	80	249	7.4
1090.0	0.393	20	2.0	61	231	7.1	5.7	3.7	93	264	5.2
1090.7	0.393	16	1.8	62	207	7.1	5.7	3.2	94	237	5.2
1091.4	0.393	22	1.5	58	204	5.9	5.7	2.7	89	233	4.3
1092.1	0.393	21	2.2	54	203	8.4	5.7	3.9	83	233	6.1
1092.8	0.393	20	2.3	62	218	9.5	5.7	4.1	95	250	6.9
1093.4	0.393	19	1.5	57	220	6.1	5.7	2.7	87	251	4.4
1094.1	0.634	18	1.5	52	213	5.8	9.1	2.7	79	244	4.3
1094.8	0.393	16	1.8	56	187	7.1	5.7	3.3	85	214	5.2
1095.5	0.393	16	2.4	59	227	7.9	5.7	4.3	90	259	5.8
1096.2	0.393	18	1.6	56	204	5.5	5.7	3.0	86	233	4.0
1096.9	1.1	19	1.4	65	224	6.6	15	2.6	99	257	4.8
1097.6	0.580	17	1.3	59	212	6.5	8.4	2.5	90	242	4.7
1098.3	0.543	21	1.8	52	203	8.2	7.8	3.3	80	232	6.0
1099.0	0.393	19	2.2	54	200	6.7	5.7	3.9	83	228	4.9
1099.7	0.393	19	1.7	47	223	6.9	5.7	3.1	72	255	5.0
1100.4	0.393	19	2.1	55	232	10	5.7	3.8	84	266	7.4
1101.1	0.393	17	1.8	50	210	5.3	5.7	3.2	77	240	3.9
1101.8	0.393	17	1.5	56	233	6.6	5.7	2.8	86	267	4.8
1102.5	0.393	16	1.9	55	255	5.7	5.7	3.6	85	291	4.1
1103.2	1.2	20	2.2	53	249	8.5	17	4.0	81	285	6.2
1103.9	0.673	17	1.6	47	233	4.7	9.7	2.9	72	266	3.4
1104.6	0.393	18	1.5	55	261	6.1	5.7	2.8	85	298	4.4
1105.3	0.393	17	1.7	56	257	5.7	5.7	3.0	86	294	4.1
1106.0	0.393	17	1.6	51	246	4.5	5.7	2.9	78	282	3.3
1106.7	0.654	18	1.7	55	258	5.0	9.4	3.2	84	295	3.6
1107.4	0.393	16	1.6	60	255	5.6	5.7	2.9	91	292	4.1
1108.1	0.540	17	1.4	42	301	5.0	7.8	2.5	65	344	3.6
1108.8	0.722	20	1.7	52	321	3.5	10	3.2	79	367	2.6
1109.5	0.393	18	1.5	51	282	4.3	5.7	2.7	78	323	3.1
1110.2	0.393	17	1.0	48	278	2.8	5.7	1.8	73	318	2.0
1110.9	0.548	15	1.6	50	283	4.3	7.9	3.0	77	323	3.2
1111.6	0.393	21	1.4	54	321	4.4	5.7	2.6	83	367	3.2
1112.3	0.393	18	1.2	45	267	3.4	5.7	2.2	69	305	2.5
1113.0	0.393	18	1.5	47	278	4.3	5.7	2.8	73	318	3.1
1113.7	0.393	18	0.831	46	307	3.1	5.7	1.5	70	351	2.3
1114.4	0.681	18	1.5	45	300	2.1	9.8	2.8	70	343	1.5
1115.1	0.509	18	1.5	42	305	3.4	7.3	2.7	65	349	2.5
1115.8	0.393	20	1.9	45	305	4.2	5.7	3.5	68	349	3.1
1116.5	0.393	17	1.4	46	275	2.9	5.7	2.6	70	315	2.1
1117.2	0.881	21	1.1	51	341	4.1	13	2.0	79	390	3.0
1117.9	0.434	18	1.1	49	295	3.9	6.3	2.0	75	337	2.9
1118.6	0.393	16	1.1	46	297	3.9	5.7	2.1	71	339	2.8
1119.2	0.530	19	1.5	48	339	2.9	7.7	2.7	73	388	2.1
1119.9	0.612	18	1.6	53	342	3.2	8.8	3.0	81	391	2.4
1120.6	0.592	19	1.1	43	296	2.9	8.5	1.9	65	339	2.1
1121.3	0.393	19	1.4	36	303	2.7	5.7	2.5	55	347	2.0
1122.0	0.393	20	1.8	48	334	2.7	5.7	3.2	74	382	2.0
1122.7	0.393	18	1.7	44	311	3.3	5.7	3.2	68	356	2.4
1123.4	0.393	19	1.2	46	330	2.9	5.7	2.2	71	377	2.1
1124.1	0.393	20	1.5	40	299	3.6	5.7	2.8	61	342	2.6
1124.8	0.393	19	1.2	38	312	3.5	5.7	2.3	59	357	2.6
1125.5	0.393	18	1.5	44	331	4.1	5.7	2.7	68	379	3.0
1126.2	0.393	20	1.3	40	308	3.0	5.7	2.4	61	352	2.2
1126.9	0.393	20	1.5	46	308	3.6	5.7	2.8	70	352	2.6
1127.6	0.393	21	1.7	44	306	2.6	5.7	3.2	67	350	1.9
1128.3	0.393	21	1.4	46	331	4.3	5.7	2.6	70	379	3.2
1129.0	0.393	19	1.2	40	293	2.1	5.7	2.2	61	335	1.5



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1129.7	0.511	19	1.8	41	329	2.8	7.4	3.3	62	376	2.1
1130.4	0.459	22	1.6	36	305	3.1	6.6	3.0	56	349	2.3
1131.1	0.393	21	1.2	44	298	1.8	5.7	2.2	67	341	1.3
1131.8	0.393	20	1.1	41	357	3.3	5.7	1.9	62	408	2.4
1132.5	0.486	20	1.7	40	319	3.5	7.0	3.0	61	364	2.6
1133.2	0.393	20	1.7	48	362	2.1	5.7	3.0	74	414	1.5
1133.9	0.460	24	1.1	43	319	3.1	6.6	2.0	65	364	2.3
1134.6	0.393	22	1.8	45	347	4.3	5.7	3.2	69	397	3.1
1135.3	0.487	23	1.3	38	336	3.1	7.0	2.4	59	384	2.3
1136.0	0.473	24	1.7	47	392	2.7	6.8	3.1	72	449	2.0
1136.7	0.393	22	1.1	52	359	2.8	5.7	2.0	79	410	2.0
1137.4	0.393	20	1.4	41	321	3.1	5.7	2.6	63	367	2.2
1138.1	0.393	21	1.8	37	329	1.8	5.7	3.4	57	376	1.3
1138.8	0.393	21	1.6	36	306	1.6	5.7	3.0	55	350	1.2
1139.5	0.393	23	1.5	42	344	2.3	5.7	2.7	65	393	1.7
1140.2	0.642	19	1.4	37	362	3.2	9.3	2.6	57	414	2.3
1140.9	0.684	24	1.5	37	323	3.9	9.9	2.8	57	370	2.8
1141.6	0.393	24	1.2	42	363	3.7	5.7	2.2	64	415	2.7
1142.3	0.393	24	1.5	41	338	3.2	5.7	2.7	62	387	2.3
1143.0	0.438	25	1.6	39	353	3.5	6.3	3.0	59	404	2.6
1143.7	0.393	24	1.3	37	307	2.5	5.7	2.3	57	351	1.8
1144.4	0.393	24	1.6	35	332	1.7	5.7	2.9	53	380	1.2
1145.1	0.393	24	1.7	42	407	3.3	5.7	3.1	64	466	2.4
1145.7	0.446	24	1.6	35	351	3.2	6.4	2.9	54	401	2.4
1146.4	0.725	26	1.5	40	364	2.9	10	2.8	61	416	2.1
1147.1	0.393	23	1.9	36	358	2.5	5.7	3.6	55	409	1.8
1147.8	0.699	27	1.6	42	344	2.1	10	2.9	65	393	1.6
1148.5	0.393	22	1.6	36	341	2.8	5.7	2.9	56	390	2.1
1149.2	0.735	25	1.3	35	390	3.4	11	2.4	54	446	2.5
1149.9	0.393	23	1.8	36	358	3.3	5.7	3.3	55	410	2.4
1150.6	0.393	21	1.2	38	346	3.1	5.7	2.3	58	396	2.3
1151.3	0.393	23	1.8	37	350	3.9	5.7	3.3	56	400	2.8
1152.0	0.393	25	1.4	43	353	3.3	5.7	2.6	65	404	2.4
1152.7	0.393	24	1.7	37	364	3.0	5.7	3.2	56	416	2.2
1153.4	0.766	24	1.5	38	344	2.9	11	2.7	58	393	2.2
1154.1	0.665	25	1.3	39	392	3.3	9.6	2.4	59	448	2.4
1154.8	0.393	24	1.5	39	336	2.9	5.7	2.8	60	385	2.1
1155.5	0.393	24	2.4	34	369	2.1	5.7	4.5	52	422	1.6
1156.2	0.843	24	1.8	32	376	4.6	12	3.3	48	429	3.4
1156.9	0.393	24	2.3	36	348	3.7	5.7	4.1	56	398	2.7
1157.6	0.498	24	1.8	33	389	2.6	7.2	3.3	50	444	1.9
1158.3	0.393	25	1.8	30	353	2.8	5.7	3.2	46	403	2.1
1159.0	0.421	27	1.9	34	367	3.3	6.1	3.6	52	419	2.4
1159.7	0.393	26	2.2	34	388	3.3	5.7	4.0	53	444	2.4
1160.4	0.677	27	2.1	34	374	2.2	9.8	3.8	52	428	1.6
1161.1	0.648	23	1.9	33	334	3.0	9.3	3.5	50	382	2.2
1161.8	0.826	25	2.0	37	410	4.1	12	3.7	56	469	3.0
1162.5	0.630	27	2.7	30	404	3.9	9.1	4.8	46	463	2.8
1163.2	0.393	23	2.3	32	377	3.8	5.7	4.2	49	432	2.8
1163.9	0.460	26	2.2	29	420	3.1	6.6	4.0	45	480	2.3
1164.6	0.393	21	1.9	34	381	4.2	5.7	3.5	52	435	3.1
1165.3	0.473	23	2.1	33	371	2.9	6.8	3.9	50	425	2.1
1166.0	0.393	26	2.1	29	390	2.9	5.7	3.9	44	446	2.1
1166.7	0.393	26	2.0	29	362	3.3	5.7	3.7	45	414	2.4
1167.4	0.426	25	2.2	34	380	3.0	6.1	3.9	51	434	2.2
1168.1	0.393	24	2.0	28	393	4.8	5.7	3.7	44	450	3.5
1168.8	0.592	26	2.8	28	424	5.1	8.5	5.0	42	485	3.7
1169.5	0.393	23	2.0	31	399	3.8	5.7	3.7	48	457	2.8
1170.2	0.393	26	2.4	31	450	4.1	5.7	4.3	48	515	3.0
1170.9	0.619	26	2.0	32	433	3.1	8.9	3.7	48	495	2.2
1171.5	0.778	23	2.3	32	394	3.1	11	4.2	48	451	2.3
1172.2	0.403	22	2.7	32	399	3.6	5.8	4.8	50	456	2.7
1172.9	0.393	25	2.2	29	384	2.8	5.7	3.9	45	440	2.0
1173.6	0.598	27	2.3	28	390	2.3	8.6	4.3	44	446	1.7
1174.3	0.511	21	2.7	31	425	2.7	7.4	4.9	47	486	2.0
1175.0	0.393	22	2.6	29	380	2.6	5.7	4.8	44	434	1.9
1175.7	1.2	28	2.6	30	403	3.4	18	4.8	46	460	2.4
1176.4	0.481	25	2.9	30	440	3.5	7.0	5.3	46	504	2.6
1177.1	0.393	26	2.6	29	352	4.4	5.7	4.7	44	403	3.2
1177.8	0.393	24	2.8	32	378	4.2	5.7	5.1	50	432	3.0
1178.5	0.765	26	3.5	25	446	3.6	11	6.4	38	511	2.6
1179.2	0.393	26	3.3	28	434	4.1	5.7	6.0	43	496	3.0
1179.9	0.629	23	2.8	25	402	2.6	9.1	5.0	38	460	1.9
1180.6	0.393	31	2.8	27	399	3.5	5.7	5.1	41	457	2.5
1181.3	0.393	28	2.7	28	387	4.0	5.7	5.0	43	442	2.9
1182.0	0.686	39	2.3	27	404	3.6	9.9	4.3	42	462	2.7
1182.7	0.393	25	3.0	26	386	3.2	5.7	5.5	40	441	2.3
1183.4	0.393	30	2.8	25	391	2.8	5.7	5.1	38	447	2.1
1184.1	0.393	31	3.2	26	386	2.4	5.7	5.9	40	442	1.8
1184.8	0.485	29	3.1	21	410	3.6	7.0	5.7	32	469	2.7
1185.5	0.393	26	3.8	25	496	3.4	5.7	7.0	38	567	2.5



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Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1186.2	0.495	29	3.0	24	462	3.7	7.1	5.5	37	529	2.7
1186.9	0.393	32	3.6	27	477	2.9	5.7	6.5	42	546	2.1
1187.6	0.393	30	3.3	26	410	3.1	5.7	6.1	40	468	2.2
1188.3	0.779	28	3.4	26	407	2.8	11	6.2	40	465	2.0
1189.0	0.832	28	3.3	22	386	4.3	12	6.0	34	441	3.2
1189.7	0.393	30	3.8	23	479	2.6	5.7	6.9	35	547	1.9
1190.4	0.393	32	3.4	26	429	2.9	5.7	6.2	40	490	2.1
1191.1	0.615	38	3.5	23	410	2.9	8.9	6.4	35	469	2.1
1191.8	0.393	30	3.3	22	433	4.5	5.7	6.0	34	495	3.3
1192.5	0.393	35	3.3	25	413	3.4	5.7	5.9	39	472	2.5
1193.2	0.426	37	3.4	24	464	3.6	6.2	6.3	36	531	2.7
1193.9	0.393	31	3.6	29	460	4.2	5.7	6.7	44	526	3.1
1194.6	0.393	34	3.2	21	353	3.8	5.7	5.9	32	403	2.8
1195.3	0.441	33	3.6	28	386	3.4	6.4	6.6	42	441	2.5
1196.0	0.393	34	3.2	27	398	3.5	5.7	5.8	42	455	2.6
1196.7	0.393	38	4.7	28	416	3.1	5.7	8.5	43	476	2.2
1197.4	0.513	29	3.4	26	370	2.5	7.4	6.2	40	423	1.8
1198.1	0.684	36	5.1	25	379	2.8	9.9	9.3	38	433	2.0
1198.7	1.3	39	4.7	27	423	4.0	19	8.5	41	483	2.9
1199.4	0.767	39	5.1	27	397	3.2	11	9.2	41	454	2.3
1200.1	0.393	40	4.6	25	403	2.5	5.7	8.5	39	461	1.8
1200.8	0.393	41	4.7	28	412	3.4	5.7	8.6	42	471	2.5
1201.5	0.720	34	4.3	20	345	3.5	10	7.9	30	395	2.6
1202.2	0.393	39	4.7	23	491	2.1	5.7	8.6	35	562	1.5
1202.9	0.426	38	5.4	27	408	2.6	6.2	9.9	41	466	1.9
1203.6	0.547	61	5.6	20	372	2.2	7.9	10	31	425	1.6
1204.3	0.530	52	5.6	25	444	2.5	7.7	10	38	508	1.8
1205.0	0.467	50	5.6	24	372	2.1	6.7	10	36	425	1.5
1205.7	0.393	47	6.6	25	421	2.4	5.7	12	38	482	1.7
1206.4	0.393	59	5.8	23	437	2.6	5.7	11	36	499	1.9
1207.1	0.433	49	6.0	20	392	3.3	6.2	11	30	448	2.4
1207.8	0.770	49	5.1	23	432	2.6	11	9.3	36	494	1.9
1208.5	0.393	56	6.7	22	414	3.4	5.7	12	33	474	2.5
1209.2	0.616	56	5.6	28	408	3.5	8.9	10	42	467	2.5
1209.9	0.393	44	5.8	23	386	1.9	5.7	11	35	442	1.4
1210.6	0.664	45	4.6	27	355	2.7	9.6	8.4	41	406	2.0
1211.3	0.525	52	4.2	23	388	2.6	7.6	7.7	35	444	1.9
1212.0	0.393	58	3.9	21	385	2.6	5.7	7.0	32	440	1.9
1212.7	0.785	42	4.4	24	437	2.7	11	8.0	36	500	2.0
1213.4	0.637	43	5.1	22	413	3.7	9.2	9.3	34	473	2.7
1214.1	0.393	43	4.7	24	377	3.1	5.7	8.6	37	431	2.3
1214.8	0.756	40	4.1	27	406	3.8	11	7.4	41	465	2.8
1215.5	0.393	34	3.6	21	357	2.3	5.7	6.5	32	408	1.7
1216.2	0.393	39	4.1	24	383	3.0	5.7	7.5	37	438	2.2
1216.9	0.550	39	5.9	28	386	3.8	7.9	11	43	441	2.8
1217.6	0.393	35	3.3	27	370	2.9	5.7	6.0	42	423	2.1
1218.3	0.571	39	3.6	25	386	2.8	8.2	6.5	38	442	2.0
1219.0	0.705	34	3.5	28	425	4.2	10	6.4	43	486	3.1
1219.7	0.458	30	2.9	27	430	2.4	6.6	5.3	42	491	1.8
1220.4	0.670	34	2.2	28	384	3.6	9.7	4.1	43	439	2.6
1221.1	0.393	36	2.9	26	411	2.5	5.7	5.2	40	470	1.8
1221.8	0.393	30	2.5	26	424	3.0	5.7	4.5	39	485	2.2
1222.5	0.393	31	1.8	30	399	2.8	5.7	3.3	45	457	2.0
1223.2	0.475	31	2.7	30	434	2.4	6.9	4.9	46	496	1.7
1223.9	0.899	31	2.2	27	395	2.6	13	4.0	42	452	1.9
1224.6	0.393	29	2.9	29	419	2.6	5.7	5.2	44	480	1.9
1225.2	0.393	26	2.2	30	417	1.5	5.7	4.0	46	477	1.1
1225.9	0.502	27	2.3	31	421	2.8	7.2	4.2	48	482	2.0
1226.6	1.5	29	1.8	34	425	3.8	21	3.3	52	486	2.8
1227.3	0.393	27	2.1	33	353	2.1	5.7	3.8	50	403	1.5
1228.0	0.421	21	1.7	29	390	3.4	6.1	3.0	45	446	2.5
1228.7	0.876	28	2.0	28	409	4.0	13	3.6	42	468	2.9
1229.4	0.739	25	2.1	28	408	3.6	11	3.9	43	466	2.6
1230.1	0.814	27	2.2	31	407	3.9	12	4.0	47	465	2.8
1230.8	0.393	26	1.9	31	429	2.6	5.7	3.5	47	491	1.9
1231.5	0.580	23	1.7	28	413	2.2	8.4	3.1	43	472	1.6
1232.2	0.393	27	2.3	33	420	2.6	5.7	4.1	50	480	1.9
1232.9	0.596	27	1.6	32	417	2.3	8.6	2.9	50	477	1.7
1233.6	0.943	22	1.7	31	382	2.2	14	3.1	48	437	1.6
1234.3	0.400	27	1.7	37	421	2.7	5.8	3.0	56	482	2.0
1235.0	0.393	23	1.5	25	396	2.9	5.7	2.7	39	453	2.1
1235.7	0.591	25	1.8	31	411	2.9	8.5	3.3	47	470	2.1
1236.4	0.393	30	1.4	36	373	2.7	5.7	2.6	55	427	2.0
1237.1	0.765	27	1.6	32	416	3.3	11	3.0	50	476	2.4
1237.8	0.796	26	1.5	28	412	3.5	11	2.8	43	471	2.5
1238.5	0.393	24	1.8	33	399	3.9	5.7	3.3	50	456	2.8
1239.2	0.393	28	1.7	34	374	3.4	5.7	3.1	52	472	2.5
1239.9	0.393	28	1.5	31	424	3.4	5.7	2.8	48	485	2.5
1240.6	0.393	27	1.6	35	375	2.6	5.7	2.9	54	429	1.9
1241.3	0.393	24	1.3	33	399	2.8	5.7	2.4	51	456	2.0
1242.0	0.428	26	1.6	32	396	3.2	6.2	2.8	49	453	2.3



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Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1242.7	0.551	28	1.5	35	422	1.9	8.0	2.7	54	483	1.4
1243.4	0.849	23	1.8	38	358	2.4	12	3.3	58	409	1.8
1244.1	0.403	22	1.3	30	368	3.6	5.8	2.3	46	421	2.7
1244.8	0.393	26	1.3	36	419	3.3	5.7	2.4	56	479	2.4
1245.5	1.1	24	1.3	31	383	3.0	16	2.4	48	438	2.2
1246.2	0.839	25	1.6	39	431	2.4	12	3.0	60	493	1.8
1246.9	0.393	27	1.7	37	362	2.5	5.7	3.1	56	414	1.8
1247.6	0.393	24	1.3	37	356	3.0	5.7	2.5	56	407	2.2
1248.3	0.558	24	1.5	35	381	3.0	8.1	2.7	53	436	2.2
1249.0	0.393	24	1.8	37	404	3.0	5.7	3.3	56	462	2.2
1249.7	0.393	27	2.0	33	380	3.8	5.7	3.7	51	434	2.7
1250.4	0.639	23	1.1	37	349	2.8	9.2	2.1	57	399	2.0
1251.1	0.432	23	1.2	34	365	3.4	6.2	2.2	53	417	2.4
1251.7	0.567	25	1.6	35	449	3.1	8.2	3.0	53	514	2.3
1252.4	0.393	25	1.6	36	351	2.6	5.7	3.0	54	401	1.9
1253.1	0.561	22	1.2	38	377	2.5	8.1	2.2	58	431	1.8
1253.8	0.393	22	0.842	33	353	2.2	5.7	1.5	51	404	1.6
1254.5	0.393	22	1.3	36	398	2.5	5.7	2.3	55	455	1.8
1255.2	0.693	21	1.6	37	353	1.8	10	3.0	56	403	1.3
1255.9	0.393	25	1.5	33	405	1.6	5.7	2.7	51	463	1.2
1256.6	0.676	24	1.3	37	380	2.4	9.8	2.4	57	435	1.8
1257.3	0.393	21	1.3	41	388	3.1	5.7	2.3	62	443	2.3
1258.0	0.393	22	1.4	34	389	3.2	5.7	2.6	53	444	2.3
1258.7	0.393	20	1.3	36	384	2.4	5.7	2.4	55	439	1.8
1259.4	0.393	23	1.5	37	379	3.9	5.7	2.7	57	434	2.9
1260.1	0.672	22	1.3	38	354	3.6	9.7	2.3	58	405	2.6
1260.8	0.393	19	1.3	38	341	2.9	5.7	2.3	58	390	2.1
1261.5	0.393	21	1.5	39	388	4.0	5.7	2.7	60	444	2.9
1262.2	0.393	22	1.2	38	453	3.5	5.7	2.2	59	518	2.5
1262.9	0.393	20	1.2	41	363	2.8	5.7	2.1	62	415	2.0
1263.6	0.393	23	1.7	42	376	2.8	5.7	3.1	64	430	2.1
1264.3	0.393	19	1.3	40	411	3.4	5.7	2.4	61	470	2.5
1265.0	0.393	20	1.2	36	370	2.7	5.7	2.1	55	423	1.9
1265.7	0.546	20	1.2	38	366	3.4	7.9	2.2	59	419	2.5
1266.4	0.946	20	1.1	43	404	2.1	14	2.0	66	462	1.6
1267.1	0.393	21	1.0	38	333	2.2	5.7	1.8	58	381	1.6
1267.8	0.393	18	1.3	35	339	2.4	5.7	2.4	54	388	1.8
1268.5	0.393	22	1.2	40	356	1.9	5.7	2.2	61	407	1.4
1269.2	0.393	20	1.5	37	376	2.7	5.7	2.8	57	430	2.0
1269.9	0.393	18	1.4	34	352	3.6	5.7	2.6	52	403	2.6
1270.6	0.956	22	1.2	47	354	2.8	14	2.3	72	405	2.1
1271.3	0.393	18	1.4	40	331	2.8	5.7	2.6	61	378	2.1
1272.0	0.544	22	1.3	45	329	2.7	7.9	2.4	68	376	1.9
1272.7	0.587	20	1.5	41	395	1.8	8.5	2.8	63	452	1.3
1273.4	0.576	20	1.1	44	385	2.1	8.3	2.0	68	440	1.6
1274.1	0.393	19	1.6	45	366	1.3	5.7	3.0	68	418	0.959
1274.8	0.393	18	1.5	41	360	2.1	5.7	2.8	63	411	1.5
1275.5	0.393	23	1.6	44	426	2.6	5.7	3.0	67	487	1.9
1276.2	0.498	19	1.6	43	360	3.0	7.2	2.9	66	412	2.2
1276.9	0.393	18	1.4	43	360	2.2	5.7	2.5	66	412	1.6
1277.6	0.393	18	1.2	39	344	2.5	5.7	2.1	60	393	1.8
1278.2	0.393	18	1.1	37	349	2.5	5.7	2.0	57	399	1.9
1278.9	0.398	21	1.1	43	355	2.3	5.7	1.9	67	405	1.7
1279.6	0.393	17	1.3	39	365	3.6	5.7	2.4	60	417	2.6
1280.3	0.393	16	1.4	41	336	2.9	5.7	2.5	63	384	2.1
1281.0	0.393	17	1.5	39	335	3.2	5.7	2.7	60	383	2.4
1281.7	0.393	16	1.3	38	363	2.2	5.7	2.5	59	416	1.6
1282.4	0.501	22	1.4	43	367	2.9	7.2	2.5	66	419	2.1
1283.1	0.393	19	1.0	41	376	2.7	5.7	1.9	63	430	2.0
1283.8	0.393	20	1.4	40	340	2.1	5.7	2.6	62	389	1.5
1284.5	0.393	17	1.4	39	341	2.6	5.7	2.6	60	390	1.9
1285.2	0.393	23	1.3	40	330	3.6	5.7	2.4	61	377	2.6
1285.9	0.976	21	1.2	45	352	2.7	14	2.2	69	402	2.0
1286.6	0.720	20	1.2	45	314	2.3	10	2.1	69	359	1.7
1287.3	0.393	19	1.2	40	316	2.0	5.7	2.2	62	361	1.4
1288.0	0.566	17	1.3	44	319	2.4	8.2	2.4	67	364	1.8
1288.7	0.635	21	1.7	50	369	3.1	9.2	3.0	77	422	2.3
1289.4	0.527	15	1.3	45	322	1.9	7.6	2.3	68	369	1.4
1290.1	0.393	19	1.3	49	341	3.2	5.7	2.4	75	390	2.3
1290.8	0.975	18	1.9	46	342	4.1	14	3.4	70	391	3.0
1291.5	0.520	19	1.3	40	314	2.0	7.5	2.4	62	359	1.5
1292.2	0.393	20	0.962	51	324	3.3	5.7	1.8	78	370	2.4
1292.9	0.393	21	1.3	49	308	2.4	5.7	2.3	76	352	1.7
1293.6	0.393	17	1.2	51	307	2.5	5.7	2.2	78	351	1.8
1294.3	0.393	18	1.3	45	314	4.1	5.7	2.3	69	359	3.0
1295.0	0.633	18	1.3	45	314	3.9	9.1	2.3	70	359	2.8
1295.7	0.393	21	1.5	48	345	2.7	5.7	2.7	74	394	2.0
1296.4	0.393	20	1.4	48	312	3.4	5.7	2.6	74	357	2.5
1297.1	0.393	19	1.3	49	312	3.5	5.7	2.4	75	356	2.5
1297.8	0.393	20	1.3	48	310	3.3	5.7	2.4	74	354	2.4
1298.5	0.393	18	1.1	50	293	2.3	5.7	2.1	77	335	1.7



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Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1299.2	0.393	19	1.2	46	301	3.1	5.7	2.3	71	344	2.3
1299.9	0.393	21	1.6	54	326	3.6	5.7	2.9	83	373	2.6
1300.6	0.538	19	1.7	48	284	3.3	7.8	3.1	74	325	2.4
1301.3	0.393	16	1.8	49	312	3.9	5.7	3.2	75	356	2.8
1302.0	0.393	19	1.7	48	286	2.9	5.7	3.0	73	328	2.1
1302.7	0.393	17	1.8	52	276	3.5	5.7	3.2	79	316	2.6
1303.4	0.393	19	1.5	47	291	3.2	5.7	2.8	71	333	2.3
1304.1	0.489	18	1.3	43	256	5.8	7.1	2.4	66	292	4.2
1304.7	0.393	18	1.6	44	272	4.9	5.7	2.8	68	311	3.6
1305.4	0.816	19	1.3	55	268	3.1	12	2.3	84	306	2.3
1306.1	0.393	18	1.5	52	289	3.9	5.7	2.8	80	331	2.9
1306.8	0.393	22	1.3	54	322	3.1	5.7	2.3	83	369	2.3
1307.5	0.393	16	1.5	48	309	4.4	5.7	2.7	73	353	3.2
1308.2	0.393	19	1.3	55	313	4.1	5.7	2.3	85	358	3.0
1308.9	0.393	20	1.9	56	268	4.2	5.7	3.5	85	306	3.0
1309.6	0.393	20	1.6	50	273	5.2	5.7	2.9	77	312	3.8
1310.3	0.393	18	1.4	50	310	3.8	5.7	2.5	77	354	2.8
1311.0	0.393	16	1.7	49	316	5.3	5.7	3.0	74	362	3.9
1311.7	0.393	20	1.3	48	276	5.0	5.7	2.3	74	316	3.6
1312.4	0.393	19	1.5	57	271	5.4	5.7	2.7	88	310	4.0
1313.1	0.393	21	1.5	53	254	6.2	5.7	2.7	81	290	4.6
1313.8	0.605	16	1.3	53	263	4.4	8.7	2.4	82	301	3.2
1314.5	0.661	21	1.3	56	316	4.7	9.5	2.3	86	361	3.4
1315.2	0.827	22	1.7	61	287	5.7	12	3.1	94	328	4.1
1315.9	0.732	21	1.5	51	253	5.0	11	2.7	78	289	3.6
1316.6	0.804	19	1.3	51	284	6.8	12	2.3	78	325	5.0
1317.3	0.393	20	1.7	50	264	3.8	5.7	3.1	77	302	2.8
1318.0	0.462	25	1.8	54	296	6.3	6.7	3.4	83	339	4.6
1318.7	0.393	21	1.3	57	282	4.0	5.7	2.4	87	322	2.9
1319.4	0.581	22	1.7	50	273	6.6	8.4	3.1	77	313	4.8
1320.1	0.393	25	1.6	53	298	4.2	5.7	3.0	81	341	3.1
1320.8	0.393	19	1.5	51	270	4.1	5.7	2.8	78	309	3.0
1321.5	0.393	20	1.5	58	264	5.0	5.7	2.7	89	302	3.6
1322.2	0.393	19	1.6	57	270	6.0	5.7	2.9	87	309	4.4
1322.9	0.411	22	1.7	55	326	3.7	5.9	3.0	85	373	2.7
1323.6	0.594	21	1.6	57	276	5.3	8.6	2.9	87	316	3.8
1324.3	0.776	19	1.4	55	267	4.6	11	2.5	85	305	3.3
1325.0	0.557	19	1.3	50	251	4.5	8.0	2.5	76	287	3.3
1325.7	0.393	23	2.3	56	297	5.2	5.7	4.1	85	340	3.8
1326.4	0.393	21	1.1	64	331	7.5	5.7	2.1	98	379	5.5
1327.1	0.488	19	1.2	56	257	6.0	7.0	2.2	86	294	4.4
1327.8	0.393	19	1.6	64	276	6.6	5.7	3.0	98	316	4.8
1328.5	0.393	17	1.7	64	309	4.8	5.7	3.0	97	353	3.5
1329.2	0.668	21	2.1	66	257	5.0	9.6	3.8	102	294	3.6
1329.9	0.609	18	1.1	58	291	4.1	8.8	2.0	89	333	3.0
1330.5	0.393	22	1.7	61	299	6.0	5.7	3.1	94	342	4.4
1331.2	0.393	18	1.5	61	301	5.8	5.7	2.7	94	344	4.2
1331.9	0.393	24	1.9	55	275	7.1	5.7	3.4	84	315	5.2
1332.6	0.393	19	1.8	75	292	7.2	5.7	3.2	115	334	5.2
1333.3	0.393	22	1.6	66	279	5.6	5.7	3.0	101	320	4.1
1334.0	0.393	19	1.7	56	254	5.1	5.7	3.1	85	291	3.7
1334.7	0.393	19	1.9	65	261	4.0	5.7	3.4	99	299	2.9
1335.4	0.741	22	1.8	65	263	6.1	11	3.2	99	301	4.5
1336.1	0.393	23	1.3	75	295	8.3	5.7	2.4	115	338	6.0
1336.8	0.589	18	1.4	66	227	4.6	8.5	2.6	101	259	3.4
1337.5	0.453	18	1.7	69	266	4.7	6.5	3.1	106	304	3.4
1338.2	0.599	20	1.7	71	264	5.2	8.7	3.1	109	302	3.8
1338.9	0.470	23	1.6	72	275	5.7	6.8	2.9	110	315	4.1
1339.6	0.393	22	1.8	74	267	7.1	5.7	3.2	113	305	5.2
1340.3	0.679	21	1.5	61	249	5.1	9.8	2.7	93	285	3.7
1341.0	0.394	22	2.1	70	265	8.0	5.7	3.8	108	303	5.9
1341.7	0.393	22	2.2	74	292	5.7	5.7	4.1	114	334	4.2
1342.4	0.935	23	2.1	73	262	5.8	13	3.9	111	299	4.2
1343.1	0.393	21	1.8	64	284	5.7	5.7	3.3	98	325	4.2
1343.8	0.393	20	1.9	63	252	7.0	5.7	3.4	96	288	5.1
1344.5	0.393	21	1.7	64	266	8.2	5.7	3.1	97	305	6.0
1345.2	0.393	20	1.7	74	302	8.5	5.7	3.1	114	346	6.2
1345.9	0.399	18	2.0	82	276	7.8	5.8	3.7	126	315	5.7
1346.6	0.525	24	2.0	77	242	7.2	7.6	3.7	117	277	5.2
1347.3	0.393	18	1.8	68	284	7.7	5.7	3.2	105	325	5.6
1348.0	0.393	23	1.6	70	296	10	5.7	2.9	107	338	7.4
1348.7	0.563	20	2.2	75	249	8.6	8.1	4.1	116	285	6.3
1349.4	0.393	20	1.2	72	265	8.2	5.7	2.1	110	303	6.0
1350.1	0.427	18	1.5	66	249	7.9	6.2	2.8	102	285	5.8
1350.8	0.565	20	1.5	77	275	8.7	8.2	2.8	118	315	6.3
1351.5	0.464	19	1.9	80	276	9.9	6.7	3.5	122	316	7.2
1352.2	0.502	21	1.6	78	264	7.6	7.2	3.0	120	302	5.6
1352.9	0.393	16	1.6	66	258	8.4	5.7	2.9	101	295	6.1
1353.6	0.603	19	2.0	74	306	8.1	8.7	3.6	113	350	5.9
1354.3	0.393	19	1.9	76	273	9.0	5.7	3.5	116	312	6.6
1355.0	0.393	21	1.9	78	268	9.7	5.7	3.4	119	307	7.1



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1355.7	0.520	21	2.2	83	294	10	7.5	4.0	128	337	7.5
1356.3	0.393	19	1.6	83	268	11	5.7	2.9	128	306	7.7
1357.0	0.393	17	2.4	82	285	11	5.7	4.3	125	326	7.7
1357.7	0.464	20	1.8	77	263	9.5	6.7	3.2	117	301	6.9
1358.4	0.471	18	2.0	78	298	9.8	6.8	3.6	119	340	7.1
1359.1	0.393	20	1.9	82	284	12	5.7	3.5	126	325	8.6
1359.8	0.393	21	2.1	78	269	11	5.7	3.8	120	308	8.3
1360.5	0.393	17	2.0	77	268	13	5.7	3.7	117	306	9.8
1361.2	0.393	20	1.9	81	326	14	5.7	3.4	124	373	10
1361.9	0.393	24	2.3	91	313	18	5.7	4.1	139	358	13
1362.6	0.393	22	1.6	92	349	14	5.7	2.9	141	399	10
1363.3	0.393	15	2.1	91	351	14	5.7	3.9	139	401	10
1364.0	0.766	21	2.3	92	358	14	11	4.1	140	409	10
1364.7	0.393	19	2.0	90	312	14	5.7	3.7	138	357	10
1365.4	0.393	19	2.1	102	292	15	5.7	3.8	156	334	11
1366.1	0.519	20	2.1	92	292	13	7.5	3.8	141	333	9.3
1366.8	0.639	14	2.0	84	308	16	9.2	3.6	128	352	12
1367.5	0.713	16	2.1	91	365	17	10	3.9	139	418	13
1368.2	0.823	20	2.2	81	288	15	12	4.0	124	329	11
1368.9	0.393	19	1.8	97	293	15	5.7	3.2	149	335	11
1369.6	0.888	16	2.4	92	298	14	13	4.4	141	340	10
1370.3	0.633	18	1.9	85	298	16	9.1	3.4	130	340	12
1371.0	0.393	19	2.1	91	321	15	5.7	3.8	140	367	11
1371.7	0.393	21	2.2	94	357	21	5.7	4.0	144	408	15
1372.4	0.393	19	2.1	93	360	16	5.7	3.8	142	412	12
1373.1	0.393	17	2.3	83	262	16	5.7	4.2	128	300	12
1373.8	0.393	22	2.5	83	300	17	5.7	4.5	128	343	13
1374.5	0.393	18	2.4	98	354	18	5.7	4.4	150	405	13
1375.2	0.605	19	2.3	88	280	16	8.7	4.1	134	320	12
1375.9	0.393	17	2.5	98	292	17	5.7	4.6	150	334	12
1376.6	0.422	16	1.8	74	269	16	6.1	3.3	114	307	12
1377.3	0.808	18	2.6	100	326	17	12	4.7	153	373	12
1378.0	0.926	21	2.4	95	371	18	13	4.4	146	424	13
1378.7	0.645	21	2.7	103	327	20	9.3	5.0	158	374	14
1379.4	0.393	20	2.3	103	320	18	5.7	4.2	157	366	13
1380.1	0.393	17	1.9	84	297	20	5.7	3.5	128	340	15
1380.8	0.393	22	2.4	98	316	22	5.7	4.4	150	362	16
1381.5	0.490	22	2.8	89	366	21	7.1	5.1	136	418	16
1382.2	0.393	20	2.3	99	384	18	5.7	4.1	152	439	13
1382.8	0.393	17	2.6	89	340	16	5.7	4.7	137	388	12
1383.5	0.393	20	2.4	110	355	19	5.7	4.4	168	406	14
1384.2	0.418	18	1.8	86	291	16	6.0	3.2	131	333	12
1384.9	0.393	19	2.2	86	300	17	5.7	4.0	131	343	13
1385.6	0.393	17	2.6	93	351	20	5.7	4.8	142	402	14
1386.3	0.650	17	2.0	99	280	19	9.4	3.7	152	320	14
1387.0	0.393	16	1.5	87	338	19	5.7	2.7	133	386	14
1387.7	0.586	21	2.2	93	340	18	8.5	4.0	142	389	13
1388.4	0.393	20	2.3	100	336	19	5.7	4.2	154	384	14
1389.1	0.393	19	2.0	96	332	16	5.7	3.6	147	380	11
1389.8	0.393	19	2.3	100	308	20	5.7	4.2	154	352	15
1390.5	0.497	18	2.3	101	367	20	7.2	4.3	155	419	15
1391.2	0.393	21	2.0	92	351	21	5.7	3.7	142	401	16
1391.9	0.454	18	2.1	94	298	17	6.5	3.9	143	340	13
1392.6	0.393	19	2.2	89	302	19	5.7	4.0	137	345	14
1393.3	0.393	18	2.0	90	333	21	5.7	3.6	138	380	15
1394.0	0.393	18	2.1	104	383	22	5.7	3.8	160	438	16
1394.7	0.393	18	2.2	90	291	18	5.7	3.9	138	333	13
1395.4	0.393	15	2.1	102	349	21	5.7	3.8	156	399	16
1396.1	0.393	15	1.7	87	305	20	5.7	3.1	134	349	15
1396.8	0.393	16	2.7	98	344	23	5.7	4.9	150	394	17
1397.5	1.1	17	2.0	95	361	23	16	3.7	145	413	17
1398.2	0.627	15	2.2	85	301	17	9.0	4.0	131	344	13
1398.9	0.393	18	2.0	95	337	19	5.7	3.7	146	385	14
1399.6	0.393	19	2.1	94	340	20	5.7	3.9	144	389	15
1400.3	0.393	17	2.3	79	305	20	5.7	4.3	121	348	15
1401.0	0.393	16	2.3	96	345	22	5.7	4.2	147	395	16
1401.7	0.513	16	2.2	84	291	21	7.4	4.0	128	332	15
1402.4	0.496	18	2.1	74	269	21	7.2	3.8	114	308	15
1403.1	0.393	17	2.1	86	323	18	5.7	3.9	131	370	13
1403.8	0.393	15	1.7	86	299	20	5.7	3.1	131	342	15
1404.5	0.679	18	2.3	85	329	20	9.8	4.1	131	376	14
1405.2	0.393	16	1.9	98	310	20	5.7	3.4	150	355	15
1405.9	0.393	16	1.7	75	282	18	5.7	3.1	116	322	13
1406.6	0.393	16	2.2	83	335	19	5.7	4.0	128	383	14
1407.3	0.393	14	1.8	86	350	20	5.7	3.3	132	400	15
1408.0	0.393	15	1.7	77	291	21	5.7	3.2	118	333	16
1408.6	0.656	18	1.9	92	364	23	9.5	3.5	141	416	17
1409.3	0.503	20	1.9	85	332	22	7.3	3.4	130	380	16
1410.0	0.393	16	1.6	83	322	23	5.7	2.8	128	368	17
1410.7	0.433	16	1.8	71	302	19	6.2	3.3	109	345	14
1411.4	0.393	17	2.1	83	330	24	5.7	3.9	127	378	17



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1412.1	0.393	16	1.7	81	314	20	5.7	3.0	124	359	15
1412.8	0.832	17	1.9	81	317	22	12	3.4	123	363	16
1413.5	0.485	16	1.6	97	373	20	7.0	2.9	148	427	15
1414.2	0.393	15	1.6	79	328	21	5.7	3.0	121	376	15
1414.9	0.757	18	2.3	95	337	20	11	4.2	146	385	15
1415.6	0.393	18	1.8	94	354	17	5.7	3.3	145	405	12
1416.3	0.393	15	1.9	72	375	22	5.7	3.5	110	429	16
1417.0	0.393	13	1.7	68	303	16	5.7	3.1	105	346	11
1417.7	0.393	16	1.9	84	323	20	5.7	3.5	128	369	14
1418.4	0.681	15	1.6	72	321	20	9.8	2.9	110	367	14
1419.1	0.393	17	1.9	81	344	22	5.7	3.5	124	393	16
1419.8	0.393	15	2.2	78	426	24	5.7	4.1	119	488	18
1420.5	0.393	15	1.9	73	324	22	5.7	3.5	112	370	16
1421.2	0.676	18	1.7	74	304	18	9.8	3.1	113	347	13
1421.9	0.393	15	1.7	77	306	20	5.7	3.1	117	350	14
1422.6	0.393	15	1.6	78	318	22	5.7	2.9	119	363	16
1423.3	0.393	13	2.3	80	312	18	5.7	4.3	122	357	13
1424.0	0.393	14	1.8	74	342	26	5.7	3.3	113	392	19
1424.7	0.393	18	1.4	80	410	27	5.7	2.5	123	469	20
1425.4	0.393	14	1.1	71	350	19	5.7	2.1	109	400	14
1426.1	0.393	16	1.3	72	310	17	5.7	2.4	110	355	13
1426.8	0.393	15	1.9	66	386	20	5.7	3.5	101	441	15
1427.5	0.423	18	2.2	77	431	24	6.1	4.0	117	492	17
1428.2	0.393	18	1.7	76	363	20	5.7	3.1	117	415	14
1428.9	0.393	17	1.7	72	445	25	5.7	3.1	111	509	18
1429.6	0.393	14	1.5	66	381	24	5.7	2.7	101	435	18
1430.3	0.393	14	0.956	73	387	15	5.7	1.7	111	443	11
1431.0	0.393	19	1.6	62	449	29	5.7	2.9	95	514	21
1431.7	0.393	17	1.1	78	381	21	5.7	2.0	119	436	15
1432.4	0.393	13	1.6	65	393	20	5.7	2.8	99	449	14
1433.1	0.393	17	1.6	75	411	20	5.7	3.0	114	470	15
1433.8	0.393	13	1.7	70	401	23	5.7	3.1	108	459	17
1434.4	0.393	12	2.1	70	409	24	5.7	3.8	108	468	17
1435.1	0.393	14	1.1	56	350	21	5.7	2.1	86	400	15
1435.8	0.393	14	1.3	58	321	18	5.7	2.4	89	367	13
1436.5	0.393	19	1.5	57	389	18	5.7	2.6	87	445	13
1437.2	0.393	16	1.4	56	402	19	5.7	2.5	86	459	14
1437.9	0.393	15	1.5	63	402	20	5.7	2.8	96	460	15
1438.6	0.393	13	1.1	66	409	21	5.7	2.0	101	468	15
1439.3	0.393	15	0.985	72	389	23	5.7	1.8	111	445	16
1440.0	0.393	15	1.5	55	430	20	5.7	2.8	84	492	15
1440.7	0.393	14	1.4	60	413	18	5.7	2.5	92	472	13
1441.4	0.393	16	1.5	57	448	20	5.7	2.7	87	512	15
1442.1	0.393	14	0.949	66	382	18	5.7	1.7	101	437	13
1442.8	0.393	16	1.4	61	420	17	5.7	2.5	93	480	12
1443.5	0.393	17	1.0	58	432	19	5.7	1.8	89	494	14
1444.2	0.393	14	1.2	54	478	21	5.7	2.2	83	547	15
1444.9	0.412	16	1.3	52	432	18	5.9	2.3	79	494	13
1445.6	0.393	14	1.2	62	400	19	5.7	2.3	96	457	14
1446.3	0.393	17	1.1	49	380	15	5.7	2.1	75	435	11
1447.0	0.553	14	1.0	56	365	17	8.0	1.9	85	418	12
1447.7	0.393	15	0.930	53	418	17	5.7	1.7	81	478	12
1448.4	0.393	17	1.6	57	427	19	5.7	2.9	87	488	14
1449.1	0.393	12	1.1	51	398	13	5.7	1.9	78	455	9.4
1449.8	0.639	16	1.2	55	417	19	9.2	2.1	84	477	14
1450.5	0.393	14	1.4	53	390	18	5.7	2.6	82	447	13
1451.2	0.393	14	1.3	68	378	14	5.7	2.4	103	433	11
1451.9	0.393	16	1.1	55	368	14	5.7	2.0	85	421	10
1452.6	0.393	14	1.4	50	420	16	5.7	2.5	77	481	12
1453.3	0.393	14	1.4	51	405	16	5.7	2.5	78	463	12
1454.0	0.393	13	1.4	54	411	18	5.7	2.6	83	470	13
1454.7	0.436	17	1.5	56	407	19	6.3	2.7	86	466	14
1455.4	0.501	15	0.833	48	456	16	7.2	1.5	74	522	12
1456.1	0.393	14	0.967	51	387	13	5.7	1.8	78	443	9.3
1456.8	0.393	15	1.5	53	398	16	5.7	2.8	81	455	11
1457.5	0.393	15	1.3	48	402	15	5.7	2.4	74	460	11
1458.2	0.393	18	1.3	55	349	16	5.7	2.4	84	399	12
1458.9	0.393	12	0.848	47	373	13	5.7	1.5	72	427	9.6
1459.6	0.393	13	1.1	53	426	13	5.7	1.9	81	488	9.8
1460.2	0.773	15	1.2	49	409	15	11	2.2	75	468	11
1460.9	0.430	17	1.2	53	434	14	6.2	2.1	82	496	10
1461.6	0.393	17	1.1	50	389	10	5.7	2.0	77	445	7.6
1462.3	0.471	14	1.5	53	352	11	6.8	2.8	81	403	8.0
1463.0	0.393	16	1.2	53	392	14	5.7	2.2	81	448	11
1463.7	0.561	14	1.5	51	413	16	8.1	2.7	79	472	12
1464.4	0.620	307	1.4	60	340	12	9.0	2.6	92	389	9.1
1465.1	0.393	17	1.1	51	378	14	5.7	2.0	78	432	10
1465.8	0.393	15	1.3	54	365	11	5.7	2.4	83	417	8.1
1466.5	0.393	14	1.3	61	435	12	5.7	2.4	93	498	8.7
1467.2	0.695	16	1.5	50	399	11	10	2.7	76	456	7.7
1467.9	0.545	17	1.3	55	419	12	7.9	2.3	85	479	8.4



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Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1468.6	0.450	14	1.8	212	355	13	6.5	3.3	324	406	9.3
1469.3	0.393	14	1.6	56	389	8.7	5.7	3.0	86	445	6.4
1470.0	0.393	13	1.2	57	371	13	5.7	2.2	87	425	9.5
1470.7	0.558	15	1.5	49	443	12	8.1	2.8	76	506	8.7
1471.4	0.393	18	0.896	64	454	12	5.7	1.6	98	519	8.5
1472.1	0.393	14	1.5	51	344	11	5.7	2.8	79	394	7.7
1472.8	0.393	14	1.4	58	363	7.9	5.7	2.6	88	415	5.8
1473.5	0.393	16	1.7	59	436	13	5.7	3.1	91	499	9.2
1474.2	0.393	14	1.6	57	392	9.9	5.7	2.9	88	448	7.2
1474.9	0.393	18	1.6	59	379	12	5.7	2.8	90	434	9.1
1475.6	0.393	18	1.6	56	391	12	5.7	2.9	86	448	8.5
1476.3	0.445	14	1.4	61	404	12	6.4	2.6	93	462	8.5
1477.0	0.393	15	1.3	49	421	9.3	5.7	2.4	75	482	6.8
1477.7	0.393	15	1.6	58	436	12	5.7	3.0	89	499	8.7
1478.4	0.393	14	1.7	56	375	10	5.7	3.1	87	429	7.5
1479.1	0.393	15	1.5	57	341	9.9	5.7	2.7	88	390	7.2
1479.8	0.393	15	1.7	62	369	9.6	5.7	3.1	94	422	7.0
1480.5	0.393	15	1.8	59	409	10	5.7	3.2	91	467	7.4
1481.2	0.393	16	1.4	69	372	12	5.7	2.6	106	426	9.0
1481.9	0.393	15	1.4	62	363	7.7	5.7	2.5	95	415	5.6
1482.6	0.393	15	1.4	66	444	10	5.7	2.6	101	508	7.4
1483.3	0.393	16	1.7	58	400	9.0	5.7	3.2	89	458	6.5
1484.0	0.461	19	1.3	64	349	8.8	6.7	2.5	97	399	6.4
1484.7	0.393	18	2.4	68	353	11	5.7	4.3	105	403	7.8
1485.4	0.393	17	2.0	64	317	11	5.7	3.7	98	362	7.9
1486.1	0.393	14	1.4	75	345	7.6	5.7	2.6	115	394	5.5
1486.7	0.393	17	1.4	59	365	8.1	5.7	2.6	91	418	5.9
1487.4	0.393	15	1.6	63	329	9.8	5.7	2.9	97	376	7.2
1488.1	0.393	15	1.5	74	371	7.7	5.7	2.8	113	425	5.6
1488.8	0.393	15	1.7	79	367	11	5.7	3.0	121	420	7.9
1489.5	0.393	18	1.5	74	347	8.9	5.7	2.8	113	396	6.5
1490.2	0.393	19	2.1	71	333	7.0	5.7	3.9	109	380	5.1
1490.9	0.393	17	1.7	81	319	7.7	5.7	3.1	124	365	5.6
1491.6	0.393	17	1.5	80	277	7.1	5.7	2.8	122	316	5.2
1492.3	0.393	17	1.9	70	318	6.7	5.7	3.5	107	364	4.9
1493.0	0.393	15	1.9	68	329	6.7	5.7	3.5	104	376	4.9
1493.7	0.393	21	2.0	69	319	7.7	5.7	3.7	106	365	5.6
1494.4	0.393	15	1.7	67	267	4.7	5.7	3.0	103	305	3.4
1495.1	0.393	18	1.8	76	256	6.2	5.7	3.3	117	293	4.5
1495.8	0.393	17	2.0	71	270	4.4	5.7	3.7	108	309	3.2
1496.5	0.393	16	1.9	84	267	5.7	5.7	3.4	128	305	4.1
1497.2	0.393	18	2.0	65	263	5.0	5.7	3.6	100	301	3.6
1497.9	0.393	15	2.0	81	228	4.1	5.7	3.6	124	261	3.0
1498.6	0.393	16	2.0	72	263	4.9	5.7	3.7	110	301	3.6
1499.3	0.393	19	2.3	79	290	4.7	5.7	4.2	122	332	3.4
1500.0	0.393	16	1.9	81	247	3.8	5.7	3.5	124	283	2.8
1500.7	0.393	17	1.8	71	271	5.1	5.7	3.3	110	310	3.7
1501.4	0.393	20	1.9	94	240	4.5	5.7	3.5	144	274	3.3
1502.1	0.393	18	1.9	95	267	4.4	5.7	3.4	146	305	3.2
1502.8	0.393	19	1.6	85	242	4.3	5.7	2.9	131	277	3.1
1503.5	0.393	15	2.0	78	260	3.9	5.7	3.6	119	297	2.9
1504.2	0.576	19	2.2	85	247	3.9	8.3	3.9	130	282	2.8
1504.9	0.393	15	1.6	79	193	2.9	5.7	3.0	121	221	2.1
1505.6	0.393	14	1.7	97	235	4.1	5.7	3.1	149	268	3.0
1506.3	0.393	16	2.2	87	266	3.5	5.7	4.0	134	304	2.6
1507.0	0.586	17	2.2	83	234	2.8	8.5	4.0	127	267	2.0
1507.7	0.393	18	2.7	119	252	2.5	5.7	4.9	182	288	1.8
1508.4	0.393	14	2.0	76	209	2.8	5.7	3.7	117	239	2.0
1509.1	0.393	18	1.7	90	234	3.3	5.7	3.1	138	268	2.4
1509.8	0.393	17	2.4	88	226	3.4	5.7	4.3	135	259	2.5
1510.5	0.393	16	2.2	102	240	3.9	5.7	4.1	156	274	2.9
1511.2	0.393	17	2.2	82	213	3.4	5.7	4.0	125	244	2.5
1511.9	0.393	19	2.4	85	251	3.0	5.7	4.5	130	287	2.2
1512.5	0.393	18	1.7	83	210	2.4	5.7	3.2	127	240	1.7
1513.2	0.393	16	2.4	79	229	3.6	5.7	4.4	121	262	2.6
1513.9	0.393	17	2.3	90	237	2.8	5.7	4.2	137	271	2.0
1514.6	0.393	17	1.9	91	255	2.1	5.7	3.6	140	292	1.6
1515.3	0.393	16	2.1	95	253	2.6	5.7	3.8	146	289	1.9
1516.0	0.393	17	1.9	82	266	3.3	5.7	3.5	126	304	2.4
1516.7	0.393	16	1.8	81	234	2.7	5.7	3.3	124	268	2.0
1517.4	0.543	18	2.3	79	271	2.2	7.8	4.3	121	310	1.6
1518.1	0.393	18	2.2	81	201	2.7	5.7	4.0	124	229	1.9
1518.8	0.393	17	1.4	79	229	2.1	5.7	2.6	122	262	1.5
1519.5	0.393	20	1.9	86	238	2.9	5.7	3.5	132	272	2.1
1520.2	0.393	16	2.1	99	240	2.5	5.7	3.8	152	274	1.8
1520.9	0.393	18	2.0	87	255	2.9	5.7	3.6	134	292	2.1
1521.6	0.393	17	1.9	87	261	2.7	5.7	3.5	133	299	2.0
1522.3	0.393	18	1.6	87	259	1.7	5.7	2.8	134	296	1.2
1523.0	0.393	16	1.7	82	257	2.8	5.7	3.1	125	294	2.0
1523.7	0.393	18	1.8	90	256	2.6	5.7	3.3	138	293	1.9
1524.4	0.393	19	1.9	86	270	3.1	5.7	3.4	131	309	2.3



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Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1525.1	0.393	19	2.0	85	243	2.0	5.7	3.6	131	278	1.4
1525.8	0.393	14	1.5	67	229	2.3	5.7	2.7	102	262	1.7
1526.5	0.393	15	2.1	91	275	1.3	5.7	3.9	140	314	0.942
1527.2	0.393	19	1.7	76	263	3.4	5.7	3.1	116	301	2.4
1527.9	0.670	21	1.9	89	302	2.5	9.7	3.4	136	345	1.8
1528.6	0.393	17	2.4	97	312	2.2	5.7	4.3	149	357	1.6
1529.3	0.459	18	1.8	90	275	3.0	6.6	3.3	138	315	2.2
1530.0	0.393	20	1.7	86	281	3.7	5.7	3.0	132	322	2.7
1530.7	0.393	15	2.0	78	276	2.9	5.7	3.6	119	316	2.1
1531.4	0.393	20	1.5	76	263	2.5	5.7	2.8	117	301	1.8
1532.1	0.393	25	1.7	108	285	3.2	5.7	3.1	165	326	2.3
1532.8	0.393	15	1.6	72	259	3.0	5.7	2.9	111	297	2.2
1533.5	0.393	15	1.7	73	255	2.6	5.7	3.1	112	292	1.9
1534.2	0.393	17	1.8	82	283	3.0	5.7	3.4	125	324	2.2
1534.9	0.393	20	1.4	72	289	1.9	5.7	2.6	110	330	1.4
1535.6	0.393	19	1.6	71	272	1.9	5.7	3.0	109	311	1.4
1536.3	0.393	19	1.7	73	302	2.1	5.7	3.1	112	345	1.6
1537.0	0.489	21	1.9	92	295	2.5	7.1	3.5	142	338	1.8
1537.7	0.393	22	1.6	74	257	2.6	5.7	3.0	113	294	1.9
1538.4	0.393	20	1.4	71	264	3.5	5.7	2.6	109	302	2.6
1539.0	0.426	18	1.6	79	312	2.3	6.2	2.9	121	357	1.6
1539.7	0.393	20	1.9	72	306	2.9	5.7	3.4	111	349	2.1
1540.4	0.393	21	1.8	70	303	2.7	5.7	3.2	108	346	2.0
1541.1	0.974	22	1.9	65	275	2.7	14	3.4	100	315	1.9
1541.8	0.393	25	1.1	68	269	3.3	5.7	1.9	104	307	2.4
1542.5	0.393	21	1.4	64	314	2.1	5.7	2.6	98	359	1.5
1543.2	0.393	21	1.7	68	309	3.2	5.7	3.1	104	354	2.3
1543.9	0.669	22	1.7	64	280	3.6	9.7	3.0	98	320	2.6
1544.6	1.0	24	1.6	62	323	4.6	15	2.9	95	370	3.4
1545.3	0.393	22	1.8	61	289	2.6	5.7	3.3	93	331	1.9
1546.0	0.393	20	0.907	62	274	2.6	5.7	1.7	94	313	1.9
1546.7	0.393	22	1.6	64	305	1.8	5.7	2.9	98	348	1.3
1547.4	0.532	20	1.6	60	292	3.0	7.7	2.9	92	334	2.2
1548.1	0.393	24	1.6	79	287	2.9	5.7	2.9	122	328	2.2
1548.8	0.393	24	1.3	67	296	3.9	5.7	2.4	102	339	2.8
1549.5	0.393	23	1.2	69	300	2.5	5.7	2.2	105	343	1.8
1550.2	0.411	23	1.2	65	284	3.5	5.9	2.2	100	324	2.6
1550.9	0.393	22	1.4	71	296	2.9	5.7	2.6	109	338	2.1
1551.6	0.393	21	1.4	61	272	3.2	5.7	2.6	93	311	2.4
1552.3	0.978	20	1.0	70	376	2.6	14	1.9	108	430	1.9
1553.0	0.393	19	1.3	63	285	2.5	5.7	2.3	97	326	1.8
1553.7	0.711	24	1.1	74	346	2.8	10	2.0	113	396	2.1
1554.4	0.393	19	1.3	69	278	2.8	5.7	2.4	106	318	2.1
1555.1	0.422	20	1.7	71	338	2.3	6.1	3.1	108	387	1.7
1555.8	0.393	20	1.8	63	320	3.1	5.7	3.3	97	366	2.3
1556.5	0.393	17	1.4	71	401	2.1	5.7	2.5	108	459	1.6
1557.2	0.393	17	1.7	67	315	2.7	5.7	3.0	102	360	2.0
1557.9	0.410	18	1.1	67	290	2.2	5.9	2.1	102	331	1.6
1558.6	0.412	17	1.4	86	327	2.8	5.9	2.6	132	374	2.0
1559.3	0.393	16	1.3	77	317	2.7	5.7	2.3	119	362	2.0
1560.0	0.393	17	1.4	66	356	2.8	5.7	2.6	101	407	2.0
1560.7	0.393	19	1.4	82	387	3.1	5.7	2.6	126	443	2.2
1561.4	0.393	18	1.6	82	330	3.6	5.7	2.9	126	377	2.6
1562.1	0.664	17	1.2	86	334	2.6	9.6	2.3	131	382	1.9
1562.8	0.694	18	1.6	75	332	2.5	10	3.0	115	379	1.8
1563.5	0.462	21	1.2	83	377	2.3	6.7	2.2	128	431	1.7
1564.2	0.393	20	1.4	75	358	3.3	5.7	2.6	114	409	2.4
1564.9	0.393	14	1.5	74	331	3.0	5.7	2.8	114	378	2.2
1565.5	0.393	15	1.3	81	356	2.8	5.7	2.4	125	407	2.0
1566.2	0.393	17	1.3	67	312	2.4	5.7	2.4	103	357	1.7
1566.9	0.393	16	1.8	74	302	2.7	5.7	3.3	113	346	2.0
1567.6	0.393	17	1.1	69	317	3.2	5.7	2.1	105	363	2.3
1568.3	0.393	13	1.0	62	286	2.8	5.7	1.8	96	327	2.0
1569.0	0.393	16	1.4	70	354	2.0	5.7	2.5	107	405	1.5
1569.7	0.393	15	1.2	65	377	3.2	5.7	2.1	99	432	2.3
1570.4	0.393	15	1.9	78	354	2.4	5.7	3.5	120	405	1.8
1571.1	0.460	17	1.7	82	383	2.2	6.6	3.1	125	438	1.6
1571.8	0.393	15	1.2	67	303	2.8	5.7	2.1	102	347	2.0
1572.5	0.393	15	1.1	66	330	3.4	5.7	2.0	101	378	2.4
1573.2	0.393	16	1.3	72	361	2.3	5.7	2.4	111	413	1.7
1573.9	0.393	17	1.1	69	346	2.6	5.7	2.0	106	396	1.9
1574.6	0.453	15	1.3	68	335	2.5	6.5	2.4	104	383	1.8
1575.3	0.393	17	1.2	69	336	3.0	5.7	2.1	106	384	2.2
1576.0	0.393	15	1.3	64	351	2.9	5.7	2.4	98	402	2.1
1576.7	0.393	15	1.3	63	333	2.1	5.7	2.4	97	381	1.5
1577.4	0.393	18	1.3	52	302	2.8	5.7	2.4	79	346	2.1
1578.1	0.542	16	0.852	59	293	3.3	7.8	1.6	91	335	2.4
1578.8	0.393	16	0.827	54	323	1.7	5.7	1.5	83	369	1.2
1579.5	0.393	16	1.4	65	381	3.4	5.7	2.5	100	436	2.5
1580.2	0.393	16	1.2	63	308	2.3	5.7	2.3	96	353	1.7
1580.9	0.393	15	1.0	51	281	2.7	5.7	1.9	78	321	2.0



Minnow Environmental  
Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1581.6	0.393	17	1.1	58	317	3.5	5.7	2.0	88	363	2.6
1582.3	0.393	13	0.933	50	304	2.5	5.7	1.7	76	348	1.8
1583.0	0.393	15	0.955	56	301	2.8	5.7	1.7	86	344	2.0
1583.7	0.393	14	1.1	70	295	2.3	5.7	2.0	108	338	1.7
1584.4	0.393	16	1.7	57	304	1.7	5.7	3.2	87	348	1.2
1585.1	0.393	15	0.858	51	295	3.3	5.7	1.6	79	338	2.4
1585.8	0.393	16	0.853	57	290	3.7	5.7	1.6	87	332	2.7
1586.5	0.393	15	0.988	49	277	3.5	5.7	1.8	76	317	2.5
1587.2	0.393	17	1.3	59	332	3.0	5.7	2.4	90	380	2.2
1587.9	0.744	17	1.5	52	317	2.9	11	2.8	80	363	2.1
1588.6	0.393	16	1.3	50	282	3.3	5.7	2.3	77	322	2.4
1589.3	0.393	15	1.3	49	315	4.4	5.7	2.5	76	360	3.2
1590.0	0.393	16	1.3	50	283	1.7	5.7	2.4	77	323	1.2
1590.7	0.393	17	1.2	46	247	3.9	5.7	2.2	70	283	2.9
1591.4	0.393	18	0.963	44	310	2.4	5.7	1.8	67	354	1.7
1592.0	0.393	17	1.2	43	279	5.1	5.7	2.3	66	319	3.7
1592.7	0.393	17	1.0	43	294	2.4	5.7	1.8	67	336	1.7
1593.4	0.393	14	1.3	40	330	2.5	5.7	2.4	62	377	1.8
1594.1	0.419	14	1.3	52	252	3.0	6.0	2.3	80	289	2.2
1594.8	0.393	16	1.1	45	244	2.9	5.7	2.0	68	278	2.1
1595.5	0.873	19	1.0	41	298	3.7	13	1.9	63	341	2.7
1596.2	0.393	18	1.2	41	316	3.9	5.7	2.2	63	362	2.8
1596.9	0.393	17	1.0	40	314	3.0	5.7	1.9	61	359	2.2
1597.6	0.393	16	0.845	36	234	2.4	5.7	1.5	55	267	1.7
1598.3	0.437	18	1.3	36	293	3.2	6.3	2.4	54	335	2.3
1599.0	0.393	17	1.2	43	308	2.7	5.7	2.3	66	352	2.0
1599.7	0.393	17	0.953	43	271	3.2	5.7	1.7	66	310	2.3
1600.4	0.393	16	1.3	45	280	3.3	5.7	2.3	69	320	2.4
1601.1	0.393	18	1.6	35	303	4.4	5.7	2.9	53	346	3.2
1601.8	0.393	17	1.4	42	295	2.9	5.7	2.5	64	337	2.1
1602.5	0.393	14	1.2	33	255	3.2	5.7	2.1	50	292	2.4
1603.2	0.393	17	1.4	41	273	2.6	5.7	2.6	62	312	1.9
1603.9	0.393	18	1.4	38	226	1.6	5.7	2.5	58	259	1.1
1604.6	0.393	17	1.5	34	256	2.0	5.7	2.6	53	293	1.5
1605.3	0.393	15	1.6	37	274	3.1	5.7	3.0	57	313	2.2
1606.0	0.393	17	1.6	44	250	3.1	5.7	2.9	68	286	2.3
1606.7	0.393	17	1.6	43	257	3.2	5.7	3.0	65	294	2.4
1607.4	0.393	14	1.0	44	249	2.9	5.7	1.9	68	285	2.1
1608.1	0.442	14	0.954	35	215	2.1	6.4	1.7	54	246	1.6
1608.8	0.393	15	1.3	33	231	3.4	5.7	2.4	50	264	2.5
1609.5	0.393	17	1.8	39	249	4.5	5.7	3.3	59	285	3.3
1610.2	0.393	18	1.4	40	239	4.2	5.7	2.5	62	273	3.1
1610.9	0.393	16	1.1	38	247	2.7	5.7	2.0	58	283	1.9
1611.6	0.393	14	1.3	36	233	2.8	5.7	2.4	54	266	2.1
1612.3	0.393	16	0.956	32	232	2.8	5.7	1.7	49	266	2.1
1613.0	0.393	18	2.1	52	243	3.8	5.7	3.8	80	278	2.8
1613.7	0.393	14	1.7	39	219	3.4	5.7	3.0	60	251	2.5
1614.4	0.393	16	1.7	46	236	3.3	5.7	3.0	71	270	2.4
1615.1	0.393	16	1.7	47	217	3.1	5.7	3.1	73	248	2.2
1615.8	0.393	15	1.4	39	229	2.8	5.7	2.6	60	261	2.1
1616.5	0.393	15	1.5	40	187	3.3	5.7	2.7	61	214	2.4
1617.2	0.393	16	1.3	40	218	4.4	5.7	2.4	62	249	3.2
1617.8	0.393	14	1.5	41	181	5.1	5.7	2.8	63	207	3.7
1618.5	0.393	17	1.8	48	220	4.4	5.7	3.3	73	251	3.2
1619.2	0.393	16	2.0	45	211	4.9	5.7	3.7	69	242	3.6
1619.9	0.393	18	2.1	46	213	5.1	5.7	3.8	70	243	3.7
1620.6	0.393	16	2.1	44	210	3.9	5.7	3.8	67	240	2.8
1621.3	0.393	16	2.4	46	193	5.1	5.7	4.4	70	221	3.7
1622.0	0.468	14	1.8	47	230	5.5	6.8	3.2	72	263	4.0
1622.7	0.393	16	2.0	45	207	5.4	5.7	3.6	69	237	3.9
1623.4	0.393	19	2.5	49	242	6.1	5.7	4.6	75	277	4.5
1624.1	0.393	13	2.5	51	229	4.8	5.7	4.5	78	262	3.5
1624.8	0.393	15	2.1	49	179	3.7	5.7	3.9	75	204	2.7
1625.5	0.393	14	1.9	49	180	6.5	5.7	3.5	76	205	4.7
1626.2	0.393	14	2.6	51	184	4.7	5.7	4.8	78	210	3.4
1626.9	0.393	13	2.4	51	211	8.1	5.7	4.3	78	241	5.9
1627.6	0.393	15	2.6	59	187	5.0	5.7	4.8	90	214	3.7
1628.3	0.393	13	3.1	56	185	6.3	5.7	5.6	87	212	4.6
1629.0	0.393	15	2.8	54	166	5.5	5.7	5.1	83	190	4.0
1629.7	0.393	19	3.3	61	175	6.4	5.7	5.9	93	200	4.7
1630.4	0.393	16	2.8	51	188	6.3	5.7	5.1	78	215	4.6
1631.1	0.393	16	2.7	57	181	7.1	5.7	5.0	88	207	5.2
1631.8	0.393	17	3.1	58	164	5.6	5.7	5.6	88	188	4.1
1632.5	0.393	16	3.2	53	163	6.6	5.7	5.7	81	186	4.8
1633.2	0.393	17	2.7	56	167	7.8	5.7	4.9	86	191	5.7
1633.9	0.393	18	3.7	67	176	8.0	5.7	6.8	102	202	5.9
1634.6	0.393	17	3.3	68	177	7.5	5.7	6.0	104	202	5.5
1635.3	0.393	19	3.5	57	172	7.8	5.7	6.4	87	196	5.7
1636.0	0.393	18	3.3	63	195	7.4	5.7	6.1	96	223	5.4
1636.7	0.393	17	3.1	68	159	7.8	5.7	5.7	104	181	5.7
1637.4	0.393	19	4.0	69	165	6.1	5.7	7.3	106	188	4.4



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1638.1	0.393	20	3.8	75	159	7.6	5.7	6.9	115	182	5.6
1638.8	0.393	17	3.1	58	155	9.0	5.7	5.7	90	178	6.6
1639.5	0.393	20	3.5	73	158	8.9	5.7	6.4	111	181	6.5
1640.2	0.393	21	4.3	67	188	8.2	5.7	7.9	103	215	6.0
1640.9	0.393	20	4.0	68	145	8.7	5.7	7.3	104	166	6.3
1641.6	0.393	17	3.8	81	151	6.9	5.7	6.8	124	173	5.1
1642.3	0.393	19	4.0	68	154	11	5.7	7.3	104	176	7.7
1643.0	0.393	16	3.7	72	146	7.2	5.7	6.8	110	167	5.3
1643.7	0.393	18	3.6	65	141	8.8	5.7	6.5	100	161	6.4
1644.3	0.393	20	3.6	69	135	7.2	5.7	6.7	106	154	5.2
1645.0	0.393	20	3.3	74	149	8.0	5.7	6.0	114	170	5.8
1645.7	0.393	20	3.4	70	138	7.8	5.7	6.3	107	158	5.7
1646.4	0.393	21	3.6	82	141	9.2	5.7	6.5	126	161	6.7
1647.1	0.393	20	3.5	77	152	9.7	5.7	6.4	117	174	7.1
1647.8	0.393	20	3.4	65	142	8.9	5.7	6.2	100	162	6.5
1648.5	0.393	17	3.2	75	150	7.0	5.7	5.9	115	172	5.1
1649.2	0.452	18	3.3	62	145	8.7	6.5	6.0	95	166	6.3
1649.9	0.393	20	3.8	65	140	9.0	5.7	7.0	100	160	6.6
1650.6	0.393	21	3.6	83	147	8.8	5.7	6.6	127	168	6.4
1651.3	0.393	19	3.8	68	133	8.2	5.7	6.9	105	152	6.0
1652.0	0.393	21	3.5	66	134	10	5.7	6.3	102	153	7.4
1652.7	0.393	17	3.4	72	130	8.7	5.7	6.1	110	148	6.4
1653.4	0.393	20	3.7	60	127	8.5	5.7	6.7	93	145	6.2
1654.1	0.393	24	4.3	76	145	10	5.7	7.8	116	166	7.6
1654.8	0.393	20	3.2	68	125	9.2	5.7	5.9	104	143	6.7
1655.5	0.393	21	3.3	68	138	10	5.7	5.9	105	158	7.5
1656.2	0.393	22	3.6	71	144	13	5.7	6.5	109	165	9.5
1656.9	0.393	19	3.1	70	130	8.7	5.7	5.7	107	149	6.4
1657.6	0.393	22	3.7	74	130	11	5.7	6.7	114	149	8.1
1658.3	0.393	19	3.2	71	134	10	5.7	5.9	109	153	7.5
1659.0	0.393	17	2.8	65	113	7.7	5.7	5.1	99	129	5.6
1659.7	0.393	19	3.9	70	136	12	5.7	7.2	107	155	8.7
1660.4	0.393	24	3.3	74	127	11	5.7	6.1	114	145	8.1
1661.1	0.393	21	3.8	81	145	9.2	5.7	7.0	125	165	6.7
1661.8	0.393	23	3.6	76	145	9.9	5.7	6.6	117	165	7.2
1662.5	0.393	24	3.6	72	137	10	5.7	6.5	111	156	7.3
1663.2	0.393	23	3.7	76	139	11	5.7	6.8	117	158	8.2
1663.9	0.393	22	3.6	72	135	12	5.7	6.5	110	154	8.8
1664.6	0.393	19	3.0	84	125	9.0	5.7	5.5	128	143	6.6
1665.3	0.393	19	2.4	74	115	9.0	5.7	4.4	113	132	6.5
1666.0	0.393	20	3.3	69	130	11	5.7	6.1	105	148	8.1
1666.7	0.393	21	2.7	76	139	14	5.7	4.9	117	159	10
1667.4	0.393	21	3.0	73	130	14	5.7	5.4	112	148	9.9
1668.1	0.393	21	2.8	84	125	12	5.7	5.1	129	143	8.5
1668.8	0.393	22	3.1	80	141	10.0	5.7	5.7	123	161	7.3
1669.5	0.393	22	2.4	66	133	12	5.7	4.3	101	152	8.4
1670.1	0.403	20	3.1	66	120	11	5.8	5.6	101	137	7.7
1670.8	0.393	21	2.8	73	118	11	5.7	5.1	111	135	7.7
1671.5	0.465	17	2.8	69	119	9.6	6.7	5.1	106	136	7.0
1672.2	0.393	18	2.5	63	122	11	5.7	4.5	96	139	8.1
1672.9	0.393	17	2.3	52	105	9.9	5.7	4.1	80	120	7.2
1673.6	0.393	22	2.5	74	124	13	5.7	4.5	113	142	9.2
1674.3	0.393	21	2.5	66	115	9.9	5.7	4.5	101	132	7.3
1675.0	0.393	20	1.8	61	123	11	5.7	3.3	94	141	7.7
1675.7	0.393	19	2.7	68	122	11	5.7	4.8	104	139	8.2
1676.4	0.393	17	2.9	65	125	9.9	5.7	5.2	99	143	7.2
1677.1	0.393	23	2.0	70	126	11	5.7	3.6	108	144	7.7
1677.8	0.393	23	2.4	67	127	10	5.7	4.4	102	145	7.6
1678.5	0.530	20	2.1	63	129	9.9	7.7	3.8	97	148	7.2
1679.2	0.393	22	2.6	65	119	11	5.7	4.7	100	136	7.8
1679.9	0.393	18	2.1	57	108	10	5.7	3.9	87	123	7.5
1680.6	0.393	25	2.8	60	121	9.4	5.7	5.1	92	139	6.9
1681.3	0.441	19	2.2	56	118	9.1	6.4	3.9	85	135	6.7
1682.0	0.393	19	2.2	61	122	9.0	5.7	4.0	93	139	6.6
1682.7	0.393	20	2.0	59	130	13	5.7	3.6	91	148	9.8
1683.4	0.393	21	1.5	52	117	9.8	5.7	2.8	80	133	7.1
1684.1	0.393	18	2.1	61	116	9.5	5.7	3.8	94	133	7.0
1684.8	0.393	19	1.9	57	128	8.2	5.7	3.5	88	146	6.0
1685.5	0.393	18	1.5	61	126	12	5.7	2.8	93	144	8.5
1686.2	0.393	17	1.8	52	114	9.2	5.7	3.3	80	131	6.7
1686.9	0.393	18	1.8	51	113	9.8	5.7	3.4	79	129	7.1
1687.6	0.393	17	2.0	56	119	9.4	5.7	3.7	86	136	6.9
1688.3	0.393	18	2.2	53	119	9.0	5.7	4.1	81	136	6.5
1689.0	0.393	20	1.6	50	122	10	5.7	3.0	77	139	7.3
1689.7	0.393	21	1.8	53	124	11	5.7	3.4	81	142	8.0
1690.4	0.393	20	1.5	54	129	13	5.7	2.7	83	148	9.8
1691.1	0.393	18	1.4	48	115	7.1	5.7	2.6	74	131	5.2
1691.8	0.393	17	1.8	47	116	9.7	5.7	3.3	72	133	7.1
1692.5	0.393	16	1.2	43	109	11	5.7	2.3	66	124	8.1
1693.2	0.393	21	1.3	51	117	12	5.7	2.3	79	134	8.6
1693.9	0.393	20	1.5	50	116	11	5.7	2.8	76	133	7.9



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Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1694.6	0.393	20	2.1	54	127	9.4	5.7	3.9	82	146	6.8
1695.3	0.393	18	1.8	47	123	8.5	5.7	3.3	73	140	6.2
1696.0	0.393	17	1.6	45	125	9.9	5.7	2.9	69	143	7.2
1696.6	0.393	19	2.0	58	118	9.8	5.7	3.6	89	135	7.2
1697.3	0.393	18	1.3	48	115	9.0	5.7	2.4	74	131	6.6
1698.0	0.393	20	1.4	49	124	12	5.7	2.6	75	142	8.7
1698.7	0.393	24	1.5	45	117	9.3	5.7	2.8	69	134	6.8
1699.4	0.393	21	1.3	46	112	8.7	5.7	2.4	70	128	6.3
1700.1	0.393	23	1.5	44	129	9.6	5.7	2.7	68	147	7.0
1700.8	0.393	23	1.7	42	118	10	5.7	3.0	64	135	7.3
1701.5	0.393	25	1.1	43	132	9.4	5.7	2.1	66	151	6.9
1702.2	0.817	24	1.4	46	119	7.7	12	2.6	71	136	5.6
1702.9	0.393	21	1.2	42	120	9.3	5.7	2.2	64	138	6.8
1703.6	0.393	24	1.4	41	124	10.0	5.7	2.5	63	142	7.3
1704.3	0.393	25	1.1	40	125	10	5.7	2.0	62	143	7.4
1705.0	0.393	27	0.916	38	131	7.8	5.7	1.7	58	150	5.7
1705.7	0.393	28	1.6	37	120	6.5	5.7	2.9	56	137	4.8
1706.4	0.393	31	0.991	38	138	8.4	5.7	1.8	58	158	6.1
1707.1	0.393	34	1.5	33	124	6.3	5.7	2.7	50	142	4.6
1707.8	0.393	33	1.4	38	133	7.6	5.7	2.5	59	152	5.5
1708.5	0.393	33	0.841	39	149	6.6	5.7	1.5	59	171	4.8
1709.2	0.393	39	1.1	36	137	6.2	5.7	2.0	55	157	4.5
1709.9	0.674	40	1.0	41	138	9.2	9.7	1.9	63	158	6.7
1710.6	0.393	44	0.823	36	138	6.9	5.7	1.5	56	158	5.1
1711.3	0.393	41	0.924	35	144	6.4	5.7	1.7	53	164	4.6
1712.0	0.393	42	1.1	29	131	7.2	5.7	2.1	45	150	5.3
1712.7	0.393	51	1.1	33	139	6.4	5.7	1.9	51	159	4.6
1713.4	0.393	48	1.1	33	133	7.0	5.7	2.0	51	153	5.1
1714.1	0.393	51	1.3	31	128	7.3	5.7	2.3	48	147	5.3
1714.8	0.393	60	0.858	31	165	6.5	5.7	1.6	48	188	4.8
1715.5	0.393	54	1.2	32	141	6.3	5.7	2.1	48	161	4.6
1716.2	0.393	70	0.999	34	148	7.1	5.7	1.8	52	169	5.2
1716.9	0.393	73	0.906	24	140	7.3	5.7	1.7	36	160	5.3
1717.6	0.393	73	0.906	32	152	7.1	5.7	1.7	50	174	5.2
1718.3	0.393	64	0.761	30	143	5.9	5.7	1.4	46	164	4.3
1719.0	0.393	68	1.1	37	158	5.5	5.7	2.0	57	181	4.0
1719.7	0.393	65	0.736	29	149	4.3	5.7	1.3	44	170	3.2
1720.4	0.393	82	0.644	30	159	5.9	5.7	1.2	47	182	4.3
1721.1	0.393	72	0.853	29	155	6.7	5.7	1.6	44	178	4.9
1721.8	0.393	73	0.696	33	166	4.9	5.7	1.3	50	190	3.6
1722.4	0.393	74	0.835	23	163	4.1	5.7	1.5	35	186	3.0
1723.1	0.393	72	0.668	26	148	6.0	5.7	1.2	39	170	4.4
1723.8	0.393	71	0.832	28	162	4.4	5.7	1.5	42	185	3.2
1724.5	0.393	77	1.1	25	151	4.8	5.7	2.0	38	172	3.5
1725.2	0.393	85	1.1	26	179	3.5	5.7	1.9	40	204	2.6
1725.9	0.393	84	0.826	28	164	4.8	5.7	1.5	43	188	3.5
1726.6	0.393	95	0.865	35	215	5.3	5.7	1.6	54	246	3.9
1727.3	0.595	79	1.1	28	160	4.4	8.6	2.0	43	183	3.2
1728.0	0.393	80	0.806	22	168	4.1	5.7	1.5	33	193	3.0
1728.7	0.393	74	0.703	29	171	5.7	5.7	1.3	45	196	4.2
1729.4	0.393	77	0.771	32	174	4.1	5.7	1.4	50	199	3.0
1730.1	0.393	77	0.918	27	181	3.9	5.7	1.7	41	207	2.8
1730.8	0.444	76	0.639	27	180	3.0	6.4	1.2	41	206	2.2
1731.5	0.393	72	1.1	26	184	5.3	5.7	2.0	40	211	3.8
1732.2	0.393	65	1.3	29	186	2.5	5.7	2.3	44	212	1.8
1732.9	0.393	59	0.587	25	153	3.1	5.7	1.1	38	175	2.2
1733.6	0.393	72	0.728	29	178	3.5	5.7	1.3	44	203	2.6
1734.3	0.393	62	0.658	22	176	4.4	5.7	1.2	34	201	3.2
1735.0	0.393	65	0.407	24	201	5.1	5.7	0.742	37	229	3.7
1735.7	0.393	59	1.0	21	193	4.0	5.7	1.9	33	220	2.9
1736.4	0.393	63	0.890	26	175	4.5	5.7	1.6	40	200	3.2
1737.1	0.393	53	0.935	27	175	3.5	5.7	1.7	41	200	2.5
1737.8	0.393	43	0.831	25	163	2.8	5.7	1.5	38	186	2.0
1738.5	0.393	48	0.973	22	182	3.3	5.7	1.8	33	208	2.4
1739.2	0.393	55	0.929	24	182	4.9	5.7	1.7	37	208	3.5
1739.9	0.393	44	0.493	24	211	3.0	5.7	0.899	36	242	2.2
1740.6	0.428	44	0.568	29	185	3.8	6.2	1.0	45	212	2.7
1741.3	0.393	38	0.544	23	210	3.2	5.7	0.992	36	240	2.3
1742.0	0.393	41	0.730	31	193	4.5	5.7	1.3	47	220	3.3
1742.7	0.751	36	0.823	27	180	3.1	11	1.5	41	206	2.3
1743.4	0.393	41	0.670	26	167	3.0	5.7	1.2	40	191	2.2
1744.1	0.393	39	0.935	27	194	3.5	5.7	1.7	42	222	2.6
1744.8	0.393	35	0.837	24	175	2.6	5.7	1.5	37	200	1.9
1745.5	0.393	39	0.509	28	192	2.4	5.7	0.928	43	220	1.8
1746.2	0.393	35	0.830	28	189	3.2	5.7	1.5	42	216	2.3
1746.9	0.393	38	0.747	32	197	3.0	5.7	1.4	50	225	2.2
1747.6	0.393	31	0.612	36	193	4.1	5.7	1.1	55	221	3.0
1748.3	0.393	31	0.678	27	196	3.8	5.7	1.2	42	224	2.8
1748.9	0.393	27	0.894	29	197	3.8	5.7	1.6	44	225	2.8
1749.6	0.393	28	0.675	33	204	3.1	5.7	1.2	50	233	2.2
1750.3	0.393	28	0.861	31	185	4.1	5.7	1.6	47	212	3.0



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1751.0	0.393	27	1.3	29	199	4.5	5.7	2.3	45	227	3.2
1751.7	0.455	25	0.824	27	182	3.8	6.6	1.5	41	208	2.8
1752.4	0.393	25	0.902	34	203	4.1	5.7	1.6	52	232	3.0
1753.1	0.393	26	1.2	32	184	3.4	5.7	2.2	50	211	2.5
1753.8	0.393	23	0.866	34	189	3.0	5.7	1.6	52	216	2.2
1754.5	0.393	23	0.787	31	169	3.3	5.7	1.4	47	194	2.4
1755.2	0.393	24	0.760	32	207	3.5	5.7	1.4	50	237	2.6
1755.9	0.393	22	1.0	36	188	3.1	5.7	1.8	55	214	2.3
1756.6	0.393	26	0.793	38	178	4.3	5.7	1.4	58	203	3.2
1757.3	0.471	21	1.0	34	187	3.8	6.8	1.9	52	214	2.8
1758.0	0.393	20	1.1	30	201	3.5	5.7	1.9	47	230	2.5
1758.7	0.393	17	0.932	30	167	1.8	5.7	1.7	45	191	1.3
1759.4	0.393	20	1.3	38	198	3.1	5.7	2.4	59	226	2.2
1760.1	0.393	20	0.644	38	189	3.3	5.7	1.2	58	216	2.4
1760.8	0.393	20	0.908	35	181	2.9	5.7	1.7	54	207	2.1
1761.5	0.393	18	1.1	36	187	3.3	5.7	2.1	55	214	2.4
1762.2	0.393	19	1.6	33	170	4.0	5.7	2.8	51	194	2.9
1762.9	0.393	24	1.1	40	189	3.4	5.7	2.1	61	216	2.5
1763.6	0.393	19	0.720	34	159	4.3	5.7	1.3	52	182	3.1
1764.3	0.393	21	1.1	32	190	4.2	5.7	2.1	49	217	3.1
1765.0	0.393	22	1.2	36	188	4.1	5.7	2.1	55	216	3.0
1765.7	0.393	18	0.737	34	167	3.9	5.7	1.3	52	191	2.8
1766.4	0.393	20	1.4	38	186	5.3	5.7	2.6	58	212	3.8
1767.1	0.393	19	1.0	37	180	2.9	5.7	1.9	56	205	2.1
1767.8	0.461	21	1.0	41	188	3.9	6.7	1.9	63	215	2.8
1768.5	0.393	17	1.2	47	194	3.7	5.7	2.1	72	221	2.7
1769.2	0.393	20	1.1	44	182	4.3	5.7	1.9	67	208	3.1
1769.9	0.450	18	1.4	44	181	4.1	6.5	2.6	68	207	3.0
1770.6	0.393	20	1.4	39	168	3.6	5.7	2.5	60	193	2.6
1771.3	0.393	18	1.1	41	186	3.7	5.7	2.0	63	212	2.7
1772.0	0.393	20	1.6	43	199	3.3	5.7	2.9	66	227	2.4
1772.7	0.393	21	1.4	60	196	4.9	5.7	2.6	93	224	3.6
1773.4	0.393	21	1.4	44	196	5.0	5.7	2.5	67	224	3.7
1774.1	0.393	18	1.6	46	196	4.8	5.7	2.8	71	224	3.5
1774.7	0.393	18	1.5	44	186	2.8	5.7	2.7	67	212	2.1
1775.4	0.393	19	1.2	49	195	3.0	5.7	2.3	75	223	2.2
1776.1	0.393	17	1.1	44	167	2.8	5.7	2.0	67	191	2.0
1776.8	0.393	18	1.4	44	196	3.6	5.7	2.6	68	224	2.7
1777.5	0.393	17	1.7	42	173	4.5	5.7	3.0	64	198	3.3
1778.2	0.393	19	1.6	53	200	2.3	5.7	2.9	81	228	1.7
1778.9	0.393	19	1.5	56	192	3.8	5.7	2.8	86	220	2.7
1779.6	0.393	20	1.8	54	188	4.0	5.7	3.2	83	215	2.9
1780.3	0.393	18	1.4	50	181	4.6	5.7	2.6	77	207	3.3
1781.0	0.393	18	1.3	45	195	4.6	5.7	2.4	68	223	3.4
1781.7	0.688	16	1.3	43	205	4.0	9.9	2.3	66	234	2.9
1782.4	0.393	17	1.5	51	194	3.4	5.7	2.7	78	222	2.5
1783.1	0.393	17	1.6	55	188	3.5	5.7	2.9	85	215	2.6
1783.8	0.393	15	1.1	51	191	3.3	5.7	2.0	77	218	2.4
1784.5	0.521	18	0.934	49	204	3.0	7.5	1.7	74	233	2.2
1785.2	0.393	19	1.6	55	209	3.1	5.7	2.9	85	239	2.3
1785.9	0.393	19	1.6	54	237	3.2	5.7	3.0	82	272	2.3
1786.6	0.393	18	1.1	54	213	4.0	5.7	2.1	83	244	2.9
1787.3	0.393	15	1.4	55	192	3.2	5.7	2.5	84	220	2.4
1788.0	0.393	16	1.6	49	185	3.6	5.7	2.9	75	211	2.6
1788.7	0.482	17	1.3	52	212	3.7	7.0	2.3	79	243	2.7
1789.4	0.393	21	1.2	55	219	3.2	5.7	2.3	85	251	2.3
1790.1	0.393	15	1.6	53	191	3.7	5.7	2.9	82	218	2.7
1790.8	0.393	15	1.2	54	209	4.1	5.7	2.2	83	239	3.0
1791.5	0.393	19	1.2	44	231	3.5	5.7	2.2	68	264	2.6
1792.2	0.393	16	1.4	50	208	3.8	5.7	2.5	77	238	2.8
1792.9	0.393	16	1.3	52	202	3.3	5.7	2.4	80	231	2.4
1793.6	0.473	17	1.3	59	201	2.6	6.8	2.3	90	230	1.9
1794.3	0.393	17	1.1	53	221	4.3	5.7	2.1	81	252	3.2
1795.0	0.470	17	0.988	53	199	2.5	6.8	1.8	81	227	1.8
1795.7	0.393	16	1.2	50	211	3.1	5.7	2.3	77	241	2.2
1796.4	0.393	16	1.1	55	221	2.3	5.7	2.1	84	252	1.7
1797.1	0.393	17	1.3	48	225	3.4	5.7	2.3	73	258	2.5
1797.8	0.393	15	1.2	48	198	3.6	5.7	2.2	74	226	2.6
1798.5	0.393	17	1.0	46	268	2.6	5.7	1.9	71	307	1.9
1799.2	0.393	15	0.946	52	221	3.5	5.7	1.7	79	253	2.5
1799.9	0.393	16	0.960	46	221	2.5	5.7	1.8	70	253	1.8
1800.5	0.393	15	0.968	48	221	2.7	5.7	1.8	73	253	2.0
1801.2	0.393	14	1.1	50	228	2.4	5.7	2.0	77	261	1.8
1801.9	0.393	17	1.5	54	244	3.3	5.7	2.7	82	279	2.4
1802.6	0.393	17	1.2	49	210	2.4	5.7	2.2	75	240	1.7
1803.3	0.393	17	1.0	46	223	2.0	5.7	1.9	70	255	1.5
1804.0	0.393	17	1.0	50	232	3.0	5.7	1.9	76	265	2.2
1804.7	0.393	18	1.3	38	237	2.0	5.7	2.4	59	271	1.4
1805.4	0.393	13	1.2	43	256	3.6	5.7	2.2	66	292	2.7
1806.1	0.393	17	0.585	50	242	3.3	5.7	1.1	77	276	2.4
1806.8	0.393	21	0.835	43	258	4.6	5.7	1.5	66	295	3.4



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1807.5	0.393	13	1.1	48	232	3.6	5.7	1.9	73	266	2.7
1808.2	0.393	19	0.880	38	265	2.4	5.7	1.6	58	303	1.7
1808.9	0.459	18	1.1	48	265	3.7	6.6	2.1	74	303	2.7
1809.6	0.393	17	0.701	43	248	3.5	5.7	1.3	67	283	2.5
1810.3	0.393	18	0.862	43	250	2.5	5.7	1.6	66	285	1.8
1811.0	0.393	17	0.959	40	276	2.5	5.7	1.7	62	316	1.8
1811.7	0.393	18	0.978	35	257	3.9	5.7	1.8	54	294	2.8
1812.4	0.393	19	1.0	42	304	1.8	5.7	1.8	65	348	1.3
1813.1	0.393	16	0.767	40	242	2.7	5.7	1.4	61	277	2.0
1813.8	0.409	17	0.705	35	251	1.8	5.9	1.3	54	287	1.3
1814.5	0.393	14	0.568	35	271	2.6	5.7	1.0	54	310	1.9
1815.2	0.828	17	0.701	34	251	2.8	12	1.3	52	287	2.1
1815.9	0.393	17	0.797	37	304	3.7	5.7	1.5	57	348	2.7
1816.6	0.393	13	0.494	33	251	2.8	5.7	0.901	51	288	2.0
1817.3	0.393	17	0.721	35	276	2.5	5.7	1.3	53	316	1.9
1818.0	0.393	18	0.392	35	251	3.1	5.7	0.714	54	287	2.2
1818.7	0.393	16	0.542	32	221	3.3	5.7	0.988	49	252	2.4
1819.4	0.393	18	0.693	34	249	2.5	5.7	1.3	52	284	1.8
1820.1	0.393	17	0.825	29	254	2.4	5.7	1.5	45	290	1.8
1820.8	0.393	14	0.827	30	236	2.6	5.7	1.5	46	270	1.9
1821.5	0.393	16	0.822	32	262	3.6	5.7	1.5	49	300	2.6
1822.2	0.393	18	0.884	32	284	3.1	5.7	1.6	49	325	2.3
1822.9	0.393	19	0.551	31	268	3.3	5.7	1.0	47	306	2.4
1823.6	0.393	16	0.480	26	235	1.9	5.7	0.876	39	269	1.4
1824.3	0.393	16	0.562	28	260	2.0	5.7	1.0	43	298	1.5
1825.0	0.676	13	0.462	22	241	3.2	9.8	0.843	34	276	2.3
1825.7	0.393	21	0.792	27	283	3.0	5.7	1.4	41	324	2.2
1826.3	0.393	17	0.499	25	243	3.0	5.7	0.910	39	278	2.2
1827.0	0.393	17	0.521	26	240	2.2	5.7	0.950	41	275	1.6
1827.7	0.393	17	0.545	23	250	4.3	5.7	0.994	35	286	3.1
1828.4	0.393	18	0.645	27	236	3.0	5.7	1.2	41	270	2.2
1829.1	0.428	17	0.762	29	260	3.3	6.2	1.4	44	297	2.4
1829.8	0.393	16	0.559	23	225	3.3	5.7	1.0	36	257	2.4
1830.5	0.393	15	0.498	24	267	3.3	5.7	0.909	36	305	2.4
1831.2	0.448	15	0.594	24	265	3.6	6.5	1.1	37	303	2.6
1831.9	0.393	13	0.292	21	230	2.3	5.7	0.532	32	263	1.7
1832.6	0.402	14	0.466	22	214	2.9	5.8	0.849	33	245	2.1
1833.3	0.393	13	0.712	19	245	2.5	5.7	1.3	30	280	1.8
1834.0	0.393	14	0.445	22	224	2.6	5.7	0.812	34	256	1.9
1834.7	0.393	16	0.835	19	226	2.3	5.7	1.5	29	259	1.6
1835.4	0.393	17	0.573	30	251	2.3	5.7	1.0	46	287	1.7
1836.1	0.585	19	1.1	29	254	3.6	8.4	2.0	45	290	2.6
1836.8	0.393	17	0.525	24	291	3.3	5.7	0.957	37	333	2.4
1837.5	0.393	15	0.665	29	252	2.8	5.7	1.2	45	289	2.0
1838.2	0.393	16	1.0	23	274	2.1	5.7	1.9	35	313	1.5
1838.9	0.393	16	0.581	24	239	2.5	5.7	1.1	37	273	1.8
1839.6	0.440	15	0.759	27	248	2.9	6.4	1.4	42	284	2.1
1840.3	0.537	18	0.868	25	312	2.7	7.8	1.6	38	357	2.0
1841.0	0.393	13	0.504	24	236	2.9	5.7	0.919	36	270	2.1
1841.7	0.473	19	0.739	21	275	2.9	6.8	1.3	32	314	2.1
1842.4	0.393	14	0.445	26	262	1.5	5.7	0.812	40	300	1.1
1843.1	0.448	15	0.500	23	225	2.5	6.5	0.912	36	258	1.8
1843.8	0.393	13	0.644	25	214	1.9	5.7	1.2	38	244	1.4
1844.5	0.393	18	0.827	27	245	2.1	5.7	1.5	42	280	1.5
1845.2	0.393	17	0.726	32	256	2.5	5.7	1.3	49	293	1.8
1845.9	0.393	12	0.790	23	225	2.3	5.7	1.4	35	257	1.7
1846.6	0.393	15	0.894	25	246	1.8	5.7	1.6	39	281	1.3
1847.3	0.393	15	0.597	25	245	3.0	5.7	1.1	38	280	2.2
1848.0	0.393	14	0.552	29	262	1.5	5.7	1.0	45	300	1.1
1848.7	0.393	14	0.668	28	238	2.6	5.7	1.2	42	273	1.9
1849.4	0.393	13	0.871	30	251	2.5	5.7	1.6	47	287	1.9
1850.1	0.393	14	0.871	28	234	2.3	5.7	1.6	44	267	1.7
1850.8	0.393	14	0.785	24	240	2.7	5.7	1.4	36	274	2.0
1851.5	0.393	14	0.975	25	253	2.5	5.7	1.8	38	289	1.8
1852.2	0.393	13	0.715	28	228	2.3	5.7	1.3	43	261	1.7
1852.9	0.393	16	1.2	29	264	2.2	5.7	2.2	44	302	1.6
1853.5	0.393	14	1.4	28	244	1.7	5.7	2.6	44	279	1.2
1854.2	0.393	13	1.0	28	252	2.0	5.7	1.9	43	288	1.5
1854.9	0.393	14	1.1	35	249	1.4	5.7	2.1	54	285	1.0
1855.6	0.393	16	0.793	40	261	1.6	5.7	1.4	61	298	1.2
1856.3	0.393	14	1.0	31	235	2.1	5.7	1.9	48	268	1.6
1857.0	0.482	15	0.921	34	272	1.5	7.0	1.7	52	311	1.1
1857.7	0.393	14	1.4	35	272	1.8	5.7	2.6	54	312	1.3
1858.4	0.393	15	0.796	30	250	1.3	5.7	1.5	46	286	0.971
1859.1	0.393	14	1.1	37	228	2.5	5.7	2.1	56	260	1.8
1859.8	0.417	14	0.859	32	222	1.6	6.0	1.6	48	254	1.1
1860.5	0.417	16	1.1	39	242	1.8	6.0	1.9	59	276	1.3
1861.2	0.393	13	1.4	33	248	2.7	5.7	2.6	51	283	2.0
1861.9	0.393	16	1.4	35	268	2.3	5.7	2.6	53	307	1.7
1862.6	0.393	15	1.1	36	258	1.9	5.7	2.1	55	295	1.4
1863.3	0.393	14	0.941	33	218	1.5	5.7	1.7	51	250	1.1



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1864.0	0.393	13	1.4	35	238	1.2	5.7	2.5	53	272	0.888
1864.7	0.393	14	1.1	37	288	2.1	5.7	1.9	56	329	1.5
1865.4	0.393	14	1.4	37	272	1.5	5.7	2.6	56	311	1.1
1866.1	0.393	15	1.3	36	244	1.5	5.7	2.4	55	280	1.1
1866.8	0.393	14	0.821	31	246	1.7	5.7	1.5	48	281	1.3
1867.5	0.393	12	1.2	38	244	1.3	5.7	2.2	58	279	0.923
1868.2	0.717	12	1.6	43	243	1.9	10	2.9	66	278	1.4
1868.9	0.393	14	1.6	43	254	2.8	5.7	3.0	65	291	2.1
1869.6	0.393	10	1.3	40	223	1.1	5.7	2.3	61	255	0.812
1870.3	0.393	13	1.2	43	235	1.4	5.7	2.2	65	268	1.0
1871.0	0.393	12	1.2	40	296	1.5	5.7	2.1	61	339	1.1
1871.7	0.437	14	1.4	47	286	1.3	6.3	2.6	72	328	0.960
1872.4	0.393	12	1.6	42	290	1.5	5.7	2.9	65	332	1.1
1873.1	0.393	14	1.4	47	296	1.1	5.7	2.6	73	339	0.773
1873.8	0.393	13	1.4	41	227	1.3	5.7	2.6	63	259	0.978
1874.5	0.393	11	1.1	47	247	2.2	5.7	1.9	71	283	1.6
1875.2	0.442	13	1.5	49	259	1.9	6.4	2.7	75	297	1.4
1875.9	0.393	12	1.4	45	230	1.7	5.7	2.5	70	264	1.2
1876.6	0.393	10	1.2	40	258	1.3	5.7	2.2	61	295	0.972
1877.3	0.393	12	1.2	43	252	1.2	5.7	2.2	67	288	0.875
1878.0	0.393	12	1.1	47	258	1.5	5.7	2.1	72	295	1.1
1878.7	0.393	12	1.2	36	247	1.3	5.7	2.1	56	282	0.949
1879.3	0.393	10	1.9	41	271	1.4	5.7	3.4	63	310	1.0
1880.0	0.393	13	1.3	38	262	0.975	5.7	2.4	58	299	0.712
1880.7	0.393	11	1.8	44	260	2.7	5.7	3.4	67	298	2.0
1881.4	0.393	11	1.3	48	223	0.855	5.7	2.4	74	255	0.624
1882.1	0.393	11	1.5	45	263	1.5	5.7	2.7	69	301	1.1
1882.8	0.393	14	0.843	46	235	1.2	5.7	1.5	71	269	0.870
1883.5	0.393	11	1.0	41	241	1.1	5.7	1.8	63	276	0.787
1884.2	0.393	15	1.1	43	253	0.923	5.7	1.9	67	289	0.673
1884.9	0.393	12	1.5	52	242	1.3	5.7	2.7	80	277	0.914
1885.6	0.393	12	1.3	43	227	0.640	5.7	2.3	66	260	0.467
1886.3	0.393	14	1.1	44	249	1.000	5.7	2.1	68	284	0.729
1887.0	0.393	12	0.963	42	263	1.4	5.7	1.8	64	300	1.1
1887.7	0.393	13	1.1	49	274	1.5	5.7	2.0	75	313	1.1
1888.4	0.393	14	1.1	42	249	1.1	5.7	1.9	65	284	0.786
1889.1	0.393	12	1.4	43	308	1.6	5.7	2.5	66	352	1.2
1889.8	0.393	10	1.000	38	281	1.4	5.7	1.8	58	321	1.0
1890.5	0.393	12	1.4	42	234	1.2	5.7	2.5	64	268	0.852
1891.2	0.393	12	1.0	45	251	1.2	5.7	1.8	69	287	0.891
1891.9	0.393	13	0.660	35	268	1.2	5.7	1.2	54	307	0.855
1892.6	0.393	12	1.1	41	237	0.966	5.7	2.0	63	271	0.705
1893.3	0.393	13	0.964	39	240	1.2	5.7	1.8	60	275	0.848
1894.0	0.393	14	1.0	29	233	1.1	5.7	1.8	45	267	0.828
1894.7	0.581	10	1.0	35	224	1.9	8.4	1.9	53	256	1.4
1895.4	0.393	13	0.971	35	237	2.1	5.7	1.8	54	272	1.5
1896.1	0.393	11	0.865	33	221	1.4	5.7	1.6	50	253	1.0
1896.8	0.393	14	0.711	28	242	1.6	5.7	1.3	42	277	1.1
1897.5	0.393	13	1.0	31	244	1.8	5.7	1.8	48	279	1.3
1898.2	0.454	13	1.0	29	237	1.7	6.5	1.9	44	271	1.2
1898.9	0.393	14	0.697	32	316	3.0	5.7	1.3	50	361	2.2
1899.6	0.393	15	0.494	23	221	3.0	5.7	0.902	36	253	2.2
1900.3	0.393	15	0.710	29	223	2.0	5.7	1.3	44	255	1.4
1901.0	0.393	14	0.750	28	255	3.2	5.7	1.4	43	292	2.3
1901.7	0.393	13	0.584	29	247	2.0	5.7	1.1	45	283	1.4
1902.4	0.393	12	0.422	24	240	3.2	5.7	0.770	37	274	2.3
1903.1	0.453	12	0.641	22	242	2.7	6.5	1.2	33	277	2.0
1903.8	0.393	15	0.635	25	245	2.7	5.7	1.2	39	280	1.9
1904.5	0.393	13	0.890	22	237	2.7	5.7	1.6	34	271	1.9
1905.1	0.626	13	0.738	23	277	2.2	9.0	1.3	35	317	1.6
1905.8	0.393	12	0.532	22	262	2.0	5.7	0.970	34	300	1.4
1906.5	0.393	12	0.435	20	240	2.5	5.7	0.794	31	274	1.9
1907.2	0.393	12	0.520	21	221	3.6	5.7	0.948	32	253	2.7
1907.9	0.393	11	0.717	18	234	3.3	5.7	1.3	28	268	2.4
1908.6	0.393	14	0.594	21	229	2.2	5.7	1.1	32	262	1.6
1909.3	0.393	13	0.788	21	253	2.4	5.7	1.4	33	290	1.7
1910.0	0.393	13	0.467	23	263	2.7	5.7	0.851	36	301	2.0
1910.7	0.446	14	0.390	19	263	3.0	6.4	0.711	29	301	2.2
1911.4	0.393	14	0.286	16	237	4.2	5.7	0.521	25	271	3.1
1912.1	0.393	14	0.742	21	237	3.2	5.7	1.4	32	271	2.4
1912.8	0.393	12	0.345	16	268	3.3	5.7	0.629	25	306	2.4
1913.5	0.393	13	0.744	18	232	3.9	5.7	1.4	27	265	2.8
1914.2	0.393	13	0.518	23	247	2.7	5.7	0.945	36	282	1.9
1914.9	0.393	12	0.652	19	261	3.6	5.7	1.2	30	298	2.6
1915.6	0.393	13	0.902	19	231	2.6	5.7	1.6	29	264	1.9
1916.3	0.393	12	0.832	18	234	3.2	5.7	1.5	27	268	2.4
1917.0	0.393	14	0.948	24	233	2.6	5.7	1.7	37	266	1.9
1917.7	0.393	16	0.773	18	201	4.0	5.7	1.4	27	229	2.9
1918.4	0.458	14	0.918	23	246	3.4	6.6	1.7	35	281	2.5
1919.1	0.393	13	1.1	22	232	2.8	5.7	1.9	33	265	2.0
1919.8	0.393	14	1.2	21	262	2.9	5.7	2.3	33	299	2.1



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1920.5	0.393	12	1.3	22	243	2.8	5.7	2.3	33	278	2.1
1921.2	0.393	12	1.0	20	241	3.2	5.7	1.8	30	276	2.3
1921.9	0.393	13	1.3	19	248	2.7	5.7	2.3	29	284	2.0
1922.6	0.393	12	1.2	22	227	2.7	5.7	2.2	33	259	1.9
1923.3	0.393	13	1.2	20	265	4.2	5.7	2.2	30	303	3.1
1924.0	0.393	13	1.3	21	243	3.3	5.7	2.4	33	277	2.4
1924.7	0.393	12	1.0	28	238	3.7	5.7	1.9	43	272	2.7
1925.4	0.393	13	1.1	27	234	2.2	5.7	2.1	41	267	1.6
1926.1	0.393	13	1.0	29	242	2.0	5.7	1.9	45	277	1.5
1926.8	0.393	9.9	1.1	27	221	2.6	5.7	2.1	42	252	1.9
1927.5	0.393	14	1.9	25	252	2.7	5.7	3.5	38	289	2.0
1928.2	0.393	12	1.6	33	244	3.5	5.7	3.0	51	279	2.6
1928.9	0.393	16	1.4	31	260	2.0	5.7	2.6	47	298	1.5
1929.6	0.393	11	1.4	32	261	2.2	5.7	2.6	49	299	1.6
1930.3	0.393	13	1.2	30	249	1.7	5.7	2.2	46	285	1.2
1931.0	0.393	14	1.1	26	229	2.9	5.7	2.1	40	262	2.1
1931.6	0.608	12	0.964	32	224	3.3	8.8	1.8	49	256	2.4
1932.3	0.393	13	1.3	37	248	1.7	5.7	2.4	56	283	1.2
1933.0	0.393	13	1.3	32	246	1.8	5.7	2.3	49	281	1.3
1933.7	0.393	13	1.2	31	232	2.8	5.7	2.1	48	265	2.0
1934.4	0.417	14	1.4	34	258	1.7	6.0	2.5	52	295	1.2
1935.1	0.393	16	1.6	43	271	0.871	5.7	2.9	66	310	0.636
1935.8	0.393	15	1.4	39	247	2.6	5.7	2.5	60	283	1.9
1936.5	0.393	15	1.2	37	262	1.4	5.7	2.3	57	300	0.992
1937.2	0.393	14	1.4	36	233	1.4	5.7	2.6	55	267	1.0
1937.9	0.393	15	1.5	40	252	2.6	5.7	2.7	62	288	1.9
1938.6	0.393	14	1.1	37	239	1.6	5.7	2.0	57	273	1.1
1939.3	0.393	13	1.4	38	240	2.0	5.7	2.6	57	275	1.5
1940.0	0.393	14	1.6	44	245	0.836	5.7	2.9	67	281	0.610
1940.7	0.393	14	1.5	39	246	1.6	5.7	2.8	59	281	1.2
1941.4	0.393	13	1.4	42	238	1.2	5.7	2.6	64	272	0.908
1942.1	0.393	14	1.6	50	292	1.8	5.7	2.9	76	334	1.3
1942.8	0.393	14	1.5	44	282	2.3	5.7	2.6	68	322	1.7
1943.5	0.393	14	1.3	45	291	2.2	5.7	2.4	69	333	1.6
1944.2	0.460	15	1.3	48	244	1.6	6.6	2.4	73	279	1.2
1944.9	0.393	13	1.2	41	250	1.8	5.7	2.2	63	286	1.3
1945.6	0.393	16	1.3	45	251	2.0	5.7	2.3	69	287	1.4
1946.3	0.393	14	1.3	41	243	1.1	5.7	2.3	62	278	0.809
1947.0	0.393	13	1.7	43	229	2.0	5.7	3.0	66	261	1.5
1947.7	0.393	15	1.1	48	290	0.921	5.7	2.0	73	332	0.672
1948.4	0.393	16	1.6	50	269	1.2	5.7	2.8	76	308	0.861
1949.1	0.393	13	0.955	47	252	0.997	5.7	1.7	72	288	0.727
1949.8	0.393	14	1.1	40	222	1.1	5.7	2.0	61	254	0.814
1950.5	0.393	16	1.2	47	262	1.3	5.7	2.3	71	299	0.926
1951.2	0.393	13	1.1	57	268	1.5	5.7	2.0	88	306	1.1
1951.9	0.393	15	1.2	43	249	2.2	5.7	2.2	67	285	1.6
1952.6	0.393	19	0.918	45	248	0.883	5.7	1.7	69	284	0.644
1953.3	0.421	15	1.3	48	253	0.844	6.1	2.3	73	290	0.616
1954.0	0.393	15	1.1	48	260	1.2	5.7	2.1	74	298	0.878
1954.7	0.393	17	1.2	53	253	1.7	5.7	2.1	81	289	1.3
1955.4	0.393	14	1.5	48	239	1.2	5.7	2.7	74	273	0.885
1956.1	0.393	18	0.818	51	247	2.1	5.7	1.5	79	283	1.6
1956.8	0.702	16	1.0	54	282	1.4	10	1.9	82	322	0.986
1957.5	0.393	18	1.1	52	272	0.992	5.7	1.9	80	311	0.723
1958.1	0.393	16	0.907	51	263	0.894	5.7	1.7	79	301	0.652
1958.8	0.393	16	0.864	49	294	0.920	5.7	1.6	75	336	0.672
1959.5	0.569	17	1.1	52	271	1.5	8.2	2.1	80	310	1.1
1960.2	0.393	17	1.3	54	278	1.5	5.7	2.5	82	318	1.1
1960.9	0.393	16	1.0	51	253	0.537	5.7	1.8	78	289	0.392
1961.6	0.798	16	0.628	51	263	1.2	12	1.1	79	301	0.877
1962.3	0.393	17	0.765	47	238	0.835	5.7	1.4	72	272	0.610
1963.0	0.635	15	1.1	48	271	1.5	9.2	1.9	74	310	1.1
1963.7	0.393	16	0.578	47	234	1.5	5.7	1.1	72	268	1.1
1964.4	0.393	15	1.1	57	261	2.0	5.7	2.0	87	299	1.5
1965.1	0.393	16	0.822	55	262	1.2	5.7	1.5	85	300	0.845
1965.8	0.393	16	1.1	49	247	1.2	5.7	2.1	74	283	0.892
1966.5	0.600	15	0.634	43	243	1.9	8.7	1.2	66	278	1.4
1967.2	0.393	16	1.2	49	271	1.3	5.7	2.1	74	310	0.971
1967.9	0.393	18	0.856	50	283	1.4	5.7	1.6	77	323	1.0
1968.6	0.393	14	0.612	51	247	1.4	5.7	1.1	78	283	1.0
1969.3	0.488	15	0.641	50	249	0.967	7.0	1.2	76	285	0.705
1970.0	0.513	16	0.851	46	291	1.6	7.4	1.6	70	333	1.2
1970.7	0.682	14	0.955	46	274	1.1	9.8	1.7	71	313	0.803
1971.4	0.393	17	0.694	55	272	1.6	5.7	1.3	84	312	1.1
1972.1	0.393	16	0.937	48	249	2.2	5.7	1.7	73	285	1.6
1972.8	0.393	18	1.2	47	273	1.3	5.7	2.3	72	312	0.968
1973.5	0.393	15	0.796	42	246	1.6	5.7	1.5	64	281	1.2
1974.2	0.393	16	0.702	50	258	1.4	5.7	1.3	76	296	1.0
1974.9	0.393	17	0.751	46	257	1.1	5.7	1.4	70	294	0.772
1975.6	0.396	14	0.737	39	244	1.2	5.7	1.3	60	279	0.891
1976.3	0.393	16	0.838	45	246	1.2	5.7	1.5	69	281	0.892



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1977.0	0.393	18	0.448	49	270	2.0	5.7	0.816	75	309	1.5
1977.7	0.393	17	0.710	48	292	1.7	5.7	1.3	74	333	1.2
1978.4	0.393	19	0.704	46	276	1.4	5.7	1.3	70	315	1.0
1979.1	0.393	14	0.537	48	275	2.1	5.7	0.980	74	315	1.6
1979.8	0.393	13	0.698	43	247	1.3	5.7	1.3	66	283	0.973
1980.5	0.393	16	0.999	40	282	1.8	5.7	1.8	61	323	1.3
1981.2	0.393	17	1.3	42	290	2.0	5.7	2.3	65	332	1.4
1981.9	0.393	19	0.986	38	268	1.7	5.7	1.8	58	307	1.2
1982.6	0.393	18	1.0	39	223	1.8	5.7	1.8	60	255	1.3
1983.3	0.393	18	0.896	38	269	1.5	5.7	1.6	58	308	1.1
1983.9	0.393	16	1.1	45	244	1.6	5.7	1.9	68	279	1.2
1984.6	0.393	17	0.931	37	275	0.928	5.7	1.7	56	314	0.677
1985.3	0.393	18	0.857	41	255	1.3	5.7	1.6	62	292	0.913
1986.0	0.393	17	0.968	39	272	1.2	5.7	1.8	60	311	0.845
1986.7	0.393	19	1.0	39	265	1.8	5.7	1.9	59	303	1.3
1987.4	0.393	18	1.3	35	269	1.8	5.7	2.4	54	307	1.3
1988.1	0.549	17	1.4	33	258	1.5	7.9	2.5	51	295	1.1
1988.8	0.393	17	0.874	34	249	2.6	5.7	1.6	52	285	1.9
1989.5	0.393	20	0.867	35	267	1.6	5.7	1.6	54	305	1.2
1990.2	0.500	17	1.0	36	275	0.982	7.2	1.9	56	315	0.717
1990.9	0.393	17	0.923	38	287	1.5	5.7	1.7	59	328	1.1
1991.6	0.393	17	0.748	37	254	2.2	5.7	1.4	56	290	1.6
1992.3	0.393	18	0.983	37	281	2.1	5.7	1.8	57	321	1.5
1993.0	0.393	18	0.748	31	262	2.8	5.7	1.4	48	300	2.0
1993.7	0.543	16	1.2	32	270	1.3	7.8	2.2	49	309	0.983
1994.4	0.393	20	0.914	36	276	1.2	5.7	1.7	56	315	0.855
1995.1	0.393	19	1.2	38	301	1.7	5.7	2.1	58	344	1.2
1995.8	0.393	18	0.777	35	274	1.8	5.7	1.4	53	313	1.3
1996.5	0.393	18	1.1	35	297	1.2	5.7	2.0	54	339	0.856
1997.2	0.467	18	1.2	38	276	2.2	6.7	2.2	58	315	1.6
1997.9	0.393	18	0.951	35	255	1.8	5.7	1.7	53	291	1.3
1998.6	0.393	17	1.1	38	266	1.5	5.7	2.0	58	304	1.1
1999.3	0.393	18	0.999	33	257	1.7	5.7	1.8	51	294	1.2
2000.0	0.393	16	1.2	39	283	1.5	5.7	2.2	59	323	1.1
2000.7	0.403	18	1.1	37	259	1.4	5.8	2.1	57	296	1.0
2001.4	0.393	16	0.999	43	267	1.9	5.7	1.8	67	305	1.4
2002.1	0.393	16	0.966	37	256	2.1	5.7	1.8	56	293	1.5
2002.8	0.393	19	1.2	39	281	1.5	5.7	2.2	59	322	1.1
2003.5	0.393	17	1.2	37	267	1.7	5.7	2.1	57	305	1.2
2004.2	0.393	19	1.0	44	282	2.2	5.7	1.9	68	323	1.6
2004.9	0.393	23	0.854	43	294	2.2	5.7	1.6	65	336	1.6
2005.6	0.860	18	1.6	41	274	2.3	12	3.0	62	314	1.7
2006.3	0.393	15	1.5	37	264	2.1	5.7	2.7	57	302	1.5
2007.0	0.393	18	1.5	46	293	1.7	5.7	2.8	71	335	1.3
2007.7	0.393	16	1.2	43	267	1.9	5.7	2.2	66	305	1.4
2008.4	0.393	18	1.2	48	257	2.2	5.7	2.2	74	294	1.6
2009.1	0.393	16	1.2	39	287	2.0	5.7	2.2	59	329	1.5
2009.7	0.393	20	1.7	51	274	1.9	5.7	3.1	78	313	1.4
2010.4	0.393	21	1.1	50	280	2.3	5.7	2.1	77	321	1.7
2011.1	0.393	17	1.3	48	290	1.5	5.7	2.3	74	332	1.1
2011.8	0.393	15	1.1	46	262	1.6	5.7	2.1	70	299	1.2
2012.5	0.393	20	1.3	49	296	1.6	5.7	2.3	74	339	1.1
2013.2	0.393	15	1.2	51	279	1.4	5.7	2.2	78	319	1.0
2013.9	0.393	19	1.5	45	272	1.9	5.7	2.7	69	311	1.4
2014.6	0.393	15	1.2	53	271	0.967	5.7	2.2	81	310	0.706
2015.3	0.393	16	1.2	46	246	0.756	5.7	2.2	71	281	0.552
2016.0	0.393	18	1.3	49	291	0.916	5.7	2.3	75	332	0.668
2016.7	0.393	15	1.0	44	270	1.2	5.7	1.8	67	309	0.876
2017.4	0.393	16	0.881	50	272	2.0	5.7	1.6	76	311	1.4
2018.1	0.393	18	1.5	55	279	1.5	5.7	2.8	85	320	1.1
2018.8	0.393	18	1.2	50	257	1.1	5.7	2.2	76	293	0.832
2019.5	0.494	16	0.995	47	284	1.1	7.1	1.8	72	325	0.779
2020.2	0.393	18	1.2	57	281	1.3	5.7	2.3	87	321	0.975
2020.9	0.393	15	1.3	53	252	1.5	5.7	2.4	80	289	1.1
2021.6	0.393	18	1.1	56	286	1.3	5.7	2.0	86	327	0.980
2022.3	0.393	17	1.3	56	259	1.9	5.7	2.3	85	296	1.4
2023.0	0.393	15	0.995	57	244	1.0	5.7	1.8	87	279	0.740
2023.7	0.393	14	0.871	52	273	1.3	5.7	1.6	80	312	0.927
2024.4	0.537	15	1.2	56	279	1.2	7.7	2.2	86	319	0.846
2025.1	0.393	17	1.3	59	256	1.6	5.7	2.4	91	293	1.2
2025.8	0.393	15	1.1	54	245	0.817	5.7	2.0	83	281	0.596
2026.5	0.393	19	1.3	53	265	1.5	5.7	2.4	82	303	1.1
2027.2	0.393	17	1.5	58	285	1.0	5.7	2.8	89	326	0.752
2027.9	0.393	16	1.2	55	299	1.3	5.7	2.3	85	341	0.919
2028.6	0.393	17	1.1	60	270	0.846	5.7	2.0	92	309	0.617
2029.3	0.393	16	0.905	51	248	0.871	5.7	1.7	79	284	0.636
2030.0	0.393	14	0.969	64	298	1.1	5.7	1.8	98	340	0.812
2030.7	0.572	19	1.3	66	277	1.7	8.3	2.3	101	316	1.3
2031.4	0.393	17	1.1	59	250	1.6	5.7	2.0	91	286	1.2
2032.1	0.393	16	1.0	56	264	1.4	5.7	1.9	87	302	0.999
2032.8	0.615	13	0.729	47	243	1.5	8.9	1.3	72	278	1.1



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2033.5	0.393	17	1.1	51	338	1.5	5.7	2.1	79	387	1.1
2034.2	0.393	18	0.913	56	279	1.1	5.7	1.7	85	319	0.767
2034.9	0.393	16	0.622	53	250	1.1	5.7	1.1	81	286	0.777
2035.5	0.393	16	0.871	64	298	0.871	5.7	1.6	98	341	0.635
2036.2	0.524	15	1.1	50	277	1.1	7.6	1.9	77	317	0.825
2036.9	0.393	15	1.0	59	282	2.1	5.7	1.9	90	322	1.5
2037.6	0.393	18	1.0	61	273	1.4	5.7	1.9	94	312	0.998
2038.3	0.393	16	0.671	58	264	1.0	5.7	1.2	89	302	0.736
2039.0	0.393	18	0.900	55	271	2.7	5.7	1.6	84	310	2.0
2039.7	0.393	15	0.908	52	295	1.6	5.7	1.7	80	337	1.1
2040.4	0.393	18	0.763	51	249	1.6	5.7	1.4	79	285	1.2
2041.1	0.393	17	0.688	50	281	1.5	5.7	1.3	77	322	1.1
2041.8	0.393	19	1.2	49	291	2.0	5.7	2.2	76	333	1.5
2042.5	0.393	14	0.649	53	276	0.878	5.7	1.2	82	316	0.641
2043.2	0.393	18	0.549	49	253	0.796	5.7	1.0	75	289	0.581
2043.9	0.393	16	0.542	51	274	1.8	5.7	0.989	79	313	1.3
2044.6	0.659	19	0.781	52	256	1.8	9.5	1.4	80	293	1.3
2045.3	0.393	19	0.832	50	312	2.0	5.7	1.5	76	357	1.4
2046.0	0.393	17	0.922	41	277	2.3	5.7	1.7	63	317	1.7
2046.7	0.393	16	0.686	45	250	1.6	5.7	1.3	69	286	1.2
2047.4	0.393	17	0.768	46	279	1.2	5.7	1.4	71	319	0.865
2048.1	0.616	19	0.972	52	300	2.2	8.9	1.8	79	343	1.6
2048.8	0.393	15	0.902	49	249	2.1	5.7	1.6	75	285	1.5
2049.5	0.742	16	1.1	41	284	1.7	11	2.0	62	325	1.3
2050.2	0.393	16	1.0	45	277	2.2	5.7	1.8	69	317	1.6
2050.9	0.393	16	0.870	53	273	2.6	5.7	1.6	81	312	1.9
2051.6	0.393	15	0.950	39	253	1.8	5.7	1.7	60	290	1.3
2052.3	0.393	14	0.801	41	265	3.5	5.7	1.5	63	303	2.6
2053.0	0.393	15	1.2	48	279	2.4	5.7	2.3	74	319	1.8
2053.7	0.393	15	1.1	48	253	2.5	5.7	2.1	74	290	1.9
2054.4	0.393	16	0.892	48	262	3.0	5.7	1.6	73	300	2.2
2055.1	0.578	15	0.934	43	245	1.8	8.3	1.7	66	281	1.3
2055.8	0.393	15	1.1	40	253	1.9	5.7	1.9	62	290	1.4
2056.5	0.393	17	0.968	43	274	2.7	5.7	1.8	66	313	2.0
2057.2	0.393	19	0.762	43	264	1.8	5.7	1.4	66	302	1.3
2057.9	0.393	19	0.862	43	280	0.913	5.7	1.6	66	320	0.666
2058.6	0.393	17	0.683	46	269	2.4	5.7	1.2	70	308	1.8
2059.3	0.393	16	1.1	36	259	2.1	5.7	2.1	55	297	1.6
2060.0	0.393	20	0.929	41	270	2.0	5.7	1.7	63	308	1.4
2060.7	0.521	16	1.0	44	264	3.4	7.5	1.9	68	302	2.5
2061.4	0.393	16	1.1	40	261	2.7	5.7	2.1	62	299	2.0
2062.0	0.393	16	1.1	43	284	2.9	5.7	2.0	66	325	2.1
2062.7	0.393	18	1.0	38	302	2.6	5.7	1.9	58	345	1.9
2063.4	0.393	20	1.4	47	280	2.7	5.7	2.5	73	320	1.9
2064.1	0.393	17	0.860	36	271	2.3	5.7	1.6	55	310	1.6
2064.8	0.482	17	1.2	35	293	4.0	7.0	2.2	53	335	2.9
2065.5	0.393	14	0.829	33	263	3.1	5.7	1.5	51	301	2.3
2066.2	0.393	15	0.900	36	256	2.9	5.7	1.6	54	293	2.1
2066.9	0.393	18	1.2	32	259	3.4	5.7	2.1	48	296	2.5
2067.6	0.393	16	1.0	32	289	3.0	5.7	1.9	49	330	2.2
2068.3	0.436	18	1.2	35	274	3.1	6.3	2.2	53	313	2.2
2069.0	0.393	17	1.4	34	272	2.3	5.7	2.5	53	311	1.7
2069.7	0.393	17	1.2	33	255	2.6	5.7	2.2	51	291	1.9
2070.4	0.393	17	0.992	34	272	2.4	5.7	1.8	51	311	1.8
2071.1	0.393	18	1.3	30	273	2.7	5.7	2.3	46	312	2.0
2071.8	0.658	17	1.1	32	306	3.1	9.5	2.0	49	350	2.2
2072.5	0.393	16	0.629	32	255	2.5	5.7	1.1	49	292	1.9
2073.2	0.393	18	1.2	34	256	2.6	5.7	2.3	52	292	1.9
2073.9	0.393	16	1.4	35	241	3.1	5.7	2.5	53	275	2.2
2074.6	0.393	18	1.5	33	251	2.3	5.7	2.7	50	287	1.7
2075.3	0.393	18	1.3	38	261	2.9	5.7	2.4	59	298	2.1
2076.0	0.393	14	1.3	35	276	2.7	5.7	2.4	54	316	2.0
2076.7	0.393	16	0.885	32	254	3.1	5.7	1.6	49	290	2.3
2077.4	0.393	12	1.5	34	262	2.9	5.7	2.7	52	300	2.1
2078.1	0.393	17	1.6	36	243	3.8	5.7	2.8	56	278	2.7
2078.8	0.393	16	1.2	32	268	3.7	5.7	2.2	49	306	2.7
2079.5	0.393	16	1.0	34	250	2.2	5.7	1.8	52	286	1.6
2080.2	0.393	16	1.0	42	244	1.8	5.7	1.9	65	279	1.3
2080.9	0.393	17	1.6	38	267	3.0	5.7	2.9	59	306	2.2
2081.6	0.393	14	1.2	35	265	2.0	5.7	2.1	53	303	1.5
2082.3	0.393	17	1.4	34	274	2.4	5.7	2.6	52	313	1.7
2083.0	0.393	19	1.3	45	261	2.4	5.7	2.4	69	299	1.7
2083.7	0.393	18	1.8	39	279	3.0	5.7	3.4	60	319	2.2
2084.4	0.393	16	1.6	42	254	2.8	5.7	2.9	65	291	2.0
2085.1	0.393	19	1.2	43	259	2.3	5.7	2.2	65	296	1.7
2085.8	0.393	20	1.5	40	257	3.9	5.7	2.7	61	294	2.8
2086.5	0.393	19	1.2	41	261	1.8	5.7	2.2	63	299	1.3
2087.2	0.393	17	1.5	41	278	1.7	5.7	2.7	63	318	1.3
2087.8	0.694	18	1.4	40	274	3.4	10	2.6	62	313	2.5
2088.5	0.393	18	1.3	34	252	2.4	5.7	2.4	53	288	1.8
2089.2	0.583	16	1.4	36	263	2.3	8.4	2.5	55	301	1.6



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2089.9	0.393	18	0.735	36	293	2.6	5.7	1.3	55	335	1.9
2090.6	0.393	18	1.3	38	262	2.5	5.7	2.4	59	299	1.9
2091.3	0.393	20	1.1	39	262	2.5	5.7	2.0	59	300	1.8
2092.0	0.393	17	1.2	42	325	2.4	5.7	2.1	65	372	1.8
2092.7	0.393	18	1.0	42	274	2.2	5.7	1.9	64	313	1.6
2093.4	0.393	19	1.2	42	261	1.7	5.7	2.2	65	298	1.3
2094.1	0.393	18	1.1	41	278	2.2	5.7	1.9	64	318	1.6
2094.8	0.393	16	0.819	37	227	2.3	5.7	1.5	56	259	1.7
2095.5	0.393	18	1.2	43	261	2.4	5.7	2.1	66	298	1.8
2096.2	0.393	18	1.1	48	282	2.2	5.7	2.1	73	322	1.6
2096.9	0.393	19	1.3	41	291	2.3	5.7	2.3	63	333	1.7
2097.6	0.393	16	0.742	40	253	1.9	5.7	1.4	61	289	1.4
2098.3	0.393	19	0.872	38	276	2.1	5.7	1.6	58	315	1.5
2099.0	0.393	16	0.999	38	253	2.5	5.7	1.8	58	289	1.9
2099.7	0.393	18	1.4	47	291	2.4	5.7	2.5	73	333	1.8
2100.4	0.393	19	1.0	45	258	2.4	5.7	1.9	69	295	1.8
2101.1	0.393	17	0.900	39	260	2.2	5.7	1.6	60	298	1.6
2101.8	0.393	18	0.787	44	307	2.5	5.7	1.4	68	351	1.9
2102.5	0.393	20	0.801	41	281	2.5	5.7	1.5	62	321	1.8
2103.2	0.528	16	1.3	45	314	3.4	7.6	2.3	70	359	2.5
2103.9	0.393	20	1.1	49	326	2.4	5.7	2.0	75	373	1.7
2104.6	0.774	16	0.800	45	291	2.5	11	1.5	68	333	1.9
2105.3	0.393	16	0.817	45	262	2.6	5.7	1.5	68	300	1.9
2106.0	0.393	17	0.771	42	317	3.0	5.7	1.4	64	362	2.2
2106.7	0.694	19	0.821	51	342	1.9	10	1.5	78	391	1.4
2107.4	0.393	18	0.744	42	324	3.2	5.7	1.4	65	370	2.3
2108.1	0.393	18	0.907	43	324	1.8	5.7	1.7	66	371	1.3
2108.8	0.393	18	0.633	48	335	2.2	5.7	1.2	74	383	1.6
2109.5	0.393	18	1.2	47	284	2.8	5.7	2.2	72	325	2.1
2110.2	0.393	18	1.0	42	342	1.9	5.7	1.8	64	391	1.4
2110.9	0.393	22	0.781	45	352	2.3	5.7	1.4	69	403	1.7
2111.6	0.393	17	0.823	51	339	2.5	5.7	1.5	78	387	1.8
2112.3	0.671	15	0.840	41	281	2.6	9.7	1.5	62	321	1.9
2113.0	0.393	20	1.1	38	356	1.4	5.7	2.0	58	407	1.0
2113.6	0.674	18	0.870	41	376	2.8	9.7	1.6	63	430	2.1
2114.3	0.393	19	0.878	43	352	3.2	5.7	1.6	66	402	2.4
2115.0	0.393	21	0.814	45	322	3.4	5.7	1.5	68	369	2.5
2115.7	0.580	20	0.936	43	346	3.4	8.4	1.7	66	396	2.5
2116.4	0.393	19	0.694	42	345	2.8	5.7	1.3	64	395	2.1
2117.1	0.607	19	0.642	42	378	3.1	8.8	1.2	65	433	2.3
2117.8	0.891	17	0.748	38	353	1.9	13	1.4	58	404	1.4
2118.5	0.393	21	0.911	38	423	3.9	5.7	1.7	58	484	2.8
2119.2	0.553	20	0.697	43	396	3.9	8.0	1.3	66	453	2.9
2119.9	0.736	21	1.0	41	335	2.8	11	1.9	64	383	2.1
2120.6	0.393	18	1.2	40	329	3.5	5.7	2.2	61	376	2.5
2121.3	0.405	15	1.2	45	413	3.5	5.8	2.2	70	472	2.5
2122.0	0.543	18	1.1	38	370	3.7	7.8	2.0	59	423	2.7
2122.7	0.634	19	1.1	40	339	2.5	9.2	2.0	61	388	1.8
2123.4	1.0	18	1.0	38	349	5.7	15	1.9	58	399	4.1
2124.1	0.503	17	0.887	43	402	3.8	7.3	1.6	65	460	2.7
2124.8	0.393	18	0.948	37	420	3.9	5.7	1.7	57	481	2.9
2125.5	0.393	17	0.830	30	347	3.7	5.7	1.5	46	397	2.7
2126.2	0.510	19	1.1	41	362	3.7	7.4	2.1	63	413	2.7
2126.9	0.393	22	1.1	38	376	3.2	5.7	1.9	58	430	2.3
2127.6	0.623	18	0.783	41	411	4.5	9.0	1.4	62	470	3.3
2128.3	0.670	20	1.2	39	426	4.3	9.7	2.1	59	487	3.2
2129.0	0.421	19	1.1	36	501	4.2	6.1	2.0	55	572	3.1
2129.7	0.571	23	1.3	42	478	3.4	8.2	2.4	65	547	2.5
2130.4	0.640	20	1.1	35	406	3.6	9.2	2.0	54	464	2.6
2131.1	0.393	19	1.2	42	375	2.9	5.7	2.1	65	429	2.2
2131.8	0.920	16	1.1	31	406	3.0	13	2.0	48	465	2.2
2132.5	1.4	24	1.1	37	461	2.9	20	2.0	56	527	2.1
2133.2	0.393	20	1.6	44	430	2.8	5.7	3.0	67	492	2.0
2133.9	0.604	21	1.3	39	468	5.2	8.7	2.3	60	535	3.8
2134.6	0.564	20	1.0	42	521	3.5	8.1	1.8	65	595	2.6
2135.3	0.526	17	0.915	36	442	1.9	7.6	1.7	55	506	1.4
2136.0	0.776	20	1.1	46	453	2.9	11	2.0	70	518	2.1
2136.7	1.1	22	1.3	47	518	2.7	16	2.5	72	593	2.0
2137.4	0.891	19	0.931	40	415	3.0	13	1.7	62	474	2.2
2138.1	0.853	17	1.5	37	502	3.0	12	2.8	56	574	2.2
2138.8	0.984	18	1.0	36	500	2.9	14	1.8	55	571	2.1
2139.4	0.684	19	1.1	45	472	2.7	9.9	2.0	68	540	2.0
2140.1	0.571	16	1.3	45	476	2.2	8.2	2.3	69	544	1.6
2140.8	1.2	17	1.6	37	447	2.1	18	2.8	57	511	1.5
2141.5	1.1	19	1.7	43	487	3.7	16	3.1	66	556	2.7
2142.2	0.393	15	1.5	32	407	2.1	5.7	2.7	48	465	1.5
2142.9	1.0	16	1.2	39	471	2.2	15	2.2	60	539	1.6
2143.6	1.0	18	1.2	46	520	2.2	15	2.1	71	595	1.6
2144.3	1.1	21	1.2	46	558	2.8	16	2.2	70	639	2.0
2145.0	0.863	18	1.2	40	597	2.0	12	2.3	61	683	1.4
2145.7	2.4	19	1.6	45	605	2.8	34	2.9	69	692	2.1



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Sample ID: 018

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
2146.4	1.2	21	1.5	47	584	2.3	17	2.8	73	667	1.7
2147.1	0.768	18	1.1	47	591	2.6	11	2.0	72	675	1.9
2147.8	1.2	19	1.1	44	534	2.0	18	2.1	67	610	1.5
2148.5	1.1	17	1.5	47	478	2.1	16	2.8	71	547	1.5
2149.2	0.655	19	1.3	56	520	1.6	9.5	2.3	85	594	1.2
2149.9	1.0	17	0.984	44	522	2.4	15	1.8	68	597	1.7
2150.6	1.7	18	1.2	49	600	3.4	24	2.2	75	686	2.5
2151.3	0.982	19	1.6	43	563	2.3	14	3.0	66	643	1.7
2152.0	1.1	22	1.2	53	536	2.1	16	2.2	81	613	1.5
2152.7	1.2	18	1.4	48	484	1.8	17	2.5	74	553	1.3
2153.4	1.5	16	0.991	51	541	1.2	21	1.8	78	618	0.850
2154.1	0.650	19	1.4	54	458	2.0	9.4	2.6	83	524	1.5
2154.8	0.940	19	1.1	53	593	2.1	14	2.0	82	678	1.5
2155.5	1.5	19	1.2	48	527	1.3	22	2.1	74	602	0.943
2156.2	1.4	21	1.2	57	615	1.4	20	2.1	87	703	1.0
2156.9	1.2	18	1.4	50	599	1.2	17	2.5	77	685	0.889
2157.6	1.6	19	0.990	51	567	1.9	22	1.8	78	648	1.4
2158.3	1.6	20	1.3	51	580	1.2	23	2.4	79	664	0.846
2159.0	0.932	21	1.5	53	654	1.5	13	2.7	81	747	1.1
2159.7	2.0	19	1.4	60	733	2.3	29	2.6	92	839	1.7
2160.4	1.3	19	1.2	56	694	2.4	19	2.2	86	793	1.7
2161.1	0.848	18	1.2	56	684	1.5	12	2.2	85	782	1.1
2161.8	1.0	23	1.3	53	787	2.1	15	2.3	81	900	1.5
2162.5	1.8	19	1.2	61	661	3.0	26	2.2	94	756	2.2
2163.2	1.5	19	1.3	55	590	1.8	22	2.4	84	674	1.3
2163.9	1.2	18	1.3	53	623	1.8	17	2.4	81	712	1.3
2164.6	1.2	19	1.7	60	725	1.9	17	3.1	93	829	1.4
2165.3	1.7	21	1.6	58	677	2.0	25	2.8	88	775	1.5
2165.9	1.1	21	1.6	59	661	1.8	16	3.0	90	755	1.3
2166.6	1.1	22	1.2	62	654	1.7	15	2.3	95	748	1.2
2167.3	1.1	17	1.2	60	613	2.2	16	2.2	91	701	1.6
2168.0	0.465	20	1.2	56	597	1.5	6.7	2.1	85	683	1.1
2168.7	1.5	21	1.2	55	696	1.9	22	2.3	84	795	1.4
2169.4	0.998	22	1.6	54	654	2.4	14	2.9	83	747	1.8
2170.1	1.7	16	1.3	58	661	3.4	24	2.4	88	756	2.4
2170.8	0.892	21	1.1	58	720	1.9	13	2.0	88	823	1.4
2171.5	1.3	22	1.8	63	812	2.8	18	3.3	97	928	2.1
2172.2	1.7	18	1.3	59	803	1.3	25	2.4	90	918	0.962
2172.9	1.7	20	1.1	63	748	2.5	24	2.1	96	855	1.8
2173.6	1.1	23	1.4	57	743	3.0	17	2.5	87	850	2.2
2174.3	1.9	23	1.1	49	672	2.1	28	2.0	76	769	1.5
2175.0	1.7	20	1.3	63	700	2.2	24	2.4	97	800	1.6
2175.7	1.9	19	1.4	58	796	1.9	27	2.6	88	910	1.4
2176.4	1.2	26	1.3	69	852	2.0	17	2.5	106	975	1.5
2177.1	2.5	22	1.5	57	735	2.2	37	2.7	87	840	1.6
2177.8	1.3	20	1.3	61	815	2.2	19	2.3	93	932	1.6
2178.5	2.2	20	1.3	64	720	1.6	32	2.3	97	823	1.2
2179.2	1.9	19	1.5	54	754	2.2	27	2.8	83	863	1.6
2179.9	1.7	21	1.5	61	783	1.6	24	2.7	94	895	1.2
2180.6	1.1	21	1.6	69	814	2.8	16	2.8	106	931	2.0
2181.3	3.1	14	1.6	54	722	2.7	45	3.0	83	825	2.0
2182.0	2.4	17	1.2	58	719	1.9	34	2.1	89	822	1.4
2182.7	2.2	18	1.7	63	857	2.3	31	3.1	96	980	1.7
2183.4	2.8	24	1.6	68	864	3.5	41	2.9	105	988	2.5
2184.1	1.8	18	1.3	58	819	2.3	26	2.5	88	937	1.7
2184.8	2.2	18	1.2	60	757	2.0	32	2.3	92	866	1.5
2185.5	2.4	18	1.4	60	1033	2.2	34	2.5	92	1181	1.6
2186.2	2.6	20	1.5	68	1035	2.4	37	2.7	104	1183	1.8
2186.9	2.4	18	1.7	61	970	2.7	34	3.2	93	1110	2.0
2187.6	2.2	19	1.5	64	859	2.4	32	2.8	98	982	1.7
2188.3	3.2	18	1.4	59	989	3.7	46	2.6	91	1131	2.7
2189.0	2.7	17	1.5	68	1013	2.8	39	2.7	104	1159	2.1
2189.7	2.8	22	1.9	67	1041	3.8	41	3.4	103	1191	2.8
2190.4	3.5	20	1.9	71	1046	2.1	50	3.4	108	1196	1.5
2191.1	3.0	18	1.7	71	1107	2.0	44	3.1	110	1266	1.5
2191.8	3.3	20	1.6	72	1218	2.1	48	3.0	111	1393	1.6
2192.4	3.4	23	1.7	72	1114	1.7	49	3.0	110	1273	1.2
2193.1	4.2	19	2.0	68	1044	2.5	60	3.6	104	1194	1.8
2193.8	4.2	18	2.2	77	1206	2.8	61	3.9	117	1379	2.1
2194.5	3.6	20	2.0	75	1409	2.4	52	3.7	114	1611	1.7
2195.2	3.8	19	1.6	73	1291	1.8	55	2.9	113	1476	1.3
2195.9	3.2	20	1.7	69	1159	2.5	46	3.2	106	1325	1.8
2196.6	3.5	24	1.9	81	1250	2.2	51	3.5	125	1430	1.6
2197.3	3.0	19	1.5	74	1207	1.7	44	2.7	113	1381	1.2
2198.0	3.6	17	1.4	81	1256	2.0	52	2.5	123	1436	1.5
2198.7	4.7	19	1.9	85	1366	2.2	67	3.4	130	1562	1.6
2199.4	3.8	17	1.9	83	1487	2.2	55	3.4	127	1701	1.6
2200.1	4.4	19	2.0	80	1509	2.1	63	3.7	122	1726	1.6
2200.8	3.0	21	1.7	77	1387	1.7	43	3.1	118	1586	1.3
2201.5	3.4	17	1.7	78	1341	2.1	49	3.1	119	1534	1.6
2202.2	4.9	18	1.8	93	1578	0.708	71	3.2	142	1804	0.516



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
2202.9	4.2	23	1.7	79	1691	2.3	60	3.1	122	1934	1.7
2203.6	3.0	19	1.7	99	1568	1.6	43	3.1	152	1793	1.2
2204.3	3.4	16	1.7	82	1612	1.9	49	3.0	125	1843	1.4
2205.0	3.5	16	1.5	78	1503	1.5	50	2.7	120	1718	1.1
2205.7	3.8	20	1.7	99	1798	2.0	55	3.1	151	2056	1.5
2206.4	3.3	17	1.7	92	1551	1.5	48	3.1	140	1774	1.1
2207.1	3.6	15	1.3	88	1730	2.4	52	2.4	134	1978	1.8
2207.8	4.4	16	1.2	83	1693	1.8	63	2.2	127	1936	1.3
2208.5	4.6	18	1.7	90	1877	2.2	66	3.0	138	2146	1.6
2209.2	4.9	19	2.1	110	2104	1.0	71	3.8	169	2406	0.748
2209.9	4.5	17	1.4	100	1824	2.3	65	2.6	154	2085	1.7
2210.6	4.1	19	1.6	97	1827	1.3	60	2.9	149	2089	0.943
2211.3	4.3	19	2.4	99	1924	0.982	62	4.4	152	2201	0.716
2212.0	4.1	19	1.7	91	2035	2.3	60	3.1	139	2327	1.7
2212.7	3.6	16	1.6	100	1917	1.1	52	2.8	153	2192	0.819
2213.4	3.7	20	2.1	90	2043	1.4	54	3.8	138	2336	1.0
2214.1	4.4	21	1.7	100	2170	1.8	64	3.1	153	2481	1.3
2214.8	3.6	17	1.6	83	1950	1.5	52	2.9	127	2230	1.1
2215.5	3.9	20	2.4	94	2138	1.8	56	4.3	143	2445	1.3
2216.2	3.5	17	1.8	95	2085	2.2	51	3.2	145	2384	1.6
2216.9	3.9	20	1.8	96	2240	2.0	56	3.2	146	2562	1.5
2217.6	2.9	20	2.5	100	2084	1.9	42	4.6	154	2383	1.4
2218.3	4.5	17	2.1	100	2385	1.4	65	3.9	153	2727	1.0
2218.9	3.8	17	2.1	106	2346	1.8	54	3.8	162	2683	1.3
2219.6	2.1	21	1.9	101	2162	1.5	30	3.5	154	2473	1.1
2220.3	3.8	18	2.0	98	2189	1.9	54	3.6	150	2503	1.4
2221.0	2.2	22	2.3	89	2228	1.9	32	4.2	137	2547	1.4
2221.7	3.9	16	1.6	89	2384	1.8	57	3.0	136	2726	1.3
2222.4	2.7	18	2.2	87	2210	2.1	40	3.9	133	2527	1.5
2223.1	2.7	18	2.0	103	2026	1.6	39	3.7	159	2317	1.1
2223.8	3.0	19	2.2	95	2237	1.4	43	4.0	146	2558	1.0
2224.5	4.1	19	1.6	110	2380	2.1	59	2.9	168	2722	1.5
2225.2	2.9	21	2.2	99	2363	2.3	41	4.0	152	2702	1.7
2225.9	2.7	19	2.5	97	2449	1.6	39	4.6	148	2801	1.2
2226.6	2.0	19	2.5	103	2243	1.9	29	4.6	158	2565	1.4
2227.3	2.5	19	2.4	110	2342	1.2	36	4.4	168	2678	0.906
2228.0	2.1	16	2.8	96	2382	1.9	30	5.0	147	2724	1.4
2228.7	2.3	18	2.9	85	2401	2.4	33	5.3	130	2746	1.8
2229.4	1.9	24	3.6	91	2244	1.6	27	6.6	140	2566	1.2
2230.1	1.7	20	3.2	103	2409	1.9	25	5.9	158	2755	1.4
2230.8	1.7	19	3.6	97	2181	2.1	25	6.6	148	2494	1.1
2231.5	1.5	17	3.4	83	2322	1.3	22	6.3	128	2655	0.973
2232.2	1.6	16	3.5	94	2291	1.9	23	6.5	144	2620	1.4
2232.9	1.8	19	4.2	87	2024	1.5	26	7.7	133	2315	1.1
2233.6	1.1	18	4.0	85	2410	1.8	16	7.2	131	2756	1.3
2234.3	0.842	17	4.2	90	2268	2.4	12	7.6	138	2593	1.7
2235.0	1.2	24	4.4	77	2195	1.4	17	8.1	119	2509	1.0
2235.7	1.4	20	4.2	96	2285	2.1	20	7.7	147	2613	1.5
2236.4	1.2	17	4.6	85	2150	2.3	17	8.5	130	2459	1.7
2237.1	0.713	17	3.7	85	2172	1.5	10	6.7	131	2484	1.1
2237.8	1.3	16	4.4	80	2138	2.2	19	8.0	123	2444	1.6
2238.5	1.3	23	3.7	83	2216	2.1	18	6.7	128	2534	1.5
2239.2	1.0	20	3.7	82	2042	1.8	15	6.7	125	2335	1.3
2239.9	0.783	18	3.9	78	1951	1.4	11	7.1	120	2231	1.0
2240.6	0.970	18	4.0	94	2327	1.7	14	7.2	144	2661	1.3
2241.3	0.937	19	3.7	81	2088	1.8	14	6.7	123	2388	1.3
2242.0	0.799	21	4.2	77	2253	1.3	12	7.7	117	2576	0.966
2242.7	0.725	20	4.2	90	1949	1.8	10	7.6	137	2229	1.3
2243.4	1.1	18	3.7	78	2048	1.4	16	6.8	119	2342	1.0
2244.0	0.859	18	4.1	73	2299	0.959	12	7.5	112	2629	0.699
2244.7	0.885	18	4.0	87	2197	1.9	13	7.4	133	2512	1.4
2245.4	0.975	19	4.0	82	2313	1.6	14	7.2	126	2644	1.1
2246.1	0.778	15	3.8	77	1999	1.4	11	7.0	118	2286	1.0
2246.8	1.2	17	3.8	82	2365	1.9	17	6.9	126	2705	1.4
2247.5	0.435	17	4.1	71	2137	1.2	6.3	7.5	109	2444	0.908
2248.2	0.399	18	3.6	71	2259	2.0	5.8	6.5	109	2584	1.5
2248.9	1.0	18	4.3	90	2416	2.1	14	7.9	137	2762	1.5
2249.6	0.453	17	4.0	72	2150	2.0	6.5	7.2	110	2459	1.5
2250.3	1.3	17	3.5	70	1833	1.4	19	6.4	107	2096	0.987
2251.0	0.754	16	3.3	67	1821	1.6	11	6.0	103	2082	1.2
2251.7	0.642	20	3.9	79	2255	2.1	9.3	7.1	121	2579	1.5
2252.4	0.835	19	4.2	75	2043	0.696	12	7.7	115	2336	0.508
2253.1	0.393	19	3.4	74	1886	1.8	5.7	6.2	114	2157	1.3
2253.8	0.393	21	4.1	63	1908	0.924	5.7	7.6	96	2182	0.675
2254.5	0.393	17	2.9	69	1944	1.3	5.7	5.3	106	2223	0.959
2255.2	0.393	18	2.5	65	1995	0.685	5.7	4.5	99	2281	0.500
2255.9	0.393	18	3.0	80	2091	2.1	5.7	5.5	123	2391	1.5
2256.6	0.729	18	2.5	61	1826	1.6	11	4.6	94	2088	1.2
2257.3	0.430	20	3.0	66	1880	1.6	6.2	5.5	101	2150	1.2
2258.0	0.850	17	2.5	63	1770	2.1	12	4.5	96	2024	1.5
2258.7	0.393	17	2.7	67	1734	3.1	5.7	4.8	102	1983	2.2



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2259.4	0.393	18	2.4	71	1888	2.6	5.7	4.3	108	2159	1.9
2260.1	0.747	17	2.6	62	1722	1.7	11	4.8	95	1969	1.3
2260.8	0.698	20	2.6	61	1668	2.3	10	4.8	94	1907	1.7
2261.5	0.393	18	2.2	61	1532	2.6	5.7	3.9	94	1751	1.9
2262.2	0.849	19	2.9	61	1838	3.1	12	5.2	94	2102	2.3
2262.9	0.421	16	1.7	70	1545	2.6	6.1	3.1	107	1766	1.9
2263.6	0.393	18	2.6	62	1500	2.3	5.7	4.7	95	1715	1.7
2264.3	0.722	16	1.8	56	1531	3.1	10	3.3	86	1750	2.3
2265.0	0.393	21	2.0	62	1744	3.2	5.7	3.6	96	1994	2.4
2265.7	0.450	19	1.9	57	1561	3.0	6.5	3.4	87	1785	2.2
2266.4	0.694	19	2.1	58	1565	1.9	10	3.7	88	1790	1.4
2267.1	0.393	14	1.8	43	1352	1.9	5.7	3.3	65	1546	1.4
2267.8	0.393	16	1.5	51	1371	2.3	5.7	2.8	78	1568	1.7
2268.5	0.393	19	1.6	49	1279	2.2	5.7	2.9	75	1463	1.6
2269.2	0.393	19	2.0	55	1460	2.3	5.7	3.6	84	1669	1.7
2269.9	0.393	17	1.3	47	1308	2.7	5.7	2.4	72	1496	2.0
2270.5	0.401	15	1.5	51	1293	2.3	5.8	2.7	78	1479	1.7
2271.2	0.393	17	1.1	38	1221	2.1	5.7	1.9	58	1396	1.6
2271.9	0.606	17	1.2	42	1249	2.5	8.7	2.2	64	1429	1.9
2272.6	0.393	18	1.1	38	1122	3.0	5.7	2.0	59	1283	2.2
2273.3	0.393	17	0.697	32	1273	1.2	5.7	1.3	50	1455	0.888
2274.0	0.393	16	0.571	37	1094	2.5	5.7	1.0	56	1251	1.8
2274.7	0.393	15	0.782	27	1184	2.4	5.7	1.4	41	1353	1.7
2275.4	0.661	17	0.718	33	1208	1.7	9.5	1.3	51	1381	1.2
2276.1	0.523	16	0.590	34	1189	2.8	7.5	1.1	53	1359	2.0
2276.8	0.393	16	0.788	26	1032	2.0	5.7	1.4	40	1180	1.4
2277.5	0.441	13	0.624	27	1084	1.5	6.4	1.1	41	1240	1.1
2278.2	0.393	15	0.618	18	954	1.9	5.7	1.1	27	1091	1.4
2278.9	0.604	16	0.639	23	1065	2.0	8.7	1.2	35	1218	1.5
2279.6	1.3	11	0.483	21	990	0.762	18	0.880	33	1132	0.556
2280.3	1.2	14	0.479	14	963	1.9	18	0.874	21	1101	1.4
2281.0	0.968	13	0.618	11	913	2.5	14	1.1	17	1044	1.8
2281.7	2.4	12	0.781	16	1047	1.9	35	1.4	25	1198	1.4
2282.4	1.4	14	0.665	16	942	2.4	21	1.2	24	1077	1.8
2283.1	1.9	11	0.674	15	1046	1.6	27	1.2	23	1197	1.2
2283.8	1.8	14	0.943	19	1033	1.1	26	1.7	29	1182	0.809
2284.5	1.8	11	0.977	20	1002	1.8	25	1.8	30	1146	1.3
2285.2	2.4	14	0.994	19	911	2.2	35	1.8	29	1042	1.6
2285.9	2.5	14	1.3	18	847	1.4	36	2.3	28	969	0.994
2286.6	2.2	11	1.4	17	896	2.6	32	2.5	26	1025	1.9
2287.3	3.5	12	1.3	20	976	1.7	51	2.4	31	1117	1.2
2288.0	3.6	13	2.2	20	905	3.4	52	4.0	31	1035	2.5
2288.7	4.4	12	2.0	23	1035	2.6	64	3.7	35	1183	1.9
2289.4	4.8	13	2.7	22	1116	3.6	69	5.0	33	1277	2.6
2290.1	4.4	12	2.4	25	1004	2.8	64	4.3	38	1149	2.1
2290.8	4.7	12	3.0	22	1138	2.9	68	5.4	34	1301	2.1
2291.5	4.3	16	3.5	30	1132	3.3	63	6.5	46	1295	2.4
2292.2	4.7	15	3.1	30	1249	1.8	68	5.7	46	1429	1.3
2292.9	5.0	15	2.9	29	1166	3.0	73	5.3	45	1334	2.2
2293.6	5.1	14	3.0	28	1317	3.2	74	5.5	43	1507	2.3
2294.3	4.1	13	2.8	45	1313	3.6	59	5.1	68	1501	2.6
2295.0	5.2	18	3.8	38	1377	2.3	75	7.0	59	1574	1.7
2295.7	5.2	16	3.5	35	1358	4.1	74	6.4	54	1553	3.0
2296.4	5.3	18	3.7	44	1421	3.6	77	6.8	68	1625	2.6
2297.0	4.9	13	3.3	42	1406	3.1	70	6.0	65	1607	2.3
2297.7	4.7	15	4.1	41	1513	3.8	68	7.5	63	1731	2.8
2298.4	5.0	16	3.9	41	1555	3.0	73	7.1	63	1778	2.2
2299.1	4.5	15	4.1	42	1673	4.8	65	7.5	64	1913	3.5
2299.8	3.9	15	4.1	45	1528	3.1	57	7.5	70	1747	2.2
2300.5	5.7	15	4.4	47	1766	4.4	82	8.0	73	2020	3.2
2301.2	4.3	15	4.2	50	1778	3.8	62	7.7	76	2034	2.7
2301.9	4.3	18	4.4	51	1753	3.1	61	8.0	78	2004	2.2
2302.6	3.3	17	4.0	50	1888	3.6	47	7.3	77	2158	2.6
2303.3	3.6	16	3.8	56	1914	3.4	52	7.0	86	2188	2.5
2304.0	3.4	16	4.8	53	2230	3.5	49	8.7	81	2550	2.6
2304.7	2.8	19	4.6	50	2180	3.9	40	8.5	77	2493	2.9
2305.4	3.0	18	3.8	61	1940	3.6	44	6.9	94	2219	2.6
2306.1	3.5	16	4.6	58	2141	3.5	50	8.4	88	2448	2.6
2306.8	3.0	16	4.0	62	2049	2.6	43	7.3	96	2343	1.9
2307.5	3.4	15	5.0	65	2355	3.6	48	9.1	100	2693	2.6
2308.2	3.7	18	5.6	61	2019	2.7	53	10	94	2308	2.0
2308.9	4.1	17	5.0	57	2070	3.4	59	9.0	87	2367	2.5
2309.6	3.4	16	6.0	57	2253	2.5	49	11	87	2576	1.9
2310.3	3.3	17	5.6	65	2346	2.6	47	10	99	2683	1.9
2311.0	4.9	16	7.3	69	2409	3.2	71	13	106	2754	2.3
2311.7	4.7	17	6.5	67	2152	3.2	68	12	102	2461	2.3
2312.4	4.6	19	7.0	64	2357	3.9	66	13	98	2695	2.8
2313.1	4.2	18	6.8	74	2433	4.5	61	12	114	2782	3.3
2313.8	4.3	19	7.2	65	2261	2.8	62	13	99	2585	2.1
2314.5	3.4	19	6.7	63	2352	5.1	50	12	97	2689	3.7
2315.2	3.1	15	7.0	64	2533	2.9	44	13	98	2896	2.1



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2315.9	3.5	17	8.1	64	2277	4.4	51	15	98	2604	3.2
2316.6	3.8	19	7.7	61	2082	3.6	55	14	93	2381	2.6
2317.3	4.1	16	7.5	58	2068	3.6	59	14	88	2365	2.6
2318.0	2.9	18	8.9	62	2291	3.9	42	16	96	2619	2.8
2318.7	3.3	19	8.8	77	2194	3.5	47	16	118	2508	2.5
2319.4	2.0	20	7.6	66	2074	2.9	29	14	101	2372	2.1
2320.1	2.3	17	7.4	61	2096	3.6	33	13	93	2397	2.6
2320.8	1.7	18	7.4	58	2179	3.4	24	14	89	2492	2.5
2321.5	1.5	16	5.1	56	1872	3.4	22	9.3	85	2140	2.5
2322.2	2.1	20	6.0	66	2047	3.1	30	11	100	2340	2.3
2322.8	1.4	20	5.6	58	1909	3.7	20	10	90	2183	2.7
2323.5	1.3	18	5.2	56	1965	2.6	19	9.5	86	2247	1.9
2324.2	1.0	19	4.6	56	1812	2.3	15	8.4	85	2072	1.6
2324.9	1.4	17	5.0	55	1730	2.6	20	9.1	84	1979	1.9
2325.6	1.4	20	5.8	60	1963	2.6	20	10	92	2245	1.9
2326.3	1.0	20	5.7	54	1868	3.2	14	10	83	2136	2.3
2327.0	0.393	18	5.5	56	1950	1.7	5.7	10	85	2230	1.3
2327.7	1.2	17	5.1	57	1875	1.8	17	9.3	87	2144	1.3
2328.4	0.867	16	4.8	49	1694	2.6	13	8.8	75	1937	1.9
2329.1	0.438	17	5.6	58	1833	2.6	6.3	10	89	2097	1.9
2329.8	0.393	18	4.7	58	1745	2.3	5.7	8.6	88	1996	1.7
2330.5	0.638	17	4.5	54	1723	3.2	9.2	8.2	83	1970	2.4
2331.2	1.3	19	5.5	56	1962	2.6	18	10.0	85	2244	1.9
2331.9	0.809	20	4.4	53	1986	2.6	12	8.0	82	2271	1.9
2332.6	0.531	17	4.9	48	1714	2.2	7.7	9.0	73	1960	1.6
2333.3	0.393	17	4.7	45	1733	2.5	5.7	8.5	69	1982	1.8
2334.0	0.436	18	5.4	47	1801	2.2	6.3	9.8	73	2059	1.6
2334.7	0.415	17	4.4	48	1761	3.5	6.0	8.1	74	2014	2.5
2335.4	0.559	21	4.5	46	1818	2.5	8.1	8.1	70	2079	1.8
2336.1	0.501	19	4.0	49	1879	3.1	7.2	7.3	76	2149	2.3
2336.8	0.393	20	5.0	43	2044	3.4	5.7	9.1	66	2337	2.5
2337.5	0.757	20	3.9	41	1803	2.9	11	7.2	63	2061	2.1
2338.2	0.393	20	4.0	45	1583	2.8	5.7	7.4	69	1810	2.1
2338.9	0.393	22	3.7	41	1647	3.3	5.7	6.8	63	1883	2.4
2339.6	0.393	18	3.3	43	1640	4.0	5.7	6.1	65	1876	2.9
2340.3	0.393	19	3.0	33	1444	2.2	5.7	5.5	50	1652	1.6
2341.0	0.393	20	2.5	38	1543	3.3	5.7	4.6	58	1765	2.4
2341.7	0.393	20	2.7	34	1402	3.0	5.7	4.9	52	1604	2.2
2342.4	0.614	22	2.4	33	1327	3.2	8.9	4.3	50	1517	2.3
2343.1	0.393	20	1.8	34	1332	2.5	5.7	3.3	52	1523	1.8
2343.8	0.393	19	2.1	31	1228	2.3	5.7	3.8	48	1404	1.7
2344.5	0.453	20	1.8	35	1225	2.2	6.5	3.3	54	1401	1.6
2345.2	0.740	21	1.4	31	1088	1.9	11	2.5	48	1244	1.4
2345.9	0.393	22	1.3	30	1032	2.7	5.7	2.5	46	1180	2.0
2346.6	0.393	23	1.0	26	1014	2.0	5.7	1.9	39	1160	1.4
2347.3	0.393	21	1.2	23	1062	1.4	5.7	2.2	36	1215	1.0
2348.0	0.598	19	1.1	25	1023	2.2	8.6	2.1	38	1170	1.6
2348.7	0.393	22	1.2	25	994	2.3	5.7	2.3	38	1137	1.7
2349.3	0.416	21	1.1	23	954	2.4	6.0	2.1	35	1091	1.7
2350.0	0.393	17	1.0	25	933	2.2	5.7	1.9	38	1067	1.6
2350.7	0.393	17	1.0	19	942	1.3	5.7	1.8	29	1077	0.947
2351.4	0.424	18	1.1	22	928	1.4	6.1	2.0	34	1061	1.0
2352.1	0.815	20	0.908	19	1055	2.2	12	1.7	29	1206	1.6
2352.8	0.393	18	0.799	19	968	2.5	5.7	1.5	29	1107	1.8
2353.5	0.508	16	0.659	18	1100	1.4	7.3	1.2	28	1257	1.0
2354.2	0.393	17	0.633	13	947	1.1	5.7	1.2	20	1082	0.781
2354.9	0.529	18	0.729	17	1060	2.2	7.6	1.3	27	1212	1.6
2355.6	0.393	16	0.725	13	934	1.6	5.7	1.3	21	1068	1.2
2356.3	0.393	17	0.585	14	878	2.0	5.7	1.1	22	1004	1.5
2357.0	0.510	14	0.510	13	979	0.577	7.4	0.931	20	1119	0.421
2357.7	0.400	14	0.704	12	1060	1.8	5.8	1.3	18	1212	1.3
2358.4	0.393	17	0.717	14	974	1.9	5.7	1.3	22	1114	1.4
2359.1	0.393	14	0.309	10	935	2.1	5.7	0.564	16	1069	1.6
2359.8	0.393	14	0.652	14	924	1.5	5.7	1.2	21	1056	1.1
2360.5	0.613	13	0.843	16	981	1.3	8.9	1.5	24	1122	0.981
2361.2	0.393	14	0.529	15	894	1.8	5.7	0.964	23	1023	1.3
2361.9	0.706	14	0.577	11	953	1.5	10	1.1	16	1090	1.1
2362.6	0.637	13	0.500	11	888	1.8	9.2	0.912	17	1015	1.3
2363.3	0.393	15	0.520	12	994	1.6	5.7	0.949	19	1137	1.2
2364.0	0.493	15	0.491	13	964	2.2	7.1	0.895	20	1102	1.6
2364.7	0.393	13	0.477	10	904	2.3	5.7	0.870	16	1033	1.7
2365.4	0.448	13	0.500	15	1027	1.8	6.5	0.911	23	1174	1.3
2366.1	0.393	14	0.368	12	962	2.2	5.7	0.671	18	1100	1.6
2366.8	0.393	15	0.425	9.5	863	1.7	5.7	0.775	15	987	1.2
2367.5	0.393	12	0.637	8.7	954	1.7	5.7	1.2	13	1091	1.2
2368.2	0.393	14	0.434	10	942	1.5	5.7	0.792	16	1078	1.1
2368.9	0.576	13	0.448	12	1054	1.7	8.3	0.817	19	1205	1.3
2369.6	0.393	12	0.340	10	936	1.7	5.7	0.621	16	1071	1.2
2370.3	0.393	13	0.519	9.1	817	1.4	5.7	0.947	14	934	1.0
2371.0	0.393	12	0.526	13	997	3.2	5.7	0.958	20	1140	2.4
2371.7	0.414	12	0.380	12	1061	1.6	6.0	0.692	18	1213	1.2



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
2372.4	0.393	12	0.281	11	1006	2.0	5.7	0.512	16	1150	1.5
2373.1	0.393	13	0.230	9.5	881	1.3	5.7	0.420	15	1007	0.975
2373.8	0.393	12	0.440	13	984	1.9	5.7	0.803	20	1126	1.4
2374.5	0.393	16	0.398	12	959	1.1	5.7	0.726	18	1096	0.812
2375.2	0.393	13	0.565	13	962	2.2	5.7	1.0	20	1100	1.6
2375.8	0.393	13	0.384	12	852	2.0	5.7	0.700	18	974	1.5
2376.5	0.393	11	0.145	9.6	833	1.6	5.7	0.265	15	953	1.1
2377.2	0.393	11	0.383	13	956	1.1	5.7	0.698	20	1093	0.780
2377.9	0.695	13	0.150	11	912	3.1	10	0.273	17	1042	2.3
2378.6	0.393	13	0.511	13	954	1.7	5.7	0.931	20	1091	1.2
2379.3	0.597	11	0.553	12	818	1.3	8.6	1.0	18	936	0.914
2380.0	0.393	11	0.454	14	978	1.8	5.7	0.828	21	1118	1.3
2380.7	0.399	13	0.552	14	975	2.6	5.8	1.0	22	1115	1.9
2381.4	0.393	13	0.411	14	818	2.2	5.7	0.749	21	936	1.6
2382.1	0.393	12	0.415	14	848	2.3	5.7	0.757	22	970	1.7
2382.8	0.447	12	0.343	13	1004	2.5	6.5	0.626	20	1148	1.8
2383.5	0.528	12	0.453	12	910	1.3	7.6	0.825	18	1040	0.955
2384.2	0.462	13	0.447	16	964	2.3	6.7	0.816	24	1103	1.7
2384.9	0.694	13	0.521	15	1083	2.9	10	0.951	22	1239	2.1
2385.6	1.3	12	0.583	18	942	1.3	18	1.1	28	1077	0.962
2386.3	0.442	14	0.581	15	1016	2.4	6.4	1.1	23	1162	1.8
2387.0	0.393	14	0.484	18	958	2.1	5.7	0.882	27	1096	1.5
2387.7	0.393	13	0.561	15	1062	1.6	5.7	1.0	22	1214	1.2
2388.4	0.625	15	0.898	18	1017	2.4	9.0	1.6	28	1162	1.8
2389.1	0.393	15	0.820	16	1111	2.6	5.7	1.5	24	1271	1.9
2389.8	0.897	13	0.530	19	1087	2.3	13	0.967	29	1243	1.7
2390.5	0.895	11	0.371	17	1028	1.8	13	0.677	25	1178	1.3
2391.2	0.901	13	0.712	22	1150	1.7	13	1.3	34	1315	1.3
2391.9	0.833	15	0.920	22	1142	2.0	12	1.7	34	1306	1.5
2392.6	1.1	14	1.2	22	1101	1.4	16	2.1	34	1259	1.0
2393.3	0.721	13	1.4	23	1170	1.7	10	2.6	36	1338	1.2
2394.0	1.4	16	0.801	19	1215	1.4	20	1.5	30	1389	1.0
2394.7	0.839	15	1.1	24	1129	1.7	12	2.1	37	1291	1.2
2395.4	1.3	16	1.4	26	1480	0.869	19	2.5	40	1693	0.634
2396.1	1.3	15	1.2	23	1175	1.1	18	2.2	35	1343	0.823
2396.8	0.857	15	0.701	22	1321	1.9	12	1.3	34	1511	1.4
2397.5	1.7	13	0.853	27	1216	1.7	24	1.6	41	1390	1.3
2398.2	1.4	14	0.789	26	1203	2.0	20	1.4	40	1376	1.4
2398.9	0.835	16	0.884	24	1429	2.5	12	1.6	37	1634	1.8
2399.6	0.960	14	0.968	29	1149	2.3	14	1.8	44	1314	1.6
2400.3	0.552	15	0.938	22	1282	1.6	8.0	1.7	33	1466	1.1
2401.0	0.849	15	0.876	27	1295	2.1	12	1.6	41	1481	1.5
2401.6	0.739	17	0.947	27	1254	2.4	11	1.7	42	1434	1.8
2402.3	0.449	17	1.3	26	1292	2.4	6.5	2.3	40	1477	1.7
2403.0	1.2	19	1.2	27	1452	2.5	18	2.1	41	1661	1.8
2403.7	0.890	15	1.1	28	1476	2.8	13	2.0	42	1688	2.0
2404.4	0.766	17	1.3	28	1234	2.4	11	2.4	43	1411	1.7
2405.1	0.673	18	1.2	22	1355	3.2	9.7	2.2	34	1550	2.4
2405.8	0.393	17	1.1	23	1324	1.8	5.7	2.0	35	1514	1.3
2406.5	0.520	16	0.945	25	1332	3.4	7.5	1.7	38	1523	2.5
2407.2	0.393	17	0.880	23	1428	3.3	5.7	1.6	35	1633	2.4
2407.9	0.777	18	1.4	26	1468	3.1	11	2.6	40	1678	2.2
2408.6	0.542	19	1.1	25	1471	5.4	7.8	1.9	38	1682	3.9
2409.3	0.393	19	1.2	24	1439	3.5	5.7	2.1	37	1646	2.6
2410.0	0.393	18	0.857	24	1735	4.1	5.7	1.6	37	1983	3.0
2410.7	0.531	19	0.604	22	1543	4.2	7.7	1.1	34	1764	3.1
2411.4	0.677	20	1.1	23	1632	4.0	9.8	2.0	35	1867	2.9
2412.1	0.700	18	1.2	25	1566	3.8	10	2.2	39	1791	2.8
2412.8	0.393	16	1.4	24	1560	3.5	5.7	2.5	36	1783	2.5
2413.5	0.935	16	1.4	20	1748	4.0	13	2.6	31	1999	2.9
2414.2	0.656	18	1.0	23	1597	3.7	9.5	1.9	36	1826	2.7
2414.9	0.393	18	0.997	24	1461	2.7	5.7	1.8	37	1671	2.0
2415.6	0.417	16	0.984	20	1406	3.1	6.0	1.8	30	1608	2.3
2416.3	0.393	16	1.5	23	1424	2.3	5.7	2.8	36	1629	1.7
2417.0	0.393	16	0.941	25	1561	3.1	5.7	1.7	39	1785	2.3
2417.7	0.393	18	1.2	22	1538	2.6	5.7	2.1	34	1759	1.9
2418.4	0.393	18	1.1	25	1419	2.4	5.7	2.0	38	1622	1.7
2419.1	0.393	13	1.2	22	1309	2.2	5.7	2.3	33	1497	1.6
2419.8	0.393	15	1.5	23	1299	1.7	5.7	2.7	36	1485	1.2
2420.5	0.620	13	1.4	21	1384	3.5	9.0	2.5	32	1583	2.6
2421.2	0.393	16	1.2	20	1412	3.1	5.7	2.2	30	1615	2.3
2421.9	0.393	16	1.5	26	1366	2.9	5.7	2.7	40	1562	2.1
2422.6	0.393	15	1.4	24	1274	2.8	5.7	2.5	36	1457	2.0
2423.3	0.454	16	1.6	23	1268	2.7	6.5	2.9	35	1450	2.0
2424.0	0.622	19	1.3	20	1157	2.1	9.0	2.4	30	1323	1.5
2424.7	0.393	18	1.6	28	1298	2.9	5.7	2.9	43	1484	2.1
2425.4	0.393	17	1.2	20	960	2.2	5.7	2.2	31	1097	1.6
2426.1	0.393	16	1.6	19	1004	2.7	5.7	3.0	29	1148	2.0
2426.8	0.393	16	1.4	19	1035	3.1	5.7	2.6	30	1183	2.2
2427.5	0.393	18	1.1	21	1040	3.3	5.7	2.1	33	1189	2.4
2428.2	0.393	17	0.955	24	968	1.8	5.7	1.7	37	1107	1.3



Minnow Environmental  
Sample ID: 018

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
2428.8	0.548	15	0.869	18	723	1.6	7.9	1.6	28	827	1.2
2429.5	0.393	16	1.2	23	909	2.1	5.7	2.1	36	1040	1.5
2430.2	0.393	17	1.1	20	974	2.1	5.7	2.0	31	1114	1.5
2430.9	0.393	16	0.851	20	979	1.1	5.7	1.6	30	1120	0.808
2431.6	0.462	18	1.1	22	989	1.9	6.7	1.9	34	1131	1.4
2432.3	0.453	16	0.776	21	896	2.5	6.5	1.4	33	1025	1.8
2433.0	0.393	17	0.645	18	872	2.0	5.7	1.2	28	997	1.5
2433.7	0.393	16	0.852	21	913	1.7	5.7	1.6	32	1045	1.3
2434.4	0.393	19	0.835	20	1020	1.9	5.7	1.5	31	1166	1.4
2435.1	0.393	18	0.735	20	928	1.8	5.7	1.3	30	1061	1.3
2435.8	0.502	20	0.521	19	860	2.0	7.2	0.951	29	984	1.4
2436.5	0.393	19	0.685	19	867	1.2	5.7	1.2	29	991	0.845
2437.2	0.393	19	0.756	14	893	2.0	5.7	1.4	22	1021	1.4
2437.9	0.820	16	0.505	14	781	1.3	12	0.921	22	893	0.935
2438.6	1.2	17	0.681	16	856	1.9	18	1.2	24	979	1.4
2439.3	1.1	19	0.549	13	840	1.8	16	1.0	19	961	1.3
2440.0	1.2	14	0.687	13	854	1.5	18	1.3	19	976	1.1
2440.7	0.938	19	0.611	11	942	1.3	14	1.1	17	1077	0.935
2441.4	1.0	18	0.714	15	945	1.6	15	1.3	23	1081	1.2
2442.1	1.8	19	0.372	13	964	1.4	26	0.679	21	1103	1.0
2442.8	1.5	18	0.617	13	844	1.9	22	1.1	20	965	1.4
2443.5	1.1	18	0.758	10	905	1.6	16	1.4	15	1035	1.1
2444.2	1.7	17	0.852	17	868	1.4	25	1.6	26	993	1.0
2444.9	1.3	15	0.607	11	856	1.2	19	1.1	17	979	0.902
2445.6	1.9	14	0.730	11	807	1.8	27	1.3	16	923	1.3
2446.3	1.6	19	0.914	9.4	977	2.0	23	1.7	14	1117	1.5
2447.0	2.1	15	0.822	13	1059	1.3	30	1.5	21	1210	0.923
2447.7	2.4	19	0.980	11	954	1.6	34	1.8	16	1091	1.2
2448.4	1.6	17	0.828	11	1057	2.3	23	1.5	16	1209	1.7
2449.1	1.6	14	1.0	11	970	2.4	23	1.9	17	1109	1.8
2449.8	2.0	15	0.955	10	852	1.8	29	1.7	16	974	1.3
2450.5	2.7	16	1.2	12	1076	1.6	39	2.2	19	1231	1.2
2451.2	2.1	15	1.2	12	958	2.1	30	2.1	19	1095	1.5
2451.9	2.3	14	1.7	13	1016	1.7	33	3.1	19	1162	1.2
2452.6	2.6	15	1.4	14	1031	1.8	37	2.6	21	1179	1.3
2453.3	3.4	14	1.2	13	1030	2.4	49	2.3	19	1178	1.7
2454.0	2.9	14	1.5	14	1018	1.0	42	2.8	22	1164	0.730
2454.7	2.5	15	1.5	12	943	1.1	36	2.7	18	1078	0.828
2455.3	2.9	15	1.7	18	1060	1.8	42	3.2	28	1213	1.3
2456.0	3.2	12	1.8	11	923	1.1	47	3.3	17	1055	0.783
2456.7	2.8	15	1.6	16	1085	2.7	40	2.9	24	1241	2.0
2457.4	3.0	15	2.2	16	1154	1.6	44	3.9	25	1320	1.2
2458.1	4.0	17	2.6	16	1243	2.4	57	4.8	24	1421	1.8
2458.8	2.9	17	1.8	14	1104	2.0	42	3.3	21	1262	1.4
2459.5	3.0	15	2.1	15	1098	1.6	43	3.9	23	1255	1.1
2460.2	3.5	13	2.5	17	1217	2.6	51	4.6	25	1391	1.9
2460.9	3.5	15	2.7	18	1237	2.3	50	4.9	27	1415	1.7
2461.6	3.5	16	2.8	19	1382	2.3	50	5.1	28	1580	1.7
2462.3	3.5	14	3.0	18	1236	2.7	51	5.4	28	1414	2.0
2463.0	3.4	15	3.6	19	1460	2.7	50	6.5	29	1670	2.0
2463.7	3.8	14	3.4	19	1502	1.6	54	6.2	29	1717	1.2
2464.4	3.4	15	3.8	19	1473	2.7	49	6.8	30	1684	2.0
2465.1	3.6	21	3.3	25	1641	2.1	52	6.0	38	1876	1.6
2465.8	3.1	16	3.4	17	1523	2.4	44	6.2	25	1742	1.7
2466.5	3.3	16	3.5	21	1709	2.8	48	6.4	31	1954	2.0
2467.2	3.0	15	3.6	20	1672	2.8	44	6.5	31	1912	2.0
2467.9	3.1	16	3.5	22	1717	2.2	44	6.5	34	1964	1.6
2468.6	2.6	15	3.7	22	1618	2.8	37	6.7	34	1851	2.0
2469.3	2.6	16	3.3	27	1668	1.8	38	6.1	41	1907	1.3
2470.0	2.4	18	3.1	23	1705	1.4	34	5.7	35	1949	0.999
2470.7	2.6	15	3.4	21	1732	2.1	38	6.1	32	1981	1.6
2471.4	2.3	15	2.9	29	1839	2.2	33	5.4	45	2103	1.6
2472.1	1.7	16	3.4	25	1938	2.1	25	6.1	39	2216	1.6
2472.8	2.6	14	3.6	23	1858	1.4	37	6.5	35	2124	1.0
2473.5	2.4	16	3.1	19	1786	2.2	35	5.6	28	2042	1.6
2474.2	2.4	18	3.0	24	1912	1.5	35	5.4	36	2186	1.1
2474.9	2.5	20	3.5	26	1983	2.1	36	6.4	40	2268	1.6
2475.6	2.4	20	3.3	27	1773	2.2	34	6.1	41	2027	1.6
2476.3	1.5	18	3.6	26	2099	2.2	22	6.6	40	2400	1.6
2477.0	1.9	18	3.0	22	1972	2.6	27	5.4	34	2256	1.9
2477.7	1.4	16	3.2	22	1774	1.9	21	5.8	34	2029	1.4
2478.4	2.2	19	2.9	22	1734	1.7	32	5.3	34	1983	1.2
2479.1	2.1	17	2.7	25	1897	1.6	30	4.9	38	2170	1.2
2479.8	2.0	17	3.2	25	1953	2.2	28	5.9	38	2233	1.6
2480.5	2.1	16	2.3	24	1800	1.3	31	4.1	37	2059	0.926
2481.1	1.1	19	2.4	29	1894	1.9	16	4.4	44	2166	1.4
2481.8	1.1	17	2.6	32	2036	2.3	16	4.7	50	2328	1.7
2482.5	1.4	17	2.8	26	1851	2.4	21	5.1	41	2117	1.7
2483.2	1.0	20	3.4	29	1934	2.7	15	6.1	44	2212	2.0
2483.9	1.0	17	2.6	29	1952	1.5	15	4.7	45	2232	1.1
2484.6	1.0	18	2.0	25	1905	1.6	15	3.6	38	2179	1.2



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Sample ID: 018

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
2485.3	0.522	22	3.1	30	2128	1.8	7.5	5.6	47	2434	1.3
2486.0	0.762	16	2.6	22	1821	2.1	11	4.7	34	2083	1.5
2486.7	0.480	15	3.3	27	1811	1.7	6.9	6.0	41	2071	1.2
2487.4	1.2	20	2.5	31	1943	1.7	18	4.6	48	2222	1.3
2488.1	1.0	19	2.4	29	1816	1.8	15	4.4	45	2077	1.3
2488.8	0.503	19	2.1	26	1923	1.8	7.3	3.8	40	2199	1.3
2489.5	0.735	18	2.5	22	2014	1.4	11	4.5	34	2303	1.0
2490.2	0.393	19	2.1	25	1962	2.1	5.7	3.8	38	2244	1.5
2490.9	0.800	17	3.0	24	1864	2.0	12	5.4	37	2132	1.5
2491.6	0.601	18	2.4	22	1773	2.0	8.7	4.3	34	2027	1.5
2492.3	0.393	19	1.9	20	1982	2.2	5.7	3.4	31	2267	1.6
2493.0	0.538	16	2.1	21	1763	1.0	7.8	3.8	33	2016	0.765
2493.7	0.393	19	2.1	23	1855	3.0	5.7	3.8	35	2121	2.2
2494.4	0.393	17	1.7	22	1797	1.6	5.7	3.1	33	2055	1.2
2495.1	0.393	19	1.9	23	1584	2.5	5.7	3.4	35	1811	1.8
2495.8	0.393	16	1.4	17	1512	2.1	5.7	2.6	26	1729	1.5
2496.5	0.393	16	1.6	21	1710	1.7	5.7	2.9	32	1956	1.2
2497.2	0.858	19	1.8	22	1662	1.4	12	3.3	33	1900	1.0
2497.9	0.722	21	1.6	23	1676	3.2	10	3.0	36	1917	2.3
2498.6	0.393	17	1.5	20	1413	2.5	5.7	2.7	30	1615	1.8
2499.3	0.393	17	1.5	17	1485	2.4	5.7	2.7	26	1698	1.7
2500.0	0.393	17	1.9	21	1495	1.6	5.7	3.5	32	1710	1.2
2500.7	0.393	18	1.3	21	1462	1.3	5.7	2.4	32	1672	0.973
2501.4	0.393	16	1.3	21	1382	2.0	5.7	2.4	33	1581	1.4
2502.1	0.393	13	1.2	19	1191	1.0	5.7	2.2	29	1362	0.734
2502.8	0.393	20	1.5	18	1193	1.5	5.7	2.8	28	1364	1.1
2503.5	0.393	15	1.8	20	1306	1.5	5.7	3.2	30	1494	1.1
2504.2	0.480	17	1.0	22	1267	1.7	6.9	1.9	34	1449	1.2
2504.9	0.393	16	1.1	19	1238	1.8	5.7	2.1	30	1416	1.3
2505.6	0.393	14	0.937	19	1001	1.5	5.7	1.7	28	1144	1.1
2506.3	0.393	18	1.0	19	1068	1.7	5.7	1.9	29	1221	1.2
2507.0	0.393	17	1.1	17	1026	1.8	5.7	2.1	25	1173	1.3
2507.7	0.393	15	0.913	16	900	2.0	5.7	1.7	24	1029	1.5
2508.3	0.393	19	0.881	17	984	1.4	5.7	1.6	26	1126	1.0
2509.0	0.446	18	0.853	14	977	1.4	6.4	1.6	22	1117	1.0
2509.7	0.393	17	1.1	15	966	0.984	5.7	2.1	23	1105	0.718
2510.4	0.597	18	0.988	17	892	1.3	8.6	1.8	26	1020	0.984
2511.1	0.393	17	1.1	17	917	1.6	5.7	2.0	25	1049	1.2
2511.8	0.393	18	0.837	16	864	1.2	5.7	1.5	24	987	0.867
2512.5	0.393	19	0.926	16	886	1.1	5.7	1.7	24	1013	0.826
2513.2	0.393	19	0.515	12	850	0.584	5.7	0.939	18	972	0.426
2513.9	0.393	16	0.861	16	812	1.2	5.7	1.6	24	929	0.864
2514.6	0.393	19	0.549	18	837	1.1	5.7	1.0	28	958	0.833
2515.3	0.393	19	0.516	16	846	0.390	5.7	0.942	25	968	0.285
2516.0	0.393	18	0.535	13	851	1.9	5.7	0.976	20	973	1.4
2516.7	0.393	20	1.0	13	802	0.795	5.7	1.9	19	917	0.580
2517.4	0.393	18	0.654	13	919	0.739	5.7	1.2	19	1051	0.539
2518.1	0.559	19	0.747	15	831	1.5	8.1	1.4	24	950	1.1
2518.8	0.393	18	0.630	14	807	0.883	5.7	1.1	21	923	0.644
2519.5	0.393	17	0.526	12	877	0.381	5.7	0.959	18	1003	0.278
2520.2	0.393	20	0.629	13	773	0.980	5.7	1.1	21	884	0.715
2520.9	0.393	18	0.429	13	778	1.4	5.7	0.782	20	890	1.0
2521.6	0.393	18	0.595	12	749	0.598	5.7	1.1	19	856	0.437
2522.3	0.604	17	0.362	12	836	0.682	8.7	0.660	18	956	0.498
2523.0	0.393	17	0.475	11	786	0.987	5.7	0.866	16	899	0.720
2523.7	0.393	18	0.373	12	815	1.4	5.7	0.679	19	932	1.0
2524.4	0.393	18	0.392	11	747	1.0	5.7	0.715	17	854	0.756
2525.1	0.393	19	0.576	12	782	0.675	5.7	1.0	18	895	0.492
2525.8	0.393	18	0.601	10.0	834	0.872	5.7	1.1	15	954	0.637
2526.5	0.508	20	0.595	10	937	1.5	7.3	1.1	15	1072	1.1
2527.2	0.574	18	0.448	12	868	1.4	8.3	0.818	18	992	1.0
2527.9	0.468	19	0.672	9.3	823	1.4	6.7	1.2	14	941	1.0
2528.6	0.668	19	0.257	9.3	793	0.915	9.6	0.469	14	907	0.667
2529.3	0.711	17	0.516	8.0	911	1.3	10	0.940	12	1042	0.924
2530.0	0.503	19	0.479	8.3	930	1.6	7.3	0.873	13	1063	1.2
2530.7	0.552	19	0.385	6.8	880	0.979	8.0	0.703	10	1006	0.714
2531.4	0.393	19	0.618	8.7	980	1.2	5.7	1.1	13	1121	0.842
2532.1	0.505	18	0.474	6.4	953	0.627	7.3	0.864	9.8	1090	0.457
2532.8	0.831	18	0.512	6.0	1117	1.2	12	0.934	9.2	1277	0.880
2533.5	0.393	17	0.519	7.3	935	1.3	5.7	0.946	11	1070	0.977
2534.1	0.514	17	0.482	4.4	994	1.1	7.4	0.878	6.8	1137	0.797
2534.8	0.400	19	0.644	5.4	1149	1.3	5.8	1.2	8.3	1314	0.951
2535.5	0.585	18	0.606	5.1	1044	1.5	8.4	1.1	7.8	1194	1.1
2536.2	0.393	18	0.638	4.7	1193	2.0	5.7	1.2	7.3	1364	1.4
2536.9	0.956	18	1.0	4.5	1182	1.1	14	1.8	6.9	1351	0.806
2537.6	0.833	20	0.748	4.6	1141	1.7	12	1.4	7.0	1305	1.2
2538.3	0.542	16	0.487	3.5	1179	0.864	7.8	0.887	5.4	1348	0.631
2539.0	0.469	18	0.508	3.1	1035	1.8	6.8	0.926	4.8	1183	1.3
2539.7	0.650	16	0.632	5.5	1008	1.2	9.4	1.2	8.4	1153	0.844
2540.4	0.640	18	0.566	4.5	1074	1.1	9.2	1.0	6.9	1228	0.831
2541.1	0.648	17	0.530	6.7	1190	1.4	9.4	0.966	10	1361	1.1



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2541.8	0.393	16	0.570	4.3	911	1.1	5.7	1.0	6.5	1042	0.787
2542.5	0.857	17	0.416	3.8	1038	1.5	12	0.759	5.8	1187	1.1
2543.2	0.677	16	0.631	3.6	992	1.6	9.8	1.2	5.6	1135	1.1
2543.9	0.687	18	0.641	4.3	1133	1.8	9.9	1.2	6.5	1296	1.3
2544.6	1.1	17	0.491	3.5	1051	1.9	16	0.896	5.4	1202	1.4
2545.3	0.869	16	0.732	3.8	1060	1.8	13	1.3	5.9	1212	1.3
2546.0	0.764	18	0.427	2.9	1230	1.8	11	0.779	4.5	1407	1.3
2546.7	0.393	17	0.840	3.7	1144	1.9	5.7	1.5	5.7	1308	1.4
2547.4	0.486	18	0.613	4.6	1111	1.4	7.0	1.1	7.1	1270	1.0
2548.1	0.916	16	0.605	3.8	1095	2.5	13	1.1	5.9	1252	1.8
2548.8	0.647	15	0.529	5.5	1126	2.0	9.3	0.965	8.4	1288	1.5
2549.5	0.576	15	0.827	5.5	1120	2.0	8.3	1.5	8.4	1281	1.4
2550.2	0.393	15	0.400	4.6	1040	2.1	5.7	0.730	7.0	1189	1.5
2550.9	0.790	17	0.752	5.2	1169	2.3	11	1.4	8.0	1336	1.6
2551.6	0.557	16	0.557	3.5	1074	2.3	8.0	1.0	5.4	1228	1.7
2552.3	0.495	14	0.484	3.0	1100	2.5	7.2	0.883	4.6	1258	1.9
2553.0	0.427	15	0.794	4.2	1266	2.9	6.2	1.4	6.4	1448	2.1
2553.7	0.609	19	0.654	5.6	1357	2.2	8.8	1.2	8.5	1551	1.6
2554.4	0.492	17	0.750	5.2	1148	3.3	7.1	1.4	8.0	1313	2.4
2555.1	0.575	14	0.847	4.9	1297	2.7	8.3	1.5	7.5	1483	2.0
2555.8	0.654	16	0.863	5.2	1470	2.6	9.4	1.6	8.0	1681	1.9
2556.5	0.817	19	1.1	4.9	1456	2.8	12	2.1	7.5	1665	2.0
2557.2	0.393	17	1.3	7.8	1512	2.4	5.7	2.3	12	1729	1.8
2557.9	0.812	16	0.992	7.6	1394	3.0	12	1.8	12	1594	2.2
2558.6	0.393	13	1.0	4.7	1484	3.2	5.7	1.9	7.2	1697	2.3
2559.3	0.393	15	1.5	7.0	1737	3.0	5.7	2.8	11	1987	2.2
2559.9	0.393	16	1.1	7.3	1558	2.6	5.7	2.0	11	1781	1.9
2560.6	0.796	14	1.2	5.6	1528	3.4	11	2.2	8.6	1747	2.5
2561.3	0.434	15	0.959	6.7	1603	1.8	6.3	1.7	10	1833	1.3
2562.0	0.393	13	1.3	7.2	1573	3.8	5.7	2.4	11	1798	2.8
2562.7	0.393	15	1.2	7.6	1839	2.9	5.7	2.1	12	2103	2.1
2563.4	0.397	16	1.4	8.5	1761	2.6	5.7	2.5	13	2014	1.9
2564.1	0.393	17	1.0	7.2	1693	2.7	5.7	1.9	11	1936	2.0
2564.8	0.393	16	1.2	10.0	1687	2.5	5.7	2.2	15	1930	1.8
2565.5	0.393	15	1.3	9.2	1583	2.4	5.7	2.4	14	1810	1.8
2566.2	0.393	14	1.4	6.9	1708	2.1	5.7	2.6	11	1953	1.5
2566.9	0.393	16	1.5	6.8	1597	2.1	5.7	2.7	10	1826	1.5
2567.6	0.393	18	0.994	6.5	1626	2.6	5.7	1.8	10	1859	1.9
2568.3	0.393	17	1.5	11	1839	2.5	5.7	2.7	17	2103	1.9
2569.0	0.393	18	1.3	8.6	1689	2.9	5.7	2.5	13	1931	2.1
2569.7	0.393	20	1.2	8.5	1635	2.4	5.7	2.2	13	1869	1.8
2570.4	0.393	18	1.1	9.1	1468	1.9	5.7	1.9	14	1679	1.4
2571.1	0.393	19	1.4	11	1417	2.1	5.7	2.6	16	1620	1.5
2571.8	0.393	15	0.996	7.8	1435	2.9	5.7	1.8	12	1641	2.1
2572.5	0.393	13	0.977	8.5	1281	2.9	5.7	1.8	13	1464	2.1
2573.2	0.393	15	1.1	8.5	1294	3.5	5.7	1.9	13	1480	2.6
2573.9	0.393	19	1.2	9.6	1313	1.9	5.7	2.2	15	1502	1.4
2574.6	0.393	19	0.813	8.9	1114	2.6	5.7	1.5	14	1274	1.9
2575.3	0.393	15	0.882	5.2	1166	2.5	5.7	1.6	8.0	1333	1.9
2576.0	0.393	18	0.984	9.8	1067	2.1	5.7	1.8	15	1220	1.5
2576.7	0.393	15	0.776	7.2	1131	2.1	5.7	1.4	11	1294	1.5
2577.4	0.393	17	0.857	11	1082	1.8	5.7	1.6	17	1237	1.3
2578.1	0.393	18	0.607	9.5	975	2.0	5.7	1.1	15	1115	1.4
2578.8	0.393	17	0.638	8.0	1068	2.2	5.7	1.2	12	1221	1.6
2579.5	0.393	19	0.472	9.8	1049	1.8	5.7	0.860	15	1199	1.3
2580.2	0.393	24	0.535	6.9	994	2.3	5.7	0.975	11	1137	1.7
2580.9	0.393	24	0.519	7.9	918	2.4	5.7	0.947	12	1049	1.7
2581.6	0.393	26	0.569	8.4	945	2.0	5.7	1.0	13	1081	1.5
2582.3	0.393	42	0.609	7.0	858	2.9	5.7	1.1	11	981	2.1
2583.0	0.532	47	0.499	5.5	939	1.3	7.7	0.910	8.4	1073	0.964
2583.7	0.393	48	0.383	5.7	921	2.4	5.7	0.698	8.7	1054	1.7
2584.4	0.393	50	0.539	5.9	718	1.7	5.7	0.983	9.0	821	1.2
2585.1	0.393	75	0.297	7.0	900	2.6	5.7	0.542	11	1029	1.9
2585.7	0.393	90	0.682	6.6	876	2.4	5.7	1.2	10	1002	1.8
2586.4	0.393	106	0.431	7.1	811	2.4	5.7	0.786	11	928	1.8
2587.1	0.393	136	0.660	5.6	730	2.9	5.7	1.2	8.6	835	2.1
2587.8	0.393	162	0.916	7.5	793	3.5	5.7	1.7	11	907	2.5
2588.5	0.393	160	0.789	7.2	789	3.3	5.7	1.4	11	903	2.4
2589.2	0.393	176	0.788	5.9	877	3.1	5.7	1.4	9.0	1003	2.3
2589.9	0.393	152	0.758	5.4	797	3.3	5.7	1.4	8.3	911	2.4
2590.6	0.393	157	0.817	3.6	706	2.4	5.7	1.5	5.5	807	1.8
2591.3	0.393	164	0.554	5.1	785	2.0	5.7	1.0	7.8	898	1.4
2592.0	0.393	185	0.704	5.1	747	3.2	5.7	1.3	7.9	854	2.3
2592.7	0.393	183	0.976	3.5	883	3.4	5.7	1.8	5.3	1009	2.5
2593.4	0.393	203	0.821	7.4	732	3.6	5.7	1.5	11	837	2.6
2594.1	0.393	220	0.787	7.2	952	3.7	5.7	1.4	11	1088	2.7
2594.8	0.393	215	0.619	6.0	684	3.3	5.7	1.1	9.2	782	2.4
2595.5	0.393	192	0.832	5.2	846	2.5	5.7	1.5	7.9	968	1.8
2596.2	0.393	196	0.951	5.5	709	3.7	5.7	1.7	8.4	811	2.7
2596.9	0.534	219	0.673	8.0	743	2.4	7.7	1.2	12	850	1.8
2597.6	0.393	241	0.913	7.6	819	3.0	5.7	1.7	12	937	2.2



Minnow Environmental  
Sample ID: 018

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2598.3	0.393	211	0.902	10	777	3.5	5.7	1.6	16	888	2.5
2599.0	0.393	207	1.0	12	779	3.5	5.7	1.9	18	891	2.6
2599.7	0.393	175	0.563	6.4	675	3.0	5.7	1.0	9.8	772	2.2
2600.4	0.393	207	0.866	6.3	664	3.1	5.7	1.6	9.6	759	2.2
2601.1	0.393	270	1.0	7.1	777	4.1	5.7	1.9	11	888	3.0
2601.8	0.393	215	0.855	7.2	731	2.3	5.7	1.6	11	836	1.7
2602.5	0.393	278	1.1	10	655	3.7	5.7	2.0	16	749	2.7
2603.2	0.393	265	0.677	9.3	897	3.1	5.7	1.2	14	1026	2.3
2603.9	0.393	205	1.1	11	741	3.4	5.7	2.0	17	847	2.5
2604.6	0.393	284	1.4	8.5	861	4.4	5.7	2.5	13	984	3.2
2605.3	0.393	274	0.841	5.5	693	3.6	5.7	1.5	8.4	793	2.6
2606.0	1.7	272	1.1	12	1125	2.1	25	1.9	18	1287	1.6
2606.7	0.393	318	0.936	6.2	1061	4.0	5.7	1.7	9.6	1213	2.9
2607.4	0.393	279	0.792	12	689	7.1	5.7	1.4	18	788	5.1
2608.1	0.393	258	0.807	6.1	754	2.5	5.7	1.5	9.3	862	1.9
2608.8	0.393	245	0.994	12	744	2.9	5.7	1.8	18	851	2.2
2609.5	0.393	154	1.8	5.4	456	3.6	5.7	3.2	8.3	521	2.6
2610.2	0.393	267	1.4	8.4	1081	3.4	5.7	2.5	13	1236	2.5
2610.9	0.393	260	1.1	9.4	874	2.2	5.7	1.9	14	1000	1.6
2611.6	0.393	304	2.0	11	885	4.8	5.7	3.7	18	1012	3.5
2612.2	0.393	285	1.6	14	789	3.8	5.7	2.8	21	902	2.8
2612.9	0.393	265	1.6	11	848	4.3	5.7	3.0	16	970	3.1
2613.6	0.393	260	0.781	7.0	932	4.8	5.7	1.4	11	1066	3.5
2614.3	0.393	274	1.3	16	795	4.3	5.7	2.3	25	909	3.1
2615.0	0.393	269	2.4	12	1325	3.4	5.7	4.3	18	1515	2.5
2615.7	0.953	240	0.659	18	880	4.8	14	1.2	27	1007	3.5
2616.4	0.393	289	1.6	12	983	6.1	5.7	2.9	18	1124	4.4
2617.1	0.393	234	0.764	15	594	4.3	5.7	1.4	24	679	3.2
2617.8	0.413	230	0.753	16	590	0.003	6.0	1.4	25	674	0.002
2618.5	0.393	298	0.971	19	1771	0.967	5.7	1.8	29	2026	0.705
2619.2	0.661	371	0.984	8.9	698	3.9	9.5	1.8	14	798	2.9
2619.9	0.393	253	0.789	7.9	894	2.0	5.7	1.4	12	1022	1.5



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
0.5	0.393	128	1.6	32	520	0.003	5.7	2.9	49	595	0.002
1.2	0.393	127	1.7	7.7	495	0.003	5.7	3.1	12	566	0.002
1.9	0.982	111	0.079	3.5	422	0.003	14	0.144	5.3	483	0.002
2.6	2.6	118	1.1	9.3	436	0.003	38	2.1	14	499	0.002
3.3	7.0	100	2.3	14	503	0.003	101	4.1	21	575	0.002
4.0	1.3	117	3.7	17	545	3.8	19	6.8	26	623	2.8
4.7	1.1	122	1.5	13	506	0.003	16	2.7	20	578	0.002
5.3	2.1	114	0.881	4.2	446	0.939	30	1.6	6.5	510	0.685
6.0	0.393	95	0.644	8.6	386	0.003	5.7	1.2	13	441	0.002
6.7	0.393	83	1.0	2.8	382	0.617	5.7	1.8	4.3	437	0.450
7.4	1.1	118	0.923	9.2	458	3.3	16	1.7	14	524	2.4
8.1	0.393	105	1.6	8.0	424	1.8	5.7	2.9	12	485	1.3
8.8	2.3	102	2.1	10	495	2.4	33	3.9	16	566	1.7
9.5	2.3	83	1.7	10	466	1.4	34	3.1	16	533	1.0
10.2	0.393	85	0.908	7.2	444	0.003	5.7	1.7	11	507	0.002
10.9	0.435	128	0.286	8.8	456	0.811	6.3	0.521	14	521	0.592
11.6	0.393	99	0.808	6.9	458	2.4	5.7	1.5	11	523	1.7
12.3	0.393	103	0.222	5.2	431	0.629	5.7	0.404	7.9	493	0.459
13.0	0.393	84	0.660	6.4	453	0.787	5.7	1.2	9.8	518	0.574
13.7	0.393	80	0.605	7.5	469	1.9	5.7	1.1	11	537	1.4
14.4	0.393	115	1.2	5.2	502	1.7	5.7	2.2	8.0	574	1.2
15.1	0.393	120	1.3	5.1	446	1.2	5.7	2.5	7.9	510	0.866
15.8	0.393	99	0.359	7.1	425	0.783	5.7	0.655	11	486	0.571
16.5	0.393	72	0.373	4.4	441	0.979	5.7	0.680	6.7	504	0.714
17.2	0.483	79	0.803	4.7	511	1.0	7.0	1.5	7.3	584	0.752
17.9	0.393	102	0.478	7.4	564	1.3	5.7	0.872	11	645	0.973
18.6	0.393	104	0.642	4.5	425	1.2	5.7	1.2	6.9	486	0.901
19.3	0.393	86	0.175	3.7	390	1.2	5.7	0.319	5.6	446	0.887
20.0	0.901	76	0.590	2.8	455	0.545	13	1.1	4.2	520	0.398
20.7	0.393	67	0.490	3.7	604	1.6	5.7	0.894	5.7	691	1.2
21.4	0.393	89	0.597	4.7	434	1.7	5.7	1.1	7.3	496	1.2
22.1	0.393	82	0.828	3.7	453	1.6	5.7	1.5	5.7	518	1.2
22.8	0.547	70	0.454	5.2	457	0.748	7.9	0.828	7.9	523	0.545
23.5	0.393	73	0.314	7.9	632	1.4	5.7	0.573	12	722	1.0
24.2	0.541	65	0.424	3.4	489	1.3	7.8	0.772	5.2	559	0.960
24.9	0.393	67	0.204	3.6	473	0.222	5.7	0.373	5.5	541	0.162
25.6	0.393	62	0.550	3.0	506	1.3	5.7	1.0	4.5	579	0.965
26.3	0.393	60	0.380	3.6	486	1.2	5.7	0.694	5.5	556	0.895
27.0	0.393	67	0.282	2.7	568	1.2	5.7	0.514	4.2	649	0.902
27.7	0.393	64	0.308	2.2	507	1.5	5.7	0.561	3.4	580	1.1
28.4	0.436	64	0.852	2.5	580	1.9	6.3	1.6	3.8	663	1.4
29.1	0.393	59	0.304	2.0	481	1.3	5.7	0.554	3.1	551	0.975
29.8	0.393	54	0.367	3.5	557	1.7	5.7	0.670	5.4	637	1.3
30.5	0.393	63	0.349	4.0	522	1.2	5.7	0.637	6.1	597	0.911
31.2	0.393	61	0.436	4.7	528	0.532	5.7	0.795	7.2	604	0.388
31.8	0.393	55	0.284	4.4	567	1.9	5.7	0.517	6.7	648	1.4
32.5	0.440	50	0.365	3.4	575	2.2	6.4	0.666	5.2	657	1.6
33.2	0.393	54	0.553	4.4	551	1.8	5.7	1.0	6.7	630	1.3
33.9	0.393	49	0.311	4.3	630	1.5	5.7	0.566	6.6	720	1.1
34.6	0.393	51	0.318	4.7	664	2.0	5.7	0.581	7.2	759	1.5
35.3	0.393	48	0.590	5.8	661	1.3	5.7	1.1	8.8	756	0.984
36.0	0.476	42	0.518	2.1	785	1.5	6.9	0.944	3.2	898	1.1
36.7	0.393	47	0.457	2.4	767	1.2	5.7	0.833	3.7	878	0.881
37.4	0.393	39	0.671	6.2	743	1.4	5.7	1.2	9.4	850	1.0
38.1	0.393	47	0.651	6.3	823	2.6	5.7	1.2	9.6	942	1.9
38.8	0.393	43	0.818	4.6	849	2.5	5.7	1.5	7.0	971	1.9
39.5	0.597	39	0.516	7.6	937	2.3	8.6	0.941	12	1071	1.7
40.2	0.393	35	0.473	7.2	874	2.4	5.7	0.863	11	1000	1.7
40.9	0.492	41	0.903	7.3	928	3.3	7.1	1.6	11	1061	2.4
41.6	0.393	39	0.929	8.9	977	2.2	5.7	1.7	14	1118	1.6
42.3	0.393	42	1.0	9.6	989	2.4	5.7	1.8	15	1131	1.8
43.0	0.432	42	1.1	11	1173	3.6	6.2	2.0	17	1341	2.6
43.7	0.438	48	1.3	13	1056	2.3	6.3	2.4	20	1208	1.7
44.4	0.393	35	0.387	11	1039	2.6	5.7	0.705	17	1188	1.9
45.1	0.393	38	1.1	17	1159	2.4	5.7	2.0	25	1326	1.8
45.8	0.393	36	1.0	14	1145	2.9	5.7	1.8	22	1309	2.1
46.5	0.393	36	1.1	14	1138	3.1	5.7	2.0	21	1301	2.3
47.2	0.570	34	1.1	14	1254	2.1	8.2	2.1	21	1434	1.5
47.9	0.393	37	1.3	16	1270	2.8	5.7	2.4	24	1453	2.0
48.6	0.448	34	1.1	17	1272	3.4	6.5	2.0	26	1455	2.5
49.3	0.393	42	1.4	17	1368	2.4	5.7	2.5	26	1565	1.8
50.0	0.393	35	0.930	17	1353	2.7	5.7	1.7	26	1547	2.0
50.7	0.487	37	0.738	16	1357	2.6	7.0	1.3	24	1551	1.9
51.4	0.393	37	0.978	13	1473	2.8	5.7	1.8	20	1685	2.1
52.1	0.393	31	0.851	16	1407	2.7	5.7	1.6	25	1609	1.9
52.8	0.393	34	1.4	16	1484	2.9	5.7	2.5	25	1697	2.1
53.5	0.603	26	1.0	15	1503	3.4	8.7	1.9	23	1719	2.5
54.2	0.713	30	1.6	15	1472	2.5	10	2.9	23	1684	1.8
54.9	0.884	26	1.4	16	1482	4.6	13	2.6	24	1694	3.4
55.6	0.393	26	1.5	17	1497	2.4	5.7	2.7	26	1711	1.8
56.3	0.719	26	1.5	21	1484	2.8	10	2.7	32	1697	2.1



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
57.0	0.393	27	1.5	26	1555	3.1	5.7	2.7	40	1778	2.3
57.6	1.1	25	1.1	21	1433	2.3	16	2.1	33	1639	1.7
58.3	0.393	25	1.4	19	1427	2.7	5.7	2.6	30	1631	2.0
59.0	0.737	24	1.3	21	1432	2.6	11	2.4	32	1638	1.9
59.7	0.868	24	1.7	24	1442	3.0	13	3.1	36	1649	2.2
60.4	0.514	26	1.6	22	1555	2.2	7.4	3.0	34	1778	1.6
61.1	0.456	22	1.5	20	1481	2.7	6.6	2.8	30	1693	2.0
61.8	0.393	23	1.4	23	1476	2.6	5.7	2.6	35	1688	1.9
62.5	1.5	25	2.0	20	1427	2.2	22	3.7	30	1632	1.6
63.2	0.977	20	1.3	19	1282	3.7	14	2.4	29	1466	2.7
63.9	1.0	18	1.9	22	1301	3.4	14	3.5	33	1488	2.5
64.6	0.940	21	1.4	20	1436	2.7	14	2.6	31	1642	2.0
65.3	0.776	23	1.3	22	1308	2.7	11	2.3	34	1496	2.0
66.0	0.880	19	1.2	22	1307	2.3	13	2.2	33	1494	1.7
66.7	0.737	21	1.5	26	1705	3.3	11	2.8	40	1950	2.4
67.4	1.1	23	2.1	20	1317	2.3	16	3.7	31	1506	1.7
68.1	1.2	21	1.5	23	1345	1.8	17	2.7	36	1538	1.3
68.8	0.686	17	0.990	18	1254	2.8	9.9	1.8	28	1434	2.1
69.5	0.562	18	0.951	24	1322	2.7	8.1	1.7	37	1512	1.9
70.2	0.871	18	1.3	22	1326	2.6	13	2.3	34	1517	1.9
70.9	0.769	20	1.1	21	1246	3.2	11	1.9	32	1425	2.3
71.6	1.3	18	1.5	25	1200	3.5	19	2.7	38	1372	2.6
72.3	0.810	19	0.906	20	1121	2.6	12	1.7	30	1282	1.9
73.0	0.865	21	1.2	20	1184	2.3	12	2.2	30	1354	1.7
73.7	1.0	16	0.985	19	1022	3.1	15	1.8	29	1169	2.2
74.4	1.1	19	0.738	19	1085	4.1	16	1.3	30	1241	3.0
75.1	0.910	18	0.983	20	1154	2.6	13	1.8	31	1320	1.9
75.8	1.3	19	0.812	18	1041	3.1	19	1.5	27	1191	2.3
76.5	0.833	16	1.1	17	960	2.1	12	1.9	26	1098	1.6
77.2	1.1	18	1.0	19	1123	3.3	16	1.8	29	1284	2.4
77.9	1.0	21	0.512	20	1014	1.8	15	0.935	30	1160	1.3
78.6	0.410	19	0.805	18	905	1.6	5.9	1.5	28	1035	1.2
79.3	1.0	18	0.821	17	853	2.4	15	1.5	26	976	1.8
80.0	1.1	19	0.974	22	1048	2.3	16	1.8	34	1199	1.7
80.7	0.584	19	0.843	20	848	3.0	8.4	1.5	31	970	2.2
81.4	0.832	17	0.837	20	850	2.6	12	1.5	30	972	1.9
82.1	0.714	18	0.841	20	891	2.8	10	1.5	30	1019	2.0
82.8	0.393	20	0.830	25	915	4.2	5.7	1.5	39	1046	3.0
83.5	0.931	21	0.695	28	1037	3.1	13	1.3	43	1186	2.2
84.1	0.393	18	0.863	27	1013	3.1	5.7	1.6	41	1158	2.3
84.8	0.754	19	0.737	21	858	2.0	11	1.3	33	981	1.4
85.5	1.1	18	0.840	24	952	3.1	16	1.5	36	1088	2.2
86.2	0.957	17	0.932	24	776	3.0	14	1.7	36	887	2.2
86.9	0.393	18	1.2	26	979	3.2	5.7	2.2	39	1120	2.4
87.6	0.523	18	1.1	26	919	2.6	7.5	2.0	41	1050	1.9
88.3	0.710	18	0.981	25	971	1.9	10	1.8	39	1110	1.4
89.0	0.656	21	1.2	29	1101	2.3	9.5	2.2	44	1259	1.7
89.7	0.393	19	1.1	28	1109	2.0	5.7	2.0	43	1268	1.5
90.4	0.823	22	1.5	31	1019	3.0	12	2.7	47	1166	2.2
91.1	0.477	18	1.2	29	1063	2.3	6.9	2.2	45	1216	1.7
91.8	0.393	18	1.8	32	1121	3.9	5.7	3.3	49	1282	2.9
92.5	0.393	18	1.4	31	1366	3.7	5.7	2.5	48	1562	2.7
93.2	0.393	20	1.7	30	1212	2.2	5.7	3.1	46	1386	1.6
93.9	0.747	21	1.6	34	1355	3.2	11	3.0	53	1549	2.4
94.6	1.1	21	1.8	37	1181	2.1	15	3.3	56	1351	1.5
95.3	0.425	21	1.8	37	1355	1.9	6.1	3.2	57	1550	1.4
96.0	0.505	20	2.1	36	1358	3.1	7.3	3.8	55	1552	2.2
96.7	0.768	21	2.4	37	1463	4.1	11	4.3	57	1673	3.0
97.4	0.393	19	2.3	34	1374	2.8	5.7	4.2	51	1572	2.1
98.1	0.393	21	2.1	37	1248	2.3	5.7	3.8	57	1427	1.6
98.8	0.997	23	2.1	40	1424	3.1	14	3.8	62	1629	2.2
99.5	0.737	23	2.7	46	1640	3.0	11	5.0	71	1875	2.2
100.2	0.393	23	2.6	43	1480	2.2	5.7	4.7	66	1692	1.6
100.9	0.393	23	2.4	39	1422	3.0	5.7	4.4	60	1627	2.2
101.6	0.393	21	3.2	41	1514	2.6	5.7	5.8	63	1732	1.9
102.3	0.393	25	3.0	46	1728	3.3	5.7	5.5	71	1976	2.4
103.0	0.822	23	2.7	41	1664	2.6	12	5.0	63	1903	1.9
103.7	1.3	25	3.2	49	1611	2.3	18	5.8	75	1843	1.7
104.4	0.749	25	3.6	46	1786	2.4	11	6.5	71	2042	1.8
105.1	0.962	22	4.0	47	1568	2.8	14	7.2	72	1793	2.0
105.8	0.654	21	3.8	46	1609	3.5	9.4	6.9	71	1840	2.5
106.5	1.0	22	3.4	40	1474	2.6	15	6.2	62	1686	1.9
107.2	1.3	25	4.1	54	1580	3.2	19	7.5	83	1807	2.3
107.9	1.2	21	4.1	48	1650	3.4	18	7.4	74	1887	2.5
108.6	0.729	23	4.3	60	1680	3.6	11	7.8	91	1921	2.6
109.3	1.5	23	4.2	54	1676	3.3	22	7.7	82	1916	2.4
110.0	1.3	25	4.2	54	1866	3.9	19	7.6	83	2134	2.8
110.6	0.611	28	4.8	63	1910	4.8	8.8	8.8	96	2184	3.5
111.3	0.977	24	4.8	55	1862	4.1	14	8.8	84	2129	3.0
112.0	2.2	25	4.4	52	1823	3.6	32	8.1	80	2085	2.6
112.7	1.6	24	4.7	56	1776	4.0	24	8.5	85	2031	2.9



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.4	1.6	22	5.7	53	1718	4.4	23	10	81	1964	3.2
114.1	1.5	23	4.7	56	1589	3.4	22	8.5	86	1817	2.5
114.8	1.8	25	4.8	55	1674	3.4	26	8.8	85	1914	2.5
115.5	1.3	25	4.9	64	1774	3.1	18	8.9	98	2029	2.3
116.2	1.8	23	5.5	58	1703	3.0	26	10	89	1948	2.2
116.9	1.5	24	5.8	58	1561	3.9	22	11	89	1785	2.8
117.6	2.9	26	5.7	67	1937	3.5	41	10	102	2215	2.5
118.3	2.5	22	5.0	55	1552	3.5	37	9.1	84	1775	2.5
119.0	1.6	25	6.2	58	1627	4.4	24	11	89	1861	3.2
119.7	2.8	23	6.4	59	1708	2.5	40	12	90	1953	1.8
120.4	4.7	22	6.1	51	1468	4.4	68	11	79	1679	3.2
121.1	3.4	23	5.7	61	1746	3.6	48	10	94	1997	2.7
121.8	3.7	24	5.6	50	1459	3.2	54	10	76	1669	2.4
122.5	4.4	23	5.7	51	1585	3.3	64	10	79	1813	2.4
123.2	5.3	25	5.5	59	1512	4.5	76	10.0	91	1729	3.3
123.9	5.4	23	5.4	44	1437	4.8	78	9.9	67	1643	3.5
124.6	6.7	21	5.3	50	1531	5.3	97	9.6	76	1751	3.8
125.3	6.4	23	5.2	46	1536	3.2	93	9.4	71	1756	2.3
126.0	6.8	23	5.1	52	1710	4.9	98	9.3	80	1955	3.6
126.7	6.3	21	4.4	45	1353	3.5	92	8.0	68	1547	2.6
127.4	8.4	22	5.1	45	1345	5.0	122	9.3	69	1537	3.6
128.1	8.1	20	4.6	46	1473	4.1	118	8.4	70	1685	3.0
128.8	8.3	20	4.2	40	1201	2.9	119	7.6	62	1373	2.1
129.5	7.8	20	4.2	38	1195	4.1	113	7.6	58	1367	3.0
130.2	7.7	18	3.9	43	1439	3.5	111	7.1	65	1646	2.6
130.9	6.8	19	3.3	39	1167	3.1	98	6.0	60	1334	2.3
131.6	6.6	21	3.2	39	1084	4.3	95	5.8	60	1240	3.1
132.3	8.1	21	3.2	32	1186	4.1	117	5.9	49	1357	3.0
133.0	5.7	18	2.7	35	977	4.2	82	4.9	53	1118	3.1
133.7	7.1	18	2.9	37	1219	4.2	102	5.3	57	1394	3.0
134.4	5.3	17	3.1	33	1018	2.5	76	5.7	50	1164	1.8
135.1	4.6	16	3.0	34	1026	3.1	67	5.4	52	1173	2.2
135.8	5.0	16	2.6	35	932	2.7	72	4.8	54	1065	1.9
136.4	5.7	15	2.3	33	1016	2.3	83	4.2	51	1162	1.7
137.1	5.4	17	2.7	31	1006	1.5	78	5.0	48	1150	1.1
137.8	4.1	15	1.9	29	1003	3.4	59	3.5	45	1147	2.5
138.5	3.4	17	1.4	27	1099	2.2	49	2.6	42	1256	1.6
139.2	4.7	13	1.6	24	852	2.0	67	2.9	37	974	1.4
139.9	4.3	15	1.4	20	913	3.9	62	2.5	30	1044	2.8
140.6	4.0	14	1.8	26	1024	1.8	57	3.3	40	1171	1.3
141.3	3.7	14	1.5	22	893	2.6	53	2.7	34	1021	1.9
142.0	4.0	16	1.4	23	907	1.9	58	2.6	35	1037	1.4
142.7	2.8	13	1.2	20	1020	2.8	41	2.2	31	1167	2.1
143.4	3.2	14	0.949	22	847	2.0	47	1.7	34	969	1.5
144.1	3.5	15	0.936	20	873	2.3	51	1.7	31	998	1.7
144.8	3.2	15	0.865	21	862	2.6	46	1.6	33	986	1.9
145.5	2.5	14	0.763	22	889	1.7	36	1.4	34	1016	1.2
146.2	2.0	14	0.784	20	841	2.1	28	1.4	31	962	1.5
146.9	2.2	14	0.918	19	848	2.0	32	1.7	29	970	1.4
147.6	0.872	14	0.438	23	833	2.6	13	0.798	35	952	1.9
148.3	1.1	15	0.646	22	909	2.0	16	1.2	34	1039	1.4
149.0	0.476	19	1.0	24	998	2.7	6.9	1.8	36	1141	2.0
149.7	1.4	14	0.313	22	848	2.5	21	0.571	34	970	1.8
150.4	2.0	16	0.451	23	846	2.3	28	0.822	36	968	1.7
151.1	0.940	13	0.530	24	913	1.8	14	0.967	38	1044	1.3
151.8	1.2	15	0.717	29	952	2.2	18	1.3	45	1088	1.6
152.5	0.808	18	1.0	26	937	2.9	12	1.9	40	1072	2.1
153.2	1.2	16	0.985	28	925	2.8	18	1.8	42	1058	2.0
153.9	1.7	18	0.900	32	1053	1.9	24	1.6	49	1204	1.4
154.6	0.873	14	0.831	31	1051	2.9	13	1.5	47	1202	2.1
155.3	1.1	14	1.4	34	1101	3.3	16	2.5	53	1259	2.4
156.0	1.2	15	0.888	35	1125	2.8	17	1.6	53	1286	2.1
156.7	0.711	16	1.0	33	1066	3.0	10	1.8	50	1219	2.2
157.4	0.615	18	1.6	30	1149	3.5	8.9	2.9	46	1314	2.5
158.1	0.646	18	1.0	31	1139	2.3	9.3	1.9	47	1302	1.6
158.8	0.661	13	1.5	30	1091	2.3	9.5	2.8	47	1248	1.7
159.5	1.1	19	1.4	32	1175	3.0	16	2.6	49	1343	2.2
160.2	0.430	17	0.866	34	1192	3.0	6.2	1.6	52	1363	2.2
160.9	1.7	16	0.921	27	1219	2.9	24	1.7	42	1394	2.1
161.6	1.0	17	1.4	36	1371	1.8	15	2.5	55	1568	1.3
162.3	0.536	16	0.907	33	1335	3.5	7.7	1.7	51	1527	2.6
162.9	0.519	16	1.7	34	1413	2.4	7.5	3.1	52	1616	1.7
163.6	0.731	19	1.3	37	1314	2.9	11	2.4	57	1503	2.1
164.3	1.0	15	1.2	35	1371	3.4	15	2.1	54	1568	2.5
165.0	0.689	18	1.5	35	1309	3.4	10.0	2.7	54	1497	2.5
165.7	0.548	18	1.1	36	1365	2.7	7.9	2.0	54	1561	2.0
166.4	0.982	17	1.5	43	1508	3.7	14	2.8	66	1724	2.7
167.1	1.1	15	1.2	36	1448	3.5	16	2.3	55	1656	2.6
167.8	1.0	17	1.1	35	1576	3.4	15	1.9	54	1802	2.4
168.5	0.782	18	0.782	40	1517	5.1	11	1.4	62	1735	3.7
169.2	0.768	20	1.1	42	1514	4.1	11	2.1	65	1731	3.0



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
169.9	0.523	19	0.768	36	1443	3.6	7.5	1.4	56	1650	2.6
170.6	0.646	16	1.4	39	1729	3.7	9.3	2.5	59	1977	2.7
171.3	0.544	19	1.2	34	1457	3.6	7.8	2.1	52	1666	2.6
172.0	1.1	19	1.4	37	1578	6.5	16	2.6	57	1804	4.7
172.7	0.704	19	1.0	33	1554	4.9	10	1.8	51	1777	3.6
173.4	0.401	18	1.3	48	1470	5.0	5.8	2.4	73	1681	3.7
174.1	0.719	19	1.4	40	1540	4.0	10	2.5	61	1761	2.9
174.8	0.393	14	1.2	35	1455	4.5	5.7	2.2	54	1664	3.3
175.5	0.447	19	0.878	40	1596	4.9	6.5	1.6	61	1825	3.6
176.2	0.759	18	1.3	34	1581	4.6	11	2.5	52	1807	3.3
176.9	0.676	18	1.2	41	1601	3.3	9.8	2.1	63	1831	2.4
177.6	1.3	19	1.2	40	1642	4.2	19	2.2	61	1877	3.0
178.3	1.4	17	1.5	40	1678	4.4	20	2.8	61	1919	3.2
179.0	1.2	18	1.2	43	1486	4.5	17	2.3	65	1700	3.3
179.7	1.2	21	1.2	37	1506	3.5	17	2.1	57	1722	2.5
180.4	0.894	17	1.5	44	1513	5.0	13	2.8	67	1730	3.6
181.1	1.5	19	1.5	40	1510	3.7	21	2.6	61	1727	2.7
181.8	1.8	19	1.5	43	1460	3.3	26	2.7	66	1670	2.4
182.5	1.0	21	1.1	45	1561	4.1	15	2.0	69	1784	3.0
183.2	1.4	19	1.2	43	1394	5.0	20	2.1	65	1594	3.7
183.9	1.9	20	0.937	39	1347	2.0	27	1.7	60	1540	1.4
184.6	1.1	20	0.970	38	1525	3.2	16	1.8	58	1744	2.3
185.3	1.1	21	1.2	39	1391	3.3	16	2.2	59	1591	2.4
186.0	1.3	17	1.6	41	1496	3.0	18	2.9	62	1711	2.2
186.7	1.6	18	1.1	44	1451	4.7	23	1.9	67	1659	3.4
187.4	1.4	18	1.0	37	1379	4.7	20	1.8	57	1577	3.4
188.1	0.827	15	1.2	44	1173	2.1	12	2.1	68	1341	1.5
188.8	1.2	17	1.1	39	1314	4.2	18	2.1	60	1502	3.1
189.4	1.3	19	1.3	41	1256	3.1	19	2.4	63	1436	2.2
190.1	1.2	17	1.1	43	1313	2.4	17	1.9	66	1501	1.7
190.8	1.4	15	0.739	34	1176	1.8	21	1.3	52	1345	1.3
191.5	0.466	17	0.856	31	1215	2.3	6.7	1.6	48	1389	1.7
192.2	0.977	16	0.930	36	1154	3.3	14	1.7	55	1320	2.4
192.9	1.3	15	1.2	40	1132	3.1	19	2.2	62	1295	2.3
193.6	1.3	15	1.4	32	1007	2.9	19	2.6	50	1151	2.1
194.3	1.2	16	0.728	35	1049	2.6	18	1.3	54	1199	1.9
195.0	1.3	16	1.3	39	1151	3.3	18	2.3	59	1317	2.4
195.7	0.939	16	1.2	35	1103	3.0	14	2.3	53	1262	2.2
196.4	0.418	16	0.865	36	1099	2.6	6.0	1.6	55	1257	1.9
197.1	0.578	15	0.859	35	1167	2.9	8.3	1.6	53	1335	2.2
197.8	0.984	15	0.785	36	1181	2.3	14	1.4	55	1351	1.7
198.5	1.5	13	0.695	36	1146	3.8	21	1.3	55	1310	2.8
199.2	1.0	16	0.727	29	1161	2.4	15	1.3	45	1328	1.8
199.9	0.846	14	0.849	29	1065	2.8	12	1.5	45	1217	2.0
200.6	0.491	17	0.856	29	1178	2.9	7.1	1.6	45	1348	2.1
201.3	0.546	13	0.811	29	1119	3.1	7.9	1.5	44	1280	2.3
202.0	0.755	15	0.790	33	1062	2.9	11	1.4	51	1214	2.1
202.7	0.790	17	0.752	30	1065	1.8	11	1.4	46	1217	1.3
203.4	0.769	14	0.845	31	1200	3.4	11	1.5	48	1372	2.5
204.1	1.1	14	0.650	31	1072	2.9	15	1.2	47	1226	2.1
204.8	1.2	15	0.879	29	1154	2.7	17	1.6	45	1320	2.0
205.5	0.593	20	0.668	31	1181	2.8	8.6	1.2	47	1351	2.0
206.2	0.780	18	0.689	32	1083	2.7	11	1.3	48	1238	2.0
206.9	0.743	18	1.2	29	1113	2.7	11	2.2	45	1272	2.0
207.6	1.0	18	1.0	29	1162	2.5	15	1.9	45	1328	1.8
208.3	0.813	17	1.0	31	1048	3.9	12	1.9	47	1198	2.9
209.0	0.877	18	1.1	34	1178	2.9	13	2.0	53	1347	2.1
209.7	1.2	16	0.746	31	1082	2.7	17	1.4	47	1237	2.0
210.4	1.2	15	1.1	30	1228	3.1	17	2.0	46	1404	2.3
211.1	0.651	16	0.939	25	1281	3.9	9.4	1.7	39	1465	2.9
211.8	1.0	18	1.1	29	1165	3.2	15	2.1	44	1332	2.4
212.5	0.941	17	0.630	31	1105	3.1	14	1.1	47	1264	2.3
213.2	0.825	17	1.1	31	1196	3.9	12	2.0	48	1368	2.8
213.9	0.880	17	1.2	34	1272	2.2	13	2.2	52	1455	1.6
214.6	1.4	15	1.0	34	1176	2.5	21	1.9	52	1345	1.8
215.2	1.7	18	1.4	31	1167	3.5	25	2.5	47	1335	2.5
215.9	1.4	15	0.827	31	1092	2.7	20	1.5	48	1249	1.9
216.6	0.940	16	1.1	33	1154	3.5	14	2.0	51	1320	2.6
217.3	1.2	15	1.2	27	1108	3.4	18	2.1	41	1267	2.5
218.0	1.0	14	1.1	31	1125	3.0	15	2.0	47	1286	2.2
218.7	0.606	16	1.1	31	1193	4.1	8.8	2.0	47	1365	3.0
219.4	0.614	18	0.938	39	1201	4.3	8.9	1.7	59	1373	3.1
220.1	1.6	20	0.836	33	1289	3.0	23	1.5	50	1474	2.2
220.8	0.772	17	0.863	34	1126	2.7	11	1.6	53	1288	2.0
221.5	1.3	21	1.1	35	1244	2.6	19	2.0	53	1422	1.9
222.2	0.416	18	1.0	30	1212	3.0	6.0	1.9	46	1386	2.2
222.9	0.393	19	1.3	34	1138	2.8	5.7	2.3	51	1302	2.0
223.6	0.468	15	1.3	33	1116	3.7	6.8	2.3	51	1276	2.7
224.3	0.741	17	1.2	33	1150	2.4	11	2.1	51	1315	1.8
225.0	0.640	18	1.3	38	1218	2.8	9.2	2.4	58	1392	2.0
225.7	0.515	18	1.3	33	1262	3.2	7.4	2.5	50	1443	2.4



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.4	1.1	18	0.476	31	1145	2.6	16	0.869	48	1309	1.9
227.1	0.883	17	1.5	34	1310	3.7	13	2.8	53	1498	2.7
227.8	0.612	20	1.7	39	1343	3.0	8.8	3.1	59	1535	2.2
228.5	0.716	17	1.6	36	1277	3.5	10	3.0	55	1460	2.5
229.2	0.740	20	1.2	38	1184	3.2	11	2.2	58	1354	2.3
229.9	1.3	17	1.0	36	1232	2.6	19	1.8	56	1408	1.9
230.6	0.804	16	1.3	36	1260	2.6	12	2.5	55	1441	1.9
231.3	0.922	18	1.6	34	1226	2.6	13	3.0	53	1402	1.9
232.0	0.393	19	1.8	35	1193	3.9	5.7	3.2	54	1364	2.8
232.7	1.1	20	1.5	37	1292	4.0	16	2.8	56	1477	2.9
233.4	0.838	16	1.3	42	1164	2.6	12	2.3	64	1331	1.9
234.1	1.3	18	1.3	33	1178	3.0	19	2.3	51	1347	2.2
234.8	0.606	19	1.3	41	1272	4.4	8.7	2.4	63	1455	3.2
235.5	1.3	20	1.6	34	1171	4.2	19	2.9	52	1339	3.1
236.2	0.393	19	1.5	45	1230	2.1	5.7	2.8	69	1406	1.5
236.9	0.891	18	1.5	38	1305	3.2	13	2.8	58	1492	2.4
237.6	0.393	19	1.8	39	1335	4.5	5.7	3.3	59	1526	3.3
238.3	0.562	21	1.7	37	1173	3.8	8.1	3.2	57	1342	2.8
239.0	1.0	20	1.9	44	1211	3.6	15	3.5	67	1384	2.6
239.7	1.4	19	1.9	39	1223	3.6	20	3.5	60	1398	2.7
240.4	0.619	22	1.4	41	1344	3.3	8.9	2.5	63	1537	2.4
241.0	0.393	18	1.7	35	1356	3.4	5.7	3.1	54	1551	2.5
241.7	0.780	19	1.9	40	1162	3.2	11	3.4	61	1329	2.4
242.4	1.5	20	1.9	40	1239	2.0	22	3.4	61	1417	1.5
243.1	0.521	17	1.5	41	1248	1.5	7.5	2.7	62	1427	1.1
243.8	0.566	13	1.6	39	1235	3.3	8.2	2.9	59	1412	2.4
244.5	0.913	16	1.4	43	1191	2.9	13	2.6	65	1362	2.1
245.2	1.1	18	1.7	47	1223	4.0	16	3.1	73	1398	2.9
245.9	0.929	19	1.6	41	1139	3.0	13	2.9	63	1303	2.2
246.6	0.803	16	1.8	35	1151	2.8	12	3.3	54	1316	2.1
247.3	0.626	16	1.3	35	1203	1.6	9.0	2.4	54	1375	1.1
248.0	0.706	18	1.6	43	1357	2.3	10	3.0	65	1552	1.6
248.7	0.983	20	1.8	40	1318	2.1	14	3.3	61	1507	1.5
249.4	0.805	19	1.8	44	1366	2.9	12	3.3	68	1563	2.1
250.1	0.761	16	1.5	39	1386	2.5	11	2.7	60	1585	1.8
250.8	0.739	18	1.8	47	1266	3.7	11	3.3	72	1447	2.7
251.5	0.458	18	1.7	41	1340	1.9	6.6	3.1	63	1532	1.4
252.2	0.876	20	1.8	40	1321	2.9	13	3.3	62	1511	2.1
252.9	0.908	19	2.0	43	1372	2.5	13	3.7	65	1569	1.8
253.6	0.454	16	2.3	45	1453	2.2	6.6	4.1	69	1662	1.6
254.3	0.574	16	2.2	42	1381	3.6	8.3	3.9	64	1579	2.6
255.0	1.3	19	2.0	43	1365	3.6	18	3.6	66	1561	2.6
255.7	0.814	17	2.4	48	1266	3.0	12	4.4	73	1447	2.2
256.4	0.913	18	2.1	40	1352	3.9	13	3.8	61	1546	2.9
257.1	1.4	17	2.4	45	1499	3.4	20	4.3	69	1714	2.5
257.8	0.967	23	2.7	49	1509	3.5	14	4.9	76	1725	2.6
258.5	1.2	18	2.6	48	1463	2.8	17	4.8	73	1674	2.0
259.2	1.1	19	2.4	49	1434	2.0	16	4.3	75	1640	1.5
259.9	0.594	19	2.3	47	1246	1.9	8.6	4.1	71	1425	1.4
260.6	0.872	19	2.3	52	1663	3.1	13	4.1	79	1901	2.2
261.3	0.933	20	3.6	45	1400	3.8	13	6.6	69	1601	2.8
262.0	0.812	21	3.4	54	1569	3.1	12	6.3	83	1795	2.2
262.7	1.7	15	3.0	58	1516	2.9	25	5.5	88	1733	2.1
263.4	1.6	15	2.6	46	1345	2.4	22	4.8	71	1538	1.8
264.1	1.7	15	2.4	45	1365	3.6	25	4.5	69	1561	2.6
264.8	1.2	18	2.6	50	1422	2.9	17	4.7	77	1626	2.1
265.5	1.0	22	2.5	53	1399	3.4	15	4.5	81	1599	2.5
266.2	0.989	22	2.5	55	1463	2.2	14	4.5	84	1673	1.6
266.8	1.7	18	3.1	49	1625	3.9	25	5.6	75	1858	2.8
267.5	1.7	17	3.0	47	1504	3.3	24	5.5	71	1719	2.4
268.2	0.773	19	2.0	56	1386	4.9	11	3.6	86	1585	3.6
268.9	0.969	18	2.6	51	1413	3.2	14	4.7	79	1616	2.3
269.6	1.3	15	2.5	45	1350	2.4	19	4.6	68	1544	1.7
270.3	1.5	17	3.2	49	1648	3.7	21	5.8	75	1884	2.7
271.0	1.6	16	2.8	54	1564	4.1	23	5.1	83	1789	3.0
271.7	1.6	19	1.8	48	1468	3.6	23	3.2	73	1678	2.7
272.4	1.7	18	1.9	54	1523	2.7	25	3.6	82	1742	2.0
273.1	1.0	15	1.9	51	1399	2.2	15	3.4	78	1600	1.6
273.8	1.2	19	2.5	43	1375	2.6	18	4.5	66	1573	1.9
274.5	1.4	15	2.3	42	1571	3.5	20	4.1	64	1796	2.6
275.2	1.5	19	1.8	45	1488	4.1	22	3.3	69	1702	3.0
275.9	1.7	16	2.1	43	1398	4.2	25	3.9	65	1599	3.0
276.6	0.900	16	1.8	37	1264	2.2	13	3.3	57	1445	1.6
277.3	1.7	17	1.6	37	1449	3.6	25	2.9	57	1657	2.6
278.0	1.1	17	1.7	45	1389	3.9	17	3.0	69	1588	2.8
278.7	0.459	16	1.4	37	1261	2.4	6.6	2.6	57	1442	1.8
279.4	1.0	18	1.9	44	1328	3.2	15	3.5	68	1518	2.3
280.1	0.832	14	1.5	39	1169	3.2	12	2.7	60	1337	2.4
280.8	0.731	16	1.1	37	1255	2.9	11	2.1	57	1436	2.1
281.5	1.1	19	1.7	47	1343	3.7	16	3.1	73	1535	2.7
282.2	0.448	17	0.833	30	1099	3.3	6.5	1.5	46	1257	2.4



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
282.9	0.789	15	1.0	41	1136	2.2	11	1.9	62	1299	1.6
283.6	0.393	15	1.6	40	1157	2.6	5.7	2.9	61	1324	1.9
284.3	0.859	18	1.3	41	1212	2.8	12	2.4	63	1386	2.1
285.0	1.1	15	1.4	40	1192	3.2	17	2.5	61	1363	2.4
285.7	0.621	18	1.7	44	1292	2.9	9.0	3.0	68	1477	2.1
286.4	0.711	15	1.4	47	1161	3.1	10	2.5	72	1328	2.3
287.1	0.916	17	1.7	45	1171	3.5	13	3.1	70	1339	2.6
287.8	0.459	18	1.8	49	1190	3.2	6.6	3.3	75	1361	2.4
288.5	1.3	18	1.8	43	1223	2.6	18	3.3	66	1399	1.9
289.2	0.431	19	1.4	49	1206	2.7	6.2	2.6	75	1379	1.9
289.9	0.885	14	1.8	37	1071	2.5	13	3.3	57	1224	1.8
290.6	0.556	15	2.1	48	1220	3.4	8.0	3.8	73	1395	2.5
291.3	0.722	17	1.6	46	1214	2.8	10	3.0	70	1389	2.1
292.0	0.624	19	2.4	55	1307	3.8	9.0	4.4	85	1495	2.8
292.7	0.780	17	2.0	55	1296	2.1	11	3.7	84	1482	1.5
293.3	0.393	17	2.5	49	1278	2.6	5.7	4.6	76	1461	1.9
294.0	0.615	18	1.7	53	1504	3.3	8.9	3.1	81	1720	2.4
294.7	0.931	20	2.5	63	1474	2.9	13	4.6	97	1686	2.1
295.4	0.700	17	2.4	54	1479	3.7	10	4.3	83	1691	2.7
296.1	0.423	17	3.4	68	1475	2.4	6.1	6.1	104	1686	1.8
296.8	0.752	17	3.7	54	1403	3.0	11	6.8	83	1604	2.2
297.5	1.1	19	3.6	61	1597	3.6	16	6.6	93	1826	2.6
298.2	0.957	18	3.8	71	1637	3.4	14	6.9	108	1872	2.5
298.9	0.624	19	3.3	58	1622	3.4	9.0	6.1	89	1854	2.5
299.6	0.633	18	3.7	65	1731	2.7	9.1	6.7	100	1980	2.0
300.3	1.7	17	4.3	61	1685	3.4	25	7.8	94	1927	2.5
301.0	0.639	19	4.2	70	1895	3.4	9.2	7.6	107	2167	2.5
301.7	1.1	17	3.5	62	1705	4.2	16	6.3	96	1949	3.1
302.4	0.768	19	4.2	62	1755	3.8	11	7.7	95	2007	2.8
303.1	1.0	19	4.1	66	1824	3.0	15	7.4	100	2085	2.2
303.8	1.2	18	4.4	62	1695	3.5	18	8.1	95	1939	2.6
304.5	1.9	19	4.5	75	1845	4.7	28	8.2	115	2110	3.4
305.2	1.1	16	4.6	74	1691	4.3	17	8.4	113	1934	3.1
305.9	0.915	19	5.2	76	1810	4.2	13	9.4	117	2070	3.0
306.6	1.8	20	5.0	79	1863	3.9	27	9.1	120	2130	2.8
307.3	1.6	18	4.9	72	1797	3.2	23	8.9	111	2054	2.4
308.0	1.3	18	5.4	67	1833	2.7	19	9.9	103	2096	2.0
308.7	1.8	16	5.4	82	1854	3.0	27	9.9	125	2120	2.2
309.4	2.3	22	5.9	76	1890	4.2	33	11	116	2161	3.1
310.1	1.5	18	6.3	72	1926	3.4	21	12	110	2202	2.5
310.8	1.5	17	6.0	72	1776	3.6	22	11	111	2031	2.6
311.5	2.5	19	5.9	80	1958	4.2	36	11	122	2239	3.1
312.2	2.3	20	6.4	83	1914	4.9	34	12	128	2188	3.5
312.9	2.7	18	6.1	83	1825	2.9	39	11	128	2087	2.1
313.6	2.5	18	5.9	84	1867	3.8	36	11	128	2135	2.8
314.3	2.4	15	6.3	75	1704	3.4	34	11	115	1949	2.5
315.0	2.6	20	6.6	87	1993	4.9	38	12	134	2279	3.6
315.7	2.2	18	5.4	78	1669	3.9	32	9.8	119	1909	2.9
316.4	2.4	18	6.3	80	1847	4.1	35	12	123	2112	3.0
317.1	2.3	21	6.1	87	2089	5.8	34	11	133	2389	4.2
317.8	2.5	20	7.2	82	1930	3.7	37	13	126	2207	2.7
318.5	2.7	21	5.8	82	1850	4.2	39	11	126	2115	3.1
319.1	2.0	19	6.0	83	1723	3.2	29	11	127	1970	2.3
319.8	2.8	19	6.1	72	1947	4.8	40	11	111	2227	3.5
320.5	2.7	18	5.7	77	2030	4.0	39	10	119	2321	2.9
321.2	2.8	19	6.0	80	1987	5.8	40	11	123	2272	4.2
321.9	2.2	19	6.3	76	1890	4.3	32	11	116	2161	3.2
322.6	2.3	17	5.3	78	1745	3.9	34	9.6	119	1995	2.9
323.3	2.7	19	7.0	78	1828	3.6	39	13	119	2090	2.6
324.0	2.1	21	5.8	82	1982	3.9	30	11	125	2267	2.8
324.7	2.7	23	7.3	81	2004	4.0	39	13	124	2291	2.9
325.4	2.9	21	6.0	87	1811	5.3	42	11	134	2071	3.9
326.1	2.9	20	7.2	80	1960	4.4	42	13	123	2242	3.2
326.8	3.8	21	6.6	76	1880	5.5	55	12	116	2150	4.0
327.5	3.1	21	6.9	83	1935	3.8	44	12	126	2213	2.8
328.2	2.3	20	5.7	75	1837	3.5	34	10	115	2100	2.6
328.9	2.5	19	4.8	73	1653	3.3	36	8.7	112	1890	2.4
329.6	2.6	19	5.7	79	1890	5.4	37	10	121	2161	3.9
330.3	2.4	18	6.3	74	1774	3.5	35	12	113	2028	2.6
331.0	2.9	18	6.0	81	1940	4.5	42	11	125	2219	3.3
331.7	2.3	20	5.8	79	1835	3.5	33	11	122	2098	2.6
332.4	2.6	20	5.8	75	1850	5.2	38	11	115	2116	3.8
333.1	3.0	22	6.0	73	1704	3.1	43	11	112	1949	2.3
333.8	3.6	20	5.9	82	1860	4.3	52	11	126	2127	3.2
334.5	3.9	21	7.1	89	2066	4.4	57	13	137	2363	3.2
335.2	3.4	20	7.0	85	1834	4.3	50	13	130	2097	3.1
335.9	2.7	15	6.0	77	1742	4.5	39	11	118	1992	3.3
336.6	3.2	20	5.9	82	1759	5.4	47	11	126	2012	3.9
337.3	3.3	19	5.0	70	1783	4.3	47	9.2	108	2039	3.1
338.0	3.0	18	5.7	66	1751	4.3	43	10	102	2003	3.1
338.7	3.3	17	5.6	66	1614	3.8	47	10	101	1845	2.8



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.4	4.5	20	5.7	66	1634	3.4	65	10	101	1869	2.5
340.1	3.7	21	5.1	62	1828	5.0	53	9.3	95	2090	3.7
340.8	4.0	21	4.8	64	1894	4.3	58	8.7	98	2166	3.2
341.5	4.2	23	4.9	78	1771	3.9	60	9.0	120	2025	2.8
342.2	4.1	21	5.3	67	1667	4.2	59	9.7	103	1907	3.1
342.9	3.5	18	4.6	68	1683	3.6	50	8.4	105	1925	2.6
343.6	3.1	20	4.9	60	1686	4.7	45	8.9	93	1928	3.4
344.3	3.9	21	4.8	65	1564	3.8	56	8.7	99	1788	2.8
345.0	4.4	20	5.2	68	1814	5.0	63	9.5	105	2074	3.7
345.6	3.9	21	5.2	60	1597	3.9	56	9.4	92	1826	2.9
346.3	3.8	22	4.8	63	1685	4.6	55	8.7	97	1927	3.4
347.0	3.5	21	4.8	61	1749	3.8	50	8.8	94	2001	2.8
347.7	3.5	19	5.4	63	1668	3.7	51	9.8	97	1907	2.7
348.4	3.2	19	4.6	59	1629	3.3	46	8.4	90	1863	2.4
349.1	2.8	18	5.0	59	1526	4.3	40	9.1	90	1745	3.2
349.8	2.4	21	4.6	59	1435	3.5	35	8.3	90	1641	2.5
350.5	3.0	18	4.3	63	1680	4.1	43	7.8	97	1921	3.0
351.2	2.3	20	4.2	67	1665	3.8	33	7.7	102	1904	2.8
351.9	2.5	22	5.0	66	1594	4.5	36	9.1	101	1822	3.3
352.6	2.5	19	5.0	58	1645	3.3	36	9.1	89	1882	2.4
353.3	2.8	16	4.3	55	1550	4.8	41	7.8	85	1773	3.5
354.0	3.5	17	4.5	55	1646	4.1	51	8.2	84	1882	3.0
354.7	2.4	19	4.1	60	1593	2.8	35	7.5	93	1822	2.1
355.4	2.0	18	4.3	62	1614	4.0	30	7.8	94	1846	2.9
356.1	3.1	18	4.5	62	1603	3.2	45	8.1	96	1833	2.4
356.8	3.3	19	4.5	60	1622	3.2	47	8.2	91	1855	2.3
357.5	3.8	16	4.6	66	1771	3.8	55	8.4	100	2025	2.8
358.2	2.9	21	4.7	63	1553	5.4	41	8.6	97	1776	3.9
358.9	2.6	19	4.6	59	1585	4.3	38	8.4	91	1813	3.2
359.6	2.2	17	3.8	60	1527	3.7	31	6.8	92	1746	2.7
360.3	2.6	19	5.2	59	1663	4.4	37	9.4	91	1902	3.2
361.0	2.9	22	4.7	75	1774	4.8	42	8.6	115	2029	3.5
361.7	2.6	18	4.8	67	1608	3.8	37	8.7	102	1839	2.8
362.4	3.3	20	5.1	59	1581	4.9	47	9.4	90	1808	3.6
363.1	2.2	17	4.2	54	1438	3.2	31	7.6	83	1644	2.4
363.8	2.9	18	4.7	57	1679	3.7	41	8.5	87	1920	2.7
364.5	3.0	19	4.3	60	1548	3.9	43	7.8	92	1770	2.8
365.2	2.5	20	3.9	62	1619	4.5	37	7.1	95	1851	3.3
365.9	3.3	18	4.2	56	1636	4.0	48	7.6	86	1871	2.9
366.6	2.8	19	3.9	52	1404	2.6	40	7.1	79	1606	1.9
367.3	3.0	17	4.1	56	1441	3.7	44	7.5	85	1648	2.7
368.0	2.7	20	3.2	58	1446	5.2	38	5.7	88	1653	3.8
368.7	2.5	19	2.9	58	1352	3.0	35	5.2	89	1546	2.2
369.4	3.0	19	3.1	48	1358	3.4	43	5.6	73	1553	2.5
370.1	2.7	20	3.5	49	1421	4.0	39	6.4	76	1625	2.9
370.8	2.7	23	3.2	57	1403	3.3	39	5.8	88	1605	2.4
371.4	4.6	21	2.8	51	1305	4.0	66	5.1	79	1492	3.0
372.1	4.0	19	3.1	61	1390	4.6	57	5.7	94	1590	3.3
372.8	2.3	20	2.9	53	1343	3.0	33	5.4	81	1536	2.2
373.5	2.3	22	3.1	56	1375	3.9	34	5.6	85	1572	2.8
374.2	2.9	21	3.1	56	1282	2.6	41	5.6	85	1466	1.9
374.9	1.8	19	2.4	58	1305	2.3	26	4.3	89	1493	1.7
375.6	1.8	22	2.5	57	1351	4.4	27	4.6	87	1545	3.2
376.3	1.7	17	2.6	53	1246	2.5	25	4.7	81	1425	1.8
377.0	2.0	19	2.3	58	1306	2.3	28	4.2	89	1493	1.7
377.7	1.3	21	3.6	56	1325	3.0	18	6.5	86	1516	2.2
378.4	2.1	19	2.6	61	1336	4.0	31	4.7	93	1527	2.9
379.1	1.4	18	2.8	52	1254	2.7	20	5.2	80	1434	1.9
379.8	1.2	19	3.2	51	1181	3.1	17	5.9	78	1351	2.3
380.5	1.5	21	2.9	53	1341	2.2	21	5.2	82	1533	1.6
381.2	1.7	18	2.6	64	1450	3.2	25	4.8	98	1658	2.4
381.9	1.3	18	2.6	61	1296	3.2	18	4.7	93	1482	2.4
382.6	1.0	17	2.7	54	1335	3.4	15	5.0	82	1527	2.5
383.3	1.6	19	3.2	56	1297	4.3	23	5.9	85	1483	3.1
384.0	2.2	20	2.6	63	1323	3.5	31	4.7	96	1513	2.6
384.7	2.5	22	2.8	61	1332	3.7	36	5.0	93	1524	2.7
385.4	1.8	21	2.9	62	1341	3.3	26	5.2	95	1534	2.4
386.1	1.6	22	2.7	54	1307	3.4	23	4.9	82	1495	2.5
386.8	2.7	23	2.3	61	1394	4.1	39	4.3	94	1595	3.0
387.5	2.1	20	2.9	54	1115	2.8	31	5.3	82	1275	2.1
388.2	0.912	18	3.0	56	1355	2.9	13	5.5	86	1550	2.1
388.9	0.966	20	2.4	49	1230	3.2	14	4.4	76	1407	2.3
389.6	1.3	19	3.0	54	1306	3.4	19	5.5	82	1493	2.5
390.3	1.2	23	2.8	56	1438	4.0	18	5.2	85	1645	2.9
391.0	0.962	22	3.2	56	1401	2.2	14	5.9	85	1602	1.6
391.7	1.1	20	3.1	58	1330	2.7	16	5.7	89	1521	1.9
392.4	1.3	20	3.2	50	1308	2.3	19	5.8	77	1496	1.7
393.1	1.7	20	3.4	56	1557	2.9	24	6.2	86	1781	2.1
393.8	1.8	20	3.8	67	1446	3.7	25	6.9	103	1654	2.7
394.5	1.5	22	2.9	52	1417	3.7	21	5.3	80	1620	2.7
395.2	1.4	22	3.4	59	1464	3.4	20	6.3	90	1674	2.5



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
395.9	1.7	19	3.0	51	1374	4.2	25	5.5	78	1571	3.1
396.6	2.4	23	4.0	58	1527	3.6	35	7.4	89	1746	2.7
397.2	2.4	25	3.6	61	1624	3.2	35	6.6	93	1857	2.3
397.9	2.2	20	3.6	61	1440	3.7	32	6.5	94	1646	2.7
398.6	2.4	23	3.5	60	1540	2.4	35	6.3	91	1761	1.7
399.3	2.1	19	3.6	55	1410	3.1	31	6.6	84	1613	2.3
400.0	1.8	22	3.3	49	1458	3.9	25	6.0	76	1668	2.8
400.7	1.7	23	2.9	67	1464	5.9	24	5.2	102	1674	4.3
401.4	1.9	21	3.0	52	1305	3.6	28	5.4	79	1492	2.6
402.1	2.3	25	3.6	53	1436	2.1	34	6.5	81	1643	1.6
402.8	2.8	25	3.2	57	1360	3.2	41	5.9	88	1555	2.3
403.5	1.9	25	3.1	48	1553	4.1	28	5.7	73	1776	3.0
404.2	1.8	24	3.7	56	1379	3.8	27	6.7	86	1577	2.7
404.9	2.0	23	2.4	52	1317	3.1	29	4.4	79	1507	2.3
405.6	1.5	21	2.8	58	1423	3.9	22	5.0	89	1627	2.8
406.3	1.7	24	2.4	60	1345	3.4	25	4.4	92	1538	2.5
407.0	1.4	25	2.6	52	1298	3.1	20	4.8	80	1484	2.3
407.7	1.3	24	2.8	49	1280	3.5	19	5.2	76	1464	2.6
408.4	2.5	22	2.8	55	1366	3.9	35	5.0	84	1563	2.8
409.1	0.633	24	2.5	51	1281	3.7	9.1	4.6	78	1465	2.7
409.8	1.1	24	2.6	52	1356	3.0	16	4.8	80	1550	2.2
410.5	1.2	23	2.7	54	1308	3.0	17	4.9	83	1496	2.2
411.2	0.969	26	2.3	50	1336	2.5	14	4.3	76	1527	1.9
411.9	1.4	27	2.5	47	1375	3.0	20	4.6	73	1573	2.2
412.6	1.4	22	2.5	50	1349	2.7	21	4.5	77	1543	2.0
413.3	1.5	25	2.9	53	1424	3.1	21	5.3	82	1629	2.3
414.0	1.1	26	2.6	47	1350	4.6	17	4.7	73	1543	3.4
414.7	1.0	27	2.2	50	1297	2.3	15	4.0	77	1484	1.7
415.4	1.5	25	3.1	47	1340	2.4	22	5.6	72	1532	1.8
416.1	1.3	24	2.4	45	1330	2.6	18	4.4	69	1521	1.9
416.8	1.3	26	2.4	39	1350	4.2	19	4.4	60	1544	3.1
417.5	1.0	26	2.9	51	1333	3.1	14	5.2	79	1525	2.3
418.2	1.0	26	2.1	44	1298	2.6	15	3.8	67	1484	1.9
418.9	1.5	26	2.5	45	1317	2.2	21	4.6	69	1506	1.6
419.6	1.0	25	2.4	42	1365	3.2	15	4.4	64	1561	2.3
420.3	0.891	24	2.6	44	1371	3.9	13	4.7	68	1568	2.8
421.0	1.4	25	2.3	55	1406	2.8	21	4.3	85	1608	2.1
421.7	1.5	26	2.7	52	1365	4.6	21	5.0	80	1561	3.3
422.4	1.6	21	2.2	46	1312	2.9	23	4.1	71	1500	2.1
423.1	0.956	20	2.0	44	1304	2.9	14	3.6	68	1491	2.1
423.7	1.3	22	2.0	49	1581	3.0	18	3.6	75	1808	2.2
424.4	1.4	22	2.4	48	1353	4.6	20	4.3	73	1547	3.4
425.1	1.4	23	2.2	46	1260	2.6	20	4.1	71	1441	1.9
425.8	1.5	23	2.4	52	1445	3.0	21	4.3	80	1652	2.2
426.5	1.2	20	2.4	41	1446	3.8	17	4.4	62	1654	2.8
427.2	1.2	18	2.3	50	1320	3.4	17	4.3	76	1510	2.5
427.9	1.1	23	1.8	52	1404	3.9	16	3.4	80	1605	2.9
428.6	1.2	21	2.3	43	1456	2.9	17	4.1	66	1665	2.1
429.3	1.9	22	2.2	43	1337	2.7	27	4.1	65	1528	2.0
430.0	0.943	23	2.5	44	1382	2.6	14	4.6	68	1580	1.9
430.7	0.918	21	2.0	49	1318	2.1	13	3.7	75	1507	1.5
431.4	1.8	20	2.3	46	1272	1.8	26	4.2	70	1454	1.3
432.1	1.2	20	2.0	44	1365	3.0	18	3.7	67	1560	2.2
432.8	1.1	18	2.0	45	1286	2.1	16	3.6	68	1471	1.5
433.5	1.1	19	2.6	45	1492	3.7	16	4.7	69	1706	2.7
434.2	0.819	20	2.4	42	1317	3.4	12	4.5	65	1506	2.5
434.9	1.2	17	2.5	43	1288	3.0	18	4.6	66	1472	2.2
435.6	0.674	20	1.8	43	1230	2.5	9.7	3.3	66	1407	1.8
436.3	0.962	19	2.3	42	1312	3.5	14	4.2	64	1501	2.6
437.0	1.0	20	1.8	45	1487	3.8	15	3.3	69	1701	2.8
437.7	1.4	18	2.9	53	1631	4.2	20	5.3	81	1865	3.1
438.4	0.788	20	2.9	44	1493	1.8	11	5.4	67	1708	1.3
439.1	0.892	22	2.1	58	1489	3.0	13	3.8	88	1703	2.2
439.8	1.7	16	3.0	54	1604	3.1	24	5.4	82	1835	2.2
440.5	1.1	19	3.2	56	1733	3.5	17	5.8	85	1981	2.6
441.2	1.4	19	3.0	55	1622	3.9	20	5.5	84	1855	2.9
441.9	1.8	17	3.3	53	1475	2.8	27	6.0	81	1687	2.0
442.6	0.922	16	2.7	49	1571	4.4	13	5.0	76	1797	3.2
443.3	0.910	19	3.3	47	1357	3.0	13	6.0	72	1551	2.2
444.0	0.890	17	2.9	55	1509	3.4	13	5.3	85	1725	2.5
444.7	1.5	18	2.8	50	1427	3.2	22	5.0	76	1632	2.3
445.4	0.927	18	3.2	52	1488	2.3	13	5.9	80	1701	1.7
446.1	1.3	20	3.2	47	1501	2.7	19	5.8	72	1716	1.9
446.8	1.1	18	2.7	52	1462	3.2	15	4.9	79	1672	2.3
447.5	1.7	21	2.8	54	1580	2.4	24	5.1	82	1806	1.8
448.2	1.6	21	3.0	50	1631	3.2	24	5.5	76	1865	2.3
448.9	1.4	17	3.0	48	1478	3.6	20	5.6	74	1690	2.6
449.6	1.9	20	3.1	47	1460	2.5	27	5.6	72	1670	1.8
450.3	1.8	20	3.6	58	1600	3.3	26	6.5	90	1829	2.4
450.9	1.9	20	3.7	63	1809	3.0	27	6.7	97	2069	2.2
451.6	1.3	18	2.8	53	1599	3.8	19	5.1	80	1828	2.8



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
452.3	1.8	19	2.6	54	1482	4.0	27	4.7	82	1695	2.9
453.0	1.9	23	3.6	56	1624	3.4	27	6.6	85	1857	2.5
453.7	2.0	17	3.1	56	1504	4.1	29	5.6	85	1720	3.0
454.4	0.943	20	3.0	52	1541	4.5	14	5.5	80	1762	3.3
455.1	1.5	20	2.7	53	1440	3.5	21	5.0	81	1646	2.6
455.8	0.997	18	3.0	58	1505	4.2	14	5.4	89	1721	3.1
456.5	1.7	21	2.8	62	1440	2.5	24	5.1	95	1647	1.9
457.2	1.4	19	2.7	56	1369	3.4	20	4.9	86	1565	2.5
457.9	1.4	19	2.2	48	1313	3.0	20	4.1	74	1501	2.2
458.6	1.4	16	2.7	64	1621	2.5	20	5.0	98	1853	1.9
459.3	1.4	18	3.3	56	1352	3.2	20	6.0	85	1546	2.3
460.0	2.7	19	3.0	56	1530	4.3	40	5.5	85	1750	3.1
460.7	1.3	16	3.0	66	1510	3.6	18	5.4	101	1727	2.7
461.4	1.4	21	3.0	56	1544	3.5	20	5.5	86	1765	2.6
462.1	1.7	17	3.0	54	1518	3.3	25	5.5	83	1736	2.4
462.8	3.0	20	3.3	64	1575	4.0	44	6.0	98	1801	2.9
463.5	2.0	20	2.8	75	1576	3.0	28	5.1	114	1803	2.2
464.2	2.1	22	3.4	73	1419	3.0	30	6.3	112	1623	2.2
464.9	1.4	15	2.5	63	1481	3.6	20	4.6	97	1693	2.6
465.6	1.5	19	3.2	68	1666	4.1	21	5.8	105	1906	3.0
466.3	1.2	19	3.6	81	1724	2.7	17	6.5	124	1971	1.9
467.0	1.5	19	3.9	75	1516	3.0	22	7.1	115	1734	2.2
467.7	1.6	17	3.4	78	1587	2.3	23	6.1	119	1814	1.7
468.4	1.3	17	3.8	78	1685	2.4	19	7.0	120	1927	1.8
469.1	1.6	18	4.5	84	1801	2.8	24	8.2	129	2060	2.0
469.8	1.1	16	3.6	74	1955	2.0	16	6.5	113	2235	1.5
470.5	1.4	20	4.0	78	1653	2.8	20	7.3	119	1890	2.0
471.2	2.0	17	3.8	80	1732	4.7	29	6.9	123	1980	3.4
471.9	2.1	21	4.5	78	1639	3.9	31	8.1	120	1874	2.8
472.6	1.9	18	4.9	80	1765	2.9	27	8.9	123	2018	2.1
473.3	2.1	18	4.2	78	1625	2.6	30	7.7	120	1858	1.9
474.0	2.9	22	4.5	81	1876	2.7	42	8.2	125	2146	2.0
474.7	1.9	20	4.9	85	1840	2.5	28	8.9	130	2104	1.8
475.4	2.5	24	5.1	91	1854	3.6	36	9.3	140	2121	2.6
476.1	2.3	22	5.3	93	1844	3.6	33	9.6	142	2109	2.6
476.7	3.7	21	4.7	97	1766	3.4	53	8.5	149	2019	2.5
477.4	3.2	21	4.3	84	1708	2.9	47	7.8	128	1954	2.1
478.1	2.9	22	4.1	93	1822	4.1	42	7.5	143	2084	3.0
478.8	2.5	20	3.8	87	1901	4.3	35	6.9	134	2174	3.2
479.5	2.8	23	5.5	95	1893	3.7	41	10	146	2164	2.7
480.2	2.9	20	4.9	99	1844	2.5	42	8.9	151	2108	1.8
480.9	3.2	22	5.7	97	1743	2.5	46	10	148	1993	1.8
481.6	2.9	22	5.3	85	1541	3.5	42	9.7	131	1762	2.6
482.3	2.4	17	4.1	85	1535	2.9	34	7.5	130	1755	2.1
483.0	3.3	22	4.2	83	1567	3.4	48	7.7	128	1792	2.5
483.7	3.4	25	4.5	104	1640	3.4	49	8.2	160	1876	2.5
484.4	2.7	20	4.7	98	1834	2.6	38	8.6	150	2097	1.9
485.1	3.3	17	4.4	92	1687	3.0	48	8.1	141	1930	2.2
485.8	2.8	21	4.9	93	1848	3.2	41	8.9	143	2114	2.4
486.5	4.1	23	4.9	94	1948	3.7	60	8.9	144	2228	2.7
487.2	4.5	20	5.2	93	1648	3.0	66	9.5	143	1884	2.2
487.9	3.3	18	4.5	102	1858	3.4	47	8.3	156	2125	2.4
488.6	3.5	18	4.8	90	1501	3.8	50	8.7	137	1717	2.8
489.3	4.2	18	4.9	96	1508	2.2	61	9.0	147	1725	1.6
490.0	4.3	22	4.1	99	1762	3.2	62	7.4	152	2015	2.3
490.7	3.2	19	4.0	88	1427	3.4	46	7.2	136	1632	2.5
491.4	3.4	21	3.7	91	1497	3.4	49	6.8	139	1712	2.5
492.1	3.0	17	4.1	84	1406	3.6	43	7.5	129	1608	2.6
492.8	3.1	17	4.1	86	1391	1.6	45	7.5	132	1591	1.2
493.5	3.5	20	4.1	90	1400	3.4	50	7.5	138	1601	2.5
494.2	3.7	19	3.6	81	1318	2.6	53	6.6	124	1507	1.9
494.9	2.5	14	3.7	86	1283	2.6	35	6.7	131	1467	1.9
495.6	3.4	17	3.8	64	1212	2.7	49	6.9	98	1385	1.9
496.3	2.5	16	3.3	79	1245	3.1	36	6.1	121	1424	2.2
497.0	3.3	19	2.7	78	1242	3.2	48	4.9	119	1420	2.3
497.7	2.4	19	3.5	68	1162	2.1	35	6.3	104	1329	1.5
498.4	2.9	15	2.9	68	1119	3.4	42	5.3	105	1280	2.4
499.1	3.0	19	3.4	63	963	1.6	43	6.2	97	1102	1.2
499.8	2.5	19	2.4	70	1040	2.9	35	4.4	107	1190	2.1
500.5	2.0	18	2.9	63	966	2.3	28	5.3	97	1105	1.7
501.2	2.0	17	2.7	85	1113	3.7	29	5.0	130	1273	2.7
501.9	2.5	17	2.8	65	978	2.5	37	5.1	100	1119	1.8
502.5	2.1	17	2.3	63	935	2.6	31	4.3	97	1069	1.9
503.2	2.0	18	3.0	70	967	2.2	29	5.4	107	1105	1.6
503.9	2.4	18	2.5	56	930	1.5	34	4.5	85	1063	1.1
504.6	2.3	15	2.9	60	812	1.8	34	5.4	92	928	1.3
505.3	2.2	17	2.4	61	959	1.8	32	4.4	93	1096	1.3
506.0	2.1	17	2.7	59	877	2.6	31	5.0	91	1003	1.9
506.7	2.2	15	2.1	62	736	1.9	31	3.8	95	842	1.4
507.4	1.6	14	2.2	53	743	2.5	22	3.9	81	850	1.8
508.1	0.876	15	2.2	50	730	1.9	13	4.1	77	835	1.4



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
508.8	1.5	17	2.7	54	691	1.9	22	4.9	83	790	1.4
509.5	2.4	18	2.5	56	784	2.0	34	4.6	85	897	1.4
510.2	1.3	16	2.1	53	733	1.2	19	3.8	81	838	0.846
510.9	1.8	17	1.6	58	692	2.0	26	3.0	89	791	1.5
511.6	1.8	17	1.9	52	637	1.3	26	3.5	79	728	0.959
512.3	1.5	15	2.1	51	614	2.2	22	3.9	78	702	1.6
513.0	0.783	15	1.8	48	607	1.4	11	3.3	74	694	1.0
513.7	1.3	15	2.3	52	572	1.2	19	4.2	80	654	0.910
514.4	0.805	17	1.7	46	591	3.1	12	3.0	70	676	2.2
515.1	0.496	15	1.8	44	580	1.5	7.2	3.3	68	663	1.1
515.8	0.753	16	1.8	43	532	0.842	11	3.3	67	608	0.614
516.5	0.624	19	1.6	41	513	2.0	9.0	3.0	63	587	1.5
517.2	0.652	15	1.5	41	491	2.1	9.4	2.7	63	561	1.5
517.9	1.3	14	1.5	39	525	1.6	19	2.8	59	600	1.2
518.6	0.707	15	1.8	41	542	1.3	10	3.3	62	620	0.938
519.3	0.393	17	1.3	41	576	1.6	5.7	2.4	62	659	1.2
520.0	1.1	16	1.5	48	653	1.4	16	2.7	74	746	1.0
520.7	1.2	17	2.3	43	647	1.8	18	4.1	65	740	1.3
521.4	0.668	18	2.2	48	604	1.4	9.6	4.0	74	691	1.0
522.1	0.564	16	1.8	46	610	1.8	8.1	3.3	71	698	1.3
522.8	1.2	16	1.5	41	506	0.995	17	2.6	63	579	0.726
523.5	0.906	14	1.8	48	517	1.3	13	3.2	74	591	0.944
524.2	1.1	14	1.7	48	485	0.970	15	3.1	73	555	0.708
524.9	0.426	13	1.3	44	472	1.7	6.1	2.4	67	539	1.2
525.6	0.796	15	2.0	41	484	1.4	11	3.7	63	553	1.1
526.3	0.652	15	1.2	42	491	1.5	9.4	2.2	64	562	1.1
527.0	1.0	16	1.1	45	404	0.836	15	2.1	68	462	0.610
527.7	0.723	14	1.4	39	348	1.4	10	2.6	60	398	1.0
528.3	0.393	16	1.5	44	419	2.6	5.7	2.7	68	479	1.9
529.0	0.544	15	1.5	43	412	2.3	7.9	2.8	65	471	1.7
529.7	1.1	14	1.4	44	396	1.5	15	2.5	68	453	1.1
530.4	1.3	16	1.8	47	431	1.8	19	3.3	72	493	1.3
531.1	0.833	14	1.7	43	434	2.1	12	3.2	66	497	1.5
531.8	0.506	14	1.8	40	378	0.923	7.3	3.3	61	432	0.673
532.5	0.427	16	1.4	47	391	1.3	6.2	2.6	71	447	0.975
533.2	0.500	13	1.2	41	376	2.4	7.2	2.1	62	430	1.7
533.9	0.483	16	1.9	39	413	1.9	7.0	3.5	60	472	1.4
534.6	0.393	15	0.992	38	358	1.2	5.7	1.8	58	409	0.891
535.3	1.1	14	1.7	40	364	2.0	16	3.0	61	416	1.4
536.0	0.393	15	1.1	42	429	1.5	5.7	2.0	64	490	1.1
536.7	0.426	14	1.4	45	360	0.666	6.1	2.6	69	411	0.486
537.4	0.713	13	1.2	42	341	1.7	10	2.2	64	390	1.3
538.1	0.393	15	1.5	40	390	2.0	5.7	2.7	61	446	1.4
538.8	0.403	14	1.3	43	361	1.5	5.8	2.3	65	413	1.1
539.5	0.494	13	1.4	45	381	0.788	7.1	2.6	70	436	0.575
540.2	1.0	15	1.3	47	403	0.758	15	2.4	71	460	0.553
540.9	0.747	14	1.4	42	347	1.8	11	2.5	64	397	1.3
541.6	0.406	15	0.985	47	345	1.1	5.9	1.8	72	394	0.774
542.3	1.1	14	1.2	47	340	1.1	16	2.2	73	389	0.831
543.0	0.772	17	1.1	44	291	2.2	11	2.1	67	333	1.6
543.7	0.393	17	1.3	43	313	1.6	5.7	2.4	66	358	1.2
544.4	0.409	13	0.992	41	283	1.4	5.9	1.8	62	324	1.0
545.1	0.393	12	1.7	41	297	1.1	5.7	3.0	64	340	0.788
545.8	0.393	13	1.5	38	268	0.855	5.7	2.7	58	306	0.624
546.5	0.432	13	1.5	47	351	1.7	6.2	2.7	72	401	1.2
547.2	0.393	12	1.5	53	311	1.0	5.7	2.7	81	356	0.740
547.9	0.409	14	1.4	49	343	1.6	5.9	2.6	76	392	1.2
548.6	0.483	13	1.1	44	339	1.4	7.0	2.0	68	388	1.0
549.3	0.635	15	1.3	46	310	1.3	9.2	2.3	71	354	0.928
550.0	0.462	14	1.4	50	305	1.7	6.7	2.5	76	349	1.2
550.7	0.393	14	1.4	51	314	1.5	5.7	2.6	78	359	1.1
551.4	0.393	16	1.3	42	273	0.789	5.7	2.4	64	312	0.576
552.1	0.393	12	1.6	42	320	0.510	5.7	2.9	65	366	0.372
552.8	0.433	15	1.9	50	284	1.7	6.2	3.4	76	325	1.2
553.5	0.723	15	1.6	50	276	1.1	10	3.0	76	315	0.800
554.1	0.411	13	1.8	48	269	1.3	5.9	3.4	74	308	0.940
554.8	0.621	10	1.7	41	271	0.925	9.0	3.1	63	310	0.675
555.5	0.551	14	1.7	46	311	1.8	7.9	3.0	70	356	1.3
556.2	0.393	13	1.8	50	266	1.6	5.7	3.3	77	304	1.2
556.9	0.672	12	1.7	42	265	1.2	9.7	3.2	65	303	0.892
557.6	0.393	11	1.8	43	302	1.3	5.7	3.3	66	345	0.979
558.3	0.393	15	2.2	43	261	1.0	5.7	3.9	66	298	0.735
559.0	0.591	14	2.4	39	284	2.7	8.5	4.4	60	325	2.0
559.7	0.393	15	1.9	46	337	1.8	5.7	3.4	71	386	1.3
560.4	0.393	12	1.9	43	300	0.880	5.7	3.6	65	343	0.642
561.1	0.393	16	2.1	44	280	2.1	5.7	3.9	67	320	1.5
561.8	0.874	12	1.9	51	274	2.2	13	3.5	78	313	1.6
562.5	0.640	12	2.0	42	252	1.1	9.2	3.7	65	289	0.773
563.2	0.393	12	2.2	38	257	2.9	5.7	4.0	59	294	2.1
563.9	0.393	12	2.2	43	260	0.787	5.7	4.1	65	298	0.574
564.6	0.471	12	2.4	41	246	1.3	6.8	4.4	63	281	0.974



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
565.3	0.393	14	1.9	43	263	0.888	5.7	3.4	67	301	0.648
566.0	0.393	13	2.2	45	264	1.1	5.7	3.9	69	302	0.816
566.7	0.393	13	1.9	47	241	1.1	5.7	3.5	73	276	0.830
567.4	0.393	12	1.9	40	243	1.9	5.7	3.5	62	278	1.4
568.1	0.393	12	1.9	39	262	1.1	5.7	3.5	60	300	0.781
568.8	0.393	12	2.3	42	241	1.4	5.7	4.1	64	276	1.0
569.5	0.456	12	1.8	44	272	2.1	6.6	3.3	67	311	1.5
570.2	0.393	14	1.9	36	270	1.7	5.7	3.5	55	309	1.3
570.9	0.393	13	2.3	39	250	1.3	5.7	4.2	59	286	0.964
571.6	0.604	11	2.1	39	253	1.0	8.7	3.8	59	289	0.735
572.3	0.404	14	2.3	46	272	1.2	5.8	4.2	71	311	0.847
573.0	0.760	12	2.0	46	265	1.1	11	3.6	70	304	0.776
573.7	0.501	13	1.7	42	246	1.1	7.2	3.1	64	281	0.815
574.4	0.765	13	1.9	35	265	1.4	11	3.5	54	303	1.0
575.1	0.393	16	2.2	46	287	2.6	5.7	4.0	71	329	1.9
575.8	0.558	17	2.1	41	263	1.5	8.1	3.9	62	301	1.1
576.5	0.393	15	1.7	40	284	0.921	5.7	3.0	62	325	0.672
577.2	0.578	15	2.0	44	275	0.526	8.3	3.7	67	314	0.383
577.9	0.393	14	2.2	41	273	1.4	5.7	4.0	63	312	1.1
578.6	0.888	15	2.3	39	282	1.7	13	4.1	61	322	1.3
579.3	0.393	15	2.0	39	275	2.1	5.7	3.6	60	315	1.5
580.0	0.393	16	1.9	41	262	1.1	5.7	3.4	63	299	0.816
580.6	0.393	14	2.2	39	265	1.4	5.7	4.0	60	303	1.1
581.3	0.532	15	1.9	45	277	1.7	7.7	3.5	69	317	1.3
582.0	0.393	16	2.3	44	260	1.4	5.7	4.2	68	297	1.0
582.7	0.393	13	1.9	44	252	0.958	5.7	3.4	68	288	0.699
583.4	0.393	17	2.4	45	273	2.3	5.7	4.3	68	313	1.7
584.1	0.393	15	1.9	46	319	1.7	5.7	3.4	70	365	1.2
584.8	0.595	17	1.7	40	270	1.6	8.6	3.2	62	309	1.1
585.5	0.766	15	2.1	42	271	2.6	11	3.8	64	310	1.9
586.2	0.701	16	1.5	44	286	1.6	10	2.8	68	327	1.2
586.9	0.580	17	1.5	36	247	1.8	8.4	2.7	54	282	1.3
587.6	0.530	17	1.5	42	300	0.724	7.6	2.7	64	343	0.528
588.3	0.393	14	1.6	48	272	0.992	5.7	3.0	73	312	0.724
589.0	0.475	17	1.7	48	290	1.5	6.9	3.1	74	331	1.1
589.7	0.757	14	1.3	43	271	1.6	11	2.4	66	310	1.2
590.4	0.573	14	1.6	46	273	1.4	8.3	3.0	70	312	0.990
591.1	0.393	16	1.4	55	279	1.0	5.7	2.6	84	319	0.756
591.8	0.434	14	1.5	51	257	0.989	6.3	2.7	79	294	0.722
592.5	0.393	15	1.2	51	262	1.4	5.7	2.2	79	300	1.0
593.2	0.398	14	1.1	48	249	1.1	5.7	1.9	74	284	0.834
593.9	0.487	15	1.3	49	264	1.4	7.0	2.3	75	302	1.0
594.6	0.393	16	1.5	51	284	1.1	5.7	2.8	78	324	0.778
595.3	0.393	16	1.3	51	257	0.640	5.7	2.4	79	294	0.467
596.0	0.393	18	1.5	46	270	0.868	5.7	2.7	71	309	0.633
596.7	0.393	14	1.1	45	248	0.815	5.7	2.0	69	283	0.595
597.4	0.393	16	1.3	55	242	0.585	5.7	2.4	84	277	0.427
598.1	0.393	12	1.6	49	265	0.522	5.7	3.0	75	303	0.381
598.8	0.393	16	1.5	48	264	1.0	5.7	2.7	74	301	0.759
599.5	0.393	17	1.5	60	272	1.2	5.7	2.8	92	311	0.841
600.2	0.415	17	1.3	53	273	1.1	6.0	2.3	81	313	0.790
600.9	0.393	14	1.3	50	262	0.599	5.7	2.4	77	300	0.437
601.6	0.419	15	1.4	50	267	0.547	6.1	2.6	76	305	0.399
602.3	0.805	17	1.7	59	274	1.6	12	3.2	90	313	1.2
603.0	0.469	14	1.0	49	247	0.962	6.8	1.9	74	282	0.702
603.7	0.854	15	1.2	55	282	1.3	12	2.2	84	323	0.971
604.4	0.611	17	0.883	59	250	0.667	8.8	1.6	90	285	0.487
605.1	0.477	16	1.4	60	267	2.2	6.9	2.6	92	305	1.6
605.8	0.423	14	1.3	59	251	0.993	6.1	2.3	90	287	0.725
606.4	0.393	17	1.1	63	264	1.3	5.7	2.0	96	301	0.933
607.1	0.393	15	1.1	61	250	1.1	5.7	2.1	94	285	0.800
607.8	0.393	16	1.6	62	271	1.9	5.7	2.9	95	309	1.4
608.5	0.393	16	1.2	61	273	1.5	5.7	2.2	93	312	1.1
609.2	0.400	14	1.3	62	259	1.3	5.8	2.4	95	296	0.914
609.9	0.631	16	1.5	62	241	0.834	9.1	2.8	95	276	0.609
610.6	0.393	14	0.918	62	260	1.4	5.7	1.7	95	297	1.0
611.3	0.393	15	1.0	70	265	1.5	5.7	1.8	107	302	1.1
612.0	0.400	16	1.2	71	287	1.0	5.8	2.1	109	329	0.762
612.7	0.393	15	0.803	54	239	1.8	5.7	1.5	83	273	1.3
613.4	0.393	16	1.5	60	238	1.4	5.7	2.8	92	273	0.991
614.1	0.393	17	1.5	63	235	0.775	5.7	2.8	97	269	0.565
614.8	0.452	15	0.819	64	256	0.929	6.5	1.5	97	292	0.677
615.5	0.393	16	1.2	58	286	1.3	5.7	2.3	90	327	0.941
616.2	0.393	17	1.5	75	252	1.3	5.7	2.8	115	288	0.973
616.9	0.393	15	1.6	65	242	0.775	5.7	3.0	100	276	0.565
617.6	0.393	17	1.3	72	262	1.5	5.7	2.4	110	300	1.1
618.3	0.559	15	0.991	74	261	1.3	8.1	1.8	114	298	0.965
619.0	0.586	15	1.1	69	261	0.640	8.5	2.0	106	299	0.467
619.7	0.789	16	1.0	68	251	0.922	11	1.9	104	287	0.673
620.4	0.393	16	1.4	69	261	1.2	5.7	2.6	105	298	0.841
621.1	0.393	15	1.5	76	264	1.7	5.7	2.7	116	302	1.2



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.8	0.393	13	1.3	60	248	1.5	5.7	2.4	91	284	1.1
622.5	0.662	16	1.5	69	267	1.2	9.6	2.8	106	305	0.879
623.2	0.495	16	2.1	71	294	1.5	7.1	3.9	109	337	1.1
623.9	0.393	14	1.8	66	261	1.4	5.7	3.3	101	299	1.0
624.6	0.393	15	1.7	58	239	2.2	5.7	3.2	89	273	1.6
625.3	0.393	14	1.2	65	256	1.4	5.7	2.1	99	293	1.0
626.0	0.393	14	2.0	64	250	1.4	5.7	3.6	98	286	1.0
626.7	0.393	17	1.3	61	254	0.787	5.7	2.4	93	290	0.574
627.4	0.393	14	1.6	63	267	1.5	5.7	2.8	96	305	1.1
628.1	0.563	14	1.7	51	245	1.3	8.1	3.2	78	280	0.973
628.8	0.395	15	2.3	60	260	2.0	5.7	4.2	92	297	1.4
629.5	0.393	15	2.1	56	227	2.3	5.7	3.7	87	259	1.7
630.2	0.393	14	2.8	56	240	2.2	5.7	5.1	85	274	1.6
630.9	0.733	18	3.2	70	300	2.7	11	5.8	108	343	1.9
631.6	0.393	14	3.0	64	252	2.3	5.7	5.5	98	288	1.7
632.3	0.453	16	3.0	58	251	1.6	6.5	5.4	88	287	1.1
632.9	0.393	16	3.6	72	289	1.7	5.7	6.5	110	330	1.2
633.6	0.393	16	3.2	59	256	1.2	5.7	5.9	91	292	0.850
634.3	0.393	15	2.5	58	267	1.3	5.7	4.6	89	306	0.980
635.0	0.438	15	3.3	56	255	2.4	6.3	6.1	85	292	1.7
635.7	0.415	15	3.7	57	257	2.2	6.0	6.7	88	294	1.6
636.4	0.393	13	3.4	57	245	2.1	5.7	6.2	87	281	1.6
637.1	0.393	13	3.5	51	253	1.8	5.7	6.3	79	289	1.3
637.8	0.529	15	3.1	51	252	1.9	7.6	5.7	78	288	1.4
638.5	0.393	15	3.5	59	290	1.5	5.7	6.4	91	332	1.1
639.2	0.529	16	3.1	42	242	1.4	7.6	5.7	65	277	0.985
639.9	0.393	17	3.1	57	260	2.3	5.7	5.7	87	297	1.7
640.6	0.393	13	2.5	41	261	1.2	5.7	4.6	63	298	0.880
641.3	0.393	13	3.1	43	266	1.5	5.7	5.6	66	304	1.1
642.0	1.0	18	3.3	43	271	1.5	15	5.9	66	310	1.1
642.7	0.588	17	2.8	42	286	1.2	8.5	5.1	65	327	0.859
643.4	0.418	16	2.3	39	244	1.7	6.0	4.3	60	279	1.3
644.1	0.393	16	1.7	36	284	1.7	5.7	3.2	55	325	1.2
644.8	0.393	17	2.3	39	254	1.8	5.7	4.2	59	290	1.3
645.5	0.468	17	2.1	45	270	1.7	6.8	3.7	69	309	1.2
646.2	0.393	16	2.0	42	288	1.2	5.7	3.6	64	329	0.875
646.9	0.393	15	1.9	40	265	1.6	5.7	3.4	62	303	1.2
647.6	0.393	17	1.9	44	276	1.5	5.7	3.4	67	316	1.1
648.3	0.393	15	1.6	42	294	1.9	5.7	2.9	64	336	1.4
649.0	0.393	13	1.7	44	252	1.5	5.7	3.1	68	288	1.1
649.7	0.393	12	1.6	40	242	1.4	5.7	3.0	62	277	1.0
650.4	0.393	14	1.2	40	230	1.1	5.7	2.3	61	263	0.786
651.1	0.393	15	1.3	50	241	1.2	5.7	2.3	77	276	0.892
651.8	0.393	18	1.3	51	261	1.2	5.7	2.4	78	298	0.875
652.5	0.461	15	1.5	45	238	0.736	6.7	2.7	69	272	0.537
653.2	0.393	14	1.2	43	245	0.826	5.7	2.3	66	281	0.603
653.9	0.538	14	1.2	48	244	0.544	7.8	2.2	74	279	0.397
654.6	0.393	16	1.2	56	253	1.4	5.7	2.3	86	289	1.0
655.3	0.393	14	0.783	48	230	0.768	5.7	1.4	73	263	0.560
656.0	0.393	14	0.726	51	226	1.4	5.7	1.3	78	258	1.0
656.7	0.481	16	1.1	56	256	1.2	7.0	2.1	86	292	0.881
657.4	0.393	14	1.0	57	276	1.8	5.7	1.9	87	316	1.3
658.1	0.393	12	0.940	59	238	0.505	5.7	1.7	90	272	0.368
658.7	0.393	14	0.952	57	275	0.538	5.7	1.7	87	314	0.392
659.4	0.393	13	1.3	58	268	0.671	5.7	2.3	89	307	0.490
660.1	0.393	14	1.1	65	257	1.0	5.7	2.0	99	294	0.733
660.8	0.393	14	1.0	56	236	1.5	5.7	1.9	85	270	1.1
661.5	0.483	12	1.3	53	210	1.2	7.0	2.4	81	240	0.857
662.2	0.594	15	1.0	68	264	1.3	8.6	1.9	104	302	0.947
662.9	0.393	14	1.0	55	227	0.367	5.7	1.9	84	259	0.268
663.6	0.393	13	1.1	69	268	1.2	5.7	2.0	105	306	0.905
664.3	0.393	15	1.1	62	233	1.7	5.7	2.1	95	267	1.2
665.0	0.393	13	1.7	65	293	1.8	5.7	3.0	100	335	1.3
665.7	0.393	11	1.2	59	215	0.643	5.7	2.2	91	246	0.469
666.4	0.393	17	1.3	58	249	0.535	5.7	2.4	89	284	0.391
667.1	0.393	13	1.4	64	248	1.8	5.7	2.6	98	284	1.3
667.8	0.393	14	1.6	61	235	0.674	5.7	2.9	94	269	0.492
668.5	0.807	13	1.7	58	264	0.390	12	3.1	89	302	0.285
669.2	0.515	16	1.4	65	240	0.521	7.4	2.5	99	275	0.380
669.9	0.665	15	1.4	67	265	1.0	9.6	2.6	102	303	0.736
670.6	0.393	15	1.7	53	246	1.2	5.7	3.2	80	281	0.847
671.3	0.566	14	1.7	65	257	1.6	8.2	3.1	99	294	1.2
672.0	0.393	16	1.5	53	282	1.9	5.7	2.7	81	323	1.4
672.7	0.818	13	1.6	52	231	1.2	12	2.9	79	264	0.868
673.4	0.626	14	1.9	53	237	1.2	9.0	3.6	82	271	0.908
674.1	0.393	11	1.7	53	244	0.904	5.7	3.2	82	279	0.659
674.8	0.393	12	1.3	48	275	0.972	5.7	2.4	74	315	0.709
675.5	0.393	16	1.7	56	249	0.531	5.7	3.2	85	285	0.387
676.2	0.492	16	1.7	61	245	1.5	7.1	3.2	94	280	1.1
676.9	0.550	16	1.5	55	264	0.445	7.9	2.8	84	302	0.325
677.6	0.393	12	2.1	44	226	2.2	5.7	3.8	68	258	1.6



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
678.3	0.393	13	2.2	61	256	1.7	5.7	4.0	93	293	1.2
679.0	0.546	12	1.9	55	258	1.9	7.9	3.4	84	295	1.4
679.7	0.393	13	1.6	49	257	1.4	5.7	3.0	74	294	1.0
680.4	0.405	13	1.8	40	238	1.1	5.8	3.3	61	272	0.772
681.1	0.393	14	1.9	49	245	1.3	5.7	3.5	75	281	0.942
681.8	0.393	14	2.2	51	247	1.5	5.7	3.9	78	282	1.1
682.5	0.536	12	2.4	42	237	1.8	7.7	4.4	65	271	1.3
683.2	0.393	14	2.3	47	232	1.2	5.7	4.3	72	266	0.896
683.9	0.489	12	2.0	45	267	1.8	7.1	3.7	70	306	1.3
684.5	0.393	15	2.0	44	237	1.3	5.7	3.7	68	271	0.952
685.2	0.393	14	2.2	42	304	1.2	5.7	4.1	64	348	0.876
685.9	0.393	15	1.7	40	256	1.1	5.7	3.2	61	293	0.814
686.6	0.416	12	1.5	39	248	2.0	6.0	2.6	60	283	1.4
687.3	0.393	14	2.0	43	284	1.3	5.7	3.6	67	325	0.968
688.0	0.393	14	1.4	40	260	2.0	5.7	2.6	61	297	1.4
688.7	0.427	15	1.7	40	277	1.3	6.2	3.1	61	317	0.976
689.4	0.534	16	1.4	38	255	1.5	7.7	2.5	58	292	1.1
690.1	0.393	16	1.6	36	312	1.0	5.7	3.0	55	356	0.751
690.8	0.458	12	1.1	34	251	2.0	6.6	2.0	52	287	1.4
691.5	0.393	16	1.3	42	272	1.2	5.7	2.4	64	311	0.861
692.2	0.393	15	1.3	42	272	1.8	5.7	2.5	65	311	1.3
692.9	0.393	15	0.949	44	266	0.792	5.7	1.7	67	304	0.578
693.6	0.393	17	1.1	33	234	1.3	5.7	2.0	51	268	0.960
694.3	0.393	16	1.0	38	271	1.6	5.7	1.9	58	310	1.2
695.0	0.393	17	1.1	37	250	0.943	5.7	2.0	57	286	0.688
695.7	0.538	17	1.2	50	266	0.872	7.8	2.2	77	304	0.636
696.4	1.0	14	1.1	42	272	1.1	15	2.1	64	311	0.769
697.1	0.498	15	0.914	40	279	1.2	7.2	1.7	62	319	0.883
697.8	0.393	15	1.5	51	286	0.854	5.7	2.7	78	327	0.623
698.5	0.402	17	1.0	44	264	1.5	5.8	1.9	68	302	1.1
699.2	0.393	20	1.0	53	323	0.671	5.7	1.9	82	369	0.490
699.9	0.526	18	0.844	46	294	1.5	7.6	1.5	71	336	1.1
700.6	0.467	14	0.965	45	241	1.4	6.7	1.8	70	275	1.0
701.3	0.393	12	0.965	44	273	1.1	5.7	1.8	67	312	0.834
702.0	0.393	15	1.2	45	271	0.815	5.7	2.3	69	310	0.595
702.7	0.836	15	1.4	55	259	0.977	12	2.6	84	296	0.713
703.4	0.446	17	1.2	54	242	1.0	6.4	2.1	83	277	0.743
704.1	0.990	15	1.4	49	262	1.1	14	2.6	75	300	0.772
704.8	0.525	14	0.931	42	241	0.669	7.6	1.7	65	276	0.488
705.5	0.393	14	1.2	52	256	1.4	5.7	2.2	80	293	1.0
706.2	0.393	16	1.6	52	241	0.958	5.7	2.9	79	275	0.699
706.9	0.393	16	1.1	50	305	1.2	5.7	2.1	76	349	0.858
707.6	0.393	15	1.4	54	274	1.4	5.7	2.6	82	313	0.998
708.3	0.393	14	1.6	52	272	1.6	5.7	3.0	79	311	1.2
709.0	0.393	16	2.1	52	272	1.5	5.7	3.8	80	311	1.1
709.7	0.407	18	1.5	48	252	0.955	5.9	2.7	73	289	0.697
710.4	0.523	15	1.8	49	270	1.2	7.6	3.2	75	309	0.851
711.0	0.393	17	1.9	57	293	1.6	5.7	3.5	88	335	1.2
711.7	0.393	17	1.8	61	305	1.8	5.7	3.3	94	349	1.3
712.4	0.474	16	2.0	53	249	1.5	6.8	3.7	81	284	1.1
713.1	0.393	14	1.9	54	277	1.5	5.7	3.4	82	316	1.1
713.8	0.393	15	1.9	51	274	1.2	5.7	3.4	78	313	0.887
714.5	0.442	13	1.6	46	261	1.4	6.4	3.0	70	299	1.0
715.2	0.393	15	1.8	44	280	1.4	5.7	3.3	68	320	1.0
715.9	0.393	16	1.7	58	241	1.1	5.7	3.2	89	275	0.831
716.6	0.393	16	1.7	44	237	1.1	5.7	3.1	68	272	0.818
717.3	0.393	13	1.8	47	270	1.6	5.7	3.4	72	308	1.2
718.0	0.393	12	1.5	48	289	0.662	5.7	2.6	73	330	0.483
718.7	0.393	14	1.6	49	279	1.1	5.7	2.9	76	320	0.778
719.4	0.393	13	1.7	49	243	11	5.7	3.1	75	278	8.2
720.1	0.393	12	1.5	38	228	1.8	5.7	2.6	58	261	1.3
720.8	0.393	14	2.3	50	278	1.4	5.7	4.2	76	318	1.000
721.5	0.393	15	2.0	45	261	2.0	5.7	3.6	69	299	1.4
722.2	0.753	14	1.7	47	250	2.0	11	3.1	71	286	1.5
722.9	0.402	14	2.0	44	264	1.2	5.8	3.6	67	302	0.842
723.6	0.393	13	2.4	37	241	0.834	5.7	4.4	56	275	0.609
724.3	0.393	12	1.9	40	253	1.7	5.7	3.4	61	290	1.2
725.0	0.393	14	2.0	40	245	0.930	5.7	3.6	61	281	0.679
725.7	0.393	13	1.8	38	246	1.5	5.7	3.4	58	281	1.1
726.4	0.393	11	2.0	40	275	1.0	5.7	3.6	61	314	0.747
727.1	0.393	15	2.4	38	271	1.7	5.7	4.4	59	310	1.2
727.8	0.393	13	1.8	31	263	0.800	5.7	3.3	48	301	0.584
728.5	0.715	14	1.7	34	294	2.0	10	3.0	52	336	1.4
729.2	0.600	15	1.7	32	264	2.2	8.7	3.0	49	302	1.6
729.9	0.393	13	1.7	29	249	1.9	5.7	3.0	45	284	1.4
730.6	0.393	16	2.0	29	281	1.0	5.7	3.6	45	322	0.734
731.3	0.393	14	1.2	22	235	1.3	5.7	2.2	34	269	0.934
732.0	0.393	15	1.8	26	257	0.763	5.7	3.2	40	293	0.557
732.7	0.393	14	2.0	26	239	0.776	5.7	3.6	40	273	0.566
733.4	0.393	14	1.6	28	257	1.6	5.7	2.9	43	294	1.1
734.1	0.393	18	1.2	27	320	2.2	5.7	2.2	42	366	1.6



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
734.8	0.437	16	1.3	23	282	2.1	6.3	2.3	35	323	1.5
735.5	0.393	14	1.1	20	259	0.672	5.7	2.1	30	297	0.491
736.2	0.393	14	1.1	24	273	1.4	5.7	2.0	36	312	1.0
736.8	0.393	14	1.1	23	278	1.1	5.7	2.0	36	318	0.826
737.5	0.393	17	1.4	25	255	1.7	5.7	2.6	38	291	1.3
738.2	0.393	13	0.918	26	275	1.9	5.7	1.7	40	315	1.4
738.9	0.393	17	0.788	21	284	2.1	5.7	1.4	33	324	1.5
739.6	0.878	18	1.1	23	279	1.5	13	2.0	36	319	1.1
740.3	0.639	19	1.2	27	271	1.9	9.2	2.1	42	310	1.4
741.0	0.393	17	0.667	24	267	0.980	5.7	1.2	37	306	0.715
741.7	0.524	18	0.817	26	263	1.6	7.6	1.5	40	301	1.2
742.4	0.402	18	0.903	26	271	1.8	5.8	1.6	40	310	1.3
743.1	0.584	15	1.1	31	259	0.851	8.4	2.1	48	296	0.621
743.8	0.419	17	0.991	31	283	2.2	6.0	1.8	47	324	1.6
744.5	0.393	16	0.745	30	266	2.5	5.7	1.4	46	304	1.8
745.2	0.393	19	0.964	31	293	1.7	5.7	1.8	48	335	1.2
745.9	0.393	16	1.0	35	290	1.4	5.7	1.9	54	331	1.0
746.6	0.393	15	0.784	35	263	1.0	5.7	1.4	54	301	0.751
747.3	0.433	14	1.1	30	276	1.3	6.3	2.0	46	316	0.938
748.0	0.393	14	1.2	30	228	1.3	5.7	2.3	46	261	0.944
748.7	0.482	17	0.823	38	234	1.2	7.0	1.5	58	268	0.883
749.4	0.543	15	0.740	35	222	0.989	7.8	1.3	53	253	0.722
750.1	0.393	15	0.958	37	230	1.3	5.7	1.7	56	263	0.949
750.8	0.393	13	1.0	42	231	1.2	5.7	1.9	64	264	0.889
751.5	0.431	13	1.4	38	260	0.787	6.2	2.5	59	297	0.574
752.2	0.393	13	0.971	38	238	1.3	5.7	1.8	59	272	0.915
752.9	0.393	18	1.3	45	253	1.6	5.7	2.4	69	289	1.1
753.6	0.393	16	0.770	48	240	1.4	5.7	1.4	73	274	0.992
754.3	0.393	13	1.2	46	265	1.2	5.7	2.2	70	303	0.874
755.0	0.393	16	1.3	41	237	1.1	5.7	2.4	63	271	0.772
755.7	0.393	14	1.4	45	236	0.749	5.7	2.5	70	269	0.546
756.4	0.942	14	1.3	37	220	1.3	14	2.3	57	251	0.955
757.1	0.393	13	1.1	53	239	0.865	5.7	2.0	82	274	0.631
757.8	0.393	14	1.5	46	226	0.538	5.7	2.7	71	258	0.392
758.5	0.393	14	1.9	49	262	0.481	5.7	3.5	74	300	0.351
759.2	0.749	12	1.7	51	235	0.523	11	3.0	78	269	0.382
759.9	0.393	15	1.9	52	260	1.1	5.7	3.5	79	298	0.778
760.6	0.393	15	1.4	49	231	0.888	5.7	2.5	75	264	0.648
761.3	0.393	14	1.9	49	247	0.543	5.7	3.5	75	282	0.396
762.0	0.466	14	2.0	48	247	1.1	6.7	3.6	73	283	0.776
762.7	0.393	14	1.7	47	246	1.3	5.7	3.0	73	281	0.956
763.4	0.515	12	1.7	52	236	1.3	7.4	3.1	79	270	0.913
764.0	0.393	20	1.8	51	241	1.0	5.7	3.2	78	276	0.743
764.7	0.393	16	2.2	49	247	1.0	5.7	4.0	75	282	0.764
765.4	0.393	13	1.6	49	228	1.0	5.7	2.9	75	260	0.744
766.1	0.393	15	2.1	49	232	1.1	5.7	3.8	75	266	0.827
766.8	0.393	14	2.0	43	238	1.3	5.7	3.7	66	273	0.923
767.5	0.393	15	1.9	44	222	1.8	5.7	3.4	67	254	1.3
768.2	0.393	13	1.8	46	270	1.7	5.7	3.3	71	309	1.2
768.9	0.393	13	1.4	43	218	0.908	5.7	2.6	67	249	0.663
769.6	0.393	14	1.5	41	211	1.5	5.7	2.8	63	242	1.1
770.3	0.393	13	2.3	46	242	1.2	5.7	4.1	70	277	0.860
771.0	0.393	14	1.9	45	233	1.2	5.7	3.5	68	267	0.885
771.7	0.393	13	1.5	39	198	0.816	5.7	2.8	60	226	0.595
772.4	0.737	11	1.7	35	230	0.669	11	3.1	54	263	0.488
773.1	0.393	14	2.0	45	251	1.1	5.7	3.6	68	287	0.805
773.8	0.772	11	1.7	41	230	0.935	11	3.1	63	263	0.682
774.5	0.590	10	1.8	40	233	1.9	8.5	3.3	62	266	1.4
775.2	0.393	14	1.7	48	235	1.0	5.7	3.2	74	269	0.741
775.9	0.393	11	2.0	45	230	0.701	5.7	3.7	69	263	0.512
776.6	0.393	13	2.1	44	267	1.5	5.7	3.9	68	305	1.1
777.3	0.398	13	2.1	42	246	1.2	5.7	3.9	65	281	0.909
778.0	0.393	10	1.5	38	253	1.1	5.7	2.8	58	289	0.810
778.7	0.393	11	1.4	43	226	1.2	5.7	2.5	65	259	0.842
779.4	0.393	14	1.8	173	228	0.996	5.7	3.4	265	261	0.727
780.1	0.393	13	1.6	42	247	1.2	5.7	2.9	65	283	0.851
780.8	0.393	12	1.5	38	228	1.1	5.7	2.7	59	260	0.795
781.5	0.393	14	1.8	41	237	0.985	5.7	3.2	63	271	0.718
782.2	0.393	14	2.0	47	236	1.4	5.7	3.6	72	270	1.0
782.9	0.393	12	2.0	46	300	1.9	5.7	3.6	70	343	1.4
783.6	0.393	12	1.6	42	276	0.668	5.7	2.9	65	316	0.488
784.3	0.393	12	1.6	42	237	1.3	5.7	2.9	65	271	0.924
785.0	0.507	14	1.8	38	249	1.5	7.3	3.3	58	284	1.1
785.7	0.878	11	2.2	44	237	1.4	13	4.0	68	271	1.0
786.4	0.393	10	1.5	42	245	1.6	5.7	2.7	65	281	1.1
787.1	0.393	12	1.4	38	272	2.3	5.7	2.6	58	311	1.7
787.8	0.393	11	2.2	37	254	2.4	5.7	4.0	57	291	1.7
788.5	0.615	13	2.1	40	262	1.3	8.9	3.9	61	299	0.982
789.2	0.468	14	1.8	36	227	1.1	6.8	3.3	54	260	0.831
789.8	0.856	11	1.5	38	235	1.3	12	2.8	58	269	0.984
790.5	0.393	10	1.4	38	249	2.0	5.7	2.6	59	285	1.4



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
791.2	0.393	16	1.9	41	249	1.5	5.7	3.5	63	285	1.1
791.9	0.393	13	1.9	40	266	1.4	5.7	3.4	61	304	1.0
792.6	0.586	14	1.6	38	260	0.854	8.5	3.0	58	298	0.623
793.3	0.393	12	1.8	32	250	1.3	5.7	3.4	49	286	0.979
794.0	0.393	12	1.8	37	253	1.8	5.7	3.3	56	290	1.3
794.7	0.393	13	2.0	40	277	1.2	5.7	3.6	62	317	0.879
795.4	0.393	13	1.5	29	285	1.8	5.7	2.8	44	326	1.3
796.1	0.752	10	1.7	37	252	1.4	11	3.0	57	289	0.998
796.8	0.393	12	2.0	33	269	0.802	5.7	3.6	51	307	0.585
797.5	0.393	13	1.9	36	259	2.0	5.7	3.4	55	296	1.5
798.2	0.393	15	2.4	34	257	1.3	5.7	4.4	53	294	0.952
798.9	0.393	13	1.5	35	285	1.8	5.7	2.7	53	326	1.3
799.6	0.393	15	1.8	32	261	2.6	5.7	3.2	49	298	1.9
800.3	0.393	13	1.5	30	249	0.718	5.7	2.8	47	284	0.524
801.0	0.393	11	1.7	32	251	1.6	5.7	3.2	50	287	1.1
801.7	0.393	15	1.2	30	244	1.7	5.7	2.3	46	279	1.2
802.4	0.393	13	1.2	31	257	1.1	5.7	2.2	48	293	0.834
803.1	0.393	13	1.5	28	236	1.3	5.7	2.8	42	270	0.961
803.8	0.393	14	1.9	30	232	1.9	5.7	3.4	47	265	1.4
804.5	0.394	15	1.4	24	249	1.4	5.7	2.5	36	285	1.1
805.2	0.393	14	1.2	27	241	1.3	5.7	2.3	41	275	0.927
805.9	0.393	15	1.1	26	253	1.4	5.7	2.0	40	289	0.992
806.6	0.625	14	0.868	33	243	2.4	9.0	1.6	51	278	1.7
807.3	0.521	15	0.695	25	303	2.0	7.5	1.3	39	346	1.5
808.0	0.393	13	0.905	29	276	1.6	5.7	1.7	44	316	1.2
808.7	0.471	15	1.1	26	274	2.6	6.8	2.0	39	313	1.9
809.4	0.393	15	1.3	22	263	1.2	5.7	2.5	33	301	0.883
810.1	0.544	17	0.816	20	256	0.991	7.9	1.5	30	292	0.723
810.8	0.538	18	1.0	26	266	1.1	7.8	1.9	40	304	0.780
811.5	0.607	18	1.1	30	326	2.4	8.8	1.9	46	372	1.7
812.2	0.393	18	0.864	27	315	1.5	5.7	1.6	42	361	1.1
812.9	0.393	16	1.2	24	295	1.1	5.7	2.1	37	338	0.806
813.6	0.393	18	0.549	27	291	1.5	5.7	1.0	41	333	1.1
814.3	0.766	21	0.882	26	335	1.6	11	1.6	40	383	1.2
815.0	0.393	20	1.0	24	318	1.8	5.7	1.9	37	363	1.3
815.7	0.393	17	0.767	29	292	2.7	5.7	1.4	45	334	2.0
816.3	0.712	20	0.816	33	322	1.5	10	1.5	50	368	1.1
817.0	0.393	22	0.782	33	302	1.5	5.7	1.4	50	345	1.1
817.7	0.610	19	0.922	36	298	1.1	8.8	1.7	55	341	0.810
818.4	0.393	24	0.904	32	310	1.4	5.7	1.6	49	355	1.0
819.1	0.393	20	0.983	35	336	1.4	5.7	1.8	54	384	1.0
819.8	0.393	20	0.910	39	297	1.3	5.7	1.7	59	340	0.933
820.5	0.393	19	1.7	39	314	1.4	5.7	3.1	60	359	1.0
821.2	0.692	20	1.1	40	367	1.5	10.0	2.0	61	420	1.1
821.9	0.547	21	1.2	43	358	1.5	7.9	2.1	66	410	1.1
822.6	0.393	18	1.2	41	315	1.6	5.7	2.1	63	361	1.2
823.3	0.393	23	1.3	47	348	1.8	5.7	2.4	72	398	1.3
824.0	0.393	19	1.2	40	290	1.9	5.7	2.2	61	331	1.4
824.7	0.443	21	0.960	48	346	2.1	6.4	1.8	73	396	1.5
825.4	0.393	18	1.2	49	334	1.4	5.7	2.2	75	382	1.0
826.1	0.547	18	1.2	53	324	2.2	7.9	2.1	81	371	1.6
826.8	0.458	20	1.2	49	295	1.9	6.6	2.1	75	338	1.4
827.5	0.393	21	1.3	49	321	1.8	5.7	2.3	75	367	1.3
828.2	0.672	19	1.3	49	334	1.8	9.7	2.3	76	382	1.3
828.9	0.393	19	1.5	52	314	1.6	5.7	2.8	79	359	1.2
829.6	0.431	21	0.919	49	313	1.1	6.2	1.7	75	358	0.821
830.3	0.393	17	1.6	58	346	2.2	5.7	2.8	89	396	1.6
831.0	0.732	20	1.4	61	356	2.3	11	2.6	93	407	1.7
831.7	0.598	19	1.6	56	366	2.1	8.6	2.8	85	418	1.5
832.4	0.520	17	1.2	63	337	1.1	7.5	2.2	97	385	0.768
833.1	0.393	18	2.0	55	336	1.3	5.7	3.6	84	384	0.961
833.8	0.534	20	1.8	54	420	1.7	7.7	3.3	83	481	1.3
834.5	0.393	18	1.6	58	328	1.2	5.7	2.9	90	375	0.908
835.2	0.393	19	1.3	60	347	1.5	5.7	2.4	91	397	1.1
835.9	0.393	18	1.2	63	339	2.0	5.7	2.3	96	387	1.5
836.6	0.393	17	2.0	55	344	1.7	5.7	3.6	84	394	1.3
837.3	0.393	19	1.4	66	437	1.5	5.7	2.6	102	500	1.1
838.0	0.471	19	1.8	59	339	1.9	6.8	3.4	90	388	1.4
838.7	0.666	18	1.1	64	369	2.2	9.6	2.0	98	422	1.6
839.4	0.393	21	1.7	66	433	2.3	5.7	3.1	101	495	1.7
840.1	0.393	20	1.6	69	375	2.8	5.7	2.9	105	429	2.1
840.8	0.393	19	1.8	67	381	1.9	5.7	3.3	103	436	1.4
841.5	0.393	19	1.7	64	323	1.8	5.7	3.1	99	369	1.3
842.1	0.393	19	1.5	67	392	2.5	5.7	2.8	103	448	1.8
842.8	0.393	18	2.0	68	358	1.1	5.7	3.6	105	410	0.771
843.5	0.393	21	1.9	73	406	3.0	5.7	3.4	112	465	2.2
844.2	0.393	17	1.8	74	394	1.8	5.7	3.2	114	451	1.3
844.9	0.393	21	1.6	72	430	1.1	5.7	2.9	111	491	0.810
845.6	0.393	20	2.0	62	338	2.3	5.7	3.6	94	386	1.7
846.3	0.393	18	2.2	61	363	2.2	5.7	4.0	94	415	1.6
847.0	0.393	18	1.8	66	342	1.0	5.7	3.2	101	391	0.755



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
847.7	0.393	20	2.2	70	405	2.0	5.7	4.0	107	463	1.4
848.4	0.509	19	1.6	68	377	2.3	7.3	3.0	104	431	1.7
849.1	0.393	19	2.1	64	371	0.940	5.7	3.8	98	424	0.686
849.8	0.393	18	2.3	63	338	1.2	5.7	4.2	96	386	0.903
850.5	0.471	20	2.1	72	424	3.2	6.8	3.8	111	484	2.4
851.2	0.463	18	1.7	76	355	1.2	6.7	3.2	117	406	0.848
851.9	0.393	17	2.0	72	375	1.8	5.7	3.7	111	429	1.3
852.6	0.585	17	1.7	75	383	2.0	8.4	3.2	115	438	1.5
853.3	0.397	17	2.0	62	354	1.7	5.7	3.6	96	404	1.2
854.0	0.393	18	2.1	84	381	2.1	5.7	3.8	129	435	1.5
854.7	0.393	18	2.1	65	319	1.2	5.7	3.9	100	364	0.850
855.4	0.393	18	2.5	78	374	2.6	5.7	4.6	119	428	1.9
856.1	0.393	19	1.7	75	345	3.3	5.7	3.1	115	394	2.4
856.8	0.393	18	2.7	76	343	1.6	5.7	4.9	116	393	1.2
857.5	0.393	22	2.7	75	377	0.534	5.7	4.9	114	431	0.390
858.2	0.397	17	2.5	76	347	1.3	5.7	4.5	117	397	0.983
858.9	0.393	18	2.5	83	344	2.0	5.7	4.5	128	393	1.4
859.6	0.393	19	2.6	75	310	2.0	5.7	4.8	114	355	1.5
860.3	0.393	19	3.5	81	346	1.4	5.7	6.5	124	396	1.0
861.0	0.393	21	2.4	85	327	2.0	5.7	4.4	130	374	1.5
861.7	0.393	19	2.2	79	326	2.1	5.7	4.1	120	373	1.5
862.4	0.393	16	2.6	79	283	1.3	5.7	4.8	121	324	0.974
863.1	0.393	16	3.0	73	324	2.2	5.7	5.5	112	370	1.6
863.8	0.540	20	3.4	85	303	2.5	7.8	6.1	131	347	1.8
864.5	0.393	19	3.4	96	337	1.9	5.7	6.2	147	386	1.4
865.2	0.504	17	3.3	85	301	1.8	7.3	6.0	130	344	1.3
865.9	0.393	17	3.3	77	288	1.5	5.7	6.1	118	329	1.1
866.6	0.393	21	3.0	89	303	1.8	5.7	5.4	136	346	1.3
867.3	0.393	20	3.0	84	298	2.4	5.7	5.5	128	341	1.7
868.0	0.450	20	3.5	95	306	2.3	6.5	6.3	146	350	1.6
868.6	0.634	19	4.1	95	306	3.3	9.2	7.5	145	350	2.4
869.3	0.393	18	3.1	84	280	1.8	5.7	5.7	129	320	1.3
870.0	0.393	18	3.5	83	288	2.7	5.7	6.4	127	330	2.0
870.7	0.393	17	3.4	88	278	1.9	5.7	6.2	134	318	1.4
871.4	0.393	21	3.2	83	282	2.2	5.7	5.8	127	322	1.6
872.1	0.468	20	4.6	88	282	2.8	6.8	8.4	134	323	2.0
872.8	0.393	19	3.1	81	286	2.9	5.7	5.7	125	326	2.1
873.5	0.549	19	3.6	84	298	2.2	7.9	6.6	129	341	1.6
874.2	0.393	19	3.7	89	310	2.5	5.7	6.8	136	354	1.8
874.9	0.393	20	3.4	91	278	3.2	5.7	6.2	139	318	2.3
875.6	0.393	17	3.6	84	278	1.7	5.7	6.6	128	318	1.3
876.3	0.393	20	3.9	86	306	2.7	5.7	7.0	131	350	2.0
877.0	0.393	19	3.7	77	281	2.7	5.7	6.8	118	322	2.0
877.7	0.393	20	3.5	76	286	2.8	5.7	6.4	116	328	2.0
878.4	0.393	20	4.3	86	307	4.3	5.7	7.8	132	351	3.1
879.1	0.393	20	3.1	84	256	2.8	5.7	5.6	128	293	2.0
879.8	0.393	19	3.3	84	273	2.5	5.7	6.1	128	313	1.8
880.5	0.393	19	3.4	79	282	2.9	5.7	6.2	122	323	2.1
881.2	0.393	21	4.1	84	285	2.0	5.7	7.6	129	326	1.4
881.9	0.398	19	3.5	76	248	2.6	5.7	6.3	117	284	1.9
882.6	0.467	19	3.1	76	265	4.7	6.7	5.6	117	303	3.4
883.3	0.393	22	3.3	86	301	3.9	5.7	6.0	132	344	2.8
884.0	0.548	24	3.5	79	263	4.1	7.9	6.3	122	301	3.0
884.7	0.393	22	3.1	75	247	4.1	5.7	5.7	115	282	3.0
885.4	0.393	19	3.0	69	244	2.6	5.7	5.4	106	279	1.9
886.1	0.393	18	3.1	64	258	2.1	5.7	5.6	98	294	1.5
886.8	0.393	20	2.6	67	244	1.8	5.7	4.8	103	280	1.3
887.5	0.452	24	3.0	72	240	2.4	6.5	5.4	110	275	1.7
888.2	0.394	23	2.4	68	242	2.7	5.7	4.3	105	277	2.0
888.9	0.393	18	2.2	66	224	2.2	5.7	4.0	100	256	1.6
889.6	0.393	21	2.7	65	222	2.8	5.7	5.0	99	254	2.1
890.3	0.393	20	2.8	57	250	1.4	5.7	5.2	88	286	1.0
891.0	0.393	20	2.4	67	218	2.2	5.7	4.4	102	249	1.6
891.7	0.393	23	1.7	57	245	2.3	5.7	3.1	87	280	1.7
892.4	0.393	18	2.3	57	203	2.6	5.7	4.3	88	232	1.9
893.1	0.393	24	2.7	62	243	1.8	5.7	4.9	95	278	1.3
893.8	0.393	25	2.3	60	279	2.3	5.7	4.2	92	319	1.7
894.4	0.393	24	2.2	63	295	1.6	5.7	4.0	97	338	1.2
895.1	0.393	25	2.6	57	233	3.0	5.7	4.7	88	266	2.2
895.8	0.393	21	1.9	53	218	2.4	5.7	3.4	81	250	1.7
896.5	0.410	26	1.8	50	282	1.6	5.9	3.3	76	322	1.2
897.2	0.484	22	1.9	57	270	2.6	7.0	3.4	87	309	1.9
897.9	0.393	20	1.8	45	227	2.1	5.7	3.3	70	260	1.5
898.6	0.393	24	2.0	46	241	1.8	5.7	3.7	70	276	1.3
899.3	0.393	21	2.0	49	251	2.8	5.7	3.6	75	287	2.1
900.0	0.395	23	1.5	50	275	1.9	5.7	2.7	76	314	1.4
900.7	0.509	22	1.8	48	246	2.2	7.3	3.4	73	281	1.6
901.4	0.393	22	1.7	47	249	2.0	5.7	3.2	72	284	1.5
902.1	0.393	23	1.5	45	257	2.6	5.7	2.7	70	294	1.9
902.8	0.393	22	1.4	43	227	2.1	5.7	2.6	66	260	1.5
903.5	0.393	22	1.4	43	258	1.3	5.7	2.5	66	295	0.973



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
904.2	0.444	23	1.9	43	277	2.8	6.4	3.5	67	317	2.1
904.9	0.393	23	1.5	48	255	1.2	5.7	2.8	73	291	0.861
905.6	0.393	22	1.2	39	250	2.2	5.7	2.1	60	286	1.6
906.3	0.393	20	1.2	40	246	2.1	5.7	2.1	61	281	1.5
907.0	0.393	20	1.7	40	261	2.4	5.7	3.1	61	298	1.7
907.7	0.601	23	1.3	45	289	2.4	8.7	2.4	69	330	1.7
908.4	0.393	21	1.3	38	254	2.7	5.7	2.3	58	290	2.0
909.1	0.587	18	1.3	40	253	2.0	8.5	2.4	61	290	1.5
909.8	0.429	20	1.1	42	273	1.4	6.2	2.0	65	313	1.000
910.5	0.393	19	1.2	34	233	2.6	5.7	2.2	52	267	1.9
911.2	0.454	19	1.1	37	246	2.0	6.6	2.1	57	282	1.4
911.9	0.393	20	1.1	37	238	2.3	5.7	2.0	57	273	1.7
912.6	0.393	18	0.742	36	252	1.6	5.7	1.4	55	289	1.2
913.3	0.393	18	0.583	42	255	1.5	5.7	1.1	64	291	1.1
914.0	0.393	16	1.1	34	241	1.5	5.7	2.0	52	276	1.1
914.7	0.393	18	0.718	34	258	2.4	5.7	1.3	52	295	1.7
915.4	0.609	18	1.1	37	257	1.9	8.8	1.9	57	294	1.4
916.1	0.393	17	0.682	35	292	1.7	5.7	1.2	53	334	1.2
916.8	0.393	17	1.2	35	270	1.6	5.7	2.1	54	309	1.2
917.5	0.831	19	0.753	34	262	1.8	12	1.4	51	299	1.3
918.2	0.496	22	1.3	33	252	1.7	7.2	2.3	51	288	1.2
918.9	0.393	16	0.928	34	281	1.8	5.7	1.7	53	321	1.3
919.6	0.559	16	0.692	33	261	1.2	8.1	1.3	51	299	0.891
920.3	0.393	17	0.614	32	265	2.3	5.7	1.1	49	303	1.7
920.9	0.393	17	0.975	32	251	1.4	5.7	1.8	50	287	1.0
921.6	0.393	17	0.595	32	239	2.9	5.7	1.1	50	273	2.1
922.3	0.393	18	0.870	27	249	2.1	5.7	1.6	42	284	1.5
923.0	0.393	18	0.819	31	288	1.9	5.7	1.5	47	330	1.4
923.7	0.492	19	0.678	30	257	2.0	7.1	1.2	46	294	1.5
924.4	0.393	18	0.982	29	260	2.7	5.7	1.8	45	298	2.0
925.1	0.393	17	0.684	28	255	2.2	5.7	1.2	43	292	1.6
925.8	0.550	16	0.783	32	288	2.3	7.9	1.4	49	330	1.7
926.5	0.450	17	0.699	32	278	2.2	6.5	1.3	49	318	1.6
927.2	0.393	17	0.702	28	264	1.5	5.7	1.3	43	301	1.1
927.9	0.393	19	1.1	27	235	2.7	5.7	2.1	41	268	1.9
928.6	0.393	15	0.676	28	281	1.5	5.7	1.2	43	321	1.1
929.3	0.479	15	0.644	30	274	1.9	6.9	1.2	46	313	1.4
930.0	0.393	16	0.530	31	268	2.3	5.7	0.966	47	306	1.7
930.7	0.393	16	0.547	26	241	1.7	5.7	0.998	40	276	1.2
931.4	0.393	18	0.711	26	266	2.5	5.7	1.3	40	305	1.8
932.1	0.393	17	0.726	25	266	3.4	5.7	1.3	38	304	2.5
932.8	0.393	17	0.600	24	267	2.0	5.7	1.1	38	305	1.4
933.5	0.393	18	0.856	32	271	1.3	5.7	1.6	49	310	0.978
934.2	0.443	15	0.787	23	261	1.9	6.4	1.4	35	298	1.4
934.9	0.393	15	0.586	22	256	1.8	5.7	1.1	34	293	1.3
935.6	0.468	18	0.703	22	267	2.1	6.8	1.3	34	306	1.6
936.3	0.393	17	0.668	23	237	2.3	5.7	1.2	36	271	1.7
937.0	0.404	19	0.575	25	276	3.0	5.8	1.0	38	316	2.2
937.7	0.393	22	1.0	25	276	3.2	5.7	1.8	38	316	2.4
938.4	0.393	21	0.646	26	259	2.6	5.7	1.2	40	296	1.9
939.1	0.393	18	0.283	22	257	1.8	5.7	0.517	33	294	1.3
939.8	0.393	20	0.502	24	313	2.4	5.7	0.916	37	357	1.8
940.5	0.393	22	0.651	25	300	2.9	5.7	1.2	38	343	2.1
941.2	0.540	26	0.558	24	311	2.5	7.8	1.0	37	356	1.8
941.9	0.393	22	0.923	27	275	3.1	5.7	1.7	41	315	2.3
942.6	0.393	24	0.959	22	276	3.2	5.7	1.7	34	315	2.4
943.3	0.393	26	0.677	23	317	2.4	5.7	1.2	35	362	1.8
944.0	0.393	28	0.698	21	326	3.2	5.7	1.3	33	373	2.3
944.7	0.393	30	0.964	25	315	3.8	5.7	1.8	38	360	2.7
945.4	0.644	31	0.818	27	308	3.2	9.3	1.5	41	352	2.4
946.1	0.393	33	0.923	25	318	4.3	5.7	1.7	38	364	3.1
946.7	0.403	34	0.977	31	297	4.7	5.8	1.8	47	339	3.5
947.4	0.393	34	0.834	27	280	3.2	5.7	1.5	42	320	2.3
948.1	0.661	33	0.772	25	282	4.2	9.5	1.4	39	323	3.1
948.8	0.393	36	0.975	29	280	3.4	5.7	1.8	44	321	2.5
949.5	0.393	36	0.941	31	282	3.6	5.7	1.7	47	322	2.7
950.2	0.393	36	1.0	35	274	4.3	5.7	1.9	54	313	3.1
950.9	0.552	35	1.3	37	277	4.0	8.0	2.3	56	317	2.9
951.6	0.393	32	0.846	38	290	3.5	5.7	1.5	59	332	2.6
952.3	0.393	28	1.1	45	332	5.8	5.7	2.1	69	379	4.2
953.0	0.393	32	1.4	36	274	4.0	5.7	2.5	55	313	2.9
953.7	0.393	33	1.0	46	303	4.4	5.7	1.8	71	347	3.2
954.4	0.439	26	1.2	39	273	4.4	6.3	2.3	60	313	3.2
955.1	0.393	28	1.5	41	292	4.9	5.7	2.7	63	333	3.6
955.8	0.393	26	1.1	39	293	4.6	5.7	1.9	60	335	3.4
956.5	0.705	31	1.4	46	283	4.9	10	2.5	70	324	3.6
957.2	0.393	31	1.4	53	317	6.5	5.7	2.6	81	362	4.8
957.9	0.393	29	1.0	54	308	5.7	5.7	1.8	82	352	4.2
958.6	0.439	28	1.5	49	303	5.3	6.3	2.7	75	346	3.9
959.3	0.393	23	1.4	47	331	5.6	5.7	2.5	72	378	4.1
960.0	0.393	25	1.4	50	296	5.6	5.7	2.5	76	339	4.1



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Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.7	0.393	26	1.4	50	286	5.7	5.7	2.5	77	327	4.1
961.4	0.393	18	1.4	43	245	5.0	5.7	2.5	65	280	3.7
962.1	0.457	24	1.8	49	310	7.2	6.6	3.2	75	355	5.3
962.8	0.393	23	1.8	45	275	7.8	5.7	3.3	70	315	5.7
963.5	0.393	28	2.3	50	255	6.7	5.7	4.2	77	292	4.9
964.2	0.792	26	1.5	55	306	7.3	11	2.7	85	350	5.3
964.9	0.393	20	2.1	50	287	9.7	5.7	3.9	77	328	7.1
965.6	0.588	24	1.9	51	259	6.8	8.5	3.5	78	296	4.9
966.3	0.393	23	1.6	52	283	9.5	5.7	3.0	80	324	6.9
967.0	0.393	27	1.5	61	304	9.7	5.7	2.8	94	348	7.1
967.7	0.399	23	1.8	49	300	8.5	5.8	3.3	75	343	6.2
968.4	0.514	23	1.3	53	303	8.5	7.4	2.4	81	346	6.2
969.1	0.393	25	1.9	56	299	7.6	5.7	3.4	85	342	5.5
969.8	0.393	26	2.1	62	309	10	5.7	3.8	94	354	7.3
970.5	0.393	25	1.6	60	270	10	5.7	2.9	92	308	7.5
971.2	0.393	22	1.8	66	317	9.5	5.7	3.3	101	363	7.0
971.8	0.513	19	1.6	57	353	9.3	7.4	2.9	88	403	6.8
972.5	0.393	23	1.6	61	317	8.9	5.7	2.9	93	363	6.5
973.2	0.673	21	1.5	70	311	11	9.7	2.7	107	356	7.7
973.9	0.393	23	1.5	59	312	8.7	5.7	2.7	90	356	6.4
974.6	0.393	19	1.6	58	275	7.8	5.7	3.0	89	315	5.7
975.3	0.424	20	1.6	54	317	7.0	6.1	2.9	82	362	5.1
976.0	0.393	23	1.9	66	301	8.2	5.7	3.4	102	345	6.0
976.7	0.393	24	1.7	70	292	7.2	5.7	3.1	108	334	5.3
977.4	0.646	20	1.2	56	279	7.7	9.3	2.2	85	319	5.6
978.1	0.393	21	1.6	66	296	7.6	5.7	3.0	100	339	5.6
978.8	0.393	20	0.998	59	288	6.0	5.7	1.8	90	329	4.4
979.5	0.393	23	1.2	78	298	5.7	5.7	2.2	119	340	4.1
980.2	0.393	22	1.5	74	295	4.4	5.7	2.8	114	337	3.2
980.9	0.393	21	1.1	76	328	3.9	5.7	2.0	116	375	2.8
981.6	0.876	22	1.3	74	290	4.6	13	2.4	114	331	3.3
982.3	0.548	24	1.4	73	303	4.3	7.9	2.5	112	346	3.2
983.0	0.711	24	1.6	70	337	5.3	10	2.9	107	385	3.9
983.7	0.597	23	1.4	73	287	4.5	8.6	2.5	113	328	3.3
984.4	0.393	21	1.4	77	280	3.1	5.7	2.6	118	320	2.2
985.1	0.393	23	1.6	68	307	3.5	5.7	3.0	105	352	2.5
985.8	0.442	21	1.3	74	308	2.5	6.4	2.4	113	352	1.9
986.5	0.507	26	1.6	65	302	3.7	7.3	2.9	100	345	2.7
987.2	0.393	24	1.4	78	330	2.6	5.7	2.6	119	377	1.9
987.9	0.718	24	1.3	78	300	3.1	10	2.4	119	344	2.3
988.6	0.393	22	1.4	80	345	3.2	5.7	2.5	122	395	2.4
989.3	0.393	22	1.3	71	332	3.8	5.7	2.3	109	380	2.8
990.0	0.393	25	1.7	89	323	3.1	5.7	3.2	136	369	2.2
990.7	0.457	23	2.0	70	296	2.9	6.6	3.6	108	338	2.1
991.4	0.393	26	2.1	85	336	3.3	5.7	3.8	131	384	2.4
992.1	0.393	23	2.1	79	331	3.7	5.7	3.7	121	379	2.7
992.8	0.568	26	1.7	89	367	3.5	8.2	3.0	136	419	2.6
993.5	0.620	32	1.8	90	374	4.1	9.0	3.3	139	428	3.0
994.2	0.393	29	2.2	92	358	2.8	5.7	4.1	141	409	2.1
994.9	0.393	27	2.5	78	326	2.5	5.7	4.5	120	373	1.8
995.6	0.393	26	1.7	78	354	2.6	5.7	3.0	119	405	1.9
996.3	0.393	30	2.7	88	388	3.5	5.7	5.0	135	444	2.5
997.0	0.393	26	2.0	91	390	2.6	5.7	3.7	139	446	1.9
997.7	0.393	26	2.0	85	357	3.2	5.7	3.6	130	408	2.3
998.4	0.554	25	2.1	87	343	3.6	8.0	3.8	133	392	2.6
999.0	0.714	26	2.1	90	367	3.2	10	3.9	138	420	2.3
999.7	0.393	30	2.8	95	414	3.5	5.7	5.0	145	474	2.5
1000.4	0.624	25	2.1	85	352	3.1	9.0	3.7	130	402	2.3
1001.1	0.393	25	2.5	92	372	4.3	5.7	4.5	141	425	3.1
1001.8	0.393	25	2.6	87	380	2.6	5.7	4.7	133	434	1.9
1002.5	0.393	29	2.3	85	379	3.0	5.7	4.1	130	434	2.2
1003.2	0.393	35	2.7	87	375	4.1	5.7	5.0	133	429	3.0
1003.9	0.393	28	2.8	81	406	3.1	5.7	5.1	124	464	2.3
1004.6	0.554	31	2.4	88	393	3.3	8.0	4.3	135	450	2.4
1005.3	0.450	27	2.4	82	326	2.9	6.5	4.3	126	372	2.1
1006.0	0.393	27	2.6	79	355	2.8	5.7	4.7	120	406	2.0
1006.7	0.393	25	2.4	87	318	2.4	5.7	4.4	134	364	1.8
1007.4	0.393	32	2.6	97	358	2.6	5.7	4.8	149	409	1.9
1008.1	0.646	27	2.0	82	369	3.0	9.3	3.7	125	422	2.2
1008.8	0.393	28	2.3	96	346	3.4	5.7	4.1	147	395	2.5
1009.5	0.393	29	2.2	86	364	3.9	5.7	4.0	131	416	2.9
1010.2	0.393	31	2.2	91	375	3.6	5.7	4.0	140	429	2.7
1010.9	0.393	27	2.5	97	366	3.0	5.7	4.5	149	418	2.2
1011.6	0.477	28	2.7	92	374	2.2	6.9	4.9	142	428	1.6
1012.3	0.393	29	2.6	89	383	2.7	5.7	4.7	136	438	2.0
1013.0	0.393	31	2.3	86	348	3.8	5.7	4.1	131	398	2.8
1013.7	0.521	28	2.3	95	349	2.9	7.5	4.1	145	399	2.2
1014.4	0.426	28	2.9	92	301	3.5	6.1	5.4	141	344	2.6
1015.1	0.393	30	2.5	87	337	3.1	5.7	4.5	133	386	2.3
1015.8	0.393	31	2.1	88	365	1.9	5.7	3.8	134	417	1.4
1016.5	0.535	28	2.1	88	319	2.5	7.7	3.8	135	364	1.9



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1017.2	0.393	34	2.5	91	302	2.7	5.7	4.5	139	345	1.9
1017.9	0.393	27	2.1	83	278	2.6	5.7	3.8	127	318	1.9
1018.6	0.393	30	2.6	84	293	2.8	5.7	4.8	129	335	2.0
1019.3	0.393	29	2.7	95	309	3.0	5.7	4.9	145	353	2.2
1020.0	0.963	32	2.7	92	365	2.5	14	4.9	141	417	1.8
1020.7	0.393	32	2.4	97	366	2.9	5.7	4.4	149	419	2.2
1021.4	0.393	27	3.1	96	306	2.8	5.7	5.6	147	350	2.1
1022.1	0.417	30	2.6	98	316	2.8	6.0	4.8	150	361	2.0
1022.8	0.393	28	2.4	85	289	2.1	5.7	4.4	130	330	1.5
1023.5	0.468	31	2.6	92	331	2.8	6.8	4.8	141	378	2.0
1024.2	0.393	29	2.6	100	316	2.4	5.7	4.7	153	361	1.7
1024.8	0.393	26	2.9	96	301	3.7	5.7	5.3	148	344	2.7
1025.5	0.393	30	3.2	98	321	2.8	5.7	5.8	150	367	2.0
1026.2	0.393	34	3.2	99	335	3.0	5.7	5.9	152	384	2.2
1026.9	0.393	31	2.9	101	309	2.5	5.7	5.3	155	354	1.9
1027.6	0.393	28	2.5	97	304	3.0	5.7	4.5	149	347	2.2
1028.3	0.393	28	3.1	93	285	2.1	5.7	5.6	142	326	1.5
1029.0	0.602	27	3.5	101	280	2.6	8.7	6.3	155	320	1.9
1029.7	0.393	31	2.7	90	297	2.5	5.7	4.9	138	339	1.8
1030.4	0.393	34	3.5	103	306	1.6	5.7	6.4	158	350	1.2
1031.1	0.393	28	3.4	98	345	3.2	5.7	6.2	150	394	2.3
1031.8	0.393	29	3.2	87	295	3.0	5.7	5.8	133	337	2.2
1032.5	0.393	31	3.0	94	328	4.6	5.7	5.4	144	375	3.4
1033.2	0.393	31	3.2	95	268	3.2	5.7	5.8	146	306	2.4
1033.9	0.393	28	3.8	103	270	3.0	5.7	6.9	157	309	2.2
1034.6	0.514	29	3.5	100	273	2.5	7.4	6.4	154	312	1.8
1035.3	0.393	28	3.8	91	243	2.7	5.7	7.0	140	278	2.0
1036.0	0.393	29	3.1	93	274	4.4	5.7	5.6	142	314	3.2
1036.7	0.393	29	3.3	85	261	3.8	5.7	6.0	130	298	2.7
1037.4	0.393	30	3.1	89	256	3.2	5.7	5.7	137	293	2.3
1038.1	0.393	36	3.2	88	262	3.4	5.7	5.8	135	300	2.5
1038.8	0.393	29	3.2	84	241	2.4	5.7	5.9	128	275	1.7
1039.5	0.393	29	2.6	90	251	2.2	5.7	4.8	138	287	1.6
1040.2	0.393	30	3.6	90	248	3.0	5.7	6.6	138	284	2.2
1040.9	0.393	31	2.8	94	246	3.5	5.7	5.1	144	282	2.6
1041.6	0.393	29	3.4	84	271	3.4	5.7	6.1	128	310	2.5
1042.3	0.565	32	3.2	90	265	3.6	8.2	5.8	137	303	2.6
1043.0	0.393	32	3.2	92	248	3.2	5.7	5.8	140	283	2.3
1043.7	0.393	28	3.6	91	246	3.1	5.7	6.6	139	281	2.3
1044.4	0.464	29	3.1	95	266	3.9	6.7	5.7	145	305	2.9
1045.1	0.393	27	3.2	92	252	5.4	5.7	5.9	141	288	3.9
1045.8	0.393	26	2.6	84	253	3.4	5.7	4.8	129	289	2.5
1046.5	0.477	28	3.0	86	264	3.5	6.9	5.4	132	302	2.5
1047.2	0.393	29	2.8	80	275	3.9	5.7	5.1	123	314	2.8
1047.9	0.393	29	3.1	84	278	3.7	5.7	5.7	129	318	2.7
1048.6	0.437	26	2.8	77	256	2.7	6.3	5.2	119	293	1.9
1049.3	0.393	28	2.7	82	287	2.5	5.7	5.0	126	328	1.8
1050.0	0.393	30	2.7	81	274	3.7	5.7	5.0	125	313	2.7
1050.6	0.393	31	3.0	89	267	3.9	5.7	5.5	137	305	2.8
1051.3	0.393	31	2.6	77	219	2.7	5.7	4.7	117	250	2.0
1052.0	0.393	30	2.6	78	257	3.3	5.7	4.7	120	294	2.4
1052.7	0.393	31	2.6	81	242	3.4	5.7	4.7	125	276	2.5
1053.4	0.393	29	2.3	79	229	3.6	5.7	4.2	121	262	2.6
1054.1	0.517	30	2.6	81	226	2.5	7.5	4.8	124	259	1.9
1054.8	0.393	27	1.7	88	246	3.8	5.7	3.1	136	281	2.8
1055.5	0.414	29	2.0	74	244	2.1	6.0	3.7	113	280	1.5
1056.2	0.393	32	2.4	78	252	3.4	5.7	4.4	120	288	2.5
1056.9	0.393	37	2.6	78	262	3.8	5.7	4.8	120	300	2.8
1057.6	0.717	30	3.0	77	235	3.3	10	5.5	118	269	2.4
1058.3	0.393	30	2.3	70	253	4.1	5.7	4.2	107	290	3.0
1059.0	0.489	30	2.4	75	246	3.7	7.1	4.4	115	282	2.7
1059.7	0.393	35	2.1	69	283	3.8	5.7	3.7	105	324	2.7
1060.4	0.393	32	2.3	71	253	2.8	5.7	4.3	109	289	2.0
1061.1	0.393	33	2.4	71	239	4.2	5.7	4.5	108	273	3.1
1061.8	0.393	31	2.0	67	250	2.2	5.7	3.6	102	286	1.6
1062.5	0.393	31	2.0	66	234	3.3	5.7	3.7	102	268	2.4
1063.2	0.508	34	2.0	69	253	3.4	7.3	3.6	106	290	2.5
1063.9	0.393	27	1.9	61	232	3.8	5.7	3.4	93	265	2.7
1064.6	0.393	27	1.7	51	223	1.7	5.7	3.0	79	255	1.2
1065.3	0.774	28	1.3	60	256	2.4	11	2.4	92	293	1.8
1066.0	0.393	31	1.5	64	273	3.3	5.7	2.7	99	312	2.4
1066.7	0.408	31	1.5	59	267	3.8	5.9	2.7	90	305	2.8
1067.4	0.393	32	1.7	63	287	4.2	5.7	3.1	96	328	3.1
1068.1	0.393	27	1.1	58	243	3.1	5.7	2.0	88	278	2.3
1068.8	0.393	30	2.3	53	256	5.2	5.7	4.2	82	293	3.8
1069.5	0.393	29	1.7	58	258	4.4	5.7	3.1	89	295	3.2
1070.2	0.477	26	1.1	57	276	5.2	6.9	1.9	87	316	3.8
1070.9	0.393	25	0.958	56	256	4.9	5.7	1.7	85	292	3.6
1071.6	0.393	21	1.2	47	240	4.4	5.7	2.2	72	274	3.2
1072.3	0.499	25	1.5	56	275	4.6	7.2	2.7	86	315	3.3
1073.0	0.393	26	1.4	53	250	3.1	5.7	2.6	81	286	2.2



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.7	0.393	25	1.3	55	250	5.1	5.7	2.4	85	286	3.7
1074.4	0.393	22	1.3	51	246	4.0	5.7	2.4	78	281	3.0
1075.1	0.393	21	1.3	47	298	3.7	5.7	2.4	72	341	2.7
1075.8	0.393	23	1.1	52	256	4.7	5.7	2.0	80	293	3.4
1076.5	0.393	24	1.2	51	290	3.8	5.7	2.3	78	331	2.8
1077.1	0.393	18	1.1	53	258	2.8	5.7	2.0	81	295	2.0
1077.8	0.449	19	0.952	44	284	4.6	6.5	1.7	68	325	3.4
1078.5	0.393	22	0.907	44	277	3.6	5.7	1.7	68	316	2.6
1079.2	0.393	18	1.4	44	240	4.9	5.7	2.5	67	275	3.5
1079.9	0.393	21	0.863	50	239	4.2	5.7	1.6	77	273	3.1
1080.6	0.512	21	0.901	44	269	4.6	7.4	1.6	67	308	3.3
1081.3	0.393	23	0.906	48	279	7.0	5.7	1.7	73	319	5.1
1082.0	0.393	21	1.3	45	290	5.0	5.7	2.4	68	332	3.6
1082.7	0.393	19	0.991	41	265	4.8	5.7	1.8	62	303	3.5
1083.4	0.393	17	1.3	48	281	4.7	5.7	2.4	73	322	3.4
1084.1	0.393	16	1.1	44	256	5.9	5.7	2.0	67	292	4.3
1084.8	0.393	18	0.922	46	282	5.8	5.7	1.7	71	323	4.2
1085.5	0.595	16	0.713	42	254	5.4	8.6	1.3	64	290	4.0
1086.2	0.393	18	1.1	38	254	4.7	5.7	2.0	58	290	3.4
1086.9	0.463	15	0.933	39	282	4.7	6.7	1.7	60	322	3.4
1087.6	0.393	16	0.600	36	314	3.6	5.7	1.1	55	360	2.7
1088.3	0.393	15	1.2	40	285	5.4	5.7	2.2	61	326	4.0
1089.0	0.393	17	1.3	35	301	7.0	5.7	2.4	53	344	5.1
1089.7	0.431	18	1.1	33	322	6.4	6.2	2.0	51	369	4.7
1090.4	0.393	17	0.880	38	303	4.8	5.7	1.6	58	347	3.5
1091.1	0.393	16	0.793	31	277	5.5	5.7	1.4	47	317	4.0
1091.8	0.393	19	0.652	36	306	6.6	5.7	1.2	54	350	4.8
1092.5	0.393	15	0.937	33	258	5.9	5.7	1.7	51	295	4.3
1093.2	0.393	16	0.637	31	270	6.2	5.7	1.2	48	309	4.5
1093.9	0.428	14	0.641	33	274	5.2	6.2	1.2	50	313	3.8
1094.6	0.655	16	0.982	30	284	4.9	9.5	1.8	47	325	3.6
1095.3	0.432	18	0.870	33	290	6.0	6.2	1.6	51	331	4.4
1096.0	0.419	17	0.867	34	305	7.0	6.0	1.6	52	349	5.1
1096.7	0.393	20	0.695	30	311	7.0	5.7	1.3	47	356	5.1
1097.4	0.393	18	1.1	31	308	6.4	5.7	2.0	48	352	4.7
1098.1	0.393	20	0.819	29	299	7.2	5.7	1.5	45	342	5.3
1098.8	0.393	17	0.784	28	297	5.4	5.7	1.4	44	339	3.9
1099.5	0.393	19	1.0	30	297	5.8	5.7	1.9	46	339	4.2
1100.2	0.393	18	1.0	34	290	8.4	5.7	1.8	52	331	6.1
1100.9	0.599	17	0.692	36	315	8.0	8.6	1.3	56	360	5.8
1101.6	0.393	19	0.723	35	297	7.2	5.7	1.3	54	340	5.3
1102.3	0.404	19	0.885	34	299	8.9	5.8	1.6	52	342	6.5
1103.0	0.393	18	0.593	36	274	8.0	5.7	1.1	55	313	5.8
1103.6	0.393	19	0.900	32	282	6.8	5.7	1.6	49	323	5.0
1104.3	0.617	18	0.865	40	352	9.3	8.9	1.6	62	403	6.8
1105.0	0.393	23	1.2	43	321	7.8	5.7	2.1	66	367	5.7
1105.7	0.393	22	1.1	40	339	9.6	5.7	2.1	61	388	7.0
1106.4	0.393	24	1.1	39	345	9.1	5.7	2.0	60	394	6.6
1107.1	0.393	20	1.1	37	289	8.7	5.7	2.1	57	331	6.3
1107.8	0.524	20	1.1	39	292	6.9	7.6	2.0	60	334	5.0
1108.5	0.891	20	1.0	42	318	8.9	13	1.8	65	363	6.5
1109.2	0.393	19	1.1	40	304	8.9	5.7	2.0	61	348	6.5
1109.9	0.393	21	0.778	39	290	8.7	5.7	1.4	59	332	6.3
1110.6	0.393	21	1.1	44	314	9.5	5.7	2.0	67	359	7.0
1111.3	0.489	23	1.2	50	310	8.6	7.1	2.2	77	354	6.3
1112.0	0.393	21	1.1	44	314	12	5.7	2.1	68	359	8.6
1112.7	0.735	21	1.2	46	305	11	11	2.2	70	349	8.3
1113.4	0.393	23	1.4	45	303	9.3	5.7	2.6	70	347	6.8
1114.1	0.398	21	1.0	46	304	9.5	5.8	1.8	70	348	6.9
1114.8	0.393	20	1.2	52	297	11	5.7	2.2	79	339	7.7
1115.5	0.575	25	1.3	54	301	12	8.3	2.3	83	344	8.5
1116.2	0.393	24	1.2	58	304	11	5.7	2.2	89	348	8.0
1116.9	0.393	20	1.2	46	278	9.3	5.7	2.2	70	318	6.8
1117.6	0.393	24	1.3	53	303	9.7	5.7	2.4	81	346	7.1
1118.3	0.393	19	1.3	59	300	12	5.7	2.4	90	343	8.8
1119.0	0.393	21	1.4	61	313	11	5.7	2.5	94	358	8.0
1119.7	0.442	22	1.3	59	302	12	6.4	2.4	90	346	8.9
1120.4	0.623	20	1.2	56	318	13	9.0	2.2	87	364	9.1
1121.1	0.393	24	1.7	63	340	14	5.7	3.1	96	388	11
1121.8	0.420	25	1.3	63	361	12	6.1	2.4	97	413	8.9
1122.5	0.393	23	1.4	68	315	13	5.7	2.6	105	360	9.5
1123.2	0.393	23	1.2	65	293	9.8	5.7	2.3	100	335	7.2
1123.9	0.393	24	1.7	65	354	13	5.7	3.2	99	405	9.7
1124.6	0.402	22	1.5	58	312	13	5.8	2.7	88	357	9.8
1125.3	0.393	21	1.6	64	319	15	5.7	3.0	98	365	11
1126.0	0.713	24	1.5	64	304	14	10	2.7	99	348	10
1126.7	0.605	22	1.5	54	297	13	8.7	2.7	82	339	9.4
1127.4	0.393	22	1.5	56	275	14	5.7	2.8	86	315	10
1128.1	0.393	20	1.4	55	293	13	5.7	2.5	84	335	9.5
1128.8	0.393	22	1.6	59	287	15	5.7	3.0	90	329	11
1129.5	0.393	22	2.1	62	304	15	5.7	3.8	94	348	11



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1130.1	0.393	24	1.5	59	312	16	5.7	2.7	90	357	12
1130.8	0.393	25	1.6	67	304	15	5.7	3.0	102	348	11
1131.5	0.863	22	1.2	59	302	17	12	2.2	90	346	12
1132.2	0.393	25	1.7	65	313	12	5.7	3.1	99	358	8.9
1132.9	0.393	24	1.7	70	315	16	5.7	3.1	107	360	12
1133.6	0.523	23	1.8	61	294	14	7.5	3.4	93	337	10.0
1134.3	0.393	23	1.7	67	320	15	5.7	3.1	102	366	11
1135.0	0.393	23	1.2	58	291	14	5.7	2.2	90	332	10
1135.7	0.393	24	1.8	69	335	18	5.7	3.3	106	383	13
1136.4	0.393	27	1.4	67	311	17	5.7	2.6	103	356	12
1137.1	0.393	26	1.6	64	331	17	5.7	2.9	99	378	12
1137.8	0.393	21	1.5	62	329	15	5.7	2.8	96	376	11
1138.5	0.393	26	1.6	62	320	14	5.7	3.0	96	366	10
1139.2	0.393	26	1.6	68	331	18	5.7	3.0	105	378	13
1139.9	0.393	27	1.8	64	330	16	5.7	3.2	98	377	12
1140.6	0.393	24	1.8	71	299	15	5.7	3.3	109	342	11
1141.3	0.632	23	1.2	64	311	18	9.1	2.2	98	356	13
1142.0	0.393	22	1.2	74	298	17	5.7	2.2	113	340	13
1142.7	0.393	25	1.3	69	326	22	5.7	2.3	106	373	16
1143.4	0.509	22	1.7	65	305	15	7.3	3.0	100	349	11
1144.1	0.393	24	1.6	62	325	19	5.7	2.8	95	372	14
1144.8	0.393	23	1.4	72	299	19	5.7	2.5	110	342	14
1145.5	0.393	28	1.6	71	345	17	5.7	2.8	109	395	12
1146.2	0.393	26	1.5	67	315	19	5.7	2.8	103	361	14
1146.9	0.393	25	1.7	69	353	20	5.7	3.1	106	403	15
1147.6	0.393	26	1.6	78	386	19	5.7	3.0	120	441	14
1148.3	0.393	26	1.6	71	354	23	5.7	3.0	108	405	17
1149.0	0.393	25	1.6	70	312	22	5.7	2.8	107	357	16
1149.7	0.393	25	2.0	82	372	23	5.7	3.6	125	426	17
1150.4	0.666	25	1.8	71	366	20	9.6	3.4	109	418	14
1151.1	0.393	22	1.9	73	320	20	5.7	3.4	112	366	14
1151.8	0.393	26	1.8	74	389	24	5.7	3.2	114	445	17
1152.5	0.740	25	1.9	80	335	20	11	3.5	123	383	15
1153.2	0.393	27	1.6	72	351	22	5.7	3.0	110	401	16
1153.9	0.393	22	1.8	70	320	20	5.7	3.2	107	366	14
1154.6	0.393	21	1.6	69	355	21	5.7	2.9	106	406	15
1155.3	0.393	23	1.7	74	323	17	5.7	3.0	114	369	12
1156.0	0.393	24	2.4	69	354	20	5.7	4.4	105	405	14
1156.6	0.393	26	1.6	76	333	15	5.7	3.0	117	381	11
1157.3	0.393	23	1.6	82	358	19	5.7	3.0	126	409	14
1158.0	0.447	23	1.7	72	326	17	6.4	3.1	111	372	12
1158.7	0.502	20	1.7	82	370	16	7.3	3.0	125	423	12
1159.4	0.393	23	2.0	80	330	16	5.7	3.6	123	377	12
1160.1	0.393	24	1.4	81	348	18	5.7	2.5	124	398	13
1160.8	0.644	23	2.2	80	360	17	9.3	4.1	122	412	13
1161.5	0.393	24	1.8	70	330	18	5.7	3.2	108	378	13
1162.2	0.996	24	1.9	71	321	17	14	3.4	109	367	13
1162.9	0.393	23	1.7	81	320	15	5.7	3.2	124	366	11
1163.6	0.393	23	1.8	93	365	17	5.7	3.3	143	417	13
1164.3	0.393	21	1.7	73	354	16	5.7	3.0	112	404	12
1165.0	0.393	23	1.7	74	333	16	5.7	3.1	113	381	12
1165.7	0.393	26	2.1	83	351	18	5.7	3.9	128	401	13
1166.4	0.393	25	2.2	93	375	17	5.7	4.0	142	429	12
1167.1	0.393	24	1.7	79	337	13	5.7	3.0	121	386	9.7
1167.8	0.393	22	1.3	79	339	15	5.7	2.4	121	388	11
1168.5	0.549	22	2.2	83	375	18	7.9	4.0	128	429	13
1169.2	0.393	27	2.2	88	347	16	5.7	4.0	135	397	12
1169.9	0.480	21	2.4	76	369	19	6.9	4.3	116	422	14
1170.6	0.393	24	2.2	73	351	16	5.7	4.1	112	401	11
1171.3	0.393	27	2.2	83	356	17	5.7	4.0	128	407	12
1172.0	0.393	25	1.8	82	354	14	5.7	3.2	125	404	10
1172.7	0.726	26	1.8	85	336	16	10	3.2	131	384	11
1173.4	0.393	23	1.7	74	301	13	5.7	3.0	114	345	9.3
1174.1	0.393	23	1.9	75	319	16	5.7	3.4	115	365	12
1174.8	0.531	22	1.9	92	340	17	7.7	3.5	142	389	12
1175.5	0.393	28	1.2	91	364	15	5.7	2.3	139	416	11
1176.2	0.393	22	2.0	86	311	14	5.7	3.7	131	356	11
1176.9	0.393	24	1.6	80	348	10	5.7	2.9	122	398	7.4
1177.6	0.674	26	2.1	83	359	13	9.7	3.8	128	411	9.1
1178.3	0.393	25	2.2	88	352	14	5.7	4.0	135	402	9.9
1179.0	0.393	25	1.9	86	297	13	5.7	3.5	131	339	9.3
1179.7	0.393	22	2.1	81	319	11	5.7	3.8	125	365	7.9
1180.4	0.393	22	1.9	85	317	13	5.7	3.5	130	362	9.3
1181.1	0.393	24	2.4	92	311	12	5.7	4.4	142	356	9.1
1181.8	0.610	27	2.3	100	345	15	8.8	4.2	154	394	11
1182.5	0.677	26	2.0	95	315	13	9.8	3.7	146	361	9.7
1183.1	0.746	27	2.0	81	345	12	11	3.6	124	395	8.9
1183.8	0.393	27	1.6	98	337	15	5.7	2.9	151	385	11
1184.5	0.393	25	1.8	90	363	13	5.7	3.3	138	415	9.4
1185.2	0.393	24	1.9	81	336	10	5.7	3.5	124	385	7.4
1185.9	0.415	26	2.0	87	292	13	6.0	3.7	133	334	9.2



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Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1186.6	0.393	24	2.0	99	349	14	5.7	3.7	152	399	10
1187.3	0.393	24	2.0	92	294	13	5.7	3.6	142	336	9.8
1188.0	0.393	23	2.4	106	313	14	5.7	4.4	163	358	11
1188.7	0.438	25	2.0	93	320	14	6.3	3.7	142	366	10
1189.4	0.393	26	2.4	96	287	9.7	5.7	4.3	148	328	7.1
1190.1	0.393	24	1.9	91	302	11	5.7	3.4	140	345	8.3
1190.8	0.393	27	2.1	106	393	13	5.7	3.7	163	449	9.6
1191.5	0.393	25	2.5	94	337	12	5.7	4.5	144	386	9.0
1192.2	0.393	25	2.3	95	296	11	5.7	4.1	146	338	7.8
1192.9	0.491	24	2.7	90	298	12	7.1	4.9	139	341	9.0
1193.6	0.393	22	2.1	97	299	11	5.7	3.8	148	342	8.3
1194.3	0.603	24	3.3	97	377	13	8.7	6.0	148	431	9.6
1195.0	0.450	23	2.5	116	330	14	6.5	4.6	178	378	9.9
1195.7	0.578	23	2.6	107	323	14	8.3	4.7	164	370	10
1196.4	0.393	22	2.3	99	279	12	5.7	4.2	152	319	8.7
1197.1	0.393	24	2.8	95	311	15	5.7	5.2	145	356	11
1197.8	0.393	22	2.9	96	311	12	5.7	5.4	147	355	8.5
1198.5	0.393	23	2.3	104	296	12	5.7	4.1	159	338	8.5
1199.2	0.393	24	2.1	94	303	11	5.7	3.8	144	347	7.8
1199.9	0.393	29	2.7	99	322	11	5.7	4.9	152	369	7.8
1200.6	0.393	24	2.3	93	293	6.5	5.7	4.2	142	335	4.8
1201.3	0.393	21	2.3	101	315	8.8	5.7	4.1	155	360	6.4
1202.0	0.490	23	2.3	98	291	8.0	7.1	4.2	151	333	5.9
1202.7	0.393	24	2.5	94	299	9.9	5.7	4.6	145	342	7.2
1203.4	0.393	23	2.5	105	329	10	5.7	4.6	161	377	7.6
1204.1	0.393	26	2.1	107	305	8.7	5.7	3.9	164	349	6.4
1204.8	0.393	22	2.7	103	289	8.8	5.7	4.9	158	330	6.4
1205.5	0.393	24	2.8	118	321	11	5.7	5.2	181	367	8.1
1206.2	0.393	22	3.0	98	296	6.3	5.7	5.5	151	338	4.6
1206.9	0.393	21	2.4	90	270	4.6	5.7	4.3	137	309	3.4
1207.6	0.393	22	3.0	104	292	7.6	5.7	5.4	160	333	5.6
1208.3	0.393	24	2.5	120	280	5.9	5.7	4.6	185	320	4.3
1209.0	0.393	23	2.8	119	266	7.0	5.7	5.1	182	304	5.1
1209.6	0.393	21	2.7	107	303	6.5	5.7	4.8	165	347	4.8
1210.3	0.393	25	2.9	99	267	7.5	5.7	5.3	152	306	5.5
1211.0	0.393	22	2.8	99	297	7.8	5.7	5.1	152	339	5.7
1211.7	0.393	23	2.9	98	279	6.6	5.7	5.4	150	319	4.8
1212.4	0.393	21	2.5	112	267	8.0	5.7	4.6	172	306	5.8
1213.1	0.393	23	2.6	106	267	7.7	5.7	4.7	162	305	5.6
1213.8	0.671	24	2.9	112	270	5.8	9.7	5.2	171	308	4.2
1214.5	0.472	25	2.7	107	270	7.1	6.8	4.9	164	309	5.2
1215.2	0.478	20	2.9	110	295	4.7	6.9	5.2	168	337	3.4
1215.9	0.433	20	2.2	96	263	4.9	6.3	4.1	148	301	3.6
1216.6	0.393	23	2.7	108	296	4.8	5.7	4.9	165	338	3.5
1217.3	0.393	25	3.0	106	268	7.3	5.7	5.5	162	306	5.3
1218.0	0.405	22	3.0	107	275	7.0	5.8	5.4	164	314	5.1
1218.7	0.393	25	2.8	124	265	3.9	5.7	5.1	189	303	2.9
1219.4	0.393	19	3.0	104	259	4.0	5.7	5.5	159	296	2.9
1220.1	0.393	23	2.8	106	261	5.6	5.7	5.2	162	299	4.1
1220.8	0.393	22	2.9	107	259	4.5	5.7	5.4	164	296	3.3
1221.5	0.452	22	2.7	108	309	4.8	6.5	4.9	165	354	3.5
1222.2	0.393	22	3.3	113	297	4.7	5.7	6.0	173	339	3.4
1222.9	0.471	21	3.0	107	251	3.1	6.8	5.4	164	287	2.3
1223.6	0.393	22	2.4	110	274	4.9	5.7	4.3	168	313	3.6
1224.3	0.393	21	3.0	101	267	3.9	5.7	5.4	155	306	2.9
1225.0	0.393	23	2.9	118	285	4.8	5.7	5.2	180	326	3.5
1225.7	0.393	22	3.1	101	244	3.6	5.7	5.6	155	278	2.7
1226.4	0.393	22	2.4	106	233	2.9	5.7	4.4	163	266	2.1
1227.1	0.393	21	2.4	104	228	3.0	5.7	4.5	159	261	2.2
1227.8	0.393	24	3.3	105	251	4.1	5.7	6.1	160	287	3.0
1228.5	0.393	21	3.3	106	254	5.9	5.7	6.1	163	291	4.3
1229.2	0.397	20	2.7	100	246	3.5	5.7	4.9	153	281	2.6
1229.9	0.393	22	2.7	109	265	5.6	5.7	4.9	166	303	4.1
1230.6	0.393	20	2.5	108	258	4.4	5.7	4.6	165	295	3.2
1231.3	0.393	25	2.2	115	254	4.8	5.7	4.1	176	290	3.5
1232.0	0.510	20	2.5	105	227	3.1	7.4	4.6	160	259	2.3
1232.7	0.393	20	2.6	115	235	2.7	5.7	4.7	177	269	1.9
1233.4	0.544	19	2.9	111	250	3.5	7.9	5.2	170	286	2.6
1234.1	0.393	19	2.5	107	236	4.1	5.7	4.5	164	269	3.0
1234.7	0.413	21	2.6	112	238	3.5	6.0	4.8	172	272	2.5
1235.4	0.393	20	3.5	107	237	4.6	5.7	6.5	165	271	3.4
1236.1	0.393	21	2.4	99	224	4.8	5.7	4.3	151	256	3.5
1236.8	0.415	19	2.7	103	236	3.6	6.0	4.9	158	270	2.6
1237.5	0.393	21	2.5	116	234	3.9	5.7	4.5	177	268	2.8
1238.2	0.393	21	2.6	113	233	5.0	5.7	4.8	173	266	3.6
1238.9	0.591	18	2.9	118	233	2.3	8.5	5.2	181	267	1.7
1239.6	0.393	20	2.6	111	229	3.9	5.7	4.7	170	262	2.8
1240.3	0.393	18	2.8	107	223	3.1	5.7	5.1	163	255	2.2
1241.0	0.393	22	3.0	119	244	4.1	5.7	5.4	183	279	3.0
1241.7	0.393	18	2.9	119	225	3.9	5.7	5.4	182	257	2.8
1242.4	0.393	22	2.7	104	220	2.1	5.7	5.0	159	251	1.5



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Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1243.1	0.393	20	2.7	109	215	3.3	5.7	4.9	167	246	2.4
1243.8	0.393	19	3.0	112	232	2.9	5.7	5.5	172	265	2.2
1244.5	0.393	21	2.9	126	249	3.6	5.7	5.2	193	285	2.7
1245.2	0.393	20	3.2	109	222	4.1	5.7	5.8	168	253	3.0
1245.9	0.393	19	2.6	111	227	3.7	5.7	4.8	170	259	2.7
1246.6	0.550	19	2.3	116	252	3.0	7.9	4.3	177	288	2.2
1247.3	0.710	20	2.9	111	216	3.2	10	5.2	170	246	2.4
1248.0	0.490	19	2.9	109	210	2.7	7.1	5.3	167	241	2.0
1248.7	0.393	20	2.9	118	222	3.0	5.7	5.2	180	254	2.2
1249.4	0.393	19	3.2	125	229	2.9	5.7	5.9	192	262	2.1
1250.1	0.393	19	2.9	114	229	2.9	5.7	5.3	175	262	2.1
1250.8	0.393	18	2.8	105	219	2.8	5.7	5.2	161	251	2.0
1251.5	0.393	19	3.1	115	244	2.3	5.7	5.6	176	279	1.7
1252.2	0.704	18	2.9	103	213	2.4	10	5.3	157	244	1.7
1252.9	0.393	20	2.5	106	237	4.3	5.7	4.6	162	271	3.1
1253.6	0.393	18	3.5	119	233	2.7	5.7	6.3	183	266	2.0
1254.3	0.551	21	3.2	123	299	3.1	8.0	5.9	188	342	2.3
1255.0	0.393	21	2.7	105	227	2.1	5.7	5.0	161	260	1.5
1255.7	0.393	21	2.9	115	240	4.2	5.7	5.4	176	274	3.1
1256.4	0.515	22	3.2	116	230	3.2	7.4	5.8	177	263	2.4
1257.1	0.615	19	2.5	97	217	2.1	8.9	4.5	149	249	1.5
1257.8	0.393	21	3.3	106	232	2.4	5.7	6.0	163	265	1.7
1258.5	0.393	21	3.3	108	217	3.2	5.7	6.1	166	248	2.3
1259.2	0.393	24	3.7	102	223	2.9	5.7	6.8	157	255	2.1
1259.9	0.393	18	3.3	103	227	2.2	5.7	6.1	159	260	1.6
1260.5	0.393	18	2.7	102	267	3.9	5.7	5.0	157	306	2.9
1261.2	0.393	23	2.7	106	227	3.0	5.7	5.0	163	260	2.2
1261.9	0.609	20	2.8	105	215	3.1	8.8	5.2	161	246	2.2
1262.6	0.393	20	2.7	97	214	2.7	5.7	4.9	149	245	2.0
1263.3	0.393	20	2.8	94	212	3.1	5.7	5.0	145	242	2.3
1264.0	0.393	20	3.2	108	228	2.9	5.7	5.9	166	260	2.1
1264.7	0.393	21	2.9	112	253	3.3	5.7	5.3	171	289	2.4
1265.4	0.393	22	3.0	93	225	3.3	5.7	5.6	142	257	2.4
1266.1	0.393	21	3.0	97	264	2.5	5.7	5.5	149	302	1.8
1266.8	0.393	20	3.0	101	235	3.3	5.7	5.5	155	269	2.4
1267.5	0.393	19	2.9	96	222	2.8	5.7	5.2	147	254	2.1
1268.2	0.393	22	3.4	99	267	3.2	5.7	6.1	152	306	2.4
1268.9	0.449	23	2.7	102	229	3.3	6.5	4.9	156	262	2.4
1269.6	0.393	21	1.8	80	201	3.0	5.7	3.2	122	230	2.2
1270.3	0.506	21	2.8	100	291	3.7	7.3	5.0	154	333	2.7
1271.0	0.393	23	2.4	99	246	3.0	5.7	4.3	152	281	2.2
1271.7	0.393	22	2.8	90	285	2.9	5.7	5.1	138	326	2.1
1272.4	0.393	22	2.5	106	282	3.7	5.7	4.6	162	322	2.7
1273.1	0.393	18	2.3	98	210	2.6	5.7	4.1	150	240	1.9
1273.8	0.393	20	2.8	101	227	3.2	5.7	5.0	154	259	2.4
1274.5	0.393	21	3.2	97	264	2.9	5.7	5.8	149	302	2.1
1275.2	0.393	21	2.4	96	236	2.6	5.7	4.3	148	269	1.9
1275.9	0.393	21	2.8	104	260	3.1	5.7	5.1	159	297	2.3
1276.6	0.652	18	2.7	101	232	2.9	9.4	4.9	155	266	2.1
1277.3	0.393	20	2.6	102	261	3.6	5.7	4.7	157	298	2.7
1278.0	0.393	19	2.6	101	238	3.3	5.7	4.8	154	272	2.4
1278.7	0.393	20	3.6	99	279	3.7	5.7	6.6	152	319	2.7
1279.4	0.393	17	3.2	100	233	4.4	5.7	5.9	154	266	3.2
1280.1	0.393	21	2.5	103	250	3.3	5.7	4.5	158	286	2.4
1280.8	0.796	19	2.8	102	259	2.7	11	5.1	157	296	2.0
1281.5	0.393	18	3.2	101	248	4.3	5.7	5.8	154	284	3.2
1282.2	0.393	21	2.3	96	254	3.0	5.7	4.3	147	290	2.2
1282.9	0.479	16	3.1	107	237	3.1	6.9	5.6	163	271	2.3
1283.6	0.393	18	3.3	88	238	3.3	5.7	6.0	135	272	2.4
1284.3	0.393	17	3.1	94	255	2.6	5.7	5.6	145	292	1.9
1285.0	0.393	21	2.8	102	234	4.7	5.7	5.1	156	268	3.4
1285.7	0.393	20	3.3	117	265	3.3	5.7	5.9	179	303	2.4
1286.4	0.635	20	3.0	95	227	3.6	9.2	5.4	145	260	2.6
1287.0	0.393	20	2.2	103	245	3.5	5.7	3.9	157	280	2.6
1287.7	0.393	17	3.0	102	248	4.6	5.7	5.4	156	284	3.4
1288.4	0.502	20	2.8	104	268	3.2	7.3	5.1	160	306	2.3
1289.1	0.393	24	2.8	100	267	3.8	5.7	5.1	154	305	2.8
1289.8	0.551	20	2.2	103	246	3.9	8.0	4.0	157	281	2.9
1290.5	0.393	19	3.0	110	263	3.2	5.7	5.5	169	301	2.3
1291.2	0.393	19	3.0	110	264	4.5	5.7	5.5	168	302	3.3
1291.9	0.393	21	2.6	109	256	4.0	5.7	4.7	167	293	2.9
1292.6	0.651	17	2.6	105	279	3.9	9.4	4.7	161	319	2.8
1293.3	0.393	21	2.6	92	255	3.4	5.7	4.7	141	291	2.5
1294.0	0.393	20	3.1	114	257	3.2	5.7	5.6	174	294	2.3
1294.7	0.411	19	2.4	100	257	3.4	5.9	4.4	154	293	2.5
1295.4	0.393	22	2.7	105	267	3.2	5.7	4.9	161	305	2.3
1296.1	0.393	17	2.8	99	252	3.5	5.7	5.1	152	288	2.5
1296.8	0.393	18	2.7	102	250	3.3	5.7	4.9	157	286	2.4
1297.5	0.393	20	2.5	96	278	4.6	5.7	4.6	148	317	3.4
1298.2	0.393	17	2.7	105	252	4.5	5.7	4.9	161	288	3.3
1298.9	0.393	17	2.8	92	258	4.5	5.7	5.0	140	295	3.3



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Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1299.6	0.443	21	2.9	113	261	5.0	6.4	5.4	173	298	3.6
1300.3	0.430	17	2.7	97	280	4.3	6.2	4.9	149	320	3.1
1301.0	0.393	19	2.7	115	283	3.9	5.7	5.0	177	324	2.8
1301.7	0.395	17	2.3	93	251	3.2	5.7	4.2	143	287	2.4
1302.4	0.393	20	1.9	96	270	3.6	5.7	3.4	148	309	2.6
1303.1	0.393	17	2.2	91	250	3.7	5.7	4.1	139	285	2.7
1303.8	0.393	18	2.4	98	270	2.7	5.7	4.3	150	309	2.0
1304.5	0.939	19	2.7	101	248	2.3	14	4.9	154	284	1.7
1305.2	0.393	17	2.0	91	257	4.5	5.7	3.7	139	294	3.3
1305.9	0.393	19	2.7	108	257	5.0	5.7	5.0	166	294	3.7
1306.6	0.393	18	2.8	91	258	3.6	5.7	5.0	140	295	2.6
1307.3	0.393	21	2.9	102	298	3.2	5.7	5.3	156	341	2.3
1308.0	0.393	18	2.2	111	293	3.8	5.7	4.1	171	335	2.8
1308.7	0.393	21	2.4	97	255	3.5	5.7	4.3	149	291	2.5
1309.4	0.393	20	2.6	103	261	3.8	5.7	4.8	157	299	2.8
1310.1	0.721	17	3.0	101	263	4.1	10	5.5	155	301	3.0
1310.8	0.393	19	2.8	102	266	3.9	5.7	5.2	157	304	2.8
1311.5	0.548	21	2.9	111	252	4.2	7.9	5.4	170	288	3.1
1312.2	0.393	20	2.8	93	292	2.4	5.7	5.2	143	334	1.8
1312.8	0.393	20	2.9	92	244	2.6	5.7	5.3	141	279	1.9
1313.5	0.393	19	2.4	91	257	4.0	5.7	4.3	140	294	2.9
1314.2	0.590	18	2.7	102	243	2.0	8.5	4.8	156	278	1.4
1314.9	0.393	18	2.7	95	269	4.6	5.7	4.9	146	308	3.4
1315.6	0.537	19	2.7	103	274	4.0	7.7	4.8	157	313	2.9
1316.3	0.393	17	2.6	88	241	3.8	5.7	4.7	135	275	2.8
1317.0	0.393	16	2.5	87	276	3.3	5.7	4.6	134	316	2.4
1317.7	0.393	19	2.2	98	249	4.3	5.7	4.0	151	285	3.1
1318.4	0.875	17	2.8	91	279	4.2	13	5.2	139	319	3.1
1319.1	0.651	18	2.7	89	261	4.3	9.4	4.9	136	299	3.2
1319.8	0.393	17	2.7	99	276	3.3	5.7	5.0	151	316	2.4
1320.5	0.427	17	2.4	101	268	5.0	6.2	4.3	155	307	3.6
1321.2	0.393	18	2.5	91	286	3.9	5.7	4.5	140	327	2.9
1321.9	0.393	18	2.6	92	248	4.5	5.7	4.7	142	284	3.3
1322.6	0.393	19	2.4	107	279	4.6	5.7	4.3	165	319	3.4
1323.3	0.427	19	2.4	84	258	3.8	6.2	4.4	129	295	2.8
1324.0	0.393	18	2.4	85	252	3.6	5.7	4.3	131	288	2.6
1324.7	0.393	20	2.7	92	304	4.0	5.7	4.9	141	347	2.9
1325.4	0.393	19	3.0	91	240	3.5	5.7	5.5	140	274	2.6
1326.1	0.473	17	2.6	104	283	4.0	6.8	4.7	159	323	2.9
1326.8	0.393	20	2.5	95	290	4.2	5.7	4.5	146	332	3.0
1327.5	0.393	18	2.8	96	301	5.0	5.7	5.1	148	344	3.6
1328.2	0.393	17	2.1	90	254	4.2	5.7	3.9	139	291	3.1
1328.9	0.393	18	2.7	93	278	3.4	5.7	5.0	142	317	2.5
1329.6	0.393	18	2.2	89	275	3.4	5.7	4.1	137	315	2.5
1330.3	0.393	18	3.2	88	285	3.6	5.7	5.9	134	326	2.6
1331.0	0.393	17	2.7	104	308	5.1	5.7	4.9	159	353	3.7
1331.7	0.393	19	2.8	91	295	4.2	5.7	5.1	140	337	3.1
1332.4	0.393	19	2.2	97	278	4.3	5.7	4.1	149	318	3.1
1333.1	0.393	21	2.9	95	276	4.1	5.7	5.4	145	315	3.0
1333.8	0.393	18	2.3	91	289	3.8	5.7	4.1	139	330	2.8
1334.5	0.393	20	2.8	93	269	3.5	5.7	5.0	142	308	2.6
1335.2	0.393	19	2.2	90	278	3.1	5.7	4.1	138	318	2.3
1335.9	0.393	19	2.1	94	269	5.5	5.7	3.9	144	307	4.0
1336.6	0.393	20	3.1	91	321	3.5	5.7	5.6	140	367	2.6
1337.3	0.393	20	2.7	94	298	4.6	5.7	4.9	143	340	3.4
1338.0	0.393	20	2.7	100	260	4.4	5.7	5.0	153	298	3.2
1338.7	0.481	19	2.6	94	274	4.3	6.9	4.7	144	314	3.1
1339.3	0.393	17	2.6	91	308	5.4	5.7	4.7	140	353	4.0
1340.0	0.435	19	2.5	76	263	4.9	6.3	4.5	117	301	3.6
1340.7	0.393	18	2.2	85	290	4.6	5.7	4.0	130	332	3.4
1341.4	0.393	17	2.7	88	252	4.0	5.7	4.9	135	288	2.9
1342.1	0.466	21	2.1	96	296	5.3	6.7	3.8	148	338	3.9
1342.8	0.393	19	3.0	81	273	3.3	5.7	5.4	124	312	2.4
1343.5	0.393	17	2.2	81	260	3.0	5.7	4.1	124	298	2.2
1344.2	0.684	18	2.9	100	261	3.7	9.9	5.3	153	298	2.7
1344.9	0.393	20	2.8	99	279	3.6	5.7	5.2	152	320	2.6
1345.6	0.393	18	2.2	86	269	5.2	5.7	4.0	132	307	3.8
1346.3	0.514	19	2.6	88	299	3.9	7.4	4.8	135	342	2.9
1347.0	0.517	22	2.6	82	263	3.7	7.5	4.8	126	300	2.7
1347.7	0.393	20	2.3	92	292	4.6	5.7	4.2	141	334	3.4
1348.4	0.393	20	2.3	92	252	5.1	5.7	4.2	141	288	3.7
1349.1	0.393	15	2.0	80	265	4.6	5.7	3.7	123	303	3.3
1349.8	0.393	16	2.5	79	259	4.8	5.7	4.6	121	296	3.5
1350.5	0.393	20	2.6	94	309	4.0	5.7	4.8	143	353	2.9
1351.2	0.393	19	2.7	86	254	4.1	5.7	4.9	132	290	3.0
1351.9	0.393	18	2.4	95	262	5.1	5.7	4.3	145	300	3.7
1352.6	0.393	19	2.5	82	288	4.6	5.7	4.6	126	329	3.3
1353.3	0.393	19	2.4	86	278	3.8	5.7	4.5	132	318	2.8
1354.0	0.393	23	2.5	90	280	4.6	5.7	4.6	138	321	3.4
1354.7	0.393	22	2.8	92	298	5.8	5.7	5.0	141	341	4.2
1355.4	0.393	19	2.7	92	286	5.3	5.7	4.9	142	327	3.8



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1356.1	0.393	17	2.7	83	270	4.5	5.7	4.8	127	309	3.3
1356.8	0.393	24	2.4	89	269	5.5	5.7	4.5	137	307	4.0
1357.5	0.394	17	2.4	90	295	5.4	5.7	4.4	137	338	3.9
1358.2	0.436	19	2.5	91	312	4.3	6.3	4.5	140	357	3.1
1358.9	0.837	22	2.1	87	292	5.3	12	3.8	134	334	3.9
1359.6	0.393	18	2.5	86	278	7.1	5.7	4.5	132	318	5.2
1360.3	0.393	15	2.7	80	274	4.4	5.7	5.0	123	313	3.2
1361.0	0.393	18	2.9	88	290	5.6	5.7	5.2	134	331	4.1
1361.7	0.393	21	2.1	84	267	3.1	5.7	3.8	129	305	2.2
1362.4	0.393	22	2.4	98	308	4.9	5.7	4.3	150	352	3.6
1363.1	0.393	18	2.5	82	272	4.8	5.7	4.6	126	311	3.5
1363.8	0.512	21	2.3	89	291	5.3	7.4	4.2	137	333	3.9
1364.5	0.393	21	2.9	90	286	5.4	5.7	5.2	137	328	4.0
1365.1	0.626	20	2.2	87	327	6.7	9.0	4.0	134	374	4.9
1365.8	0.393	19	2.7	78	270	4.6	5.7	4.8	119	309	3.4
1366.5	0.452	20	2.9	87	307	5.4	6.5	5.3	133	351	3.9
1367.2	0.554	20	2.6	85	322	4.6	8.0	4.7	130	369	3.4
1367.9	0.393	19	2.2	92	290	5.8	5.7	4.1	142	332	4.2
1368.6	0.393	22	2.5	94	296	6.4	5.7	4.5	144	338	4.7
1369.3	0.393	21	2.4	95	304	5.0	5.7	4.4	146	348	3.6
1370.0	0.598	19	2.4	89	304	5.6	8.6	4.4	136	347	4.1
1370.7	0.393	20	3.0	101	274	5.4	5.7	5.4	155	313	3.9
1371.4	0.393	20	3.0	93	320	6.4	5.7	5.5	143	366	4.7
1372.1	0.393	15	2.1	74	226	3.3	5.7	3.9	114	259	2.4
1372.8	0.508	17	2.5	89	305	5.0	7.3	4.6	136	349	3.7
1373.5	0.393	19	2.4	94	321	7.3	5.7	4.3	144	367	5.3
1374.2	0.393	22	3.2	98	271	4.5	5.7	5.8	151	309	3.3
1374.9	0.408	22	3.1	84	265	6.7	5.9	5.6	129	303	4.9
1375.6	0.393	20	3.1	88	289	6.1	5.7	5.6	135	331	4.5
1376.3	0.393	20	2.3	97	283	5.2	5.7	4.2	148	324	3.8
1377.0	0.450	21	2.6	88	327	5.8	6.5	4.7	135	374	4.2
1377.7	0.393	20	2.6	81	258	5.9	5.7	4.8	124	295	4.3
1378.4	0.393	23	2.1	80	274	5.2	5.7	3.8	122	313	3.8
1379.1	0.393	20	2.2	89	278	5.3	5.7	4.1	136	318	3.9
1379.8	0.393	21	3.0	87	263	4.6	5.7	5.4	134	300	3.4
1380.5	0.393	21	2.4	91	295	6.1	5.7	4.5	140	337	4.5
1381.2	0.393	22	2.6	99	282	5.0	5.7	4.8	151	323	3.6
1381.9	0.393	21	2.3	99	317	3.7	5.7	4.2	152	363	2.7
1382.6	0.405	19	2.4	98	283	4.9	5.8	4.4	150	323	3.5
1383.3	0.393	20	2.6	92	287	6.1	5.7	4.7	140	328	4.4
1384.0	0.393	22	3.0	95	272	6.4	5.7	5.5	146	310	4.6
1384.7	0.746	20	2.5	81	280	5.7	11	4.6	124	321	4.2
1385.4	0.417	21	2.2	91	310	7.2	6.0	4.1	140	355	5.2
1386.1	0.822	18	2.5	91	278	6.3	12	4.5	140	318	4.6
1386.8	0.393	22	2.7	95	299	5.9	5.7	4.9	145	342	4.3
1387.5	0.518	20	2.7	96	280	6.5	7.5	5.0	147	321	4.8
1388.2	0.393	25	3.0	109	313	6.1	5.7	5.6	167	358	4.5
1388.9	0.393	20	2.8	87	258	5.8	5.7	5.1	134	295	4.3
1389.6	0.393	20	2.7	102	293	5.0	5.7	4.9	157	335	3.6
1390.3	0.393	19	2.4	88	301	4.7	5.7	4.3	135	344	3.4
1391.0	0.393	22	2.4	91	274	6.1	5.7	4.3	139	313	4.4
1391.6	0.393	22	2.2	89	297	4.4	5.7	4.0	137	340	3.2
1392.3	0.393	21	2.3	91	289	5.3	5.7	4.1	139	330	3.8
1393.0	0.393	19	3.0	94	275	6.2	5.7	5.4	144	315	4.5
1393.7	0.393	23	2.1	99	261	5.3	5.7	3.8	152	298	3.9
1394.4	0.393	20	2.4	92	276	6.5	5.7	4.4	140	315	4.8
1395.1	0.393	23	2.9	97	308	6.7	5.7	5.3	149	352	4.9
1395.8	0.393	20	1.9	100	302	7.4	5.7	3.6	153	345	5.4
1396.5	0.393	23	2.5	101	307	5.5	5.7	4.6	154	351	4.0
1397.2	0.393	21	2.3	94	297	4.8	5.7	4.2	145	339	3.5
1397.9	0.393	22	2.4	97	265	4.8	5.7	4.5	148	303	3.5
1398.6	0.393	19	2.8	97	289	5.3	5.7	5.2	149	330	3.9
1399.3	0.768	17	2.8	97	280	5.5	11	5.1	149	320	4.0
1400.0	0.393	21	2.5	99	283	5.1	5.7	4.6	151	324	3.7
1400.7	0.393	20	2.9	99	293	6.7	5.7	5.4	151	336	4.9
1401.4	0.393	20	2.7	86	289	4.8	5.7	4.9	132	331	3.5
1402.1	0.393	21	2.9	103	274	5.0	5.7	5.4	158	314	3.7
1402.8	0.393	19	2.2	91	278	6.4	5.7	3.9	140	318	4.7
1403.5	0.393	24	2.8	99	275	6.0	5.7	5.1	151	315	4.4
1404.2	0.393	22	2.2	95	263	5.8	5.7	4.1	145	301	4.2
1404.9	0.393	24	2.7	106	323	5.8	5.7	4.9	162	370	4.2
1405.6	0.393	24	2.4	86	272	6.4	5.7	4.3	132	311	4.7
1406.3	0.393	20	2.4	99	289	5.7	5.7	4.4	152	330	4.2
1407.0	0.393	18	2.3	94	271	5.0	5.7	4.2	144	310	3.6
1407.7	0.393	22	2.7	92	277	5.5	5.7	5.0	141	317	4.0
1408.4	0.393	19	2.6	108	319	4.7	5.7	4.8	165	365	3.4
1409.1	0.393	20	2.6	99	290	6.0	5.7	4.8	152	332	4.4
1409.8	0.515	22	2.8	97	327	6.3	7.4	5.1	149	374	4.6
1410.5	0.393	19	2.2	91	251	5.0	5.7	4.0	139	287	3.6
1411.2	0.393	20	2.6	95	302	7.5	5.7	4.7	145	346	5.5
1411.9	0.393	20	2.7	101	325	5.6	5.7	4.9	155	372	4.1



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1412.6	1.2	21	2.9	93	328	5.8	17	5.4	142	375	4.2
1413.3	0.393	22	2.5	84	269	4.8	5.7	4.5	129	308	3.5
1414.0	0.504	23	3.0	98	306	4.6	7.3	5.4	150	349	3.4
1414.7	0.493	19	2.5	97	292	6.3	7.1	4.6	149	333	4.6
1415.4	0.393	20	3.1	102	317	6.2	5.7	5.6	156	363	4.6
1416.1	0.393	19	2.7	86	265	3.9	5.7	5.0	132	303	2.9
1416.8	0.401	22	3.1	97	294	5.6	5.8	5.6	149	336	4.1
1417.5	0.393	23	3.3	104	305	5.2	5.7	5.9	159	349	3.8
1418.2	0.627	25	2.7	92	298	6.3	9.0	4.9	141	341	4.6
1418.8	0.393	20	2.7	95	268	3.3	5.7	5.0	145	307	2.4
1419.5	0.412	23	2.5	93	247	4.7	6.0	4.6	142	283	3.5
1420.2	0.667	23	2.7	88	294	3.1	9.6	5.0	134	336	2.3
1420.9	0.393	22	2.8	94	250	3.4	5.7	5.2	144	286	2.5
1421.6	0.393	21	2.3	89	238	3.7	5.7	4.2	136	272	2.7
1422.3	0.393	21	2.7	88	246	3.3	5.7	5.0	135	281	2.4
1423.0	0.393	25	3.1	77	263	3.4	5.7	5.6	118	300	2.4
1423.7	0.393	30	2.4	84	242	3.8	5.7	4.4	128	277	2.8
1424.4	0.715	26	2.6	80	249	3.6	10	4.8	123	285	2.6
1425.1	0.562	27	2.9	70	229	2.0	8.1	5.3	108	261	1.4
1425.8	0.393	23	2.3	70	261	2.8	5.7	4.2	108	298	2.0
1426.5	0.757	26	2.6	74	296	3.4	11	4.7	113	338	2.5
1427.2	0.484	27	2.8	77	270	2.9	7.0	5.1	118	309	2.1
1427.9	0.565	27	2.4	73	267	4.0	8.1	4.4	112	305	2.9
1428.6	0.460	25	2.4	64	287	3.8	6.6	4.3	98	329	2.8
1429.3	0.393	28	2.7	62	282	3.9	5.7	5.0	95	323	2.8
1430.0	0.678	27	2.8	74	335	4.8	9.8	5.2	113	383	3.5
1430.7	0.496	26	2.7	63	316	4.4	7.2	4.9	97	361	3.2
1431.4	0.432	25	2.3	70	280	4.9	6.2	4.1	107	321	3.6
1432.1	0.474	24	2.2	70	355	5.3	6.8	4.1	108	406	3.9
1432.8	0.616	23	2.3	65	359	5.8	8.9	4.2	100	410	4.2
1433.5	0.393	25	2.9	65	330	4.7	5.7	5.2	99	378	3.5
1434.2	0.476	24	2.3	61	305	5.6	6.9	4.2	93	349	4.1
1434.9	0.393	24	1.9	66	334	4.6	5.7	3.5	101	382	3.4
1435.6	0.393	26	2.4	63	326	4.3	5.7	4.4	97	373	3.2
1436.3	0.518	21	2.8	69	322	5.5	7.5	5.0	105	368	4.0
1437.0	0.495	23	2.2	68	341	5.2	7.1	4.1	104	390	3.8
1437.7	0.637	26	3.1	67	343	5.4	9.2	5.6	103	392	4.0
1438.4	0.443	22	2.3	70	360	5.4	6.4	4.1	108	412	3.9
1439.1	0.588	22	2.3	73	350	6.1	8.5	4.1	112	401	4.5
1439.8	0.393	22	2.4	70	339	5.5	5.7	4.3	107	387	4.0
1440.5	0.519	21	2.7	81	348	7.8	7.5	4.9	124	398	5.7
1441.2	0.393	18	2.4	69	336	4.2	5.7	4.3	106	384	3.1
1441.9	0.393	22	2.3	71	307	4.1	5.7	4.2	109	351	3.0
1442.6	0.544	23	2.2	86	313	5.3	7.9	4.0	131	358	3.9
1443.3	0.393	25	3.1	104	357	8.2	5.7	5.6	159	408	5.9
1444.0	0.393	25	2.8	83	324	5.6	5.7	5.0	127	371	4.1
1444.7	0.393	23	2.6	82	289	4.4	5.7	4.7	126	330	3.2
1445.3	0.393	22	2.8	80	338	4.5	5.7	5.1	123	386	3.3
1446.0	0.393	20	2.9	83	304	5.6	5.7	5.2	127	348	4.1
1446.7	0.570	20	2.8	86	295	4.7	8.2	5.2	132	337	3.5
1447.4	0.393	19	2.2	80	296	6.3	5.7	4.1	123	339	4.6
1448.1	0.393	20	2.9	87	286	4.9	5.7	5.2	134	327	3.6
1448.8	0.393	23	2.8	94	349	9.4	5.7	5.2	144	399	6.9
1449.5	0.724	23	3.1	87	291	6.4	10	5.7	133	333	4.6
1450.2	0.393	24	2.3	84	280	5.4	5.7	4.2	128	320	3.9
1450.9	0.604	21	2.2	98	286	5.4	8.7	4.1	150	327	3.9
1451.6	0.393	21	2.7	95	277	4.1	5.7	4.9	145	317	3.0
1452.3	0.393	23	2.7	84	296	6.3	5.7	5.0	129	338	4.6
1453.0	0.393	22	2.2	75	287	7.5	5.7	4.0	114	328	5.5
1453.7	0.529	21	2.2	82	298	6.8	7.6	4.0	126	341	4.9
1454.4	0.614	21	2.4	86	300	5.4	8.9	4.3	131	343	3.9
1455.1	0.581	19	3.2	83	295	6.7	8.4	5.9	127	338	4.9
1455.8	0.393	18	2.7	90	331	7.0	5.7	4.8	138	378	5.1
1456.5	0.393	21	2.7	89	325	8.0	5.7	5.0	137	371	5.8
1457.2	0.861	24	2.7	91	281	6.9	12	4.8	140	322	5.1
1457.9	0.393	22	2.3	94	309	5.6	5.7	4.2	144	353	4.1
1458.6	0.393	20	2.6	90	300	7.4	5.7	4.7	139	343	5.4
1459.3	0.473	18	2.4	87	306	6.4	6.8	4.4	133	350	4.7
1460.0	0.393	19	2.7	87	278	6.6	5.7	4.9	133	318	4.8
1460.7	0.393	19	2.1	81	290	6.4	5.7	3.9	123	331	4.7
1461.4	0.919	19	2.8	92	311	7.5	13	5.2	142	356	5.5
1462.1	0.393	17	2.8	91	297	6.0	5.7	5.0	140	339	4.4
1462.8	0.430	17	2.3	88	317	6.4	6.2	4.3	135	363	4.7
1463.5	0.393	19	2.9	98	291	6.7	5.7	5.2	151	332	4.9
1464.2	0.655	21	2.7	91	314	8.1	9.5	5.0	140	359	5.9
1464.9	0.393	20	2.8	95	330	9.7	5.7	5.1	146	378	7.0
1465.6	0.393	17	2.7	89	279	7.5	5.7	5.0	136	319	5.5
1466.3	0.429	20	2.2	99	313	7.4	6.2	4.1	152	358	5.4
1467.0	0.393	19	2.9	91	291	8.6	5.7	5.4	139	333	6.3
1467.7	0.393	18	2.5	96	308	8.5	5.7	4.6	147	352	6.2
1468.4	0.393	20	2.8	88	308	8.5	5.7	5.1	135	352	6.2



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1469.1	0.393	19	2.8	93	288	6.3	5.7	5.1	143	329	4.6
1469.8	0.557	21	2.6	97	356	7.8	8.0	4.7	148	407	5.7
1470.5	0.393	18	2.3	92	284	6.5	5.7	4.3	140	324	4.8
1471.1	0.452	20	2.8	85	292	7.8	6.5	5.1	130	334	5.7
1471.8	0.393	19	2.7	90	304	7.6	5.7	5.0	138	348	5.6
1472.5	0.588	19	3.1	83	288	7.3	8.5	5.6	127	329	5.3
1473.2	0.393	23	2.9	88	303	11	5.7	5.2	135	346	8.3
1473.9	0.393	17	2.7	84	310	7.5	5.7	5.0	129	354	5.5
1474.6	0.393	17	2.7	88	278	6.0	5.7	4.9	136	317	4.4
1475.3	0.393	20	2.6	92	306	7.9	5.7	4.8	141	350	5.8
1476.0	0.666	18	2.7	88	310	9.7	9.6	5.0	135	354	7.1
1476.7	0.393	18	2.4	83	293	8.2	5.7	4.4	127	335	6.0
1477.4	0.393	20	2.7	91	341	9.4	5.7	5.0	140	390	6.9
1478.1	0.393	17	2.5	85	328	9.8	5.7	4.5	130	375	7.1
1478.8	0.393	20	2.4	95	327	11	5.7	4.3	146	374	8.2
1479.5	0.393	20	2.9	88	323	8.4	5.7	5.3	135	370	6.1
1480.2	0.393	17	2.4	81	294	8.2	5.7	4.4	124	337	6.0
1480.9	0.393	21	3.1	92	338	9.2	5.7	5.6	141	387	6.7
1481.6	0.393	22	2.6	89	329	11	5.7	4.8	136	376	7.9
1482.3	0.443	19	2.7	93	359	11	6.4	5.0	142	410	7.9
1483.0	0.393	20	2.9	88	338	12	5.7	5.3	136	386	8.7
1483.7	0.393	17	2.1	78	288	11	5.7	3.7	120	329	7.7
1484.4	0.393	16	2.7	81	305	9.5	5.7	4.9	124	349	6.9
1485.1	0.393	17	2.5	95	365	9.7	5.7	4.6	145	417	7.0
1485.8	0.393	20	2.7	85	315	11	5.7	5.0	130	360	8.0
1486.5	0.393	19	2.2	92	336	11	5.7	3.9	141	385	7.7
1487.2	0.393	17	2.5	93	340	11	5.7	4.5	143	388	7.7
1487.9	0.393	17	2.6	85	340	12	5.7	4.8	131	389	8.5
1488.6	0.393	18	2.6	81	318	14	5.7	4.7	124	364	10
1489.3	0.393	23	2.4	83	312	12	5.7	4.4	128	356	8.6
1490.0	0.393	20	1.9	84	331	13	5.7	3.5	129	379	9.4
1490.7	0.393	19	2.4	92	346	11	5.7	4.4	141	395	8.2
1491.4	0.393	21	3.4	94	328	11	5.7	6.1	144	375	7.8
1492.1	0.393	17	1.9	87	311	11	5.7	3.5	133	355	7.9
1492.8	0.393	17	2.2	85	327	9.6	5.7	4.0	130	374	7.0
1493.5	0.393	16	2.4	91	346	13	5.7	4.4	140	396	9.8
1494.2	0.393	18	2.4	78	313	12	5.7	4.3	120	358	8.4
1494.9	0.393	16	2.3	78	284	9.5	5.7	4.2	119	325	6.9
1495.6	0.469	16	2.0	84	356	11	6.8	3.6	129	407	7.8
1496.3	0.396	19	2.3	88	335	12	5.7	4.1	135	383	8.7
1497.0	0.393	20	1.8	85	330	12	5.7	3.4	130	377	9.0
1497.6	0.393	19	1.9	87	321	13	5.7	3.5	133	367	9.3
1498.3	0.393	16	2.6	74	306	12	5.7	4.7	113	350	8.5
1499.0	0.924	20	3.2	86	310	14	13	5.8	131	354	10
1499.7	0.570	21	2.7	85	359	14	8.2	5.0	130	411	10
1500.4	0.393	18	2.2	86	325	15	5.7	4.0	133	371	11
1501.1	0.393	13	1.8	79	327	14	5.7	3.2	121	374	11
1501.8	0.393	19	1.9	84	318	13	5.7	3.6	128	363	9.8
1502.5	0.468	19	2.4	91	361	13	6.7	4.4	139	412	9.8
1503.2	0.393	20	2.0	91	342	13	5.7	3.7	139	391	9.7
1503.9	0.527	18	2.2	82	309	12	7.6	4.1	126	353	8.8
1504.6	0.393	16	2.2	74	320	11	5.7	4.0	113	366	8.2
1505.3	0.393	18	2.1	87	363	11	5.7	3.8	133	416	7.9
1506.0	0.393	18	2.4	84	360	12	5.7	4.4	129	412	8.9
1506.7	0.459	20	1.4	77	334	9.1	6.6	2.6	118	382	6.7
1507.4	0.393	19	2.3	82	312	11	5.7	4.2	126	357	8.2
1508.1	0.393	19	2.8	84	318	12	5.7	5.0	128	364	8.6
1508.8	0.393	19	2.3	83	333	13	5.7	4.1	126	381	9.2
1509.5	0.393	17	2.1	84	328	11	5.7	3.9	129	376	8.4
1510.2	0.393	19	2.0	81	342	11	5.7	3.7	124	391	8.2
1510.9	0.393	19	2.0	83	304	10.0	5.7	3.6	127	347	7.3
1511.6	0.453	17	2.1	87	361	13	6.5	3.9	133	412	9.4
1512.3	0.393	17	2.5	88	337	9.0	5.7	4.5	135	385	6.6
1513.0	0.393	20	2.0	80	327	11	5.7	3.6	123	374	7.7
1513.7	0.393	17	2.4	85	312	12	5.7	4.3	130	357	8.5
1514.4	0.393	17	1.9	83	386	11	5.7	3.4	127	441	7.8
1515.1	0.465	16	2.3	84	321	11	6.7	4.1	128	367	7.9
1515.8	0.393	18	2.7	87	331	11	5.7	4.9	133	379	8.3
1516.5	0.393	17	2.4	82	314	9.4	5.7	4.4	126	359	6.8
1517.2	0.393	18	2.4	91	306	11	5.7	4.4	139	349	7.8
1517.9	0.393	16	2.4	87	336	12	5.7	4.4	134	384	8.7
1518.6	0.393	19	2.5	84	347	12	5.7	4.5	129	396	8.7
1519.3	0.393	21	2.2	84	350	14	5.7	4.1	129	400	9.9
1520.0	0.393	19	2.1	77	303	11	5.7	3.9	117	347	8.3
1520.7	0.393	18	2.1	82	328	9.3	5.7	3.8	125	375	6.8
1521.4	0.393	20	2.3	81	341	9.9	5.7	4.1	125	390	7.2
1522.1	0.393	17	2.5	77	322	11	5.7	4.6	118	368	7.7
1522.8	0.460	17	2.2	90	318	11	6.6	4.0	139	363	7.7
1523.4	0.393	18	2.2	88	331	11	5.7	3.9	134	379	8.0
1524.1	0.393	18	2.2	88	340	13	5.7	4.0	134	389	9.5
1524.8	0.393	18	2.0	84	318	9.7	5.7	3.6	129	364	7.1



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Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1525.5	0.393	18	1.8	78	312	12	5.7	3.3	120	357	8.8
1526.2	0.812	16	2.2	81	325	11	12	4.1	125	371	8.3
1526.9	0.393	17	2.2	75	282	8.9	5.7	4.0	114	322	6.5
1527.6	0.393	17	2.0	74	301	9.1	5.7	3.7	113	345	6.7
1528.3	0.641	15	2.2	75	303	8.6	9.2	4.0	115	346	6.2
1529.0	0.393	20	1.8	85	295	9.7	5.7	3.4	130	338	7.1
1529.7	0.624	17	2.3	81	321	9.0	9.0	4.1	124	367	6.6
1530.4	0.393	18	2.3	86	315	10	5.7	4.2	131	360	7.6
1531.1	0.393	18	2.0	78	289	10.0	5.7	3.7	119	330	7.3
1531.8	0.393	18	1.9	83	315	10	5.7	3.5	128	361	7.6
1532.5	0.393	18	2.7	89	338	10	5.7	5.0	136	387	7.5
1533.2	0.393	21	2.0	86	389	9.7	5.7	3.6	132	445	7.1
1533.9	0.393	18	2.1	83	315	10	5.7	3.8	127	360	7.4
1534.6	0.393	18	1.7	77	333	11	5.7	3.0	118	381	8.3
1535.3	0.393	17	1.8	71	309	9.8	5.7	3.2	108	353	7.2
1536.0	0.393	21	2.5	80	356	9.4	5.7	4.5	123	407	6.9
1536.7	0.968	19	2.7	84	359	11	14	4.9	128	411	7.9
1537.4	0.393	19	2.3	79	318	8.2	5.7	4.1	121	364	6.0
1538.1	0.393	20	2.3	80	289	9.3	5.7	4.2	123	330	6.8
1538.8	0.393	21	2.7	87	347	12	5.7	4.9	134	397	8.5
1539.5	0.393	20	2.2	87	319	9.2	5.7	4.0	133	364	6.7
1540.2	0.393	21	2.2	89	308	9.0	5.7	4.1	137	352	6.5
1540.9	0.393	19	2.4	90	323	8.6	5.7	4.4	138	369	6.3
1541.6	0.393	17	2.4	76	303	11	5.7	4.3	117	347	7.9
1542.3	0.393	21	2.4	96	369	7.3	5.7	4.4	147	422	5.4
1543.0	0.393	19	2.0	91	379	8.5	5.7	3.7	139	433	6.2
1543.7	0.393	19	2.1	86	330	8.5	5.7	3.9	132	377	6.2
1544.4	0.393	20	2.4	84	306	6.6	5.7	4.4	129	350	4.8
1545.1	0.393	17	2.4	81	326	8.1	5.7	4.4	124	373	5.9
1545.8	0.393	21	3.0	89	326	10	5.7	5.5	136	372	7.6
1546.5	0.393	20	2.4	97	349	8.0	5.7	4.5	149	399	5.8
1547.2	0.393	20	2.5	84	313	7.6	5.7	4.5	129	358	5.6
1547.9	0.558	18	2.5	85	331	6.3	8.1	4.5	131	378	4.6
1548.6	0.393	18	2.2	88	310	7.1	5.7	4.0	135	354	5.2
1549.3	0.393	19	2.1	92	313	7.8	5.7	3.7	141	358	5.7
1550.0	0.393	17	2.5	82	311	6.3	5.7	4.5	126	356	4.6
1550.6	0.393	15	2.2	90	288	8.1	5.7	4.0	138	329	5.9
1551.3	0.393	18	2.7	91	302	8.4	5.7	4.9	140	345	6.2
1552.0	0.393	18	2.3	100	330	7.6	5.7	4.2	153	377	5.5
1552.7	0.393	18	2.3	95	328	8.7	5.7	4.1	145	376	6.4
1553.4	0.393	20	2.1	94	296	7.2	5.7	3.8	144	339	5.3
1554.1	0.393	17	2.6	91	311	5.7	5.7	4.7	139	356	4.2
1554.8	0.393	16	2.7	91	331	8.0	5.7	5.0	139	378	5.8
1555.5	0.393	17	3.0	85	278	5.3	5.7	5.4	130	318	3.8
1556.2	0.393	19	2.8	105	305	5.7	5.7	5.1	161	349	4.1
1556.9	0.393	22	2.3	95	307	8.3	5.7	4.2	145	351	6.1
1557.6	0.393	17	2.5	91	302	8.5	5.7	4.5	139	345	6.2
1558.3	0.393	18	2.4	79	276	9.4	5.7	4.5	122	316	6.9
1559.0	0.393	21	2.8	102	289	8.1	5.7	5.1	156	330	5.9
1559.7	0.393	17	2.4	99	289	9.0	5.7	4.3	152	331	6.6
1560.4	0.393	18	2.8	107	303	7.1	5.7	5.2	164	346	5.2
1561.1	0.393	17	2.1	94	287	4.8	5.7	3.8	144	328	3.5
1561.8	0.393	18	2.3	94	266	5.7	5.7	4.2	144	304	4.1
1562.5	0.393	18	2.5	87	306	6.4	5.7	4.6	134	350	4.6
1563.2	0.393	17	2.8	93	289	8.3	5.7	5.1	142	330	6.0
1563.9	0.393	16	2.3	93	311	6.8	5.7	4.2	142	355	5.0
1564.6	0.393	17	2.3	94	328	5.6	5.7	4.3	144	375	4.1
1565.3	0.393	16	2.4	87	318	7.3	5.7	4.4	134	363	5.4
1566.0	0.393	18	2.7	87	278	5.3	5.7	4.9	133	318	3.9
1566.7	0.393	17	2.8	90	282	7.5	5.7	5.1	138	323	5.5
1567.4	0.393	20	2.6	94	287	9.2	5.7	4.7	144	328	6.7
1568.1	0.393	15	2.3	87	290	5.5	5.7	4.1	134	332	4.0
1568.8	0.393	17	2.7	96	358	6.4	5.7	5.0	147	410	4.7
1569.5	0.393	18	2.5	98	290	6.0	5.7	4.6	151	332	4.4
1570.2	0.393	16	2.2	83	281	8.1	5.7	4.0	128	321	5.9
1570.9	0.393	19	2.6	98	308	5.1	5.7	4.8	151	353	3.8
1571.6	0.393	15	2.6	97	289	6.0	5.7	4.8	149	330	4.4
1572.3	0.393	18	2.2	107	330	5.4	5.7	4.0	165	377	4.0
1573.0	0.393	17	2.4	88	273	7.9	5.7	4.3	135	312	5.8
1573.7	0.727	21	2.1	95	292	6.8	10	3.9	146	333	5.0
1574.4	0.393	17	2.8	95	290	8.5	5.7	5.0	145	332	6.2
1575.1	0.393	16	2.6	94	283	7.7	5.7	4.7	144	324	5.6
1575.8	0.546	19	2.4	88	313	6.3	7.9	4.4	135	358	4.6
1576.5	0.393	19	2.5	87	253	5.2	5.7	4.6	134	290	3.8
1577.1	0.586	19	2.5	86	281	7.0	8.5	4.5	131	322	5.1
1577.8	0.393	18	2.5	88	289	6.6	5.7	4.6	135	330	4.8
1578.5	0.393	18	2.7	92	285	6.5	5.7	5.0	141	326	4.7
1579.2	0.584	21	2.5	90	305	8.8	8.4	4.6	137	349	6.4
1579.9	0.393	20	3.0	100	292	5.1	5.7	5.5	153	334	3.8
1580.6	0.393	18	2.3	88	277	7.7	5.7	4.3	134	316	5.6
1581.3	0.393	17	2.9	102	316	8.3	5.7	5.2	157	361	6.1



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1582.0	0.541	18	2.6	75	279	5.5	7.8	4.7	116	319	4.0
1582.7	0.393	21	2.3	91	373	8.1	5.7	4.3	139	427	5.9
1583.4	0.393	19	2.3	85	319	7.4	5.7	4.3	130	365	5.4
1584.1	0.393	18	2.2	99	279	7.2	5.7	3.9	151	319	5.3
1584.8	0.393	19	2.4	83	279	4.4	5.7	4.4	127	319	3.2
1585.5	0.393	18	2.5	88	277	5.7	5.7	4.6	135	317	4.2
1586.2	0.393	19	2.5	91	336	7.0	5.7	4.5	140	384	5.1
1586.9	0.393	17	2.4	86	272	7.9	5.7	4.3	132	311	5.8
1587.6	0.393	20	2.3	89	287	8.2	5.7	4.2	136	328	6.0
1588.3	0.393	22	2.6	90	279	7.2	5.7	4.8	138	319	5.2
1589.0	0.393	20	2.3	90	329	8.8	5.7	4.2	138	376	6.4
1589.7	0.393	23	2.6	78	285	7.7	5.7	4.8	119	326	5.6
1590.4	0.615	22	2.6	89	308	6.6	8.9	4.8	136	352	4.8
1591.1	0.393	21	2.3	82	284	8.4	5.7	4.3	126	325	6.1
1591.8	0.393	22	2.0	78	266	8.2	5.7	3.6	119	305	6.0
1592.5	0.393	24	2.3	88	312	9.3	5.7	4.2	135	357	6.8
1593.2	0.393	22	2.5	89	280	8.4	5.7	4.5	137	320	6.1
1593.9	0.393	21	3.3	87	286	6.5	5.7	5.9	133	327	4.7
1594.6	0.393	21	2.2	75	292	7.8	5.7	4.1	114	333	5.7
1595.3	0.393	20	2.2	73	252	8.8	5.7	4.0	112	288	6.4
1596.0	0.393	19	2.8	90	280	8.5	5.7	5.1	138	320	6.2
1596.7	0.393	18	2.0	79	263	7.5	5.7	3.7	121	301	5.5
1597.4	0.456	19	1.9	78	276	8.8	6.6	3.5	119	315	6.4
1598.1	0.393	20	3.1	82	287	9.9	5.7	5.6	126	328	7.2
1598.8	0.393	20	2.7	71	275	9.5	5.7	5.0	109	315	7.0
1599.5	0.417	22	2.3	89	275	10	6.0	4.2	137	315	7.4
1600.2	0.443	20	1.8	84	305	9.5	6.4	3.2	128	349	6.9
1600.9	0.393	21	2.6	72	259	9.9	5.7	4.8	110	296	7.2
1601.6	0.393	18	1.6	73	257	9.5	5.7	2.9	112	294	6.9
1602.3	0.626	21	2.4	80	282	9.3	9.0	4.3	123	322	6.8
1602.9	0.393	20	2.7	76	328	11	5.7	4.9	117	375	8.1
1603.6	0.393	22	2.3	73	276	11	5.7	4.2	112	315	8.0
1604.3	0.393	20	2.2	68	285	11	5.7	4.0	105	326	8.3
1605.0	0.393	22	2.1	79	284	13	5.7	3.9	121	325	9.4
1605.7	0.576	19	2.4	85	322	12	8.3	4.4	130	368	8.5
1606.4	0.393	20	2.1	76	274	10	5.7	3.9	117	314	7.6
1607.1	0.393	19	2.2	70	252	7.7	5.7	3.9	107	288	5.6
1607.8	0.393	19	1.8	70	301	11	5.7	3.2	108	344	8.0
1608.5	0.393	22	2.1	75	280	12	5.7	3.8	114	320	8.4
1609.2	0.470	21	1.7	69	302	11	6.8	3.2	106	346	8.4
1609.9	0.393	19	1.8	80	294	10	5.7	3.2	123	336	7.7
1610.6	0.393	17	1.7	76	303	9.3	5.7	3.2	117	346	6.8
1611.3	0.393	19	2.2	75	290	10	5.7	4.1	115	331	7.5
1612.0	0.393	19	2.3	76	346	11	5.7	4.1	116	395	7.8
1612.7	0.393	18	1.9	72	319	12	5.7	3.4	111	365	8.5
1613.4	0.393	20	2.2	69	297	11	5.7	4.0	106	340	8.0
1614.1	0.393	16	1.5	62	265	10.0	5.7	2.8	95	303	7.3
1614.8	0.393	19	1.9	67	301	14	5.7	3.5	102	344	10
1615.5	0.393	21	1.8	78	313	12	5.7	3.2	120	358	8.9
1616.2	0.393	21	1.9	70	289	13	5.7	3.5	107	330	9.3
1616.9	0.763	20	1.8	73	301	13	11	3.3	112	344	9.4
1617.6	0.393	17	1.4	69	284	9.7	5.7	2.6	105	325	7.1
1618.3	0.393	21	1.7	71	334	13	5.7	3.1	108	382	9.1
1619.0	0.393	18	2.0	61	314	11	5.7	3.6	94	359	8.2
1619.7	0.426	20	1.5	71	328	12	6.1	2.8	109	375	8.7
1620.4	0.393	16	1.8	64	290	11	5.7	3.2	99	331	8.0
1621.1	0.483	17	1.8	63	338	11	7.0	3.2	97	387	8.4
1621.8	0.393	20	1.6	61	295	12	5.7	3.0	94	338	8.8
1622.5	0.393	18	1.6	63	296	11	5.7	2.9	97	339	8.4
1623.2	0.518	22	1.9	69	320	10	7.5	3.4	106	366	7.5
1623.9	0.393	14	1.9	57	337	11	5.7	3.4	87	385	8.0
1624.6	0.393	15	1.5	61	322	12	5.7	2.7	94	368	8.5
1625.3	0.393	20	2.0	66	332	14	5.7	3.6	102	380	10
1626.0	0.393	16	1.5	62	298	11	5.7	2.8	94	341	8.2
1626.7	0.393	18	1.6	59	324	11	5.7	2.9	91	370	7.8
1627.4	0.393	18	1.8	57	363	12	5.7	3.2	88	416	8.9
1628.1	0.393	14	1.4	58	314	13	5.7	2.6	89	359	9.6
1628.7	0.398	14	1.5	59	310	11	5.8	2.7	90	355	8.1
1629.4	0.393	14	1.5	64	299	14	5.7	2.7	98	341	10
1630.1	0.666	17	1.6	62	324	15	9.6	2.9	95	371	11
1630.8	0.393	16	1.4	56	299	12	5.7	2.6	85	342	8.5
1631.5	0.393	15	1.1	57	303	13	5.7	2.1	87	346	9.4
1632.2	0.525	15	1.2	59	334	14	7.6	2.2	90	381	10
1632.9	0.393	17	1.4	52	289	13	5.7	2.5	80	331	9.4
1633.6	0.393	15	1.2	47	297	13	5.7	2.3	71	340	9.3
1634.3	0.393	14	1.3	54	312	11	5.7	2.4	83	357	8.1
1635.0	0.393	14	1.4	57	309	11	5.7	2.5	88	354	8.1
1635.7	0.603	13	1.5	54	317	12	8.7	2.8	84	363	8.5
1636.4	0.393	16	1.7	58	333	13	5.7	3.1	89	381	9.7
1637.1	0.393	15	1.7	63	317	14	5.7	3.1	96	362	10
1637.8	0.430	16	1.3	52	316	13	6.2	2.5	80	361	9.4



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1638.5	0.393	13	1.3	51	327	16	5.7	2.4	78	374	12
1639.2	0.393	15	1.5	52	313	13	5.7	2.7	79	358	9.5
1639.9	0.393	14	1.4	52	349	12	5.7	2.5	80	400	8.4
1640.6	0.393	15	1.0	58	323	9.4	5.7	1.9	89	369	6.8
1641.3	0.393	14	1.2	50	289	12	5.7	2.3	76	330	8.9
1642.0	0.559	13	1.5	50	303	12	8.1	2.8	77	346	8.5
1642.7	0.393	14	1.0	54	380	12	5.7	1.9	82	434	8.8
1643.4	0.393	13	1.3	51	344	12	5.7	2.4	78	393	8.4
1644.1	0.393	13	1.3	45	320	12	5.7	2.3	70	366	8.8
1644.8	0.393	15	1.1	38	325	9.8	5.7	2.1	59	372	7.1
1645.5	0.393	12	1.2	44	298	12	5.7	2.3	68	341	9.0
1646.2	0.393	16	1.0	53	351	11	5.7	1.9	82	401	7.9
1646.9	0.393	11	0.963	37	274	12	5.7	1.8	56	314	9.0
1647.6	0.393	14	1.3	47	284	11	5.7	2.3	71	325	7.9
1648.3	0.393	12	1.1	38	307	11	5.7	2.0	59	352	8.1
1649.0	0.393	14	1.3	46	316	9.5	5.7	2.3	71	361	6.9
1649.7	0.393	13	0.794	38	284	7.5	5.7	1.4	58	325	5.5
1650.4	0.393	15	0.992	41	314	11	5.7	1.8	62	359	8.0
1651.1	0.393	14	0.978	40	339	11	5.7	1.8	62	388	7.7
1651.8	0.545	13	1.4	42	303	11	7.9	2.6	65	346	7.7
1652.5	0.702	14	1.3	39	297	8.5	10	2.4	60	340	6.2
1653.2	0.393	16	0.976	40	299	10	5.7	1.8	61	342	7.4
1653.9	0.397	13	1.1	32	271	8.7	5.7	1.9	49	310	6.4
1654.5	0.393	15	0.852	38	269	9.5	5.7	1.6	58	308	6.9
1655.2	0.393	15	0.948	41	382	9.5	5.7	1.7	63	437	6.9
1655.9	0.393	12	1.0	35	275	9.1	5.7	1.8	54	314	6.7
1656.6	0.393	14	1.5	33	302	8.6	5.7	2.7	51	345	6.3
1657.3	0.407	13	1.1	36	303	8.2	5.9	2.0	56	347	6.0
1658.0	0.393	13	0.764	34	261	6.9	5.7	1.4	51	299	5.1
1658.7	0.393	13	0.982	37	289	7.9	5.7	1.8	57	330	5.8
1659.4	0.393	12	1.1	39	372	8.6	5.7	2.0	59	425	6.2
1660.1	0.393	16	0.981	38	288	6.2	5.7	1.8	58	330	4.5
1660.8	0.393	13	0.989	42	293	8.2	5.7	1.8	64	335	6.0
1661.5	0.393	16	0.761	40	319	9.5	5.7	1.4	62	364	6.9
1662.2	0.393	15	1.3	40	299	8.8	5.7	2.3	61	342	6.4
1662.9	0.393	16	0.977	42	305	8.5	5.7	1.8	64	349	6.2
1663.6	0.393	14	0.871	34	269	7.2	5.7	1.6	53	307	5.3
1664.3	0.393	15	0.907	38	299	7.1	5.7	1.7	58	341	5.2
1665.0	0.576	15	1.2	37	269	6.1	8.3	2.1	57	307	4.4
1665.7	0.393	14	0.991	38	292	10	5.7	1.8	58	334	7.3
1666.4	0.567	16	1.1	41	292	7.6	8.2	1.9	63	334	5.5
1667.1	0.393	15	0.845	37	278	6.2	5.7	1.5	56	318	4.5
1667.8	0.393	14	1.2	43	283	6.7	5.7	2.1	66	324	4.9
1668.5	0.393	14	1.2	39	290	6.8	5.7	2.1	60	331	5.0
1669.2	0.728	12	0.992	34	254	6.1	11	1.8	53	291	4.5
1669.9	0.393	14	1.0	45	302	6.1	5.7	1.9	69	346	4.5
1670.6	0.393	13	0.964	38	262	5.5	5.7	1.8	58	299	4.0
1671.3	0.393	13	0.854	38	280	5.7	5.7	1.6	58	321	4.2
1672.0	0.401	15	1.6	45	351	7.1	5.8	2.9	69	401	5.2
1672.7	0.520	15	0.773	41	254	7.0	7.5	1.4	63	291	5.1
1673.4	0.393	13	1.3	41	290	5.9	5.7	2.5	63	331	4.3
1674.1	0.393	15	1.4	41	270	7.0	5.7	2.5	63	309	5.1
1674.8	0.920	16	1.3	40	289	6.4	13	2.3	61	330	4.7
1675.5	0.393	15	1.7	45	283	6.0	5.7	3.1	69	323	4.3
1676.2	0.393	15	1.2	44	268	5.8	5.7	2.1	68	306	4.2
1676.9	0.393	17	0.977	43	334	5.1	5.7	1.8	65	382	3.8
1677.6	0.393	17	1.6	45	324	5.0	5.7	2.9	70	370	3.7
1678.3	0.598	18	1.1	45	286	7.2	8.6	2.1	69	326	5.3
1679.0	0.393	15	1.5	48	293	5.3	5.7	2.7	73	335	3.9
1679.6	0.393	19	1.4	41	268	4.6	5.7	2.5	62	306	3.3
1680.3	0.494	17	1.5	54	287	3.9	7.1	2.8	82	329	2.9
1681.0	0.393	17	1.2	46	283	7.1	5.7	2.2	71	323	5.2
1681.7	0.393	17	1.6	46	288	7.1	5.7	2.8	71	330	5.2
1682.4	0.716	16	1.5	53	278	5.6	10	2.8	81	318	4.1
1683.1	0.393	20	1.6	58	275	5.7	5.7	3.0	89	314	4.1
1683.8	0.393	16	1.3	50	281	5.5	5.7	2.4	77	322	4.0
1684.5	0.393	19	1.8	54	265	4.1	5.7	3.3	82	303	3.0
1685.2	0.393	20	1.6	46	275	5.3	5.7	2.9	70	314	3.8
1685.9	0.393	19	2.0	52	305	4.1	5.7	3.7	80	349	3.0
1686.6	0.393	19	1.7	53	257	3.8	5.7	3.0	81	294	2.8
1687.3	0.393	19	1.5	54	274	4.6	5.7	2.8	82	313	3.4
1688.0	0.393	18	1.8	63	297	5.2	5.7	3.2	97	340	3.8
1688.7	0.416	21	2.1	52	326	5.6	6.0	3.9	79	373	4.0
1689.4	0.393	20	1.5	50	271	5.2	5.7	2.8	77	310	3.8
1690.1	0.393	20	1.7	60	298	5.3	5.7	3.2	92	341	3.9
1690.8	0.454	20	1.5	48	269	3.8	6.6	2.8	74	308	2.8
1691.5	0.393	18	1.7	56	305	4.3	5.7	3.0	86	349	3.2
1692.2	0.393	19	1.5	58	280	3.7	5.7	2.7	89	320	2.7
1692.9	0.393	21	1.7	59	298	5.3	5.7	3.1	90	340	3.9
1693.6	0.439	21	1.5	62	293	4.3	6.3	2.8	94	335	3.1
1694.3	0.393	21	2.2	61	285	3.6	5.7	3.9	93	325	2.6



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1695.0	0.393	18	2.0	58	298	4.1	5.7	3.7	89	341	3.0
1695.7	0.393	19	1.8	57	272	3.3	5.7	3.2	87	311	2.4
1696.4	0.393	20	1.9	59	281	3.1	5.7	3.4	91	321	2.3
1697.1	0.417	19	1.8	58	292	4.0	6.0	3.3	89	334	2.9
1697.8	0.401	19	1.8	64	316	5.6	5.8	3.2	98	362	4.1
1698.5	0.393	19	1.6	61	263	3.9	5.7	2.9	93	301	2.8
1699.2	0.624	21	2.1	60	272	5.3	9.0	3.9	92	311	3.8
1699.9	0.393	23	2.0	63	299	4.1	5.7	3.6	97	342	3.0
1700.6	0.465	21	1.7	64	304	3.0	6.7	3.0	98	347	2.2
1701.3	0.393	17	2.2	53	277	3.4	5.7	3.9	82	317	2.5
1702.0	0.393	20	1.9	64	295	5.5	5.7	3.5	98	338	4.0
1702.7	0.393	20	1.9	61	309	2.5	5.7	3.4	94	353	1.8
1703.4	0.440	17	2.0	55	283	3.5	6.4	3.6	84	324	2.6
1704.1	0.393	19	1.9	61	291	2.5	5.7	3.5	94	333	1.8
1704.8	0.393	21	2.1	54	284	4.5	5.7	3.8	83	324	3.3
1705.5	0.605	22	2.5	69	288	3.2	8.7	4.5	105	329	2.3
1706.2	0.502	23	1.7	63	290	4.7	7.2	3.2	96	332	3.4
1706.8	0.393	19	2.0	63	305	3.0	5.7	3.6	97	349	2.2
1707.5	0.421	19	1.7	58	287	3.1	6.1	3.2	88	328	2.2
1708.2	0.599	23	1.9	63	331	2.5	8.6	3.5	97	379	1.8
1708.9	0.393	21	1.9	70	308	4.8	5.7	3.5	107	352	3.5
1709.6	0.393	20	1.8	57	295	3.2	5.7	3.4	87	337	2.3
1710.3	0.393	17	2.1	65	290	3.4	5.7	3.9	100	332	2.5
1711.0	0.499	19	1.9	67	310	3.0	7.2	3.5	102	354	2.2
1711.7	0.702	19	2.0	62	308	2.9	10	3.6	94	352	2.1
1712.4	0.393	20	1.4	67	304	4.3	5.7	2.5	102	347	3.1
1713.1	0.393	19	1.7	58	285	3.4	5.7	3.0	89	326	2.5
1713.8	0.393	17	1.5	65	273	2.3	5.7	2.8	99	312	1.7
1714.5	0.393	21	1.8	61	310	4.3	5.7	3.2	94	354	3.2
1715.2	0.393	20	2.0	63	312	4.3	5.7	3.6	97	357	3.1
1715.9	0.559	19	1.8	58	290	3.3	8.1	3.2	89	332	2.4
1716.6	0.393	18	1.7	61	275	4.3	5.7	3.0	94	314	3.1
1717.3	0.529	20	1.5	56	283	3.4	7.6	2.7	86	323	2.5
1718.0	0.393	20	2.2	65	317	4.1	5.7	4.0	99	362	3.0
1718.7	0.754	21	2.1	63	308	6.0	11	3.9	96	353	4.4
1719.4	0.738	21	1.5	59	325	4.3	11	2.7	91	372	3.2
1720.1	0.457	19	1.5	59	313	3.6	6.6	2.8	90	358	2.6
1720.8	0.393	19	2.0	64	300	4.4	5.7	3.7	98	343	3.2
1721.5	0.659	20	1.9	70	307	4.0	9.5	3.5	108	351	2.9
1722.2	0.393	21	2.0	68	319	4.8	5.7	3.7	104	365	3.5
1722.9	0.393	19	1.8	58	306	4.3	5.7	3.3	89	350	3.1
1723.6	0.393	19	1.4	55	261	4.7	5.7	2.6	84	299	3.4
1724.3	0.393	18	1.8	65	312	4.5	5.7	3.2	100	356	3.3
1725.0	0.393	19	2.2	61	282	3.8	5.7	4.1	94	322	2.8
1725.7	0.393	18	1.6	60	277	4.2	5.7	2.9	92	316	3.0
1726.4	0.393	19	1.8	60	324	4.3	5.7	3.3	93	370	3.1
1727.1	0.605	20	1.7	57	285	4.9	8.7	3.1	88	326	3.6
1727.8	0.448	17	2.0	61	277	2.8	6.5	3.6	94	317	2.0
1728.5	0.393	21	2.0	64	288	4.2	5.7	3.7	98	329	3.0
1729.2	0.393	20	1.6	66	281	4.9	5.7	3.0	101	322	3.6
1729.9	0.393	19	1.6	62	335	3.7	5.7	2.9	94	383	2.7
1730.6	0.661	18	1.5	63	336	4.9	9.5	2.6	97	384	3.6
1731.3	0.789	19	2.2	62	323	4.2	11	4.1	95	370	3.1
1732.0	0.393	20	1.8	60	325	3.4	5.7	3.3	92	371	2.5
1732.7	0.393	18	2.1	56	288	4.3	5.7	3.9	86	329	3.2
1733.3	0.393	18	1.4	56	300	4.5	5.7	2.6	86	343	3.3
1734.0	0.393	21	2.0	60	285	4.4	5.7	3.6	91	326	3.2
1734.7	0.393	21	1.5	61	279	4.0	5.7	2.7	94	319	2.9
1735.4	0.393	19	1.9	57	273	4.4	5.7	3.4	88	312	3.2
1736.1	0.589	18	2.2	61	282	3.7	8.5	3.9	94	323	2.7
1736.8	0.420	18	2.0	56	265	4.7	6.1	3.6	87	303	3.4
1737.5	0.393	19	1.7	59	269	3.0	5.7	3.1	90	308	2.2
1738.2	0.393	18	2.5	58	321	4.2	5.7	4.6	89	367	3.1
1738.9	0.393	21	1.7	66	312	3.3	5.7	3.2	102	357	2.4
1739.6	0.393	21	1.4	59	290	5.2	5.7	2.5	90	331	3.8
1740.3	0.393	16	2.0	60	307	4.6	5.7	3.6	92	351	3.3
1741.0	0.393	18	1.2	60	304	3.6	5.7	2.3	91	347	2.6
1741.7	0.475	18	1.7	57	319	5.2	6.9	3.2	88	365	3.8
1742.4	0.557	18	1.6	59	279	4.4	8.0	2.9	91	319	3.2
1743.1	0.747	19	2.0	64	313	3.6	11	3.6	99	358	2.6
1743.8	0.393	19	1.8	53	305	3.6	5.7	3.3	81	349	2.6
1744.5	0.605	20	1.7	55	294	4.2	8.7	3.0	85	337	3.1
1745.2	0.393	19	1.9	64	295	3.7	5.7	3.4	98	338	2.7
1745.9	0.404	18	1.6	50	291	3.9	5.8	2.9	77	333	2.9
1746.6	0.393	17	1.8	56	296	4.6	5.7	3.3	87	339	3.4
1747.3	0.393	21	1.2	53	337	5.2	5.7	2.2	81	385	3.8
1748.0	0.393	17	1.8	52	299	5.3	5.7	3.3	79	342	3.9
1748.7	0.393	19	1.3	53	283	4.8	5.7	2.5	82	323	3.5
1749.4	0.393	19	1.8	55	290	5.4	5.7	3.3	84	331	3.9
1750.1	0.393	17	1.7	48	279	5.2	5.7	3.1	74	320	3.8
1750.8	0.393	19	1.6	51	299	6.8	5.7	2.8	78	342	5.0



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Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1751.5	0.393	16	1.4	46	316	4.2	5.7	2.6	70	362	3.1
1752.2	0.393	17	1.3	48	284	3.0	5.7	2.3	73	325	2.2
1752.9	0.393	18	1.3	52	286	4.9	5.7	2.4	80	327	3.5
1753.6	0.393	16	1.7	47	286	4.0	5.7	3.1	72	327	2.9
1754.3	0.434	18	1.6	47	306	4.1	6.3	2.9	71	349	3.0
1755.0	0.393	18	1.6	56	295	4.1	5.7	2.8	86	337	3.0
1755.7	0.583	19	1.3	50	295	4.1	8.4	2.3	77	337	3.0
1756.4	0.393	18	1.3	52	280	5.1	5.7	2.3	80	320	3.7
1757.1	0.393	17	1.2	54	316	3.9	5.7	2.3	83	362	2.9
1757.8	0.393	18	1.6	46	319	4.7	5.7	2.9	71	365	3.4
1758.5	0.393	15	1.4	50	285	3.7	5.7	2.6	76	326	2.7
1759.2	0.393	15	1.5	51	282	3.4	5.7	2.7	78	322	2.5
1759.8	0.393	18	1.4	52	297	4.1	5.7	2.6	79	340	3.0
1760.5	0.393	16	1.1	46	272	3.9	5.7	2.0	70	311	2.9
1761.2	0.741	17	1.5	49	315	3.9	11	2.8	76	360	2.9
1761.9	0.393	17	1.4	46	333	3.7	5.7	2.5	70	381	2.7
1762.6	0.402	16	1.3	53	305	3.9	5.8	2.4	81	349	2.8
1763.3	0.393	15	1.1	37	267	4.0	5.7	2.0	57	305	2.9
1764.0	0.393	16	1.2	45	277	4.2	5.7	2.1	69	316	3.0
1764.7	0.393	12	1.5	44	311	4.8	5.7	2.7	67	356	3.5
1765.4	0.393	17	1.1	35	295	3.1	5.7	2.1	53	337	2.2
1766.1	0.393	14	1.3	38	304	3.1	5.7	2.3	58	347	2.2
1766.8	0.702	15	1.3	42	293	4.2	10	2.4	64	336	3.0
1767.5	0.437	15	1.4	35	273	2.6	6.3	2.6	54	312	1.9
1768.2	0.393	15	0.805	38	321	3.6	5.7	1.5	58	367	2.6
1768.9	0.476	14	0.788	40	289	3.6	6.9	1.4	61	331	2.6
1769.6	0.393	12	1.0	37	257	2.4	5.7	1.9	57	294	1.8
1770.3	0.424	14	1.1	42	313	3.7	6.1	2.1	64	357	2.7
1771.0	0.393	14	1.1	38	270	2.4	5.7	2.0	58	309	1.8
1771.7	0.393	13	0.917	34	276	3.5	5.7	1.7	53	315	2.6
1772.4	0.393	12	1.0	30	291	2.2	5.7	1.8	47	332	1.6
1773.1	0.393	13	0.974	31	268	3.3	5.7	1.8	48	307	2.4
1773.8	0.393	13	0.845	38	288	3.7	5.7	1.5	58	330	2.7
1774.5	0.457	13	0.803	35	257	3.1	6.6	1.5	54	293	2.3
1775.2	0.393	15	1.3	40	331	4.6	5.7	2.3	62	378	3.4
1775.9	0.393	12	1.0	38	307	2.9	5.7	1.9	58	351	2.1
1776.6	0.393	13	1.0	35	255	4.1	5.7	1.9	54	292	3.0
1777.3	0.393	13	0.741	30	261	3.2	5.7	1.4	46	299	2.3
1778.0	0.468	14	1.2	32	276	3.7	6.8	2.2	49	315	2.7
1778.7	0.393	13	1.1	34	324	3.5	5.7	2.0	51	371	2.6
1779.4	0.553	12	1.1	34	287	2.8	8.0	2.0	52	328	2.1
1780.1	0.393	13	1.000	30	258	2.8	5.7	1.8	45	295	2.1
1780.8	0.393	15	0.757	32	261	2.4	5.7	1.4	48	299	1.8
1781.5	0.393	15	0.891	32	259	3.0	5.7	1.6	50	296	2.2
1782.2	0.393	12	0.795	31	233	2.9	5.7	1.4	47	267	2.1
1782.9	0.393	14	1.1	35	280	2.6	5.7	2.1	54	320	1.9
1783.6	0.393	9.9	0.943	30	254	2.4	5.7	1.7	46	290	1.7
1784.3	0.393	15	1.1	33	262	2.9	5.7	2.0	51	300	2.1
1785.0	0.393	15	1.2	36	307	2.8	5.7	2.2	55	351	2.0
1785.7	0.393	13	0.677	29	254	2.0	5.7	1.2	44	291	1.4
1786.3	0.393	14	0.888	32	291	4.1	5.7	1.6	48	333	3.0
1787.0	0.393	13	0.985	32	251	2.8	5.7	1.8	49	287	2.0
1787.7	0.393	14	1.5	28	253	2.7	5.7	2.7	43	289	2.0
1788.4	0.393	16	1.3	39	279	1.8	5.7	2.5	59	319	1.3
1789.1	0.416	15	1.2	34	259	3.4	6.0	2.2	52	296	2.5
1789.8	0.393	15	0.706	33	282	2.6	5.7	1.3	51	322	1.9
1790.5	0.393	14	1.3	34	276	3.7	5.7	2.4	52	315	2.7
1791.2	0.393	15	0.709	33	262	2.8	5.7	1.3	50	300	2.1
1791.9	0.393	15	1.3	39	289	2.5	5.7	2.4	60	330	1.8
1792.6	0.393	17	1.2	40	274	2.5	5.7	2.1	61	314	1.8
1793.3	0.393	15	0.818	35	269	3.2	5.7	1.5	53	308	2.3
1794.0	0.393	14	1.1	29	257	2.0	5.7	1.9	45	294	1.5
1794.7	0.393	12	1.2	32	272	3.9	5.7	2.2	50	312	2.8
1795.4	0.393	11	0.680	28	276	3.5	5.7	1.2	43	316	2.6
1796.1	0.393	13	1.2	33	269	2.6	5.7	2.2	50	307	1.9
1796.8	0.453	14	1.2	35	279	1.9	6.5	2.2	53	319	1.4
1797.5	0.393	18	1.1	35	278	2.7	5.7	2.1	54	318	2.0
1798.2	0.393	14	1.3	38	260	2.8	5.7	2.3	58	297	2.0
1798.9	0.456	13	1.5	31	259	2.8	6.6	2.8	47	296	2.1
1799.6	0.393	11	1.0	31	294	2.1	5.7	1.9	47	336	1.5
1800.3	0.393	15	1.2	35	274	3.0	5.7	2.2	53	314	2.2
1801.0	0.463	14	1.1	37	273	4.7	6.7	2.0	56	312	3.4
1801.7	0.393	14	1.4	33	303	3.8	5.7	2.6	51	347	2.8
1802.4	0.393	16	1.4	34	319	2.5	5.7	2.6	52	364	1.9
1803.1	0.393	14	1.0	40	257	2.0	5.7	1.9	62	293	1.4
1803.8	0.393	14	1.2	29	257	2.1	5.7	2.1	44	294	1.5
1804.5	0.393	16	1.2	32	270	2.5	5.7	2.3	49	309	1.9
1805.2	0.393	14	0.974	32	301	2.3	5.7	1.8	50	344	1.6
1805.9	0.393	12	1.2	31	293	2.5	5.7	2.2	48	335	1.8
1806.6	0.393	15	1.2	32	270	2.2	5.7	2.2	49	309	1.6
1807.3	0.398	16	1.1	34	314	2.3	5.7	1.9	52	359	1.7



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Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1808.0	0.393	15	1.0	29	326	2.2	5.7	1.8	45	372	1.6
1808.7	0.393	19	1.3	31	281	2.3	5.7	2.3	48	321	1.7
1809.4	0.393	13	1.1	27	294	2.9	5.7	2.0	42	336	2.1
1810.1	0.393	16	0.866	32	289	3.3	5.7	1.6	49	331	2.4
1810.8	0.634	14	1.3	32	284	2.4	9.2	2.4	50	325	1.8
1811.5	0.536	12	1.1	31	275	1.8	7.7	1.9	47	315	1.3
1812.2	0.393	14	1.3	36	261	2.0	5.7	2.3	55	298	1.4
1812.8	0.393	16	1.1	31	273	2.1	5.7	2.0	48	312	1.6
1813.5	0.393	13	1.1	37	259	1.9	5.7	2.0	57	296	1.4
1814.2	0.393	14	1.1	30	258	0.934	5.7	2.0	46	296	0.682
1814.9	0.393	13	1.1	35	266	2.0	5.7	2.0	54	304	1.5
1815.6	0.393	15	1.0	31	267	1.6	5.7	1.9	48	305	1.2
1816.3	0.393	13	1.3	32	238	2.3	5.7	2.4	50	272	1.6
1817.0	0.878	17	1.1	41	283	2.0	13	2.1	63	324	1.5
1817.7	0.393	15	1.4	34	290	1.6	5.7	2.6	53	331	1.2
1818.4	0.393	16	1.3	32	299	2.5	5.7	2.4	49	342	1.8
1819.1	0.393	15	1.3	39	290	2.8	5.7	2.4	60	332	2.0
1819.8	0.393	15	1.4	34	264	2.5	5.7	2.6	52	302	1.8
1820.5	0.393	15	1.5	35	298	1.7	5.7	2.7	53	341	1.3
1821.2	0.424	17	1.5	38	307	1.9	6.1	2.7	59	351	1.4
1821.9	0.512	18	1.1	34	290	2.9	7.4	2.0	53	332	2.1
1822.6	0.393	16	1.4	38	271	1.6	5.7	2.5	58	310	1.2
1823.3	0.393	16	1.5	38	267	2.6	5.7	2.6	58	305	1.9
1824.0	0.556	14	1.4	36	255	2.5	8.0	2.6	55	291	1.8
1824.7	0.479	15	1.2	44	318	2.7	6.9	2.1	67	364	2.0
1825.4	0.393	15	1.6	34	263	2.5	5.7	2.9	52	301	1.9
1826.1	0.393	16	1.4	37	322	1.6	5.7	2.5	57	368	1.2
1826.8	0.393	16	1.5	34	307	2.9	5.7	2.8	52	351	2.1
1827.5	0.393	20	1.5	43	323	2.3	5.7	2.8	65	370	1.7
1828.2	0.393	17	1.4	39	298	1.4	5.7	2.5	60	340	1.1
1828.9	0.393	17	1.5	38	282	1.2	5.7	2.7	59	323	0.880
1829.6	0.393	17	1.4	31	248	1.5	5.7	2.5	48	283	1.1
1830.3	0.516	17	1.8	36	300	2.2	7.4	3.2	56	343	1.6
1831.0	0.393	18	1.6	40	282	2.1	5.7	3.0	62	323	1.5
1831.7	0.810	18	1.3	47	313	2.1	12	2.3	72	358	1.5
1832.4	0.393	17	1.3	41	276	1.7	5.7	2.4	62	316	1.2
1833.1	0.631	15	1.6	41	263	1.4	9.1	3.0	63	301	1.0
1833.8	0.393	16	1.5	37	307	1.3	5.7	2.7	57	351	0.951
1834.5	0.393	17	1.5	38	280	2.0	5.7	2.7	59	320	1.4
1835.2	0.393	17	1.1	44	267	1.2	5.7	2.0	68	305	0.863
1835.9	0.393	17	1.7	42	277	1.9	5.7	3.0	64	316	1.4
1836.6	0.474	15	0.957	40	282	1.8	6.8	1.7	61	323	1.3
1837.3	0.393	15	1.5	33	274	1.7	5.7	2.7	51	314	1.2
1838.0	0.539	18	1.3	45	290	1.6	7.8	2.3	70	332	1.2
1838.6	0.395	16	1.4	42	284	1.9	5.7	2.6	65	325	1.4
1839.3	0.393	16	1.3	39	301	1.7	5.7	2.3	60	345	1.2
1840.0	0.393	17	1.4	41	282	1.1	5.7	2.6	63	323	0.784
1840.7	0.411	17	1.7	41	314	1.3	5.9	3.2	63	359	0.940
1841.4	0.393	18	1.5	41	310	2.7	5.7	2.6	62	354	1.9
1842.1	0.393	15	1.3	35	258	1.6	5.7	2.4	54	295	1.2
1842.8	0.393	16	1.6	38	266	1.6	5.7	2.9	59	304	1.1
1843.5	0.393	15	2.2	37	274	2.1	5.7	3.9	57	313	1.5
1844.2	0.393	17	1.4	38	280	2.0	5.7	2.6	58	320	1.4
1844.9	0.393	19	1.7	41	296	2.7	5.7	3.2	63	339	1.9
1845.6	0.393	18	1.4	46	278	1.2	5.7	2.5	71	317	0.889
1846.3	0.393	17	1.1	39	301	1.4	5.7	2.1	59	344	1.0
1847.0	0.393	17	1.5	41	330	2.3	5.7	2.8	63	378	1.7
1847.7	0.393	16	1.4	35	313	1.4	5.7	2.6	53	357	1.0
1848.4	0.393	15	1.9	41	313	1.3	5.7	3.4	63	358	0.971
1849.1	0.393	16	1.8	41	290	1.2	5.7	3.2	63	331	0.855
1849.8	0.480	16	1.7	37	259	1.3	6.9	3.0	56	296	0.923
1850.5	0.393	16	1.4	39	331	1.8	5.7	2.6	60	378	1.3
1851.2	0.393	17	1.4	38	277	2.4	5.7	2.6	59	317	1.8
1851.9	0.393	15	1.9	41	306	2.2	5.7	3.4	63	350	1.6
1852.6	0.393	14	1.3	37	268	1.5	5.7	2.4	57	306	1.1
1853.3	0.651	17	1.9	42	308	2.0	9.4	3.4	64	352	1.5
1854.0	0.393	16	1.9	36	386	1.6	5.7	3.5	55	442	1.2
1854.7	0.393	17	1.5	34	248	1.6	5.7	2.8	52	283	1.1
1855.4	0.442	17	1.3	34	267	1.2	6.4	2.4	52	306	0.883
1856.1	0.453	13	1.5	36	302	1.3	6.5	2.8	55	345	0.981
1856.8	0.436	15	1.5	46	292	1.1	6.3	2.7	70	334	0.797
1857.5	0.393	14	1.6	39	289	2.6	5.7	2.9	60	331	1.9
1858.2	0.393	14	1.4	47	297	1.6	5.7	2.5	72	340	1.1
1858.9	0.393	17	1.2	37	322	1.2	5.7	2.2	57	368	0.906
1859.6	0.393	16	1.5	34	286	1.5	5.7	2.7	52	327	1.1
1860.3	0.393	18	1.3	35	299	1.5	5.7	2.4	54	342	1.1
1861.0	0.393	15	1.6	37	288	1.7	5.7	3.0	56	329	1.2
1861.7	0.393	13	1.1	40	257	1.6	5.7	2.0	61	294	1.2
1862.4	0.393	14	1.2	36	275	1.4	5.7	2.2	56	314	1.0
1863.1	0.393	17	1.3	38	282	1.4	5.7	2.3	58	323	0.987
1863.8	0.393	13	1.4	34	273	1.4	5.7	2.6	52	312	1.0



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Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1864.5	0.393	14	1.3	37	285	1.4	5.7	2.4	57	326	0.988
1865.2	0.393	14	1.4	35	270	1.5	5.7	2.5	53	309	1.1
1865.8	0.393	11	1.0	35	279	1.3	5.7	1.8	54	320	0.970
1866.5	0.488	13	2.0	38	294	1.1	7.0	3.7	59	336	0.794
1867.2	0.592	13	1.5	37	296	1.7	8.5	2.8	57	338	1.3
1867.9	0.393	13	1.2	38	265	0.891	5.7	2.2	58	303	0.650
1868.6	0.393	15	1.2	37	279	0.997	5.7	2.2	56	319	0.728
1869.3	0.393	16	1.2	35	310	1.8	5.7	2.1	53	355	1.3
1870.0	0.393	16	1.4	37	279	1.1	5.7	2.6	57	320	0.810
1870.7	0.393	18	1.6	33	314	0.974	5.7	2.9	51	359	0.711
1871.4	0.393	14	1.1	37	267	0.888	5.7	2.1	56	305	0.648
1872.1	0.393	14	0.801	34	285	1.3	5.7	1.5	53	326	0.958
1872.8	0.393	14	1.2	34	279	1.4	5.7	2.2	52	320	1.0
1873.5	0.393	15	1.4	31	283	1.9	5.7	2.6	48	324	1.4
1874.2	0.393	13	0.978	31	289	0.803	5.7	1.8	48	331	0.586
1874.9	0.393	13	0.838	31	294	1.4	5.7	1.5	48	336	1.0
1875.6	0.393	15	1.5	40	284	1.2	5.7	2.7	62	325	0.888
1876.3	0.393	16	1.1	31	273	1.4	5.7	2.0	47	312	0.994
1877.0	0.393	13	1.2	35	294	2.0	5.7	2.2	54	337	1.4
1877.7	0.393	15	0.870	33	276	1.1	5.7	1.6	50	316	0.823
1878.4	0.532	12	0.768	29	258	1.3	7.7	1.4	45	295	0.919
1879.1	0.393	12	0.886	29	333	1.6	5.7	1.6	44	380	1.1
1879.8	0.393	12	0.868	25	254	1.6	5.7	1.6	39	291	1.1
1880.5	0.393	16	1.0	26	251	1.0	5.7	1.9	40	287	0.756
1881.2	0.393	13	0.708	24	234	0.852	5.7	1.3	37	268	0.622
1881.9	0.393	14	0.740	27	269	1.5	5.7	1.4	41	307	1.1
1882.6	0.486	13	0.803	24	271	1.4	7.0	1.5	36	309	1.0
1883.3	0.393	12	0.848	24	262	1.3	5.7	1.5	38	300	0.937
1884.0	0.393	16	0.887	26	276	1.5	5.7	1.6	40	316	1.1
1884.7	0.393	14	0.836	25	296	1.7	5.7	1.5	39	339	1.2
1885.4	0.393	15	1.1	25	276	0.878	5.7	2.0	38	316	0.641
1886.1	0.393	13	0.742	25	284	2.0	5.7	1.4	38	325	1.4
1886.8	0.475	13	0.836	23	260	0.867	6.9	1.5	35	297	0.633
1887.5	0.393	13	1.1	23	244	0.966	5.7	2.0	36	279	0.705
1888.2	0.393	14	0.933	26	257	1.1	5.7	1.7	40	294	0.770
1888.9	0.393	12	0.875	25	263	1.3	5.7	1.6	38	300	0.966
1889.6	0.564	14	0.751	26	267	2.4	8.1	1.4	39	305	1.8
1890.3	0.695	12	0.812	26	267	1.1	10	1.5	39	305	0.768
1891.0	0.393	12	1.2	26	273	1.6	5.7	2.3	40	313	1.2
1891.7	0.393	14	1.0	28	255	1.1	5.7	1.9	43	292	0.825
1892.3	0.569	12	1.0	31	301	1.1	8.2	1.8	48	344	0.832
1893.0	0.393	12	1.2	32	257	1.1	5.7	2.1	49	294	0.835
1893.7	0.423	12	1.3	25	291	1.7	6.1	2.4	38	333	1.2
1894.4	0.393	13	1.2	26	256	1.4	5.7	2.2	40	292	0.989
1895.1	0.393	13	1.1	29	263	0.995	5.7	2.0	44	301	0.726
1895.8	0.393	11	1.1	26	237	1.1	5.7	1.9	40	271	0.805
1896.5	0.393	12	1.2	26	264	1.5	5.7	2.1	39	302	1.1
1897.2	0.789	14	1.2	30	281	0.957	11	2.2	46	322	0.698
1897.9	0.393	15	1.0	26	287	0.913	5.7	1.8	39	328	0.666
1898.6	0.998	14	1.2	28	270	1.2	14	2.2	43	309	0.910
1899.3	0.407	13	0.963	27	274	0.744	5.9	1.8	41	314	0.542
1900.0	0.393	12	1.2	25	265	0.882	5.7	2.2	38	303	0.643
1900.7	0.393	14	0.752	26	295	0.904	5.7	1.4	39	338	0.660
1901.4	0.393	12	1.5	25	246	0.931	5.7	2.6	38	282	0.679
1902.1	0.393	12	0.994	26	299	1.1	5.7	1.8	40	342	0.783
1902.8	0.393	14	1.2	23	241	0.868	5.7	2.1	36	275	0.633
1903.5	0.420	15	1.0	29	255	1.6	6.1	1.9	44	292	1.2
1904.2	0.405	12	1.1	24	263	1.5	5.8	2.1	36	301	1.1
1904.9	0.393	12	1.0	26	251	0.979	5.7	1.9	39	287	0.715
1905.6	0.592	12	1.2	24	217	0.718	8.5	2.1	37	248	0.524
1906.3	0.393	12	1.3	30	261	1.1	5.7	2.4	46	299	0.784
1907.0	0.393	11	1.3	31	244	0.803	5.7	2.3	48	279	0.586
1907.7	0.393	13	1.6	26	246	1.2	5.7	2.9	41	281	0.906
1908.4	0.393	15	1.4	26	284	1.5	5.7	2.6	39	324	1.1
1909.1	0.393	12	1.6	29	259	0.805	5.7	2.9	44	296	0.588
1909.8	0.393	15	0.825	30	255	1.5	5.7	1.5	47	291	1.1
1910.5	0.981	13	1.3	29	258	0.749	14	2.3	44	295	0.547
1911.2	0.393	15	1.5	29	253	1.8	5.7	2.8	45	289	1.3
1911.9	0.393	14	1.2	27	282	1.1	5.7	2.3	42	323	0.785
1912.6	0.393	14	1.1	28	242	1.4	5.7	2.0	43	277	1.0
1913.3	0.393	15	1.8	29	270	0.820	5.7	3.3	44	309	0.598
1914.0	0.393	14	0.943	27	253	1.5	5.7	1.7	42	290	1.1
1914.7	0.687	12	1.3	29	248	1.3	9.9	2.4	44	284	0.912
1915.4	0.393	15	1.2	32	254	1.5	5.7	2.2	49	290	1.1
1916.1	0.482	13	1.1	35	251	0.976	7.0	2.1	54	287	0.712
1916.8	0.393	13	1.2	28	286	1.7	5.7	2.2	43	327	1.2
1917.5	0.393	16	1.3	33	268	1.5	5.7	2.4	51	307	1.1
1918.2	0.393	17	1.1	31	287	0.636	5.7	1.9	47	328	0.464
1918.9	0.393	14	1.1	31	271	1.0	5.7	1.9	48	310	0.741
1919.5	0.393	12	1.4	28	266	1.0	5.7	2.5	42	305	0.743
1920.2	0.393	13	1.6	27	276	2.0	5.7	3.0	42	316	1.5



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1920.9	0.500	16	1.4	28	283	0.607	7.2	2.5	44	324	0.443
1921.6	0.393	14	1.0	24	238	1.2	5.7	1.8	37	272	0.843
1922.3	0.410	12	1.0	23	230	0.498	5.9	1.9	35	263	0.364
1923.0	0.393	13	0.963	29	255	0.814	5.7	1.8	45	291	0.594
1923.7	0.393	12	1.2	31	253	1.3	5.7	2.1	47	289	0.932
1924.4	0.393	14	0.998	27	260	1.2	5.7	1.8	42	297	0.857
1925.1	0.393	15	1.2	30	287	0.993	5.7	2.1	46	328	0.724
1925.8	0.393	14	0.680	25	251	1.8	5.7	1.2	38	287	1.3
1926.5	0.440	16	1.1	27	240	1.3	6.4	2.0	41	274	0.977
1927.2	0.580	15	1.2	23	244	1.2	8.4	2.2	35	279	0.911
1927.9	0.393	13	1.4	24	246	1.4	5.7	2.5	37	281	1.0
1928.6	0.750	15	0.998	26	274	0.733	11	1.8	40	314	0.535
1929.3	0.393	11	1.3	24	224	0.960	5.7	2.4	37	256	0.700
1930.0	0.393	14	0.995	26	251	0.859	5.7	1.8	40	287	0.627
1930.7	0.393	13	1.4	27	293	1.7	5.7	2.6	41	335	1.2
1931.4	0.503	16	1.3	24	292	1.2	7.3	2.4	37	334	0.892
1932.1	0.393	16	1.3	26	293	1.3	5.7	2.4	39	335	0.953
1932.8	0.393	13	1.1	25	268	1.5	5.7	1.9	38	306	1.1
1933.5	0.393	13	1.6	26	246	1.3	5.7	2.9	40	281	0.950
1934.2	0.393	17	0.965	27	254	0.710	5.7	1.8	41	291	0.518
1934.9	0.455	14	1.2	26	260	0.934	6.6	2.1	39	297	0.681
1935.6	0.393	13	1.1	29	277	1.2	5.7	2.0	44	317	0.867
1936.3	0.393	13	1.2	22	263	1.1	5.7	2.2	34	300	0.803
1937.0	0.393	14	1.4	25	266	1.4	5.7	2.5	38	304	1.0
1937.7	0.393	14	1.2	27	233	1.8	5.7	2.2	41	267	1.3
1938.4	0.393	14	1.2	30	259	0.843	5.7	2.1	45	296	0.615
1939.1	0.422	15	1.1	30	253	0.440	6.1	2.0	46	289	0.321
1939.8	0.393	13	1.2	25	239	1.8	5.7	2.2	38	273	1.3
1940.5	0.393	12	1.4	28	237	0.404	5.7	2.5	43	271	0.295
1941.2	0.393	14	1.2	28	233	1.7	5.7	2.2	43	266	1.2
1941.9	0.393	13	1.3	29	237	1.1	5.7	2.3	44	271	0.784
1942.6	0.393	12	1.3	30	237	1.8	5.7	2.3	47	271	1.3
1943.3	0.393	15	1.4	29	273	1.6	5.7	2.5	45	312	1.1
1944.0	0.393	12	1.1	29	283	1.3	5.7	2.1	45	323	0.962
1944.7	0.393	13	1.3	28	232	0.802	5.7	2.4	43	265	0.585
1945.4	0.393	14	1.2	29	287	0.831	5.7	2.2	45	328	0.607
1946.0	0.393	12	0.886	23	244	1.4	5.7	1.6	35	279	1.0
1946.7	0.393	13	1.0	27	250	1.3	5.7	1.9	42	286	0.972
1947.4	0.449	16	0.859	30	277	1.4	6.5	1.6	45	317	1.0
1948.1	0.393	13	1.1	29	245	1.9	5.7	2.0	44	280	1.4
1948.8	0.700	16	1.3	24	312	1.2	10	2.4	36	357	0.852
1949.5	0.527	16	1.5	25	258	1.4	7.6	2.6	38	295	1.0
1950.2	0.393	16	0.999	26	248	1.4	5.7	1.8	40	284	1.0
1950.9	0.393	13	1.1	25	266	0.809	5.7	2.0	38	304	0.590
1951.6	0.551	15	1.2	26	279	1.2	7.9	2.2	40	319	0.878
1952.3	0.393	14	0.964	27	288	1.6	5.7	1.8	42	329	1.2
1953.0	0.393	15	1.1	27	264	1.6	5.7	2.0	42	301	1.1
1953.7	0.425	16	0.804	25	271	1.6	6.1	1.5	38	310	1.1
1954.4	0.393	14	0.822	26	303	1.4	5.7	1.5	41	346	1.0
1955.1	0.393	14	0.990	27	248	1.3	5.7	1.8	41	284	0.934
1955.8	0.491	12	0.913	29	271	1.2	7.1	1.7	44	310	0.899
1956.5	0.393	13	1.2	31	286	0.693	5.7	2.2	47	327	0.506
1957.2	0.393	15	1.2	29	260	1.0	5.7	2.1	44	297	0.741
1957.9	0.393	15	1.2	35	284	1.5	5.7	2.2	53	325	1.1
1958.6	0.393	13	1.5	30	296	1.2	5.7	2.7	46	339	0.910
1959.3	0.393	14	1.5	31	282	1.7	5.7	2.7	48	322	1.3
1960.0	0.393	14	1.5	31	270	1.3	5.7	2.7	48	309	0.937
1960.7	0.393	13	1.4	36	242	0.324	5.7	2.5	56	277	0.236
1961.4	0.393	15	0.812	30	293	1.5	5.7	1.5	46	335	1.1
1962.1	0.393	14	1.4	25	281	0.768	5.7	2.5	38	322	0.561
1962.8	0.393	15	1.3	29	273	1.0	5.7	2.4	44	312	0.737
1963.5	0.393	16	1.4	33	291	1.1	5.7	2.6	50	333	0.805
1964.2	0.393	14	1.0	31	288	0.900	5.7	1.9	47	330	0.657
1964.9	0.454	14	0.868	30	326	1.7	6.6	1.6	46	373	1.2
1965.6	0.393	15	0.960	36	318	1.6	5.7	1.8	55	363	1.2
1966.3	0.456	15	1.5	32	281	1.0	6.6	2.7	50	321	0.759
1967.0	0.539	17	0.767	29	311	1.6	7.8	1.4	44	356	1.2
1967.7	0.408	15	1.2	29	322	1.3	5.9	2.2	45	368	0.933
1968.4	0.393	17	1.1	35	296	2.3	5.7	2.0	53	338	1.7
1969.1	0.446	17	0.922	33	282	0.915	6.4	1.7	50	322	0.668
1969.8	0.393	16	1.4	32	340	0.850	5.7	2.5	49	388	0.620
1970.5	0.393	17	1.2	31	302	1.7	5.7	2.3	47	345	1.3
1971.2	0.393	16	1.4	34	294	1.2	5.7	2.5	52	337	0.868
1971.9	0.802	13	0.837	28	282	1.8	12	1.5	42	322	1.3
1972.5	0.393	13	1.2	34	298	1.7	5.7	2.2	52	341	1.2
1973.2	0.702	16	1.3	34	277	1.4	10	2.3	53	317	1.0
1973.9	0.711	16	1.3	36	291	1.4	10	2.3	55	333	1.0
1974.6	0.393	15	1.3	34	304	1.6	5.7	2.4	51	347	1.2
1975.3	0.393	14	1.1	31	271	1.8	5.7	1.9	47	310	1.3
1976.0	0.393	12	0.888	34	283	1.5	5.7	1.6	52	323	1.1
1976.7	0.393	16	1.0	36	314	1.3	5.7	1.9	55	359	0.954



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1977.4	0.393	17	1.0	35	259	1.6	5.7	1.9	54	296	1.2
1978.1	0.393	15	1.2	40	337	1.4	5.7	2.1	61	386	0.994
1978.8	0.393	14	1.6	36	310	1.6	5.7	2.9	55	355	1.2
1979.5	0.393	17	1.5	38	357	2.0	5.7	2.7	59	409	1.5
1980.2	0.393	16	1.3	34	298	1.3	5.7	2.4	52	341	0.952
1980.9	0.393	14	1.2	39	291	1.6	5.7	2.2	60	333	1.2
1981.6	0.393	14	0.786	34	282	1.2	5.7	1.4	53	322	0.894
1982.3	0.393	17	0.972	36	295	1.7	5.7	1.8	56	337	1.2
1983.0	0.684	15	0.987	40	277	1.1	9.9	1.8	62	317	0.833
1983.7	0.393	14	1.4	41	288	1.2	5.7	2.5	63	329	0.908
1984.4	0.393	15	1.0	32	295	1.3	5.7	1.9	50	337	0.918
1985.1	0.393	13	1.2	39	328	1.2	5.7	2.1	60	375	0.862
1985.8	0.393	14	0.730	38	309	1.7	5.7	1.3	59	354	1.3
1986.5	0.574	19	1.1	38	382	1.5	8.3	2.1	58	437	1.1
1987.2	0.393	14	1.2	42	324	1.8	5.7	2.1	65	371	1.3
1987.9	0.393	16	1.1	36	308	1.1	5.7	2.0	55	352	0.807
1988.6	0.705	12	1.2	37	316	1.9	10	2.1	57	361	1.4
1989.3	0.410	13	1.1	33	279	1.5	5.9	2.0	51	319	1.1
1990.0	0.698	12	1.3	39	336	1.4	10	2.4	60	385	1.0
1990.7	0.863	16	1.2	39	307	1.1	12	2.2	60	351	0.818
1991.4	0.393	14	1.0	31	334	2.3	5.7	1.8	47	382	1.7
1992.1	0.393	12	1.1	39	313	1.9	5.7	2.1	60	358	1.4
1992.8	0.393	15	1.1	39	317	1.9	5.7	2.0	59	362	1.4
1993.5	1.0	15	0.813	39	334	1.4	15	1.5	59	382	1.0
1994.2	0.393	14	1.1	42	339	2.1	5.7	2.1	65	388	1.5
1994.9	0.393	12	0.778	44	310	1.3	5.7	1.4	68	355	0.918
1995.6	0.393	12	1.1	42	325	1.8	5.7	2.0	65	372	1.3
1996.3	0.556	13	1.3	39	337	1.4	8.0	2.3	60	385	0.986
1997.0	0.393	13	1.1	37	293	1.1	5.7	2.0	57	335	0.774
1997.7	0.393	13	0.810	35	332	0.735	5.7	1.5	54	379	0.536
1998.3	0.393	14	1.1	40	333	1.6	5.7	2.1	62	380	1.2
1999.0	0.529	14	1.4	37	314	0.965	7.6	2.5	57	359	0.704
1999.7	0.393	12	1.0	36	384	1.5	5.7	1.9	55	439	1.1
2000.4	0.393	13	0.763	37	314	2.2	5.7	1.4	57	359	1.6
2001.1	0.426	12	0.857	37	310	1.6	6.2	1.6	57	355	1.1
2001.8	0.393	11	1.1	31	294	0.616	5.7	2.0	48	336	0.450
2002.5	0.393	11	0.578	32	307	1.7	5.7	1.1	49	351	1.2
2003.2	0.393	9.5	0.994	39	298	2.1	5.7	1.8	59	341	1.6
2003.9	0.564	11	1.2	32	310	2.1	8.1	2.2	50	355	1.5
2004.6	0.393	9.7	1.2	35	318	1.7	5.7	2.1	54	364	1.2
2005.3	0.393	13	1.0	38	304	1.0	5.7	1.8	58	348	0.734
2006.0	0.393	12	1.0	36	301	0.862	5.7	1.8	54	344	0.629
2006.7	0.393	12	1.0	30	348	0.964	5.7	1.9	46	397	0.703
2007.4	0.393	12	1.1	40	384	1.8	5.7	2.0	61	439	1.3
2008.1	0.393	12	0.943	34	327	0.775	5.7	1.7	52	374	0.565
2008.8	0.393	12	1.1	35	307	1.6	5.7	2.0	53	351	1.2
2009.5	0.393	12	1.5	39	302	1.8	5.7	2.8	59	345	1.3
2010.2	0.393	13	1.2	37	321	1.6	5.7	2.2	56	367	1.2
2010.9	0.393	11	1.0	35	299	0.867	5.7	1.9	53	342	0.633
2011.6	0.393	12	0.878	50	330	1.3	5.7	1.6	76	377	0.921
2012.3	0.393	8.5	0.779	35	298	1.1	5.7	1.4	53	341	0.781
2013.0	0.393	12	1.2	38	347	1.0	5.7	2.2	58	397	0.754
2013.7	0.393	13	0.902	35	373	1.6	5.7	1.6	53	426	1.1
2014.4	0.393	9.9	1.4	32	351	1.4	5.7	2.5	49	401	1.0
2015.1	0.444	10	0.659	33	327	1.6	6.4	1.2	50	374	1.2
2015.8	0.393	12	0.966	33	318	1.4	5.7	1.8	50	363	1.1
2016.5	0.393	11	1.3	36	386	2.0	5.7	2.5	55	441	1.5
2017.2	0.452	10	0.895	30	346	0.988	6.5	1.6	46	396	0.721
2017.9	0.393	13	0.882	32	338	2.1	5.7	1.6	48	387	1.5
2018.6	0.489	11	0.847	29	368	0.890	7.1	1.5	45	421	0.649
2019.3	0.393	12	0.788	32	374	1.4	5.7	1.4	50	428	1.1
2020.0	0.393	11	1.2	33	388	1.5	5.7	2.2	51	444	1.1
2020.7	0.393	9.1	0.797	30	276	1.9	5.7	1.5	46	315	1.4
2021.4	0.393	9.4	0.751	29	287	1.8	5.7	1.4	45	328	1.3
2022.1	0.393	11	0.965	28	342	1.3	5.7	1.8	43	391	0.915
2022.8	0.393	12	0.822	26	337	0.864	5.7	1.5	39	386	0.630
2023.5	0.393	11	0.783	28	313	1.4	5.7	1.4	43	358	0.998
2024.2	0.757	9.9	0.565	26	330	1.7	11	1.0	40	378	1.3
2024.8	0.574	11	0.904	30	349	1.2	8.3	1.6	46	399	0.901
2025.5	0.393	11	0.721	33	384	1.5	5.7	1.3	50	439	1.1
2026.2	0.393	9.0	0.789	28	313	1.5	5.7	1.4	43	358	1.1
2026.9	0.393	12	1.1	27	350	1.4	5.7	2.0	42	400	1.0
2027.6	0.393	11	0.752	28	334	1.4	5.7	1.4	43	382	1.0
2028.3	0.393	9.9	0.841	27	298	1.0	5.7	1.5	41	341	0.764
2029.0	0.393	10	0.687	27	330	1.8	5.7	1.3	41	378	1.3
2029.7	0.393	11	0.608	22	372	1.4	5.7	1.1	33	425	1.0
2030.4	0.393	9.6	0.862	26	361	1.3	5.7	1.6	40	413	0.926
2031.1	0.393	11	0.724	30	345	1.1	5.7	1.3	46	395	0.801
2031.8	0.393	9.8	0.603	25	361	1.7	5.7	1.1	38	413	1.2
2032.5	0.393	8.6	0.785	23	340	1.8	5.7	1.4	36	389	1.3
2033.2	0.393	9.7	0.494	24	341	1.0	5.7	0.902	36	390	0.756



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2033.9	0.393	8.8	0.615	25	339	0.903	5.7	1.1	38	388	0.659
2034.6	0.393	8.2	0.695	20	339	1.2	5.7	1.3	31	387	0.882
2035.3	0.393	9.2	0.634	21	355	1.8	5.7	1.2	33	406	1.3
2036.0	0.393	11	0.787	22	354	1.3	5.7	1.4	33	404	0.921
2036.7	0.393	9.0	0.707	17	300	1.5	5.7	1.3	26	343	1.1
2037.4	0.393	7.4	0.533	20	277	1.7	5.7	0.972	31	316	1.2
2038.1	1.1	6.8	0.576	20	314	1.5	16	1.1	31	359	1.1
2038.8	0.393	7.9	0.512	21	337	0.846	5.7	0.934	32	386	0.617
2039.5	0.393	9.4	0.649	18	375	1.5	5.7	1.2	28	429	1.1
2040.2	0.393	10.0	0.559	22	318	1.4	5.7	1.0	34	364	1.0
2040.9	0.393	9.0	0.705	19	295	0.829	5.7	1.3	30	338	0.605
2041.6	0.393	7.9	0.422	16	299	0.743	5.7	0.770	24	342	0.542
2042.3	0.393	11	0.530	18	353	1.5	5.7	0.966	27	403	1.1
2043.0	0.393	9.5	0.562	18	312	0.969	5.7	1.0	27	357	0.707
2043.7	0.393	8.1	0.500	16	287	0.801	5.7	0.913	24	328	0.585
2044.4	0.393	9.8	0.425	16	332	1.5	5.7	0.776	25	380	1.1
2045.1	0.393	7.2	0.353	16	275	0.970	5.7	0.643	25	314	0.707
2045.8	0.393	9.5	0.669	16	369	1.2	5.7	1.2	24	422	0.845
2046.5	0.393	8.1	0.282	15	261	0.720	5.7	0.514	23	299	0.526
2047.2	0.393	9.8	0.704	14	309	1.4	5.7	1.3	22	354	1.0
2047.9	0.393	10	0.404	12	325	1.4	5.7	0.736	18	372	0.991
2048.6	0.393	6.8	0.393	13	265	0.914	5.7	0.716	20	303	0.667
2049.3	0.393	9.6	0.527	12	297	1.1	5.7	0.960	19	339	0.806
2050.0	0.393	9.3	0.506	16	281	1.7	5.7	0.922	25	322	1.3
2050.7	0.393	9.0	0.600	15	258	0.916	5.7	1.1	23	295	0.668
2051.3	0.393	8.7	0.630	14	261	0.863	5.7	1.1	21	298	0.629
2052.0	0.393	8.9	0.374	16	293	1.4	5.7	0.682	24	335	1.0
2052.7	0.393	9.1	0.534	19	266	2.0	5.7	0.973	29	304	1.5
2053.4	0.393	8.2	0.584	14	262	1.4	5.7	1.1	21	300	1.0
2054.1	0.393	8.4	0.789	16	284	0.632	5.7	1.4	24	325	0.461
2054.8	0.393	9.0	0.655	12	284	0.776	5.7	1.2	19	324	0.566
2055.5	0.393	8.5	0.561	14	312	1.1	5.7	1.0	22	357	0.784
2056.2	0.393	9.5	0.761	14	301	1.4	5.7	1.4	21	344	1.0
2056.9	0.393	7.3	0.596	16	274	0.984	5.7	1.1	24	314	0.718
2057.6	0.586	9.3	0.943	16	304	1.2	8.5	1.7	24	348	0.856
2058.3	0.890	7.4	0.712	15	243	1.3	13	1.3	23	278	0.972
2059.0	0.468	8.7	0.702	13	290	1.2	6.8	1.3	21	332	0.857
2059.7	0.607	10	0.677	16	270	1.2	8.8	1.2	24	309	0.888
2060.4	0.393	8.0	0.612	14	240	0.799	5.7	1.1	21	274	0.583
2061.1	0.558	9.0	0.897	15	334	0.678	8.1	1.6	23	382	0.495
2061.8	0.463	10	0.718	19	271	0.739	6.7	1.3	30	310	0.539
2062.5	0.393	7.8	0.870	14	279	0.960	5.7	1.6	22	319	0.700
2063.2	0.393	8.6	1.2	16	272	0.673	5.7	2.2	24	311	0.491
2063.9	0.393	9.9	0.979	19	240	0.823	5.7	1.8	29	274	0.600
2064.6	0.393	7.8	1.3	18	264	1.3	5.7	2.4	27	302	0.930
2065.3	0.393	9.7	0.868	16	269	1.3	5.7	1.6	25	308	0.931
2066.0	0.561	9.9	1.2	21	327	1.7	8.1	2.1	33	374	1.2
2066.7	0.393	8.3	0.834	20	251	1.1	5.7	1.5	31	288	0.820
2067.4	0.482	10	1.1	20	262	0.880	7.0	2.0	31	299	0.642
2068.1	0.393	9.5	0.968	18	232	1.1	5.7	1.8	28	266	0.779
2068.8	0.393	9.6	1.2	16	294	1.1	5.7	2.1	25	337	0.776
2069.5	0.393	9.3	0.965	21	249	1.1	5.7	1.8	32	285	0.834
2070.2	0.393	11	1.3	20	301	0.852	5.7	2.3	31	344	0.622
2070.9	0.393	11	0.987	25	213	1.1	5.7	1.8	38	244	0.830
2071.6	0.393	7.5	1.0	22	268	1.3	5.7	1.9	34	306	0.961
2072.3	0.393	10	1.3	23	260	1.5	5.7	2.3	35	298	1.1
2073.0	0.393	9.4	1.4	23	248	0.815	5.7	2.5	36	284	0.595
2073.7	0.393	13	1.3	23	248	1.1	5.7	2.4	35	283	0.773
2074.4	0.393	11	1.2	25	265	0.880	5.7	2.2	38	303	0.642
2075.1	0.393	10	1.3	25	285	1.4	5.7	2.3	39	326	0.994
2075.8	0.393	9.4	1.5	20	226	0.722	5.7	2.7	31	259	0.527
2076.5	0.393	9.6	1.5	22	277	0.942	5.7	2.7	33	317	0.687
2077.1	0.393	9.7	1.2	23	249	0.476	5.7	2.1	35	285	0.347
2077.8	0.393	9.4	1.1	24	237	1.2	5.7	2.0	37	271	0.858
2078.5	0.393	9.0	1.7	23	208	0.689	5.7	3.1	35	237	0.502
2079.2	0.393	9.7	1.3	25	255	1.2	5.7	2.4	39	291	0.906
2079.9	0.393	11	1.4	25	232	0.677	5.7	2.6	39	266	0.494
2080.6	0.393	10	1.4	28	240	0.931	5.7	2.6	44	275	0.679
2081.3	0.561	12	1.3	23	219	0.371	8.1	2.3	36	250	0.270
2082.0	0.393	13	1.3	25	247	0.960	5.7	2.3	39	282	0.700
2082.7	0.729	10	1.6	31	241	1.1	11	2.9	47	276	0.819
2083.4	0.393	11	1.5	28	225	1.2	5.7	2.8	43	257	0.871
2084.1	0.393	8.8	1.2	26	254	1.4	5.7	2.1	39	290	1.0
2084.8	0.393	9.1	1.3	27	219	0.845	5.7	2.4	42	251	0.616
2085.5	0.393	10	1.3	31	273	0.572	5.7	2.4	48	312	0.418
2086.2	0.393	12	1.3	26	224	1.0	5.7	2.3	41	257	0.753
2086.9	0.393	8.9	1.4	24	221	1.3	5.7	2.5	37	253	0.916
2087.6	0.393	11	1.2	27	283	0.803	5.7	2.2	41	324	0.586
2088.3	0.393	9.4	1.4	28	225	0.767	5.7	2.5	43	257	0.560
2089.0	0.393	8.8	1.4	26	229	0.579	5.7	2.6	40	262	0.422
2089.7	0.393	10	1.5	29	231	0.508	5.7	2.8	44	265	0.370



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2090.4	0.393	8.7	1.5	26	214	0.675	5.7	2.7	41	245	0.493
2091.1	0.393	10	1.6	26	235	0.707	5.7	2.8	41	269	0.516
2091.8	0.393	9.9	1.2	28	234	1.4	5.7	2.2	43	268	1.0
2092.5	0.393	10	1.3	25	234	1.0	5.7	2.3	38	268	0.765
2093.2	0.393	9.3	1.2	25	268	1.2	5.7	2.2	38	306	0.861
2093.9	0.393	9.6	1.3	29	257	1.4	5.7	2.3	45	294	1.0
2094.6	0.393	11	1.3	24	289	1.2	5.7	2.4	36	330	0.880
2095.3	0.393	10	1.3	25	333	1.7	5.7	2.4	39	381	1.2
2096.0	0.516	11	1.1	25	250	1.6	7.5	2.1	38	286	1.2
2096.7	0.393	9.2	1.2	27	258	1.5	5.7	2.2	42	295	1.1
2097.4	0.393	12	0.906	27	267	1.7	5.7	1.7	42	305	1.2
2098.1	0.393	9.9	1.0	23	240	1.2	5.7	1.9	36	274	0.911
2098.8	0.393	11	1.3	25	248	0.608	5.7	2.3	38	284	0.444
2099.5	0.393	11	1.1	26	243	0.532	5.7	2.0	40	278	0.388
2100.2	0.393	11	0.877	26	250	0.774	5.7	1.6	40	286	0.565
2100.9	0.461	9.1	1.2	22	262	1.8	6.7	2.3	34	300	1.3
2101.6	0.393	10	1.1	26	263	1.1	5.7	2.0	39	301	0.774
2102.3	0.393	8.9	0.899	20	239	1.4	5.7	1.6	31	274	0.987
2103.0	0.393	10	1.3	25	308	1.3	5.7	2.4	39	352	0.960
2103.6	0.393	9.8	0.848	17	240	0.891	5.7	1.5	26	275	0.650
2104.3	0.590	9.8	1.1	28	252	1.1	8.5	2.0	43	288	0.784
2105.0	0.393	11	0.930	18	256	1.8	5.7	1.7	28	292	1.3
2105.7	0.393	8.9	0.997	18	229	0.961	5.7	1.8	27	262	0.701
2106.4	0.518	10	0.770	22	302	1.1	7.5	1.4	33	345	0.827
2107.1	0.393	12	1.1	17	257	1.2	5.7	2.0	25	294	0.858
2107.8	0.393	9.2	0.703	20	243	0.797	5.7	1.3	31	277	0.582
2108.5	0.393	9.6	0.608	17	266	0.778	5.7	1.1	26	305	0.568
2109.2	0.393	8.6	0.906	21	271	0.977	5.7	1.7	32	310	0.713
2109.9	0.393	9.4	0.757	17	277	0.615	5.7	1.4	25	317	0.449
2110.6	0.393	9.2	0.730	17	243	0.984	5.7	1.3	25	278	0.718
2111.3	0.393	9.3	0.574	16	279	1.2	5.7	1.0	25	319	0.892
2112.0	0.393	9.1	0.650	17	292	0.832	5.7	1.2	26	334	0.607
2112.7	0.393	8.4	0.799	16	315	0.952	5.7	1.5	25	360	0.695
2113.4	0.393	9.1	0.687	16	271	1.1	5.7	1.3	24	310	0.784
2114.1	0.473	11	0.630	19	282	1.1	6.8	1.1	29	322	0.769
2114.8	0.754	7.8	0.356	15	296	1.3	11	0.650	23	338	0.929
2115.5	0.393	7.5	0.643	13	249	1.3	5.7	1.2	20	285	0.934
2116.2	0.470	10	0.475	13	268	1.2	6.8	0.867	20	306	0.903
2116.9	0.393	10	0.541	15	299	1.0	5.7	0.987	23	342	0.756
2117.6	0.393	11	0.404	15	274	0.888	5.7	0.736	23	313	0.648
2118.3	0.393	10	0.416	12	284	1.1	5.7	0.759	19	324	0.803
2119.0	0.393	8.8	0.299	14	261	1.7	5.7	0.545	22	298	1.2
2119.7	0.478	9.1	0.474	14	244	1.7	6.9	0.864	21	279	1.2
2120.4	0.393	9.1	0.205	13	267	0.699	5.7	0.374	19	305	0.510
2121.1	0.393	8.3	0.604	12	257	1.2	5.7	1.1	18	294	0.864
2121.8	0.393	8.8	0.828	14	269	1.1	5.7	1.5	21	308	0.838
2122.5	0.583	8.4	0.651	11	293	0.850	8.4	1.2	17	335	0.620
2123.2	0.444	9.6	0.689	12	239	1.2	6.4	1.3	18	274	0.887
2123.9	0.393	8.7	0.581	13	254	0.532	5.7	1.1	20	291	0.388
2124.6	0.404	8.8	0.455	12	272	0.526	5.8	0.830	18	312	0.384
2125.3	0.393	11	0.861	11	304	0.718	5.7	1.6	17	347	0.524
2126.0	0.393	8.1	0.294	13	268	1.7	5.7	0.536	20	306	1.3
2126.7	0.393	8.7	0.560	11	249	0.965	5.7	1.0	17	285	0.704
2127.4	0.393	8.5	0.715	11	227	0.928	5.7	1.3	17	260	0.677
2128.1	0.393	9.0	0.665	10	290	1.3	5.7	1.2	16	331	0.951
2128.8	0.393	8.0	0.692	14	298	1.2	5.7	1.3	22	341	0.907
2129.5	0.393	8.9	0.528	15	281	1.6	5.7	0.963	23	321	1.2
2130.1	0.393	8.3	0.446	11	242	1.0	5.7	0.814	16	276	0.751
2130.8	0.393	8.9	0.388	15	293	0.959	5.7	0.707	22	335	0.700
2131.5	0.393	7.7	0.996	13	258	1.000	5.7	1.8	20	295	0.729
2132.2	0.393	9.3	0.860	12	230	1.0	5.7	1.6	19	263	0.762
2132.9	0.507	8.0	1.1	12	268	1.3	7.3	2.1	18	306	0.974
2133.6	0.393	8.3	0.866	13	286	1.3	5.7	1.6	21	327	0.956
2134.3	0.393	9.9	1.1	14	261	1.4	5.7	2.0	21	299	0.988
2135.0	0.393	9.0	1.0	13	260	1.3	5.7	1.9	20	297	0.955
2135.7	0.393	8.2	0.941	14	270	1.2	5.7	1.7	22	308	0.895
2136.4	0.393	11	1.1	13	261	1.3	5.7	1.9	20	299	0.942
2137.1	0.393	8.4	0.787	14	252	0.736	5.7	1.4	21	289	0.537
2137.8	0.657	9.2	1.2	16	238	1.1	9.5	2.1	25	272	0.799
2138.5	0.393	10	0.760	13	268	0.609	5.7	1.4	19	306	0.445
2139.2	0.393	8.2	1.2	14	211	1.1	5.7	2.1	22	241	0.821
2139.9	0.393	11	1.5	18	259	1.1	5.7	2.7	27	296	0.807
2140.6	0.743	7.8	1.4	19	267	0.935	11	2.5	29	306	0.682
2141.3	0.393	7.7	1.5	19	240	0.965	5.7	2.7	29	275	0.704
2142.0	0.393	9.0	1.3	18	261	0.762	5.7	2.3	27	298	0.556
2142.7	0.393	6.7	0.987	16	235	0.933	5.7	1.8	25	269	0.681
2143.4	0.393	8.5	1.6	19	232	0.654	5.7	2.9	29	265	0.477
2144.1	0.393	7.0	1.3	18	261	0.957	5.7	2.3	27	299	0.698
2144.8	0.393	9.0	1.2	19	244	1.1	5.7	2.1	28	279	0.825
2145.5	0.393	10	1.1	21	243	0.950	5.7	2.0	32	278	0.693
2146.2	0.393	10	1.4	19	242	1.3	5.7	2.6	29	276	0.940



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Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2146.9	0.884	9.6	1.2	24	233	0.401	13	2.2	36	266	0.292
2147.6	0.393	9.4	1.5	18	222	0.877	5.7	2.8	28	254	0.640
2148.3	0.393	8.0	0.981	22	216	0.492	5.7	1.8	33	247	0.359
2149.0	0.393	11	1.1	19	238	1.3	5.7	2.1	29	272	0.925
2149.7	0.393	8.9	1.0	21	234	0.744	5.7	1.8	32	268	0.543
2150.4	0.393	8.9	1.1	22	215	0.824	5.7	1.9	34	245	0.601
2151.1	0.393	9.6	1.5	22	233	1.4	5.7	2.7	33	266	1.1
2151.8	0.678	10	1.3	23	246	0.616	9.8	2.4	35	281	0.450
2152.5	0.393	11	1.6	27	253	1.5	5.7	3.0	41	290	1.1
2153.2	0.749	11	1.6	26	240	0.838	11	2.9	40	275	0.611
2153.9	0.393	9.3	1.6	25	232	0.854	5.7	2.9	39	265	0.623
2154.6	0.393	9.8	1.5	29	244	0.687	5.7	2.7	45	279	0.501
2155.3	0.393	10	1.7	26	255	0.811	5.7	3.0	40	291	0.592
2155.9	0.393	10	1.7	26	235	0.402	5.7	3.1	40	268	0.293
2156.6	0.393	8.0	2.4	26	231	1.3	5.7	4.3	40	264	0.971
2157.3	0.393	9.8	1.2	22	254	0.567	5.7	2.2	34	290	0.414
2158.0	0.393	8.2	1.2	26	265	0.993	5.7	2.2	40	303	0.724
2158.7	0.393	10	1.3	20	310	0.839	5.7	2.4	31	355	0.612
2159.4	0.393	9.6	1.6	26	267	1.0	5.7	3.0	39	305	0.734
2160.1	0.393	9.0	0.999	25	246	0.686	5.7	1.8	38	282	0.500
2160.8	0.393	11	1.6	25	232	1.1	5.7	2.8	39	265	0.792
2161.5	0.393	8.9	0.825	25	253	0.954	5.7	1.5	39	290	0.696
2162.2	0.393	10	1.8	27	275	0.907	5.7	3.3	41	314	0.662
2162.9	0.393	8.6	1.3	27	228	1.2	5.7	2.4	41	261	0.875
2163.6	0.393	11	1.2	28	250	0.658	5.7	2.2	42	286	0.480
2164.3	0.393	7.9	1.2	25	268	0.559	5.7	2.1	38	306	0.408
2165.0	0.393	10	0.961	25	247	1.1	5.7	1.8	38	283	0.774
2165.7	0.393	9.3	1.2	21	216	0.454	5.7	2.1	32	247	0.331
2166.4	0.472	11	1.4	25	253	0.765	6.8	2.6	39	289	0.558
2167.1	0.567	10	1.000	23	233	0.657	8.2	1.8	36	267	0.479
2167.8	0.484	9.5	0.977	24	224	0.528	7.0	1.8	37	256	0.385
2168.5	0.393	9.3	0.878	22	251	0.704	5.7	1.6	33	287	0.514
2169.2	0.393	11	1.1	24	257	0.798	5.7	2.1	36	294	0.582
2169.9	0.662	11	1.6	26	254	1.1	9.6	2.9	39	291	0.805
2170.6	0.462	10	0.907	31	260	1.5	6.7	1.7	47	297	1.1
2171.3	0.393	9.7	0.747	24	244	0.753	5.7	1.4	37	279	0.549
2172.0	0.393	11	1.1	28	295	1.4	5.7	2.0	43	338	0.998
2172.7	0.393	9.0	0.932	27	253	0.822	5.7	1.7	42	290	0.600
2173.4	0.983	12	0.832	24	246	0.893	14	1.5	37	281	0.651
2174.1	0.562	12	1.2	22	228	0.744	8.1	2.2	34	260	0.543
2174.8	0.393	11	1.1	21	259	1.2	5.7	1.9	32	297	0.849
2175.5	0.393	11	0.780	20	233	0.651	5.7	1.4	31	267	0.475
2176.2	0.393	11	0.606	19	270	0.924	5.7	1.1	29	309	0.674
2176.9	0.393	9.4	0.854	17	235	1.0	5.7	1.6	26	268	0.757
2177.6	0.393	11	0.552	22	238	1.4	5.7	1.0	34	272	1.0
2178.3	0.393	10.0	0.855	17	237	1.3	5.7	1.6	26	271	0.918
2179.0	0.543	9.1	0.695	18	281	0.395	7.8	1.3	28	321	0.288
2179.7	0.393	8.9	0.816	18	233	0.681	5.7	1.5	28	266	0.497
2180.4	0.393	9.9	0.773	18	258	1.2	5.7	1.4	28	295	0.855
2181.1	0.393	8.1	0.547	16	248	0.803	5.7	0.997	25	283	0.586
2181.7	0.407	11	0.650	20	256	0.530	5.9	1.2	30	293	0.387
2182.4	0.393	9.9	0.377	14	307	1.7	5.7	0.688	22	351	1.2
2183.1	0.675	8.1	0.627	20	263	1.4	9.7	1.1	31	300	1.0
2183.8	0.393	10	0.536	17	249	1.2	5.7	0.978	26	285	0.897
2184.5	0.393	9.9	0.644	14	308	1.5	5.7	1.2	21	352	1.1
2185.2	0.393	10	0.653	16	251	0.496	5.7	1.2	25	287	0.362
2185.9	0.393	11	0.800	14	291	1.6	5.7	1.5	22	332	1.1
2186.6	0.393	8.2	0.628	17	240	1.2	5.7	1.1	27	275	0.905
2187.3	0.393	9.7	1.2	15	245	0.781	5.7	2.1	23	280	0.570
2188.0	0.585	7.9	0.571	12	253	1.1	8.4	1.0	19	289	0.777
2188.7	0.393	11	0.945	15	264	1.9	5.7	1.7	23	301	1.4
2189.4	0.393	9.8	0.614	17	287	2.2	5.7	1.1	26	328	1.6
2190.1	0.410	8.6	0.657	13	237	0.841	5.9	1.2	20	271	0.614
2190.8	0.393	9.7	0.881	13	273	1.4	5.7	1.6	20	312	1.0
2191.5	0.393	7.8	0.934	17	252	0.843	5.7	1.7	25	289	0.615
2192.2	0.393	9.2	0.998	13	297	1.4	5.7	1.8	20	340	1.0
2192.9	0.559	8.5	0.985	14	249	1.2	8.1	1.8	21	285	0.878
2193.6	0.393	7.9	1.0	13	246	1.1	5.7	1.8	19	281	0.812
2194.3	0.393	8.2	1.1	15	233	0.991	5.7	2.0	23	266	0.723
2195.0	0.393	9.0	1.1	13	226	1.4	5.7	2.1	20	258	1.0
2195.7	0.393	8.8	0.980	19	268	0.756	5.7	1.8	29	307	0.552
2196.4	0.393	8.0	1.2	15	264	1.7	5.7	2.2	23	302	1.3
2197.1	0.393	7.6	0.986	16	229	0.742	5.7	1.8	25	262	0.542
2197.8	0.479	8.0	1.1	12	240	0.873	6.9	1.9	18	274	0.637
2198.5	0.393	9.1	1.4	17	244	0.703	5.7	2.5	26	278	0.513
2199.2	0.551	9.3	1.4	15	260	1.2	8.0	2.5	23	297	0.879
2199.9	0.393	9.9	1.3	17	253	1.4	5.7	2.4	25	289	1.0
2200.6	0.393	8.1	1.4	16	214	0.887	5.7	2.6	25	244	0.647
2201.3	0.393	8.2	1.7	18	233	1.4	5.7	3.0	27	266	1.0
2202.0	0.393	10	1.7	20	292	1.9	5.7	3.1	30	334	1.4
2202.7	0.396	9.9	1.4	18	237	1.1	5.7	2.5	28	271	0.830



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2203.4	0.691	8.1	1.6	22	248	1.2	10.0	2.9	33	284	0.841
2204.1	0.393	8.0	1.5	17	256	1.4	5.7	2.7	27	292	1.0
2204.8	0.393	8.3	1.4	21	258	1.3	5.7	2.5	31	295	0.931
2205.5	0.393	7.9	1.2	20	254	1.5	5.7	2.1	31	290	1.1
2206.2	0.393	7.8	1.6	20	267	1.3	5.7	2.9	31	306	0.929
2206.9	0.393	9.3	1.4	26	222	1.6	5.7	2.6	40	254	1.2
2207.5	0.408	7.9	1.2	22	236	0.930	5.9	2.2	33	270	0.679
2208.2	0.393	7.8	1.4	23	250	0.966	5.7	2.5	35	286	0.705
2208.9	0.393	11	1.3	20	227	1.3	5.7	2.5	31	259	0.956
2209.6	0.393	7.3	1.1	20	211	0.774	5.7	2.0	31	241	0.564
2210.3	0.393	7.7	1.0	22	225	0.850	5.7	1.9	34	257	0.620
2211.0	0.393	8.7	1.5	24	231	1.5	5.7	2.8	37	264	1.1
2211.7	0.393	11	1.7	25	261	1.4	5.7	3.1	38	298	1.0
2212.4	0.393	9.0	1.5	27	228	1.2	5.7	2.7	41	261	0.883
2213.1	0.393	9.6	1.4	31	233	0.925	5.7	2.5	47	267	0.675
2213.8	0.393	8.8	1.2	24	254	0.746	5.7	2.2	36	291	0.545
2214.5	0.393	8.2	1.4	29	215	1.3	5.7	2.6	44	246	0.957
2215.2	0.393	10	1.6	27	238	1.7	5.7	2.8	42	273	1.3
2215.9	0.466	9.1	1.3	29	215	0.744	6.7	2.3	44	246	0.543
2216.6	0.393	9.3	1.2	29	242	1.0	5.7	2.1	44	277	0.740
2217.3	0.393	9.4	1.4	26	252	1.2	5.7	2.5	41	289	0.860
2218.0	0.393	7.8	1.3	26	264	1.6	5.7	2.4	40	302	1.1
2218.7	0.393	10	0.864	26	272	1.5	5.7	1.6	40	312	1.1
2219.4	0.532	12	1.1	21	217	1.4	7.7	2.1	33	249	0.991
2220.1	0.653	7.5	1.3	30	253	0.791	9.4	2.3	46	290	0.577
2220.8	0.393	8.9	1.0	28	240	0.413	5.7	1.8	43	275	0.301
2221.5	0.393	10	1.3	29	228	1.2	5.7	2.4	44	261	0.871
2222.2	0.482	8.6	1.1	29	244	0.880	7.0	2.0	44	280	0.642
2222.9	0.393	8.8	1.3	31	238	0.976	5.7	2.3	47	273	0.712
2223.6	0.393	9.6	1.1	29	221	1.1	5.7	2.1	44	253	0.773
2224.3	0.830	8.2	1.4	24	257	0.565	12	2.5	37	294	0.412
2225.0	0.393	12	0.934	30	229	0.846	5.7	1.7	45	262	0.617
2225.7	0.393	11	1.2	31	244	1.2	5.7	2.1	48	279	0.885
2226.4	0.393	11	1.7	30	227	1.4	5.7	3.1	45	259	1.0
2227.1	0.393	11	1.3	31	233	1.2	5.7	2.4	48	267	0.847
2227.8	0.393	11	0.983	23	222	1.1	5.7	1.8	35	253	0.829
2228.5	0.393	7.5	1.5	21	242	0.871	5.7	2.7	32	277	0.636
2229.2	0.393	11	0.941	22	256	0.579	5.7	1.7	34	293	0.422
2229.9	0.393	11	1.1	26	231	0.804	5.7	2.1	39	264	0.587
2230.6	0.446	6.7	1.0	21	241	0.089	6.4	1.9	32	276	0.065
2231.3	0.643	11	1.0	22	240	0.682	9.3	1.9	34	274	0.497
2232.0	0.543	14	1.4	28	258	0.990	7.8	2.6	42	296	0.722
2232.7	0.393	11	0.877	24	243	1.2	5.7	1.6	36	278	0.839
2233.3	0.393	12	0.937	21	246	0.492	5.7	1.7	32	281	0.359
2234.0	0.490	12	0.765	21	237	0.993	7.1	1.4	33	270	0.725
2234.7	0.393	9.0	1.2	19	238	0.919	5.7	2.2	30	272	0.670
2235.4	0.393	11	1.1	21	237	0.789	5.7	2.0	32	271	0.576
2236.1	0.393	11	0.626	19	247	1.0	5.7	1.1	29	282	0.746
2236.8	0.393	9.8	0.794	19	237	0.424	5.7	1.4	29	271	0.309
2237.5	0.393	9.3	0.918	20	251	0.935	5.7	1.7	30	287	0.682
2238.2	0.393	10	0.462	21	250	0.748	5.7	0.842	32	286	0.546
2238.9	0.393	8.1	0.924	20	218	0.995	5.7	1.7	30	249	0.726
2239.6	0.393	9.3	0.783	17	213	0.493	5.7	1.4	26	243	0.360
2240.3	0.408	11	0.652	21	247	0.425	5.9	1.2	32	282	0.310
2241.0	0.393	9.0	0.680	19	223	0.967	5.7	1.2	28	255	0.706
2241.7	0.393	9.7	0.842	17	238	1.0	5.7	1.5	26	272	0.753
2242.4	0.393	9.1	0.454	21	260	1.1	5.7	0.827	32	297	0.767
2243.1	0.393	9.9	0.834	17	236	1.0	5.7	1.5	26	270	0.746
2243.8	0.393	9.2	0.701	17	229	0.498	5.7	1.3	26	261	0.363
2244.5	0.393	11	0.767	17	258	0.995	5.7	1.4	27	295	0.726
2245.2	0.393	7.4	0.769	14	215	0.471	5.7	1.4	22	246	0.343
2245.9	0.393	9.4	0.682	14	231	0.802	5.7	1.2	21	264	0.585
2246.6	0.552	8.5	0.684	14	263	0.603	8.0	1.2	21	300	0.440
2247.3	0.393	11	0.344	14	273	0.807	5.7	0.628	22	312	0.589
2248.0	0.393	9.6	0.644	16	233	0.567	5.7	1.2	24	267	0.414
2248.7	0.393	9.8	0.680	13	240	1.3	5.7	1.2	20	274	0.917
2249.4	0.562	8.6	0.604	14	242	1.4	8.1	1.1	22	277	1.0
2250.1	0.393	7.7	0.560	12	209	0.949	5.7	1.0	18	239	0.693
2250.8	0.393	8.1	1.0	15	237	1.2	5.7	1.9	23	271	0.863
2251.5	0.445	11	0.874	12	252	1.1	6.4	1.6	18	288	0.815
2252.2	0.976	8.2	1.3	13	252	1.2	14	2.4	19	288	0.862
2252.9	0.393	7.1	0.949	14	264	1.6	5.7	1.7	21	302	1.2
2253.6	0.393	6.7	0.924	14	236	1.0	5.7	1.7	22	269	0.761
2254.3	0.393	8.6	1.3	14	273	1.3	5.7	2.4	21	313	0.983
2255.0	0.393	7.3	0.979	14	226	1.2	5.7	1.8	21	259	0.854
2255.7	0.393	7.2	1.2	14	233	0.740	5.7	2.2	22	267	0.540
2256.4	0.393	8.2	1.4	13	247	0.872	5.7	2.6	20	283	0.636
2257.1	0.393	7.8	1.5	14	240	1.3	5.7	2.8	22	274	0.953
2257.8	0.393	7.4	1.5	14	245	0.597	5.7	2.7	22	281	0.435
2258.5	0.393	6.6	1.4	14	269	1.0	5.7	2.5	21	308	0.745
2259.2	0.393	7.9	1.5	15	264	0.926	5.7	2.7	23	302	0.676



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2259.8	0.393	8.2	1.7	14	271	1.3	5.7	3.0	22	310	0.981
2260.5	0.393	7.6	1.5	13	255	1.2	5.7	2.7	20	292	0.875
2261.2	0.393	8.3	1.7	17	262	1.4	5.7	3.2	25	299	1.0
2261.9	0.393	8.3	1.3	15	228	1.6	5.7	2.3	23	261	1.2
2262.6	0.393	6.0	2.2	15	254	1.7	5.7	4.1	22	291	1.2
2263.3	0.393	8.5	1.7	14	247	1.1	5.7	3.1	22	283	0.820
2264.0	0.410	6.4	1.8	18	227	1.3	5.9	3.2	28	260	0.955
2264.7	0.393	6.8	1.4	17	235	0.874	5.7	2.5	25	269	0.638
2265.4	0.393	6.9	1.5	18	282	0.868	5.7	2.7	28	322	0.633
2266.1	0.616	9.3	1.8	21	279	1.7	8.9	3.3	33	319	1.3
2266.8	0.393	6.6	1.6	20	221	1.4	5.7	2.9	31	253	1.1
2267.5	0.393	7.5	1.6	20	235	0.863	5.7	3.0	31	268	0.630
2268.2	0.393	7.6	1.7	24	229	1.4	5.7	3.2	37	262	0.992
2268.9	0.393	6.9	1.9	18	240	1.5	5.7	3.5	27	275	1.1
2269.6	0.393	9.8	2.1	25	229	1.7	5.7	3.8	38	262	1.3
2270.3	0.405	6.8	1.8	23	224	1.5	5.9	3.2	35	256	1.1
2271.0	0.393	8.4	1.6	23	225	1.2	5.7	2.9	35	258	0.848
2271.7	0.500	8.1	2.0	22	264	1.5	7.2	3.7	33	302	1.1
2272.4	0.393	8.6	1.6	22	230	1.4	5.7	2.9	33	263	1.0
2273.1	0.393	7.8	2.0	25	233	1.4	5.7	3.6	38	267	1.0
2273.8	0.393	7.4	2.0	27	225	0.673	5.7	3.6	42	257	0.491
2274.5	0.393	6.7	2.1	24	232	1.2	5.7	3.8	37	265	0.892
2275.2	0.479	8.2	1.3	26	223	1.2	6.9	2.3	40	255	0.849
2275.9	0.393	7.4	2.1	23	197	1.6	5.7	3.8	35	225	1.1
2276.6	0.453	6.4	2.2	33	248	1.3	6.5	3.9	50	283	0.981
2277.3	0.393	9.5	2.3	30	224	1.3	5.7	4.1	47	256	0.931
2278.0	0.393	6.6	2.2	26	258	1.6	5.7	4.0	40	296	1.2
2278.7	0.393	7.8	1.9	29	261	1.2	5.7	3.5	45	299	0.885
2279.4	0.393	7.8	2.0	29	257	1.4	5.7	3.7	45	294	1.0
2280.1	0.393	8.5	2.0	27	262	1.1	5.7	3.6	42	299	0.800
2280.8	0.396	6.8	1.9	25	246	0.826	5.7	3.4	39	281	0.603
2281.5	0.393	8.9	2.2	28	243	0.712	5.7	4.0	43	278	0.519
2282.2	0.393	6.2	1.7	31	235	1.2	5.7	3.1	47	269	0.882
2282.9	0.393	7.8	2.0	28	267	1.4	5.7	3.6	43	305	1.0
2283.6	0.393	8.0	1.5	34	227	1.1	5.7	2.7	51	259	0.770
2284.3	0.393	8.4	1.6	23	221	0.823	5.7	2.9	36	253	0.600
2285.0	0.393	9.6	2.4	29	288	0.992	5.7	4.5	44	329	0.724
2285.6	0.759	9.9	2.0	28	248	0.636	11	3.7	43	284	0.464
2286.3	0.393	8.9	1.8	33	226	0.305	5.7	3.3	51	258	0.223
2287.0	0.393	9.6	1.6	25	237	1.3	5.7	3.0	39	270	0.959
2287.7	0.393	8.9	1.6	31	242	1.4	5.7	2.9	47	276	1.0
2288.4	0.393	9.0	1.1	32	260	0.886	5.7	2.1	48	297	0.647
2289.1	0.581	8.0	1.7	33	233	0.740	8.4	3.0	50	267	0.540
2289.8	0.393	8.7	1.6	25	193	0.620	5.7	2.9	39	221	0.452
2290.5	0.393	9.1	1.9	29	249	0.578	5.7	3.4	44	285	0.421
2291.2	0.393	8.6	1.4	29	281	0.588	5.7	2.6	44	321	0.429
2291.9	0.393	8.6	1.5	27	217	0.772	5.7	2.7	42	248	0.563
2292.6	0.393	8.8	1.3	32	235	1.1	5.7	2.4	49	269	0.806
2293.3	0.393	8.1	1.4	28	264	1.1	5.7	2.5	43	302	0.817
2294.0	0.393	11	1.5	32	262	0.396	5.7	2.8	49	299	0.289
2294.7	0.393	8.7	1.4	24	211	0.465	5.7	2.5	37	241	0.339
2295.4	0.444	9.3	1.7	25	220	0.810	6.4	3.0	39	252	0.591
2296.1	0.529	9.8	1.7	27	226	0.674	7.6	3.1	41	259	0.492
2296.8	0.393	9.5	1.3	25	255	0.498	5.7	2.4	38	291	0.364
2297.5	0.393	11	1.2	29	261	0.525	5.7	2.2	44	299	0.383
2298.2	0.393	12	1.1	23	215	0.392	5.7	2.0	35	246	0.286
2298.9	0.393	11	1.1	22	212	0.285	5.7	1.9	33	243	0.208
2299.6	0.393	11	1.2	25	242	1.0	5.7	2.1	39	277	0.733
2300.3	0.414	11	0.621	24	214	1.3	6.0	1.1	36	244	0.964
2301.0	0.393	11	1.1	27	251	0.510	5.7	2.0	41	287	0.372
2301.7	0.393	11	0.967	28	219	0.728	5.7	1.8	43	251	0.531
2302.4	0.393	11	1.2	29	271	0.946	5.7	2.2	44	310	0.690
2303.1	0.393	11	0.779	21	245	0.785	5.7	1.4	32	280	0.573
2303.8	0.703	11	1.1	25	257	0.639	10	2.0	38	293	0.466
2304.5	0.393	11	1.0	24	273	0.523	5.7	1.9	37	312	0.381
2305.2	0.393	10	0.766	20	249	1.2	5.7	1.4	31	284	0.875
2305.9	1.1	10	0.922	22	244	0.711	15	1.7	34	279	0.519
2306.6	0.415	8.6	0.944	21	233	0.757	6.0	1.7	33	267	0.552
2307.3	0.393	7.8	0.705	19	249	0.621	5.7	1.3	28	285	0.453
2308.0	0.393	11	0.895	24	260	1.2	5.7	1.6	37	297	0.911
2308.7	0.393	7.3	0.655	17	214	0.559	5.7	1.2	25	245	0.408
2309.4	0.393	9.3	0.883	16	255	0.615	5.7	1.6	25	292	0.448
2310.1	0.393	9.8	0.710	14	260	0.293	5.7	1.3	22	297	0.214
2310.8	0.393	10	0.701	15	277	1.1	5.7	1.3	23	316	0.800
2311.5	0.393	8.9	0.621	16	250	0.766	5.7	1.1	24	285	0.559
2312.1	0.393	8.6	0.612	16	268	0.539	5.7	1.1	24	307	0.393
2312.8	0.393	11	0.868	14	248	1.0	5.7	1.6	22	283	0.755
2313.5	0.393	8.6	0.973	16	282	0.920	5.7	1.8	24	323	0.671
2314.2	0.393	8.8	0.624	15	255	1.4	5.7	1.1	23	291	1.0
2314.9	0.433	9.2	0.404	15	236	0.790	6.2	0.737	23	270	0.576
2315.6	0.451	9.3	0.653	13	253	0.719	6.5	1.2	20	290	0.524



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2316.3	0.733	7.2	0.497	11	214	0.761	11	0.906	16	244	0.555
2317.0	0.393	8.9	0.521	12	223	0.499	5.7	0.951	19	255	0.364
2317.7	0.393	9.1	0.498	9.9	244	0.797	5.7	0.908	15	279	0.582
2318.4	0.393	9.9	0.461	15	277	0.812	5.7	0.841	23	317	0.592
2319.1	0.393	8.3	0.870	15	294	0.933	5.7	1.6	23	337	0.681
2319.8	0.393	9.9	0.853	15	279	0.395	5.7	1.6	23	319	0.288
2320.5	0.536	8.8	0.906	13	279	0.585	7.7	1.7	19	319	0.427
2321.2	0.393	8.9	0.591	14	241	1.4	5.7	1.1	22	276	1.0
2321.9	0.393	9.6	0.844	13	230	0.784	5.7	1.5	20	263	0.572
2322.6	0.393	8.6	0.867	13	273	0.850	5.7	1.6	20	312	0.620
2323.3	0.393	6.5	0.995	14	289	1.1	5.7	1.8	21	330	0.766
2324.0	0.393	7.4	0.767	11	248	1.3	5.7	1.4	17	283	0.934
2324.7	0.492	7.4	1.0	14	303	0.498	7.1	1.9	21	346	0.363
2325.4	0.479	8.4	1.1	13	295	0.970	6.9	2.0	20	337	0.708
2326.1	0.393	7.9	1.0	9.9	253	1.3	5.7	1.9	15	290	0.918
2326.8	0.393	8.4	0.964	11	286	0.494	5.7	1.8	17	327	0.361
2327.5	0.393	7.3	1.1	15	271	1.1	5.7	2.1	23	310	0.781
2328.2	0.393	6.2	1.1	12	272	2.3	5.7	2.1	18	311	1.7
2328.9	0.393	8.6	1.2	11	292	1.0	5.7	2.2	17	334	0.764
2329.6	0.393	8.1	1.3	15	281	1.9	5.7	2.4	22	321	1.4
2330.3	0.393	7.4	1.2	12	291	0.711	5.7	2.2	18	332	0.518
2331.0	0.481	7.6	1.3	13	260	1.1	6.9	2.5	20	298	0.783
2331.7	0.393	9.0	0.993	11	255	1.1	5.7	1.8	16	291	0.780
2332.4	0.393	6.5	1.0	12	253	0.783	5.7	1.9	18	289	0.571
2333.1	0.639	7.8	1.1	13	294	1.1	9.2	2.0	19	336	0.771
2333.8	0.393	7.9	1.4	14	289	0.796	5.7	2.6	22	331	0.581
2334.5	0.739	7.9	1.4	15	248	1.0	11	2.5	22	284	0.754
2335.2	0.393	8.4	1.3	17	266	1.1	5.7	2.4	26	304	0.793
2335.9	0.393	8.3	1.2	15	313	0.872	5.7	2.3	23	358	0.637
2336.6	0.717	8.4	1.0	14	238	1.1	10	1.9	22	272	0.805
2337.3	0.393	6.3	1.4	11	278	1.6	5.7	2.6	17	318	1.2
2338.0	0.393	9.7	1.1	15	270	1.6	5.7	2.0	24	308	1.2
2338.6	0.393	8.3	1.3	12	224	0.804	5.7	2.4	19	256	0.586
2339.3	0.393	7.3	1.1	12	295	0.654	5.7	2.0	19	337	0.477
2340.0	0.393	7.6	1.2	13	264	1.2	5.7	2.1	20	302	0.853
2340.7	0.543	9.3	1.2	16	297	0.770	7.8	2.1	25	339	0.562
2341.4	0.393	8.7	1.4	15	279	1.6	5.7	2.5	23	319	1.2
2342.1	0.393	8.8	1.5	14	245	1.3	5.7	2.8	21	280	0.946
2342.8	0.393	8.6	1.1	14	298	1.5	5.7	2.0	21	340	1.1
2343.5	0.393	6.6	1.4	16	309	0.928	5.7	2.5	24	353	0.677
2344.2	0.393	9.6	1.3	17	323	1.2	5.7	2.4	26	369	0.875
2344.9	0.393	8.2	0.816	12	241	1.4	5.7	1.5	18	276	1.1
2345.6	0.393	10	1.2	14	238	0.638	5.7	2.1	22	273	0.466
2346.3	0.393	7.1	1.2	17	252	1.1	5.7	2.2	26	289	0.834
2347.0	0.393	8.8	1.1	16	265	1.2	5.7	2.0	25	303	0.872
2347.7	0.393	7.9	1.1	16	294	1.4	5.7	1.9	24	336	1.0
2348.4	0.393	7.9	1.1	14	227	1.2	5.7	2.1	22	259	0.909
2349.1	0.393	9.3	1.3	12	219	1.3	5.7	2.3	19	250	0.958
2349.8	0.393	11	1.4	14	242	0.798	5.7	2.5	21	277	0.582
2350.5	0.536	7.7	0.960	13	293	1.5	7.7	1.8	21	335	1.1
2351.2	0.403	13	1.2	16	253	0.525	5.8	2.2	24	290	0.383
2351.9	0.659	9.8	1.2	13	263	1.3	9.5	2.2	20	301	0.955
2352.6	0.393	9.2	1.1	14	238	0.695	5.7	2.0	22	272	0.507
2353.3	0.406	8.1	0.923	9.8	209	0.926	5.9	1.7	15	239	0.675
2354.0	0.393	9.7	0.598	13	290	1.1	5.7	1.1	19	331	0.813
2354.7	0.393	10	1.3	14	238	0.980	5.7	2.4	22	272	0.715
2355.4	0.699	7.3	0.841	15	242	1.2	10	1.5	23	276	0.856
2356.1	0.393	9.4	1.3	15	296	0.746	5.7	2.4	22	339	0.544
2356.8	0.442	7.7	1.0	14	267	1.3	6.4	1.9	22	306	0.957
2357.5	0.701	8.0	0.932	10	228	0.686	10	1.7	16	261	0.500
2358.2	0.393	8.0	0.872	12	241	1.4	5.7	1.6	19	275	1.0
2358.9	0.393	7.9	1.4	11	199	0.853	5.7	2.5	17	228	0.622
2359.6	0.393	8.8	0.892	14	266	1.0	5.7	1.6	21	304	0.737
2360.3	0.393	8.0	0.949	12	240	1.2	5.7	1.7	19	274	0.874
2361.0	0.393	8.5	0.529	14	304	1.6	5.7	0.964	22	347	1.1
2361.7	0.393	9.4	0.646	15	259	0.911	5.7	1.2	23	296	0.665
2362.4	0.393	7.9	0.779	10	232	1.0	5.7	1.4	16	265	0.738
2363.1	0.393	8.1	0.804	11	272	0.303	5.7	1.5	17	311	0.221
2363.8	0.393	8.4	1.1	12	266	0.857	5.7	2.0	18	304	0.625
2364.5	0.505	8.0	0.626	12	245	0.552	7.3	1.1	18	280	0.403
2365.1	0.393	7.8	0.610	11	271	1.0	5.7	1.1	16	310	0.755
2365.8	0.428	9.4	0.951	13	244	0.878	6.2	1.7	20	280	0.641
2366.5	0.393	7.8	0.799	12	256	0.858	5.7	1.5	18	293	0.626
2367.2	0.393	8.2	0.877	13	249	1.2	5.7	1.6	20	285	0.869
2367.9	0.393	8.7	0.775	10	241	1.3	5.7	1.4	16	275	0.944
2368.6	0.514	8.3	0.806	12	260	0.936	7.4	1.5	19	298	0.683
2369.3	0.608	7.4	0.689	12	232	0.552	8.8	1.3	18	265	0.403
2370.0	0.393	7.9	0.832	9.5	265	0.753	5.7	1.5	15	303	0.549
2370.7	0.393	8.9	0.789	12	246	1.1	5.7	1.4	18	281	0.799
2371.4	0.629	7.8	0.779	9.9	271	1.5	9.1	1.4	15	310	1.1
2372.1	0.704	7.4	1.1	14	284	0.747	10	2.0	21	325	0.545



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2372.8	0.393	10	0.764	13	284	1.1	5.7	1.4	20	325	0.773
2373.5	0.393	6.7	0.784	12	221	1.0	5.7	1.4	18	252	0.751
2374.2	0.393	8.7	1.2	12	252	0.795	5.7	2.1	18	288	0.580
2374.9	0.393	8.3	0.992	12	257	2.5	5.7	1.8	18	294	1.8
2375.6	0.575	9.2	0.690	11	241	4.6	8.3	1.3	17	276	3.3
2376.3	0.502	8.7	0.967	11	273	0.304	7.2	1.8	17	312	0.222
2377.0	0.393	8.3	0.745	12	265	1.3	5.7	1.4	18	303	0.975
2377.7	0.393	8.4	0.667	13	254	1.3	5.7	1.2	20	291	0.963
2378.4	0.393	9.1	1.1	10	273	1.0	5.7	2.0	16	312	0.733
2379.1	0.491	8.4	0.564	10	292	1.5	7.1	1.0	16	333	1.1
2379.8	0.393	7.6	0.787	9.5	248	1.6	5.7	1.4	15	284	1.2
2380.5	0.393	8.2	0.913	9.6	267	1.1	5.7	1.7	15	305	0.809
2381.2	0.393	9.0	0.669	10	308	0.655	5.7	1.2	16	352	0.478
2381.9	0.393	8.8	0.634	11	275	0.859	5.7	1.2	16	315	0.627
2382.6	0.393	8.6	0.738	9.4	263	1.3	5.7	1.3	14	300	0.936
2383.3	0.393	6.8	0.814	8.9	295	0.923	5.7	1.5	14	338	0.674
2384.0	0.457	9.9	0.781	12	348	0.834	6.6	1.4	18	398	0.609
2384.7	0.393	9.0	0.972	8.7	300	1.3	5.7	1.8	13	343	0.947
2385.4	0.393	9.8	1.0	8.3	244	0.957	5.7	1.9	13	279	0.698
2386.1	0.534	7.9	0.816	11	235	0.876	7.7	1.5	17	269	0.639
2386.8	0.393	8.6	0.817	9.0	243	0.317	5.7	1.5	14	278	0.231
2387.5	0.393	8.9	0.699	7.2	233	0.964	5.7	1.3	11	267	0.703
2388.2	0.393	11	0.860	13	318	1.2	5.7	1.6	20	364	0.870
2388.9	0.406	7.4	0.546	8.2	218	0.740	5.9	0.996	13	249	0.540
2389.6	0.393	8.2	0.556	9.6	216	0.876	5.7	1.0	15	247	0.639
2390.3	0.752	9.0	0.621	11	256	0.526	11	1.1	16	293	0.383
2391.0	0.393	10	0.564	11	303	1.5	5.7	1.0	16	347	1.1
2391.7	0.393	10.0	0.802	9.0	288	1.5	5.7	1.5	14	329	1.1
2392.3	0.393	7.8	0.886	8.9	256	0.802	5.7	1.6	14	293	0.585
2393.0	0.393	9.6	0.759	7.7	289	0.887	5.7	1.4	12	330	0.647
2393.7	0.796	8.5	0.809	11	280	0.868	11	1.5	17	320	0.633
2394.4	0.393	11	0.756	8.7	257	1.6	5.7	1.4	13	294	1.1
2395.1	0.767	7.7	0.767	8.5	280	0.896	11	1.4	13	320	0.653
2395.8	0.393	8.2	0.919	8.6	221	0.849	5.7	1.7	13	253	0.620
2396.5	0.393	7.6	0.908	10	264	0.779	5.7	1.7	16	302	0.568
2397.2	0.393	7.9	0.902	12	290	1.4	5.7	1.6	18	331	0.996
2397.9	1.0	7.0	0.884	10	298	1.7	15	1.6	15	341	1.3
2398.6	0.616	8.1	0.947	12	306	0.815	8.9	1.7	19	350	0.595
2399.3	0.987	9.2	0.947	10	298	0.597	14	1.7	16	340	0.435
2400.0	0.480	8.1	0.991	11	314	0.777	6.9	1.8	16	359	0.567
2400.7	0.926	9.9	0.712	10	350	0.672	13	1.3	16	400	0.491
2401.4	0.467	9.8	0.629	11	322	1.9	6.7	1.1	17	369	1.4
2402.1	0.917	9.6	1.0	11	377	1.3	13	1.8	16	431	0.973
2402.8	0.559	7.7	0.946	16	452	1.8	8.1	1.7	24	517	1.3
2403.5	0.819	8.6	1.4	16	487	1.2	12	2.5	25	557	0.883
2404.2	1.2	9.2	1.3	19	511	1.7	18	2.4	28	585	1.2
2404.9	0.712	8.9	1.4	12	470	1.3	10	2.5	19	537	0.945
2405.6	1.7	8.1	1.3	17	567	0.516	24	2.4	26	648	0.377
2406.3	1.4	9.8	1.5	16	497	0.411	20	2.8	24	569	0.300
2407.0	1.8	11	1.7	21	685	1.9	26	3.0	32	783	1.4
2407.7	1.0	9.5	1.4	16	601	1.1	15	2.6	25	687	0.775
2408.4	1.5	11	1.8	23	711	1.3	21	3.4	36	813	0.933
2409.1	2.4	11	2.1	22	761	2.7	35	3.7	34	870	2.0
2409.8	2.1	9.0	2.3	29	739	1.3	30	4.2	45	845	0.912
2410.5	2.1	11	2.1	24	756	2.2	30	3.8	36	864	1.6
2411.2	1.8	11	2.0	24	784	1.7	26	3.6	37	896	1.2
2411.9	1.5	8.5	2.1	25	912	1.3	21	3.9	39	1043	0.942
2412.6	2.4	11	2.9	28	1013	1.7	35	5.2	44	1158	1.2
2413.3	2.2	11	2.8	32	919	2.8	32	5.2	50	1051	2.1
2414.0	1.5	11	2.2	27	982	1.6	22	3.9	42	1123	1.1
2414.7	2.2	9.4	3.3	33	1129	1.7	31	6.0	51	1291	1.2
2415.4	2.6	11	2.7	31	1034	2.1	38	5.0	47	1182	1.5
2416.1	3.3	11	2.8	30	1155	2.0	47	5.2	47	1321	1.5
2416.8	2.8	10	2.3	33	1108	1.6	41	4.1	50	1267	1.2
2417.5	2.6	10	3.9	35	1251	2.1	38	7.1	53	1430	1.6
2418.2	2.1	13	2.7	34	1168	1.3	30	5.0	53	1336	0.975
2418.8	3.2	11	3.4	35	1187	1.8	46	6.2	54	1357	1.3
2419.5	2.3	10	3.3	29	1134	1.4	34	6.0	44	1296	1.0
2420.2	2.4	12	3.9	36	1339	2.0	35	7.1	55	1531	1.5
2420.9	2.3	9.9	3.7	36	1237	3.0	33	6.8	55	1414	2.2
2421.6	3.2	10	3.2	37	1306	1.3	46	5.8	56	1494	0.922
2422.3	2.1	11	3.5	36	1439	2.0	31	6.4	55	1645	1.5
2423.0	2.5	13	3.7	34	1252	2.3	36	6.7	52	1432	1.7
2423.7	2.7	12	4.4	35	1460	2.7	39	8.1	54	1670	2.0
2424.4	2.6	14	3.9	44	1499	1.3	37	7.2	68	1715	0.970
2425.1	1.9	11	4.0	42	1395	1.9	27	7.3	64	1596	1.4
2425.8	2.5	12	3.4	39	1549	2.1	36	6.2	61	1771	1.5
2426.5	2.8	11	4.1	37	1543	2.3	40	7.5	57	1765	1.7
2427.2	2.5	12	3.9	40	1570	3.5	36	7.1	62	1795	2.5
2427.9	1.9	14	4.0	41	1757	1.9	27	7.3	62	2009	1.4
2428.6	3.2	13	3.3	45	1683	2.3	46	6.0	69	1925	1.6



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2429.3	2.6	14	4.3	40	1606	2.1	37	7.8	62	1836	1.5
2430.0	2.5	14	4.8	38	1639	2.2	36	8.8	59	1874	1.6
2430.7	2.0	14	3.6	39	1573	1.2	29	6.7	60	1799	0.851
2431.4	3.3	15	4.3	42	1570	2.3	47	7.9	64	1796	1.7
2432.1	2.8	13	3.8	42	1561	2.9	41	7.0	64	1785	2.1
2432.8	1.6	14	3.2	37	1435	2.1	23	5.9	57	1641	1.5
2433.5	1.9	16	3.7	41	1641	2.6	27	6.8	62	1877	1.9
2434.2	2.3	14	3.9	46	1616	3.2	34	7.1	70	1848	2.3
2434.9	1.0	14	3.0	40	1582	2.9	15	5.5	62	1809	2.1
2435.6	1.9	17	3.9	43	1614	2.5	27	7.1	65	1845	1.8
2436.3	2.3	17	4.0	41	1826	1.8	33	7.2	63	2089	1.3
2437.0	1.5	12	4.0	39	1490	2.5	22	7.3	60	1704	1.8
2437.7	2.0	18	3.8	42	1654	1.1	29	6.9	65	1892	0.825
2438.4	2.1	16	3.2	35	1581	2.2	30	5.8	54	1808	1.6
2439.1	1.7	14	3.8	43	1658	1.9	24	7.0	67	1896	1.4
2439.8	1.2	14	3.7	33	1324	1.9	18	6.7	50	1514	1.4
2440.5	1.9	17	3.2	35	1631	2.6	28	5.9	54	1865	1.9
2441.2	2.5	15	3.7	40	1615	2.5	36	6.7	61	1847	1.8
2441.9	1.9	15	3.5	38	1609	1.9	28	6.3	58	1840	1.4
2442.6	2.3	16	3.6	32	1429	1.8	33	6.6	49	1634	1.3
2443.3	2.2	17	3.5	35	1572	2.1	32	6.4	53	1798	1.5
2444.0	1.2	15	3.1	33	1461	1.9	17	5.7	51	1670	1.4
2444.7	1.7	17	3.1	31	1292	3.0	25	5.6	47	1477	2.2
2445.3	1.5	12	2.6	40	1384	1.6	21	4.7	61	1582	1.2
2446.0	1.6	16	2.8	33	1477	2.4	23	5.1	50	1689	1.8
2446.7	1.9	17	3.2	28	1449	1.7	28	5.8	43	1657	1.2
2447.4	1.9	18	2.5	30	1558	2.6	27	4.6	47	1782	1.9
2448.1	1.5	14	2.1	27	1251	2.1	21	3.8	41	1430	1.5
2448.8	1.1	16	3.0	28	1396	2.4	15	5.5	43	1597	1.8
2449.5	2.2	15	2.4	29	1316	3.0	32	4.4	45	1505	2.2
2450.2	1.6	15	2.7	27	1366	2.7	23	4.9	42	1562	2.0
2450.9	1.6	15	2.2	28	1254	1.6	24	4.0	42	1434	1.2
2451.6	2.3	14	2.3	30	1275	3.0	33	4.3	46	1458	2.2
2452.3	2.3	14	1.8	24	1204	2.6	33	3.3	36	1377	1.9
2453.0	1.8	13	2.1	21	1098	1.6	26	3.8	33	1255	1.2
2453.7	3.3	12	2.0	21	1204	2.4	48	3.7	32	1377	1.8
2454.4	2.7	13	1.9	25	1307	2.3	39	3.6	38	1495	1.6
2455.1	3.2	14	2.3	22	1247	2.8	46	4.2	34	1426	2.0
2455.8	2.7	13	2.4	21	1288	2.3	40	4.3	33	1473	1.7
2456.5	3.7	14	2.2	23	1240	3.5	53	4.0	35	1418	2.5
2457.2	3.9	12	2.5	24	1064	2.5	56	4.5	37	1216	1.8
2457.9	3.8	14	2.2	25	1192	2.6	54	4.0	38	1363	1.9
2458.6	3.3	14	2.3	23	1369	2.9	47	4.1	35	1566	2.1
2459.3	3.4	14	2.5	20	1329	3.1	49	4.6	30	1519	2.3
2460.0	3.5	13	2.2	18	1285	2.9	51	4.1	28	1470	2.1
2460.7	4.0	12	2.9	26	1471	3.2	57	5.3	40	1682	2.3
2461.4	5.5	16	3.0	20	1223	2.5	79	5.5	31	1398	1.8
2462.1	4.1	13	2.8	18	1152	2.2	59	5.1	28	1317	1.6
2462.8	4.4	13	2.8	22	1274	2.9	63	5.1	34	1457	2.1
2463.5	4.8	14	2.8	23	1448	3.9	69	5.2	35	1656	2.8
2464.2	4.5	14	2.6	26	1339	2.6	65	4.7	40	1532	1.9
2464.9	5.5	13	3.4	27	1415	3.3	79	6.1	41	1618	2.4
2465.6	5.0	13	2.6	22	1220	3.2	72	4.7	34	1395	2.4
2466.3	4.4	12	3.1	24	1275	2.8	64	5.7	37	1458	2.1
2467.0	4.8	13	3.1	25	1462	3.2	70	5.6	38	1672	2.3
2467.7	4.3	14	2.6	21	1328	4.6	62	4.7	33	1519	3.3
2468.4	4.1	13	3.1	23	1445	2.5	60	5.6	35	1652	1.8
2469.1	5.1	12	2.7	18	1302	2.7	74	4.9	27	1489	1.9
2469.8	4.5	15	3.4	24	1554	4.9	64	6.2	36	1778	3.6
2470.5	4.2	15	2.7	26	1225	3.5	61	4.8	40	1400	2.5
2471.1	3.6	13	2.8	22	1335	2.7	52	5.1	34	1526	2.0
2471.8	5.0	13	2.7	21	1307	3.0	72	5.0	33	1494	2.2
2472.5	5.1	14	3.1	25	1474	3.3	73	5.6	38	1685	2.4
2473.2	5.5	15	3.1	24	1380	3.3	80	5.6	37	1578	2.4
2473.9	4.4	13	2.5	21	1317	2.2	64	4.6	32	1506	1.6
2474.6	5.4	16	2.4	24	1399	1.7	77	4.4	38	1600	1.2
2475.3	4.4	14	3.0	24	1402	2.7	63	5.5	36	1603	2.0
2476.0	3.7	13	2.6	19	1502	3.4	53	4.8	29	1717	2.5
2476.7	5.0	14	3.0	21	1315	3.1	73	5.5	32	1504	2.3
2477.4	3.8	16	2.4	22	1422	3.3	54	4.4	34	1626	2.4
2478.1	3.9	13	2.2	18	1230	2.8	56	4.1	28	1407	2.0
2478.8	4.1	13	2.6	20	1453	3.6	59	4.8	31	1661	2.6
2479.5	3.8	12	2.7	22	1350	2.5	54	5.0	34	1544	1.8
2480.2	3.1	15	3.4	23	1427	2.2	44	6.2	36	1632	1.6
2480.9	3.9	14	3.1	20	1529	3.2	56	5.7	31	1749	2.3
2481.6	4.2	12	3.1	20	1494	2.6	61	5.6	31	1709	1.9
2482.3	4.4	12	2.3	18	1370	3.8	64	4.3	28	1566	2.8
2483.0	3.6	15	3.1	19	1359	4.3	51	5.6	29	1554	3.2
2483.7	3.2	13	2.3	22	1244	2.4	46	4.3	33	1423	1.8
2484.4	4.2	11	2.4	18	1328	2.2	60	4.4	28	1518	1.6
2485.1	3.5	10	2.3	16	1307	2.5	50	4.2	24	1495	1.8



Minnow Environmental  
Sample ID: 019

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2485.8	4.5	11	2.2	14	1398	2.4	64	4.1	22	1599	1.7
2486.5	2.7	13	2.5	25	1478	4.3	38	4.6	39	1690	3.2
2487.2	3.1	11	2.2	16	1004	1.8	45	3.9	24	1148	1.3
2487.9	3.0	11	2.4	19	1270	4.0	43	4.3	29	1452	2.9
2488.6	2.2	12	2.0	17	1392	3.7	32	3.7	26	1592	2.7
2489.3	3.4	10	1.9	18	1289	2.9	49	3.5	27	1474	2.1
2490.0	3.3	14	2.2	16	1290	3.8	48	4.0	25	1475	2.8
2490.7	2.8	12	2.7	18	1222	3.7	41	4.9	28	1398	2.7
2491.4	3.0	12	1.8	15	1193	3.1	43	3.2	24	1364	2.3
2492.1	1.7	11	2.1	17	1183	2.3	25	3.9	26	1353	1.7
2492.8	2.0	12	1.8	21	1428	2.8	29	3.3	32	1633	2.1
2493.5	2.6	15	2.2	19	1625	2.9	38	4.0	29	1859	2.1
2494.2	2.0	12	1.9	15	1277	2.8	29	3.5	23	1461	2.0
2494.9	1.6	11	2.4	14	1190	2.5	24	4.5	21	1361	1.9
2495.6	3.3	8.9	1.6	20	1263	2.4	48	2.9	30	1444	1.8
2496.3	1.0	11	2.2	15	1342	2.2	15	4.0	23	1535	1.6
2496.9	1.7	14	2.0	17	1373	3.2	24	3.6	26	1570	2.3
2497.6	2.0	11	2.1	18	1359	4.5	29	3.8	27	1554	3.2
2498.3	1.8	11	1.3	17	1255	2.9	26	2.4	26	1435	2.1
2499.0	1.6	11	1.6	14	1306	3.4	24	3.0	22	1493	2.5
2499.7	1.4	12	1.6	13	1470	2.2	21	2.9	20	1681	1.6
2500.4	1.4	15	1.6	15	1479	2.8	20	2.9	23	1691	2.0
2501.1	0.960	12	1.3	14	1358	2.4	14	2.3	22	1553	1.8
2501.8	1.2	12	1.2	15	1262	3.5	17	2.2	23	1443	2.6
2502.5	0.808	14	2.0	13	1387	2.9	12	3.6	20	1586	2.1
2503.2	0.798	17	1.1	12	1303	2.5	12	1.9	18	1490	1.8
2503.9	0.682	13	1.1	13	1382	2.3	9.8	2.1	20	1581	1.6
2504.6	0.393	11	1.1	11	1309	3.5	5.7	2.0	17	1497	2.6
2505.3	0.735	11	0.908	15	1165	3.0	11	1.7	23	1333	2.2
2506.0	0.486	14	0.979	11	1157	1.9	7.0	1.8	18	1323	1.4
2506.7	0.846	13	0.778	14	1248	2.1	12	1.4	22	1427	1.6
2507.4	0.393	11	1.0	11	1268	3.0	5.7	1.8	17	1450	2.2
2508.1	1.0	9.3	0.711	9.5	974	2.3	15	1.3	15	1113	1.6
2508.8	1.7	9.7	0.767	8.8	1141	3.1	25	1.4	14	1304	2.2
2509.5	1.1	10	0.651	8.2	1011	2.4	15	1.2	13	1156	1.7
2510.2	2.4	13	1.1	9.1	1131	1.7	35	1.9	14	1293	1.2
2510.9	1.7	10	0.798	7.3	1082	1.9	25	1.5	11	1237	1.4
2511.6	0.880	9.7	0.751	7.7	1243	2.5	13	1.4	12	1422	1.8
2512.3	2.1	12	0.650	10	1247	2.6	31	1.2	16	1426	1.9
2513.0	2.0	9.6	1.0	7.7	1017	1.9	28	1.8	12	1163	1.4
2513.7	1.9	11	0.770	11	1149	3.4	27	1.4	16	1313	2.5
2514.4	2.9	10	0.615	8.2	1039	1.8	42	1.1	13	1188	1.3
2515.1	1.1	12	1.1	7.6	1090	3.8	16	2.0	12	1246	2.8
2515.8	2.4	10	0.658	7.9	1069	2.3	34	1.2	12	1223	1.7
2516.5	1.9	9.4	0.887	8.5	1164	2.2	28	1.6	13	1331	1.6
2517.2	2.8	11	0.840	9.7	1171	2.8	41	1.5	15	1339	2.1
2517.9	2.5	10	0.898	11	1138	3.0	37	1.6	17	1302	2.2
2518.6	2.4	13	0.981	9.8	1139	2.2	35	1.8	15	1303	1.6
2519.3	2.9	14	1.4	13	1249	1.5	42	2.6	20	1428	1.1
2520.0	3.2	11	0.995	7.9	1268	3.9	46	1.8	12	1450	2.9
2520.7	1.7	11	1.3	15	1172	3.3	24	2.4	23	1340	2.4
2521.4	2.7	11	1.1	13	1184	3.6	39	2.0	20	1354	2.6
2522.1	2.4	10	1.2	8.5	1200	3.4	34	2.2	13	1373	2.5
2522.8	3.2	13	1.3	11	1372	2.5	46	2.3	17	1569	1.8
2523.4	1.8	13	1.2	9.8	1402	2.7	26	2.2	15	1603	2.0
2524.1	1.3	12	0.875	9.9	1109	1.8	19	1.6	15	1269	1.3
2524.8	2.5	13	1.1	13	1442	2.8	36	2.1	19	1649	2.0
2525.5	2.7	11	1.2	8.8	1311	2.3	39	2.2	14	1499	1.7
2526.2	2.3	12	1.2	12	1398	2.8	33	2.2	18	1598	2.1
2526.9	2.8	12	1.5	11	1228	2.4	41	2.8	17	1404	1.8
2527.6	2.2	12	1.2	11	1322	3.1	31	2.2	16	1511	2.2
2528.3	2.2	12	1.1	14	1446	2.6	32	1.9	22	1654	1.9
2529.0	2.5	15	1.5	9.6	1326	2.0	37	2.7	15	1517	1.5
2529.7	2.3	15	1.6	14	1399	3.3	34	2.9	21	1600	2.4
2530.4	2.4	13	1.4	14	1278	2.5	34	2.6	21	1461	1.8
2531.1	2.6	12	1.1	12	1343	2.3	37	2.0	18	1536	1.6
2531.8	1.7	11	1.5	12	1225	2.5	24	2.7	18	1401	1.8
2532.5	3.3	14	1.3	12	1327	2.8	48	2.3	19	1517	2.0
2533.2	1.6	15	1.1	10	1331	2.7	23	2.0	16	1522	2.0
2533.9	2.2	15	0.755	11	1267	1.9	32	1.4	17	1449	1.4
2534.6	3.0	13	1.1	13	1257	3.1	43	1.9	19	1437	2.2
2535.3	2.3	13	1.2	12	1324	2.6	33	2.2	19	1514	1.9
2536.0	1.5	14	1.4	12	1365	1.9	22	2.5	19	1561	1.4
2536.7	2.4	12	1.1	8.3	1218	3.0	35	2.0	13	1393	2.2
2537.4	2.0	14	1.1	8.4	1063	2.5	29	1.9	13	1216	1.8
2538.1	1.9	11	1.3	11	1261	2.5	28	2.3	17	1442	1.8
2538.8	1.9	15	1.1	12	1281	2.8	27	2.1	18	1465	2.1
2539.5	1.2	13	0.765	11	1256	2.1	17	1.4	16	1436	1.5
2540.2	1.6	12	1.3	11	1391	3.1	23	2.3	16	1590	2.2
2540.9	1.8	11	0.787	8.7	1056	2.5	26	1.4	13	1208	1.8
2541.6	1.6	13	1.2	9.1	1229	2.5	23	2.2	14	1406	1.8



Minnow Environmental  
Sample ID: 019

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
2542.3	1.5	13	1.4	8.0	1348	2.1	21	2.6	12	1541	1.5
2543.0	1.6	11	1.1	9.4	1125	2.0	23	1.9	14	1287	1.5
2543.7	2.3	12	0.887	7.3	1117	2.7	34	1.6	11	1277	2.0
2544.4	2.5	11	0.757	12	1125	2.9	36	1.4	18	1287	2.1
2545.1	2.2	11	1.0	10	1217	1.9	32	1.9	15	1392	1.4
2545.8	1.7	11	0.732	7.9	1021	2.0	24	1.3	12	1167	1.5
2546.5	2.6	12	1.2	8.1	1165	2.6	38	2.2	12	1332	1.9
2547.2	1.5	14	1.2	9.0	1256	2.1	22	2.2	14	1436	1.6
2547.9	2.2	12	1.5	13	1217	2.7	32	2.7	19	1392	2.0
2548.6	1.9	9.7	0.821	9.1	1145	2.5	27	1.5	14	1309	1.8
2549.2	2.1	13	1.1	7.9	1344	2.7	30	1.9	12	1537	2.0
2549.9	2.8	9.5	1.1	9.1	1229	2.7	41	2.1	14	1405	1.9
2550.6	2.7	11	1.0	9.1	1174	2.4	38	1.8	14	1343	1.8
2551.3	0.737	11	0.981	7.0	1070	2.7	11	1.8	11	1224	2.0
2552.0	2.2	13	0.914	9.0	1222	2.3	32	1.7	14	1397	1.7
2552.7	1.4	14	0.984	11	1236	2.3	21	1.8	17	1413	1.7
2553.4	1.3	12	0.949	7.5	1221	2.8	18	1.7	11	1397	2.0
2554.1	1.9	18	0.949	9.9	1178	2.7	28	1.7	15	1348	2.0
2554.8	1.3	12	0.820	6.8	1304	1.7	19	1.5	10	1491	1.3
2555.5	2.1	14	1.1	7.8	1213	2.6	30	2.0	12	1387	1.9
2556.2	0.822	12	0.860	7.3	1308	1.5	12	1.6	11	1496	1.1
2556.9	1.6	15	0.966	9.1	1140	1.1	23	1.8	14	1304	0.797
2557.6	0.939	15	1.3	8.9	1361	2.8	14	2.4	14	1557	2.1
2558.3	1.2	13	0.535	11	1296	1.9	18	0.975	17	1482	1.4
2559.0	0.860	15	0.845	9.6	1230	2.0	12	1.5	15	1407	1.5
2559.7	0.996	13	0.848	7.7	1239	1.9	14	1.5	12	1417	1.4
2560.4	1.6	16	0.596	7.9	1356	2.6	23	1.1	12	1551	1.9
2561.1	0.680	14	0.842	8.1	1288	2.3	9.8	1.5	12	1473	1.6
2561.8	1.1	16	0.783	7.2	1078	2.1	15	1.4	11	1233	1.5
2562.5	0.746	13	0.781	6.4	1021	1.9	11	1.4	9.8	1168	1.4
2563.2	0.781	14	0.644	7.6	1207	1.7	11	1.2	12	1380	1.3
2563.9	0.393	15	0.668	8.1	1340	3.2	5.7	1.2	12	1532	2.3
2564.6	0.435	16	0.540	6.5	982	3.1	6.3	0.985	9.9	1123	2.2
2565.3	0.470	14	3.6	6.6	1088	1.8	6.8	6.5	10	1244	1.3
2566.0	0.393	16	0.502	4.3	1077	2.1	5.7	0.915	6.6	1231	1.5
2566.7	0.547	17	0.653	5.3	1069	2.4	7.9	1.2	8.1	1223	1.8
2567.4	0.420	14	0.473	5.1	1091	1.5	6.1	0.863	7.8	1247	1.1
2568.1	0.393	27	0.325	6.1	990	1.2	5.7	0.592	9.4	1132	0.892
2568.8	0.452	18	0.352	4.1	1045	2.0	6.5	0.641	6.3	1195	1.4
2569.5	0.478	21	0.680	4.8	983	1.5	6.9	1.2	7.3	1124	1.1
2570.2	0.393	23	0.329	5.4	984	2.0	5.7	0.600	8.3	1125	1.5
2570.9	0.420	20	0.608	4.0	978	2.1	6.1	1.1	6.1	1119	1.5
2571.6	0.475	22	0.350	4.2	911	1.5	6.9	0.638	6.5	1042	1.1
2572.3	0.393	21	0.386	3.1	906	1.5	5.7	0.703	4.7	1036	1.1
2573.0	0.643	23	0.377	4.0	861	2.2	9.3	0.687	6.2	985	1.6
2573.7	0.393	22	0.422	2.9	904	0.825	5.7	0.769	4.5	1034	0.602
2574.4	0.393	24	0.340	3.7	854	1.7	5.7	0.619	5.7	976	1.2
2575.1	0.539	20	0.402	2.4	900	2.1	7.8	0.733	3.6	1030	1.5
2575.7	0.393	21	0.623	3.8	920	2.0	5.7	1.1	5.8	1052	1.5
2576.4	0.647	22	0.467	2.1	926	2.6	9.3	0.852	3.2	1059	1.9
2577.1	0.393	22	0.407	3.0	923	1.7	5.7	0.741	4.6	1055	1.2
2577.8	0.535	26	0.200	2.9	958	1.4	7.7	0.365	4.4	1095	0.996
2578.5	1.1	24	0.547	2.3	956	1.3	15	0.998	3.6	1093	0.916
2579.2	0.393	28	0.396	3.3	987	0.922	5.7	0.722	5.1	1128	0.673
2579.9	0.465	26	0.343	1.8	930	1.8	6.7	0.626	2.7	1064	1.3
2580.6	0.393	22	0.360	2.2	914	1.3	5.7	0.656	3.4	1046	0.963
2581.3	0.562	23	0.359	2.6	937	1.5	8.1	0.655	4.0	1072	1.1
2582.0	0.508	24	0.421	1.6	1093	1.5	7.3	0.767	2.5	1250	1.1
2582.7	0.393	25	0.216	1.8	913	2.4	5.7	0.393	2.7	1044	1.7
2583.4	0.393	26	0.268	2.8	964	1.8	5.7	0.488	4.2	1103	1.3
2584.1	0.393	23	0.215	2.0	905	2.2	5.7	0.393	3.1	1035	1.6
2584.8	0.393	23	0.302	0.744	898	2.0	5.7	0.551	1.1	1026	1.5
2585.5	0.698	27	0.466	2.5	994	1.5	10	0.850	3.8	1137	1.1
2586.2	0.393	31	0.426	2.4	927	1.1	5.7	0.777	3.7	1060	0.836
2586.9	0.393	27	0.451	1.8	983	1.8	5.7	0.823	2.8	1124	1.3
2587.6	0.505	26	0.280	2.1	949	1.8	7.3	0.511	3.2	1085	1.3
2588.3	0.393	27	0.550	3.5	849	1.9	5.7	1.0	5.4	971	1.4
2589.0	0.457	25	0.308	3.1	944	0.833	6.6	0.563	4.7	1080	0.608
2589.7	0.393	26	0.558	3.4	1117	2.9	5.7	1.0	5.3	1277	2.1
2590.4	0.525	27	0.555	2.3	954	1.8	7.6	1.0	3.5	1091	1.3
2591.1	0.635	26	0.501	2.7	979	1.6	9.2	0.913	4.1	1119	1.1
2591.8	0.393	28	0.428	2.3	914	1.6	5.7	0.780	3.5	1045	1.1
2592.5	0.393	28	0.325	2.7	988	1.6	5.7	0.593	4.1	1130	1.2
2593.2	0.393	25	0.454	1.6	903	1.1	5.7	0.827	2.4	1033	0.767
2593.9	0.424	27	0.402	2.8	949	1.1	6.1	0.734	4.3	1086	0.807
2594.6	0.393	27	0.577	3.8	915	1.7	5.7	1.1	5.9	1046	1.2
2595.3	0.738	28	0.281	1.7	983	1.6	11	0.512	2.6	1124	1.1
2596.0	0.393	27	0.325	2.1	808	1.1	5.7	0.593	3.2	925	0.834
2596.7	0.464	31	0.385	1.6	901	1.6	6.7	0.702	2.4	1030	1.2
2597.4	0.393	31	0.249	2.9	954	2.0	5.7	0.454	4.5	1090	1.4
2598.1	1.0	30	0.342	3.0	1035	1.8	15	0.624	4.5	1184	1.3



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
2598.8	0.393	33	0.344	1.9	1007	2.6	5.7	0.628	2.9	1152	1.9
2599.5	0.569	35	0.498	1.9	963	1.8	8.2	0.907	2.9	1102	1.3
2600.2	0.532	31	0.441	2.8	1032	2.1	7.7	0.805	4.3	1180	1.5
2600.9	0.393	28	0.495	2.9	920	1.8	5.7	0.903	4.5	1052	1.3
2601.5	0.396	31	0.412	1.0	904	1.2	5.7	0.751	1.6	1034	0.880
2602.2	0.393	32	0.527	1.5	963	1.5	5.7	0.962	2.3	1101	1.1
2602.9	0.393	33	0.396	1.3	1087	1.7	5.7	0.722	2.0	1243	1.3
2603.6	0.393	36	0.382	0.702	999	1.3	5.7	0.696	1.1	1143	0.941
2604.3	0.393	29	0.221	2.9	973	1.2	5.7	0.403	4.5	1113	0.881
2605.0	0.540	31	0.365	2.3	893	1.8	7.8	0.665	3.6	1021	1.3
2605.7	0.393	32	0.350	1.1	924	0.945	5.7	0.638	1.8	1057	0.690
2606.4	0.393	33	0.353	1.9	957	1.1	5.7	0.644	3.0	1094	0.783
2607.1	0.423	34	0.323	1.1	978	1.2	6.1	0.590	1.7	1118	0.847
2607.8	0.393	27	0.607	2.2	888	1.1	5.7	1.1	3.3	1015	0.780
2608.5	0.627	32	0.404	2.1	875	1.4	9.0	0.737	3.2	1001	1.0
2609.2	0.393	30	0.248	1.3	903	1.8	5.7	0.453	2.0	1032	1.3
2609.9	0.393	26	0.187	0.959	884	1.2	5.7	0.340	1.5	1011	0.888
2610.6	0.393	28	0.425	0.702	875	2.0	5.7	0.776	1.1	1001	1.5
2611.3	0.393	34	0.273	3.6	879	1.9	5.7	0.499	5.5	1005	1.4
2612.0	0.393	29	0.443	1.9	825	1.2	5.7	0.809	2.8	943	0.874
2612.7	0.502	32	0.522	1.1	1008	2.9	7.2	0.953	1.7	1153	2.1
2613.4	0.393	35	0.374	1.3	809	1.8	5.7	0.682	1.9	925	1.3
2614.1	0.393	31	0.187	1.7	835	1.8	5.7	0.341	2.6	955	1.3
2614.8	0.393	26	0.290	1.4	841	1.7	5.7	0.529	2.1	961	1.2
2615.5	0.623	32	0.408	4.2	926	1.8	9.0	0.744	6.4	1059	1.3
2616.2	0.393	28	0.465	1.6	733	0.728	5.7	0.848	2.5	838	0.531
2616.9	0.393	25	0.301	1.0	722	0.732	5.7	0.550	1.6	826	0.534
2617.6	0.393	27	0.265	1.6	632	0.722	5.7	0.483	2.4	723	0.527
2618.3	0.393	25	0.225	1.4	765	0.978	5.7	0.410	2.1	875	0.713
2619.0	0.393	30	0.308	2.7	748	0.840	5.7	0.561	4.2	856	0.613
2619.7	0.393	30	0.086	2.7	991	1.4	5.7	0.157	4.2	1133	1.1
2620.4	0.393	27	0.346	2.3	725	1.8	5.7	0.630	3.5	829	1.3
2621.1	0.393	24	0.131	0.702	591	1.7	5.7	0.239	1.1	675	1.2
2621.8	0.393	25	0.083	0.782	759	0.526	5.7	0.152	1.2	868	0.384
2622.5	0.393	28	0.119	3.5	768	1.2	5.7	0.218	5.3	878	0.869
2623.2	0.393	30	0.351	1.4	736	1.5	5.7	0.640	2.1	841	1.1
2623.9	0.393	25	0.079	1.2	689	0.678	5.7	0.144	1.8	788	0.495
2624.6	0.393	26	0.210	3.2	647	1.3	5.7	0.384	4.9	740	0.932
2625.3	0.393	29	0.082	1.2	679	1.0	5.7	0.150	1.9	777	0.757
2626.0	0.393	27	0.141	3.6	726	1.0	5.7	0.257	5.4	830	0.734
2626.7	0.393	32	0.079	2.1	724	0.003	5.7	0.144	3.2	828	0.002
2627.3	0.599	33	0.128	2.5	597	0.546	8.6	0.233	3.8	683	0.399
2628.0	0.393	31	0.230	0.702	468	0.332	5.7	0.420	1.1	535	0.242
2628.7	0.393	28	0.079	1.2	695	1.0	5.7	0.144	1.8	795	0.751
2629.4	0.393	25	0.288	4.2	630	0.625	5.7	0.525	6.5	720	0.456
2630.1	0.762	24	0.409	1.7	562	0.595	11	0.746	2.6	643	0.434
2630.8	0.393	25	0.217	0.702	655	1.3	5.7	0.396	1.1	749	0.962
2631.5	0.393	27	0.383	2.5	543	0.743	5.7	0.698	3.9	621	0.542
2632.2	0.407	37	0.176	2.1	927	1.3	5.9	0.321	3.2	1060	0.916
2632.9	0.393	27	0.247	2.9	732	1.1	5.7	0.451	4.5	837	0.781
2633.6	0.393	21	0.397	0.702	845	1.4	5.7	0.724	1.1	966	0.986
2634.3	0.393	38	0.236	4.8	697	2.8	5.7	0.430	7.4	797	2.0
2635.0	0.393	27	0.556	3.3	630	0.728	5.7	1.0	5.1	720	0.531
2635.7	0.393	34	0.406	0.791	729	0.250	5.7	0.741	1.2	834	0.182
2636.4	0.393	33	0.147	0.702	580	2.5	5.7	0.268	1.1	664	1.8
2637.1	0.393	23	0.251	2.2	529	1.1	5.7	0.457	3.4	605	0.796
2637.8	0.393	28	0.114	2.3	612	1.2	5.7	0.208	3.6	700	0.876
2638.5	0.393	29	0.254	2.1	607	0.660	5.7	0.464	3.3	694	0.481
2639.2	0.393	34	0.392	1.7	608	1.2	5.7	0.715	2.7	695	0.890
2639.9	0.393	33	0.169	1.7	696	0.720	5.7	0.308	2.6	796	0.526
2640.6	0.393	26	0.079	3.9	717	1.8	5.7	0.144	6.0	820	1.3
2641.3	0.485	27	0.308	2.2	756	0.891	7.0	0.561	3.3	864	0.650
2642.0	0.393	27	0.304	0.982	588	1.3	5.7	0.555	1.5	672	0.965
2642.7	0.877	32	0.079	0.702	558	0.455	13	0.144	1.1	639	0.332
2643.4	0.393	25	0.462	1.1	496	0.501	5.7	0.842	1.7	568	0.366
2644.1	0.393	21	0.240	1.8	753	1.5	5.7	0.438	2.7	861	1.1
2644.8	0.393	24	0.172	1.1	481	1.1	5.7	0.313	1.6	550	0.810
2645.5	0.393	33	0.343	2.7	593	0.744	5.7	0.625	4.2	679	0.543
2646.2	0.393	25	0.562	1.1	554	1.2	5.7	1.0	1.7	633	0.897
2646.9	0.393	39	0.336	4.4	739	0.871	5.7	0.612	6.7	845	0.635
2647.6	0.393	29	0.368	0.702	597	0.531	5.7	0.671	1.1	683	0.387
2648.3	0.393	32	0.277	3.3	672	0.894	5.7	0.505	5.1	769	0.652
2649.0	0.393	25	0.079	3.3	676	0.260	5.7	0.144	5.0	773	0.190
2649.7	0.661	37	0.213	0.951	502	0.300	9.5	0.389	1.5	574	0.219
2650.4	0.393	25	0.190	1.6	465	1.9	5.7	0.347	2.4	531	1.4
2651.1	0.879	21	0.153	2.7	654	1.9	13	0.279	4.2	748	1.4
2651.8	0.393	35	0.340	2.5	613	1.5	5.7	0.620	3.8	701	1.1
2652.5	0.393	31	0.079	2.7	581	0.946	5.7	0.144	4.1	665	0.691
2653.2	0.596	31	0.813	1.9	521	1.6	8.6	1.5	3.0	596	1.2
2653.9	0.993	30	0.079	1.7	573	0.299	14	0.144	2.7	656	0.218
2654.5	0.393	28	0.375	1.9	511	1.4	5.7	0.685	3.0	585	0.992



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
2655.2	0.393	29	0.432	1.2	592	1.6	5.7	0.789	1.8	677	1.2
2655.9	0.956	28	0.344	0.780	460	0.746	14	0.627	1.2	526	0.544
2656.6	0.965	37	0.605	1.7	524	0.585	14	1.1	2.6	599	0.427
2657.3	0.393	33	0.228	3.7	384	0.243	5.7	0.416	5.7	439	0.177
2658.0	2.2	30	0.091	1.6	581	0.726	32	0.165	2.5	664	0.529
2658.7	0.956	43	0.706	0.702	574	0.003	14	1.3	1.1	657	0.002
2659.4	0.393	31	0.166	2.0	560	0.697	5.7	0.303	3.1	641	0.508
2660.1	0.393	32	0.176	2.6	721	0.738	5.7	0.321	4.0	825	0.538
2660.8	0.756	33	0.559	1.1	429	1.0	11	1.0	1.7	491	0.759
2661.5	0.393	35	0.079	0.702	541	0.895	5.7	0.144	1.1	618	0.653
2662.2	0.393	37	0.618	4.4	738	0.003	5.7	1.1	6.7	844	0.002
2662.9	1.4	27	0.079	3.6	443	0.423	20	0.144	5.5	506	0.309
2663.6	0.393	32	0.100	11	441	0.003	5.7	0.182	17	504	0.002
2664.3	0.710	27	2.4	7.5	644	2.9	10	4.5	11	736	2.1
2665.0	2.6	30	0.083	1.9	316	0.666	37	0.152	3.0	361	0.486
2665.7	0.677	41	0.387	5.7	665	1.2	9.8	0.706	8.8	760	0.912
2666.4	1.1	81	2.7	3.8	607	0.649	15	4.9	5.8	694	0.473
2667.1	9.0	47	1.3	7.2	589	0.575	130	2.4	11	673	0.420
2667.8	1.4	30	0.583	0.702	494	0.500	20	1.1	1.1	565	0.364
2668.5	0.393	32	0.469	0.702	670	0.402	5.7	0.856	1.1	766	0.293
2669.2	0.393	35	0.460	305	468	0.003	5.7	0.839	467	536	0.002
2669.9	0.393	39	0.079	1.8	413	0.003	5.7	0.144	2.8	472	0.002
2670.6	0.393	39	0.079	0.702	569	0.820	5.7	0.144	1.1	651	0.598
2671.3	1.3	37	0.370	0.702	878	0.769	18	0.674	1.1	1004	0.561
2672.0	2.2	42	0.079	6.7	543	1.6	31	0.144	10	621	1.1
2672.7	0.393	51	0.241	0.702	505	3.9	5.7	0.440	1.1	577	2.8
2673.4	0.393	37	0.198	17	585	1.6	5.7	0.362	26	669	1.2
2674.1	0.393	52	0.757	9.0	425	1.6	5.7	1.4	14	486	1.2
2674.8	0.393	62	1.4	13	490	1.0	5.7	2.6	20	560	0.742
2675.5	0.521	42	0.710	14	481	1.0	7.5	1.3	21	549	0.730
2676.2	0.393	56	1.0	0.702	426	0.003	5.7	1.9	1.1	488	0.002
2676.9	0.393	45	0.922	0.702	438	3.9	5.7	1.7	1.1	501	2.9
2677.6	0.393	23	0.803	15	346	0.003	5.7	1.5	23	396	0.002
2678.3	0.557	28	0.079	6.2	306	0.003	8.0	0.144	9.6	350	0.002
2679.0	0.841	49	0.777	0.798	388	0.003	12	1.4	1.2	443	0.002
2679.7	0.393	83	4.1	0.969	464	2.0	5.7	7.5	1.5	531	1.4



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
0.3	1.7	53	2.6	26	421	1.6	24	4.7	40	481	1.2
1.0	2.0	56	2.9	27	410	1.7	29	5.3	42	468	1.3
1.7	1.3	53	3.8	37	407	1.7	18	7.0	57	465	1.2
2.4	1.3	77	5.8	32	372	1.9	19	11	49	425	1.4
3.1	1.6	65	8.1	35	424	1.7	23	15	53	485	1.2
3.8	1.2	64	5.5	31	395	2.0	18	10	47	451	1.5
4.5	0.944	53	4.4	29	387	1.7	14	8.0	44	443	1.3
5.2	0.958	47	3.9	29	394	2.4	14	7.2	45	451	1.8
5.9	1.2	49	3.9	25	397	2.0	17	7.0	39	454	1.5
6.6	1.4	52	6.3	26	355	1.6	21	11	40	406	1.2
7.3	1.5	56	7.0	28	371	1.9	22	13	43	425	1.4
8.0	1.5	64	4.5	30	454	2.3	21	8.2	47	519	1.7
8.7	1.3	56	4.2	26	452	2.3	18	7.7	40	517	1.7
9.4	1.4	45	3.4	27	379	1.5	20	6.2	42	433	1.1
10.1	1.3	55	3.8	29	406	1.7	19	6.9	44	465	1.2
10.8	1.6	57	3.2	27	374	1.8	23	5.8	41	428	1.3
11.5	1.1	58	3.0	25	361	1.4	15	5.4	38	412	1.0
12.2	1.5	52	2.7	27	415	3.0	22	4.9	41	475	2.2
12.9	2.1	47	2.5	24	310	2.1	30	4.5	36	355	1.5
13.6	2.0	48	1.8	27	418	2.4	29	3.3	41	477	1.8
14.3	1.6	62	1.9	28	375	1.5	24	3.5	43	429	1.1
15.0	1.8	53	2.6	31	411	1.9	26	4.8	48	471	1.4
15.7	1.4	56	2.1	27	403	1.6	21	3.9	41	461	1.1
16.4	1.5	46	2.5	31	389	3.1	21	4.5	47	445	2.2
17.1	1.7	56	4.0	34	390	2.4	25	7.3	53	446	1.8
17.8	1.2	56	1.9	32	383	2.2	17	3.5	49	438	1.6
18.5	1.4	56	2.6	33	403	2.3	20	4.8	50	461	1.6
19.2	1.6	47	2.0	25	380	2.0	22	3.7	38	434	1.4
19.9	1.1	51	1.5	29	429	1.7	16	2.7	44	490	1.3
20.6	0.807	46	1.8	28	365	1.3	12	3.4	43	417	0.977
21.3	1.2	57	1.8	29	397	2.5	18	3.3	44	454	1.8
22.0	1.3	46	7.6	31	352	2.0	18	14	47	402	1.5
22.6	1.1	51	1.5	29	368	2.4	16	2.8	44	420	1.7
23.3	1.6	44	1.4	28	365	2.0	22	2.5	42	417	1.4
24.0	1.5	54	1.1	32	370	2.0	22	2.0	48	423	1.5
24.7	1.4	52	1.1	31	354	2.6	20	2.0	48	405	1.9
25.4	2.2	48	0.822	34	425	2.3	32	1.5	52	486	1.7
26.1	1.7	39	1.2	27	387	2.7	25	2.3	42	442	2.0
26.8	1.4	53	1.3	30	376	2.7	20	2.4	47	430	2.0
27.5	1.8	55	1.2	33	396	2.1	26	2.1	51	452	1.5
28.2	1.4	41	0.967	40	374	3.0	20	1.8	62	428	2.2
28.9	1.2	38	0.955	28	347	2.2	18	1.7	43	397	1.6
29.6	1.9	48	1.2	31	408	3.2	28	2.2	47	467	2.4
30.3	2.0	55	1.5	35	407	3.3	29	2.7	54	466	2.4
31.0	1.8	50	0.639	39	347	3.1	26	1.2	60	397	2.3
31.7	1.0	42	1.0	38	392	1.9	15	1.9	58	449	1.4
32.4	1.6	39	1.1	27	404	2.9	23	2.0	42	462	2.1
33.1	1.8	56	1.2	39	439	3.0	26	2.2	59	502	2.2
33.8	1.7	48	0.974	35	364	2.1	25	1.8	54	416	1.5
34.5	1.3	50	1.1	44	386	2.6	19	2.0	68	442	1.9
35.2	1.0	35	1.0	29	347	3.7	15	1.9	45	397	2.7
35.9	1.8	47	0.835	27	377	2.4	26	1.5	41	431	1.8
36.6	1.9	50	0.741	29	342	2.6	27	1.4	44	391	1.9
37.3	1.5	52	0.886	40	448	3.1	22	1.6	61	512	2.2
38.0	1.1	47	1.0	36	399	2.5	15	1.9	55	456	1.8
38.7	1.2	37	0.923	30	300	2.3	18	1.7	47	343	1.7
39.4	1.5	38	0.693	32	346	2.2	21	1.3	49	396	1.6
40.1	2.2	42	0.948	32	343	2.0	32	1.7	50	392	1.5
40.8	1.3	46	1.2	36	323	1.8	18	2.2	56	370	1.3
41.5	1.2	36	0.705	32	339	2.6	17	1.3	50	387	1.9
42.2	0.917	37	1.0	37	336	2.1	13	1.9	57	385	1.6
42.9	1.9	40	1.1	38	345	2.5	27	1.9	58	395	1.8
43.6	1.4	38	0.823	34	349	2.3	20	1.5	52	399	1.7
44.3	1.3	39	1.3	48	395	3.2	18	2.4	73	452	2.3
45.0	1.2	40	0.896	37	308	2.5	17	1.6	57	352	1.9
45.7	1.4	32	0.772	34	303	2.1	20	1.4	52	346	1.5
46.4	1.7	34	0.867	35	333	2.5	25	1.6	54	381	1.8
47.1	1.5	36	1.0	36	416	3.0	21	1.8	55	475	2.2
47.8	2.0	44	0.805	39	338	2.3	28	1.5	60	386	1.7
48.5	1.3	38	1.2	43	378	2.2	18	2.1	65	433	1.6
49.1	1.1	34	0.850	35	315	1.7	15	1.5	54	361	1.2
49.8	1.7	40	0.713	35	313	2.3	24	1.3	54	357	1.7
50.5	0.891	38	0.796	36	324	2.0	13	1.5	55	370	1.4
51.2	1.6	34	1.0	35	369	2.2	23	1.8	53	422	1.6
51.9	1.5	38	0.683	36	293	1.4	21	1.2	56	335	0.995
52.6	2.0	38	0.674	29	353	2.4	29	1.2	44	403	1.7
53.3	1.6	35	0.967	45	385	2.6	23	1.8	68	441	1.9
54.0	2.0	38	0.946	38	342	2.7	29	1.7	58	391	2.0
54.7	1.7	39	0.767	45	328	4.2	25	1.4	68	375	3.1
55.4	1.2	31	0.489	42	293	2.2	18	0.892	64	335	1.6
56.1	1.9	35	0.699	38	268	2.6	27	1.3	58	306	1.9



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
56.8	2.0	30	0.922	46	314	3.8	29	1.7	70	359	2.7
57.5	1.1	35	0.858	62	412	2.8	15	1.6	94	471	2.1
58.2	1.4	33	0.979	39	333	2.7	20	1.8	60	381	2.0
58.9	1.1	37	1.2	54	449	2.9	16	2.2	83	514	2.1
59.6	1.4	32	1.0	43	370	2.8	20	1.9	67	423	2.1
60.3	1.6	41	0.782	48	342	2.2	23	1.4	74	391	1.6
61.0	1.7	31	0.817	48	357	3.0	25	1.5	74	408	2.2
61.7	0.778	39	0.848	50	333	3.7	11	1.5	76	380	2.7
62.4	0.883	28	0.833	50	375	2.1	13	1.5	77	428	1.5
63.1	2.1	30	0.949	48	345	2.8	31	1.7	73	394	2.1
63.8	1.8	33	1.2	54	359	3.1	25	2.2	83	410	2.3
64.5	2.9	40	1.0	49	369	2.6	42	1.8	75	422	1.9
65.2	1.2	32	0.719	50	345	2.6	17	1.3	77	394	1.9
65.9	1.1	27	0.773	47	317	2.0	15	1.4	72	362	1.4
66.6	1.2	25	1.2	40	308	2.1	17	2.3	62	352	1.6
67.3	1.5	29	0.963	46	317	1.8	22	1.8	70	363	1.3
68.0	1.2	31	0.772	56	370	2.8	17	1.4	86	424	2.0
68.7	1.3	25	0.719	44	268	2.4	19	1.3	68	307	1.8
69.4	1.5	26	0.765	41	412	3.1	22	1.4	63	471	2.3
70.1	0.578	26	0.804	47	338	2.5	8.3	1.5	72	386	1.8
70.8	1.3	36	0.952	47	338	3.5	18	1.7	71	386	2.5
71.5	1.4	29	0.855	59	355	2.9	20	1.6	91	406	2.1
72.2	1.8	32	0.755	62	355	2.3	26	1.4	95	406	1.7
72.9	1.7	29	1.1	52	438	2.9	25	1.9	79	501	2.1
73.6	2.1	29	1.0	57	396	4.6	31	1.9	87	453	3.4
74.3	1.2	35	0.676	43	245	1.9	17	1.2	66	280	1.4
74.9	1.5	26	0.877	49	313	2.0	22	1.6	75	358	1.5
75.6	1.7	25	0.881	52	323	3.0	24	1.6	80	369	2.2
76.3	1.0	22	0.735	50	342	3.3	15	1.3	76	391	2.4
77.0	1.9	32	0.981	55	422	1.7	28	1.8	84	483	1.2
77.7	1.5	25	0.985	57	381	3.8	21	1.8	87	435	2.8
78.4	1.1	27	0.927	57	371	3.4	16	1.7	87	424	2.4
79.1	1.4	19	0.921	46	304	2.9	20	1.7	71	347	2.1
79.8	1.2	22	0.733	59	364	2.6	17	1.3	91	416	1.9
80.5	1.7	27	0.926	59	340	2.6	25	1.7	90	389	1.9
81.2	0.950	26	0.943	50	333	3.2	14	1.7	77	381	2.4
81.9	0.803	25	1.000	52	244	2.3	12	1.8	79	279	1.6
82.6	1.0	20	0.976	58	356	2.7	15	1.8	89	407	2.0
83.3	1.2	24	1.1	62	358	3.3	18	2.0	96	409	2.4
84.0	1.7	26	0.980	61	334	3.7	25	1.8	93	382	2.7
84.7	1.3	23	1.1	75	357	2.8	19	2.0	114	408	2.0
85.4	1.3	20	0.854	58	312	2.9	18	1.6	89	357	2.1
86.1	1.6	26	1.2	56	333	2.6	23	2.2	85	381	1.9
86.8	1.6	24	0.721	53	279	3.5	23	1.3	81	320	2.5
87.5	1.4	17	1.1	50	311	2.6	20	2.0	77	355	1.9
88.2	1.4	19	1.0	60	291	1.8	21	1.9	91	333	1.3
88.9	1.4	19	0.957	62	328	3.2	20	1.7	95	375	2.3
89.6	1.1	20	1.3	55	320	3.5	16	2.3	85	366	2.6
90.3	1.3	23	1.0	59	271	2.7	18	1.9	90	310	2.0
91.0	0.764	21	0.954	62	345	2.5	11	1.7	95	394	1.8
91.7	0.905	20	1.4	53	329	3.1	13	2.5	81	376	2.3
92.4	1.2	19	0.809	54	332	3.6	17	1.5	83	379	2.6
93.1	0.705	18	0.970	56	281	1.9	10	1.8	86	321	1.4
93.8	1.0	17	1.2	60	314	2.5	15	2.3	92	359	1.8
94.5	0.975	18	1.0	49	290	2.1	14	1.9	75	331	1.5
95.2	0.869	17	0.848	70	348	3.9	13	1.5	107	398	2.8
95.9	0.874	19	1.1	64	331	3.7	13	2.0	97	379	2.7
96.6	1.3	23	0.886	56	353	2.9	18	1.6	85	403	2.1
97.3	1.0	18	1.2	67	325	2.8	15	2.1	103	372	2.0
98.0	1.7	17	1.2	55	300	2.2	24	2.2	84	343	1.6
98.7	1.9	19	1.1	60	350	3.4	27	2.0	92	401	2.5
99.4	1.3	20	0.902	68	424	2.8	19	1.6	105	485	2.1
100.1	1.4	17	1.0	67	338	3.6	21	1.9	102	387	2.6
100.8	1.2	19	1.2	66	380	3.4	17	2.2	101	435	2.5
101.4	1.1	21	0.839	68	382	3.3	16	1.5	103	436	2.4
102.1	1.7	22	0.797	52	236	2.7	25	1.5	80	270	2.0
102.8	1.7	21	0.983	68	309	2.8	25	1.8	104	354	2.0
103.5	0.586	18	0.918	65	321	3.2	8.5	1.7	99	367	2.3
104.2	1.4	15	0.680	54	278	1.6	20	1.2	83	318	1.1
104.9	1.3	16	0.707	70	309	3.1	19	1.3	108	353	2.3
105.6	1.4	21	0.937	57	306	3.0	21	1.7	88	350	2.2
106.3	1.1	16	1.0	67	342	2.3	16	1.9	103	391	1.7
107.0	1.3	15	1.1	59	274	2.5	18	2.0	91	313	1.9
107.7	1.2	14	1.4	68	369	4.0	18	2.5	104	421	2.9
108.4	0.843	20	0.656	62	342	3.2	12	1.2	96	391	2.3
109.1	1.0	16	0.756	56	234	1.9	15	1.4	86	268	1.4
109.8	1.5	23	0.891	66	262	2.6	22	1.6	101	300	1.9
110.5	1.5	19	1.0	74	362	3.2	21	1.8	113	414	2.3
111.2	0.747	18	0.911	64	379	3.5	11	1.7	99	433	2.5
111.9	1.5	18	0.670	77	402	2.7	22	1.2	118	459	1.9
112.6	0.988	17	0.698	63	302	3.4	14	1.3	96	345	2.5



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
113.3	1.2	18	1.0	75	345	2.6	17	1.9	114	395	1.9
114.0	1.3	16	1.0	58	263	2.1	19	1.8	89	301	1.6
114.7	1.0	17	0.855	63	327	2.4	15	1.6	97	374	1.8
115.4	1.1	17	0.935	66	298	2.6	15	1.7	101	341	1.9
116.1	0.987	17	0.964	59	270	2.3	14	1.8	90	309	1.7
116.8	1.1	20	1.1	77	378	3.2	17	2.0	118	432	2.3
117.5	0.865	16	0.895	65	292	3.0	12	1.6	100	334	2.2
118.2	0.957	14	0.930	64	329	3.2	14	1.7	99	376	2.4
118.9	1.3	19	0.991	52	247	2.1	19	1.8	80	282	1.5
119.6	1.7	16	0.747	63	268	1.9	24	1.4	96	306	1.4
120.3	0.944	17	0.990	63	269	2.8	14	1.8	96	308	2.0
121.0	0.776	16	0.925	61	332	3.3	11	1.7	93	380	2.4
121.7	1.7	17	0.762	55	287	2.7	25	1.4	85	328	2.0
122.4	1.6	17	0.937	71	368	2.7	23	1.7	109	421	1.9
123.1	1.4	18	0.858	64	284	2.6	20	1.6	99	325	1.9
123.8	1.7	19	1.3	62	272	3.1	24	2.4	95	311	2.3
124.5	1.3	17	0.905	62	318	2.2	19	1.7	94	363	1.6
125.2	1.0	16	0.995	67	266	2.5	15	1.8	102	304	1.8
125.9	0.950	17	1.0	69	281	2.6	14	1.9	105	321	1.9
126.6	1.2	14	0.776	76	287	3.7	17	1.4	117	328	2.7
127.2	1.3	14	0.828	50	223	2.1	18	1.5	77	255	1.5
127.9	1.4	20	0.905	71	270	2.3	20	1.7	109	308	1.7
128.6	1.8	19	0.926	59	274	3.1	26	1.7	90	313	2.2
129.3	1.1	18	1.2	70	355	3.8	16	2.3	107	406	2.7
130.0	0.939	17	0.916	64	349	3.8	14	1.7	98	399	2.7
130.7	2.0	15	0.810	63	303	2.2	28	1.5	96	346	1.6
131.4	1.6	19	0.850	71	304	2.4	23	1.6	109	348	1.8
132.1	0.807	19	0.959	73	323	4.6	12	1.7	112	370	3.3
132.8	1.6	15	0.848	62	269	2.9	23	1.5	96	307	2.1
133.5	1.4	16	1.0	68	301	3.1	20	1.9	104	344	2.2
134.2	1.1	16	0.875	63	254	4.1	16	1.6	96	291	3.0
134.9	0.842	15	0.836	66	268	2.2	12	1.5	101	306	1.6
135.6	0.651	18	0.997	49	235	1.4	9.4	1.8	75	269	1.0
136.3	0.973	18	1.2	69	323	3.9	14	2.1	106	369	2.8
137.0	0.885	16	0.798	64	249	2.7	13	1.5	99	285	2.0
137.7	0.484	15	1.2	58	310	3.2	7.0	2.2	90	355	2.3
138.4	0.956	18	1.1	65	317	3.7	14	1.9	99	363	2.7
139.1	1.2	18	0.796	59	330	3.0	18	1.5	90	377	2.2
139.8	1.8	15	0.739	61	302	3.4	26	1.3	94	345	2.5
140.5	1.6	19	1.0	71	300	3.5	23	1.9	109	343	2.6
141.2	1.5	18	0.737	54	228	1.5	21	1.3	83	261	1.1
141.9	1.6	18	1.1	76	348	2.7	23	2.0	117	398	2.0
142.6	1.0	16	0.821	63	263	1.8	15	1.5	96	301	1.3
143.3	1.1	18	0.973	76	371	3.1	16	1.8	116	424	2.3
144.0	0.890	13	1.0	62	298	1.6	13	1.9	94	340	1.2
144.7	1.1	19	1.1	64	308	2.4	16	2.1	99	352	1.7
145.4	2.1	15	0.976	61	314	3.2	30	1.8	94	359	2.4
146.1	1.0	20	0.810	68	304	2.7	14	1.5	104	347	2.0
146.8	1.1	13	1.0	59	237	2.6	15	1.9	91	271	1.9
147.5	0.813	15	0.652	69	379	2.9	12	1.2	106	433	2.1
148.2	1.5	18	1.0	56	233	1.8	22	1.9	87	267	1.3
148.9	1.2	14	0.892	70	280	2.7	17	1.6	107	320	1.9
149.6	0.964	17	0.924	56	296	3.1	14	1.7	87	338	2.3
150.3	0.815	18	0.971	64	292	4.8	12	1.8	98	334	3.5
151.0	2.1	21	0.803	69	297	2.8	30	1.5	106	340	2.0
151.7	0.714	14	0.912	52	241	2.1	10	1.7	80	276	1.5
152.4	1.5	15	0.848	67	350	4.2	21	1.5	103	400	3.1
153.0	1.3	15	0.975	66	280	3.2	18	1.8	102	321	2.3
153.7	2.0	20	0.829	55	286	2.7	29	1.5	85	327	2.0
154.4	1.2	13	0.973	70	333	4.0	18	1.8	107	381	2.9
155.1	1.8	16	1.0	62	244	3.5	26	1.9	95	279	2.5
155.8	1.1	14	0.995	75	403	4.2	16	1.8	115	460	3.1
156.5	1.9	18	0.955	48	250	2.6	27	1.7	73	286	1.9
157.2	1.2	18	0.974	62	330	3.0	17	1.8	95	377	2.2
157.9	1.7	15	1.0	52	266	2.4	25	1.9	80	304	1.7
158.6	1.1	15	0.903	46	264	3.5	16	1.6	71	301	2.5
159.3	1.3	17	1.2	69	329	2.0	18	2.2	106	376	1.5
160.0	1.1	15	1.3	64	273	2.4	15	2.4	98	312	1.8
160.7	1.1	17	0.806	56	239	2.7	16	1.5	86	274	2.0
161.4	1.2	12	1.1	64	325	2.7	17	2.0	98	372	2.0
162.1	1.3	16	1.2	52	278	2.1	19	2.1	80	318	1.6
162.8	1.6	13	0.923	72	258	3.2	22	1.7	111	295	2.3
163.5	1.3	15	0.863	70	315	3.4	19	1.6	107	360	2.5
164.2	1.4	16	0.945	58	259	2.1	21	1.7	88	296	1.5
164.9	1.5	16	0.708	60	242	2.4	22	1.3	92	276	1.8
165.6	0.969	17	1.2	67	281	3.1	14	2.2	102	321	2.3
166.3	0.930	16	0.986	58	292	2.5	13	1.8	90	333	1.8
167.0	1.1	15	0.795	52	239	2.4	15	1.5	80	273	1.7
167.7	1.1	19	0.813	68	201	1.7	16	1.5	104	230	1.2
168.4	1.1	12	0.994	70	319	1.8	16	1.8	107	365	1.3
169.1	1.6	19	0.510	63	240	2.9	22	0.931	96	275	2.1



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
169.8	1.3	14	0.854	69	331	4.4	19	1.6	105	378	3.2
170.5	1.5	17	0.790	59	270	2.3	21	1.4	90	309	1.7
171.2	1.8	16	0.888	53	240	2.7	25	1.6	82	275	1.9
171.9	1.5	17	1.1	66	285	2.6	22	2.0	101	326	1.9
172.6	1.6	16	1.0	58	308	2.9	24	1.9	89	352	2.1
173.3	1.1	18	0.721	57	265	1.7	16	1.3	87	304	1.2
174.0	1.5	17	0.656	52	192	1.8	21	1.2	79	219	1.3
174.7	1.6	15	0.664	59	295	2.5	23	1.2	90	337	1.8
175.4	1.0	18	0.969	59	275	3.6	15	1.8	91	314	2.6
176.1	1.1	16	0.448	67	306	2.9	16	0.817	103	350	2.1
176.8	2.1	15	0.918	61	307	2.5	30	1.7	94	351	1.9
177.5	0.870	17	0.703	55	285	1.9	13	1.3	84	326	1.4
178.2	1.2	14	0.531	59	231	2.2	18	0.968	90	264	1.6
178.8	0.982	18	0.838	57	269	2.7	14	1.5	88	308	1.9
179.5	1.1	17	1.0	60	263	3.3	16	1.9	92	301	2.4
180.2	1.2	21	1.2	67	328	2.7	17	2.2	102	375	2.0
180.9	2.1	18	0.704	52	239	1.5	30	1.3	79	273	1.1
181.6	1.6	16	0.672	56	257	1.6	24	1.2	85	294	1.1
182.3	1.2	20	0.790	52	280	2.0	18	1.4	80	320	1.5
183.0	1.4	16	0.535	50	251	1.9	20	0.975	76	287	1.4
183.7	0.873	17	0.701	62	251	2.3	13	1.3	94	288	1.6
184.4	1.0	17	1.0	59	354	3.3	15	1.9	90	405	2.4
185.1	1.0	20	0.726	54	259	2.7	15	1.3	82	296	2.0
185.8	1.1	20	0.926	64	271	2.0	16	1.7	98	310	1.4
186.5	1.5	20	0.756	63	331	2.8	21	1.4	97	379	2.0
187.2	1.1	16	0.898	56	276	1.9	16	1.6	86	315	1.4
187.9	1.2	22	0.766	56	280	2.7	18	1.4	85	320	2.0
188.6	0.978	18	0.809	60	275	2.8	14	1.5	91	315	2.0
189.3	1.4	18	1.1	57	251	2.1	21	2.0	87	287	1.5
190.0	1.4	19	0.753	57	250	2.7	21	1.4	88	285	2.0
190.7	1.2	17	0.569	54	255	2.0	17	1.0	83	292	1.5
191.4	1.1	20	0.986	61	240	1.7	16	1.8	93	275	1.3
192.1	1.2	16	0.575	52	232	2.0	17	1.0	80	266	1.4
192.8	1.5	20	0.898	64	241	2.0	21	1.6	98	275	1.5
193.5	0.626	13	0.894	51	192	1.7	9.0	1.6	79	219	1.2
194.2	0.886	14	0.907	61	310	3.4	13	1.7	93	355	2.5
194.9	0.599	17	0.938	49	221	3.1	8.6	1.7	75	253	2.2
195.6	0.944	16	0.747	56	281	2.2	14	1.4	86	321	1.6
196.3	1.0	16	1.0	42	243	1.8	15	1.9	65	278	1.3
197.0	0.976	17	1.0	47	209	1.9	14	1.8	72	238	1.4
197.7	0.921	16	0.572	50	301	1.9	13	1.0	77	345	1.4
198.4	1.7	19	0.619	49	242	1.4	24	1.1	75	277	1.0
199.1	1.3	19	0.796	50	274	1.9	19	1.5	76	314	1.4
199.8	1.2	18	0.826	47	256	1.4	18	1.5	71	293	1.0
200.5	1.3	13	0.792	53	239	2.6	19	1.4	82	273	1.9
201.2	0.987	15	0.913	54	274	1.8	14	1.7	83	313	1.3
201.9	0.744	15	0.714	54	260	1.9	11	1.3	83	297	1.4
202.6	0.926	14	0.938	65	288	1.4	13	1.7	100	330	0.992
203.3	1.0	15	0.771	53	234	2.0	15	1.4	81	268	1.4
204.0	1.0	15	0.586	56	297	2.6	15	1.1	86	339	1.9
204.7	1.3	17	0.637	57	303	2.0	18	1.2	88	347	1.5
205.3	1.1	16	0.770	56	284	1.5	16	1.4	86	325	1.1
206.0	0.958	17	0.772	50	261	2.4	14	1.4	77	298	1.8
206.7	0.923	13	0.709	53	255	1.5	13	1.3	81	292	1.1
207.4	1.5	14	0.920	54	277	2.6	22	1.7	83	317	1.9
208.1	1.4	19	0.655	53	284	1.8	21	1.2	82	325	1.3
208.8	1.2	14	0.984	61	263	2.1	18	1.8	94	301	1.6
209.5	0.999	20	0.597	57	244	1.6	14	1.1	87	279	1.2
210.2	1.1	16	0.996	57	270	1.9	15	1.8	87	308	1.4
210.9	1.3	17	1.1	62	271	2.5	19	2.0	95	310	1.8
211.6	1.0	15	0.916	51	290	2.5	15	1.7	78	331	1.8
212.3	1.3	16	0.849	42	181	1.9	18	1.5	65	207	1.4
213.0	1.2	16	1.0	60	258	3.1	17	1.8	91	296	2.2
213.7	0.892	17	0.835	50	224	2.1	13	1.5	76	256	1.5
214.4	1.0	16	0.656	51	205	2.1	15	1.2	79	234	1.5
215.1	1.5	16	0.698	52	265	2.4	21	1.3	80	303	1.8
215.8	0.900	18	0.686	45	226	1.8	13	1.3	69	259	1.3
216.5	0.920	14	0.656	58	297	2.1	13	1.2	89	340	1.5
217.2	0.748	13	0.638	47	228	2.0	11	1.2	72	260	1.5
217.9	1.0	16	0.590	58	275	1.7	15	1.1	89	314	1.2
218.6	1.4	15	0.773	50	221	1.1	20	1.4	76	253	0.834
219.3	0.997	14	0.899	51	263	2.2	14	1.6	78	301	1.6
220.0	1.8	18	0.586	58	288	2.6	27	1.1	89	329	1.9
220.7	0.669	16	0.815	59	335	2.6	9.7	1.5	91	383	1.9
221.4	1.3	17	0.806	52	222	1.5	18	1.5	80	254	1.1
222.1	1.1	14	0.609	59	260	1.5	15	1.1	91	297	1.1
222.8	0.863	13	0.589	47	307	2.4	12	1.1	72	351	1.8
223.5	1.1	13	0.622	52	232	2.3	15	1.1	80	265	1.7
224.2	1.7	16	0.703	57	349	2.2	24	1.3	88	399	1.6
224.9	1.1	18	0.758	59	239	1.8	16	1.4	90	273	1.3
225.6	1.6	15	0.635	46	258	1.5	23	1.2	71	295	1.1



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
226.3	0.618	17	0.908	56	302	2.2	8.9	1.7	86	346	1.6
227.0	2.1	19	0.849	54	287	1.9	31	1.5	83	329	1.4
227.7	0.722	15	0.803	52	237	2.3	10	1.5	80	271	1.7
228.4	0.567	13	0.841	58	262	2.1	8.2	1.5	88	299	1.5
229.1	0.522	20	0.985	57	232	1.6	7.5	1.8	88	265	1.1
229.8	1.6	16	0.785	58	232	1.8	24	1.4	88	265	1.3
230.5	0.707	16	0.941	61	295	1.6	10	1.7	94	337	1.1
231.2	1.2	15	0.639	50	255	1.7	17	1.2	77	291	1.2
231.8	1.5	19	0.718	52	261	2.0	21	1.3	79	298	1.5
232.5	0.761	16	1.0	71	337	2.3	11	1.9	108	385	1.7
233.2	1.1	13	0.668	47	239	2.4	16	1.2	72	274	1.7
233.9	1.6	15	0.728	61	311	2.2	23	1.3	93	355	1.6
234.6	1.6	14	0.798	51	231	1.1	23	1.5	78	264	0.819
235.3	0.869	15	0.789	66	298	2.2	13	1.4	101	340	1.6
236.0	0.901	16	0.891	62	310	1.7	13	1.6	94	355	1.3
236.7	0.826	15	1.3	56	312	2.3	12	2.3	85	356	1.7
237.4	0.962	21	0.880	56	257	1.6	14	1.6	85	294	1.2
238.1	1.1	12	0.980	58	291	2.1	16	1.8	89	332	1.5
238.8	0.722	15	0.831	44	203	0.959	10	1.5	67	232	0.699
239.5	0.993	14	0.629	55	332	2.6	14	1.1	84	380	1.9
240.2	1.1	13	0.528	44	202	1.3	15	0.964	68	230	0.944
240.9	1.2	20	1.0	62	310	3.0	18	1.8	95	354	2.2
241.6	1.6	15	0.788	57	232	1.9	23	1.4	87	265	1.4
242.3	0.561	14	0.722	46	194	1.6	8.1	1.3	71	221	1.2
243.0	0.393	14	1.0	52	254	1.1	5.7	1.8	80	290	0.830
243.7	1.6	14	0.750	44	300	1.7	24	1.4	68	343	1.2
244.4	1.2	13	0.535	39	231	1.1	17	0.976	60	264	0.777
245.1	1.1	14	0.611	53	229	1.8	17	1.1	82	262	1.3
245.8	0.623	11	0.715	57	269	1.3	9.0	1.3	87	308	0.982
246.5	1.3	15	0.620	41	264	3.3	19	1.1	63	301	2.4
247.2	1.2	14	0.774	48	255	1.5	17	1.4	74	292	1.1
247.9	0.981	15	0.423	44	268	1.6	14	0.772	67	307	1.2
248.6	1.3	14	1.1	58	290	2.0	19	1.9	89	331	1.5
249.3	1.8	14	0.860	37	227	2.1	26	1.6	57	259	1.5
250.0	2.1	13	0.541	48	272	1.5	30	0.987	74	311	1.1
250.7	0.592	15	1.1	53	297	1.9	8.6	2.1	81	340	1.4
251.4	0.393	16	0.819	62	286	2.0	5.7	1.5	96	327	1.5
252.1	1.0	15	0.767	50	261	2.4	15	1.4	77	298	1.8
252.8	1.5	13	0.734	46	218	1.6	22	1.3	71	250	1.2
253.5	1.4	20	1.2	49	303	2.6	21	2.1	75	346	1.9
254.2	0.965	15	0.862	52	336	2.4	14	1.6	80	385	1.8
254.9	1.2	13	0.585	43	194	1.8	17	1.1	66	221	1.3
255.6	0.663	13	0.761	58	290	1.7	9.6	1.4	90	332	1.3
256.3	1.0	14	0.900	47	246	2.0	15	1.6	72	281	1.4
256.9	0.774	15	0.922	46	233	1.7	11	1.7	70	267	1.3
257.6	1.0	15	0.597	43	249	1.6	15	1.1	66	285	1.2
258.3	1.5	14	0.773	43	285	2.3	21	1.4	66	326	1.7
259.0	0.407	14	0.580	57	282	2.2	5.9	1.1	88	323	1.6
259.7	0.962	12	0.835	37	202	1.9	14	1.5	57	231	1.4
260.4	0.830	13	0.667	48	327	1.8	12	1.2	74	374	1.3
261.1	0.954	13	0.873	41	216	1.8	14	1.6	63	247	1.3
261.8	1.2	13	0.485	56	266	2.1	17	0.884	86	304	1.5
262.5	1.6	14	0.807	39	205	1.2	22	1.5	60	235	0.871
263.2	1.3	15	0.693	48	242	1.6	18	1.3	73	277	1.2
263.9	1.2	11	0.872	49	313	1.7	17	1.6	75	358	1.2
264.6	1.2	15	0.974	47	287	2.6	17	1.8	73	329	1.9
265.3	0.668	16	0.788	58	316	1.8	9.6	1.4	88	361	1.3
266.0	1.4	14	0.864	49	232	1.5	20	1.6	76	266	1.1
266.7	1.0	15	0.564	43	260	2.6	15	1.0	66	298	1.9
267.4	1.5	12	0.815	45	277	2.0	22	1.5	68	317	1.5
268.1	1.8	14	0.608	45	254	1.4	26	1.1	70	291	1.0
268.8	1.3	13	0.855	47	195	2.0	18	1.6	72	223	1.4
269.5	0.793	15	0.612	51	246	1.5	11	1.1	78	281	1.1
270.2	0.773	15	0.663	47	296	1.9	11	1.2	72	339	1.4
270.9	1.6	13	0.921	52	246	1.6	22	1.7	79	281	1.2
271.6	1.0	14	0.891	60	299	2.9	15	1.6	92	342	2.1
272.3	0.565	15	1.0	64	352	2.3	8.2	1.9	99	402	1.7
273.0	1.2	16	0.683	41	212	2.3	17	1.2	63	242	1.7
273.7	0.564	9.9	0.805	38	219	1.7	8.1	1.5	59	250	1.2
274.4	1.2	18	0.727	49	241	1.2	18	1.3	75	275	0.863
275.1	1.4	13	0.522	50	266	2.3	20	0.953	76	304	1.7
275.8	1.7	14	0.990	45	244	2.0	24	1.8	70	279	1.5
276.5	0.893	16	0.866	49	297	2.0	13	1.6	75	339	1.4
277.2	1.0	13	0.598	54	341	2.0	15	1.1	83	390	1.5
277.9	0.961	14	0.884	41	268	1.0	14	1.6	63	307	0.759
278.6	1.2	13	0.889	49	233	1.2	18	1.6	75	266	0.850
279.3	0.840	13	0.655	48	230	1.5	12	1.2	74	263	1.1
280.0	0.998	12	0.609	46	221	1.2	14	1.1	70	253	0.890
280.7	0.979	14	0.829	41	190	2.1	14	1.5	62	217	1.5
281.4	1.0	15	0.588	47	233	1.3	15	1.1	72	267	0.920
282.1	0.892	13	0.427	48	181	1.7	13	0.779	74	207	1.3



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
282.8	0.786	13	0.575	55	288	2.9	11	1.0	85	330	2.1
283.5	1.0	13	0.666	41	230	1.8	15	1.2	63	263	1.3
284.1	1.5	16	0.563	47	262	1.6	22	1.0	73	299	1.1
284.8	1.3	17	1.0	50	241	1.9	18	1.8	77	276	1.4
285.5	0.720	14	0.470	46	220	1.9	10	0.857	71	252	1.4
286.2	1.1	11	0.962	43	275	2.3	15	1.8	66	315	1.7
286.9	0.607	12	0.544	48	266	1.7	8.8	0.993	73	305	1.3
287.6	0.803	12	0.791	40	190	0.832	12	1.4	61	217	0.607
288.3	1.7	13	0.616	53	298	2.7	24	1.1	81	341	2.0
289.0	1.0	13	0.927	55	303	2.2	15	1.7	84	346	1.6
289.7	0.776	16	0.765	49	229	1.8	11	1.4	75	262	1.3
290.4	1.2	15	1.1	47	269	2.4	18	2.0	72	307	1.7
291.1	1.3	17	0.656	48	321	2.1	19	1.2	74	367	1.5
291.8	1.2	14	0.910	43	219	1.8	17	1.7	66	251	1.3
292.5	0.666	16	0.726	46	235	1.0	9.6	1.3	70	268	0.761
293.2	1.1	13	0.648	42	242	1.1	16	1.2	65	277	0.769
293.9	1.3	13	0.532	46	255	2.1	19	0.971	70	291	1.5
294.6	0.775	16	0.926	48	232	1.7	11	1.7	73	265	1.2
295.3	1.7	15	0.768	45	256	2.4	25	1.4	70	292	1.8
296.0	1.2	16	0.911	57	318	1.9	17	1.7	88	364	1.4
296.7	0.515	14	0.587	45	301	1.5	7.4	1.1	68	344	1.1
297.4	0.971	14	0.715	43	225	0.991	14	1.3	65	257	0.723
298.1	1.6	14	0.728	54	297	1.9	23	1.3	83	340	1.4
298.8	1.4	17	0.906	61	284	1.8	20	1.7	93	325	1.3
299.5	1.2	13	0.769	43	257	0.875	18	1.4	67	294	0.638
300.2	1.1	15	0.695	47	242	1.6	16	1.3	72	277	1.2
300.9	1.2	16	0.695	51	306	1.5	17	1.3	77	350	1.1
301.6	0.743	18	1.0	57	324	1.2	11	1.9	87	370	0.858
302.3	1.2	15	0.936	46	214	1.4	17	1.7	70	245	1.1
303.0	1.3	16	0.767	46	287	0.470	18	1.4	71	329	0.343
303.7	0.728	11	1.0	53	285	1.5	11	1.9	80	326	1.1
304.4	1.6	15	1.1	50	265	1.1	23	1.9	77	303	0.774
305.1	1.8	15	0.680	40	215	1.1	26	1.2	61	246	0.808
305.8	1.4	15	0.789	55	251	2.1	20	1.4	84	288	1.6
306.5	0.829	14	0.647	53	279	1.1	12	1.2	81	319	0.786
307.2	1.2	13	0.993	44	247	0.816	17	1.8	68	283	0.595
307.9	1.3	16	0.821	42	285	1.4	19	1.5	65	326	1.0
308.6	0.613	14	0.707	44	212	0.784	8.8	1.3	67	242	0.572
309.3	1.2	16	0.884	56	244	1.5	17	1.6	85	279	1.1
309.9	0.420	14	0.688	50	303	1.3	6.1	1.3	77	346	0.954
310.6	0.708	15	0.624	44	242	0.896	10	1.1	68	276	0.654
311.3	1.4	12	0.521	52	255	0.868	21	0.950	79	291	0.633
312.0	1.4	12	0.825	54	276	1.5	20	1.5	82	316	1.1
312.7	1.2	17	0.945	44	245	0.912	17	1.7	68	280	0.665
313.4	1.4	12	0.797	46	234	0.619	20	1.5	71	267	0.451
314.1	0.932	13	0.625	42	235	0.925	13	1.1	64	268	0.675
314.8	0.768	14	0.937	46	258	0.796	11	1.7	71	295	0.581
315.5	1.6	16	0.796	55	263	2.0	23	1.5	84	301	1.5
316.2	0.924	13	0.637	49	262	1.3	13	1.2	75	300	0.964
316.9	0.707	11	0.863	44	266	0.794	10	1.6	67	305	0.579
317.6	1.3	16	0.844	46	281	1.2	19	1.5	71	321	0.888
318.3	1.3	17	0.634	43	249	1.2	18	1.2	66	284	0.906
319.0	1.1	19	0.886	48	248	1.4	15	1.6	73	284	1.0
319.7	1.6	17	0.882	55	258	0.612	23	1.6	85	295	0.446
320.4	0.986	13	0.962	53	273	1.2	14	1.8	81	312	0.857
321.1	1.2	13	0.833	50	317	1.2	17	1.5	77	363	0.873
321.8	1.4	17	0.552	55	290	1.3	21	1.0	84	331	0.930
322.5	1.1	15	0.811	43	228	1.2	16	1.5	65	261	0.853
323.2	0.748	11	0.711	42	228	0.971	11	1.3	64	261	0.709
323.9	1.0	11	0.593	46	224	1.0	15	1.1	71	257	0.744
324.6	0.769	16	0.978	49	236	0.974	11	1.8	76	270	0.711
325.3	1.3	16	0.871	53	244	1.3	18	1.6	81	279	0.915
326.0	1.3	15	0.734	49	325	1.1	18	1.3	76	372	0.767
326.7	0.534	13	0.725	46	295	1.6	7.7	1.3	71	337	1.2
327.4	1.1	15	0.711	47	244	1.6	15	1.3	72	279	1.2
328.1	1.4	18	0.728	56	247	1.7	21	1.3	87	283	1.2
328.8	0.951	15	1.2	59	317	1.8	14	2.1	90	363	1.3
329.5	0.393	15	0.661	36	276	0.652	5.7	1.2	56	316	0.476
330.2	1.1	14	0.849	43	292	0.942	16	1.5	66	334	0.687
330.9	0.966	15	0.689	43	288	0.966	14	1.3	66	330	0.705
331.6	0.913	16	0.840	44	263	0.653	13	1.5	68	301	0.476
332.3	0.565	17	0.606	53	317	0.937	8.2	1.1	81	362	0.684
333.0	0.965	14	0.965	50	329	1.8	14	1.8	76	376	1.3
333.7	0.540	13	0.843	47	255	0.547	7.8	1.5	72	291	0.399
334.4	0.827	13	0.665	45	254	1.2	12	1.2	70	291	0.903
335.1	1.5	14	0.716	50	272	1.2	21	1.3	76	311	0.843
335.8	1.2	13	0.835	53	308	0.976	18	1.5	81	352	0.712
336.4	0.748	13	0.757	40	214	0.840	11	1.4	61	245	0.613
337.1	0.393	14	0.449	42	222	1.2	5.7	0.819	65	254	0.902
337.8	0.590	15	0.840	44	292	0.988	8.5	1.5	67	334	0.720
338.5	0.670	15	0.902	55	296	1.7	9.7	1.6	84	339	1.3



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
339.2	0.714	13	0.704	41	251	0.740	10	1.3	63	287	0.540
339.9	1.8	14	0.783	38	255	1.2	26	1.4	58	292	0.868
340.6	1.3	14	0.785	40	251	0.871	18	1.4	62	287	0.636
341.3	0.786	15	0.632	41	207	1.4	11	1.2	62	237	1.1
342.0	1.1	15	0.868	47	260	1.8	16	1.6	72	297	1.3
342.7	0.420	14	0.799	41	262	1.2	6.1	1.5	63	300	0.862
343.4	0.782	14	0.669	37	250	1.8	11	1.2	57	286	1.3
344.1	0.884	15	0.797	38	227	0.670	13	1.5	59	259	0.488
344.8	1.5	14	0.530	51	313	1.0	21	0.966	78	358	0.747
345.5	0.981	17	0.898	41	207	0.664	14	1.6	63	237	0.485
346.2	0.876	16	0.962	42	238	1.7	13	1.8	64	273	1.2
346.9	0.868	12	0.984	39	262	0.924	13	1.8	60	299	0.674
347.6	0.710	13	0.710	35	213	0.538	10	1.3	53	243	0.392
348.3	0.907	14	0.793	46	231	0.741	13	1.4	71	265	0.541
349.0	1.2	15	0.625	42	241	0.411	18	1.1	65	276	0.300
349.7	0.810	11	0.608	38	209	1.3	12	1.1	58	239	0.936
350.4	0.949	13	0.523	43	234	1.3	14	0.954	66	268	0.968
351.1	1.1	15	0.574	40	226	1.3	15	1.0	62	258	0.968
351.8	0.666	13	0.903	36	238	1.1	9.6	1.6	55	272	0.825
352.5	0.418	14	1.1	34	245	1.5	6.0	2.0	52	280	1.1
353.2	0.469	14	0.613	41	240	0.972	6.8	1.1	63	274	0.709
353.9	0.478	13	0.871	46	292	0.991	6.9	1.6	70	334	0.723
354.6	0.728	15	0.888	43	218	1.1	11	1.6	66	250	0.795
355.3	0.743	16	1.0	41	252	1.1	11	1.9	63	288	0.787
356.0	0.393	13	1.0	41	294	0.981	5.7	1.9	64	337	0.716
356.7	0.689	13	1.0	39	242	1.4	9.9	1.9	60	277	1.0
357.4	1.3	15	0.687	39	282	0.814	19	1.3	60	323	0.594
358.1	0.981	15	0.609	39	261	1.3	14	1.1	60	298	0.950
358.8	1.4	15	0.669	44	225	1.2	20	1.2	67	258	0.888
359.5	0.656	12	0.909	34	195	0.887	9.5	1.7	51	223	0.647
360.2	0.605	14	0.713	45	269	1.5	8.7	1.3	68	308	1.1
360.9	1.2	17	0.910	51	310	0.606	17	1.7	78	355	0.442
361.6	1.1	15	0.940	43	265	1.1	16	1.7	66	303	0.797
362.2	0.880	18	0.959	42	256	4.5	13	1.7	64	292	3.3
362.9	14	13	1077	37	252	1.1	203	1963	57	288	0.797
363.6	2.2	14	0.842	30	194	0.700	32	1.5	46	221	0.511
364.3	3.1	15	0.759	39	203	1.2	44	1.4	59	233	0.843
365.0	0.811	13	0.863	40	242	1.3	12	1.6	61	277	0.954
365.7	0.736	15	0.673	43	278	1.1	11	1.2	66	318	0.792
366.4	1.4	14	0.818	40	263	0.864	20	1.5	61	301	0.630
367.1	0.490	13	0.637	50	266	0.821	7.1	1.2	76	304	0.599
367.8	0.648	16	0.731	42	282	1.0	9.3	1.3	65	323	0.748
368.5	1.5	16	0.969	47	277	1.1	21	1.8	72	316	0.832
369.2	0.646	14	0.989	52	266	0.897	9.3	1.8	80	304	0.654
369.9	0.546	16	1.5	57	308	1.4	7.9	2.7	88	353	1.0
370.6	0.592	13	0.893	39	234	0.758	8.5	1.6	59	267	0.553
371.3	0.994	15	1.1	41	327	1.5	14	2.0	62	374	1.1
372.0	0.732	14	0.915	44	255	1.2	11	1.7	68	292	0.912
372.7	0.478	12	1.1	59	254	0.793	6.9	1.9	90	290	0.578
373.4	0.942	16	0.564	50	262	0.691	14	1.0	77	299	0.504
374.1	0.393	12	0.953	38	215	0.450	5.7	1.7	59	246	0.328
374.8	0.796	14	0.794	49	250	1.2	11	1.4	75	286	0.857
375.5	0.957	17	0.682	41	260	0.684	14	1.2	62	297	0.499
376.2	0.686	13	0.693	51	235	0.905	9.9	1.3	79	269	0.661
376.9	0.858	17	0.823	59	265	0.988	12	1.5	90	303	0.721
377.6	1.4	15	0.616	49	236	1.3	21	1.1	75	270	0.927
378.3	1.1	15	0.960	45	248	0.741	16	1.8	69	283	0.541
379.0	0.944	16	1.2	46	256	0.913	14	2.1	71	293	0.666
379.7	0.881	14	0.960	51	260	0.811	13	1.8	79	297	0.592
380.4	0.625	14	0.979	50	318	1.3	9.0	1.8	77	363	0.916
381.1	0.701	15	0.938	47	278	0.924	10	1.7	72	318	0.674
381.8	1.3	18	0.789	52	221	0.757	19	1.4	80	253	0.552
382.5	0.693	16	1.1	52	306	1.1	10.0	2.0	80	350	0.800
383.2	1.3	16	0.746	49	281	0.876	18	1.4	75	321	0.639
383.9	0.646	15	0.999	51	280	1.4	9.3	1.8	78	321	0.995
384.6	0.393	14	1.2	51	237	0.654	5.7	2.2	78	271	0.477
385.3	1.4	15	1.2	44	249	0.743	20	2.2	68	285	0.542
386.0	1.0	14	0.812	44	229	0.858	15	1.5	67	262	0.626
386.7	0.817	15	0.865	38	233	1.1	12	1.6	58	266	0.791
387.4	1.0	15	0.741	39	226	1.4	14	1.4	60	259	0.989
388.0	0.912	17	1.2	47	291	0.987	13	2.3	72	333	0.720
388.7	1.4	18	1.1	40	228	1.1	20	2.0	62	260	0.776
389.4	0.839	15	0.813	58	276	1.4	12	1.5	89	316	1.1
390.1	1.3	15	0.951	60	249	0.866	19	1.7	92	285	0.632
390.8	0.717	12	1.2	39	266	0.529	10	2.1	60	304	0.386
391.5	0.512	16	1.2	46	239	0.668	7.4	2.2	70	273	0.487
392.2	0.950	15	1.4	47	238	1.5	14	2.5	73	272	1.1
392.9	0.796	12	1.1	50	306	0.825	11	1.9	76	350	0.602
393.6	40	1587	266	374	164	19	574	485	572	188	14
394.3	7.4	13	4.8	51	283	1.0	106	8.7	77	324	0.738
395.0	0.826	16	41	49	251	2.1	12	75	76	287	1.5



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
395.7	0.974	13	1.1	41	265	1.4	14	2.1	63	303	1.0
396.4	0.717	17	1.1	43	244	0.881	10	2.0	65	279	0.643
397.1	0.393	12	0.802	34	264	1.1	5.7	1.5	52	302	0.779
397.8	1.1	14	1.2	51	302	1.6	16	2.2	78	346	1.1
398.5	1.0	14	0.831	47	270	0.776	14	1.5	72	309	0.566
399.2	0.727	17	1.3	54	258	0.767	10	2.3	83	295	0.560
399.9	1.5	17	1.2	53	301	1.6	21	2.2	81	344	1.2
400.6	0.393	15	1.3	53	368	1.2	5.7	2.3	81	421	0.878
401.3	0.393	12	0.680	37	301	1.6	5.7	1.2	57	344	1.1
402.0	0.611	14	1.1	46	237	0.569	8.8	2.1	71	272	0.415
402.7	0.782	12	0.585	39	258	0.962	11	1.1	59	296	0.702
403.4	0.923	13	1.3	47	314	1.6	13	2.4	72	359	1.2
404.1	0.831	12	0.889	50	268	0.658	12	1.6	77	306	0.480
404.8	0.634	15	0.706	47	233	0.881	9.2	1.3	72	266	0.643
405.5	0.393	15	1.4	51	251	1.3	5.7	2.6	78	287	0.933
406.2	0.680	13	0.872	45	304	1.4	9.8	1.6	70	348	0.988
406.9	0.545	10	1.3	45	280	1.1	7.9	2.4	69	320	0.814
407.6	1.3	16	1.2	38	262	1.1	19	2.1	59	300	0.837
408.3	0.933	13	1.1	44	263	1.0	13	2.0	68	300	0.750
409.0	0.494	15	1.3	46	254	1.6	7.1	2.4	70	290	1.1
409.7	0.615	14	1.2	52	251	1.4	8.9	2.2	79	287	1.0
410.4	0.698	15	1.1	51	263	1.2	10	2.1	78	301	0.876
411.1	1.3	15	1.6	51	208	0.803	19	3.0	79	237	0.586
411.8	0.917	13	1.3	52	322	1.3	13	2.3	80	368	0.956
412.5	0.539	16	1.4	60	341	1.3	7.8	2.6	92	390	0.952
413.2	0.799	12	1.3	59	275	1.3	12	2.5	91	315	0.953
413.9	0.973	15	1.5	54	269	1.6	14	2.8	82	307	1.2
414.5	0.393	18	1.3	53	361	0.465	5.7	2.4	81	413	0.339
415.2	0.905	12	0.861	52	265	1.7	13	1.6	80	303	1.2
415.9	0.959	16	1.2	50	296	0.980	14	2.1	76	339	0.715
416.6	1.4	14	1.2	54	273	1.1	19	2.2	83	312	0.832
417.3	0.828	14	1.2	45	221	1.8	12	2.2	70	252	1.3
418.0	0.917	14	1.1	49	278	0.842	13	2.0	75	317	0.614
418.7	0.834	14	1.1	50	231	1.1	12	2.1	77	264	0.824
419.4	0.990	12	1.6	54	277	1.1	14	3.0	83	317	0.795
420.1	1.2	15	1.4	59	334	1.3	17	2.5	90	382	0.975
420.8	0.763	18	1.3	49	288	1.8	11	2.4	75	329	1.3
421.5	0.704	16	1.2	54	303	1.8	10	2.2	82	346	1.3
422.2	1.1	17	1.3	70	380	2.6	16	2.4	108	434	1.9
422.9	0.479	16	1.2	48	308	0.981	6.9	2.1	74	352	0.716
423.6	1.0	17	1.6	56	361	1.7	15	2.9	86	413	1.2
424.3	0.556	15	1.2	56	257	1.2	8.0	2.3	85	294	0.876
425.0	1.1	15	0.906	58	270	0.770	16	1.7	89	309	0.562
425.7	0.765	14	1.4	50	236	0.625	11	2.5	77	269	0.456
426.4	0.884	15	1.3	56	224	1.6	13	2.4	86	256	1.2
427.1	0.393	15	1.1	51	249	1.6	5.7	1.9	78	285	1.2
427.8	0.653	14	1.2	55	213	1.0	9.4	2.1	84	244	0.754
428.5	0.447	16	1.3	53	236	0.832	6.5	2.3	81	270	0.607
429.2	1.0	17	1.2	65	266	0.970	15	2.2	99	304	0.708
429.9	0.826	14	1.5	55	261	0.958	12	2.7	85	299	0.699
430.6	1.5	16	1.2	53	284	1.4	22	2.2	82	325	1.0
431.3	1.1	17	1.5	62	281	1.6	15	2.7	96	321	1.2
432.0	0.905	15	1.2	48	236	1.1	13	2.2	74	270	0.766
432.7	0.654	12	1.3	50	203	0.804	9.4	2.3	76	232	0.586
433.4	1.3	17	1.1	52	264	0.763	19	2.0	79	302	0.557
434.1	1.0	14	1.5	70	291	1.6	15	2.8	107	333	1.2
434.8	0.849	15	0.879	58	221	0.623	12	1.6	89	253	0.455
435.5	0.615	13	1.1	52	263	1.4	8.9	2.0	80	301	1.0
436.2	0.921	15	1.4	57	287	0.930	13	2.5	88	328	0.678
436.9	1.2	17	1.3	52	208	2.0	17	2.4	79	237	1.5
437.6	0.626	13	1.2	51	218	0.483	9.0	2.1	79	249	0.352
438.3	1.2	15	1.0	59	252	1.0	18	1.8	90	289	0.759
439.0	0.618	12	1.5	72	331	1.2	8.9	2.7	111	378	0.905
439.7	0.657	14	1.3	63	260	1.4	9.5	2.3	97	298	1.0
440.3	0.798	14	1.5	55	277	1.0	12	2.7	85	317	0.756
441.0	1.2	17	1.1	53	229	0.950	17	2.0	82	262	0.693
441.7	1.9	18	1.3	66	346	1.3	28	2.4	101	395	0.918
442.4	0.393	15	1.2	70	276	0.628	5.7	2.2	108	316	0.458
443.1	0.648	15	1.2	61	264	0.922	9.4	2.2	93	301	0.672
443.8	1.5	15	1.4	63	277	0.828	21	2.6	96	317	0.604
444.5	0.872	11	1.1	68	294	2.2	13	2.1	104	336	1.6
445.2	0.787	11	1.2	64	226	1.4	11	2.2	98	258	0.997
445.9	0.800	12	1.3	59	297	0.921	12	2.4	91	340	0.672
446.6	0.562	16	1.6	73	345	1.4	8.1	3.0	112	394	0.992
447.3	1.4	14	1.2	64	223	1.3	20	2.2	99	255	0.945
448.0	1.1	18	1.3	73	262	1.0	16	2.3	112	300	0.766
448.7	0.485	16	1.4	73	304	1.5	7.0	2.6	112	348	1.1
449.4	0.704	14	0.926	67	288	0.701	10	1.7	103	329	0.512
450.1	0.577	17	1.2	60	284	0.973	8.3	2.1	92	325	0.710
450.8	1.3	14	0.993	61	311	5.5	18	1.8	93	356	4.0
451.5	3.4	18	6.6	60	247	1.3	49	12	91	282	0.968



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
452.2	1.0	15	3.2	57	315	1.3	15	5.8	87	360	0.945
452.9	1.6	16	1.1	63	243	1.0	22	2.1	96	277	0.735
453.6	0.876	14	1.6	73	300	1.6	13	2.9	112	343	1.2
454.3	0.922	15	1.1	60	279	0.898	13	2.1	92	319	0.655
455.0	0.929	14	1.1	70	327	1.0	13	1.9	107	374	0.733
455.7	1.1	15	1.6	64	307	0.991	16	3.0	98	351	0.723
456.4	1.2	13	1.2	55	225	0.480	17	2.1	85	258	0.351
457.1	1.1	15	1.1	65	276	2.0	15	2.1	99	315	1.4
457.8	0.951	15	0.899	55	219	1.7	14	1.6	85	251	1.2
458.5	0.613	17	1.1	77	391	1.6	8.9	2.1	119	447	1.1
459.2	0.874	13	1.3	64	258	1.5	13	2.3	99	295	1.1
459.9	0.901	13	1.1	63	260	0.871	13	2.0	97	298	0.635
460.6	1.1	15	0.929	70	311	1.6	16	1.7	107	356	1.1
461.3	0.967	17	1.2	86	352	2.6	14	2.2	132	403	1.9
462.0	1.4	17	1.2	66	256	1.2	20	2.2	101	293	0.904
462.7	0.756	12	1.1	58	233	1.1	11	1.9	89	266	0.825
463.4	0.532	14	1.5	59	299	1.3	7.7	2.8	91	342	0.983
464.1	1.3	17	1.5	52	259	1.8	19	2.7	79	296	1.3
464.8	1.1	16	0.980	61	261	1.2	16	1.8	94	299	0.896
465.5	0.755	14	1.2	68	345	1.3	11	2.2	104	394	0.948
466.2	0.421	13	1.4	67	282	0.986	6.1	2.6	103	322	0.719
466.8	1.1	14	1.3	64	396	2.0	16	2.3	99	453	1.5
467.5	1.5	16	1.4	61	305	1.7	22	2.5	93	349	1.3
468.2	0.660	17	1.1	58	240	0.812	9.5	2.0	89	274	0.592
468.9	0.857	17	1.2	57	269	1.5	12	2.1	87	308	1.1
469.6	0.710	15	1.2	51	260	0.877	10	2.1	79	297	0.640
470.3	1.0	19	1.0	65	300	1.8	15	1.9	99	343	1.3
471.0	0.600	16	1.6	81	330	1.0	8.7	2.8	125	377	0.733
471.7	1.6	15	0.976	72	309	1.7	23	1.8	110	353	1.3
472.4	1.2	16	1.1	59	284	1.1	17	1.9	90	325	0.771
473.1	0.561	16	1.3	50	252	0.866	8.1	2.5	77	288	0.632
473.8	1.2	18	1.1	63	257	0.726	18	2.0	97	294	0.530
474.5	0.543	14	1.2	71	337	1.5	7.8	2.1	109	385	1.1
475.2	0.960	16	0.972	53	296	1.7	14	1.8	81	338	1.2
475.9	1.2	15	1.3	56	322	1.2	17	2.3	85	368	0.865
476.6	1.1	13	1.2	66	221	1.5	15	2.1	102	253	1.1
477.3	0.943	17	1.2	70	334	1.1	14	2.1	108	382	0.792
478.0	0.951	17	1.4	69	304	1.2	14	2.6	106	347	0.868
478.7	1.3	16	1.5	64	261	1.3	18	2.7	99	298	0.917
479.4	0.905	15	1.3	55	263	1.3	13	2.3	84	301	0.981
480.1	0.891	19	1.2	56	321	1.6	13	2.2	85	367	1.2
480.8	0.750	17	1.3	59	226	1.1	11	2.4	91	258	0.819
481.5	0.762	14	0.948	55	189	0.825	11	1.7	84	216	0.602
482.2	0.861	14	1.3	55	302	1.3	12	2.4	85	346	0.952
482.9	0.988	12	1.3	51	282	0.980	14	2.4	78	322	0.715
483.6	1.1	16	1.5	59	322	1.2	16	2.7	91	368	0.871
484.3	1.0	21	1.7	68	336	1.4	15	3.0	104	384	1.0
485.0	0.634	15	1.4	67	288	2.0	9.2	2.6	102	330	1.5
485.7	0.803	13	1.5	61	309	1.6	12	2.7	93	354	1.2
486.4	1.1	18	1.3	63	319	1.5	16	2.3	97	365	1.1
487.1	0.781	13	1.1	69	323	1.3	11	2.1	106	369	0.980
487.8	0.745	16	1.4	65	324	1.1	11	2.5	100	371	0.814
488.5	1.2	17	0.802	62	351	1.2	17	1.5	95	401	0.841
489.2	0.432	11	1.4	61	334	1.5	6.2	2.5	94	382	1.1
489.9	0.700	14	1.2	61	347	1.5	10	2.1	93	397	1.1
490.6	0.910	15	1.1	72	268	1.5	13	1.9	110	306	1.1
491.3	0.635	17	1.5	84	277	1.5	9.2	2.8	129	317	1.1
492.0	0.662	13	1.2	58	304	1.4	9.6	2.3	89	347	1.0
492.7	0.575	14	0.941	61	291	1.4	8.3	1.7	93	332	0.992
493.3	1.3	14	1.4	54	256	1.5	19	2.6	83	293	1.1
494.0	1.1	15	1.1	71	354	1.8	16	2.0	109	404	1.3
494.7	0.869	14	0.809	62	285	0.877	13	1.5	96	326	0.640
495.4	1.3	14	1.4	67	271	0.889	19	2.5	102	310	0.648
496.1	0.963	11	0.965	58	258	0.931	14	1.8	88	295	0.679
496.8	0.765	14	1.1	52	291	0.908	11	2.0	80	333	0.662
497.5	1.0	17	1.3	72	353	1.1	15	2.3	110	404	0.828
498.2	1.4	17	1.7	72	323	1.6	21	3.1	110	369	1.2
498.9	0.582	15	0.757	58	301	1.8	8.4	1.4	88	344	1.3
499.6	0.989	11	0.966	51	287	1.1	14	1.8	79	329	0.782
500.3	0.736	14	1.3	61	283	0.680	11	2.4	94	323	0.496
501.0	1.2	15	1.2	74	375	1.6	18	2.3	113	429	1.2
501.7	1.5	13	0.627	62	357	0.857	21	1.1	94	408	0.625
502.4	0.464	14	0.777	42	215	0.783	6.7	1.4	65	245	0.572
503.1	0.798	14	1.0	68	289	1.4	12	1.9	104	330	0.994
503.8	1.4	16	0.952	46	283	1.0	20	1.7	70	324	0.755
504.5	1.1	18	1.1	71	326	1.0	16	2.0	109	373	0.754
505.2	0.860	14	1.4	51	264	0.631	12	2.5	78	302	0.461
505.9	0.804	15	1.1	51	297	0.890	12	2.0	79	340	0.649
506.6	0.718	15	1.3	62	332	1.7	10	2.5	95	380	1.2
507.3	1.0	17	1.2	78	360	0.944	15	2.2	120	411	0.689
508.0	0.414	13	0.721	55	219	0.582	6.0	1.3	84	251	0.425



Minnow Environmental Sample ID: 020											
Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
508.7	0.639	12	1.1	69	379	0.789	9.2	2.1	106	433	0.576
509.4	1.8	17	0.870	53	240	1.0	26	1.6	81	274	0.734
510.1	0.393	15	0.837	54	250	0.684	5.7	1.5	83	285	0.499
510.8	1.0	14	0.635	56	246	1.5	15	1.2	86	281	1.1
511.5	0.960	12	0.845	53	261	0.995	14	1.5	81	298	0.726
512.2	0.991	13	0.763	51	232	0.743	14	1.4	79	265	0.542
512.9	0.661	14	1.2	51	332	1.5	9.5	2.2	78	380	1.1
513.6	1.3	12	0.762	60	287	1.1	19	1.4	92	328	0.822
514.3	0.582	14	0.746	51	247	0.745	8.4	1.4	78	282	0.544
515.0	0.475	15	0.843	65	267	0.492	6.9	1.5	99	305	0.359
515.7	0.636	14	0.897	47	281	0.814	9.2	1.6	72	321	0.594
516.4	0.832	16	0.958	52	279	0.850	12	1.7	80	320	0.620
517.1	1.5	17	0.939	50	238	0.500	22	1.7	76	273	0.364
517.8	1.2	13	0.859	46	210	1.5	18	1.6	71	240	1.1
518.5	1.1	14	0.879	55	255	0.513	15	1.6	84	291	0.374
519.2	1.3	17	1.4	54	308	0.818	19	2.6	82	352	0.597
519.8	0.881	13	1.1	58	347	1.1	13	2.0	89	396	0.835
520.5	1.2	17	1.0	72	295	1.4	18	1.9	110	337	0.996
521.2	1.4	15	0.804	53	292	0.625	20	1.5	82	334	0.456
521.9	1.2	15	0.862	58	303	1.2	18	1.6	88	346	0.858
522.6	1.2	16	0.875	60	300	0.970	18	1.6	93	343	0.708
523.3	1.2	17	1.1	67	374	1.5	18	1.9	103	428	1.1
524.0	0.966	14	0.659	60	272	1.2	14	1.2	92	311	0.906
524.7	1.1	15	1.0	51	271	1.2	16	1.8	78	310	0.885
525.4	0.957	15	0.866	55	296	1.0	14	1.6	85	339	0.732
526.1	0.983	16	0.754	50	294	1.2	14	1.4	76	336	0.877
526.8	0.898	17	0.930	57	263	1.0	13	1.7	88	300	0.736
527.5	0.406	19	0.686	56	244	1.1	5.9	1.3	86	279	0.833
528.2	0.995	15	0.641	58	333	0.813	14	1.2	89	381	0.593
528.9	1.3	17	0.955	53	360	1.5	19	1.7	81	412	1.1
529.6	0.749	21	0.667	52	286	1.4	11	1.2	80	327	1.0
530.3	0.672	20	0.817	54	286	0.907	9.7	1.5	83	327	0.662
531.0	0.834	16	1.0	72	325	1.1	12	1.9	110	372	0.771
531.7	1.2	18	0.811	46	265	1.5	17	1.5	71	303	1.1
532.4	0.536	16	0.932	46	269	1.1	7.7	1.7	71	308	0.784
533.1	1.0	18	0.637	46	247	1.5	15	1.2	70	282	1.1
533.8	0.393	20	0.639	52	288	1.4	5.7	1.2	80	329	0.994
534.5	0.659	18	0.827	69	325	1.0	9.5	1.5	105	372	0.730
535.2	0.781	18	0.729	50	262	0.629	11	1.3	76	299	0.459
535.9	1.5	15	0.766	44	292	1.6	21	1.4	67	334	1.2
536.6	1.1	15	1.0	49	331	0.579	15	1.9	75	379	0.423
537.3	1.4	18	0.700	39	232	0.319	20	1.3	60	266	0.233
538.0	1.1	16	0.898	51	319	1.1	17	1.6	79	365	0.769
538.7	1.1	16	1.2	45	266	1.4	15	2.1	70	304	1.0
539.4	0.954	19	0.769	39	253	1.0	14	1.4	60	289	0.741
540.1	1.0	17	0.993	57	310	1.3	14	1.8	88	354	0.972
540.8	1.4	15	0.610	47	284	1.7	20	1.1	72	324	1.2
541.5	0.933	16	0.849	49	249	0.771	13	1.5	75	285	0.562
542.2	0.794	19	0.484	37	262	0.258	11	0.882	56	300	0.188
542.9	0.640	18	0.885	51	312	0.953	9.2	1.6	78	356	0.695
543.6	1.2	18	0.685	39	268	1.3	18	1.2	60	307	0.971
544.3	0.666	18	0.509	45	288	1.2	9.6	0.929	69	329	0.901
545.0	0.664	18	0.580	54	269	1.1	9.6	1.1	82	308	0.817
545.7	0.806	15	0.786	41	263	0.872	12	1.4	62	301	0.636
546.3	0.684	17	0.833	41	297	1.6	9.9	1.5	63	340	1.2
547.0	0.786	16	0.897	56	414	1.9	11	1.6	85	474	1.4
547.7	0.754	17	0.942	46	346	0.995	11	1.7	71	395	0.726
548.4	1.0	13	0.613	34	229	1.3	14	1.1	52	262	0.934
549.1	1.7	16	0.697	38	331	1.1	24	1.3	57	379	0.821
549.8	1.2	16	0.794	45	360	0.726	18	1.4	68	411	0.530
550.5	0.804	17	0.712	38	268	0.790	12	1.3	58	307	0.577
551.2	1.1	19	0.747	49	319	0.982	16	1.4	75	365	0.717
551.9	1.7	17	0.835	44	358	0.953	24	1.5	67	409	0.695
552.6	0.638	13	0.759	32	310	0.926	9.2	1.4	49	355	0.675
553.3	1.4	17	0.877	37	323	1.8	20	1.6	57	369	1.3
554.0	0.636	17	0.798	36	290	1.7	9.2	1.5	55	332	1.3
554.7	1.4	13	0.755	39	270	1.2	20	1.4	60	309	0.908
555.4	1.5	15	0.627	42	367	1.1	21	1.1	65	420	0.812
556.1	0.700	14	0.562	29	257	1.0	10	1.0	44	293	0.753
556.8	1.0	18	0.957	30	297	0.447	15	1.7	46	339	0.326
557.5	1.4	18	0.729	42	295	0.809	20	1.3	65	337	0.590
558.2	0.756	13	0.830	35	323	0.491	11	1.5	53	370	0.358
558.9	0.836	16	0.596	34	331	0.598	12	1.1	53	378	0.436
559.6	0.826	13	0.862	33	297	0.866	12	1.6	50	340	0.632
560.3	1.4	18	0.821	29	261	1.2	20	1.5	44	299	0.907
561.0	0.898	18	0.955	35	281	1.1	13	1.7	54	321	0.830
561.7	0.674	13	0.914	42	331	0.728	9.7	1.7	65	378	0.531
562.4	0.954	13	0.852	36	245	0.369	14	1.6	55	281	0.269
563.1	0.820	15	0.872	33	380	1.4	12	1.6	51	434	1.0
563.8	0.486	18	0.636	43	355	1.2	7.0	1.2	66	406	0.883
564.5	0.911	17	0.811	38	305	1.1	13	1.5	58	348	0.793



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
565.2	0.756	12	0.522	35	244	1.5	11	0.951	54	278	1.1
565.9	0.690	13	0.779	33	294	1.1	10.0	1.4	50	336	0.797
566.6	1.0	15	0.763	35	358	1.1	14	1.4	54	409	0.777
567.3	1.6	18	0.915	44	333	1.7	23	1.7	67	381	1.2
568.0	0.616	14	0.888	35	254	0.963	8.9	1.6	54	290	0.703
568.7	0.992	13	0.726	43	309	1.5	14	1.3	66	354	1.1
569.4	0.704	15	0.834	35	307	0.901	10	1.5	54	351	0.657
570.1	0.682	15	0.853	41	299	1.4	9.8	1.6	63	342	0.998
570.8	1.4	16	0.971	39	289	0.680	20	1.8	60	331	0.496
571.5	0.581	14	0.728	34	301	1.3	8.4	1.3	52	344	0.917
572.2	0.798	11	0.486	33	267	0.771	12	0.887	51	305	0.563
572.9	0.393	13	0.842	39	328	0.467	5.7	1.5	59	375	0.341
573.5	0.807	15	0.795	35	258	1.3	12	1.5	54	295	0.949
574.2	0.786	16	0.805	43	338	1.7	11	1.5	66	386	1.3
574.9	0.705	15	0.946	44	300	1.1	10	1.7	68	343	0.835
575.6	0.870	15	0.994	32	244	0.760	13	1.8	49	279	0.555
576.3	0.845	13	0.856	34	287	0.863	12	1.6	52	328	0.630
577.0	1.2	14	0.826	41	265	1.3	17	1.5	64	304	0.981
577.7	0.393	14	0.931	36	265	1.2	5.7	1.7	56	303	0.882
578.4	0.714	12	0.785	45	294	0.847	10	1.4	69	336	0.618
579.1	0.870	12	0.972	36	281	1.2	13	1.8	56	321	0.874
579.8	0.540	13	0.732	36	286	1.2	7.8	1.3	54	327	0.851
580.5	0.998	14	0.864	36	248	0.872	14	1.6	55	284	0.636
581.2	0.746	13	0.910	37	246	0.886	11	1.7	56	282	0.646
581.9	0.402	15	0.935	36	244	1.1	5.8	1.7	55	279	0.825
582.6	0.947	12	0.600	36	321	1.7	14	1.1	56	367	1.3
583.3	0.595	14	1.2	35	318	1.5	8.6	2.1	54	364	1.1
584.0	0.884	17	0.867	32	229	0.513	13	1.6	50	262	0.374
584.7	0.971	13	0.924	40	270	1.4	14	1.7	61	308	0.997
585.4	0.719	10	0.895	31	247	1.6	10	1.6	48	282	1.2
586.1	0.488	13	0.712	34	283	0.677	7.0	1.3	52	323	0.494
586.8	1.3	15	0.829	41	295	0.644	19	1.5	63	337	0.470
587.5	0.770	15	0.854	43	289	1.3	11	1.6	66	330	0.967
588.2	1.6	15	0.737	36	233	1.2	23	1.3	56	267	0.862
588.9	0.393	11	0.467	38	287	1.1	5.7	0.853	58	328	0.821
589.6	1.2	10.0	0.684	40	267	0.982	18	1.2	61	305	0.717
590.3	0.926	17	1.2	48	313	1.3	13	2.2	74	358	0.914
591.0	0.500	15	0.982	54	397	1.7	7.2	1.8	82	454	1.2
591.7	1.2	14	0.762	32	258	0.639	17	1.4	48	295	0.466
592.4	1.4	12	1.1	41	277	0.735	21	1.9	63	317	0.536
593.1	0.850	13	0.730	40	289	0.941	12	1.3	61	330	0.686
593.8	0.995	12	0.889	34	243	0.962	14	1.6	53	278	0.702
594.5	1.1	12	1.2	64	347	1.1	15	2.1	98	397	0.788
595.2	1.1	15	0.703	40	282	1.5	16	1.3	61	322	1.1
595.9	1.1	14	0.968	37	222	0.840	15	1.8	56	254	0.613
596.6	0.756	16	1.1	58	414	0.700	11	1.9	89	474	0.511
597.3	1.3	15	0.596	44	299	1.4	18	1.1	68	342	1.0
598.0	0.865	13	0.797	39	243	0.619	12	1.5	59	278	0.451
598.7	0.399	11	1.4	40	253	1.4	5.8	2.5	62	289	1.0
599.4	0.654	13	0.888	50	294	1.2	9.4	1.6	76	336	0.884
600.0	1.1	16	0.971	51	285	1.0	16	1.8	78	326	0.749
600.7	0.908	14	0.733	41	228	0.834	13	1.3	63	261	0.608
601.4	0.679	13	0.747	46	306	1.2	9.8	1.4	71	350	0.850
602.1	0.884	12	0.969	39	251	0.568	13	1.8	60	287	0.414
602.8	1.2	16	0.828	46	300	1.1	17	1.5	70	343	0.819
603.5	0.393	13	1.2	48	281	1.1	5.7	2.1	74	321	0.777
604.2	0.870	17	1.0	38	285	0.848	13	1.9	58	325	0.618
604.9	0.975	16	0.965	47	284	0.597	14	1.8	72	324	0.436
605.6	0.836	13	1.5	41	329	0.453	12	2.8	63	376	0.330
606.3	0.853	12	0.894	40	285	0.646	12	1.6	62	326	0.471
607.0	0.393	15	0.517	51	240	0.353	5.7	0.942	79	275	0.258
607.7	0.816	12	0.995	48	262	1.1	12	1.8	74	300	0.822
608.4	0.749	12	1.1	47	281	0.644	11	2.1	72	321	0.470
609.1	0.929	14	0.748	43	266	1.2	13	1.4	67	305	0.880
609.8	1.1	14	1.1	56	292	1.2	16	1.9	86	334	0.854
610.5	0.774	14	1.2	47	245	0.791	11	2.1	72	280	0.577
611.2	1.4	13	0.829	45	259	1.3	20	1.5	69	296	0.947
611.9	1.2	14	1.0	48	300	1.4	17	1.8	73	343	1.0
612.6	0.659	14	0.887	44	271	1.5	9.5	1.6	68	309	1.1
613.3	0.710	14	1.1	49	281	1.1	10	2.0	75	321	0.775
614.0	0.736	16	0.918	46	225	0.453	11	1.7	70	257	0.330
614.7	0.393	11	0.649	42	237	1.2	5.7	1.2	65	271	0.909
615.4	1.2	14	0.636	43	265	1.1	18	1.2	65	303	0.782
616.1	1.1	13	1.0	53	360	0.893	16	1.9	81	412	0.652
616.8	1.6	13	0.977	39	257	0.747	24	1.8	60	294	0.545
617.5	1.2	14	0.938	60	308	0.767	17	1.7	92	353	0.560
618.2	0.986	13	0.834	47	260	0.986	14	1.5	72	297	0.720
618.9	0.625	14	0.781	50	292	1.1	9.0	1.4	76	334	0.778
619.6	0.754	16	0.784	50	240	0.398	11	1.4	76	275	0.290
620.3	0.393	15	0.690	48	214	0.721	5.7	1.3	74	244	0.526
621.0	1.1	12	0.825	53	317	0.539	15	1.5	82	363	0.393



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Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
621.7	0.786	11	1.0	48	271	0.995	11	1.9	73	310	0.726
622.4	0.538	15	0.955	56	284	0.831	7.8	1.7	86	325	0.606
623.1	0.712	16	0.973	53	281	1.4	10	1.8	81	321	1.0
623.8	0.847	14	1.1	50	285	0.878	12	1.9	77	326	0.641
624.5	0.721	13	0.859	60	304	1.3	10	1.6	92	348	0.970
625.2	1.4	15	1.4	50	282	1.2	20	2.5	77	323	0.911
625.9	0.935	14	0.856	51	325	1.1	13	1.6	78	372	0.792
626.5	1.5	15	1.2	62	303	1.0	22	2.2	95	346	0.738
627.2	1.1	15	0.958	56	296	1.1	16	1.7	85	339	0.775
627.9	0.966	12	0.894	51	279	1.2	14	1.6	78	319	0.862
628.6	1.0	13	1.0	47	214	0.658	15	1.8	71	245	0.480
629.3	0.690	17	1.1	51	308	0.815	10.0	2.1	79	352	0.595
630.0	0.588	15	0.690	58	273	1.2	8.5	1.3	89	313	0.878
630.7	1.3	17	1.0	56	261	0.960	19	1.9	86	299	0.701
631.4	1.1	16	1.2	66	312	0.777	16	2.2	101	357	0.567
632.1	2.1	16	0.883	44	254	1.3	30	1.6	68	291	0.931
632.8	1.1	16	1.2	52	346	1.3	17	2.2	80	396	0.933
633.5	0.922	21	0.824	56	298	0.802	13	1.5	86	340	0.586
634.2	0.916	16	0.858	46	209	0.708	13	1.6	71	239	0.517
634.9	1.5	16	0.548	46	313	0.304	22	1.0	71	358	0.222
635.6	0.781	17	0.800	46	320	0.592	11	1.5	70	366	0.432
636.3	2.4	20	0.874	43	303	1.1	34	1.6	66	347	0.772
637.0	1.4	20	0.838	52	257	1.2	20	1.5	80	294	0.904
637.7	1.4	21	0.984	41	255	0.699	20	1.8	63	292	0.510
638.4	1.2	16	0.856	43	233	0.411	18	1.6	66	266	0.300
639.1	0.854	21	0.931	41	286	1.1	12	1.7	63	327	0.798
639.8	1.3	24	0.834	41	259	0.952	19	1.5	64	297	0.694
640.5	2.0	24	1.1	49	288	1.0	28	1.9	75	330	0.743
641.2	1.2	30	1.1	39	238	0.655	17	2.1	60	272	0.478
641.9	0.464	19	1.4	48	368	1.3	6.7	2.5	73	420	0.912
642.6	1.1	30	1.2	50	304	0.903	16	2.3	77	348	0.659
643.3	1.1	31	1.0	47	301	0.588	17	1.9	72	345	0.429
644.0	0.731	33	0.796	45	272	0.757	11	1.5	69	311	0.552
644.7	1.4	32	1.1	40	252	0.174	20	2.0	62	289	0.127
645.4	1.0	38	0.755	46	329	0.493	15	1.4	70	376	0.359
646.1	0.607	40	1.1	49	336	1.1	8.8	2.0	75	384	0.824
646.8	0.836	42	1.1	48	325	1.9	12	1.9	74	372	1.4
647.5	1.1	39	0.655	46	312	0.934	15	1.2	71	357	0.682
648.2	1.0	35	0.821	47	329	0.593	15	1.5	72	377	0.433
648.9	0.701	42	0.764	36	312	1.2	10	1.4	56	357	0.883
649.6	0.772	49	0.688	43	319	1.2	11	1.3	66	365	0.892
650.3	0.473	44	0.953	40	258	0.880	6.8	1.7	62	294	0.642
651.0	1.4	50	1.1	45	290	0.726	21	2.1	69	332	0.529
651.7	1.7	41	1.0	38	301	0.845	25	1.8	58	345	0.617
652.3	0.985	44	0.740	37	235	0.739	14	1.3	57	269	0.539
653.0	1.8	47	0.976	46	317	1.7	26	1.8	71	362	1.3
653.7	1.3	33	0.700	47	301	0.643	19	1.3	71	344	0.469
654.4	0.820	34	0.979	39	335	0.755	12	1.8	59	383	0.551
655.1	1.3	32	0.904	46	286	0.501	19	1.6	70	327	0.366
655.8	1.1	35	0.441	41	251	1.2	16	0.804	63	287	0.844
656.5	1.2	32	0.916	47	266	0.717	18	1.7	72	305	0.523
657.2	1.2	28	0.882	50	380	1.2	18	1.6	77	435	0.884
657.9	0.529	31	0.799	41	255	1.6	7.6	1.5	63	292	1.1
658.6	1.2	26	0.997	42	344	1.7	17	1.8	64	393	1.2
659.3	1.3	33	1.0	44	250	1.1	19	1.9	67	286	0.833
660.0	0.679	29	1.0	56	372	0.869	9.8	1.8	85	425	0.634
660.7	1.2	28	1.1	40	277	0.178	17	2.1	61	317	0.130
661.4	0.971	30	1.2	46	320	1.6	14	2.2	70	366	1.2
662.1	0.625	28	1.0	42	360	1.9	9.0	1.9	65	412	1.4
662.8	1.7	33	0.898	50	297	0.732	25	1.6	76	340	0.534
663.5	1.0	32	0.641	47	315	1.0	14	1.2	72	361	0.737
664.2	1.3	30	0.905	46	271	1.6	18	1.7	71	310	1.2
664.9	1.3	32	0.874	45	248	1.2	18	1.6	69	284	0.889
665.6	1.1	29	0.923	53	385	1.3	17	1.7	81	440	0.965
666.3	0.647	24	0.811	43	258	0.899	9.3	1.5	66	295	0.656
667.0	0.861	23	1.1	54	329	1.2	12	2.1	83	376	0.850
667.7	1.7	24	0.953	44	225	0.961	25	1.7	68	258	0.701
668.4	0.787	24	1.4	54	266	1.2	11	2.6	82	305	0.909
669.1	1.8	22	1.2	50	259	0.917	25	2.2	76	296	0.669
669.8	0.662	17	1.2	57	268	0.753	9.6	2.1	87	306	0.549
670.5	1.0	21	0.802	54	319	1.4	15	1.5	83	364	1.1
671.2	1.0	18	0.990	55	325	1.7	15	1.8	84	372	1.2
671.9	0.784	20	1.0	43	269	0.721	11	1.9	66	308	0.526
672.6	1.3	18	1.1	40	266	1.5	18	2.1	62	304	1.1
673.3	1.1	22	0.998	64	303	1.5	16	1.8	97	346	1.1
674.0	1.3	16	1.5	62	299	1.2	19	2.8	95	341	0.840
674.7	0.865	15	1.1	45	286	0.972	12	2.0	69	326	0.709
675.4	0.933	19	1.2	48	302	1.3	13	2.1	74	345	0.958
676.1	0.393	20	1.2	61	351	0.888	5.7	2.1	94	401	0.648
676.8	1.5	19	1.1	48	343	0.556	22	2.0	73	393	0.405
677.5	0.795	19	1.2	45	297	0.734	11	2.2	69	339	0.536



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
678.1	0.653	15	0.991	50	296	1.3	9.4	1.8	76	339	0.943
678.8	2.1	19	1.4	47	270	0.602	31	2.6	72	309	0.439
679.5	1.1	16	0.777	49	263	0.668	16	1.4	75	301	0.487
680.2	1.3	17	1.4	55	332	1.4	18	2.5	84	380	1.0
680.9	1.2	17	1.4	52	321	1.1	17	2.5	79	367	0.770
681.6	0.698	17	0.940	49	278	0.695	10	1.7	75	318	0.507
682.3	2.0	17	1.1	48	278	1.5	28	2.0	73	318	1.1
683.0	1.3	18	0.983	61	340	1.7	19	1.8	94	389	1.2
683.7	1.3	16	1.1	45	256	1.1	19	2.0	69	292	0.837
684.4	1.2	14	1.0	60	293	1.0	18	1.9	92	335	0.756
685.1	0.945	14	0.991	52	290	0.409	14	1.8	80	331	0.298
685.8	1.3	14	0.957	59	273	0.579	18	1.7	91	313	0.423
686.5	0.708	15	0.885	53	283	1.6	10	1.6	81	324	1.2
687.2	0.987	15	1.0	58	375	1.4	14	1.9	88	428	1.0
687.9	1.3	16	0.757	52	249	1.3	19	1.4	79	284	0.928
688.6	1.7	18	1.1	63	335	1.3	25	2.0	96	383	0.923
689.3	1.3	13	0.779	50	246	0.672	18	1.4	77	282	0.490
690.0	1.1	16	1.1	54	305	0.905	16	2.0	83	349	0.660
690.7	1.6	17	1.3	48	235	0.458	24	2.4	74	268	0.334
691.4	0.884	12	1.0	62	353	0.978	13	1.8	95	403	0.714
692.1	0.689	12	0.952	47	255	0.703	9.9	1.7	73	292	0.513
692.8	0.967	16	0.799	57	291	0.422	14	1.5	87	333	0.308
693.5	1.5	15	1.3	50	223	0.962	21	2.3	77	255	0.702
694.2	1.5	15	1.1	53	267	1.4	22	2.0	80	305	1.0
694.9	0.705	13	0.686	61	351	0.870	10	1.3	93	402	0.635
695.6	0.956	16	0.748	61	302	0.586	14	1.4	93	345	0.427
696.3	1.2	16	0.854	55	276	0.389	18	1.6	84	316	0.284
697.0	1.7	16	0.899	57	271	0.584	24	1.6	88	310	0.426
697.7	1.1	14	0.639	49	281	0.945	16	1.2	75	321	0.690
698.4	0.866	15	0.604	44	262	0.838	13	1.1	67	300	0.611
699.1	1.3	15	0.819	54	299	0.623	19	1.5	82	342	0.454
699.8	1.2	17	0.717	52	259	0.821	18	1.3	80	296	0.599
700.5	0.721	13	0.479	50	286	0.797	10	0.873	76	327	0.582
701.2	1.5	17	0.878	56	294	0.682	22	1.6	86	336	0.498
701.9	1.8	15	1.0	53	315	1.3	26	1.9	81	360	0.960
702.6	1.4	15	1.1	51	279	1.4	21	2.0	79	319	1.0
703.3	1.1	14	0.940	53	277	0.798	15	1.7	82	316	0.582
704.0	1.5	15	0.649	46	278	0.872	21	1.2	71	318	0.636
704.6	1.6	14	0.972	45	284	1.4	24	1.8	69	325	1.0
705.3	0.658	15	0.612	36	251	0.375	9.5	1.1	56	287	0.273
706.0	1.4	19	0.795	58	327	1.7	20	1.4	89	373	1.2
706.7	0.950	13	0.940	43	298	1.3	14	1.7	66	341	0.920
707.4	1.2	13	0.687	42	249	0.462	17	1.3	64	284	0.337
708.1	1.5	15	0.731	40	278	0.901	21	1.3	62	318	0.658
708.8	1.2	20	0.988	45	335	1.1	18	1.8	70	383	0.768
709.5	0.973	18	1.0	41	295	0.804	14	1.8	63	338	0.586
710.2	0.969	15	1.1	45	241	0.979	14	2.1	68	276	0.714
710.9	1.2	14	0.604	52	283	0.925	17	1.1	80	324	0.675
711.6	1.4	14	0.837	45	284	1.3	20	1.5	69	324	0.979
712.3	1.5	15	0.906	43	294	1.4	21	1.7	66	337	1.0
713.0	1.0	16	0.926	45	285	1.7	15	1.7	69	326	1.2
713.7	1.3	17	0.744	39	230	0.971	18	1.4	60	263	0.708
714.4	1.3	16	0.801	42	295	1.0	19	1.5	65	337	0.763
715.1	1.4	18	0.666	36	300	0.869	21	1.2	55	343	0.634
715.8	1.3	18	0.795	37	233	0.617	19	1.4	57	267	0.450
716.5	1.7	16	0.787	44	310	1.6	25	1.4	67	355	1.2
717.2	0.393	18	0.855	44	347	1.6	5.7	1.6	67	396	1.2
717.9	1.2	16	0.825	40	325	0.666	17	1.5	61	371	0.486
718.6	1.2	16	0.686	38	269	1.7	17	1.3	59	308	1.2
719.3	1.1	14	1.0	34	261	1.0	16	1.9	52	299	0.743
720.0	0.495	16	0.768	36	267	1.4	7.1	1.4	55	305	1.0
720.7	1.6	15	1.1	37	292	0.980	23	1.9	56	334	0.715
721.4	1.0	16	1.0	40	307	1.1	15	1.8	61	351	0.787
722.1	0.544	17	0.994	35	351	1.2	7.9	1.8	53	401	0.871
722.8	1.1	18	0.913	40	310	1.1	16	1.7	61	354	0.800
723.5	0.958	17	1.2	38	254	1.1	14	2.2	58	290	0.811
724.2	0.799	15	0.809	41	288	1.4	12	1.5	63	329	1.0
724.9	1.4	16	1.1	44	370	0.721	20	1.9	67	423	0.526
725.6	0.882	15	0.945	41	310	0.882	13	1.7	63	354	0.643
726.3	1.7	15	0.748	35	300	1.9	24	1.4	54	343	1.4
727.0	0.691	17	1.4	40	301	1.0	10.0	2.5	61	344	0.731
727.7	1.2	16	371	171	228	3.0	17	676	262	260	2.2
728.4	2.0	19	3.8	51	348	1.4	29	6.9	78	398	1.0
729.1	0.676	15	2.0	48	340	1.1	9.8	3.7	73	389	0.838
729.8	0.934	16	1.3	44	311	1.2	13	2.4	67	356	0.893
730.5	1.4	17	1.2	43	281	1.3	20	2.1	66	321	0.951
731.2	0.810	14	1.7	43	284	1.1	12	3.1	67	325	0.821
731.8	0.602	14	0.843	46	362	0.624	8.7	1.5	71	414	0.455
732.5	1.1	17	1.5	42	281	1.2	15	2.8	65	321	0.864
733.2	0.789	16	1.4	38	279	0.582	11	2.6	58	319	0.425
733.9	0.660	13	1.1	39	301	0.563	9.5	2.1	60	344	0.411



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Sample ID: 020

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
734.6	1.1	18	0.755	34	230	0.670	15	1.4	52	263	0.489
735.3	0.393	15	1.3	45	332	2.1	5.7	2.4	70	379	1.5
736.0	0.941	18	1.1	43	247	1.2	14	2.1	65	283	0.911
736.7	0.926	16	1.6	53	277	1.1	13	2.8	81	316	0.804
737.4	0.979	17	1.4	43	391	1.2	14	2.6	66	447	0.875
738.1	0.781	16	1.4	47	290	1.3	11	2.6	72	332	0.977
738.8	0.646	15	1.2	40	267	1.3	9.3	2.2	61	305	0.945
739.5	0.760	15	1.4	47	266	1.8	11	2.5	72	304	1.3
740.2	0.481	16	1.2	45	301	1.6	6.9	2.2	68	344	1.2
740.9	0.590	15	1.5	42	247	1.1	8.5	2.8	64	283	0.796
741.6	1.0	17	1.7	50	301	1.3	15	3.2	77	345	0.921
742.3	0.771	20	1.2	48	240	1.3	11	2.1	74	275	0.968
743.0	0.611	14	1.2	45	252	2.0	8.8	2.2	69	288	1.4
743.7	0.866	15	1.5	38	265	0.937	12	2.7	58	303	0.684
744.4	0.708	12	1.5	46	336	1.5	10	2.7	71	384	1.1
745.1	0.893	14	1.9	51	358	1.6	13	3.6	78	409	1.2
745.8	0.393	15	1.6	48	246	1.4	5.7	3.0	74	282	0.996
746.5	1.0	17	1.3	58	324	1.0	15	2.4	89	370	0.757
747.2	0.678	14	1.6	41	278	1.5	9.8	3.0	64	318	1.1
747.9	0.708	16	1.3	48	212	1.1	10	2.4	74	242	0.773
748.6	0.542	15	1.9	53	294	2.3	7.8	3.4	82	336	1.7
749.3	0.865	18	1.8	46	287	2.2	12	3.3	70	328	1.6
750.0	0.834	15	1.2	49	299	1.4	12	2.2	75	342	0.988
750.7	0.710	18	1.6	52	317	1.9	10	2.9	79	363	1.4
751.4	0.815	16	2.1	52	310	2.6	12	3.9	79	354	1.9
752.1	0.574	15	1.7	51	317	1.2	8.3	3.2	78	362	0.857
752.8	0.588	15	1.7	60	363	1.9	8.5	3.1	92	415	1.4
753.5	0.393	15	1.7	47	225	0.964	5.7	3.1	72	258	0.703
754.2	0.865	16	1.4	42	229	1.1	12	2.6	65	262	0.773
754.9	1.5	16	1.1	46	328	2.0	22	2.0	71	375	1.4
755.6	0.439	16	1.2	42	267	1.9	6.3	2.2	64	305	1.4
756.3	0.463	13	1.5	51	263	1.2	6.7	2.7	78	301	0.855
757.0	0.756	15	1.4	42	219	1.0	11	2.5	64	251	0.762
757.7	0.452	13	1.6	54	272	1.3	6.5	3.0	83	311	0.957
758.3	0.840	16	1.6	56	265	1.0	12	2.8	86	303	0.730
759.0	1.1	17	1.5	46	212	1.2	16	2.7	71	242	0.878
759.7	0.412	13	2.0	56	292	1.4	5.9	3.7	86	333	0.986
760.4	1.2	16	1.2	59	367	2.0	17	2.2	90	419	1.4
761.1	0.672	16	1.3	46	256	1.2	9.7	2.3	70	293	0.906
761.8	0.822	15	1.5	60	308	1.8	12	2.7	92	352	1.3
762.5	0.955	16	1.4	46	261	1.6	14	2.6	71	299	1.2
763.2	0.692	16	1.4	56	253	0.912	10.0	2.6	86	290	0.665
763.9	0.725	16	1.4	106	238	2.0	10	2.6	163	272	1.5
764.6	0.495	16	1.8	51	302	1.0	7.1	3.3	79	346	0.749
765.3	0.863	17	1.3	60	333	2.2	12	2.4	92	381	1.6
766.0	1.2	16	0.981	55	242	1.2	18	1.8	84	277	0.886
766.7	0.704	14	1.3	59	330	1.4	10	2.4	91	377	1.0
767.4	1.3	13	1.3	50	240	0.756	19	2.4	77	274	0.552
768.1	0.957	14	1.3	41	262	1.8	14	2.4	63	299	1.3
768.8	0.844	13	1.2	49	229	1.3	12	2.2	74	262	0.944
769.5	0.750	16	1.4	58	263	1.9	11	2.5	89	301	1.4
770.2	0.945	16	0.968	52	237	1.6	14	1.8	79	271	1.1
770.9	0.938	14	1.3	44	245	1.0	14	2.3	67	280	0.741
771.6	0.753	17	1.3	49	326	1.8	11	2.4	75	373	1.3
772.3	0.534	14	1.1	51	268	1.2	7.7	2.0	77	306	0.843
773.0	1.5	16	1.3	61	266	0.697	22	2.3	93	304	0.508
773.7	0.832	13	1.2	44	252	1.1	12	2.2	68	288	0.836
774.4	0.722	16	1.3	46	242	1.6	10	2.3	71	277	1.1
775.1	0.576	12	0.921	44	294	1.2	8.3	1.7	67	336	0.843
775.8	1.2	14	0.972	50	225	1.8	17	1.8	77	257	1.3
776.5	1.3	16	1.6	52	238	0.985	18	2.9	80	273	0.719
777.2	0.393	13	1.3	43	249	1.5	5.7	2.4	66	285	1.1
777.9	0.813	14	1.0	40	279	0.865	12	1.9	61	319	0.631
778.6	1.1	15	1.1	45	272	1.1	15	2.1	69	311	0.767
779.3	1.2	18	1.5	45	245	1.2	17	2.8	68	280	0.878
780.0	1.1	18	1.1	52	249	0.814	16	2.0	79	285	0.594
780.7	42	310	1.2	44	237	1.5	604	2.2	68	271	1.1
781.4	7.5	16	1.4	42	262	1.2	108	2.6	65	299	0.858
782.1	0.426	14	1.1	41	275	1.7	6.2	1.9	62	314	1.3
782.8	1.2	16	1.6	46	325	1.6	18	2.9	70	372	1.1
783.5	0.704	14	1.1	37	239	0.650	10	2.0	57	273	0.474
784.2	0.670	14	1.1	34	242	0.849	9.7	2.1	52	277	0.619
784.8	1.3	18	0.999	36	244	1.2	18	1.8	55	279	0.850
785.5	0.608	18	0.995	41	257	1.0	8.8	1.8	63	293	0.754
786.2	0.966	15	1.1	43	280	1.3	14	1.9	66	320	0.936
786.9	0.681	35	1.1	45	311	0.969	9.8	2.1	69	355	0.707
787.6	0.462	14	0.879	37	311	1.1	6.7	1.6	57	355	0.797
788.3	0.491	13	1.1	36	284	1.6	7.1	2.0	56	325	1.1
789.0	1.6	21	1.0	34	265	1.1	22	1.9	52	303	0.828
789.7	0.933	20	1.2	38	277	0.902	13	2.2	58	317	0.658
790.4	1.1	17	1.1	40	276	1.9	15	2.1	61	315	1.4



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
791.1	0.860	17	1.2	32	299	1.0	12	2.2	49	341	0.747
791.8	0.795	19	1.2	39	423	1.6	11	2.1	60	484	1.1
792.5	0.948	22	1.1	38	282	1.3	14	2.0	58	322	0.937
793.2	0.829	15	0.878	36	230	1.4	12	1.6	55	263	1.1
793.9	1.6	17	0.937	38	288	0.416	23	1.7	58	329	0.303
794.6	0.686	15	1.000	30	313	1.4	9.9	1.8	46	358	1.1
795.3	0.850	16	1.2	33	305	0.941	12	2.2	51	349	0.686
796.0	1.1	16	1.3	53	331	2.1	16	2.4	81	379	1.5
796.7	0.631	17	1.2	44	361	1.5	9.1	2.1	68	412	1.1
797.4	0.874	12	0.895	35	296	0.992	13	1.6	54	338	0.724
798.1	1.5	14	1.2	36	318	1.3	22	2.3	55	363	0.917
798.8	0.582	21	1.7	41	326	1.4	8.4	3.0	63	373	1.0
799.5	2.1	19	1.1	45	311	1.0	30	2.0	69	355	0.762
800.2	0.896	15	0.996	36	271	0.866	13	1.8	56	310	0.632
800.9	0.880	20	1.2	31	290	1.8	13	2.2	48	332	1.3
801.6	1.1	16	1.6	39	319	1.5	16	3.0	60	364	1.1
802.3	1.5	20	1.3	41	283	1.3	22	2.4	63	323	0.948
803.0	0.665	19	0.989	31	233	0.877	9.6	1.8	48	266	0.640
803.7	0.499	15	1.0	37	303	1.0	7.2	1.9	57	346	0.746
804.4	0.393	15	1.1	30	289	1.4	5.7	2.1	46	330	1.1
805.1	1.3	19	1.2	39	338	1.9	19	2.2	60	387	1.4
805.8	0.781	20	1.6	49	295	0.927	11	2.9	75	338	0.676
806.5	1.6	21	1.2	40	289	2.0	23	2.2	61	330	1.5
807.2	0.789	17	1.3	34	333	1.2	11	2.4	52	381	0.911
807.9	1.3	22	1.3	39	361	1.3	18	2.4	60	413	0.949
808.6	0.729	23	1.2	49	316	0.788	11	2.2	75	361	0.575
809.3	0.956	18	1.4	68	340	2.9	14	2.5	105	389	2.1
810.0	1.1	22	1.4	54	363	2.0	16	2.6	83	415	1.4
810.7	0.646	22	1.2	45	294	0.341	9.3	2.2	69	336	0.249
811.3	1.3	20	1.3	40	343	1.2	19	2.4	61	392	0.873
812.0	1.2	24	1.3	47	309	1.4	17	2.4	71	353	1.0
812.7	0.535	24	1.3	38	227	0.813	7.7	2.4	58	259	0.593
813.4	0.543	21	0.735	44	273	1.1	7.8	1.3	68	312	0.821
814.1	0.661	21	1.2	46	297	2.0	9.5	2.1	70	340	1.5
814.8	0.878	26	1.4	44	303	1.3	13	2.5	68	346	0.929
815.5	1.0	26	1.4	52	256	1.3	14	2.6	80	293	0.970
816.2	0.734	27	1.4	52	332	1.6	11	2.6	79	380	1.1
816.9	1.3	25	1.5	43	303	1.6	19	2.7	66	346	1.2
817.6	1.0	27	1.3	46	259	1.7	15	2.5	71	296	1.2
818.3	1.1	25	1.2	44	287	0.943	16	2.2	68	328	0.688
819.0	0.858	28	1.3	50	347	1.9	12	2.4	77	397	1.4
819.7	0.900	26	1.5	42	259	0.609	13	2.7	65	296	0.445
820.4	0.622	24	1.4	49	273	1.2	9.0	2.6	75	312	0.897
821.1	0.842	32	1.3	47	342	1.2	12	2.4	71	391	0.864
821.8	0.467	28	1.3	50	394	1.6	6.7	2.3	77	451	1.1
822.5	1.0	27	1.4	47	313	1.4	15	2.6	73	358	0.996
823.2	0.875	27	1.3	44	233	0.894	13	2.3	67	267	0.652
823.9	1.1	24	0.741	52	336	1.4	16	1.4	79	384	1.0
824.6	1.1	25	1.4	56	347	0.809	16	2.5	86	397	0.590
825.3	0.965	30	1.4	58	317	1.8	14	2.5	88	363	1.3
826.0	1.4	24	1.0	45	249	1.2	21	1.9	69	284	0.910
826.7	1.0	25	1.4	46	308	1.2	15	2.5	70	352	0.873
827.4	0.789	20	1.4	54	298	1.6	11	2.6	83	341	1.2
828.1	1.3	29	1.5	51	287	1.2	18	2.7	78	329	0.902
828.8	0.943	20	1.1	41	229	0.866	14	2.0	63	262	0.632
829.5	1.3	19	0.987	47	264	1.1	18	1.8	71	302	0.813
830.2	1.3	23	0.769	51	292	1.3	18	1.4	78	334	0.952
830.9	0.814	21	1.2	58	301	1.5	12	2.2	88	344	1.1
831.6	0.697	28	1.0	51	257	1.3	10	1.8	78	294	0.938
832.3	0.815	25	1.2	50	290	0.801	12	2.1	77	332	0.585
833.0	1.3	23	1.2	49	283	0.965	19	2.2	76	324	0.704
833.7	0.930	20	1.3	44	282	0.768	13	2.4	68	322	0.560
834.4	0.519	23	1.4	51	306	0.701	7.5	2.6	78	350	0.512
835.1	1.5	21	1.3	44	271	1.5	22	2.3	68	310	1.1
835.8	0.965	23	1.4	50	311	0.788	14	2.6	77	355	0.575
836.5	0.905	19	1.2	54	333	0.686	13	2.1	83	380	0.500
837.2	1.4	20	1.2	47	309	1.6	21	2.2	72	353	1.2
837.8	1.0	20	1.2	41	256	0.902	15	2.1	62	292	0.658
838.5	1.3	22	1.4	55	282	0.995	18	2.6	84	323	0.726
839.2	0.573	20	1.0	42	254	0.708	8.3	1.9	64	290	0.516
839.9	0.980	21	1.2	65	451	1.2	14	2.1	100	516	0.851
840.6	1.8	19	1.4	47	306	0.816	27	2.5	71	350	0.595
841.3	1.4	22	1.2	41	282	1.4	20	2.2	62	322	1.0
842.0	0.726	22	1.4	51	377	1.8	10	2.6	78	431	1.3
842.7	1.3	17	1.5	48	418	1.0	19	2.7	74	477	0.747
843.4	1.5	12	1.7	48	434	1.7	21	3.1	73	496	1.2
844.1	1.6	21	1.4	45	423	1.6	24	2.6	69	484	1.1
844.8	1.3	19	1.6	54	488	2.1	19	2.9	82	558	1.5
845.5	1.7	24	1.8	56	542	2.0	25	3.3	86	620	1.4
846.2	1.1	12	1.4	44	346	0.869	16	2.6	67	395	0.634
846.9	1.2	16	1.5	45	479	1.9	18	2.7	69	548	1.4



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Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
847.6	0.759	17	1.6	57	519	1.7	11	3.0	87	594	1.2
848.3	1.4	24	1.8	44	422	0.733	20	3.2	67	483	0.535
849.0	2.1	20	2.0	51	604	3.2	30	3.6	79	690	2.3
849.7	1.1	18	1.9	59	612	1.6	16	3.5	91	700	1.2
850.4	1.8	20	1.2	42	701	1.6	25	2.3	64	802	1.2
851.1	2.5	17	2.0	45	623	2.2	36	3.7	69	712	1.6
851.8	2.0	25	2.0	45	559	2.4	28	3.6	69	640	1.7
852.5	1.7	18	2.1	48	692	1.2	24	3.8	73	791	0.897
853.2	1.6	15	2.0	68	1106	3.7	23	3.7	104	1265	2.7
853.9	2.4	18	1.9	51	537	1.6	34	3.5	78	614	1.2
854.6	2.7	26	2.4	51	822	2.6	39	4.3	79	940	1.9
855.3	0.940	19	383	47	658	1.7	14	698	71	752	1.3
856.0	1.9	19	1.9	47	627	2.3	27	3.5	72	717	1.7
856.7	1.1	15	2.3	48	739	1.7	15	4.1	73	845	1.3
857.4	2.1	20	1.8	40	802	1.4	31	3.3	62	917	1.0
858.1	1.5	16	2.2	53	749	1.6	21	4.1	81	857	1.2
858.8	2.0	20	1.5	43	643	1.1	29	2.8	66	735	0.797
859.5	1.3	16	2.5	58	791	2.6	19	4.6	89	905	1.9
860.2	2.0	17	2.1	51	805	1.8	29	3.9	78	920	1.3
860.9	2.3	20	1.6	50	991	2.1	34	2.9	76	1133	1.5
861.6	1.7	20	1.7	45	735	1.2	25	3.1	69	841	0.863
862.3	2.7	18	2.2	78	1488	4.4	39	4.0	119	1701	3.2
863.0	1.9	17	1.7	52	891	2.7	27	3.0	79	1019	2.0
863.7	2.6	20	1.9	40	841	2.3	38	3.4	61	962	1.6
864.3	2.3	21	1.7	58	933	2.1	34	3.2	88	1066	1.5
865.0	1.7	23	2.4	58	1031	2.5	24	4.4	89	1179	1.8
865.7	2.0	19	1.9	62	1104	1.7	29	3.5	95	1262	1.2
866.4	2.4	22	1.6	49	1050	1.8	35	2.9	75	1201	1.3
867.1	2.0	21	2.2	59	1384	2.9	29	4.0	90	1583	2.1
867.8	1.4	17	1.9	50	917	2.4	20	3.4	76	1048	1.8
868.5	1.9	22	1.8	67	1268	1.9	28	3.3	103	1450	1.4
869.2	0.933	20	2.0	60	1182	1.9	13	3.6	92	1352	1.4
869.9	1.7	15	1.8	53	1006	1.9	25	3.3	81	1150	1.4
870.6	2.1	21	1.5	53	1002	2.7	31	2.8	81	1146	2.0
871.3	2.3	24	2.0	52	1133	2.4	33	3.6	80	1296	1.8
872.0	1.6	20	1.7	51	944	2.1	23	3.1	78	1080	1.6
872.7	1.6	19	1.7	51	945	2.6	23	3.1	78	1081	1.9
873.4	2.0	20	2.0	54	1218	2.1	29	3.6	82	1393	1.6
874.1	1.8	22	1.9	55	1204	1.7	27	3.5	84	1376	1.3
874.8	1.6	20	1.7	57	1166	4.2	23	3.2	88	1333	3.1
875.5	2.5	22	2.2	60	1086	2.6	36	4.0	92	1242	1.9
876.2	1.9	21	1.8	56	966	1.6	27	3.3	86	1105	1.2
876.9	2.0	17	2.1	64	1319	2.1	29	3.9	98	1509	1.5
877.6	1.9	19	1.6	54	1067	1.1	27	2.9	83	1220	0.781
878.3	2.0	19	2.8	81	1419	3.1	29	5.2	123	1623	2.2
879.0	1.6	20	1.9	62	1242	2.9	23	3.4	96	1420	2.1
879.7	3.0	21	2.1	53	1074	1.8	43	3.8	81	1229	1.3
880.4	2.0	16	2.4	58	1261	2.3	29	4.3	88	1442	1.7
881.1	2.8	20	1.9	71	1340	1.9	41	3.4	109	1533	1.4
881.8	2.2	18	2.7	69	1118	2.6	32	4.9	106	1279	1.9
882.5	1.5	21	1.8	63	1209	2.4	21	3.3	96	1382	1.8
883.2	1.4	18	1.9	59	1355	1.8	20	3.4	91	1550	1.3
883.9	1.7	23	2.5	72	1524	4.2	25	4.5	110	1742	3.0
884.6	2.9	19	2.0	89	1477	2.8	42	3.7	136	1689	2.0
885.3	2.8	18	1.9	65	1142	2.5	40	3.5	99	1306	1.8
886.0	1.8	19	2.2	70	1404	2.1	26	3.9	108	1606	1.5
886.7	1.9	20	2.7	70	1249	2.5	27	4.8	107	1428	1.8
887.4	1.5	18	2.0	70	1389	2.3	22	3.7	107	1589	1.7
888.1	2.3	19	1.8	78	1380	2.1	33	3.3	119	1578	1.5
888.8	1.9	19	2.2	75	1431	1.9	27	4.0	115	1636	1.4
889.5	2.5	20	2.3	75	1321	3.1	36	4.2	115	1511	2.2
890.1	2.1	20	1.6	69	1268	2.1	30	2.9	105	1449	1.5
890.8	2.9	28	1.8	63	1261	2.1	42	3.3	96	1442	1.5
891.5	2.2	20	2.1	72	1340	2.3	32	3.8	111	1533	1.7
892.2	2.0	21	1.9	74	1281	2.8	29	3.5	113	1465	2.0
892.9	2.7	17	2.1	72	1576	2.3	39	3.9	111	1803	1.7
893.6	2.2	23	2.2	70	1321	2.3	32	4.1	107	1510	1.7
894.3	2.6	19	2.6	75	1460	2.4	38	4.7	115	1670	1.8
895.0	2.4	25	2.3	84	1510	3.0	35	4.1	129	1726	2.2
895.7	1.6	16	2.1	54	1093	1.9	23	3.8	84	1250	1.4
896.4	1.1	16	1.9	65	1250	2.6	16	3.5	100	1430	1.9
897.1	2.4	19	1.7	63	1193	1.4	34	3.2	97	1364	1.0
897.8	2.6	18	1.9	69	1456	3.5	37	3.4	105	1664	2.6
898.5	1.7	17	1.6	72	1126	1.6	24	3.0	110	1287	1.1
899.2	1.6	17	1.4	80	1422	3.6	23	2.6	123	1626	2.7
899.9	2.5	21	2.6	83	1707	3.3	35	4.8	128	1952	2.4
900.6	1.8	19	1.5	77	1781	3.5	26	2.8	118	2036	2.5
901.3	1.9	22	1.9	77	1179	2.1	27	3.4	119	1348	1.5
902.0	2.7	22	1.8	70	1362	2.5	40	3.2	107	1557	1.8
902.7	2.5	19	1.6	76	1759	2.8	35	2.9	116	2012	2.0
903.4	3.7	20	1.4	68	1446	2.6	53	2.6	105	1653	1.9



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
904.1	2.3	18	2.0	74	1230	3.6	33	3.7	113	1407	2.6
904.8	2.5	19	1.8	76	1383	3.3	36	3.3	116	1581	2.4
905.5	2.6	18	1.9	72	1359	1.6	38	3.5	110	1554	1.2
906.2	1.5	19	1.9	78	1412	3.1	21	3.6	119	1615	2.3
906.9	2.6	19	1.7	85	1536	2.9	38	3.1	130	1756	2.1
907.6	1.7	17	1.7	93	1490	3.7	24	3.1	142	1704	2.7
908.3	3.0	19	2.1	83	1678	4.1	43	3.8	127	1919	3.0
909.0	2.4	20	1.9	80	1533	2.3	35	3.5	123	1753	1.7
909.7	2.3	22	2.1	71	1444	3.1	33	3.9	110	1651	2.2
910.4	2.8	21	2.3	85	1589	3.3	40	4.1	130	1817	2.4
911.1	4.6	20	2.1	76	1685	2.4	67	3.7	116	1927	1.8
911.8	3.2	16	1.9	82	1364	3.1	47	3.5	125	1560	2.3
912.5	2.6	19	2.0	75	1555	3.3	37	3.6	115	1778	2.4
913.2	3.2	19	1.8	65	1307	2.0	46	3.3	99	1495	1.4
913.9	3.4	20	1.8	62	1365	3.0	49	3.2	96	1561	2.2
914.6	2.7	20	2.6	81	1572	4.8	39	4.8	124	1797	3.5
915.3	3.6	19	2.1	75	1436	4.2	52	3.8	115	1642	3.1
916.0	3.1	19	1.5	58	1284	1.8	44	2.8	89	1468	1.3
916.6	3.0	17	1.8	68	1342	3.4	43	3.2	104	1534	2.5
917.3	5.0	21	2.1	66	1402	4.4	73	3.9	101	1603	3.2
918.0	3.4	18	2.0	84	1295	4.9	49	3.6	129	1481	3.6
918.7	3.6	19	1.7	73	1354	3.3	52	3.1	112	1548	2.4
919.4	3.3	19	1.5	56	1147	4.7	48	2.8	86	1312	3.5
920.1	5.0	19	1.9	62	1502	5.4	73	3.5	95	1718	3.9
920.8	4.9	20	2.2	57	1079	4.2	70	4.0	87	1233	3.0
921.5	4.5	18	1.2	59	1146	6.2	65	2.2	91	1310	4.5
922.2	3.7	16	1.5	56	1320	4.6	53	2.8	85	1510	3.4
922.9	4.1	18	1.7	40	1106	4.6	59	3.1	62	1265	3.3
923.6	5.8	19	1.5	41	1028	4.3	83	2.7	62	1175	3.1
924.3	4.9	17	2.0	61	1187	5.3	71	3.6	93	1357	3.8
925.0	4.4	18	1.4	40	952	4.2	64	2.6	62	1088	3.1
925.7	5.7	19	1.8	51	1115	6.1	83	3.2	79	1275	4.5
926.4	6.5	20	2.0	38	972	3.1	94	3.6	58	1111	2.3
927.1	6.6	21	2.5	52	1162	6.6	96	4.6	80	1329	4.8
927.8	7.3	19	2.8	52	1296	6.4	105	5.2	80	1482	4.7
928.5	7.6	22	2.9	59	1141	3.5	110	5.2	90	1304	2.6
929.2	6.2	20	2.4	47	1362	5.4	90	4.4	72	1557	4.0
929.9	3.6	11	3.0	49	1204	4.3	52	5.4	75	1377	3.2
930.6	6.6	15	2.7	50	1182	3.7	96	5.0	77	1351	2.7
931.3	9.6	18	3.4	65	1352	6.2	138	6.1	99	1546	4.5
932.0	9.5	18	3.2	59	1583	7.4	137	5.9	90	1810	5.4
932.7	8.6	16	3.1	48	1028	3.9	124	5.6	73	1175	2.8
933.4	8.6	19	3.3	60	1523	5.4	124	5.9	93	1741	3.9
934.1	8.2	18	3.1	67	1719	7.4	119	5.7	103	1965	5.4
934.8	9.2	19	3.5	60	1212	3.1	133	6.4	93	1386	2.3
935.5	8.9	19	3.9	62	1387	5.6	128	7.2	96	1586	4.1
936.2	9.5	18	3.8	59	1421	4.3	136	6.9	91	1624	3.1
936.9	8.7	15	4.2	68	1513	4.6	125	7.7	104	1730	3.4
937.6	9.5	16	3.9	71	1755	4.6	137	7.1	108	2007	3.3
938.3	7.5	19	4.4	63	2012	4.9	109	8.0	96	2301	3.6
939.0	9.3	15	3.8	64	1394	3.4	134	7.0	98	1594	2.5
939.7	6.5	13	4.3	56	1504	3.0	94	7.8	86	1720	2.2
940.4	7.9	15	4.4	61	1448	2.4	115	8.0	93	1656	1.7
941.1	7.5	18	4.5	73	2085	4.2	108	8.3	112	2384	3.1
941.8	6.8	20	4.9	70	2164	4.5	99	8.9	107	2474	3.3
942.4	10.0	22	4.5	63	1442	3.0	144	8.2	97	1650	2.2
943.1	6.4	16	3.9	84	2124	4.6	93	7.1	128	2429	3.4
943.8	8.2	18	5.1	91	1896	4.1	118	9.3	140	2169	3.0
944.5	6.9	17	3.6	62	1654	2.8	99	6.6	95	1891	2.0
945.2	6.2	16	5.3	82	1925	2.6	89	9.6	125	2201	1.9
945.9	8.3	16	5.1	73	1872	4.2	120	9.3	111	2140	3.0
946.6	6.7	12	6.0	78	2021	3.8	97	11	119	2311	2.8
947.3	8.8	18	6.1	76	2207	3.2	127	11	116	2524	2.4
948.0	7.6	17	5.6	80	2048	3.5	110	10	123	2341	2.5
948.7	7.3	16	5.7	75	1980	3.5	106	10	116	2264	2.5
949.4	9.5	15	4.9	71	2495	4.9	138	9.0	108	2853	3.6
950.1	8.6	17	6.0	66	1916	2.6	124	11	101	2191	1.9
950.8	8.2	19	7.0	77	2276	3.6	119	13	117	2603	2.6
951.5	7.3	15	7.3	91	2835	7.2	105	13	140	3242	5.3
952.2	7.9	16	7.9	85	2488	3.6	115	14	131	2845	2.6
952.9	7.3	16	5.7	78	2367	3.7	106	10	120	2707	2.7
953.6	8.9	15	5.8	88	2404	2.9	129	11	134	2749	2.1
954.3	7.5	16	5.9	77	2625	4.1	108	11	117	3002	3.0
955.0	6.6	15	6.5	86	2180	4.5	95	12	132	2493	3.3
955.7	6.2	14	5.6	67	1870	3.5	90	10	102	2139	2.5
956.4	6.9	15	6.3	78	2427	5.2	100	11	119	2776	3.8
957.1	6.3	17	6.1	79	2151	4.4	90	11	121	2459	3.2
957.8	6.5	21	5.5	81	2535	3.9	94	9.9	124	2898	2.9
958.5	4.4	14	6.6	78	2339	4.0	63	12	119	2675	2.9
959.2	6.5	17	5.9	69	2263	3.2	94	11	106	2588	2.4
959.9	5.2	13	6.8	87	2457	5.6	76	12	133	2810	4.1



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
960.6	7.0	19	6.1	90	2334	4.0	100	11	138	2669	2.9
961.3	4.6	13	5.5	82	2288	3.7	66	10.0	125	2616	2.7
962.0	6.9	18	5.1	69	1784	4.2	99	9.2	105	2040	3.1
962.7	5.2	14	6.6	78	2579	4.6	75	12	119	2949	3.4
963.4	5.6	15	6.5	73	2444	2.9	81	12	111	2794	2.1
964.1	4.6	14	5.4	77	2161	3.4	67	9.8	117	2471	2.5
964.8	5.1	17	6.5	88	2221	3.8	74	12	135	2540	2.8
965.5	4.9	18	4.8	71	2269	3.6	70	8.8	109	2595	2.6
966.2	6.4	19	5.8	87	2737	3.6	93	11	133	3129	2.6
966.9	5.3	15	5.3	63	2217	4.0	77	9.6	96	2535	2.9
967.6	6.2	18	5.5	76	2110	3.3	89	10.0	117	2413	2.4
968.3	5.1	19	5.1	85	2244	3.6	73	9.2	130	2566	2.7
968.9	5.0	13	5.1	64	2200	2.3	72	9.3	98	2516	1.7
969.6	5.0	16	5.2	76	2090	2.3	72	9.6	116	2389	1.7
970.3	4.3	16	4.6	65	2278	2.8	63	8.5	100	2605	2.0
971.0	6.2	18	4.5	83	2392	3.2	90	8.2	128	2735	2.3
971.7	6.3	18	4.4	66	2315	3.2	90	8.1	101	2648	2.3
972.4	5.1	14	4.3	60	1785	3.2	74	7.8	91	2041	2.3
973.1	4.9	14	4.0	79	2168	2.5	71	7.3	121	2480	1.8
973.8	5.2	19	4.3	65	1956	3.3	75	7.8	99	2236	2.4
974.5	5.1	18	4.5	77	2173	2.7	74	8.2	118	2485	2.0
975.2	6.6	16	4.6	78	2192	3.3	95	8.3	120	2507	2.4
975.9	4.7	16	4.0	62	1958	2.4	67	7.4	95	2239	1.7
976.6	6.3	22	4.5	70	2644	4.1	91	8.2	107	3024	3.0
977.3	5.3	18	3.9	59	1866	2.7	77	7.2	91	2133	2.0
978.0	5.9	22	3.5	67	1896	2.6	85	6.5	103	2169	1.9
978.7	3.1	13	3.7	69	2039	3.1	45	6.7	105	2332	2.2
979.4	4.4	19	3.6	67	2518	3.7	64	6.6	103	2879	2.7
980.1	3.9	15	3.9	65	2230	4.3	56	7.2	99	2550	3.1
980.8	4.4	18	4.1	74	2013	3.2	63	7.5	113	2302	2.3
981.5	4.9	20	3.7	82	2219	2.9	71	6.8	126	2538	2.1
982.2	4.2	15	3.5	66	2210	2.6	60	6.5	102	2527	1.9
982.9	4.1	15	3.6	62	2298	3.0	60	6.6	94	2628	2.2
983.6	4.8	15	3.2	54	2049	3.3	69	5.9	83	2343	2.4
984.3	3.7	15	3.4	64	2060	3.4	53	6.2	97	2355	2.5
985.0	3.7	19	4.4	79	2400	4.5	54	8.1	121	2745	3.3
985.7	3.4	16	2.4	58	1624	1.9	50	4.5	89	1857	1.4
986.4	3.3	12	3.4	55	2070	2.9	48	6.3	84	2367	2.1
987.1	3.7	14	2.7	54	1870	3.1	54	4.9	83	2138	2.3
987.8	3.5	20	3.7	72	2316	4.1	50	6.7	111	2648	3.0
988.5	2.9	17	2.6	61	2065	3.0	42	4.8	93	2361	2.2
989.2	2.5	19	2.8	56	2050	3.2	36	5.1	86	2344	2.3
989.9	2.2	18	3.1	59	2359	3.1	32	5.6	91	2697	2.3
990.6	2.6	17	2.9	70	2445	4.2	38	5.2	107	2796	3.0
991.3	2.2	16	2.5	58	1677	1.7	31	4.6	89	1917	1.3
992.0	2.9	16	2.6	51	1502	2.2	43	4.7	78	1718	1.6
992.7	2.5	14	2.9	60	2150	3.7	36	5.2	93	2459	2.7
993.4	2.7	16	2.2	59	1772	2.0	39	4.1	91	2027	1.4
994.1	2.8	18	2.3	53	2245	3.0	40	4.2	81	2567	2.2
994.8	2.0	17	2.1	51	1762	2.5	28	3.8	78	2014	1.8
995.4	2.3	16	2.1	50	1910	2.3	33	3.7	77	2184	1.7
996.1	2.3	14	1.9	39	1764	2.3	34	3.5	59	2017	1.7
996.8	2.4	18	2.4	49	1827	3.0	35	4.4	76	2089	2.2
997.5	2.3	16	1.9	59	1882	2.3	33	3.5	90	2152	1.7
998.2	1.4	15	2.0	50	1931	2.5	20	3.7	76	2208	1.8
998.9	2.4	16	1.8	44	1877	2.5	34	3.4	67	2146	1.8
999.6	1.2	16	1.8	47	2031	2.2	17	3.3	72	2323	1.6
1000.3	1.4	19	2.2	45	2051	2.7	20	4.0	69	2345	2.0
1001.0	1.9	18	1.3	42	1814	1.7	28	2.4	64	2074	1.3
1001.7	1.4	20	1.6	49	1842	2.4	20	2.9	75	2106	1.7
1002.4	1.2	18	1.5	49	2477	2.7	17	2.7	75	2832	1.9
1003.1	0.848	16	1.2	40	1453	1.9	12	2.2	62	1662	1.4
1003.8	1.5	19	1.3	37	1875	2.0	21	2.4	57	2144	1.4
1004.5	1.0	17	1.0	61	2262	2.9	15	1.9	94	2586	2.1
1005.2	1.1	20	1.9	52	2050	1.4	16	3.5	80	2345	1.1
1005.9	1.3	14	1.4	39	2012	2.2	19	2.6	59	2301	1.6
1006.6	0.951	17	1.1	37	1546	2.4	14	2.1	57	1768	1.7
1007.3	0.567	17	1.3	42	2205	2.6	8.2	2.4	65	2521	1.9
1008.0	1.1	21	1.3	37	1652	2.1	15	2.4	57	1889	1.6
1008.7	1.5	15	1.0	32	1281	1.3	22	1.9	49	1465	0.972
1009.4	0.779	19	1.6	37	1823	1.7	11	2.9	57	2084	1.2
1010.1	0.864	19	1.6	50	1954	2.9	12	2.9	76	2234	2.2
1010.8	0.793	21	1.8	37	1317	1.8	11	3.3	57	1506	1.3
1011.5	0.801	22	1.6	44	1434	2.0	12	2.9	68	1640	1.5
1012.2	0.743	18	1.2	42	1484	2.2	11	2.3	64	1696	1.6
1012.9	0.881	16	1.2	34	1304	1.8	13	2.1	52	1491	1.3
1013.6	1.1	19	1.3	35	1314	2.4	16	2.3	53	1503	1.7
1014.3	0.472	18	1.5	33	1156	2.0	6.8	2.7	51	1322	1.4
1015.0	0.462	14	1.3	34	1225	2.3	6.7	2.3	53	1401	1.7
1015.7	0.629	18	1.7	40	1217	1.9	9.1	3.1	61	1392	1.4
1016.4	0.810	22	1.4	37	1285	2.0	12	2.6	57	1469	1.5



Minnow Environmental Sample ID: 020											
Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1017.1	0.531	22	1.2	36	1355	3.4	7.7	2.2	56	1549	2.4
1017.8	0.628	22	1.3	37	1176	1.5	9.1	2.3	57	1345	1.1
1018.5	0.397	22	1.2	31	1104	1.5	5.7	2.1	48	1262	1.1
1019.2	0.752	17	1.0	35	1252	3.5	11	1.8	53	1432	2.6
1019.9	0.896	24	1.3	25	1176	2.6	13	2.3	39	1345	1.9
1020.5	0.746	18	1.2	37	930	2.0	11	2.2	56	1063	1.5
1021.2	1.2	21	1.2	45	1427	3.2	17	2.2	69	1632	2.3
1021.9	0.532	16	0.931	42	1130	1.8	7.7	1.7	64	1292	1.3
1022.6	1.3	17	1.1	38	980	1.9	18	2.1	59	1121	1.4
1023.3	0.393	16	1.0	31	944	2.9	5.7	1.9	47	1080	2.1
1024.0	1.2	18	1.3	50	1394	2.8	18	2.4	76	1595	2.0
1024.7	0.923	19	0.786	36	1012	2.0	13	1.4	56	1157	1.4
1025.4	0.954	16	0.735	28	794	2.1	14	1.3	44	908	1.5
1026.1	0.840	16	1.3	32	1024	1.9	12	2.3	49	1171	1.4
1026.8	0.663	18	0.974	35	927	1.5	9.6	1.8	54	1060	1.1
1027.5	0.467	18	0.873	34	927	2.2	6.7	1.6	52	1060	1.6
1028.2	0.652	18	0.438	30	675	1.1	9.4	0.800	47	772	0.812
1028.9	0.852	16	0.973	31	987	2.8	12	1.8	47	1129	2.1
1029.6	0.984	18	0.795	30	858	1.6	14	1.4	46	982	1.1
1030.3	0.904	16	0.853	29	901	2.1	13	1.6	44	1031	1.5
1031.0	0.862	20	0.788	35	1004	3.4	12	1.4	53	1148	2.5
1031.7	0.393	17	0.745	36	974	2.5	5.7	1.4	55	1113	1.8
1032.4	0.587	16	0.531	29	1006	2.8	8.5	0.968	45	1150	2.0
1033.1	0.748	12	0.785	19	814	1.3	11	1.4	29	931	0.945
1033.8	0.693	15	0.577	29	1143	3.3	10	1.1	44	1307	2.4
1034.5	0.968	18	0.457	30	726	1.5	14	0.833	46	831	1.1
1035.2	0.393	14	0.613	26	804	2.0	5.7	1.1	39	919	1.5
1035.9	0.524	11	0.529	26	902	2.0	7.6	0.965	40	1031	1.5
1036.6	0.712	13	0.769	27	977	2.1	10	1.4	41	1118	1.5
1037.3	1.1	21	0.895	33	852	2.7	16	1.6	51	974	2.0
1038.0	0.985	19	0.730	26	644	1.4	14	1.3	40	736	1.0
1038.7	1.5	16	0.503	35	920	1.2	22	0.917	53	1052	0.870
1039.4	0.448	14	0.662	30	1011	1.7	6.5	1.2	46	1156	1.2
1040.1	0.425	15	0.763	31	984	2.2	6.1	1.4	47	1125	1.6
1040.8	0.957	17	0.594	32	934	2.8	14	1.1	49	1068	2.1
1041.5	0.870	17	0.576	29	817	2.6	13	1.0	44	934	1.9
1042.2	0.393	16	0.469	27	780	1.7	5.7	0.855	41	892	1.2
1042.9	0.601	17	0.663	27	868	2.2	8.7	1.2	41	993	1.6
1043.6	0.393	16	0.547	28	915	2.9	5.7	0.998	43	1046	2.1
1044.3	1.2	16	0.441	28	894	2.4	17	0.805	43	1022	1.8
1045.0	0.625	20	0.665	22	883	2.5	9.0	1.2	34	1010	1.8
1045.7	1.3	17	0.493	24	971	3.5	18	0.899	37	1111	2.6
1046.3	0.607	17	0.400	24	830	2.2	8.8	0.730	36	949	1.6
1047.0	0.623	17	0.606	27	844	1.9	9.0	1.1	42	965	1.4
1047.7	0.759	17	0.399	23	719	2.4	11	0.727	35	823	1.8
1048.4	1.1	18	0.534	19	700	1.5	15	0.975	29	801	1.1
1049.1	0.753	18	0.549	27	1101	2.3	11	1.0	41	1259	1.7
1049.8	0.844	18	0.411	20	788	2.0	12	0.749	31	902	1.5
1050.5	1.6	18	0.605	23	1122	1.4	24	1.1	35	1283	1.0
1051.2	1.4	16	0.306	24	934	1.8	20	0.559	36	1069	1.3
1051.9	1.3	16	0.593	17	717	1.8	19	1.1	26	820	1.3
1052.6	0.818	16	0.520	22	823	1.9	12	0.949	34	941	1.4
1053.3	1.0	19	0.453	23	867	1.8	15	0.827	35	991	1.3
1054.0	1.3	17	0.469	16	867	1.9	18	0.855	24	992	1.4
1054.7	1.0	14	0.448	23	728	0.839	15	0.817	35	833	0.612
1055.4	1.5	12	0.484	18	935	2.1	22	0.882	28	1069	1.5
1056.1	1.9	16	0.368	18	814	1.9	27	0.671	28	931	1.4
1056.8	0.785	15	0.223	19	693	2.1	11	0.407	29	793	1.5
1057.5	0.793	14	0.502	15	688	1.0	11	0.916	23	787	0.751
1058.2	1.3	15	0.380	19	659	1.4	19	0.693	29	753	1.0
1058.9	0.801	16	0.199	19	833	1.9	12	0.362	28	952	1.4
1059.6	1.7	14	0.549	19	912	1.6	25	1.0	29	1042	1.2
1060.3	1.4	14	0.328	24	1205	2.3	21	0.598	36	1378	1.7
1061.0	1.5	15	0.349	15	794	1.1	22	0.637	23	908	0.775
1061.7	1.2	15	0.545	17	931	1.7	17	0.994	26	1065	1.2
1062.4	1.9	11	0.563	13	915	2.0	27	1.0	20	1047	1.4
1063.1	1.4	14	0.577	19	881	2.3	20	1.1	29	1007	1.7
1063.8	0.742	14	0.307	19	859	1.7	11	0.559	29	982	1.3
1064.5	1.7	18	0.586	21	848	2.2	24	1.1	32	969	1.6
1065.2	1.6	13	0.702	17	841	1.0	23	1.3	26	962	0.731
1065.9	1.2	14	0.598	16	912	1.6	17	1.1	25	1043	1.2
1066.6	1.3	15	0.326	21	836	1.4	19	0.595	32	956	0.993
1067.3	1.4	17	0.663	23	930	2.9	21	1.2	36	1064	2.1
1068.0	0.958	14	0.347	20	1004	2.2	14	0.633	30	1148	1.6
1068.7	1.4	14	0.580	15	750	1.1	21	1.1	23	858	0.812
1069.4	1.9	13	0.444	19	963	2.1	27	0.810	29	1101	1.5
1070.1	1.1	17	0.272	20	1047	2.4	16	0.496	30	1198	1.8
1070.8	1.9	13	0.697	27	1243	2.9	28	1.3	42	1421	2.1
1071.5	1.7	12	0.469	16	883	1.4	25	0.855	24	1010	1.0
1072.2	2.0	11	0.296	15	895	1.8	30	0.541	23	1023	1.3
1072.8	2.1	12	0.299	13	1073	1.5	30	0.544	20	1227	1.1



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1073.5	1.7	17	0.479	17	1070	2.2	25	0.874	26	1224	1.6
1074.2	1.6	17	0.433	16	857	2.0	23	0.790	24	980	1.5
1074.9	2.2	14	0.422	13	980	1.6	32	0.769	20	1120	1.2
1075.6	0.810	15	0.732	16	949	1.5	12	1.3	25	1086	1.1
1076.3	1.4	10	0.333	15	843	2.3	21	0.607	23	964	1.7
1077.0	1.6	16	0.434	15	832	2.3	22	0.791	23	952	1.7
1077.7	1.7	11	0.479	15	1016	2.1	25	0.873	24	1162	1.6
1078.4	0.962	13	0.333	14	815	1.3	14	0.607	21	932	0.925
1079.1	1.4	10	0.355	11	808	1.6	21	0.647	17	924	1.2
1079.8	1.6	15	0.668	16	938	1.7	23	1.2	24	1072	1.2
1080.5	1.4	15	0.248	16	1014	2.8	20	0.452	24	1159	2.0
1081.2	2.0	13	0.381	11	1007	1.6	29	0.696	18	1152	1.2
1081.9	1.1	9.9	0.309	14	1022	1.6	17	0.563	21	1168	1.2
1082.6	2.3	12	0.266	8.9	934	1.5	33	0.486	14	1068	1.1
1083.3	2.4	15	0.266	11	1082	2.4	35	0.484	17	1237	1.7
1084.0	1.8	16	0.296	16	1038	1.6	26	0.539	25	1187	1.2
1084.7	2.5	16	0.305	14	1091	1.4	36	0.556	21	1247	0.990
1085.4	1.3	10	0.261	11	854	1.3	18	0.476	17	977	0.969
1086.1	1.7	11	0.337	10	937	1.6	25	0.615	16	1071	1.2
1086.8	1.1	13	0.428	15	1005	2.6	16	0.781	24	1149	1.9
1087.5	1.8	12	0.105	17	1039	2.6	25	0.192	25	1188	1.9
1088.2	2.0	11	0.205	9.7	846	1.2	29	0.374	15	967	0.908
1088.9	1.9	9.3	0.314	12	743	3.0	27	0.573	18	850	2.2
1089.6	2.4	10	0.414	13	1154	1.3	35	0.755	19	1320	0.970
1090.3	2.8	15	0.320	15	962	2.1	41	0.583	23	1100	1.5
1091.0	3.4	14	0.305	14	924	2.0	48	0.556	22	1057	1.5
1091.7	2.7	13	0.291	16	840	2.6	39	0.531	24	961	1.9
1092.4	3.7	14	0.325	10	980	2.6	53	0.592	16	1121	1.9
1093.1	3.2	13	0.456	15	978	3.1	47	0.832	23	1118	2.3
1093.8	3.3	15	0.484	17	1027	3.2	48	0.883	25	1175	2.3
1094.5	3.6	13	0.464	22	1053	3.2	51	0.847	34	1204	2.4
1095.2	5.3	13	0.642	18	781	2.0	77	1.2	27	893	1.5
1095.9	4.0	13	0.871	19	1258	2.6	58	1.6	30	1439	1.9
1096.6	6.6	13	1.000	23	1124	3.7	95	1.8	35	1285	2.7
1097.3	6.8	16	0.867	21	981	1.8	99	1.6	32	1122	1.3
1098.0	5.2	11	1.0	22	1077	2.6	75	1.9	34	1231	1.9
1098.7	7.1	11	0.792	19	915	3.3	102	1.4	30	1046	2.4
1099.4	6.0	14	1.5	15	998	5.1	87	2.7	23	1141	3.7
1100.0	6.4	14	1.3	25	1070	4.0	93	2.4	38	1224	2.9
1100.7	5.9	16	1.6	25	1138	2.9	85	2.9	38	1302	2.1
1101.4	5.9	17	1.7	33	1454	4.7	85	3.1	51	1663	3.5
1102.1	7.3	17	2.0	25	1245	2.7	105	3.6	39	1424	2.0
1102.8	8.1	14	1.9	23	1269	4.2	117	3.4	36	1451	3.1
1103.5	10	15	2.4	32	1238	3.3	148	4.3	49	1416	2.4
1104.2	10	19	3.1	34	1248	4.5	150	5.7	53	1427	3.3
1104.9	11	17	3.3	35	1539	4.2	152	6.1	53	1760	3.1
1105.6	9.5	17	4.0	35	1291	3.2	137	7.3	54	1476	2.3
1106.3	12	19	4.6	36	1506	3.8	168	8.3	55	1722	2.8
1107.0	12	20	4.7	32	1255	3.0	167	8.7	49	1435	2.2
1107.7	8.8	22	4.0	57	1649	3.6	127	7.3	87	1886	2.6
1108.4	9.4	19	4.2	48	1836	5.3	136	7.7	74	2100	3.8
1109.1	9.7	16	4.9	39	1773	4.9	139	8.9	60	2028	3.6
1109.8	10	22	6.0	41	1685	2.8	147	11	62	1926	2.0
1110.5	8.7	21	5.8	36	1376	3.1	125	11	55	1573	2.3
1111.2	8.7	18	5.9	55	2016	4.7	125	11	84	2306	3.4
1111.9	7.1	15	6.2	38	1500	3.2	103	11	58	1716	2.3
1112.6	8.4	20	5.8	42	1875	4.4	121	11	65	2144	3.2
1113.3	6.7	18	4.5	35	1385	2.6	97	8.2	54	1584	1.9
1114.0	7.3	21	5.4	51	2075	4.0	105	9.8	79	2373	2.9
1114.7	7.1	18	5.3	46	1901	4.3	103	9.6	70	2174	3.1
1115.4	6.4	19	4.7	44	1999	3.2	92	8.5	67	2286	2.3
1116.1	6.1	18	5.8	45	1508	2.7	88	10	69	1724	1.9
1116.8	7.3	19	5.1	51	2150	4.2	105	9.3	79	2459	3.0
1117.5	7.8	21	5.9	45	1770	2.4	112	11	69	2024	1.7
1118.2	6.5	18	4.8	46	1955	2.7	94	8.7	70	2236	2.0
1118.9	6.1	16	5.9	50	2010	2.9	88	11	76	2298	2.1
1119.6	5.1	19	4.4	48	1810	2.9	74	7.9	74	2070	2.1
1120.3	4.8	16	5.0	53	2153	2.5	69	9.2	82	2462	1.9
1121.0	4.9	16	5.0	45	2139	3.1	70	9.1	69	2446	2.3
1121.7	4.4	21	5.2	53	1957	1.8	64	9.5	82	2238	1.3
1122.4	5.2	19	5.8	48	2180	2.7	74	10	73	2493	2.0
1123.1	5.0	15	5.0	54	2072	3.3	72	9.0	82	2370	2.4
1123.8	4.0	17	4.7	53	1826	3.7	57	8.5	81	2089	2.7
1124.5	4.7	19	4.1	47	2116	2.4	67	7.6	72	2419	1.8
1125.2	4.9	19	4.4	41	1904	2.7	71	8.0	63	2177	1.9
1125.8	3.4	16	4.5	48	2092	4.0	50	8.2	73	2392	2.9
1126.5	2.7	18	3.5	38	1694	1.7	39	6.4	59	1937	1.2
1127.2	3.4	21	3.8	44	2086	3.1	49	6.9	68	2386	2.3
1127.9	3.5	16	3.3	37	1532	2.2	51	6.0	57	1752	1.6
1128.6	3.2	19	3.6	48	2212	2.3	47	6.5	74	2529	1.7
1129.3	3.0	16	3.5	39	2055	2.7	44	6.5	60	2350	2.0



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1130.0	3.7	19	3.6	47	2031	3.2	54	6.5	72	2323	2.4
1130.7	2.8	17	3.3	40	1764	2.3	41	5.9	61	2017	1.7
1131.4	3.9	13	3.2	43	1990	3.0	56	5.9	66	2276	2.2
1132.1	3.2	17	3.2	46	2298	2.0	46	5.8	70	2627	1.5
1132.8	2.7	20	3.2	45	2002	3.8	39	5.8	69	2289	2.7
1133.5	3.2	22	2.9	43	1855	2.4	46	5.2	65	2122	1.7
1134.2	2.2	17	2.5	33	1670	2.7	31	4.5	51	1910	2.0
1134.9	1.3	14	2.2	35	1632	2.0	19	4.1	53	1866	1.5
1135.6	2.0	16	2.5	36	2068	2.5	28	4.6	55	2365	1.8
1136.3	1.6	15	2.1	44	1924	2.6	23	3.9	68	2200	1.9
1137.0	1.8	22	2.2	35	1833	3.3	25	4.1	53	2096	2.4
1137.7	2.2	18	1.9	39	2192	2.4	32	3.5	59	2507	1.7
1138.4	1.4	15	2.1	28	1342	1.4	20	3.7	43	1534	1.0
1139.1	2.2	20	2.5	26	1567	2.8	32	4.6	40	1791	2.0
1139.8	1.6	18	2.0	38	1650	2.7	23	3.7	59	1887	2.0
1140.5	1.0	18	1.9	34	1631	2.0	15	3.5	52	1865	1.5
1141.2	2.0	20	2.0	30	1504	2.3	29	3.7	45	1720	1.7
1141.9	1.6	14	1.8	33	1557	1.4	23	3.4	50	1780	1.1
1142.6	2.1	19	1.9	32	1641	2.2	31	3.5	50	1877	1.6
1143.3	2.1	21	1.8	29	1249	1.5	30	3.3	44	1429	1.1
1144.0	1.4	17	1.9	37	1527	2.6	20	3.5	57	1747	1.9
1144.7	1.5	18	1.5	29	1402	1.5	22	2.8	44	1603	1.1
1145.4	2.3	13	2.0	33	1736	2.1	33	3.6	51	1985	1.5
1146.1	0.921	17	1.8	31	1380	1.9	13	3.3	47	1578	1.4
1146.8	1.5	16	2.0	38	1526	1.8	22	3.6	58	1745	1.3
1147.5	1.4	15	1.2	29	1401	1.9	20	2.2	45	1602	1.4
1148.2	0.684	14	1.5	28	1417	1.1	9.9	2.8	42	1620	0.781
1148.9	1.6	16	1.3	29	1478	2.3	23	2.5	44	1690	1.7
1149.6	0.805	14	1.1	29	1448	1.4	12	2.1	44	1656	1.0
1150.3	0.967	18	1.0	29	1251	1.3	14	1.9	45	1431	0.972
1151.0	1.3	16	1.0	23	1177	0.908	18	1.8	36	1346	0.663
1151.6	0.804	13	1.1	22	1383	1.0	12	2.1	33	1582	0.743
1152.3	1.1	17	1.5	21	1640	2.0	16	2.7	32	1876	1.5
1153.0	1.3	17	1.2	28	1508	1.7	19	2.2	42	1724	1.3
1153.7	0.889	14	0.780	24	1281	2.0	13	1.4	37	1464	1.5
1154.4	0.892	15	1.1	28	1284	1.6	13	2.0	42	1468	1.2
1155.1	0.791	12	1.5	20	1280	1.1	11	2.7	31	1463	0.812
1155.8	1.0	13	1.7	23	1546	1.4	15	3.1	35	1768	0.990
1156.5	0.886	15	1.1	29	1405	2.1	13	2.1	44	1607	1.5
1157.2	1.2	16	0.988	19	1046	1.3	18	1.8	29	1196	0.914
1157.9	0.646	16	1.1	21	1030	2.3	9.3	1.9	32	1178	1.7
1158.6	0.530	12	0.966	22	1365	1.5	7.6	1.8	34	1561	1.1
1159.3	0.424	16	1.3	24	1506	1.5	6.1	2.4	36	1722	1.1
1160.0	0.886	17	1.3	27	1204	1.5	13	2.3	42	1377	1.1
1160.7	1.3	15	0.913	23	1181	2.1	18	1.7	35	1350	1.6
1161.4	0.769	12	0.852	24	1227	1.8	11	1.6	37	1403	1.3
1162.1	0.947	15	1.1	17	942	1.3	14	2.1	27	1077	0.951
1162.8	1.1	16	0.775	23	1083	1.8	15	1.4	36	1238	1.3
1163.5	1.2	15	0.553	22	987	0.851	17	1.0	33	1128	0.621
1164.2	0.868	14	0.793	23	1232	1.1	13	1.4	35	1409	0.779
1164.9	0.393	14	0.705	17	1116	2.3	5.7	1.3	26	1277	1.7
1165.6	1.6	14	0.827	17	1252	1.4	23	1.5	27	1432	1.0
1166.3	1.2	16	0.913	16	1077	1.1	17	1.7	25	1231	0.806
1167.0	1.4	11	0.686	19	912	2.0	20	1.3	29	1042	1.5
1167.7	0.694	10	0.711	20	979	1.3	10	1.3	30	1119	0.936
1168.4	0.732	11	0.648	16	1165	1.7	11	1.2	24	1332	1.2
1169.1	1.7	15	0.583	15	997	1.7	24	1.1	23	1140	1.2
1169.8	0.750	14	0.769	20	1029	1.5	11	1.4	31	1176	1.1
1170.5	0.693	15	0.421	16	1195	2.5	10.0	0.768	25	1366	1.8
1171.2	0.733	13	0.655	15	968	1.4	11	1.2	23	1107	1.0
1171.9	1.5	15	0.395	17	898	1.3	21	0.721	27	1027	0.976
1172.6	0.659	11	0.801	16	1045	1.1	9.5	1.5	25	1195	0.805
1173.3	1.7	14	0.357	20	1159	2.8	24	0.651	30	1325	2.1
1174.0	1.3	14	0.795	12	962	1.9	18	1.4	19	1100	1.4
1174.7	0.963	11	0.701	15	925	1.8	14	1.3	23	1058	1.3
1175.4	0.848	14	0.822	17	1069	3.1	12	1.5	27	1223	2.3
1176.1	1.7	15	0.578	16	1167	2.1	25	1.1	25	1335	1.5
1176.8	1.0	13	0.618	17	938	1.4	15	1.1	26	1072	1.1
1177.4	1.0	17	0.658	12	930	1.4	14	1.2	19	1063	1.0
1178.1	1.3	8.6	0.344	14	1165	1.5	18	0.628	22	1333	1.1
1178.8	1.3	12	0.455	12	981	1.0	18	0.829	18	1122	0.737
1179.5	1.1	13	0.421	11	1086	1.6	16	0.768	16	1242	1.1
1180.2	0.793	14	0.725	13	926	1.8	11	1.3	20	1059	1.3
1180.9	1.1	13	0.448	15	982	1.3	16	0.818	22	1123	0.930
1181.6	0.937	12	0.535	12	961	1.7	14	0.975	19	1098	1.3
1182.3	0.923	14	0.723	12	942	1.2	13	1.3	18	1077	0.846
1183.0	1.1	12	0.513	15	1096	1.4	16	0.936	23	1253	0.999
1183.7	0.414	13	0.401	14	888	1.8	6.0	0.732	21	1015	1.3
1184.4	0.997	11	0.491	13	1079	1.6	14	0.895	20	1234	1.2
1185.1	0.955	11	0.505	12	1084	2.0	14	0.921	19	1240	1.4
1185.8	1.7	11	0.409	9.2	1138	2.5	25	0.746	14	1301	1.8



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1186.5	1.2	15	0.521	15	1258	3.3	17	0.951	23	1438	2.4
1187.2	0.881	14	0.659	12	986	1.5	13	1.2	18	1128	1.1
1187.9	0.829	12	0.606	11	957	1.6	12	1.1	17	1094	1.2
1188.6	0.603	11	0.404	13	1073	1.9	8.7	0.737	20	1227	1.4
1189.3	1.1	14	0.516	11	838	1.4	16	0.941	17	958	0.989
1190.0	1.4	14	0.587	12	1429	2.8	20	1.1	18	1635	2.1
1190.7	1.0	11	0.245	12	869	1.2	15	0.447	18	994	0.910
1191.4	1.2	11	0.339	11	1035	2.2	17	0.619	17	1183	1.6
1192.1	0.427	13	0.079	11	912	1.6	6.2	0.144	17	1043	1.2
1192.8	1.2	13	0.504	14	1154	2.0	18	0.920	21	1320	1.5
1193.5	1.3	14	0.581	15	1157	1.6	18	1.1	23	1323	1.2
1194.2	0.417	11	0.109	13	1052	2.1	6.0	0.199	21	1203	1.6
1194.9	1.0	15	0.240	7.3	926	1.1	15	0.438	11	1059	0.781
1195.6	0.827	13	0.245	10	1047	2.5	12	0.446	16	1198	1.8
1196.3	1.2	13	0.304	8.5	980	2.6	17	0.555	13	1121	1.9
1197.0	1.3	11	0.333	13	1025	1.9	19	0.608	21	1173	1.4
1197.7	1.1	11	0.384	11	1120	2.0	15	0.701	17	1281	1.4
1198.4	0.954	11	0.281	8.2	899	2.0	14	0.512	13	1028	1.5
1199.1	1.3	12	0.294	9.6	882	2.0	19	0.536	15	1008	1.4
1199.8	0.824	14	0.458	15	1235	2.0	12	0.835	24	1412	1.5
1200.5	1.2	11	0.418	13	1164	2.8	17	0.763	19	1331	2.0
1201.2	0.994	12	0.324	11	1033	2.1	14	0.591	16	1181	1.5
1201.9	0.688	10	0.522	10	791	1.7	9.9	0.953	16	904	1.2
1202.6	0.642	13	0.390	13	932	1.6	9.3	0.712	20	1066	1.2
1203.2	1.4	14	0.317	14	966	1.8	20	0.579	22	1104	1.3
1203.9	0.918	13	0.380	11	964	1.8	13	0.693	17	1103	1.3
1204.6	1.4	11	0.342	13	1084	2.1	20	0.623	20	1239	1.6
1205.3	1.3	10	0.354	13	1046	2.3	18	0.646	19	1196	1.7
1206.0	0.916	13	0.518	11	1028	2.1	13	0.945	16	1175	1.6
1206.7	0.408	13	0.301	11	1015	1.7	5.9	0.549	16	1160	1.3
1207.4	1.2	14	0.375	13	1227	2.9	17	0.684	20	1403	2.1
1208.1	1.3	11	0.299	10	830	1.8	19	0.546	15	949	1.3
1208.8	2.0	14	0.497	10	1161	1.5	29	0.907	16	1327	1.1
1209.5	1.2	14	0.325	14	1026	3.3	17	0.593	21	1173	2.4
1210.2	0.653	11	0.502	13	928	1.8	9.4	0.915	20	1061	1.3
1210.9	1.0	11	0.454	12	1015	2.0	15	0.827	19	1160	1.5
1211.6	0.751	15	0.155	12	909	1.4	11	0.283	19	1040	1.0
1212.3	1.6	15	0.458	19	1313	2.6	23	0.835	29	1502	1.9
1213.0	1.3	15	0.441	17	1218	3.8	19	0.804	27	1393	2.8
1213.7	1.2	16	0.384	14	888	2.6	17	0.700	21	1016	1.9
1214.4	1.3	12	0.556	21	1142	2.7	19	1.0	32	1306	2.0
1215.1	1.4	12	0.650	18	1323	2.7	20	1.2	27	1512	2.0
1215.8	2.5	18	0.570	18	1291	3.4	37	1.0	28	1477	2.5
1216.5	1.7	14	0.642	21	1129	3.1	24	1.2	32	1291	2.2
1217.2	1.4	13	0.467	24	1340	3.9	20	0.852	36	1532	2.8
1217.9	1.6	11	0.765	20	1324	3.1	23	1.4	31	1514	2.2
1218.6	1.8	16	0.409	23	1432	3.3	26	0.746	36	1637	2.4
1219.3	1.8	17	0.596	26	1501	4.4	26	1.1	40	1716	3.2
1220.0	1.8	14	0.996	19	1133	4.5	25	1.8	29	1295	3.3
1220.7	2.7	12	0.938	22	1145	2.8	39	1.7	34	1310	2.0
1221.4	2.2	13	0.777	23	1419	4.2	32	1.4	35	1622	3.1
1222.1	2.3	15	0.849	21	1262	3.1	33	1.5	32	1443	2.3
1222.8	2.1	15	1.0	30	1701	6.0	31	1.9	46	1945	4.4
1223.5	2.2	17	0.745	26	1602	5.1	32	1.4	40	1832	3.8
1224.2	1.7	15	1.1	30	1628	3.6	25	2.0	45	1862	2.6
1224.9	1.8	15	0.737	23	1641	4.7	26	1.3	35	1877	3.4
1225.6	0.821	17	0.894	23	1773	6.5	12	1.6	35	2028	4.8
1226.3	1.5	20	0.953	22	1328	5.1	22	1.7	33	1519	3.7
1227.0	1.2	16	1.0	27	1598	4.0	17	1.8	42	1828	2.9
1227.7	0.994	12	0.740	22	1410	3.7	14	1.3	34	1613	2.7
1228.4	1.7	16	1.0	20	1914	3.4	25	1.8	31	2188	2.5
1229.1	1.1	17	0.810	26	1588	4.8	16	1.5	40	1816	3.5
1229.7	1.3	17	1.3	27	1360	2.7	19	2.4	42	1555	2.0
1230.4	0.853	14	0.725	25	1236	2.6	12	1.3	39	1414	1.9
1231.1	1.2	15	1.2	25	1622	3.6	18	2.2	39	1854	2.6
1231.8	1.0	17	0.628	22	1525	2.8	15	1.1	34	1744	2.0
1232.5	0.853	19	1.1	36	1821	3.6	12	2.0	56	2083	2.6
1233.2	0.763	17	0.952	27	1740	3.4	11	1.7	42	1990	2.5
1233.9	0.787	19	0.943	20	1406	2.4	11	1.7	31	1608	1.8
1234.6	1.4	14	0.658	20	1526	2.7	20	1.2	30	1745	1.9
1235.3	1.3	16	0.820	20	1317	1.9	18	1.5	30	1507	1.4
1236.0	1.8	21	0.805	27	1840	5.0	26	1.5	42	2104	3.7
1236.7	0.617	18	0.973	28	1356	3.3	8.9	1.8	42	1551	2.4
1237.4	1.0	16	0.626	20	1201	1.9	15	1.1	30	1373	1.4
1238.1	1.1	16	0.703	23	1310	2.4	16	1.3	36	1499	1.7
1238.8	0.701	17	1.5	29	1617	4.2	10	2.8	45	1849	3.0
1239.5	1.0	17	1.1	29	1380	3.0	15	2.0	44	1578	2.2
1240.2	1.1	19	0.892	30	1142	2.6	17	1.6	47	1305	1.9
1240.9	0.736	18	0.959	24	1107	3.3	11	1.7	36	1266	2.4
1241.6	0.981	14	0.812	20	1273	2.8	14	1.5	31	1456	2.1
1242.3	1.4	21	0.712	24	1141	2.8	20	1.3	36	1305	2.1



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1243.0	0.669	17	0.636	27	961	2.4	9.7	1.2	41	1099	1.7
1243.7	0.672	20	0.538	24	1074	1.6	9.7	0.982	36	1228	1.2
1244.4	1.5	17	0.454	22	1182	2.0	22	0.828	34	1352	1.5
1245.1	1.1	12	0.470	21	1009	2.0	16	0.857	33	1154	1.5
1245.8	1.0	20	0.902	23	1078	2.8	14	1.6	35	1232	2.0
1246.5	1.4	16	0.247	21	984	2.3	21	0.450	32	1125	1.7
1247.2	1.0	16	0.357	15	660	1.3	14	0.651	22	755	0.914
1247.9	2.0	18	0.626	21	1089	1.5	29	1.1	33	1246	1.1
1248.6	1.9	15	0.469	14	904	2.0	28	0.855	22	1034	1.4
1249.3	2.3	17	0.395	18	779	1.5	34	0.720	28	891	1.1
1250.0	1.6	16	0.446	23	965	2.9	23	0.814	35	1104	2.1
1250.7	2.0	13	0.514	17	934	2.6	28	0.937	26	1068	1.9
1251.4	3.1	18	0.223	16	956	2.3	45	0.406	24	1093	1.7
1252.1	4.0	16	0.473	17	783	1.6	58	0.863	27	895	1.1
1252.8	4.1	16	0.445	19	805	1.8	59	0.811	30	921	1.3
1253.5	2.9	14	0.245	18	755	1.5	42	0.448	28	863	1.1
1254.2	3.3	8.7	0.433	19	781	1.8	48	0.790	30	893	1.3
1254.9	4.6	11	0.495	11	843	1.5	67	0.902	17	964	1.1
1255.6	6.2	15	0.706	22	966	3.4	89	1.3	33	1104	2.5
1256.2	6.7	15	0.508	22	843	1.9	97	0.926	34	964	1.4
1256.9	6.7	15	0.558	25	1014	3.8	97	1.0	39	1159	2.8
1257.6	5.9	13	1.1	24	1242	3.0	85	1.9	37	1420	2.2
1258.3	7.1	13	0.665	21	918	1.6	102	1.2	33	1049	1.2
1259.0	9.0	15	0.761	20	937	1.8	130	1.4	31	1072	1.3
1259.7	8.0	15	1.1	28	1038	2.8	116	2.1	43	1187	2.0
1260.4	7.1	12	1.2	27	967	1.8	103	2.1	42	1105	1.3
1261.1	7.3	11	1.3	21	720	1.7	105	2.3	32	824	1.3
1261.8	8.7	15	2.1	29	1273	2.2	126	3.8	44	1455	1.6
1262.5	8.5	17	2.0	29	1282	2.8	122	3.6	45	1466	2.0
1263.2	7.6	17	1.9	36	1044	2.5	110	3.4	55	1194	1.8
1263.9	7.4	13	2.1	35	1185	1.9	107	3.9	54	1355	1.4
1264.6	7.1	14	2.7	27	1322	2.3	103	4.9	42	1512	1.7
1265.3	9.3	14	3.8	44	1470	2.7	134	6.9	68	1681	2.0
1266.0	8.9	18	2.8	42	1542	3.6	128	5.2	65	1764	2.7
1266.7	6.8	16	3.3	43	1347	2.2	97	6.0	67	1540	1.6
1267.4	6.0	13	3.5	36	1368	1.9	87	6.3	55	1564	1.4
1268.1	8.0	17	3.7	33	1481	1.5	115	6.7	51	1693	1.1
1268.8	7.3	17	4.1	53	1538	2.5	105	7.5	81	1759	1.8
1269.5	6.8	20	4.3	59	1795	2.1	98	7.9	90	2052	1.5
1270.2	4.3	16	3.6	41	1169	1.5	62	6.5	62	1337	1.1
1270.9	5.0	14	4.4	33	1178	1.7	73	8.0	51	1347	1.2
1271.6	4.5	14	3.9	44	1807	1.8	65	7.1	67	2066	1.3
1272.3	5.1	16	5.2	48	1658	2.6	73	9.6	74	1896	1.9
1273.0	3.5	17	3.6	50	1464	2.6	51	6.5	76	1674	1.9
1273.7	4.5	14	3.9	39	1361	2.8	66	7.1	60	1557	2.0
1274.4	5.3	18	4.3	41	1736	2.8	76	7.8	63	1985	2.0
1275.1	3.8	15	3.6	45	2052	3.4	54	6.5	69	2347	2.5
1275.8	5.2	17	4.1	47	1718	3.5	74	7.5	72	1964	2.5
1276.5	3.0	16	3.0	40	1484	2.8	44	5.4	62	1697	2.0
1277.2	3.6	19	2.8	38	1477	2.5	52	5.0	58	1689	1.8
1277.9	2.3	16	3.4	44	2198	4.5	34	6.1	67	2513	3.3
1278.6	3.7	22	4.0	47	2260	3.6	54	7.3	72	2584	2.6
1279.3	4.1	24	2.4	35	1467	3.3	59	4.4	54	1678	2.4
1280.0	2.8	17	2.4	44	1874	2.6	40	4.3	68	2143	1.9
1280.7	2.4	12	2.0	35	1740	2.4	34	3.6	54	1990	1.7
1281.4	3.5	16	2.7	38	1613	2.6	50	5.0	58	1844	1.9
1282.0	4.1	22	2.7	52	1910	3.9	59	4.9	79	2184	2.8
1282.7	3.3	26	2.5	53	1971	3.6	47	4.6	81	2254	2.6
1283.4	3.2	19	2.2	49	1802	2.8	46	3.9	75	2061	2.0
1284.1	2.3	15	2.7	43	1978	2.2	33	4.9	66	2262	1.6
1284.8	2.6	15	2.6	43	1847	2.4	37	4.7	67	2112	1.8
1285.5	2.9	23	2.8	50	2111	3.9	41	5.0	77	2413	2.8
1286.2	2.1	20	1.7	44	1460	2.6	30	3.2	67	1669	1.9
1286.9	1.7	16	2.2	35	1368	2.0	25	3.9	54	1564	1.5
1287.6	1.5	16	2.4	43	2070	3.3	21	4.3	65	2367	2.4
1288.3	1.6	20	2.4	39	1759	3.3	23	4.4	60	2011	2.4
1289.0	1.8	26	2.6	49	1909	2.7	26	4.7	76	2183	2.0
1289.7	1.5	20	1.8	50	1572	2.8	21	3.2	76	1798	2.0
1290.4	1.8	19	1.8	40	1578	2.3	26	3.4	61	1805	1.7
1291.1	1.7	17	1.9	38	1582	2.3	24	3.5	58	1809	1.7
1291.8	0.795	21	2.3	49	2103	2.6	11	4.2	75	2404	1.9
1292.5	1.0	22	2.0	39	1444	2.3	15	3.6	60	1651	1.7
1293.2	0.393	24	2.1	44	1371	2.2	5.7	3.9	67	1568	1.6
1293.9	1.2	16	1.7	37	1497	3.8	17	3.1	56	1712	2.8
1294.6	0.393	17	1.4	31	1740	3.0	5.7	2.6	47	1990	2.2
1295.3	1.7	21	1.9	41	1670	3.3	25	3.5	63	1910	2.4
1296.0	1.2	19	1.3	34	1120	2.8	17	2.4	53	1280	2.1
1296.7	0.766	15	1.1	39	1421	1.9	11	2.1	60	1624	1.4
1297.4	1.0	17	1.4	27	1118	1.5	15	2.5	42	1278	1.1
1298.1	1.1	16	1.0	34	1457	2.5	15	1.9	52	1666	1.8
1298.8	0.659	19	1.3	38	1293	3.3	9.5	2.4	59	1479	2.4



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Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1299.5	0.709	21	1.3	39	1203	2.6	10	2.4	60	1376	1.9
1300.2	0.627	16	0.763	41	1061	3.2	9.0	1.4	62	1213	2.3
1300.9	0.991	17	1.1	27	1178	1.8	14	2.1	41	1347	1.3
1301.6	0.886	17	1.4	29	1173	1.9	13	2.5	45	1341	1.4
1302.3	1.1	20	0.945	35	1186	2.7	16	1.7	53	1356	2.0
1303.0	0.393	20	1.1	32	1038	1.2	5.7	1.9	48	1187	0.895
1303.7	0.925	14	0.995	23	1046	1.7	13	1.8	35	1196	1.2
1304.4	0.785	15	0.919	23	922	1.2	11	1.7	35	1054	0.868
1305.1	2.0	21	0.951	30	1108	2.5	29	1.7	46	1267	1.8
1305.8	1.3	21	0.810	29	892	1.5	19	1.5	45	1020	1.1
1306.5	0.546	18	0.893	22	936	0.922	7.9	1.6	34	1070	0.672
1307.2	0.968	13	0.590	16	812	0.761	14	1.1	25	928	0.555
1307.9	1.1	16	0.736	19	901	2.2	15	1.3	29	1031	1.6
1308.5	0.539	15	0.630	21	1070	1.7	7.8	1.1	32	1224	1.2
1309.2	1.0	20	0.713	19	751	1.9	15	1.3	29	859	1.4
1309.9	0.679	17	0.564	21	805	1.2	9.8	1.0	33	920	0.853
1310.6	0.500	16	0.678	19	922	1.7	7.2	1.2	29	1054	1.2
1311.3	0.669	14	0.407	14	753	1.1	9.7	0.742	21	861	0.834
1312.0	0.676	15	0.616	17	981	2.4	9.8	1.1	27	1121	1.7
1312.7	0.393	17	0.592	19	860	1.2	5.7	1.1	29	983	0.895
1313.4	0.726	15	0.451	18	727	1.5	10	0.823	28	831	1.1
1314.1	1.0	13	0.478	13	785	0.898	15	0.872	19	898	0.656
1314.8	0.977	16	0.405	21	1171	2.4	14	0.738	32	1339	1.7
1315.5	0.867	20	0.613	21	774	1.3	13	1.1	32	885	0.959
1316.2	0.776	20	0.402	20	984	0.626	11	0.734	30	1126	0.456
1316.9	0.686	14	0.398	13	630	1.0	9.9	0.727	20	721	0.738
1317.6	0.622	17	0.541	17	981	1.2	9.0	0.986	26	1121	0.911
1318.3	1.1	16	0.372	18	1014	1.4	16	0.678	28	1160	1.1
1319.0	1.0	18	0.205	20	803	1.5	15	0.374	30	919	1.1
1319.7	0.771	15	0.205	17	907	1.1	11	0.374	27	1037	0.816
1320.4	0.393	14	0.465	12	782	1.4	5.7	0.849	19	894	1.0
1321.1	0.522	17	0.377	15	811	1.1	7.5	0.687	23	927	0.836
1321.8	0.832	17	0.816	20	917	1.8	12	1.5	30	1049	1.3
1322.5	1.3	20	0.201	16	931	1.2	19	0.367	24	1064	0.902
1323.2	0.502	13	0.210	16	758	0.624	7.2	0.383	25	867	0.456
1323.9	0.782	12	0.507	16	940	0.990	11	0.924	25	1075	0.722
1324.6	0.811	16	0.373	11	715	0.993	12	0.679	17	818	0.725
1325.3	1.2	20	0.162	15	901	1.1	18	0.295	23	1030	0.829
1326.0	0.865	17	0.079	12	782	1.3	12	0.144	19	894	0.957
1326.7	0.649	13	0.173	12	818	1.8	9.4	0.315	19	936	1.3
1327.4	0.811	12	0.201	11	1082	0.997	12	0.367	17	1237	0.727
1328.1	0.393	16	0.142	11	988	1.7	5.7	0.259	16	1130	1.3
1328.8	1.1	16	0.136	11	811	1.5	16	0.249	16	927	1.1
1329.5	1.1	15	0.206	14	1058	0.790	17	0.376	21	1210	0.577
1330.2	0.630	14	0.104	7.1	930	1.3	9.1	0.190	11	1064	0.941
1330.9	1.0	13	0.105	11	905	2.1	15	0.192	17	1035	1.5
1331.6	0.745	13	0.079	9.3	850	1.3	11	0.144	14	972	0.933
1332.3	0.991	11	0.250	14	875	1.8	14	0.456	22	1001	1.3
1333.0	0.459	10	0.128	8.7	830	1.5	6.6	0.233	13	949	1.1
1333.7	1.0	9.8	0.079	8.3	907	1.0	15	0.144	13	1037	0.751
1334.3	0.795	10	0.079	8.6	916	0.978	11	0.144	13	1047	0.713
1335.0	0.393	14	0.093	11	958	0.833	5.7	0.169	17	1095	0.608
1335.7	0.982	13	0.079	9.3	640	1.3	14	0.144	14	731	0.952
1336.4	0.393	11	0.100	7.9	742	1.5	5.7	0.183	12	849	1.1
1337.1	0.393	12	0.079	11	943	1.3	5.7	0.144	16	1078	0.976
1337.8	1.6	12	0.133	11	863	2.1	23	0.242	18	987	1.5
1338.5	1.4	12	0.248	14	927	1.7	21	0.451	22	1060	1.2
1339.2	1.2	10	0.079	17	873	0.932	18	0.144	27	998	0.680
1339.9	1.4	13	0.174	12	725	1.4	21	0.318	19	830	0.994
1340.6	1.2	8.0	0.162	12	852	2.0	18	0.295	19	974	1.4
1341.3	1.5	13	0.333	15	936	1.7	22	0.607	23	1070	1.2
1342.0	1.3	15	0.092	18	842	1.9	19	0.169	28	963	1.4
1342.7	1.6	12	0.109	17	894	2.2	23	0.199	25	1022	1.6
1343.4	1.1	9.4	0.339	15	869	1.3	16	0.619	23	994	0.926
1344.1	1.5	10	0.291	16	935	2.2	22	0.530	25	1069	1.6
1344.8	1.5	12	0.525	18	1043	2.7	21	0.958	28	1192	2.0
1345.5	1.9	12	0.327	16	940	2.2	27	0.596	25	1075	1.6
1346.2	1.9	11	0.632	15	1005	2.5	28	1.2	24	1149	1.8
1346.9	1.6	11	0.518	15	1035	2.4	23	0.945	23	1184	1.7
1347.6	2.8	14	0.673	18	1245	3.0	40	1.2	28	1424	2.2
1348.3	2.7	15	0.832	23	1356	3.0	39	1.5	35	1551	2.2
1349.0	2.9	16	0.817	24	1278	2.6	42	1.5	37	1461	1.9
1349.7	2.4	15	0.894	24	1202	3.4	35	1.6	36	1375	2.5
1350.4	2.6	12	0.956	20	1219	2.4	37	1.7	31	1394	1.7
1351.1	1.9	13	0.875	23	1497	4.1	28	1.6	35	1712	3.0
1351.8	2.5	15	0.771	26	1590	5.7	37	1.4	40	1818	4.2
1352.5	2.6	17	0.553	25	1348	4.1	38	1.0	39	1542	3.0
1353.2	1.7	13	0.736	19	1293	2.5	25	1.3	28	1478	1.8
1353.9	2.1	23	1.1	22	1675	4.2	30	2.0	34	1915	3.1
1354.6	1.7	14	1.5	21	1799	5.0	25	2.7	32	2058	3.6
1355.3	2.7	16	0.932	31	2032	5.5	40	1.7	48	2323	4.0



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Sample ID: 020

Parameter	7Li	24Mg	55Mn	66Zn	88Sr	137Ba	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
DL (ppm)	0.393	0.403	0.079	0.702	0.005	0.003					
Length (µm)											
1356.0	1.7	15	0.887	23	1343	3.5	25	1.6	35	1536	2.5
1356.7	1.8	14	1.1	24	1712	3.2	27	2.1	36	1958	2.3
1357.4	1.6	13	1.4	24	1764	4.0	23	2.5	36	2017	2.9
1358.1	2.5	18	1.1	29	2009	4.6	36	2.1	44	2297	3.4
1358.8	0.904	17	1.3	34	1982	5.5	13	2.3	53	2266	4.0
1359.5	0.897	15	1.1	30	1543	4.7	13	2.0	46	1764	3.4
1360.1	0.809	21	0.899	21	1618	2.9	12	1.6	32	1850	2.1
1360.8	1.2	11	1.2	23	1759	3.9	17	2.1	36	2011	2.8
1361.5	0.856	15	1.3	32	1874	4.1	12	2.4	49	2143	3.0
1362.2	0.393	17	1.4	30	1532	4.1	5.7	2.6	45	1752	3.0
1362.9	0.518	12	1.4	29	1873	3.8	7.5	2.5	45	2142	2.7
1363.6	0.554	13	0.906	26	1721	2.4	8.0	1.7	39	1968	1.8
1364.3	0.394	16	1.4	24	1686	2.9	5.7	2.5	38	1928	2.1
1365.0	0.910	17	0.731	30	1598	3.1	13	1.3	46	1828	2.3
1365.7	1.0	18	1.3	28	1602	3.2	15	2.3	43	1832	2.3
1366.4	0.623	15	0.918	28	1550	3.6	9.0	1.7	43	1773	2.6
1367.1	0.566	13	1.1	21	1176	2.7	8.2	2.0	31	1345	1.9
1367.8	0.810	15	1.4	27	1767	2.1	12	2.5	41	2021	1.6
1368.5	0.393	17	0.766	26	1488	2.9	5.7	1.4	40	1701	2.1
1369.2	0.486	14	0.841	26	1382	1.5	7.0	1.5	41	1580	1.1
1369.9	0.423	11	0.889	25	1454	2.6	6.1	1.6	38	1663	1.9
1370.6	0.393	13	0.921	20	1107	1.4	5.7	1.7	31	1266	1.0
1371.3	0.618	16	1.3	28	1712	2.8	8.9	2.4	42	1957	2.1
1372.0	0.766	19	1.2	29	1351	2.8	11	2.1	45	1544	2.1
1372.7	0.875	16	0.703	22	1179	1.9	13	1.3	34	1348	1.4
1373.4	0.783	13	0.651	27	1573	2.2	11	1.2	42	1799	1.6
1374.1	1.1	18	0.625	20	1403	2.3	16	1.1	31	1605	1.6
1374.8	0.638	21	0.821	19	1278	2.3	9.2	1.5	28	1461	1.7
1375.5	0.949	16	0.541	29	1121	3.4	14	0.986	44	1281	2.5
1376.2	0.929	12	0.555	24	1123	2.1	13	1.0	37	1284	1.5
1376.9	0.393	11	0.504	13	1039	2.2	5.7	0.919	20	1188	1.6
1377.6	0.786	13	0.514	18	1170	3.2	11	0.937	28	1338	2.3
1378.3	0.856	15	0.777	20	1038	2.0	12	1.4	30	1187	1.4
1379.0	0.798	14	0.393	17	986	1.4	12	0.716	26	1128	1.0
1379.7	0.561	12	0.624	13	909	1.4	8.1	1.1	20	1039	1.0
1380.4	0.664	17	0.346	13	956	1.3	9.6	0.631	19	1094	0.973
1381.1	1.1	15	0.496	13	1087	2.3	16	0.905	19	1243	1.7
1381.8	0.896	15	0.239	14	818	2.4	13	0.437	22	935	1.8
1382.5	0.694	17	0.288	11	796	1.7	10	0.525	17	911	1.3
1383.2	0.782	16	0.302	11	671	1.2	11	0.551	16	767	0.912
1383.9	0.636	13	0.420	10	891	1.1	9.2	0.766	15	1019	0.789
1384.6	0.750	16	0.336	9.9	1117	3.3	11	0.612	15	1277	2.4
1385.3	0.687	22	0.219	11	722	1.2	9.9	0.400	17	825	0.856
1386.0	0.652	18	0.089	12	960	1.3	9.4	0.163	19	1097	0.955
1386.6	0.951	22	0.306	9.7	961	1.4	14	0.557	15	1099	0.992
1387.3	0.439	20	0.254	10	835	0.823	6.3	0.463	16	955	0.601
1388.0	0.485	21	0.383	8.3	777	1.6	7.0	0.699	13	889	1.2
1388.7	0.531	18	0.282	8.6	686	1.4	7.7	0.514	13	784	1.0
1389.4	0.704	21	0.079	9.3	814	1.2	10	0.144	14	930	0.880
1390.1	0.393	17	0.123	7.0	768	1.5	5.7	0.225	11	878	1.1
1390.8	0.582	21	0.222	8.5	861	1.3	8.4	0.404	13	984	0.983
1391.5	0.533	22	0.129	9.3	690	1.2	7.7	0.235	14	789	0.841
1392.2	0.417	25	0.116	6.2	642	1.2	6.0	0.212	9.5	734	0.884
1392.9	0.779	28	0.149	7.3	795	1.6	11	0.271	11	909	1.1
1393.6	0.642	33	0.110	6.4	769	0.892	9.3	0.201	9.8	879	0.651
1394.3	0.680	40	0.212	6.5	669	1.5	9.8	0.386	10.0	765	1.1
1395.0	0.541	47	0.227	5.7	725	1.1	7.8	0.414	8.7	829	0.832
1395.7	0.663	44	0.352	5.9	609	0.896	9.6	0.642	9.1	697	0.654
1396.4	0.393	42	0.079	5.6	655	0.845	5.7	0.144	8.5	749	0.617
1397.1	0.569	54	0.171	9.9	699	2.4	8.2	0.311	15	799	1.8
1397.8	0.393	54	0.079	4.4	635	1.5	5.7	0.144	6.7	726	1.1
1398.5	0.393	48	0.171	4.5	559	1.4	5.7	0.312	6.8	639	1.0
1399.2	0.393	61	0.513	5.5	580	1.9	5.7	0.936	8.5	663	1.4
1399.9	0.393	52	0.079	2.5	678	1.3	5.7	0.144	3.8	775	0.968
1400.6	1.3	59	0.237	9.8	642	1.8	19	0.433	15	735	1.3
1401.3	0.619	61	0.527	10	705	1.6	8.9	0.962	16	807	1.1
1402.0	0.393	58	0.079	7.4	508	1.8	5.7	0.144	11	581	1.3
1402.7	0.718	65	0.339	8.0	560	1.0	10	0.619	12	641	0.736
1403.4	0.393	65	0.290	4.3	565	0.972	5.7	0.529	6.6	646	0.709
1404.1	0.838	61	0.314	6.2	510	0.468	12	0.574	9.5	583	0.341
1404.8	0.999	77	0.378	4.9	508	0.169	14	0.690	7.5	580	0.123
1405.5	1.1	69	0.340	13	524	0.569	16	0.620	20	599	0.415
1406.2	0.937	79	0.492	9.6	474	1.1	14	0.898	15	542	0.801
1406.9	1.5	106	0.914	11	816	1.9	22	1.7	17	933	1.4
1407.6	0.983	84	0.487	14	541	1.6	14	0.887	21	619	1.1
1408.3	0.393	91	0.303	10	530	0.543	5.7	0.552	16	606	0.396
1409.0	0.393	91	0.749	14	615	0.836	5.7	1.4	21	703	0.610
1409.7	0.901	88	0.389	14	488	0.437	13	0.709	22	558	0.319
1410.4	0.393	77	0.494	25	994	2.2	5.7	0.900	38	1136	1.6
1411.1	1.5	64	1.3	3.2	487	0.003	22	2.4	5.0	557	0.002
1411.8	1.2	144	0.640	18	556	1.9	18	1.2	28	635	1.4



Minnow Environmental  
Sample ID: 020

Parameter DL (ppm) Length (µm)	7Li 0.393	24Mg 0.403	55Mn 0.079	66Zn 0.702	88Sr 0.005	137Ba 0.003	7Li/Ca	55Mn/Ca	66Zn/Ca	88Sr/Ca	137Ba/Ca
1412.4	0.393	70	0.835	22	505	4.7	5.7	1.5	34	578	3.5
1413.1	0.914	105	0.695	26	444	0.887	13	1.3	39	508	0.647
1413.8	0.777	108	2.9	25	509	0.516	11	5.3	39	582	0.376
1414.5	0.830	107	0.738	57	720	3.3	12	1.3	87	823	2.4
1415.2	0.393	108	2.7	26	687	0.003	5.7	5.0	40	785	0.002
1415.9	2.0	123	4.5	28	557	1.3	29	8.1	43	637	0.933
1416.6	1.1	100	1.1	20	540	1.5	16	2.1	31	617	1.1
1417.3	1.6	86	0.079	18	631	2.4	23	0.144	28	722	1.8
1418.0	2.9	146	3.0	23	427	1.2	43	5.5	36	489	0.893
1418.7	0.393	106	1.4	32	567	1.6	5.7	2.6	49	648	1.2
1419.4	0.702	110	0.819	49	532	0.735	10	1.5	76	609	0.536
1420.1	1.1	112	1.9	31	626	0.003	16	3.5	48	716	0.002
1420.8	1.2	769	1.1	30	605	3.2	17	1.9	47	691	2.3
1421.5	0.393	133	0.402	24	676	0.919	5.7	0.734	37	773	0.670
1422.2	0.393	76	1.9	50	606	0.003	5.7	3.5	76	693	0.002
1422.9	2.3	115	1.8	36	735	2.3	34	3.2	55	840	1.7
1423.6	0.393	77	0.079	6.5	627	2.0	5.7	0.144	10	717	1.4
1424.3	1.5	79	0.434	22	974	0.003	22	0.792	34	1113	0.002
1425.0	0.393	76	1.4	6.7	601	2.0	5.7	2.5	10	688	1.5
1425.7	0.393	81	2.0	19	701	1.0	5.7	3.7	29	802	0.733
1426.4	0.393	52	0.079	7.0	598	0.881	5.7	0.144	11	684	0.643
1427.1	0.393	69	1.2	0.702	638	1.1	5.7	2.3	1.1	730	0.815
1427.8	0.393	28	0.079	5.6	301	1.2	5.7	0.144	8.5	344	0.874
1428.5	1.3	91	1.2	33	830	0.003	19	2.2	50	949	0.002
1429.2	0.393	80	0.079	17	615	1.2	5.7	0.144	25	703	0.909
1429.9	0.529	57	0.079	10	958	0.003	7.6	0.144	16	1096	0.002
1430.6	3.1	42	0.079	7.7	476	0.825	44	0.144	12	545	0.602
1431.3	1.8	59	1.9	32	770	0.003	26	3.5	49	880	0.002
1432.0	2.4	51	0.079	11	516	1.1	34	0.144	16	590	0.837
1432.7	0.393	98	0.079	18	664	3.1	5.7	0.144	28	759	2.2
1433.4	0.393	35	0.191	2.4	428	0.902	5.7	0.349	3.7	490	0.658
1434.1	0.393	43	1.0	25	602	0.003	5.7	1.9	38	689	0.002
1434.8	0.393	77	0.079	22	613	1.5	5.7	0.144	34	701	1.1



Minnow Environmental  
Sample Notes

Sample ID	Client ID	Notes
001	BA-QURL-AC-OT-01-Aug-28	Ablation line from core to edge.
002	BA-QURL-AC-OT-02-Aug-28	
003	BA-QURL-AC-OT-03-Aug-28	
004	BA-QURL-AC-OT-04-Aug-28	Ablation line from core to edge.
005	BA-QURL-AC-OT-05-Aug-28	
006	BA-QURL-AC-OT-06-Aug-28	Ablation line from core to edge.
007	BA-QURL-AC-OT-07-Aug-28	
008	BA-QURL-AC-OT-08-Aug-28	Ablation line from core to edge.
009	BA-QURL-AC-OT-09-Aug-28	Ablation line from core to edge.
010	BA-QURL-AC-OT-10-Aug-28	Abnormal concentrations after 1640µm - otolith likely too thin. Use left side, core at ~1215µm.
011	BA-QURL-AC-OT-11-Aug-28	
012	BA-QURL-AC-OT-12-Aug-28	Ablation line from core to edge.
013	BA-QURL-AC-OT-13-Aug-28	Ablation line from core to edge.
014	BA-QURL-AC-OT-14-Aug-28	
015	BA-QURL-AC-OT-15-Aug-28	Ablation line from core to edge.
016	BA-QURL-AC-OT-16-Aug-28	
017	BA-QURL-AC-OT-17-Aug-28	
018	BA-QURL-AC-OT-18-Aug-28	
019	BA-QURL-AC-OT-19-Aug-28	
020	BA-QURL-AC-OT-20-Aug-28	Ablation line from core to edge.



Minnow Environmental  
Sample Aging

Sample ID	Client ID	Estimated Age (based on chemistry)	Migrated to Ocean (Y or N)	Estimated Duration in Ocean
001	BA-QURL-AC-OT-01-Aug-28	14	Y	5
002	BA-QURL-AC-OT-02-Aug-28	12	Y	5
003	BA-QURL-AC-OT-03-Aug-28	13	Y	6
004	BA-QURL-AC-OT-04-Aug-28	18	Y	5
005	BA-QURL-AC-OT-05-Aug-28	14	Y	5
006	BA-QURL-AC-OT-06-Aug-28	14	Y	5
007	BA-QURL-AC-OT-07-Aug-28	14	Y	6
008	BA-QURL-AC-OT-08-Aug-28	25	Y	11
009	BA-QURL-AC-OT-09-Aug-28	18	N	-
010	BA-QURL-AC-OT-10-Aug-28	15	Y	5
011	BA-QURL-AC-OT-11-Aug-28	16	Y	3
012	BA-QURL-AC-OT-12-Aug-28	14	Y	3*
013	BA-QURL-AC-OT-13-Aug-28	15	Y	5
014	BA-QURL-AC-OT-14-Aug-28	13	Y	3
015	BA-QURL-AC-OT-15-Aug-28	14	Y	11
016	BA-QURL-AC-OT-16-Aug-28	14	Y	5
017	BA-QURL-AC-OT-17-Aug-28	12	Y	5
018	BA-QURL-AC-OT-18-Aug-28	14	Y	5
019	BA-QURL-AC-OT-19-Aug-28	14	Y	6
020	BA-QURL-AC-OT-20-Aug-28	12	Y	6

\* Note: Regarding Sample ID #012, the estimated duration in ocean was difficult to evaluate using elemental chemistry.



Minnow Environmental  
Sample Set Information

Set	Detection Limit (DL)					
	7Li	24Mg	55Mn	66Zn	88Sr	137Ba
01	0.097	0.295	0.139	1.5	0.001	0.005
02	0.269	0.196	0.051	0.509	0.002	0.006
03	0.337	0.298	0.059	0.458	0.003	0.003
04	0.490	0.362	0.079	0.534	0.003	0.007
05	0.513	0.149	0.058	0.611	0.004	0.009
06	0.393	0.403	0.079	0.702	0.005	0.003
07	0.228	0.272	0.183	1.5	0.494	0.021

Set	Sample ID	Client ID	Date of Analysis
01	001	BA-QURL-AC-OT-01-Aug-28	10 Feb 2025
	002	BA-QURL-AC-OT-02-Aug-28	
02	003	BA-QURL-AC-OT-03-Aug-28	10 Feb 2025
	004	BA-QURL-AC-OT-04-Aug-28	
03	005	BA-QURL-AC-OT-05-Aug-28	10 Feb 2025
	006	BA-QURL-AC-OT-06-Aug-28	
04	007	BA-QURL-AC-OT-07-Aug-28	10 Feb 2025
	010	BA-QURL-AC-OT-10-Aug-28	
05	011	BA-QURL-AC-OT-11-Aug-28	10 Feb 2025
	012	BA-QURL-AC-OT-12-Aug-28	
06	013	BA-QURL-AC-OT-13-Aug-28	10 Feb 2025
	014	BA-QURL-AC-OT-14-Aug-28	
07	015	BA-QURL-AC-OT-15-Aug-28	10 Feb 2025
	016	BA-QURL-AC-OT-16-Aug-28	
	017	BA-QURL-AC-OT-17-Aug-28	10 Feb 2025
	018	BA-QURL-AC-OT-18-Aug-28	
	019	BA-QURL-AC-OT-19-Aug-28	10 Feb 2025
	020	BA-QURL-AC-OT-20-Aug-28	
	008	BA-QURL-AC-OT-08-Aug-28	06 Mar 2025
	009	BA-QURL-AC-OT-09-Aug-28	



Results Summary BF2400295

Project	Pit 2 and 3 Baseline
Report To	Matthew Wilson, Baffinland Iron Mines Corporation
Date Received	27-Aug-2024 20:49
Issue Date	06-Sep-2024 16:32
Amendment	0

Client Sample ID			SYS_QURL-WS_2024-08-26	SYS_IKL-2408_2024-08-26
Date Sampled			26-Aug-2024	26-Aug-2024
Time Sampled			10:30	15:25
ALS Sample ID			BF2400295-001	BF2400295-002
Analyte	Lowest Detection Limit	Units	Sub-Matrix: Water	Sub-Matrix: Water

Physical Tests (Matrix: Water)

Conductivity	1.0	µS/cm	167	21.5
Alkalinity, total (as CaCO3)	2.0	mg/L	78.1	7.3
Hardness (as CaCO3), dissolved	0.50	mg/L	80.9	7.92
Solids, total dissolved [TDS]	10	mg/L	100	21
Solids, total suspended [TSS]	1.0	mg/L	<1.0	<1.0
Turbidity	0.10	NTU	0.41	0.31
pH	0.10	pH units	8.05	7.65

Anions and Nutrients (Matrix: Water)

Ammonia, total (as N)	0.0050	mg/L	0.0057	<0.0050
Bromide	0.10	mg/L	<0.10	<0.10
Chloride	0.50	mg/L	1.27	1.07
Kjeldahl nitrogen, total [TKN]	0.050	mg/L	0.115	0.126
Nitrate (as N)	0.020	mg/L	<0.020	0.050
Nitrite (as N)	0.010	mg/L	<0.010	<0.010
Phosphorus, total	0.0020	mg/L	0.0024	0.0025
Sulfate (as SO4)	0.30	mg/L	6.19	0.86

Organic / Inorganic Carbon (Matrix: Water)

Carbon, dissolved organic [DOC]	0.50	mg/L	1.51	1.65
Carbon, total organic [TOC]	0.50	mg/L	1.28	1.27

Total Metals (Matrix: Water)

Aluminum, total	0.0030	mg/L	0.0068	0.0144
Antimony, total	0.00010	mg/L	<0.00010	<0.00010
Arsenic, total	0.00010	mg/L	<0.00010	<0.00010
Barium, total	0.00010	mg/L	0.00217	0.0190
Beryllium, total	0.000020	mg/L	<0.000020	<0.000020
Bismuth, total	0.000050	mg/L	<0.000050	<0.000050
Boron, total	0.010	mg/L	<0.010	<0.010
Cadmium, total	0.0000050	mg/L	<0.0000050	0.0000084
Calcium, total	0.050	mg/L	24.1	2.05
Cesium, total	0.000010	mg/L	<0.000010	<0.000010
Chromium, total	0.00050	mg/L	<0.00050	<0.00050
Cobalt, total	0.00010	mg/L	<0.00010	<0.00010
Copper, total	0.00050	mg/L	<0.00050	0.00084
Iron, total	0.010	mg/L	<0.010	0.010
Lead, total	0.000050	mg/L	<0.000050	<0.000050
Lithium, total	0.0010	mg/L	0.0012	<0.0010
Magnesium, total	0.0050	mg/L	5.21	0.728
Manganese, total	0.00010	mg/L	0.00068	0.00050
Mercury, total	0.0000050	mg/L	<0.0000050	<0.0000050
Molybdenum, total	0.000050	mg/L	0.000100	0.000225
Nickel, total	0.00050	mg/L	<0.00050	<0.00050
Phosphorus, total	0.050	mg/L	<0.050	<0.050
Potassium, total	0.050	mg/L	0.317	0.376
Rubidium, total	0.00020	mg/L	0.00023	0.00104
Selenium, total	0.000050	mg/L	<0.000050	<0.000050
Silicon, total	0.10	mg/L	0.36	0.38
Silver, total	0.000010	mg/L	<0.000010	<0.000010
Sodium, total	0.050	mg/L	0.617	0.632
Strontium, total	0.00020	mg/L	0.0580	0.00575
Sulfur, total	0.50	mg/L	2.15	<0.50
Tellurium, total	0.00020	mg/L	<0.00020	<0.00020
Thallium, total	0.000010	mg/L	<0.000010	<0.000010
Thorium, total	0.00010	mg/L	<0.00010	<0.00010
Tin, total	0.00010	mg/L	<0.00010	<0.00010
Titanium, total	0.00030	mg/L	<0.00030	0.00038
Tungsten, total	0.00010	mg/L	<0.00010	<0.00010
Uranium, total	0.000010	mg/L	0.000456	0.000379
Vanadium, total	0.00050	mg/L	<0.00050	<0.00050
Zinc, total	0.0030	mg/L	<0.0030	<0.0030
Zirconium, total	0.00020	mg/L	<0.00020	<0.00020



Results Summary BF2400295

Project	Pit 2 and 3 Baseline
Report To	Matthew Wilson, Baffinland Iron Mines Corporation
Date Received	27-Aug-2024 20:49
Issue Date	06-Sep-2024 16:32
Amendment	0

Client Sample ID			SYS_QURL-WS_2024-08-26	SYS_IKL-2408_2024-08-26
Date Sampled			26-Aug-2024	26-Aug-2024
Time Sampled			10:30	15:25
ALS Sample ID			BF2400295-001	BF2400295-002
Analyte	Lowest Detection Limit	Units	Sub-Matrix: Water	Sub-Matrix: Water

Dissolved Metals (Matrix: Water)

Aluminum, dissolved	0.0010	mg/L	0.0022	0.0074
Antimony, dissolved	0.00010	mg/L	<0.00010	<0.00010
Arsenic, dissolved	0.00010	mg/L	<0.00010	<0.00010
Barium, dissolved	0.00010	mg/L	0.00198	0.0179
Beryllium, dissolved	0.000020	mg/L	<0.000020	<0.000020
Bismuth, dissolved	0.000050	mg/L	<0.000050	<0.000050
Boron, dissolved	0.010	mg/L	<0.010	<0.010
Cadmium, dissolved	0.0000050	mg/L	0.0000058	<0.0000050
Calcium, dissolved	0.050	mg/L	23.5	2.00
Cesium, dissolved	0.000010	mg/L	<0.000010	<0.000010
Chromium, dissolved	0.00050	mg/L	<0.00050	<0.00050
Cobalt, dissolved	0.00010	mg/L	<0.00010	<0.00010
Copper, dissolved	0.00020	mg/L	0.00034	0.00073
Iron, dissolved	0.010	mg/L	<0.010	<0.010
Lead, dissolved	0.000050	mg/L	<0.000050	<0.000050
Lithium, dissolved	0.0010	mg/L	0.0016	<0.0010
Magnesium, dissolved	0.0050	mg/L	5.39	0.711
Manganese, dissolved	0.00010	mg/L	0.00027	0.00019
Mercury, dissolved	0.0000050	mg/L	<0.0000050	<0.0000050
Molybdenum, dissolved	0.000050	mg/L	0.000100	0.000192
Nickel, dissolved	0.00050	mg/L	<0.00050	<0.00050
Phosphorus, dissolved	0.050	mg/L	<0.050	<0.050
Potassium, dissolved	0.050	mg/L	0.311	0.317
Rubidium, dissolved	0.00020	mg/L	0.00022	0.00097
Selenium, dissolved	0.000050	mg/L	<0.000050	<0.000050
Silicon, dissolved	0.050	mg/L	0.312	0.342
Silver, dissolved	0.000010	mg/L	<0.000010	<0.000010
Sodium, dissolved	0.050	mg/L	0.696	0.576
Strontium, dissolved	0.00020	mg/L	0.0564	0.00544
Sulfur, dissolved	0.50	mg/L	2.11	<0.50
Tellurium, dissolved	0.00020	mg/L	<0.00020	<0.00020
Thallium, dissolved	0.000010	mg/L	<0.000010	<0.000010
Thorium, dissolved	0.00010	mg/L	<0.00010	<0.00010
Tin, dissolved	0.00010	mg/L	<0.00010	<0.00010
Titanium, dissolved	0.00030	mg/L	<0.00030	<0.00030
Tungsten, dissolved	0.00010	mg/L	<0.00010	<0.00010
Uranium, dissolved	0.000010	mg/L	0.000431	0.000361
Vanadium, dissolved	0.00050	mg/L	<0.00050	<0.00050
Zinc, dissolved	0.0010	mg/L	0.0022	<0.0010
Zirconium, dissolved	0.00030	mg/L	<0.00030	<0.00030
Dissolved mercury filtration location			Field	Field
Dissolved metals filtration location			Field	Field

Aggregate Organics (Matrix: Water)

Phenols, total (4AAP)	0.0010	mg/L	<0.0010	<0.0010
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Plant Pigments (Matrix: Water)

Chlorophyll a	0.010	µg/L	0.623	1.45
Pheophytin a	0.100	µg/L	0.130	0.373



CERTIFICATE OF ANALYSIS

Work Order	: WT2437881	Laboratory	: ALS Environmental - Waterloo
Client	: Baffinland Iron Mines Corporation	Account Manager	: Rick Hawthorne
Contact	: Environmental Lab Results	Address	: 60 Northland Road, Unit 1
Address	: 360 Oakville Place Dr Suite 300 Oakville Ontario Canada L6H 6K8		: Waterloo ON Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 247202.00XX (MILNE 2024)	Date Samples Received	: 19-Dec-2024 10:30
PO	: 4500140399	Date Analysis Commenced	: 16-Jan-2025
C-O-C number	: 19-DEC-2024 MINNOW FISH TISSUE	Issue Date	: 14-Feb-2025 15:53
Sampler	: MINNOW		
Site	: ----		
Quote number	: 2024-2025 Scope of Work		
No. of samples received	: 92		
No. of samples analysed	: 92		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Milithza Silva	Manager - Inorganics	Metals, Burlington, Ontario
Philip Elder	Technical Manager	Organics, Burlington, Ontario





General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key: CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.  
LOR: Limit of Reporting (detection limit).

Unit	Description
%	percent
mg/kg	milligrams per kilogram

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.  
UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.





## Analytical Results

Sub-Matrix: Biota

(Matrix: Biota)

					Client sample ID	BA-1KLL-AC-LIV-01-AUG-27	BA-1KLL-AC-LIV-02-AUG-27	BA-1KLL-AC-LIV-28-AUG-28	BA-1KLL-AC-LIV-29-AUG-28	BA-1KLL-AC-LIV-30-AUG-28
					Client sampling date / time	27-Aug-2024 00:00	27-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-001	WT2437881-002	WT2437881-003	WT2437881-004	WT2437881-005
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		74.3	78.0	66.8	62.8	68.2
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		3.1	68.5	<2.0	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	0.011	<0.010	<0.010	<0.010
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		1.66	1.37	3.28	3.11	2.34
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	0.63	<0.10	<0.10	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		3.04	4.15	0.680	1.34	2.94
Calcium	7440-70-2	E464/BU	25	mg/kg		154	503	113	79	101
Chromium	7440-47-3	E464/BU	0.050	mg/kg		0.101	0.246	<0.050	<0.050	<0.050
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		0.953	0.820	0.256	0.146	0.380
Copper	7440-50-8	E464/BU	0.10	mg/kg		41.9	58.6	33.6	25.9	50.4
Iron	7439-89-6	E464/BU	2.5	mg/kg		1130	2380	455	676	943
Lead	7439-92-1	E464/BU	0.020	mg/kg		0.167	0.321	0.073	0.057	0.069
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		716	792	577	481	652
Manganese	7439-96-5	E464/BU	0.50	mg/kg		4.49	7.57	4.12	3.36	3.48
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.402	0.462	0.128	0.150	0.300
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		0.728	0.709	0.732	0.717	0.653





## Analytical Results

Sub-Matrix: Biota  
(Matrix: Biota)

					Client sample ID	BA-IKLL-AC-LIV-01-AUG-27	BA-IKLL-AC-LIV-02-AUG-27	BA-IKLL-AC-LIV-28-AUG-28	BA-IKLL-AC-LIV-29-AUG-28	BA-IKLL-AC-LIV-30-AUG-28
					Client sampling date / time	27-Aug-2024 00:00	27-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-001	WT2437881-002	WT2437881-003	WT2437881-004	WT2437881-005
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		0.26	0.51	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		14000	13000	11700	10200	10700
Potassium	7440-09-7	E464/BU	20	mg/kg		12300	12000	8310	7450	9580
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		5.12	4.82	3.42	3.17	4.07
Selenium	7782-49-2	E464/BU	0.050	mg/kg		4.52	6.09	9.77	10.7	8.51
Silver	7440-22-4	E464/BU	0.0050	mg/kg		1.82	1.36	0.760	0.546	1.21
Sodium	7440-23-5	E464/BU	25	mg/kg		5280	7210	3650	2670	2840
Strontium	7440-24-6	E464/BU	0.10	mg/kg		0.36	1.07	0.33	0.26	0.29
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.0596	0.0374	0.0307	0.0363	0.0331
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	0.028	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		2.22	0.62	0.10	0.15	0.26
Zinc	7440-66-6	E464/BU	0.50	mg/kg		121	137	105	83.8	116
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota

(Matrix: Biota)

					Client sample ID	BA-IKLL-AC-LIV-34-AUG-28	BA-IKLL-AC-LIV-37-AUG-28	BA-IKLL-AC-LIV-12-AUG-27	BA-IKLL-AC-LIV-22-AUG-27	BA-IKLL-AC-LIV-35-AUG-27
					Client sampling date / time	28-Aug-2024 00:00	28-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-006	WT2437881-007	WT2437881-008	WT2437881-009	WT2437881-010
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		78.2	79.6	63.6	67.6	50.2
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		1.66	1.83	3.46	1.94	3.06
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	0.14	<0.10	<0.10	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		3.94	4.78	1.36	1.50	0.515
Calcium	7440-70-2	E464/BU	25	mg/kg		206	293	117	106	42
Chromium	7440-47-3	E464/BU	0.050	mg/kg		<0.050	0.069	<0.050	<0.050	<0.050
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		0.553	2.20	0.134	0.202	0.181
Copper	7440-50-8	E464/BU	0.10	mg/kg		28.9	19.1	19.4	72.6	29.3
Iron	7439-89-6	E464/BU	2.5	mg/kg		1040	1540	379	472	205
Lead	7439-92-1	E464/BU	0.020	mg/kg		0.122	0.104	0.033	0.091	0.032
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		689	776	487	491	249
Manganese	7439-96-5	E464/BU	0.50	mg/kg		4.42	4.65	3.12	2.37	1.67
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.374	0.485	0.150	0.344	0.106
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		0.758	0.435	0.559	0.676	0.282





## Analytical Results

Sub-Matrix: Biota  
 (Matrix: Biota)

					Client sample ID	BA-IKLL-AC-LIV-34-AUG-28	BA-IKLL-AC-LIV-37-AUG-28	BA-IKLL-AC-LIV-12-AUG-27	BA-IKLL-AC-LIV-22-AUG-27	BA-IKLL-AC-LIV-35-AUG-27
					Client sampling date / time	28-Aug-2024 00:00	28-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-006	WT2437881-007	WT2437881-008	WT2437881-009	WT2437881-010
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		0.23	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		13500	14300	9580	9620	5000
Potassium	7440-09-7	E464/BU	20	mg/kg		12600	14000	7800	8230	3920
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		4.67	6.53	3.35	3.73	1.72
Selenium	7782-49-2	E464/BU	0.050	mg/kg		4.81	3.99	7.46	6.08	6.71
Silver	7440-22-4	E464/BU	0.0050	mg/kg		1.24	1.18	0.503	1.76	0.344
Sodium	7440-23-5	E464/BU	25	mg/kg		7680	7520	3090	2990	1470
Strontium	7440-24-6	E464/BU	0.10	mg/kg		0.33	0.38	0.52	0.21	0.12
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.0278	0.0810	0.0217	0.0182	0.0312
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		0.50	0.32	<0.10	0.29	<0.10
Zinc	7440-66-6	E464/BU	0.50	mg/kg		108	110	89.9	98.8	55.9
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota  
 (Matrix: Biota)

					Client sample ID	BA-IKLL-AC-LIV-31-AUG-27	BA-IKLL-AC-LIV-08-AUG-27	BA-IKLL-AC-LIV-09-AUG-27	BA-IKLL-AC-LIV-10-AUG-27	BA-IKLL-AC-LIV-13-AUG-27
					Client sampling date / time	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-011	WT2437881-012	WT2437881-013	WT2437881-014	WT2437881-015
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		60.1	76.8	76.7	75.9	78.2
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		2.65	1.20	0.702	1.03	2.18
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	0.14
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		1.32	1.28	1.64	1.06	6.08
Calcium	7440-70-2	E464/BU	25	mg/kg		68	257	345	288	232
Chromium	7440-47-3	E464/BU	0.050	mg/kg		<0.050	<0.050	<0.050	0.051	<0.050
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		0.291	0.133	0.128	0.121	0.634
Copper	7440-50-8	E464/BU	0.10	mg/kg		55.7	6.38	6.52	5.81	16.8
Iron	7439-89-6	E464/BU	2.5	mg/kg		400	469	488	257	2160
Lead	7439-92-1	E464/BU	0.020	mg/kg		0.038	0.067	0.061	0.081	0.153
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		422	1180	1280	1210	1110
Manganese	7439-96-5	E464/BU	0.50	mg/kg		3.00	6.28	7.78	8.09	4.71
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.131	0.206	0.213	0.127	0.552
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		0.671	0.358	0.409	0.428	0.357





## Analytical Results

Sub-Matrix: Biota  
(Matrix: Biota)

					Client sample ID	BA-IKLL-AC-LIV-31-AUG-27	BA-IKLL-AC-LIV-08-AUG-27	BA-IKLL-AC-LIV-09-AUG-27	BA-IKLL-AC-LIV-10-AUG-27	BA-IKLL-AC-LIV-13-AUG-27
					Client sampling date / time	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-011	WT2437881-012	WT2437881-013	WT2437881-014	WT2437881-015
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		8400	18800	21100	18800	18600
Potassium	7440-09-7	E464/BU	20	mg/kg		6780	19000	20000	19900	17900
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		2.57	11.3	11.3	10.4	10.9
Selenium	7782-49-2	E464/BU	0.050	mg/kg		9.78	3.24	3.18	2.72	3.41
Silver	7440-22-4	E464/BU	0.0050	mg/kg		1.58	0.120	0.125	0.0824	0.282
Sodium	7440-23-5	E464/BU	25	mg/kg		2180	4540	4700	4420	6290
Strontium	7440-24-6	E464/BU	0.10	mg/kg		0.25	0.42	0.63	0.46	0.26
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.0264	0.0601	0.0573	0.0510	0.204
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		0.14	0.33	0.21	0.15	0.58
Zinc	7440-66-6	E464/BU	0.50	mg/kg		82.9	93.7	116	90.7	157
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota

(Matrix: Biota)

					Client sample ID	BA-IKLL-AC-LIV-14-AUG-27	BA-IKLL-AC-LIV-15-AUG-27	BA-IKLL-AC-LIV-16-AUG-27	BA-IKLL-AC-LIV-19-AUG-27	BA-IKLL-AC-LIV-21-AUG-27
					Client sampling date / time	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-016	WT2437881-017	WT2437881-018	WT2437881-019	WT2437881-020
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		69.8	62.2	78.4	59.8	77.3
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		1.72	2.31	1.90	2.73	1.38
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	0.12
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		2.24	0.881	4.92	1.38	1.97
Calcium	7440-70-2	E464/BU	25	mg/kg		241	100	242	83	326
Chromium	7440-47-3	E464/BU	0.050	mg/kg		0.106	<0.050	<0.050	<0.050	0.066
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		0.381	0.159	0.297	0.172	0.388
Copper	7440-50-8	E464/BU	0.10	mg/kg		17.1	20.3	6.96	73.1	4.05
Iron	7439-89-6	E464/BU	2.5	mg/kg		788	380	402	488	768
Lead	7439-92-1	E464/BU	0.020	mg/kg		0.072	0.037	0.145	0.028	0.035
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		605	420	1020	403	1330
Manganese	7439-96-5	E464/BU	0.50	mg/kg		4.03	3.39	3.27	2.86	5.03
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.219	0.099	0.460	0.142	0.253
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		0.866	0.558	0.312	0.609	0.286





## Analytical Results

Sub-Matrix: Biota  
 (Matrix: Biota)

					Client sample ID	BA-IKLL-AC-LIV-14-AUG-27	BA-IKLL-AC-LIV-15-AUG-27	BA-IKLL-AC-LIV-16-AUG-27	BA-IKLL-AC-LIV-19-AUG-27	BA-IKLL-AC-LIV-21-AUG-27
					Client sampling date / time	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-016	WT2437881-017	WT2437881-018	WT2437881-019	WT2437881-020
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		0.24	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		11800	8700	15800	8570	21000
Potassium	7440-09-7	E464/BU	20	mg/kg		9720	7290	16600	6330	20500
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		3.96	2.80	7.86	3.34	13.3
Selenium	7782-49-2	E464/BU	0.050	mg/kg		10.2	7.99	2.79	8.83	2.19
Silver	7440-22-4	E464/BU	0.0050	mg/kg		0.275	0.529	0.0782	2.05	0.0095
Sodium	7440-23-5	E464/BU	25	mg/kg		4250	2660	6780	2690	5690
Strontium	7440-24-6	E464/BU	0.10	mg/kg		1.96	0.47	0.36	0.29	0.34
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.0269	0.0259	0.0940	0.0338	0.0917
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		0.76	<0.10	0.30	0.12	0.32
Zinc	7440-66-6	E464/BU	0.50	mg/kg		102	71.4	158	80.5	81.1
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota  
 (Matrix: Biota)

					Client sample ID	BA-IKLL-AC-LIV-24-AUG-27	BA-DUP-AC-LIV-01-2024-08	BA-DUP-AC-LIV-02-2024-08	BA-DUP-AC-LIV-03-2024-08	BA-QURL-AC-LI-03-AUG-28
					Client sampling date / time	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	29-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-021	WT2437881-022	WT2437881-023	WT2437881-024	WT2437881-025
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		68.5	62.9	67.5	60.3	80.2
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		0.657	3.30	1.96	2.52	1.51
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		1.24	1.35	1.38	1.36	5.53
Calcium	7440-70-2	E464/BU	25	mg/kg		126	103	120	76	569
Chromium	7440-47-3	E464/BU	0.050	mg/kg		0.137	<0.050	<0.050	<0.050	<0.050
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		0.130	0.119	0.168	0.263	0.193
Copper	7440-50-8	E464/BU	0.10	mg/kg		25.3	22.3	62.2	48.4	9.69
Iron	7439-89-6	E464/BU	2.5	mg/kg		459	352	467	415	858
Lead	7439-92-1	E464/BU	0.020	mg/kg		0.053	<0.020	0.044	0.025	0.036
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		501	443	490	405	1020
Manganese	7439-96-5	E464/BU	0.50	mg/kg		2.69	3.14	2.72	3.07	4.25
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.196	0.150	0.356	0.126	0.469
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		0.681	0.574	0.563	0.685	0.396





## Analytical Results

Sub-Matrix: Biota  
(Matrix: Biota)

					Client sample ID	BA-IKLL-AC-LIV-24-AUG-27	BA-DUP-AC-LIV-01-2024-08	BA-DUP-AC-LIV-02-2024-08	BA-DUP-AC-LIV-03-2024-08	BA-QURL-AC-LI-03-AUG-28
					Client sampling date / time	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	29-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-021	WT2437881-022	WT2437881-023	WT2437881-024	WT2437881-025
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		0.24	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		9450	8890	9000	7930	18900
Potassium	7440-09-7	E464/BU	20	mg/kg		8000	7080	7940	6490	14900
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		3.67	3.10	3.73	2.54	7.75
Selenium	7782-49-2	E464/BU	0.050	mg/kg		4.68	7.34	5.91	9.87	3.58
Silver	7440-22-4	E464/BU	0.0050	mg/kg		0.618	0.580	1.60	1.46	0.149
Sodium	7440-23-5	E464/BU	25	mg/kg		3400	3110	2990	2330	6860
Strontium	7440-24-6	E464/BU	0.10	mg/kg		0.36	0.38	0.22	0.26	0.47
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.0381	0.0186	0.0165	0.0233	0.113
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		0.43	<0.10	0.25	0.13	0.21
Zinc	7440-66-6	E464/BU	0.50	mg/kg		92.0	90.3	106	82.9	159
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota  
 (Matrix: Biota)

					Client sample ID	BA-QURL-AC-LI-04-AUG-29	BA-QURL-AC-LI-05-AUG-29	BA-QURL-AC-LI-06-AUG-29	BA-QURL-AC-LI-07-AUG-29	BA-QURL-AC-LI-08-AUG-29
					Client sampling date / time	29-Aug-2024 00:00	29-Aug-2024 00:00	29-Aug-2024 00:00	29-Aug-2024 00:00	29-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-026	WT2437881-027	WT2437881-028	WT2437881-029	WT2437881-030
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		79.3	81.0	75.1	79.1	81.4
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		3.0	<2.0	<2.0	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	0.012
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		1.99	2.08	2.01	1.22	3.07
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		<1.0	1.7	<1.0	<1.0	<1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		6.72	4.22	8.40	6.23	8.76
Calcium	7440-70-2	E464/BU	25	mg/kg		462	584	226	411	379
Chromium	7440-47-3	E464/BU	0.050	mg/kg		<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		0.276	0.173	0.272	0.288	0.316
Copper	7440-50-8	E464/BU	0.10	mg/kg		8.01	6.45	100	15.3	6.48
Iron	7439-89-6	E464/BU	2.5	mg/kg		1650	974	1820	1370	5180
Lead	7439-92-1	E464/BU	0.020	mg/kg		0.053	0.074	0.059	0.038	0.080
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		1020	1080	669	881	984
Manganese	7439-96-5	E464/BU	0.50	mg/kg		4.78	5.17	2.76	3.19	4.67
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.491	0.346	0.378	0.468	0.999
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		0.386	0.348	0.386	0.410	0.396





## Analytical Results

Sub-Matrix: Biota  
 (Matrix: Biota)

					Client sample ID	BA-QURL-AC-LI-04-AUG-29	BA-QURL-AC-LI-05-AUG-29	BA-QURL-AC-LI-06-AUG-29	BA-QURL-AC-LI-07-AUG-29	BA-QURL-AC-LI-08-AUG-29
					Client sampling date / time	29-Aug-2024 00:00	29-Aug-2024 00:00	29-Aug-2024 00:00	29-Aug-2024 00:00	29-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-026	WT2437881-027	WT2437881-028	WT2437881-029	WT2437881-030
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		18800	18400	13200	15900	18200
Potassium	7440-09-7	E464/BU	20	mg/kg		15900	16200	12500	14000	16800
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		9.03	9.41	6.11	7.21	6.82
Selenium	7782-49-2	E464/BU	0.050	mg/kg		3.27	3.21	2.81	3.49	4.61
Silver	7440-22-4	E464/BU	0.0050	mg/kg		0.0878	0.0486	3.45	0.464	0.0257
Sodium	7440-23-5	E464/BU	25	mg/kg		5820	7400	5760	7220	8630
Strontium	7440-24-6	E464/BU	0.10	mg/kg		0.35	0.47	0.25	0.36	0.30
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.158	0.114	0.0728	0.0959	0.103
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		0.53	0.21	0.17	0.24	0.72
Zinc	7440-66-6	E464/BU	0.50	mg/kg		119	127	155	145	132
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota  
 (Matrix: Biota)

					Client sample ID	BA-QURL-AC-LI-09-AUG-29	BA-QURL-AC-LI-10-AUG-29	BA-QURL-AC-LI-11-AUG-30	BA-QURL-AC-LI-12-AUG-30	BA-QURL-AC-LI-13-AUG-30
					Client sampling date / time	29-Aug-2024 00:00	29-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-031	WT2437881-032	WT2437881-033	WT2437881-034	WT2437881-035
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		79.7	78.4	78.2	78.8	78.7
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		<2.0	<2.0	2.1	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		0.0540	2.37	2.42	3.70	2.40
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		0.772	7.71	5.48	3.97	3.44
Calcium	7440-70-2	E464/BU	25	mg/kg		999	320	313	523	411
Chromium	7440-47-3	E464/BU	0.050	mg/kg		<0.050	<0.050	0.184	<0.050	<0.050
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		0.186	0.550	0.435	0.193	0.218
Copper	7440-50-8	E464/BU	0.10	mg/kg		36.9	40.1	36.5	7.53	35.7
Iron	7439-89-6	E464/BU	2.5	mg/kg		2640	2340	1540	835	987
Lead	7439-92-1	E464/BU	0.020	mg/kg		0.042	0.054	0.078	0.047	0.042
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		1110	958	804	1140	1000
Manganese	7439-96-5	E464/BU	0.50	mg/kg		7.69	4.38	5.40	4.96	4.84
Mercury	7439-97-6	E524/BU	0.031	mg/kg		3.38	0.655	0.364	0.302	0.315
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		0.664	0.467	0.686	0.250	0.356





## Analytical Results

Sub-Matrix: Biota  
(Matrix: Biota)

					Client sample ID	BA-QURL-AC-LI-09-AUG-29	BA-QURL-AC-LI-10-AUG-29	BA-QURL-AC-LI-11-AUG-30	BA-QURL-AC-LI-12-AUG-30	BA-QURL-AC-LI-13-AUG-30
					Client sampling date / time	29-Aug-2024 00:00	29-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-031	WT2437881-032	WT2437881-033	WT2437881-034	WT2437881-035
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		17500	18500	15500	18900	18100
Potassium	7440-09-7	E464/BU	20	mg/kg		13800	16200	12500	15200	16100
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		7.40	7.48	5.22	6.79	7.47
Selenium	7782-49-2	E464/BU	0.050	mg/kg		11.6	3.71	4.53	2.80	2.59
Silver	7440-22-4	E464/BU	0.0050	mg/kg		0.568	1.88	1.92	0.0599	1.28
Sodium	7440-23-5	E464/BU	25	mg/kg		5120	6660	7530	5690	6580
Strontium	7440-24-6	E464/BU	0.10	mg/kg		0.36	0.30	0.30	0.42	0.28
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.219	0.119	0.0315	0.0791	0.0812
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		<0.10	0.74	0.30	0.15	0.15
Zinc	7440-66-6	E464/BU	0.50	mg/kg		161	164	138	130	144
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota

(Matrix: Biota)

					Client sample ID	BA-QURL-AC-LI-14-AUG-30	BA-QURL-AC-LI-15-AUG-30	BA-QURL-AC-LI-16-AUG-30	BA-QURL-AC-LI-17-AUG-30	BA-QURL-AC-LI-18-AUG-30
					Client sampling date / time	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-036	WT2437881-037	WT2437881-038	WT2437881-039	WT2437881-040
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		81.2	77.5	77.6	79.6	78.2
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		1.41	2.16	1.83	2.21	1.53
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		2.81	8.07	3.97	6.04	5.26
Calcium	7440-70-2	E464/BU	25	mg/kg		438	331	394	370	518
Chromium	7440-47-3	E464/BU	0.050	mg/kg		<0.050	<0.050	0.149	<0.050	<0.050
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		0.266	0.190	0.217	0.164	0.302
Copper	7440-50-8	E464/BU	0.10	mg/kg		93.2	9.06	22.4	14.7	6.46
Iron	7439-89-6	E464/BU	2.5	mg/kg		1140	1330	1140	1680	971
Lead	7439-92-1	E464/BU	0.020	mg/kg		0.062	0.047	0.041	0.044	0.059
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		1090	1100	1060	1010	1350
Manganese	7439-96-5	E464/BU	0.50	mg/kg		5.48	4.78	4.47	5.49	6.14
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.365	0.579	0.345	0.396	0.301
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		0.451	0.486	0.367	0.329	0.414





## Analytical Results

Sub-Matrix: Biota  
 (Matrix: Biota)

					Client sample ID	BA-QURL-AC-LI-14-AUG-30	BA-QURL-AC-LI-15-AUG-30	BA-QURL-AC-LI-16-AUG-30	BA-QURL-AC-LI-17-AUG-30	BA-QURL-AC-LI-18-AUG-30
					Client sampling date / time	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-036	WT2437881-037	WT2437881-038	WT2437881-039	WT2437881-040
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		20300	19000	17500	18600	19600
Potassium	7440-09-7	E464/BU	20	mg/kg		16200	15100	14600	14900	14900
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		9.95	7.37	7.52	7.94	7.84
Selenium	7782-49-2	E464/BU	0.050	mg/kg		3.16	4.15	3.22	3.59	3.13
Silver	7440-22-4	E464/BU	0.0050	mg/kg		3.29	0.135	1.05	0.416	0.0369
Sodium	7440-23-5	E464/BU	25	mg/kg		7710	5030	5630	6170	6450
Strontium	7440-24-6	E464/BU	0.10	mg/kg		0.35	0.24	0.36	0.32	0.46
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.105	0.152	0.0849	0.0743	0.0817
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		0.26	0.39	0.13	0.18	0.28
Zinc	7440-66-6	E464/BU	0.50	mg/kg		142	167	136	142	125
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota

(Matrix: Biota)

					Client sample ID	BA-QURL-AC-LI-19-AUG-30	BA-QURL-AC-LI-20-AUG-30	BA-DUP-AC-LIV-05-2024-08	BA-DUP-AC-LIV-15-2024-08	BA-IKLL-AC-MUS-01-AUG-27
					Client sampling date / time	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	27-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-041	WT2437881-042	WT2437881-043	WT2437881-044	WT2437881-045
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		78.3	80.6	79.9	77.5	76.1
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		2.25	1.10	1.94	2.30	2.02
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		<1.0	1.3	1.2	<1.0	1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		3.59	7.75	4.90	9.23	0.0095
Calcium	7440-70-2	E464/BU	25	mg/kg		288	473	502	714	173
Chromium	7440-47-3	E464/BU	0.050	mg/kg		<0.050	<0.050	<0.050	<0.050	0.054
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		0.167	0.227	0.195	0.242	0.153
Copper	7440-50-8	E464/BU	0.10	mg/kg		5.83	13.8	6.61	10.6	2.56
Iron	7439-89-6	E464/BU	2.5	mg/kg		1030	1490	1080	1500	19.8
Lead	7439-92-1	E464/BU	0.020	mg/kg		0.049	0.045	0.042	0.119	<0.020
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		1130	826	1090	1260	1600
Manganese	7439-96-5	E464/BU	0.50	mg/kg		6.71	3.73	5.86	5.73	<0.50
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.371	0.404	0.346	0.503	0.171
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		0.281	0.398	0.351	0.510	<0.020





## Analytical Results

Sub-Matrix: Biota  
(Matrix: Biota)

					Client sample ID	BA-QURL-AC-LI-19-AUG-30	BA-QURL-AC-LI-20-AUG-30	BA-DUP-AC-LIV-05-2024-08	BA-DUP-AC-LIV-15-2024-08	BA-IKLL-AC-MUS-01-AUG-27
					Client sampling date / time	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	27-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-041	WT2437881-042	WT2437881-043	WT2437881-044	WT2437881-045
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		20100	15200	20500	21100	12400
Potassium	7440-09-7	E464/BU	20	mg/kg		14100	12200	15900	16800	20800
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		7.17	6.70	9.58	8.27	6.15
Selenium	7782-49-2	E464/BU	0.050	mg/kg		2.73	3.14	3.23	4.61	1.22
Silver	7440-22-4	E464/BU	0.0050	mg/kg		0.0336	0.517	0.0484	0.161	<0.0050
Sodium	7440-23-5	E464/BU	25	mg/kg		5330	7960	6780	5160	1560
Strontium	7440-24-6	E464/BU	0.10	mg/kg		0.23	0.39	0.39	0.67	0.21
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.124	0.0661	0.113	0.160	0.0085
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		0.20	0.25	0.24	0.46	<0.10
Zinc	7440-66-6	E464/BU	0.50	mg/kg		109	172	140	208	16.2
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota

(Matrix: Biota)

					Client sample ID	BA-IKLL-AC-MUS-02-AUG-27	BA-IKLL-AC-MUS-28-AUG-28	BA-IKLL-AC-MUS-29-AUG-28	BA-QURL-AC-MUS-01-AUG-28	BA-QURL-AC-MUS-02-AUG-28
					Client sampling date / time	27-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-046	WT2437881-047	WT2437881-048	WT2437881-049	WT2437881-050
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		74.8	76.7	74.1	77.3	76.1
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		23.6	<2.0	<2.0	<2.0	4.6
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	0.018
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		1.34	2.72	2.95	1.48	1.56
Barium	7440-39-3	E464/BU	0.10	mg/kg		0.18	<0.10	<0.10	<0.10	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		1.0	1.0	<1.0	1.0	2.7
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		0.0111	0.0131	0.0151	0.0114	0.0185
Calcium	7440-70-2	E464/BU	25	mg/kg		1590	159	121	136	240
Chromium	7440-47-3	E464/BU	0.050	mg/kg		<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		0.852	0.080	<0.020	0.053	0.044
Copper	7440-50-8	E464/BU	0.10	mg/kg		2.41	2.51	2.14	2.96	3.00
Iron	7439-89-6	E464/BU	2.5	mg/kg		243	15.5	14.3	24.9	34.0
Lead	7439-92-1	E464/BU	0.020	mg/kg		0.046	0.021	<0.020	<0.020	<0.020
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		1380	1560	1220	1120	1110
Manganese	7439-96-5	E464/BU	0.50	mg/kg		2.59	<0.50	<0.50	<0.50	<0.50
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.207	0.128	0.172	0.240	0.275
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020





## Analytical Results

Sub-Matrix: Biota  
(Matrix: Biota)

					Client sample ID	BA-IKLL-AC-MUS-02-AUG-27	BA-IKLL-AC-MUS-28-AUG-28	BA-IKLL-AC-MUS-29-AUG-28	BA-QURL-AC-MUS-01-AUG-28	BA-QURL-AC-MUS-02-AUG-28
					Client sampling date / time	27-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-046	WT2437881-047	WT2437881-048	WT2437881-049	WT2437881-050
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		0.37	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		10300	12000	10000	9530	9780
Potassium	7440-09-7	E464/BU	20	mg/kg		16600	19600	15600	15700	15300
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		4.96	5.11	4.34	6.47	6.61
Selenium	7782-49-2	E464/BU	0.050	mg/kg		1.28	1.31	1.26	0.981	1.26
Silver	7440-22-4	E464/BU	0.0050	mg/kg		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	7440-23-5	E464/BU	25	mg/kg		1140	1370	958	2030	2730
Strontium	7440-24-6	E464/BU	0.10	mg/kg		1.47	0.17	0.14	<0.10	0.16
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.0063	0.0042	0.0048	0.0086	0.0094
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Zinc	7440-66-6	E464/BU	0.50	mg/kg		14.3	18.5	15.1	14.5	17.3
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota

(Matrix: Biota)

					Client sample ID	BA-QURL-AC-MUS-03-AUG-28	BA-QURL-AC-MUS-04-AUG-29	BA-QURL-AC-MUS-05-AUG-29	BA-QURL-AC-MUS-06-AUG-29	BA-QURL-AC-MUS-07-AUG-29
					Client sampling date / time	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-051	WT2437881-052	WT2437881-053	WT2437881-054	WT2437881-055
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		74.4	74.6	78.4	75.6	76.8
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	0.015
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		1.66	1.94	2.23	2.40	1.42
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	0.013	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		1.0	1.9	1.0	1.1	1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		0.0119	0.0141	0.0090	0.0116	0.0096
Calcium	7440-70-2	E464/BU	25	mg/kg		145	118	248	153	162
Chromium	7440-47-3	E464/BU	0.050	mg/kg		<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		0.035	0.027	0.025	<0.020	<0.020
Copper	7440-50-8	E464/BU	0.10	mg/kg		2.76	3.39	3.16	2.51	2.76
Iron	7439-89-6	E464/BU	2.5	mg/kg		31.7	38.0	27.9	24.6	20.3
Lead	7439-92-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	0.022	<0.020
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		988	1020	1210	1080	1210
Manganese	7439-96-5	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.230	0.226	0.212	0.230	0.277
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020





## Analytical Results

Sub-Matrix: Biota  
 (Matrix: Biota)

					Client sample ID	BA-QURL-AC-MUS-03-AUG-28	BA-QURL-AC-MUS-04-AUG-29	BA-QURL-AC-MUS-05-AUG-29	BA-QURL-AC-MUS-06-AUG-29	BA-QURL-AC-MUS-07-AUG-29
					Client sampling date / time	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-051	WT2437881-052	WT2437881-053	WT2437881-054	WT2437881-055
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		8490	8720	10100	8980	9870
Potassium	7440-09-7	E464/BU	20	mg/kg		13500	13200	16600	14800	15500
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		6.07	5.42	7.68	6.14	6.52
Selenium	7782-49-2	E464/BU	0.050	mg/kg		1.00	1.05	1.20	1.02	1.10
Silver	7440-22-4	E464/BU	0.0050	mg/kg		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	7440-23-5	E464/BU	25	mg/kg		1960	1830	1720	2030	2050
Strontium	7440-24-6	E464/BU	0.10	mg/kg		<0.10	<0.10	0.21	0.10	<0.10
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.0098	0.0102	0.0114	0.0113	0.0129
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Zinc	7440-66-6	E464/BU	0.50	mg/kg		13.9	15.1	15.4	13.7	14.4
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota

(Matrix: Biota)

					Client sample ID	BA-QURL-AC-MUS-08-AUG-29	BA-QURL-AC-MUS-09-AUG-29	BA-QURL-AC-MUS-10-AUG-29	BA-QURL-AC-MUS-11-AUG-30	BA-QURL-AC-MUS-12-AUG-30
					Client sampling date / time	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-056	WT2437881-057	WT2437881-058	WT2437881-059	WT2437881-060
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		79.3	82.0	74.7	76.5	77.9
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		4.07	0.0310	1.92	2.75	4.57
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		1.2	1.4	<1.0	1.1	1.2
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		0.0184	<0.0050	0.0084	0.0099	0.0085
Calcium	7440-70-2	E464/BU	25	mg/kg		209	231	134	167	176
Chromium	7440-47-3	E464/BU	0.050	mg/kg		<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		0.022	0.064	<0.020	0.022	<0.020
Copper	7440-50-8	E464/BU	0.10	mg/kg		1.83	2.81	2.02	3.37	2.67
Iron	7439-89-6	E464/BU	2.5	mg/kg		25.2	31.2	22.1	29.7	21.4
Lead	7439-92-1	E464/BU	0.020	mg/kg		0.027	0.029	0.028	0.029	<0.020
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		1200	1330	1070	1080	1210
Manganese	7439-96-5	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.600	2.22	0.232	0.198	0.230
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020





## Analytical Results

Sub-Matrix: Biota  
 (Matrix: Biota)

					Client sample ID	BA-QURL-AC-MUS-08-AUG-29	BA-QURL-AC-MUS-09-AUG-29	BA-QURL-AC-MUS-10-AUG-29	BA-QURL-AC-MUS-11-AUG-30	BA-QURL-AC-MUS-12-AUG-30
					Client sampling date / time	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-056	WT2437881-057	WT2437881-058	WT2437881-059	WT2437881-060
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		10200	12300	8850	8950	9990
Potassium	7440-09-7	E464/BU	20	mg/kg		18400	20900	14500	14600	16600
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		6.16	6.43	5.90	4.97	5.80
Selenium	7782-49-2	E464/BU	0.050	mg/kg		1.10	2.05	0.944	1.14	1.04
Silver	7440-22-4	E464/BU	0.0050	mg/kg		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	7440-23-5	E464/BU	25	mg/kg		2660	1950	1840	2460	2140
Strontium	7440-24-6	E464/BU	0.10	mg/kg		0.11	<0.10	<0.10	0.10	<0.10
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.0102	0.0661	0.0103	0.0092	0.0109
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	0.12
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Zinc	7440-66-6	E464/BU	0.50	mg/kg		16.4	19.9	12.6	15.6	14.8
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota

(Matrix: Biota)

					Client sample ID	BA-QURL-AC-MUS-13-AUG-30	BA-QURL-AC-MUS-14-AUG-30	BA-QURL-AC-MUS-15-AUG-30	BA-QURL-AC-MUS-16-AUG-30	BA-QURL-AC-MUS-17-AUG-30
					Client sampling date / time	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-061	WT2437881-062	WT2437881-063	WT2437881-064	WT2437881-065
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		76.6	75.6	77.9	76.5	78.1
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		2.20	1.55	2.00	2.16	2.01
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		0.0073	0.0060	0.0138	0.0058	0.0125
Calcium	7440-70-2	E464/BU	25	mg/kg		209	242	177	203	224
Chromium	7440-47-3	E464/BU	0.050	mg/kg		<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		0.023	0.021	0.133	<0.020	0.022
Copper	7440-50-8	E464/BU	0.10	mg/kg		2.14	2.50	1.95	2.25	3.68
Iron	7439-89-6	E464/BU	2.5	mg/kg		24.1	19.8	21.4	18.4	37.8
Lead	7439-92-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		957	986	1110	1130	1180
Manganese	7439-96-5	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.199	0.247	0.381	0.244	0.221
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020





## Analytical Results

Sub-Matrix: Biota  
 (Matrix: Biota)

					Client sample ID	BA-QURL-AC-MUS-13-AUG-30	BA-QURL-AC-MUS-14-AUG-30	BA-QURL-AC-MUS-15-AUG-30	BA-QURL-AC-MUS-16-AUG-30	BA-QURL-AC-MUS-17-AUG-30
					Client sampling date / time	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-061	WT2437881-062	WT2437881-063	WT2437881-064	WT2437881-065
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		8590	8730	9220	9610	10200
Potassium	7440-09-7	E464/BU	20	mg/kg		13600	14200	14700	15100	16300
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		5.94	6.68	6.70	6.55	7.50
Selenium	7782-49-2	E464/BU	0.050	mg/kg		1.06	1.16	1.13	1.22	1.21
Silver	7440-22-4	E464/BU	0.0050	mg/kg		<0.0050	<0.0050	0.0122	<0.0050	<0.0050
Sodium	7440-23-5	E464/BU	25	mg/kg		2760	2660	3190	2090	2910
Strontium	7440-24-6	E464/BU	0.10	mg/kg		0.12	0.18	0.10	0.12	0.14
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.0108	0.0113	0.0102	0.0109	0.0132
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Zinc	7440-66-6	E464/BU	0.50	mg/kg		14.7	14.2	15.4	13.8	16.8
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota

(Matrix: Biota)

					Client sample ID	BA-QURL-AC-MUS-18-AUG-30	BA-QURL-AC-MUS-19-AUG-30	BA-QURL-AC-MUS-20-AUG-30	BA-DUP-AC-MUS-05-2024-08	BA-DUP-AC-MUS-15-2024-08
					Client sampling date / time	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-066	WT2437881-067	WT2437881-068	WT2437881-069	WT2437881-070
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		78.2	75.8	76.9	78.9	78.5
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		<2.0	<2.0	<2.0	3.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		1.14	2.73	2.11	1.96	2.51
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		0.0118	0.0080	0.0170	0.0087	0.0134
Calcium	7440-70-2	E464/BU	25	mg/kg		198	178	176	138	180
Chromium	7440-47-3	E464/BU	0.050	mg/kg		<0.050	<0.050	0.065	<0.050	0.088
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		<0.020	<0.020	0.021	<0.020	<0.020
Copper	7440-50-8	E464/BU	0.10	mg/kg		2.44	2.12	5.90	2.17	2.12
Iron	7439-89-6	E464/BU	2.5	mg/kg		21.6	19.5	52.6	19.8	17.3
Lead	7439-92-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	0.030	0.027
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		1220	1100	1050	1210	1350
Manganese	7439-96-5	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.225	0.231	0.186	0.239	0.413
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020





## Analytical Results

Sub-Matrix: Biota  
(Matrix: Biota)

					Client sample ID	BA-QURL-AC-MUS-18-AUG-30	BA-QURL-AC-MUS-19-AUG-30	BA-QURL-AC-MUS-20-AUG-30	BA-DUP-AC-MUS-05-2024-08	BA-DUP-AC-MUS-15-2024-08
					Client sampling date / time	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00	30-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-066	WT2437881-067	WT2437881-068	WT2437881-069	WT2437881-070
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		10200	9030	9480	10300	10500
Potassium	7440-09-7	E464/BU	20	mg/kg		16400	14800	13200	17300	16900
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		6.81	5.90	5.67	8.31	7.65
Selenium	7782-49-2	E464/BU	0.050	mg/kg		1.20	1.16	1.16	1.24	1.34
Silver	7440-22-4	E464/BU	0.0050	mg/kg		<0.0050	<0.0050	<0.0050	<0.0050	0.0294
Sodium	7440-23-5	E464/BU	25	mg/kg		2570	2560	2930	1640	2730
Strontium	7440-24-6	E464/BU	0.10	mg/kg		0.12	<0.10	0.12	<0.10	0.10
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.0118	0.0108	0.0151	0.0153	0.0103
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Zinc	7440-66-6	E464/BU	0.50	mg/kg		15.8	14.3	18.4	14.2	15.6
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota

(Matrix: Biota)

					Client sample ID	BA-QURL-AC-LI-01-AUG-28	BA-QURL-AC-LI-02-AUG-28	BA-IKLL-AC-MUS-30-AUG-28	BA-IKLL-AC-MUS-34-AUG-28	BA-IKLL-AC-MUS-37-AUG-28
					Client sampling date / time	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-071	WT2437881-072	WT2437881-073	WT2437881-074	WT2437881-075
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		79.4	80.1	72.4	76.5	77.7
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		1.56	1.51	2.17	5.05	1.50
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		7.49	4.74	0.0724	0.0134	0.0202
Calcium	7440-70-2	E464/BU	25	mg/kg		458	561	157	161	164
Chromium	7440-47-3	E464/BU	0.050	mg/kg		0.097	<0.050	<0.050	<0.050	<0.050
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		0.305	0.187	0.025	<0.020	0.034
Copper	7440-50-8	E464/BU	0.10	mg/kg		38.4	5.31	2.74	2.51	2.95
Iron	7439-89-6	E464/BU	2.5	mg/kg		2150	964	23.0	15.8	32.6
Lead	7439-92-1	E464/BU	0.020	mg/kg		0.060	0.027	<0.020	<0.020	<0.020
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	0.59	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		1140	1190	1320	1270	1160
Manganese	7439-96-5	E464/BU	0.50	mg/kg		5.04	6.81	<0.50	<0.50	<0.50
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.393	0.312	0.161	0.219	0.275
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		0.448	0.304	<0.020	<0.020	<0.020





## Analytical Results

Sub-Matrix: Biota  
(Matrix: Biota)

					Client sample ID	BA-QURL-AC-LI-01-AUG-28	BA-QURL-AC-LI-02-AUG-28	BA-IKLL-AC-MUS-30-AUG-28	BA-IKLL-AC-MUS-34-AUG-28	BA-IKLL-AC-MUS-37-AUG-28
					Client sampling date / time	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00	28-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-071	WT2437881-072	WT2437881-073	WT2437881-074	WT2437881-075
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		18600	19500	10600	10500	9930
Potassium	7440-09-7	E464/BU	20	mg/kg		15400	16600	16300	18100	16800
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		8.38	9.50	5.32	5.28	6.27
Selenium	7782-49-2	E464/BU	0.050	mg/kg		3.42	2.80	1.42	1.34	1.20
Silver	7440-22-4	E464/BU	0.0050	mg/kg		1.62	0.0364	<0.0050	<0.0050	<0.0050
Sodium	7440-23-5	E464/BU	25	mg/kg		7680	7780	1150	1760	2610
Strontium	7440-24-6	E464/BU	0.10	mg/kg		0.38	0.45	0.24	0.17	0.14
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.0932	0.101	0.0066	0.0059	0.0087
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		0.34	0.13	<0.10	<0.10	<0.10
Zinc	7440-66-6	E464/BU	0.50	mg/kg		162	101	17.5	14.4	19.5
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota

(Matrix: Biota)

					Client sample ID	BA-IKLL-AC-MUS-12-AUG-27	BA-IKLL-AC-MUS-22-AUG-27	BA-IKLL-AC-MUS-35-AUG-27	BA-IKLL-AC-MUS-31-AUG-27	BA-IKLL-AC-MUS-08-AUG-27
					Client sampling date / time	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-076	WT2437881-077	WT2437881-078	WT2437881-079	WT2437881-080
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		74.0	71.9	72.1	73.6	73.6
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		1.98	2.61	2.82	2.99	1.40
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	0.17	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		0.0220	0.0417	0.0100	0.0546	0.0137
Calcium	7440-70-2	E464/BU	25	mg/kg		144	151	123	138	150
Chromium	7440-47-3	E464/BU	0.050	mg/kg		<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		<0.020	0.021	0.085	0.043	0.036
Copper	7440-50-8	E464/BU	0.10	mg/kg		1.69	3.14	1.70	1.76	1.64
Iron	7439-89-6	E464/BU	2.5	mg/kg		16.2	37.4	14.5	17.5	14.3
Lead	7439-92-1	E464/BU	0.020	mg/kg		0.108	<0.020	<0.020	<0.020	<0.020
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		1430	1140	1190	1430	1350
Manganese	7439-96-5	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.141	0.201	0.177	0.162	0.250
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020





## Analytical Results

Sub-Matrix: Biota  
 (Matrix: Biota)

					Client sample ID	BA-IKLL-AC-MUS-12-AUG-27	BA-IKLL-AC-MUS-22-AUG-27	BA-IKLL-AC-MUS-35-AUG-27	BA-IKLL-AC-MUS-31-AUG-27	BA-IKLL-AC-MUS-08-AUG-27
					Client sampling date / time	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-076	WT2437881-077	WT2437881-078	WT2437881-079	WT2437881-080
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		11500	9540	9870	11000	9920
Potassium	7440-09-7	E464/BU	20	mg/kg		17600	14100	15000	16700	16000
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		5.29	4.70	4.64	5.13	5.43
Selenium	7782-49-2	E464/BU	0.050	mg/kg		1.48	1.39	1.36	1.34	1.15
Silver	7440-22-4	E464/BU	0.0050	mg/kg		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	7440-23-5	E464/BU	25	mg/kg		886	1550	1220	1040	1240
Strontium	7440-24-6	E464/BU	0.10	mg/kg		0.20	0.23	0.17	0.20	0.21
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.0046	0.0066	0.0085	0.0075	0.0096
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Zinc	7440-66-6	E464/BU	0.50	mg/kg		16.0	17.1	16.6	15.9	14.5
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota

(Matrix: Biota)

					Client sample ID	BA-IKLL-AC-MUS-09-AUG-27	BA-IKLL-AC-MUS-10-AUG-27	BA-IKLL-AC-MUS-13-AUG-27	BA-IKLL-AC-MUS-14-AUG-27	BA-IKLL-AC-MUS-15-AUG-27
					Client sampling date / time	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-081	WT2437881-082	WT2437881-083	WT2437881-084	WT2437881-085
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		75.9	75.7	77.8	74.7	73.0
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		<2.0	<2.0	6.4	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		0.602	1.01	2.47	2.35	1.54
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		0.0126	0.0116	0.0196	0.0465	0.0435
Calcium	7440-70-2	E464/BU	25	mg/kg		158	161	160	152	138
Chromium	7440-47-3	E464/BU	0.050	mg/kg		<0.050	0.278	<0.050	<0.050	<0.050
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		<0.020	6.24	0.022	<0.020	<0.020
Copper	7440-50-8	E464/BU	0.10	mg/kg		2.53	3.12	3.60	2.79	2.13
Iron	7439-89-6	E464/BU	2.5	mg/kg		30.2	34.2	52.5	29.8	18.9
Lead	7439-92-1	E464/BU	0.020	mg/kg		0.027	0.023	0.029	<0.020	<0.020
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		1260	1320	1070	1380	1420
Manganese	7439-96-5	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.199	0.129	0.228	0.183	0.109
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020





## Analytical Results

Sub-Matrix: Biota  
 (Matrix: Biota)

					Client sample ID	BA-IKLL-AC-MUS-09-AUG-27	BA-IKLL-AC-MUS-10-AUG-27	BA-IKLL-AC-MUS-13-AUG-27	BA-IKLL-AC-MUS-14-AUG-27	BA-IKLL-AC-MUS-15-AUG-27
					Client sampling date / time	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-081	WT2437881-082	WT2437881-083	WT2437881-084	WT2437881-085
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		<0.20	0.22	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		10500	10900	10200	11400	11400
Potassium	7440-09-7	E464/BU	20	mg/kg		17200	18100	16300	18100	16800
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		5.64	4.77	7.94	4.84	4.82
Selenium	7782-49-2	E464/BU	0.050	mg/kg		1.12	1.09	1.08	1.40	1.30
Silver	7440-22-4	E464/BU	0.0050	mg/kg		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	7440-23-5	E464/BU	25	mg/kg		1410	1410	1800	1240	997
Strontium	7440-24-6	E464/BU	0.10	mg/kg		0.20	0.19	0.15	0.28	0.21
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.0071	0.0065	0.0123	0.0051	0.0049
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Zinc	7440-66-6	E464/BU	0.50	mg/kg		14.6	16.1	16.1	17.0	17.4
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota

(Matrix: Biota)

					Client sample ID	BA-IKLL-AC-MUS-16-AUG-27	BA-IKLL-AC-MUS-19-AUG-27	BA-IKLL-AC-MUS-21-AUG-27	BA-IKLL-AC-MUS-24-AUG-27	BA-DUP-AC-MUS-01-2024-08
					Client sampling date / time	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-086	WT2437881-087	WT2437881-088	WT2437881-089	WT2437881-090
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/BU	0.50	%		77.3	74.5	77.2	73.5	74.2
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
Antimony	7440-36-0	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg		2.53	2.16	1.58	1.23	2.20
Barium	7440-39-3	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Beryllium	7440-41-7	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth	7440-69-9	E464/BU	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
Boron	7440-42-8	E464/BU	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg		0.0172	0.0127	0.0278	0.0232	0.0147
Calcium	7440-70-2	E464/BU	25	mg/kg		136	136	192	150	140
Chromium	7440-47-3	E464/BU	0.050	mg/kg		<0.050	<0.050	<0.050	0.184	<0.050
Cobalt	7440-48-4	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Copper	7440-50-8	E464/BU	0.10	mg/kg		2.54	1.93	2.49	2.53	2.20
Iron	7439-89-6	E464/BU	2.5	mg/kg		22.9	14.8	36.2	28.5	16.3
Lead	7439-92-1	E464/BU	0.020	mg/kg		<0.020	<0.020	0.022	<0.020	0.020
Lithium	7439-93-2	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	7439-95-4	E464/BU	5.0	mg/kg		1100	1310	1360	1280	1310
Manganese	7439-96-5	E464/BU	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Mercury	7439-97-6	E524/BU	0.031	mg/kg		0.225	0.185	0.228	0.158	0.146
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020





## Analytical Results

Sub-Matrix: Biota  
(Matrix: Biota)

					Client sample ID	BA-IKLL-AC-MUS-16-AUG-27	BA-IKLL-AC-MUS-19-AUG-27	BA-IKLL-AC-MUS-21-AUG-27	BA-IKLL-AC-MUS-24-AUG-27	BA-DUP-AC-MUS-01-2024-08
					Client sampling date / time	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00	27-Aug-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2437881-086	WT2437881-087	WT2437881-088	WT2437881-089	WT2437881-090
						Result	Result	Result	Result	Result
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg		<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus	7723-14-0	E464/BU	10	mg/kg		9580	10900	11400	11000	11600
Potassium	7440-09-7	E464/BU	20	mg/kg		15900	16300	18800	17300	17800
Rubidium	7440-17-7	E464/BU	0.10	mg/kg		6.02	5.09	7.72	5.35	5.04
Selenium	7782-49-2	E464/BU	0.050	mg/kg		1.02	1.35	1.14	1.21	1.46
Silver	7440-22-4	E464/BU	0.0050	mg/kg		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	7440-23-5	E464/BU	25	mg/kg		1670	1080	1580	1200	1020
Strontium	7440-24-6	E464/BU	0.10	mg/kg		0.13	0.19	0.15	0.22	0.21
Tellurium	13494-80-9	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	7440-28-0	E464/BU	0.0020	mg/kg		0.0064	0.0059	0.0068	0.0088	0.0045
Tin	7440-31-5	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Tungsten	7440-33-7	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	7440-61-1	E464/BU	0.020	mg/kg		<0.020	<0.020	<0.020	<0.020	<0.020
Vanadium	7440-62-2	E464/BU	0.10	mg/kg		<0.10	<0.10	<0.10	<0.10	<0.10
Zinc	7440-66-6	E464/BU	0.50	mg/kg		13.5	14.8	15.8	16.7	16.1
Zirconium	7440-67-7	E464/BU	0.30	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30

Please refer to the General Comments section for an explanation of any result qualifiers detected.





## Analytical Results

Sub-Matrix: Biota

(Matrix: Biota)

Sub-Matrix: Biota (Matrix: Biota)					Client sample ID	BA-DUP-AC-MUS-02-2024-08	BA-DUP-AC-MUS-03-2024-08	----	----	----
Client sampling date / time					27-Aug-2024 00:00	27-Aug-2024 00:00	----	----	----	
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2437881-091	WT2437881-092	----	----	----	
					Result	Result	----	----	----	
Physical Tests										
Moisture	----	E144/BU	0.50	%	72.2	73.9	----	----	----	
Metals										
Aluminum	7429-90-5	E464/BU	2.0	mg/kg	<2.0	<2.0	----	----	----	
Antimony	7440-36-0	E464/BU	0.010	mg/kg	<0.010	<0.010	----	----	----	
Arsenic	7440-38-2	E464/BU	0.0200	mg/kg	2.24	3.36	----	----	----	
Barium	7440-39-3	E464/BU	0.10	mg/kg	<0.10	0.11	----	----	----	
Beryllium	7440-41-7	E464/BU	0.010	mg/kg	<0.010	<0.010	----	----	----	
Bismuth	7440-69-9	E464/BU	0.010	mg/kg	<0.010	<0.010	----	----	----	
Boron	7440-42-8	E464/BU	1.0	mg/kg	<1.0	<1.0	----	----	----	
Cadmium	7440-43-9	E464/BU	0.0050	mg/kg	0.0178	0.0301	----	----	----	
Calcium	7440-70-2	E464/BU	25	mg/kg	144	131	----	----	----	
Chromium	7440-47-3	E464/BU	0.050	mg/kg	<0.050	0.233	----	----	----	
Cobalt	7440-48-4	E464/BU	0.020	mg/kg	0.119	<0.020	----	----	----	
Copper	7440-50-8	E464/BU	0.10	mg/kg	2.32	2.86	----	----	----	
Iron	7439-89-6	E464/BU	2.5	mg/kg	24.9	25.0	----	----	----	
Lead	7439-92-1	E464/BU	0.020	mg/kg	<0.020	<0.020	----	----	----	
Lithium	7439-93-2	E464/BU	0.50	mg/kg	<0.50	<0.50	----	----	----	
Magnesium	7439-95-4	E464/BU	5.0	mg/kg	1230	1240	----	----	----	
Manganese	7439-96-5	E464/BU	0.50	mg/kg	<0.50	<0.50	----	----	----	
Mercury	7439-97-6	E524/BU	0.031	mg/kg	0.172	0.148	----	----	----	
Molybdenum	7439-98-7	E464/BU	0.020	mg/kg	<0.020	<0.020	----	----	----	





## Analytical Results

Sub-Matrix: Biota  
 (Matrix: Biota)

					Client sample ID	BA-DUP-AC-MUS-02-2024-08	BA-DUP-AC-MUS-03-2024-08	----	----	----
					Client sampling date / time	27-Aug-2024 00:00	27-Aug-2024 00:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2437881-091	WT2437881-092	----	----	----	----
					Result	Result	----	----	----	----
<b>Metals</b>										
Nickel	7440-02-0	E464/BU	0.20	mg/kg	<0.20	<0.20	----	----	----	----
Phosphorus	7723-14-0	E464/BU	10	mg/kg	10400	10800	----	----	----	----
Potassium	7440-09-7	E464/BU	20	mg/kg	15800	15900	----	----	----	----
Rubidium	7440-17-7	E464/BU	0.10	mg/kg	5.08	4.54	----	----	----	----
Selenium	7782-49-2	E464/BU	0.050	mg/kg	1.37	1.26	----	----	----	----
Silver	7440-22-4	E464/BU	0.0050	mg/kg	<0.0050	<0.0050	----	----	----	----
Sodium	7440-23-5	E464/BU	25	mg/kg	952	1100	----	----	----	----
Strontium	7440-24-6	E464/BU	0.10	mg/kg	0.16	0.21	----	----	----	----
Tellurium	13494-80-9	E464/BU	0.10	mg/kg	<0.10	<0.10	----	----	----	----
Thallium	7440-28-0	E464/BU	0.0020	mg/kg	0.0062	0.0047	----	----	----	----
Tin	7440-31-5	E464/BU	0.10	mg/kg	<0.10	<0.10	----	----	----	----
Tungsten	7440-33-7	E464/BU	0.10	mg/kg	<0.10	<0.10	----	----	----	----
Uranium	7440-61-1	E464/BU	0.020	mg/kg	<0.020	<0.020	----	----	----	----
Vanadium	7440-62-2	E464/BU	0.10	mg/kg	<0.10	<0.10	----	----	----	----
Zinc	7440-66-6	E464/BU	0.50	mg/kg	14.8	16.9	----	----	----	----
Zirconium	7440-67-7	E464/BU	0.30	mg/kg	<0.30	<0.30	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.



## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: WT2437881	Page	: 1 of 37
Client	: Baffinland Iron Mines Corporation	Laboratory	: ALS Environmental - Waterloo
Contact	: Environmental Lab Results	Account Manager	: Rick Hawthorne
Address	: 360 Oakville Place Dr Suite 300 Oakville ON Canada L6H 6K8	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 247202.00XX (MILNE 2024)	Date Samples Received	: 19-Dec-2024 10:30
PO	: 4500140399	Issue Date	: 14-Feb-2025 15:53
C-O-C number	: 19-DEC-2024 MINNOW FISH TISSUE		
Sampler	: MINNOW		
Site	: ----		
Quote number	: 2024-2025 Scope of Work		
No. of samples received	: 92		
No. of samples analysed	: 92		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

### Key

**Anonymous:** Refers to samples which are not part of this work order, but which formed part of the QC process lot.

**CAS Number:** Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

**DQO:** Data Quality Objective.

**LOR:** Limit of Reporting (detection limit).

**RPD:** Relative Percent Difference.

### Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

### Summary of Outliers

#### Outliers : Quality Control Samples

- Method Blank value outliers occur - please see following pages for full details.
- Duplicate outliers occur - please see following pages for full details.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- Matrix Spike outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

#### Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.



### ***Outliers : Analysis Holding Time Compliance (Breaches)***

- Analysis Holding Time Outliers exist - please see following pages for full details.

### ***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.





## Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: Biota

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
<b>Method Blank (MB) Values</b>								
Metals	QC-MRG2-1853948 001	----	Arsenic	7440-38-2	E464	<0.0200 <sup>B</sup> mg/kg	0.0048 mg/kg	Blank result exceeds permitted value

## Result Qualifiers

Qualifier Description

**B** Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.

## Duplicate (DUP) RPDs

Metals	WT2437881-002	BA-IKLL-AC-LIV-02-AUG-27	Calcium	7440-70-2	E464	21.5 % <sup>DUP-H</sup>	20%	Duplicate RPD does not meet the DQO for this test.
Metals	WT2437881-021	BA-IKLL-AC-LIV-24-AUG-27	Chromium	7440-47-3	E464	0.122 % <sup>DUP-H, J</sup>	Diff <2x LOR	Low Level DUP DQO exceeded (difference > 2 LOR).

## Result Qualifiers

Qualifier Description

**DUP-H** Duplicate results outside ALS DQO, due to sample heterogeneity.  
**J** Duplicate results and limits are expressed in terms of absolute difference.

## Laboratory Control Sample (LCS) Recoveries

Metals	QC-MRG2-1841075 002	----	Lithium	7439-93-2	E464	62.6 % <sup>LCS-L</sup>	70.0-130%	Recovery less than lower control limit
Metals	QC-MRG2-1847480 002	----	Lithium	7439-93-2	E464	66.7 % <sup>LCS-L</sup>	70.0-130%	Recovery less than lower control limit
Metals	QC-MRG2-1848876 002	----	Lithium	7439-93-2	E464	65.9 % <sup>LCS-L</sup>	70.0-130%	Recovery less than lower control limit
Metals	QC-MRG2-1853948 002	----	Lithium	7439-93-2	E464	65.0 % <sup>LCS-L</sup>	70.0-130%	Recovery less than lower control limit
Metals	QC-MRG2-1847480 002	----	Silver	7440-22-4	E464	69.8 % <sup>LCS-L</sup>	70.0-130%	Recovery less than lower control limit
Metals	QC-MRG2-1848876 002	----	Zirconium	7440-67-7	E464	68.8 % <sup>LCS-L</sup>	70.0-130%	Recovery less than lower control limit

## Result Qualifiers

Qualifier Description





Matrix: Biota

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
---------------	----------------------	----------------------	---------	------------	--------	--------	--------	---------

LCS-L
Lab Control Sample recovery was below ALS DQO. Reference Material and/or Matrix Spike results were acceptable. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.

Matrix Spike (MS) Recoveries								
Metals	WT2437881-002	BA-IKLL-AC-LIV-02-AUG-27	Calcium	7440-70-2	E464	167 % <sup>E</sup>	70.0-130%	Recovery greater than upper data quality objective
Metals	WT2437881-002	BA-IKLL-AC-LIV-02-AUG-27	Lithium	7439-93-2	E464	69.3 % <sup>K</sup>	70.0-130%	Recovery less than lower data quality objective
Metals	WT2437881-061	BA-QURL-AC-MUS-1 3-AUG-30	Lithium	7439-93-2	E464	67.3 % <sup>K</sup>	70.0-130%	Recovery less than lower data quality objective
Metals	WT2437881-048	BA-IKLL-AC-MUS-29 -AUG-28	Silver	7440-22-4	E464	67.3 % <sup>K</sup>	70.0-130%	Recovery less than lower data quality objective
Metals	WT2437881-061	BA-QURL-AC-MUS-1 3-AUG-30	Silver	7440-22-4	E464	69.7 % <sup>K</sup>	70.0-130%	Recovery less than lower data quality objective

Result Qualifiers

Qualifier	Description
E	Matrix Spike recovery outside ALS DQO due to heterogeneous analyte background in sample.
K	Matrix Spike recovery outside ALS DQO due to sample matrix effects.





## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Biota**

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-28-AUG-28	E524	28-Aug-2024	16-Jan-2025	28 days	141 days	✖ EHTR	16-Jan-2025	28 days	142 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-29-AUG-28	E524	28-Aug-2024	16-Jan-2025	28 days	141 days	✖ EHTR	16-Jan-2025	28 days	142 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-30-AUG-28	E524	28-Aug-2024	16-Jan-2025	28 days	141 days	✖ EHTR	16-Jan-2025	28 days	142 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-34-AUG-28	E524	28-Aug-2024	16-Jan-2025	28 days	141 days	✖ EHTR	16-Jan-2025	28 days	142 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-37-AUG-28	E524	28-Aug-2024	16-Jan-2025	28 days	141 days	✖ EHTR	16-Jan-2025	28 days	142 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-01-AUG-27	E524	27-Aug-2024	16-Jan-2025	28 days	142 days	✖ EHTR	16-Jan-2025	28 days	143 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-02-AUG-27	E524	27-Aug-2024	16-Jan-2025	28 days	142 days	✖ EHTR	16-Jan-2025	28 days	143 days	✖ EHTR





Matrix: Biota Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-08-AUG-27	E524	27-Aug-2024	16-Jan-2025	28 days	142 days	* EHTR	16-Jan-2025	28 days	143 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-09-AUG-27	E524	27-Aug-2024	16-Jan-2025	28 days	142 days	* EHTR	16-Jan-2025	28 days	143 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-10-AUG-27	E524	27-Aug-2024	16-Jan-2025	28 days	142 days	* EHTR	16-Jan-2025	28 days	143 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-12-AUG-27	E524	27-Aug-2024	16-Jan-2025	28 days	142 days	* EHTR	16-Jan-2025	28 days	143 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-13-AUG-27	E524	27-Aug-2024	16-Jan-2025	28 days	142 days	* EHTR	16-Jan-2025	28 days	143 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-14-AUG-27	E524	27-Aug-2024	16-Jan-2025	28 days	142 days	* EHTR	16-Jan-2025	28 days	143 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-15-AUG-27	E524	27-Aug-2024	16-Jan-2025	28 days	142 days	* EHTR	16-Jan-2025	28 days	143 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-16-AUG-27	E524	27-Aug-2024	16-Jan-2025	28 days	142 days	* EHTR	16-Jan-2025	28 days	143 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-19-AUG-27	E524	27-Aug-2024	16-Jan-2025	28 days	142 days	* EHTR	16-Jan-2025	28 days	143 days	* EHTR





Matrix: **Biota** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-21-AUG-27	E524	27-Aug-2024	16-Jan-2025	28 days	142 days	* EHTR	16-Jan-2025	28 days	143 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-22-AUG-27	E524	27-Aug-2024	16-Jan-2025	28 days	142 days	* EHTR	16-Jan-2025	28 days	143 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-31-AUG-27	E524	27-Aug-2024	16-Jan-2025	28 days	142 days	* EHTR	16-Jan-2025	28 days	143 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-35-AUG-27	E524	27-Aug-2024	16-Jan-2025	28 days	142 days	* EHTR	16-Jan-2025	28 days	143 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-11-AUG-30	E524	30-Aug-2024	20-Jan-2025	28 days	144 days	* EHTR	21-Jan-2025	28 days	145 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-12-AUG-30	E524	30-Aug-2024	20-Jan-2025	28 days	144 days	* EHTR	21-Jan-2025	28 days	145 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-13-AUG-30	E524	30-Aug-2024	20-Jan-2025	28 days	144 days	* EHTR	21-Jan-2025	28 days	145 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-14-AUG-30	E524	30-Aug-2024	20-Jan-2025	28 days	144 days	* EHTR	21-Jan-2025	28 days	145 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-15-AUG-30	E524	30-Aug-2024	20-Jan-2025	28 days	144 days	* EHTR	21-Jan-2025	28 days	145 days	* EHTR





Matrix: **Biota** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-16-AUG-30	E524	30-Aug-2024	20-Jan-2025	28 days	144 days	* EHTR	21-Jan-2025	28 days	145 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-17-AUG-30	E524	30-Aug-2024	20-Jan-2025	28 days	144 days	* EHTR	21-Jan-2025	28 days	145 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-18-AUG-30	E524	30-Aug-2024	20-Jan-2025	28 days	144 days	* EHTR	21-Jan-2025	28 days	145 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-03-AUG-28	E524	29-Aug-2024	20-Jan-2025	28 days	145 days	* EHTR	21-Jan-2025	28 days	146 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-04-AUG-29	E524	29-Aug-2024	20-Jan-2025	28 days	145 days	* EHTR	21-Jan-2025	28 days	146 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-05-AUG-29	E524	29-Aug-2024	20-Jan-2025	28 days	145 days	* EHTR	21-Jan-2025	28 days	146 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-06-AUG-29	E524	29-Aug-2024	20-Jan-2025	28 days	145 days	* EHTR	21-Jan-2025	28 days	146 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-07-AUG-29	E524	29-Aug-2024	20-Jan-2025	28 days	145 days	* EHTR	21-Jan-2025	28 days	146 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-08-AUG-29	E524	29-Aug-2024	20-Jan-2025	28 days	145 days	* EHTR	21-Jan-2025	28 days	146 days	* EHTR





Matrix: **Biota** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-09-AUG-29	E524	29-Aug-2024	20-Jan-2025	28 days	145 days	* EHTR	21-Jan-2025	28 days	146 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-10-AUG-29	E524	29-Aug-2024	20-Jan-2025	28 days	145 days	* EHTR	21-Jan-2025	28 days	146 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-LIV-05-2024-08	E524	30-Aug-2024	22-Jan-2025	28 days	145 days	* EHTR	23-Jan-2025	28 days	147 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-LIV-15-2024-08	E524	30-Aug-2024	22-Jan-2025	28 days	145 days	* EHTR	23-Jan-2025	28 days	147 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-19-AUG-30	E524	30-Aug-2024	22-Jan-2025	28 days	145 days	* EHTR	23-Jan-2025	28 days	147 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-20-AUG-30	E524	30-Aug-2024	22-Jan-2025	28 days	145 days	* EHTR	23-Jan-2025	28 days	147 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-MUS-05-2024-08	E524	30-Aug-2024	23-Jan-2025	28 days	146 days	* EHTR	24-Jan-2025	28 days	148 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-MUS-15-2024-08	E524	30-Aug-2024	23-Jan-2025	28 days	146 days	* EHTR	24-Jan-2025	28 days	148 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-13-AUG-30	E524	30-Aug-2024	23-Jan-2025	28 days	146 days	* EHTR	24-Jan-2025	28 days	148 days	* EHTR





Matrix: Biota Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-14-AUG-30	E524	30-Aug-2024	23-Jan-2025	28 days	146 days	* EHTR	24-Jan-2025	28 days	148 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-15-AUG-30	E524	30-Aug-2024	23-Jan-2025	28 days	146 days	* EHTR	24-Jan-2025	28 days	148 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-16-AUG-30	E524	30-Aug-2024	23-Jan-2025	28 days	146 days	* EHTR	24-Jan-2025	28 days	148 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-17-AUG-30	E524	30-Aug-2024	23-Jan-2025	28 days	146 days	* EHTR	24-Jan-2025	28 days	148 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-18-AUG-30	E524	30-Aug-2024	23-Jan-2025	28 days	146 days	* EHTR	24-Jan-2025	28 days	148 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-19-AUG-30	E524	30-Aug-2024	23-Jan-2025	28 days	146 days	* EHTR	24-Jan-2025	28 days	148 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-20-AUG-30	E524	30-Aug-2024	23-Jan-2025	28 days	146 days	* EHTR	24-Jan-2025	28 days	148 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-LIV-01-2024-08	E524	27-Aug-2024	20-Jan-2025	28 days	147 days	* EHTR	21-Jan-2025	28 days	148 days	* EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-LIV-02-2024-08	E524	27-Aug-2024	20-Jan-2025	28 days	147 days	* EHTR	21-Jan-2025	28 days	148 days	* EHTR





Matrix: Biota Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-LIV-03-2024-08	E524	27-Aug-2024	20-Jan-2025	28 days	147 days	✖ EHTR	21-Jan-2025	28 days	148 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-24-AUG-27	E524	27-Aug-2024	20-Jan-2025	28 days	147 days	✖ EHTR	21-Jan-2025	28 days	148 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-28-AUG-28	E524	28-Aug-2024	22-Jan-2025	28 days	147 days	✖ EHTR	23-Jan-2025	28 days	149 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-29-AUG-28	E524	28-Aug-2024	22-Jan-2025	28 days	147 days	✖ EHTR	23-Jan-2025	28 days	149 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-01-AUG-28	E524	28-Aug-2024	22-Jan-2025	28 days	147 days	✖ EHTR	23-Jan-2025	28 days	149 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-02-AUG-28	E524	28-Aug-2024	22-Jan-2025	28 days	147 days	✖ EHTR	23-Jan-2025	28 days	149 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-03-AUG-28	E524	28-Aug-2024	22-Jan-2025	28 days	147 days	✖ EHTR	23-Jan-2025	28 days	149 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-04-AUG-29	E524	28-Aug-2024	22-Jan-2025	28 days	147 days	✖ EHTR	23-Jan-2025	28 days	149 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-05-AUG-29	E524	28-Aug-2024	22-Jan-2025	28 days	147 days	✖ EHTR	23-Jan-2025	28 days	149 days	✖ EHTR





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Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-06-AUG-29	E524	28-Aug-2024	22-Jan-2025	28 days	147 days	✖ EHTR	23-Jan-2025	28 days	149 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-07-AUG-29	E524	28-Aug-2024	22-Jan-2025	28 days	147 days	✖ EHTR	23-Jan-2025	28 days	149 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-08-AUG-29	E524	28-Aug-2024	22-Jan-2025	28 days	147 days	✖ EHTR	23-Jan-2025	28 days	149 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-09-AUG-29	E524	28-Aug-2024	22-Jan-2025	28 days	147 days	✖ EHTR	23-Jan-2025	28 days	149 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-10-AUG-29	E524	28-Aug-2024	22-Jan-2025	28 days	147 days	✖ EHTR	23-Jan-2025	28 days	149 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-11-AUG-30	E524	28-Aug-2024	22-Jan-2025	28 days	147 days	✖ EHTR	23-Jan-2025	28 days	149 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-12-AUG-30	E524	28-Aug-2024	22-Jan-2025	28 days	147 days	✖ EHTR	23-Jan-2025	28 days	149 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-01-AUG-27	E524	27-Aug-2024	22-Jan-2025	28 days	148 days	✖ EHTR	23-Jan-2025	28 days	150 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-02-AUG-27	E524	27-Aug-2024	22-Jan-2025	28 days	148 days	✖ EHTR	23-Jan-2025	28 days	150 days	✖ EHTR





Matrix: Biota Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-30-AUG-28	E524	28-Aug-2024	23-Jan-2025	28 days	148 days	✖ EHTR	24-Jan-2025	28 days	150 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-34-AUG-28	E524	28-Aug-2024	23-Jan-2025	28 days	148 days	✖ EHTR	24-Jan-2025	28 days	150 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-37-AUG-28	E524	28-Aug-2024	23-Jan-2025	28 days	148 days	✖ EHTR	24-Jan-2025	28 days	150 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-01-AUG-28	E524	28-Aug-2024	23-Jan-2025	28 days	148 days	✖ EHTR	24-Jan-2025	28 days	150 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-02-AUG-28	E524	28-Aug-2024	23-Jan-2025	28 days	148 days	✖ EHTR	24-Jan-2025	28 days	150 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-08-AUG-27	E524	27-Aug-2024	23-Jan-2025	28 days	149 days	✖ EHTR	24-Jan-2025	28 days	151 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-12-AUG-27	E524	27-Aug-2024	23-Jan-2025	28 days	149 days	✖ EHTR	24-Jan-2025	28 days	151 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-22-AUG-27	E524	27-Aug-2024	23-Jan-2025	28 days	149 days	✖ EHTR	24-Jan-2025	28 days	151 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-31-AUG-27	E524	27-Aug-2024	23-Jan-2025	28 days	149 days	✖ EHTR	24-Jan-2025	28 days	151 days	✖ EHTR





Matrix: Biota Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-35-AUG-27	E524	27-Aug-2024	23-Jan-2025	28 days	149 days	✖ EHTR	24-Jan-2025	28 days	151 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-MUS-01-2024-08	E524	27-Aug-2024	28-Jan-2025	28 days	154 days	✖ EHTR	28-Jan-2025	28 days	155 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-MUS-02-2024-08	E524	27-Aug-2024	28-Jan-2025	28 days	154 days	✖ EHTR	28-Jan-2025	28 days	155 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-MUS-03-2024-08	E524	27-Aug-2024	28-Jan-2025	28 days	154 days	✖ EHTR	28-Jan-2025	28 days	155 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-09-AUG-27	E524	27-Aug-2024	28-Jan-2025	28 days	154 days	✖ EHTR	28-Jan-2025	28 days	155 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-10-AUG-27	E524	27-Aug-2024	28-Jan-2025	28 days	154 days	✖ EHTR	28-Jan-2025	28 days	155 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-13-AUG-27	E524	27-Aug-2024	28-Jan-2025	28 days	154 days	✖ EHTR	28-Jan-2025	28 days	155 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-14-AUG-27	E524	27-Aug-2024	28-Jan-2025	28 days	154 days	✖ EHTR	28-Jan-2025	28 days	155 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-15-AUG-27	E524	27-Aug-2024	28-Jan-2025	28 days	154 days	✖ EHTR	28-Jan-2025	28 days	155 days	✖ EHTR





Matrix: **Biota** Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-16-AUG-27	E524	27-Aug-2024	28-Jan-2025	28 days	154 days	✖ EHTR	28-Jan-2025	28 days	155 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-19-AUG-27	E524	27-Aug-2024	28-Jan-2025	28 days	154 days	✖ EHTR	28-Jan-2025	28 days	155 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-21-AUG-27	E524	27-Aug-2024	28-Jan-2025	28 days	154 days	✖ EHTR	28-Jan-2025	28 days	155 days	✖ EHTR
Metals : Mercury in Tissues by CVAAS (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-24-AUG-27	E524	27-Aug-2024	28-Jan-2025	28 days	154 days	✖ EHTR	28-Jan-2025	28 days	155 days	✖ EHTR
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-28-AUG-28	E464	28-Aug-2024	16-Jan-2025	180 days	141 days	✔	17-Jan-2025	180 days	142 days	✔
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-29-AUG-28	E464	28-Aug-2024	16-Jan-2025	180 days	141 days	✔	17-Jan-2025	180 days	142 days	✔
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-30-AUG-28	E464	28-Aug-2024	16-Jan-2025	180 days	141 days	✔	17-Jan-2025	180 days	142 days	✔
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-34-AUG-28	E464	28-Aug-2024	16-Jan-2025	180 days	141 days	✔	17-Jan-2025	180 days	142 days	✔
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-37-AUG-28	E464	28-Aug-2024	16-Jan-2025	180 days	141 days	✔	17-Jan-2025	180 days	142 days	✔





Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-01-AUG-27	E464	27-Aug-2024	16-Jan-2025	180 days	142 days	✓	17-Jan-2025	180 days	143 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-02-AUG-27	E464	27-Aug-2024	16-Jan-2025	180 days	142 days	✓	17-Jan-2025	180 days	143 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-08-AUG-27	E464	27-Aug-2024	16-Jan-2025	180 days	142 days	✓	17-Jan-2025	180 days	143 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-09-AUG-27	E464	27-Aug-2024	16-Jan-2025	180 days	142 days	✓	17-Jan-2025	180 days	143 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-10-AUG-27	E464	27-Aug-2024	16-Jan-2025	180 days	142 days	✓	17-Jan-2025	180 days	143 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-12-AUG-27	E464	27-Aug-2024	16-Jan-2025	180 days	142 days	✓	17-Jan-2025	180 days	143 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-13-AUG-27	E464	27-Aug-2024	16-Jan-2025	180 days	142 days	✓	17-Jan-2025	180 days	143 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-14-AUG-27	E464	27-Aug-2024	16-Jan-2025	180 days	142 days	✓	17-Jan-2025	180 days	143 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-15-AUG-27	E464	27-Aug-2024	16-Jan-2025	180 days	142 days	✓	17-Jan-2025	180 days	143 days	✓





Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

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Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-16-AUG-27	E464	27-Aug-2024	16-Jan-2025	180 days	142 days	✓	17-Jan-2025	180 days	143 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-19-AUG-27	E464	27-Aug-2024	16-Jan-2025	180 days	142 days	✓	17-Jan-2025	180 days	143 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-21-AUG-27	E464	27-Aug-2024	16-Jan-2025	180 days	142 days	✓	17-Jan-2025	180 days	143 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-22-AUG-27	E464	27-Aug-2024	16-Jan-2025	180 days	142 days	✓	17-Jan-2025	180 days	143 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-31-AUG-27	E464	27-Aug-2024	16-Jan-2025	180 days	142 days	✓	17-Jan-2025	180 days	143 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-35-AUG-27	E464	27-Aug-2024	16-Jan-2025	180 days	142 days	✓	17-Jan-2025	180 days	143 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-11-AUG-30	E464	30-Aug-2024	20-Jan-2025	180 days	144 days	✓	21-Jan-2025	180 days	145 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-12-AUG-30	E464	30-Aug-2024	20-Jan-2025	180 days	144 days	✓	21-Jan-2025	180 days	145 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-13-AUG-30	E464	30-Aug-2024	20-Jan-2025	180 days	144 days	✓	21-Jan-2025	180 days	145 days	✓





Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-14-AUG-30	E464	30-Aug-2024	20-Jan-2025	180 days	144 days	✓	21-Jan-2025	180 days	145 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-15-AUG-30	E464	30-Aug-2024	20-Jan-2025	180 days	144 days	✓	21-Jan-2025	180 days	145 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-16-AUG-30	E464	30-Aug-2024	20-Jan-2025	180 days	144 days	✓	21-Jan-2025	180 days	145 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-17-AUG-30	E464	30-Aug-2024	20-Jan-2025	180 days	144 days	✓	21-Jan-2025	180 days	145 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-18-AUG-30	E464	30-Aug-2024	20-Jan-2025	180 days	144 days	✓	21-Jan-2025	180 days	145 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-LIV-05-2024-08	E464	30-Aug-2024	22-Jan-2025	180 days	145 days	✓	23-Jan-2025	180 days	146 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-LIV-15-2024-08	E464	30-Aug-2024	22-Jan-2025	180 days	145 days	✓	23-Jan-2025	180 days	146 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-03-AUG-28	E464	29-Aug-2024	20-Jan-2025	180 days	145 days	✓	21-Jan-2025	180 days	146 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-04-AUG-29	E464	29-Aug-2024	20-Jan-2025	180 days	145 days	✓	21-Jan-2025	180 days	146 days	✓





Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-05-AUG-29	E464	29-Aug-2024	20-Jan-2025	180 days	145 days	✓	21-Jan-2025	180 days	146 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-06-AUG-29	E464	29-Aug-2024	20-Jan-2025	180 days	145 days	✓	21-Jan-2025	180 days	146 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-07-AUG-29	E464	29-Aug-2024	20-Jan-2025	180 days	145 days	✓	21-Jan-2025	180 days	146 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-08-AUG-29	E464	29-Aug-2024	20-Jan-2025	180 days	145 days	✓	21-Jan-2025	180 days	146 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-09-AUG-29	E464	29-Aug-2024	20-Jan-2025	180 days	145 days	✓	21-Jan-2025	180 days	146 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-10-AUG-29	E464	29-Aug-2024	20-Jan-2025	180 days	145 days	✓	21-Jan-2025	180 days	146 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-19-AUG-30	E464	30-Aug-2024	22-Jan-2025	180 days	145 days	✓	23-Jan-2025	180 days	146 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-20-AUG-30	E464	30-Aug-2024	22-Jan-2025	180 days	145 days	✓	23-Jan-2025	180 days	146 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-MUS-05-2024-08	E464	30-Aug-2024	23-Jan-2025	180 days	146 days	✓	27-Jan-2025	180 days	150 days	✓



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Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-MUS-15-2024-08	E464	30-Aug-2024	23-Jan-2025	180 days	146 days	✓	27-Jan-2025	180 days	150 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-13-AUG-30	E464	30-Aug-2024	23-Jan-2025	180 days	146 days	✓	27-Jan-2025	180 days	150 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-14-AUG-30	E464	30-Aug-2024	23-Jan-2025	180 days	146 days	✓	27-Jan-2025	180 days	150 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-15-AUG-30	E464	30-Aug-2024	23-Jan-2025	180 days	146 days	✓	27-Jan-2025	180 days	150 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-16-AUG-30	E464	30-Aug-2024	23-Jan-2025	180 days	146 days	✓	27-Jan-2025	180 days	150 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-17-AUG-30	E464	30-Aug-2024	23-Jan-2025	180 days	146 days	✓	27-Jan-2025	180 days	150 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-18-AUG-30	E464	30-Aug-2024	23-Jan-2025	180 days	146 days	✓	27-Jan-2025	180 days	150 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-19-AUG-30	E464	30-Aug-2024	23-Jan-2025	180 days	146 days	✓	27-Jan-2025	180 days	150 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-20-AUG-30	E464	30-Aug-2024	23-Jan-2025	180 days	146 days	✓	27-Jan-2025	180 days	150 days	✓



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Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-LIV-01-2024-08	E464	27-Aug-2024	20-Jan-2025	180 days	147 days	✓	21-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-LIV-02-2024-08	E464	27-Aug-2024	20-Jan-2025	180 days	147 days	✓	21-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-LIV-03-2024-08	E464	27-Aug-2024	20-Jan-2025	180 days	147 days	✓	21-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-LIV-24-AUG-27	E464	27-Aug-2024	20-Jan-2025	180 days	147 days	✓	21-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-28-AUG-28	E464	28-Aug-2024	22-Jan-2025	180 days	147 days	✓	23-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-29-AUG-28	E464	28-Aug-2024	22-Jan-2025	180 days	147 days	✓	23-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-01-AUG-28	E464	28-Aug-2024	22-Jan-2025	180 days	147 days	✓	23-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-02-AUG-28	E464	28-Aug-2024	22-Jan-2025	180 days	147 days	✓	23-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-03-AUG-28	E464	28-Aug-2024	22-Jan-2025	180 days	147 days	✓	23-Jan-2025	180 days	148 days	✓



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Matrix: Biota Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-04-AUG-29	E464	28-Aug-2024	22-Jan-2025	180 days	147 days	✓	23-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-05-AUG-29	E464	28-Aug-2024	22-Jan-2025	180 days	147 days	✓	23-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-06-AUG-29	E464	28-Aug-2024	22-Jan-2025	180 days	147 days	✓	23-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-07-AUG-29	E464	28-Aug-2024	22-Jan-2025	180 days	147 days	✓	23-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-08-AUG-29	E464	28-Aug-2024	22-Jan-2025	180 days	147 days	✓	23-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-09-AUG-29	E464	28-Aug-2024	22-Jan-2025	180 days	147 days	✓	23-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-10-AUG-29	E464	28-Aug-2024	22-Jan-2025	180 days	147 days	✓	23-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-11-AUG-30	E464	28-Aug-2024	22-Jan-2025	180 days	147 days	✓	23-Jan-2025	180 days	148 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-MUS-12-AUG-30	E464	28-Aug-2024	22-Jan-2025	180 days	147 days	✓	23-Jan-2025	180 days	148 days	✓



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Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-01-AUG-27	E464	27-Aug-2024	22-Jan-2025	180 days	148 days	✓	23-Jan-2025	180 days	149 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-02-AUG-27	E464	27-Aug-2024	22-Jan-2025	180 days	148 days	✓	23-Jan-2025	180 days	149 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-30-AUG-28	E464	28-Aug-2024	23-Jan-2025	180 days	148 days	✓	27-Jan-2025	180 days	152 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-34-AUG-28	E464	28-Aug-2024	23-Jan-2025	180 days	148 days	✓	27-Jan-2025	180 days	152 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-37-AUG-28	E464	28-Aug-2024	23-Jan-2025	180 days	148 days	✓	27-Jan-2025	180 days	152 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-01-AUG-28	E464	28-Aug-2024	23-Jan-2025	180 days	148 days	✓	27-Jan-2025	180 days	152 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-QURL-AC-LI-02-AUG-28	E464	28-Aug-2024	23-Jan-2025	180 days	148 days	✓	27-Jan-2025	180 days	152 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-08-AUG-27	E464	27-Aug-2024	23-Jan-2025	180 days	149 days	✓	27-Jan-2025	180 days	153 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-12-AUG-27	E464	27-Aug-2024	23-Jan-2025	180 days	149 days	✓	27-Jan-2025	180 days	153 days	✓



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Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-22-AUG-27	E464	27-Aug-2024	23-Jan-2025	180 days	149 days	✓	27-Jan-2025	180 days	153 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-31-AUG-27	E464	27-Aug-2024	23-Jan-2025	180 days	149 days	✓	27-Jan-2025	180 days	153 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-35-AUG-27	E464	27-Aug-2024	23-Jan-2025	180 days	149 days	✓	27-Jan-2025	180 days	153 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-MUS-01-2024-08	E464	27-Aug-2024	28-Jan-2025	180 days	154 days	✓	29-Jan-2025	180 days	155 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-MUS-02-2024-08	E464	27-Aug-2024	28-Jan-2025	180 days	154 days	✓	29-Jan-2025	180 days	155 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-DUP-AC-MUS-03-2024-08	E464	27-Aug-2024	28-Jan-2025	180 days	154 days	✓	29-Jan-2025	180 days	155 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-09-AUG-27	E464	27-Aug-2024	28-Jan-2025	180 days	154 days	✓	29-Jan-2025	180 days	155 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-10-AUG-27	E464	27-Aug-2024	28-Jan-2025	180 days	154 days	✓	29-Jan-2025	180 days	155 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-13-AUG-27	E464	27-Aug-2024	28-Jan-2025	180 days	154 days	✓	29-Jan-2025	180 days	155 days	✓





Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-14-AUG-27	E464	27-Aug-2024	28-Jan-2025	180 days	154 days	✓	29-Jan-2025	180 days	155 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-15-AUG-27	E464	27-Aug-2024	28-Jan-2025	180 days	154 days	✓	29-Jan-2025	180 days	155 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-16-AUG-27	E464	27-Aug-2024	28-Jan-2025	180 days	154 days	✓	29-Jan-2025	180 days	155 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-19-AUG-27	E464	27-Aug-2024	28-Jan-2025	180 days	154 days	✓	29-Jan-2025	180 days	155 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-21-AUG-27	E464	27-Aug-2024	28-Jan-2025	180 days	154 days	✓	29-Jan-2025	180 days	155 days	✓
Metals : Metals in Tissue by ICPMS Analysis (DRY units, Routine)										
Glass soil jar/Teflon lined cap BA-IKLL-AC-MUS-24-AUG-27	E464	27-Aug-2024	28-Jan-2025	180 days	154 days	✓	29-Jan-2025	180 days	155 days	✓
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-DUP-AC-LIV-05-2024-08	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-DUP-AC-LIV-15-2024-08	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-DUP-AC-MUS-05-2024-08	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	





Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-DUP-AC-MUS-15-2024-08	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-11-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-12-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-13-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-14-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-15-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-16-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-17-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-18-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	





Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-19-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-20-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-13-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-14-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-15-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-16-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-17-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-18-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-19-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	





Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-20-AUG-30	E144	30-Aug-2024	----	----	----		11-Feb-2025	----	166 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-03-AUG-28	E144	29-Aug-2024	----	----	----		11-Feb-2025	----	167 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-04-AUG-29	E144	29-Aug-2024	----	----	----		11-Feb-2025	----	167 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-05-AUG-29	E144	29-Aug-2024	----	----	----		11-Feb-2025	----	167 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-06-AUG-29	E144	29-Aug-2024	----	----	----		11-Feb-2025	----	167 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-07-AUG-29	E144	29-Aug-2024	----	----	----		11-Feb-2025	----	167 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-08-AUG-29	E144	29-Aug-2024	----	----	----		11-Feb-2025	----	167 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-09-AUG-29	E144	29-Aug-2024	----	----	----		11-Feb-2025	----	167 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-10-AUG-29	E144	29-Aug-2024	----	----	----		11-Feb-2025	----	167 days	





Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-28-AUG-28	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-29-AUG-28	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-30-AUG-28	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-34-AUG-28	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-37-AUG-28	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-28-AUG-28	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-29-AUG-28	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-30-AUG-28	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-34-AUG-28	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	





Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-37-AUG-28	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-01-AUG-28	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-LI-02-AUG-28	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-01-AUG-28	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-02-AUG-28	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-03-AUG-28	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-04-AUG-29	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-05-AUG-29	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-06-AUG-29	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	





Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-07-AUG-29	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-08-AUG-29	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-09-AUG-29	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-10-AUG-29	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-11-AUG-30	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-QURL-AC-MUS-12-AUG-30	E144	28-Aug-2024	----	----	----		11-Feb-2025	----	168 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-DUP-AC-LIV-01-2024-08	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-DUP-AC-LIV-02-2024-08	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-DUP-AC-LIV-03-2024-08	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	





Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-DUP-AC-MUS-01-2024-08	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-DUP-AC-MUS-02-2024-08	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-DUP-AC-MUS-03-2024-08	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-01-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-02-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-08-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-09-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-10-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-12-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	





Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-13-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-14-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-15-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-16-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-19-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-21-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-22-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-24-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-31-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	





Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-LIV-35-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-01-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-02-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-08-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-09-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-10-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-12-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-13-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-14-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	





Matrix: **Biota** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-15-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-16-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-19-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-21-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-22-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-24-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-31-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA-IKLL-AC-MUS-35-AUG-27	E144	27-Aug-2024	----	----	----		11-Feb-2025	----	169 days	

**Legend & Qualifier Definitions**

Rec. HT: ALS recommended hold time (see units).





Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: Biota

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Moisture Content by Gravimetry	E144	1870554	5	92	5.4	5.0	✔
Metals in Tissue by ICPMS Analysis (DRY units, Routine)	E464	1841075	5	92	5.4	5.0	✔
Mercury in Tissues by CVAAS (DRY units, Routine)	E524	1841076	5	92	5.4	5.0	✔
Laboratory Control Samples (LCS)							
Moisture Content by Gravimetry	E144	1870554	5	92	5.4	5.0	✔
Metals in Tissue by ICPMS Analysis (DRY units, Routine)	E464	1841075	5	92	5.4	5.0	✔
Mercury in Tissues by CVAAS (DRY units, Routine)	E524	1841076	5	92	5.4	5.0	✔
Method Blanks (MB)							
Moisture Content by Gravimetry	E144	1870554	5	92	5.4	5.0	✔
Metals in Tissue by ICPMS Analysis (DRY units, Routine)	E464	1841075	5	92	5.4	5.0	✔
Mercury in Tissues by CVAAS (DRY units, Routine)	E524	1841076	5	92	5.4	5.0	✔
Matrix Spikes (MS)							
Metals in Tissue by ICPMS Analysis (DRY units, Routine)	E464	1841075	5	92	5.4	5.0	✔
Mercury in Tissues by CVAAS (DRY units, Routine)	E524	1841076	5	92	5.4	5.0	✔





## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

<i>Analytical Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Moisture Content by Gravimetry	E144 ALS Environmental - Burlington	Biota	Puget Sound Water Quality Authority/CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Metals in Tissue by ICPMS Analysis (DRY units, Routine)	E464 ALS Environmental - Burlington	Biota	EPA Method 3052 (preparation) and EPA Method 6020B (analysis)	Tissue samples are homogenized and sub-sampled, then digested using a closed-vessel microwave process. Instrumental analysis is performed via collision-reaction cell ICPMS. Data is reported on a dry weight basis.
Mercury in Tissues by CVAAS (DRY units, Routine)	E524 ALS Environmental - Burlington	Biota	EPA Method 3052 (preparation) and EPA Method 7470A (analytical)	After microwave digestion, a sub-sample is re-digested in oxidizing reagents, using an open-vessel hotblock method. Samples are treated with a reductant to facilitate analysis by CVAA. Data is reported on a dry weight basis.
<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Metals and Mercury in Tissues - Digestion	EP464 ALS Environmental - Burlington	Biota	EPA Method 3052 (preparation)	Tissue samples are homogenized and sub-sampled, then digested using a closed-vessel microwave process.



QUALITY CONTROL REPORT

Work Order	: WT2437881	Page	: 1 of 26
Client	: Baffinland Iron Mines Corporation	Laboratory	: ALS Environmental - Waterloo
Contact	: Environmental Lab Results	Account Manager	: Rick Hawthorne
Address	: 360 Oakville Place Dr Suite 300 Oakville ON Canada L6H 6K8	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 247202.00XX (MILNE 2024)	Date Samples Received	: 19-Dec-2024 10:30
PO	: 4500140399	Date Analysis Commenced	: 16-Jan-2025
C-O-C number	: 19-DEC-2024 MINNOW FISH TISSUE	Issue Date	: 14-Feb-2025 15:52
Sampler	: MINNOW		
Site	: ----		
Quote number	: 2024-2025 Scope of Work		
No. of samples received	: 92		
No. of samples analysed	: 92		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Milithza Silva	Manager - Inorganics	Burlington Metals, Burlington, Ontario
Philip Elder	Technical Manager	Burlington Organics, Burlington, Ontario





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## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

### Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

# = Indicates a QC result that did not meet the ALS DQO.

## Workorder Comments

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Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

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Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1870554)											
WT2437881-001	BA-IKLL-AC-LIV-01-AUG-27	Moisture	----	E144	0.50	%	74.3	62.7	16.9%	20%	----
Physical Tests (QC Lot: 1870587)											
WT2437881-021	BA-IKLL-AC-LIV-24-AUG-27	Moisture	----	E144	0.50	%	68.5	81.4	17.2%	20%	----
Physical Tests (QC Lot: 1870610)											
WT2437881-041	BA-QURL-AC-LI-19-AUG-30	Moisture	----	E144	0.50	%	78.3	78.2	0.136%	20%	----
Physical Tests (QC Lot: 1870626)											
WT2437881-061	BA-QURL-AC-MUS-13-AUG-30	Moisture	----	E144	0.50	%	76.6	76.8	0.187%	20%	----
Physical Tests (QC Lot: 1870635)											
WT2437881-081	BA-IKLL-AC-MUS-09-AUG-27	Moisture	----	E144	0.50	%	75.9	76.3	0.527%	20%	----
Metals (QC Lot: 1841075)											
WT2437881-002	BA-IKLL-AC-LIV-02-AUG-27	Aluminum	7429-90-5	E464	2.0	mg/kg	68.5	77.7	12.6%	20%	----
		Antimony	7440-36-0	E464	0.010	mg/kg	0.011	<0.010	0.0007	Diff <2x LOR	J
		Arsenic	7440-38-2	E464	0.0200	mg/kg	1.37	1.57	13.8%	20%	----
		Barium	7440-39-3	E464	0.10	mg/kg	0.63	0.51	0.12	Diff <2x LOR	J
		Beryllium	7440-41-7	E464	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	J
		Bismuth	7440-69-9	E464	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	J
		Boron	7440-42-8	E464	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	J
		Cadmium	7440-43-9	E464	0.0050	mg/kg	4.15	4.02	3.28%	20%	----
		Calcium	7440-70-2	E464	25	mg/kg	503	625	21.5%	20%	DUP-H
		Chromium	7440-47-3	E464	0.050	mg/kg	0.246	0.192	0.054	Diff <2x LOR	J
		Cobalt	7440-48-4	E464	0.020	mg/kg	0.820	0.816	0.598%	20%	----
		Copper	7440-50-8	E464	0.10	mg/kg	58.6	58.2	0.681%	20%	----
		Iron	7439-89-6	E464	2.5	mg/kg	2380	1990	17.8%	20%	----
		Lead	7439-92-1	E464	0.020	mg/kg	0.321	0.311	3.28%	20%	----
		Lithium	7439-93-2	E464	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	J
		Magnesium	7439-95-4	E464	5.0	mg/kg	792	777	1.92%	20%	----
		Manganese	7439-96-5	E464	0.50	mg/kg	7.57	8.53	12.0%	20%	----
		Molybdenum	7439-98-7	E464	0.020	mg/kg	0.709	0.840	16.8%	20%	----





Sub-Matrix: Biota					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Metals (QC Lot: 1841075) - continued											
WT2437881-002	BA-IKLL-AC-LIV-02-AUG-27	Nickel	7440-02-0	E464	0.20	mg/kg	0.51	0.44	0.07	Diff <2x LOR	J
		Phosphorus	7723-14-0	E464	10	mg/kg	13000	14500	10.4%	20%	----
		Potassium	7440-09-7	E464	20	mg/kg	12000	12300	2.94%	20%	----
		Rubidium	7440-17-7	E464	0.10	mg/kg	4.82	4.91	1.98%	20%	----
		Selenium	7782-49-2	E464	0.050	mg/kg	6.09	6.40	4.94%	20%	----
		Silver	7440-22-4	E464	0.0050	mg/kg	1.36	1.45	6.09%	20%	----
		Sodium	7440-23-5	E464	25	mg/kg	7210	7480	3.64%	20%	----
		Strontium	7440-24-6	E464	0.10	mg/kg	1.07	1.07	0.0314%	20%	----
		Tellurium	13494-80-9	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Thallium	7440-28-0	E464	0.0020	mg/kg	0.0374	0.0370	0.958%	20%	----
		Tin	7440-31-5	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Tungsten	7440-33-7	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Uranium	7440-61-1	E464	0.020	mg/kg	0.028	0.025	0.003	Diff <2x LOR	J
		Vanadium	7440-62-2	E464	0.10	mg/kg	0.62	0.62	0.004	Diff <2x LOR	J
		Zinc	7440-66-6	E464	0.50	mg/kg	137	142	3.74%	20%	----
		Zirconium	7440-67-7	E464	0.30	mg/kg	<0.30	<0.30	0	Diff <2x LOR	J
Metals (QC Lot: 1841076)											
WT2437881-002	BA-IKLL-AC-LIV-02-AUG-27	Mercury	7439-97-6	E524	0.031	mg/kg	0.462	0.470	1.77%	25%	----
Metals (QC Lot: 1844973)											
WT2437881-021	BA-IKLL-AC-LIV-24-AUG-27	Aluminum	7429-90-5	E464	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	J
		Antimony	7440-36-0	E464	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	J
		Arsenic	7440-38-2	E464	0.0200	mg/kg	0.657	0.679	3.27%	20%	----
		Barium	7440-39-3	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Beryllium	7440-41-7	E464	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	J
		Bismuth	7440-69-9	E464	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	J
		Boron	7440-42-8	E464	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	J
		Cadmium	7440-43-9	E464	0.0050	mg/kg	1.24	1.28	2.55%	20%	----
		Calcium	7440-70-2	E464	25	mg/kg	126	120	6	Diff <2x LOR	J
		Chromium	7440-47-3	E464	0.050	mg/kg	0.137	# 0.259	0.122	Diff <2x LOR	DUP-H,J
		Cobalt	7440-48-4	E464	0.020	mg/kg	0.130	0.127	0.003	Diff <2x LOR	J
		Copper	7440-50-8	E464	0.10	mg/kg	25.3	26.8	5.84%	20%	----
		Iron	7439-89-6	E464	2.5	mg/kg	459	480	4.36%	20%	----
		Lead	7439-92-1	E464	0.020	mg/kg	0.053	0.063	0.010	Diff <2x LOR	J





Sub-Matrix: Biota					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Metals (QC Lot: 1844973) - continued											
WT2437881-021	BA-IKLL-AC-LIV-24-AUG-27	Lithium	7439-93-2	E464	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	J
		Magnesium	7439-95-4	E464	5.0	mg/kg	501	499	0.327%	20%	----
		Manganese	7439-96-5	E464	0.50	mg/kg	2.69	2.60	0.08	Diff <2x LOR	J
		Molybdenum	7439-98-7	E464	0.020	mg/kg	0.681	0.682	0.0877%	20%	----
		Nickel	7440-02-0	E464	0.20	mg/kg	0.24	0.23	0.01	Diff <2x LOR	J
		Phosphorus	7723-14-0	E464	10	mg/kg	9450	9690	2.46%	20%	----
		Potassium	7440-09-7	E464	20	mg/kg	8000	8250	3.05%	20%	----
		Rubidium	7440-17-7	E464	0.10	mg/kg	3.67	3.69	0.527%	20%	----
		Selenium	7782-49-2	E464	0.050	mg/kg	4.68	4.83	3.10%	20%	----
		Silver	7440-22-4	E464	0.0050	mg/kg	0.618	0.635	2.71%	20%	----
		Sodium	7440-23-5	E464	25	mg/kg	3400	3400	0.110%	20%	----
		Strontium	7440-24-6	E464	0.10	mg/kg	0.36	0.34	0.02	Diff <2x LOR	J
		Tellurium	13494-80-9	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Thallium	7440-28-0	E464	0.0020	mg/kg	0.0381	0.0329	14.5%	20%	----
		Tin	7440-31-5	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Tungsten	7440-33-7	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Uranium	7440-61-1	E464	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	J
		Vanadium	7440-62-2	E464	0.10	mg/kg	0.43	0.45	0.02	Diff <2x LOR	J
		Zinc	7440-66-6	E464	0.50	mg/kg	92.0	90.9	1.12%	20%	----
		Zirconium	7440-67-7	E464	0.30	mg/kg	<0.30	<0.30	0	Diff <2x LOR	J
Metals (QC Lot: 1844974)											
WT2437881-021	BA-IKLL-AC-LIV-24-AUG-27	Mercury	7439-97-6	E524	0.031	mg/kg	0.196	0.200	0.004	Diff <2x LOR	J
Metals (QC Lot: 1847480)											
WT2437881-048	BA-IKLL-AC-MUS-29-AUG-28	Aluminum	7429-90-5	E464	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	J
		Antimony	7440-36-0	E464	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	J
		Arsenic	7440-38-2	E464	0.0200	mg/kg	2.95	2.98	0.957%	20%	----
		Barium	7440-39-3	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Beryllium	7440-41-7	E464	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	J
		Bismuth	7440-69-9	E464	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	J
		Boron	7440-42-8	E464	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	J
		Cadmium	7440-43-9	E464	0.0050	mg/kg	0.0151	0.0131	0.0020	Diff <2x LOR	J
		Calcium	7440-70-2	E464	25	mg/kg	121	116	5	Diff <2x LOR	J
		Chromium	7440-47-3	E464	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	J





Sub-Matrix: Biota					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Metals (QC Lot: 1847480) - continued											
WT2437881-048	BA-IKLL-AC-MUS-29-AUG-28	Cobalt	7440-48-4	E464	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	J
		Copper	7440-50-8	E464	0.10	mg/kg	2.14	2.07	3.14%	20%	----
		Iron	7439-89-6	E464	2.5	mg/kg	14.3	13.2	1.1	Diff <2x LOR	J
		Lead	7439-92-1	E464	0.020	mg/kg	<0.020	0.025	0.005	Diff <2x LOR	J
		Lithium	7439-93-2	E464	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	J
		Magnesium	7439-95-4	E464	5.0	mg/kg	1220	1200	2.00%	20%	----
		Manganese	7439-96-5	E464	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	J
		Molybdenum	7439-98-7	E464	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	J
		Nickel	7440-02-0	E464	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	J
		Phosphorus	7723-14-0	E464	10	mg/kg	10000	9860	1.79%	20%	----
		Potassium	7440-09-7	E464	20	mg/kg	15600	15400	1.53%	20%	----
		Rubidium	7440-17-7	E464	0.10	mg/kg	4.34	4.22	2.78%	20%	----
		Selenium	7782-49-2	E464	0.050	mg/kg	1.26	1.23	2.67%	20%	----
		Silver	7440-22-4	E464	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	J
		Sodium	7440-23-5	E464	25	mg/kg	958	938	2.11%	20%	----
		Strontium	7440-24-6	E464	0.10	mg/kg	0.14	0.13	0.010	Diff <2x LOR	J
		Tellurium	13494-80-9	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Thallium	7440-28-0	E464	0.0020	mg/kg	0.0048	0.0059	0.0010	Diff <2x LOR	J
		Tin	7440-31-5	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Tungsten	7440-33-7	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Uranium	7440-61-1	E464	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	J
		Vanadium	7440-62-2	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Zinc	7440-66-6	E464	0.50	mg/kg	15.1	14.8	1.64%	20%	----
		Zirconium	7440-67-7	E464	0.30	mg/kg	<0.30	<0.30	0	Diff <2x LOR	J
Metals (QC Lot: 1847481)											
WT2437881-048	BA-IKLL-AC-MUS-29-AUG-28	Mercury	7439-97-6	E524	0.031	mg/kg	0.172	0.174	0.002	Diff <2x LOR	J
Metals (QC Lot: 1848876)											
WT2437881-061	BA-QURL-AC-MUS-13-AUG-30	Aluminum	7429-90-5	E464	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	J
		Antimony	7440-36-0	E464	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	J
		Arsenic	7440-38-2	E464	0.0200	mg/kg	2.20	2.24	1.62%	20%	----
		Barium	7440-39-3	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Beryllium	7440-41-7	E464	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	J
		Bismuth	7440-69-9	E464	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	J





Sub-Matrix: Biota					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Metals (QC Lot: 1848876) - continued											
WT2437881-061	BA-QURL-AC-MUS-13-AU G-30	Boron	7440-42-8	E464	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	J
		Cadmium	7440-43-9	E464	0.0050	mg/kg	0.0073	0.0067	0.0006	Diff <2x LOR	J
		Calcium	7440-70-2	E464	25	mg/kg	209	202	7	Diff <2x LOR	J
		Chromium	7440-47-3	E464	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	J
		Cobalt	7440-48-4	E464	0.020	mg/kg	0.023	<0.020	0.003	Diff <2x LOR	J
		Copper	7440-50-8	E464	0.10	mg/kg	2.14	2.57	18.1%	20%	----
		Iron	7439-89-6	E464	2.5	mg/kg	24.1	27.0	11.3%	20%	----
		Lead	7439-92-1	E464	0.020	mg/kg	<0.020	0.024	0.004	Diff <2x LOR	J
		Lithium	7439-93-2	E464	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	J
		Magnesium	7439-95-4	E464	5.0	mg/kg	957	938	1.94%	20%	----
		Manganese	7439-96-5	E464	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	J
		Molybdenum	7439-98-7	E464	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	J
		Nickel	7440-02-0	E464	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	J
		Phosphorus	7723-14-0	E464	10	mg/kg	8590	8760	2.01%	20%	----
		Potassium	7440-09-7	E464	20	mg/kg	13600	14200	3.68%	20%	----
		Rubidium	7440-17-7	E464	0.10	mg/kg	5.94	5.95	0.289%	20%	----
		Selenium	7782-49-2	E464	0.050	mg/kg	1.06	0.987	7.39%	20%	----
		Silver	7440-22-4	E464	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	J
		Sodium	7440-23-5	E464	25	mg/kg	2760	2750	0.208%	20%	----
		Strontium	7440-24-6	E464	0.10	mg/kg	0.12	0.11	0.007	Diff <2x LOR	J
		Tellurium	13494-80-9	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Thallium	7440-28-0	E464	0.0020	mg/kg	0.0108	0.0103	0.0004	Diff <2x LOR	J
		Tin	7440-31-5	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Tungsten	7440-33-7	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Uranium	7440-61-1	E464	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	J
		Vanadium	7440-62-2	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Zinc	7440-66-6	E464	0.50	mg/kg	14.7	14.7	0.111%	20%	----
		Zirconium	7440-67-7	E464	0.30	mg/kg	<0.30	<0.30	0	Diff <2x LOR	J
Metals (QC Lot: 1848877)											
WT2437881-061	BA-QURL-AC-MUS-13-AU G-30	Mercury	7439-97-6	E524	0.031	mg/kg	0.199	0.187	0.012	Diff <2x LOR	J
Metals (QC Lot: 1853948)											
WT2437881-081	BA-IKLL-AC-MUS-09-AUG-27	Aluminum	7429-90-5	E464	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	J
		Antimony	7440-36-0	E464	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	J





Sub-Matrix: Biota					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Metals (QC Lot: 1853948) - continued											
WT2437881-081	BA-IKLL-AC-MUS-09-AUG-27	Arsenic	7440-38-2	E464	0.0200	mg/kg	0.602	0.606	0.711%	20%	----
		Barium	7440-39-3	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Beryllium	7440-41-7	E464	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	J
		Bismuth	7440-69-9	E464	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	J
		Boron	7440-42-8	E464	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	J
		Cadmium	7440-43-9	E464	0.0050	mg/kg	0.0126	0.0100	0.0026	Diff <2x LOR	J
		Calcium	7440-70-2	E464	25	mg/kg	158	154	4	Diff <2x LOR	J
		Chromium	7440-47-3	E464	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	J
		Cobalt	7440-48-4	E464	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	J
		Copper	7440-50-8	E464	0.10	mg/kg	2.53	2.43	3.81%	20%	----
		Iron	7439-89-6	E464	2.5	mg/kg	30.2	29.3	2.87%	20%	----
		Lead	7439-92-1	E464	0.020	mg/kg	0.027	0.024	0.003	Diff <2x LOR	J
		Lithium	7439-93-2	E464	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	J
		Magnesium	7439-95-4	E464	5.0	mg/kg	1260	1230	2.32%	20%	----
		Manganese	7439-96-5	E464	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	J
		Molybdenum	7439-98-7	E464	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	J
		Nickel	7440-02-0	E464	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	J
		Phosphorus	7723-14-0	E464	10	mg/kg	10500	10300	1.56%	20%	----
		Potassium	7440-09-7	E464	20	mg/kg	17200	17300	0.499%	20%	----
		Rubidium	7440-17-7	E464	0.10	mg/kg	5.64	5.68	0.650%	20%	----
		Selenium	7782-49-2	E464	0.050	mg/kg	1.12	1.12	0.156%	20%	----
		Silver	7440-22-4	E464	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	J
		Sodium	7440-23-5	E464	25	mg/kg	1410	1390	1.28%	20%	----
		Strontium	7440-24-6	E464	0.10	mg/kg	0.20	0.20	0.007	Diff <2x LOR	J
		Tellurium	13494-80-9	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Thallium	7440-28-0	E464	0.0020	mg/kg	0.0071	0.0066	0.0006	Diff <2x LOR	J
		Tin	7440-31-5	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Tungsten	7440-33-7	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Uranium	7440-61-1	E464	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	J
		Vanadium	7440-62-2	E464	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	J
		Zinc	7440-66-6	E464	0.50	mg/kg	14.6	14.6	0.0487%	20%	----
		Zirconium	7440-67-7	E464	0.30	mg/kg	<0.30	<0.30	0	Diff <2x LOR	J
Metals (QC Lot: 1853949)											





Sub-Matrix: Biota					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Metals (QC Lot: 1853949) - continued											
WT2437881-081	BA-IKLL-AC-MUS-09-AUG-27	Mercury	7439-97-6	E524	0.031	mg/kg	0.199	0.192	0.006	Diff <2x LOR	J

Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
J	Duplicate results and limits are expressed in terms of absolute difference.





Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Biota

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1870554)						
Moisture	----	E144	0.5	%	<0.50	----
Physical Tests (QCLot: 1870587)						
Moisture	----	E144	0.5	%	<0.50	----
Physical Tests (QCLot: 1870610)						
Moisture	----	E144	0.5	%	<0.50	----
Physical Tests (QCLot: 1870626)						
Moisture	----	E144	0.5	%	<0.50	----
Physical Tests (QCLot: 1870635)						
Moisture	----	E144	0.5	%	<0.50	----
Metals (QCLot: 1841075)						
Aluminum	7429-90-5	E464	2	mg/kg	<2.0	----
Antimony	7440-36-0	E464	0.01	mg/kg	<0.010	----
Arsenic	7440-38-2	E464	0.02	mg/kg	<0.0200	----
Barium	7440-39-3	E464	0.1	mg/kg	<0.10	----
Beryllium	7440-41-7	E464	0.01	mg/kg	<0.010	----
Bismuth	7440-69-9	E464	0.01	mg/kg	<0.010	----
Boron	7440-42-8	E464	1	mg/kg	<1.0	----
Cadmium	7440-43-9	E464	0.005	mg/kg	<0.0050	----
Calcium	7440-70-2	E464	25	mg/kg	<25	----
Chromium	7440-47-3	E464	0.05	mg/kg	<0.050	----
Cobalt	7440-48-4	E464	0.02	mg/kg	<0.020	----
Copper	7440-50-8	E464	0.1	mg/kg	<0.10	----
Iron	7439-89-6	E464	2.5	mg/kg	<2.5	----
Lead	7439-92-1	E464	0.02	mg/kg	<0.020	----
Lithium	7439-93-2	E464	0.5	mg/kg	<0.50	----
Magnesium	7439-95-4	E464	5	mg/kg	<5.0	----
Manganese	7439-96-5	E464	0.5	mg/kg	<0.50	----
Molybdenum	7439-98-7	E464	0.02	mg/kg	<0.020	----
Nickel	7440-02-0	E464	0.2	mg/kg	<0.20	----
Phosphorus	7723-14-0	E464	10	mg/kg	<10	----
Potassium	7440-09-7	E464	20	mg/kg	<20	----
Rubidium	7440-17-7	E464	0.1	mg/kg	<0.10	----





Sub-Matrix: Biota

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 1841075) - continued						
Selenium	7782-49-2	E464	0.05	mg/kg	<0.050	----
Silver	7440-22-4	E464	0.005	mg/kg	<0.0050	----
Sodium	7440-23-5	E464	25	mg/kg	<25	----
Strontium	7440-24-6	E464	0.1	mg/kg	<0.10	----
Tellurium	13494-80-9	E464	0.1	mg/kg	<0.10	----
Thallium	7440-28-0	E464	0.002	mg/kg	<0.0020	----
Tin	7440-31-5	E464	0.1	mg/kg	<0.10	----
Tungsten	7440-33-7	E464	0.1	mg/kg	<0.10	----
Uranium	7440-61-1	E464	0.02	mg/kg	<0.020	----
Vanadium	7440-62-2	E464	0.1	mg/kg	<0.10	----
Zinc	7440-66-6	E464	0.5	mg/kg	<0.50	----
Zirconium	7440-67-7	E464	0.3	mg/kg	<0.30	----
Metals (QCLot: 1841076)						
Mercury	7439-97-6	E524	0.0313	mg/kg	<0.031	----
Metals (QCLot: 1844973)						
Aluminum	7429-90-5	E464	2	mg/kg	<2.0	----
Antimony	7440-36-0	E464	0.01	mg/kg	<0.010	----
Arsenic	7440-38-2	E464	0.02	mg/kg	<0.0200	----
Barium	7440-39-3	E464	0.1	mg/kg	<0.10	----
Beryllium	7440-41-7	E464	0.01	mg/kg	<0.010	----
Bismuth	7440-69-9	E464	0.01	mg/kg	<0.010	----
Boron	7440-42-8	E464	1	mg/kg	<1.0	----
Cadmium	7440-43-9	E464	0.005	mg/kg	<0.0050	----
Calcium	7440-70-2	E464	25	mg/kg	<25	----
Chromium	7440-47-3	E464	0.05	mg/kg	<0.050	----
Cobalt	7440-48-4	E464	0.02	mg/kg	<0.020	----
Copper	7440-50-8	E464	0.1	mg/kg	<0.10	----
Iron	7439-89-6	E464	2.5	mg/kg	<2.5	----
Lead	7439-92-1	E464	0.02	mg/kg	<0.020	----
Lithium	7439-93-2	E464	0.5	mg/kg	<0.50	----
Magnesium	7439-95-4	E464	5	mg/kg	<5.0	----
Manganese	7439-96-5	E464	0.5	mg/kg	<0.50	----
Molybdenum	7439-98-7	E464	0.02	mg/kg	<0.020	----
Nickel	7440-02-0	E464	0.2	mg/kg	<0.20	----
Phosphorus	7723-14-0	E464	10	mg/kg	<10	----





Sub-Matrix: Biota

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 1844973) - continued						
Potassium	7440-09-7	E464	20	mg/kg	<20	----
Rubidium	7440-17-7	E464	0.1	mg/kg	<0.10	----
Selenium	7782-49-2	E464	0.05	mg/kg	<0.050	----
Silver	7440-22-4	E464	0.005	mg/kg	<0.0050	----
Sodium	7440-23-5	E464	25	mg/kg	<25	----
Strontium	7440-24-6	E464	0.1	mg/kg	<0.10	----
Tellurium	13494-80-9	E464	0.1	mg/kg	<0.10	----
Thallium	7440-28-0	E464	0.002	mg/kg	<0.0020	----
Tin	7440-31-5	E464	0.1	mg/kg	<0.10	----
Tungsten	7440-33-7	E464	0.1	mg/kg	<0.10	----
Uranium	7440-61-1	E464	0.02	mg/kg	<0.020	----
Vanadium	7440-62-2	E464	0.1	mg/kg	<0.10	----
Zinc	7440-66-6	E464	0.5	mg/kg	<0.50	----
Zirconium	7440-67-7	E464	0.3	mg/kg	<0.30	----
Metals (QCLot: 1844974)						
Mercury	7439-97-6	E524	0.0313	mg/kg	<0.031	----
Metals (QCLot: 1847480)						
Aluminum	7429-90-5	E464	2	mg/kg	<2.0	----
Antimony	7440-36-0	E464	0.01	mg/kg	<0.010	----
Arsenic	7440-38-2	E464	0.02	mg/kg	<0.0200	----
Barium	7440-39-3	E464	0.1	mg/kg	<0.10	----
Beryllium	7440-41-7	E464	0.01	mg/kg	<0.010	----
Bismuth	7440-69-9	E464	0.01	mg/kg	<0.010	----
Boron	7440-42-8	E464	1	mg/kg	<1.0	----
Cadmium	7440-43-9	E464	0.005	mg/kg	<0.0050	----
Calcium	7440-70-2	E464	25	mg/kg	<25	----
Chromium	7440-47-3	E464	0.05	mg/kg	<0.050	----
Cobalt	7440-48-4	E464	0.02	mg/kg	<0.020	----
Copper	7440-50-8	E464	0.1	mg/kg	<0.10	----
Iron	7439-89-6	E464	2.5	mg/kg	<2.5	----
Lead	7439-92-1	E464	0.02	mg/kg	<0.020	----
Lithium	7439-93-2	E464	0.5	mg/kg	<0.50	----
Magnesium	7439-95-4	E464	5	mg/kg	<5.0	----
Manganese	7439-96-5	E464	0.5	mg/kg	<0.50	----
Molybdenum	7439-98-7	E464	0.02	mg/kg	<0.020	----





Sub-Matrix: Biota

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 1847480) - continued						
Nickel	7440-02-0	E464	0.2	mg/kg	<0.20	----
Phosphorus	7723-14-0	E464	10	mg/kg	<10	----
Potassium	7440-09-7	E464	20	mg/kg	<20	----
Rubidium	7440-17-7	E464	0.1	mg/kg	<0.10	----
Selenium	7782-49-2	E464	0.05	mg/kg	<0.050	----
Silver	7440-22-4	E464	0.005	mg/kg	<0.0050	----
Sodium	7440-23-5	E464	25	mg/kg	<25	----
Strontium	7440-24-6	E464	0.1	mg/kg	<0.10	----
Tellurium	13494-80-9	E464	0.1	mg/kg	<0.10	----
Thallium	7440-28-0	E464	0.002	mg/kg	<0.0020	----
Tin	7440-31-5	E464	0.1	mg/kg	<0.10	----
Tungsten	7440-33-7	E464	0.1	mg/kg	<0.10	----
Uranium	7440-61-1	E464	0.02	mg/kg	<0.020	----
Vanadium	7440-62-2	E464	0.1	mg/kg	<0.10	----
Zinc	7440-66-6	E464	0.5	mg/kg	<0.50	----
Zirconium	7440-67-7	E464	0.3	mg/kg	<0.30	----
Metals (QCLot: 1847481)						
Mercury	7439-97-6	E524	0.0313	mg/kg	<0.031	----
Metals (QCLot: 1848876)						
Aluminum	7429-90-5	E464	2	mg/kg	<2.0	----
Antimony	7440-36-0	E464	0.01	mg/kg	<0.010	----
Arsenic	7440-38-2	E464	0.02	mg/kg	<0.0200	----
Barium	7440-39-3	E464	0.1	mg/kg	<0.10	----
Beryllium	7440-41-7	E464	0.01	mg/kg	<0.010	----
Bismuth	7440-69-9	E464	0.01	mg/kg	<0.010	----
Boron	7440-42-8	E464	1	mg/kg	<1.0	----
Cadmium	7440-43-9	E464	0.005	mg/kg	<0.0050	----
Calcium	7440-70-2	E464	25	mg/kg	<25	----
Chromium	7440-47-3	E464	0.05	mg/kg	<0.050	----
Cobalt	7440-48-4	E464	0.02	mg/kg	<0.020	----
Copper	7440-50-8	E464	0.1	mg/kg	<0.10	----
Iron	7439-89-6	E464	2.5	mg/kg	<2.5	----
Lead	7439-92-1	E464	0.02	mg/kg	<0.020	----
Lithium	7439-93-2	E464	0.5	mg/kg	<0.50	----
Magnesium	7439-95-4	E464	5	mg/kg	<5.0	----





Sub-Matrix: Biota

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 1848876) - continued						
Manganese	7439-96-5	E464	0.5	mg/kg	<0.50	----
Molybdenum	7439-98-7	E464	0.02	mg/kg	<0.020	----
Nickel	7440-02-0	E464	0.2	mg/kg	<0.20	----
Phosphorus	7723-14-0	E464	10	mg/kg	<10	----
Potassium	7440-09-7	E464	20	mg/kg	<20	----
Rubidium	7440-17-7	E464	0.1	mg/kg	<0.10	----
Selenium	7782-49-2	E464	0.05	mg/kg	<0.050	----
Silver	7440-22-4	E464	0.005	mg/kg	<0.0050	----
Sodium	7440-23-5	E464	25	mg/kg	<25	----
Strontium	7440-24-6	E464	0.1	mg/kg	<0.10	----
Tellurium	13494-80-9	E464	0.1	mg/kg	<0.10	----
Thallium	7440-28-0	E464	0.002	mg/kg	<0.0020	----
Tin	7440-31-5	E464	0.1	mg/kg	<0.10	----
Tungsten	7440-33-7	E464	0.1	mg/kg	<0.10	----
Uranium	7440-61-1	E464	0.02	mg/kg	<0.020	----
Vanadium	7440-62-2	E464	0.1	mg/kg	<0.10	----
Zinc	7440-66-6	E464	0.5	mg/kg	<0.50	----
Zirconium	7440-67-7	E464	0.3	mg/kg	<0.30	----
Metals (QCLot: 1848877)						
Mercury	7439-97-6	E524	0.0313	mg/kg	<0.031	----
Metals (QCLot: 1853948)						
Aluminum	7429-90-5	E464	2	mg/kg	<2.0	----
Antimony	7440-36-0	E464	0.01	mg/kg	<0.010	----
Arsenic	7440-38-2	E464	0.02	mg/kg	# <0.0200	B
Barium	7440-39-3	E464	0.1	mg/kg	<0.10	----
Beryllium	7440-41-7	E464	0.01	mg/kg	<0.010	----
Bismuth	7440-69-9	E464	0.01	mg/kg	<0.010	----
Boron	7440-42-8	E464	1	mg/kg	<1.0	----
Cadmium	7440-43-9	E464	0.005	mg/kg	<0.0050	----
Calcium	7440-70-2	E464	25	mg/kg	<25	----
Chromium	7440-47-3	E464	0.05	mg/kg	<0.050	----
Cobalt	7440-48-4	E464	0.02	mg/kg	<0.020	----
Copper	7440-50-8	E464	0.1	mg/kg	0.11	----
Iron	7439-89-6	E464	2.5	mg/kg	<2.5	----
Lead	7439-92-1	E464	0.02	mg/kg	<0.020	----





Sub-Matrix: Biota

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 1853948) - continued						
Lithium	7439-93-2	E464	0.5	mg/kg	<0.50	----
Magnesium	7439-95-4	E464	5	mg/kg	<5.0	----
Manganese	7439-96-5	E464	0.5	mg/kg	<0.50	----
Molybdenum	7439-98-7	E464	0.02	mg/kg	<0.020	----
Nickel	7440-02-0	E464	0.2	mg/kg	<0.20	----
Phosphorus	7723-14-0	E464	10	mg/kg	<10	----
Potassium	7440-09-7	E464	20	mg/kg	<20	----
Rubidium	7440-17-7	E464	0.1	mg/kg	<0.10	----
Selenium	7782-49-2	E464	0.05	mg/kg	<0.050	----
Silver	7440-22-4	E464	0.005	mg/kg	<0.0050	----
Sodium	7440-23-5	E464	25	mg/kg	<25	----
Strontium	7440-24-6	E464	0.1	mg/kg	<0.10	----
Tellurium	13494-80-9	E464	0.1	mg/kg	<0.10	----
Thallium	7440-28-0	E464	0.002	mg/kg	<0.0020	----
Tin	7440-31-5	E464	0.1	mg/kg	<0.10	----
Tungsten	7440-33-7	E464	0.1	mg/kg	<0.10	----
Uranium	7440-61-1	E464	0.02	mg/kg	<0.020	----
Vanadium	7440-62-2	E464	0.1	mg/kg	<0.10	----
Zinc	7440-66-6	E464	0.5	mg/kg	<0.50	----
Zirconium	7440-67-7	E464	0.3	mg/kg	<0.30	----
Metals (QCLot: 1853949)						
Mercury	7439-97-6	E524	0.0313	mg/kg	<0.031	----

Qualifiers

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.





Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Biota

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1870554)									
Moisture	----	E144	0.5	%	50 %	98.2	90.0	110	----
Physical Tests (QCLot: 1870587)									
Moisture	----	E144	0.5	%	50 %	101	90.0	110	----
Physical Tests (QCLot: 1870610)									
Moisture	----	E144	0.5	%	50 %	93.9	90.0	110	----
Physical Tests (QCLot: 1870626)									
Moisture	----	E144	0.5	%	50 %	99.4	90.0	110	----
Physical Tests (QCLot: 1870635)									
Moisture	----	E144	0.5	%	50 %	95.3	90.0	110	----
Metals (QCLot: 1841075)									
Aluminum	7429-90-5	E464	2	mg/kg	10 mg/kg	83.1	70.0	130	----
Antimony	7440-36-0	E464	0.01	mg/kg	5 mg/kg	83.3	70.0	130	----
Arsenic	7440-38-2	E464	0.02	mg/kg	5 mg/kg	84.7	70.0	130	----
Barium	7440-39-3	E464	0.1	mg/kg	1.25 mg/kg	80.6	70.0	130	----
Beryllium	7440-41-7	E464	0.01	mg/kg	0.5 mg/kg	79.3	70.0	130	----
Bismuth	7440-69-9	E464	0.01	mg/kg	5 mg/kg	82.0	70.0	130	----
Boron	7440-42-8	E464	1	mg/kg	5 mg/kg	82.4	70.0	130	----
Cadmium	7440-43-9	E464	0.005	mg/kg	0.5 mg/kg	84.9	70.0	130	----
Calcium	7440-70-2	E464	25	mg/kg	250 mg/kg	81.0	70.0	130	----
Chromium	7440-47-3	E464	0.05	mg/kg	1.25 mg/kg	84.4	70.0	130	----
Cobalt	7440-48-4	E464	0.02	mg/kg	1.25 mg/kg	83.7	70.0	130	----
Copper	7440-50-8	E464	0.1	mg/kg	1.25 mg/kg	83.9	70.0	130	----
Iron	7439-89-6	E464	2.5	mg/kg	5 mg/kg	86.4	70.0	130	----
Lead	7439-92-1	E464	0.02	mg/kg	2.5 mg/kg	81.3	70.0	130	----
Lithium	7439-93-2	E464	0.5	mg/kg	1.25 mg/kg	# 62.6	70.0	130	LCS-L
Magnesium	7439-95-4	E464	5	mg/kg	250 mg/kg	83.2	70.0	130	----
Manganese	7439-96-5	E464	0.5	mg/kg	1.25 mg/kg	82.8	70.0	130	----
Molybdenum	7439-98-7	E464	0.02	mg/kg	1.25 mg/kg	81.6	70.0	130	----
Nickel	7440-02-0	E464	0.2	mg/kg	2.5 mg/kg	83.7	70.0	130	----
Phosphorus	7723-14-0	E464	10	mg/kg	50 mg/kg	79.1	70.0	130	----
Potassium	7440-09-7	E464	20	mg/kg	250 mg/kg	79.1	70.0	130	----





Sub-Matrix: Biota

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 1841075) - continued									
Rubidium	7440-17-7	E464	0.1	mg/kg	0.5 mg/kg	85.2	70.0	130	----
Selenium	7782-49-2	E464	0.05	mg/kg	5 mg/kg	83.5	70.0	130	----
Silver	7440-22-4	E464	0.005	mg/kg	0.5 mg/kg	72.9	70.0	130	----
Sodium	7440-23-5	E464	25	mg/kg	250 mg/kg	86.6	70.0	130	----
Strontium	7440-24-6	E464	0.1	mg/kg	1.25 mg/kg	75.0	70.0	130	----
Tellurium	13494-80-9	E464	0.1	mg/kg	0.5 mg/kg	70.7	70.0	130	----
Thallium	7440-28-0	E464	0.002	mg/kg	5 mg/kg	80.5	70.0	130	----
Tin	7440-31-5	E464	0.1	mg/kg	2.5 mg/kg	81.6	70.0	130	----
Tungsten	7440-33-7	E464	0.1	mg/kg	0.5 mg/kg	82.8	70.0	130	----
Uranium	7440-61-1	E464	0.02	mg/kg	0.025 mg/kg	80.3	70.0	130	----
Vanadium	7440-62-2	E464	0.1	mg/kg	2.5 mg/kg	83.9	70.0	130	----
Zinc	7440-66-6	E464	0.5	mg/kg	2.5 mg/kg	80.3	70.0	130	----
Zirconium	7440-67-7	E464	0.3	mg/kg	0.5 mg/kg	73.4	70.0	130	----
Metals (QCLot: 1841076)									
Mercury	7439-97-6	E524	0.0313	mg/kg	0.083 mg/kg	88.4	70.0	130	----
Metals (QCLot: 1844973)									
Aluminum	7429-90-5	E464	2	mg/kg	10 mg/kg	85.6	70.0	130	----
Antimony	7440-36-0	E464	0.01	mg/kg	5 mg/kg	87.0	70.0	130	----
Arsenic	7440-38-2	E464	0.02	mg/kg	5 mg/kg	85.5	70.0	130	----
Barium	7440-39-3	E464	0.1	mg/kg	1.25 mg/kg	85.6	70.0	130	----
Beryllium	7440-41-7	E464	0.01	mg/kg	0.5 mg/kg	83.6	70.0	130	----
Bismuth	7440-69-9	E464	0.01	mg/kg	5 mg/kg	82.0	70.0	130	----
Boron	7440-42-8	E464	1	mg/kg	5 mg/kg	85.4	70.0	130	----
Cadmium	7440-43-9	E464	0.005	mg/kg	0.5 mg/kg	82.5	70.0	130	----
Calcium	7440-70-2	E464	25	mg/kg	250 mg/kg	85.6	70.0	130	----
Chromium	7440-47-3	E464	0.05	mg/kg	1.25 mg/kg	85.9	70.0	130	----
Cobalt	7440-48-4	E464	0.02	mg/kg	1.25 mg/kg	83.5	70.0	130	----
Copper	7440-50-8	E464	0.1	mg/kg	1.25 mg/kg	84.7	70.0	130	----
Iron	7439-89-6	E464	2.5	mg/kg	5 mg/kg	89.5	70.0	130	----
Lead	7439-92-1	E464	0.02	mg/kg	2.5 mg/kg	81.4	70.0	130	----
Lithium	7439-93-2	E464	0.5	mg/kg	1.25 mg/kg	72.1	70.0	130	----
Magnesium	7439-95-4	E464	5	mg/kg	250 mg/kg	85.6	70.0	130	----
Manganese	7439-96-5	E464	0.5	mg/kg	1.25 mg/kg	87.8	70.0	130	----
Molybdenum	7439-98-7	E464	0.02	mg/kg	1.25 mg/kg	87.0	70.0	130	----
Nickel	7440-02-0	E464	0.2	mg/kg	2.5 mg/kg	83.7	70.0	130	----
Phosphorus	7723-14-0	E464	10	mg/kg	50 mg/kg	86.1	70.0	130	----





Sub-Matrix: Biota

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 1844973) - continued									
Potassium	7440-09-7	E464	20	mg/kg	250 mg/kg	82.3	70.0	130	----
Rubidium	7440-17-7	E464	0.1	mg/kg	0.5 mg/kg	88.5	70.0	130	----
Selenium	7782-49-2	E464	0.05	mg/kg	5 mg/kg	83.9	70.0	130	----
Silver	7440-22-4	E464	0.005	mg/kg	0.5 mg/kg	78.6	70.0	130	----
Sodium	7440-23-5	E464	25	mg/kg	250 mg/kg	83.6	70.0	130	----
Strontium	7440-24-6	E464	0.1	mg/kg	1.25 mg/kg	79.9	70.0	130	----
Tellurium	13494-80-9	E464	0.1	mg/kg	0.5 mg/kg	79.8	70.0	130	----
Thallium	7440-28-0	E464	0.002	mg/kg	5 mg/kg	81.5	70.0	130	----
Tin	7440-31-5	E464	0.1	mg/kg	2.5 mg/kg	86.4	70.0	130	----
Tungsten	7440-33-7	E464	0.1	mg/kg	0.5 mg/kg	86.3	70.0	130	----
Uranium	7440-61-1	E464	0.02	mg/kg	0.025 mg/kg	83.7	70.0	130	----
Vanadium	7440-62-2	E464	0.1	mg/kg	2.5 mg/kg	85.1	70.0	130	----
Zinc	7440-66-6	E464	0.5	mg/kg	2.5 mg/kg	81.4	70.0	130	----
Zirconium	7440-67-7	E464	0.3	mg/kg	0.5 mg/kg	80.4	70.0	130	----
Metals (QCLot: 1844974)									
Mercury	7439-97-6	E524	0.0313	mg/kg	0.083 mg/kg	93.7	70.0	130	----
Metals (QCLot: 1847480)									
Aluminum	7429-90-5	E464	2	mg/kg	10 mg/kg	81.4	70.0	130	----
Antimony	7440-36-0	E464	0.01	mg/kg	5 mg/kg	74.6	70.0	130	----
Arsenic	7440-38-2	E464	0.02	mg/kg	5 mg/kg	84.5	70.0	130	----
Barium	7440-39-3	E464	0.1	mg/kg	1.25 mg/kg	83.4	70.0	130	----
Beryllium	7440-41-7	E464	0.01	mg/kg	0.5 mg/kg	78.4	70.0	130	----
Bismuth	7440-69-9	E464	0.01	mg/kg	5 mg/kg	86.4	70.0	130	----
Boron	7440-42-8	E464	1	mg/kg	5 mg/kg	80.0	70.0	130	----
Cadmium	7440-43-9	E464	0.005	mg/kg	0.5 mg/kg	80.1	70.0	130	----
Calcium	7440-70-2	E464	25	mg/kg	250 mg/kg	81.1	70.0	130	----
Chromium	7440-47-3	E464	0.05	mg/kg	1.25 mg/kg	83.3	70.0	130	----
Cobalt	7440-48-4	E464	0.02	mg/kg	1.25 mg/kg	83.6	70.0	130	----
Copper	7440-50-8	E464	0.1	mg/kg	1.25 mg/kg	84.0	70.0	130	----
Iron	7439-89-6	E464	2.5	mg/kg	5 mg/kg	85.2	70.0	130	----
Lead	7439-92-1	E464	0.02	mg/kg	2.5 mg/kg	82.8	70.0	130	----
Lithium	7439-93-2	E464	0.5	mg/kg	1.25 mg/kg	# 66.7	70.0	130	LCS-L
Magnesium	7439-95-4	E464	5	mg/kg	250 mg/kg	84.2	70.0	130	----
Manganese	7439-96-5	E464	0.5	mg/kg	1.25 mg/kg	82.6	70.0	130	----
Molybdenum	7439-98-7	E464	0.02	mg/kg	1.25 mg/kg	76.5	70.0	130	----
Nickel	7440-02-0	E464	0.2	mg/kg	2.5 mg/kg	82.3	70.0	130	----





Sub-Matrix: Biota

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 1847480) - continued									
Phosphorus	7723-14-0	E464	10	mg/kg	50 mg/kg	78.8	70.0	130	----
Potassium	7440-09-7	E464	20	mg/kg	250 mg/kg	80.0	70.0	130	----
Rubidium	7440-17-7	E464	0.1	mg/kg	0.5 mg/kg	82.7	70.0	130	----
Selenium	7782-49-2	E464	0.05	mg/kg	5 mg/kg	77.3	70.0	130	----
Silver	7440-22-4	E464	0.005	mg/kg	0.5 mg/kg	# 69.8	70.0	130	LCS-L
Sodium	7440-23-5	E464	25	mg/kg	250 mg/kg	88.8	70.0	130	----
Strontium	7440-24-6	E464	0.1	mg/kg	1.25 mg/kg	74.4	70.0	130	----
Tellurium	13494-80-9	E464	0.1	mg/kg	0.5 mg/kg	71.8	70.0	130	----
Thallium	7440-28-0	E464	0.002	mg/kg	5 mg/kg	82.4	70.0	130	----
Tin	7440-31-5	E464	0.1	mg/kg	2.5 mg/kg	79.2	70.0	130	----
Tungsten	7440-33-7	E464	0.1	mg/kg	0.5 mg/kg	80.6	70.0	130	----
Uranium	7440-61-1	E464	0.02	mg/kg	0.025 mg/kg	83.0	70.0	130	----
Vanadium	7440-62-2	E464	0.1	mg/kg	2.5 mg/kg	84.3	70.0	130	----
Zinc	7440-66-6	E464	0.5	mg/kg	2.5 mg/kg	82.4	70.0	130	----
Zirconium	7440-67-7	E464	0.3	mg/kg	0.5 mg/kg	71.7	70.0	130	----
Metals (QCLot: 1847481)									
Mercury	7439-97-6	E524	0.0313	mg/kg	0.083 mg/kg	90.7	70.0	130	----
Metals (QCLot: 1848876)									
Aluminum	7429-90-5	E464	2	mg/kg	10 mg/kg	82.6	70.0	130	----
Antimony	7440-36-0	E464	0.01	mg/kg	5 mg/kg	76.6	70.0	130	----
Arsenic	7440-38-2	E464	0.02	mg/kg	5 mg/kg	81.5	70.0	130	----
Barium	7440-39-3	E464	0.1	mg/kg	1.25 mg/kg	77.1	70.0	130	----
Beryllium	7440-41-7	E464	0.01	mg/kg	0.5 mg/kg	77.5	70.0	130	----
Bismuth	7440-69-9	E464	0.01	mg/kg	5 mg/kg	85.8	70.0	130	----
Boron	7440-42-8	E464	1	mg/kg	5 mg/kg	75.0	70.0	130	----
Cadmium	7440-43-9	E464	0.005	mg/kg	0.5 mg/kg	83.4	70.0	130	----
Calcium	7440-70-2	E464	25	mg/kg	250 mg/kg	78.2	70.0	130	----
Chromium	7440-47-3	E464	0.05	mg/kg	1.25 mg/kg	84.3	70.0	130	----
Cobalt	7440-48-4	E464	0.02	mg/kg	1.25 mg/kg	84.7	70.0	130	----
Copper	7440-50-8	E464	0.1	mg/kg	1.25 mg/kg	84.1	70.0	130	----
Iron	7439-89-6	E464	2.5	mg/kg	5 mg/kg	86.2	70.0	130	----
Lead	7439-92-1	E464	0.02	mg/kg	2.5 mg/kg	84.8	70.0	130	----
Lithium	7439-93-2	E464	0.5	mg/kg	1.25 mg/kg	# 65.9	70.0	130	LCS-L
Magnesium	7439-95-4	E464	5	mg/kg	250 mg/kg	83.8	70.0	130	----
Manganese	7439-96-5	E464	0.5	mg/kg	1.25 mg/kg	82.3	70.0	130	----
Molybdenum	7439-98-7	E464	0.02	mg/kg	1.25 mg/kg	74.4	70.0	130	----





Sub-Matrix: Biota

Sub-Matrix: Biota					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Target Concentration	LCS	Low	High	
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 1848876) - continued									
Nickel	7440-02-0	E464	0.2	mg/kg	2.5 mg/kg	84.4	70.0	130	----
Phosphorus	7723-14-0	E464	10	mg/kg	50 mg/kg	77.0	70.0	130	----
Potassium	7440-09-7	E464	20	mg/kg	250 mg/kg	78.2	70.0	130	----
Rubidium	7440-17-7	E464	0.1	mg/kg	0.5 mg/kg	85.8	70.0	130	----
Selenium	7782-49-2	E464	0.05	mg/kg	5 mg/kg	80.0	70.0	130	----
Silver	7440-22-4	E464	0.005	mg/kg	0.5 mg/kg	72.8	70.0	130	----
Sodium	7440-23-5	E464	25	mg/kg	250 mg/kg	87.8	70.0	130	----
Strontium	7440-24-6	E464	0.1	mg/kg	1.25 mg/kg	72.3	70.0	130	----
Tellurium	13494-80-9	E464	0.1	mg/kg	0.5 mg/kg	75.1	70.0	130	----
Thallium	7440-28-0	E464	0.002	mg/kg	5 mg/kg	84.1	70.0	130	----
Tin	7440-31-5	E464	0.1	mg/kg	2.5 mg/kg	77.6	70.0	130	----
Tungsten	7440-33-7	E464	0.1	mg/kg	0.5 mg/kg	81.6	70.0	130	----
Uranium	7440-61-1	E464	0.02	mg/kg	0.025 mg/kg	88.0	70.0	130	----
Vanadium	7440-62-2	E464	0.1	mg/kg	2.5 mg/kg	83.6	70.0	130	----
Zinc	7440-66-6	E464	0.5	mg/kg	2.5 mg/kg	80.0	70.0	130	----
Zirconium	7440-67-7	E464	0.3	mg/kg	0.5 mg/kg	# 68.8	70.0	130	LCS-L
Metals (QCLot: 1848877)									
Mercury	7439-97-6	E524	0.0313	mg/kg	0.083 mg/kg	90.1	70.0	130	----
Metals (QCLot: 1853948)									
Aluminum	7429-90-5	E464	2	mg/kg	10 mg/kg	84.0	70.0	130	----
Antimony	7440-36-0	E464	0.01	mg/kg	5 mg/kg	83.4	70.0	130	----
Arsenic	7440-38-2	E464	0.02	mg/kg	5 mg/kg	81.5	70.0	130	----
Barium	7440-39-3	E464	0.1	mg/kg	1.25 mg/kg	82.3	70.0	130	----
Beryllium	7440-41-7	E464	0.01	mg/kg	0.5 mg/kg	78.2	70.0	130	----
Bismuth	7440-69-9	E464	0.01	mg/kg	5 mg/kg	79.4	70.0	130	----
Boron	7440-42-8	E464	1	mg/kg	5 mg/kg	82.7	70.0	130	----
Cadmium	7440-43-9	E464	0.005	mg/kg	0.5 mg/kg	79.0	70.0	130	----
Calcium	7440-70-2	E464	25	mg/kg	250 mg/kg	81.6	70.0	130	----
Chromium	7440-47-3	E464	0.05	mg/kg	1.25 mg/kg	81.8	70.0	130	----
Cobalt	7440-48-4	E464	0.02	mg/kg	1.25 mg/kg	80.9	70.0	130	----
Copper	7440-50-8	E464	0.1	mg/kg	1.25 mg/kg	87.4	70.0	130	----
Iron	7439-89-6	E464	2.5	mg/kg	5 mg/kg	83.0	70.0	130	----
Lead	7439-92-1	E464	0.02	mg/kg	2.5 mg/kg	81.1	70.0	130	----
Lithium	7439-93-2	E464	0.5	mg/kg	1.25 mg/kg	# 65.0	70.0	130	LCS-L
Magnesium	7439-95-4	E464	5	mg/kg	250 mg/kg	86.0	70.0	130	----
Manganese	7439-96-5	E464	0.5	mg/kg	1.25 mg/kg	82.3	70.0	130	----





Sub-Matrix: Biota					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Target Concentration	LCS	Low	High	
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 1853948) - continued									
Molybdenum	7439-98-7	E464	0.02	mg/kg	1.25 mg/kg	82.4	70.0	130	----
Nickel	7440-02-0	E464	0.2	mg/kg	2.5 mg/kg	79.4	70.0	130	----
Phosphorus	7723-14-0	E464	10	mg/kg	50 mg/kg	79.6	70.0	130	----
Potassium	7440-09-7	E464	20	mg/kg	250 mg/kg	79.8	70.0	130	----
Rubidium	7440-17-7	E464	0.1	mg/kg	0.5 mg/kg	80.8	70.0	130	----
Selenium	7782-49-2	E464	0.05	mg/kg	5 mg/kg	77.8	70.0	130	----
Silver	7440-22-4	E464	0.005	mg/kg	0.5 mg/kg	75.2	70.0	130	----
Sodium	7440-23-5	E464	25	mg/kg	250 mg/kg	84.3	70.0	130	----
Strontium	7440-24-6	E464	0.1	mg/kg	1.25 mg/kg	80.2	70.0	130	----
Tellurium	13494-80-9	E464	0.1	mg/kg	0.5 mg/kg	74.0	70.0	130	----
Thallium	7440-28-0	E464	0.002	mg/kg	5 mg/kg	79.2	70.0	130	----
Tin	7440-31-5	E464	0.1	mg/kg	2.5 mg/kg	81.8	70.0	130	----
Tungsten	7440-33-7	E464	0.1	mg/kg	0.5 mg/kg	81.4	70.0	130	----
Uranium	7440-61-1	E464	0.02	mg/kg	0.025 mg/kg	79.3	70.0	130	----
Vanadium	7440-62-2	E464	0.1	mg/kg	2.5 mg/kg	80.9	70.0	130	----
Zinc	7440-66-6	E464	0.5	mg/kg	2.5 mg/kg	76.9	70.0	130	----
Zirconium	7440-67-7	E464	0.3	mg/kg	0.5 mg/kg	75.9	70.0	130	----
Metals (QCLot: 1853949)									
Mercury	7439-97-6	E524	0.0313	mg/kg	0.083 mg/kg	89.0	70.0	130	----

Qualifiers

Qualifier	Description
LCS-L	Lab Control Sample recovery was below ALS DQO. Reference Material and/or Matrix Spike results were acceptable. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.





Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: Biota

Sub-Matrix: Biota					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Metals (QCLot: 1841075)										
WT2437881-002	BA-IKLL-AC-LIV-02-AUG-27	Aluminum	7429-90-5	E464	ND mg/kg	----	ND	70.0	130	----
		Antimony	7440-36-0	E464	4.12 mg/kg	4.87 mg/kg	84.6	70.0	130	----
		Arsenic	7440-38-2	E464	4.55 mg/kg	4.87 mg/kg	93.4	70.0	130	----
		Barium	7440-39-3	E464	1.19 mg/kg	1.22 mg/kg	97.6	70.0	130	----
		Beryllium	7440-41-7	E464	0.413 mg/kg	0.487 mg/kg	84.8	70.0	130	----
		Bismuth	7440-69-9	E464	4.22 mg/kg	4.87 mg/kg	86.6	70.0	130	----
		Boron	7440-42-8	E464	4.2 mg/kg	4.87 mg/kg	86.2	70.0	130	----
		Cadmium	7440-43-9	E464	ND mg/kg	----	ND	70.0	130	----
		Calcium	7440-70-2	E464	407 mg/kg	244 mg/kg	167	70.0	130	E
		Chromium	7440-47-3	E464	1.06 mg/kg	1.22 mg/kg	86.7	70.0	130	----
		Cobalt	7440-48-4	E464	1.05 mg/kg	1.22 mg/kg	86.2	70.0	130	----
		Copper	7440-50-8	E464	ND mg/kg	----	ND	70.0	130	----
		Iron	7439-89-6	E464	ND mg/kg	----	ND	70.0	130	----
		Lead	7439-92-1	E464	2.03 mg/kg	2.44 mg/kg	83.3	70.0	130	----
		Lithium	7439-93-2	E464	0.84 mg/kg	1.22 mg/kg	69.3	70.0	130	K
		Magnesium	7439-95-4	E464	255 mg/kg	244 mg/kg	105	70.0	130	----
		Manganese	7439-96-5	E464	ND mg/kg	----	ND	70.0	130	----
		Molybdenum	7439-98-7	E464	1.04 mg/kg	1.22 mg/kg	85.0	70.0	130	----
		Nickel	7440-02-0	E464	2.02 mg/kg	2.44 mg/kg	82.8	70.0	130	----
		Phosphorus	7723-14-0	E464	ND mg/kg	----	ND	70.0	130	----
		Potassium	7440-09-7	E464	ND mg/kg	----	ND	70.0	130	----
		Rubidium	7440-17-7	E464	ND mg/kg	----	ND	70.0	130	----
		Selenium	7782-49-2	E464	4.51 mg/kg	4.87 mg/kg	92.6	70.0	130	----
		Silver	7440-22-4	E464	0.357 mg/kg	0.487 mg/kg	73.3	70.0	130	----
		Sodium	7440-23-5	E464	ND mg/kg	----	ND	70.0	130	----
		Strontium	7440-24-6	E464	1.28 mg/kg	1.22 mg/kg	105	70.0	130	----
		Tellurium	13494-80-9	E464	0.36 mg/kg	0.487 mg/kg	74.5	70.0	130	----
		Thallium	7440-28-0	E464	4.01 mg/kg	4.87 mg/kg	82.2	70.0	130	----
		Tin	7440-31-5	E464	2.05 mg/kg	2.44 mg/kg	84.2	70.0	130	----
		Tungsten	7440-33-7	E464	0.42 mg/kg	0.487 mg/kg	85.7	70.0	130	----
		Uranium	7440-61-1	E464	0.020 mg/kg	0.024 mg/kg	80.2	70.0	130	----
		Vanadium	7440-62-2	E464	2.14 mg/kg	2.44 mg/kg	87.8	70.0	130	----
		Zinc	7440-66-6	E464	ND mg/kg	----	ND	70.0	130	----
		Zirconium	7440-67-7	E464	0.37 mg/kg	0.487 mg/kg	76.5	70.0	130	----
Metals (QCLot: 1841076)										
WT2437881-002	BA-IKLL-AC-LIV-02-AUG-27	Mercury	7439-97-6	E524	ND mg/kg	----	ND	70.0	130	----
Metals (QCLot: 1844973)										
WT2437881-021	BA-IKLL-AC-LIV-24-AUG-27	Aluminum	7429-90-5	E464	8.3 mg/kg	9.63 mg/kg	86.4	70.0	130	----
		Antimony	7440-36-0	E464	4.06 mg/kg	4.82 mg/kg	84.4	70.0	130	----





Sub-Matrix: Biota					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Metals (QCLot: 1844973) - continued										
WT2437881-021	BA-IKLL-AC-LIV-24-AUG-27	Arsenic	7440-38-2	E464	4.41 mg/kg	4.82 mg/kg	91.6	70.0	130	----
		Barium	7440-39-3	E464	1.02 mg/kg	1.2 mg/kg	84.6	70.0	130	----
		Beryllium	7440-41-7	E464	0.399 mg/kg	0.482 mg/kg	82.9	70.0	130	----
		Bismuth	7440-69-9	E464	3.86 mg/kg	4.82 mg/kg	80.2	70.0	130	----
		Boron	7440-42-8	E464	4.0 mg/kg	4.82 mg/kg	83.2	70.0	130	----
		Cadmium	7440-43-9	E464	0.404 mg/kg	0.482 mg/kg	83.8	70.0	130	----
		Calcium	7440-70-2	E464	194 mg/kg	241 mg/kg	80.7	70.0	130	----
		Chromium	7440-47-3	E464	0.979 mg/kg	1.2 mg/kg	81.3	70.0	130	----
		Cobalt	7440-48-4	E464	0.985 mg/kg	1.2 mg/kg	81.8	70.0	130	----
		Copper	7440-50-8	E464	ND mg/kg	----	ND	70.0	130	----
		Iron	7439-89-6	E464	ND mg/kg	----	ND	70.0	130	----
		Lead	7439-92-1	E464	1.90 mg/kg	2.41 mg/kg	79.1	70.0	130	----
		Lithium	7439-93-2	E464	0.88 mg/kg	1.2 mg/kg	73.0	70.0	130	----
		Magnesium	7439-95-4	E464	226 mg/kg	241 mg/kg	94.0	70.0	130	----
		Manganese	7439-96-5	E464	1.00 mg/kg	1.2 mg/kg	82.8	70.0	130	----
		Molybdenum	7439-98-7	E464	0.998 mg/kg	1.2 mg/kg	82.8	70.0	130	----
		Nickel	7440-02-0	E464	1.95 mg/kg	2.41 mg/kg	81.0	70.0	130	----
		Phosphorus	7723-14-0	E464	ND mg/kg	----	ND	70.0	130	----
		Potassium	7440-09-7	E464	ND mg/kg	----	ND	70.0	130	----
		Rubidium	7440-17-7	E464	ND mg/kg	----	ND	70.0	130	----
		Selenium	7782-49-2	E464	4.65 mg/kg	4.82 mg/kg	96.6	70.0	130	----
		Silver	7440-22-4	E464	0.362 mg/kg	0.482 mg/kg	75.1	70.0	130	----
		Sodium	7440-23-5	E464	ND mg/kg	----	ND	70.0	130	----
		Strontium	7440-24-6	E464	0.92 mg/kg	1.2 mg/kg	76.8	70.0	130	----
		Tellurium	13494-80-9	E464	0.41 mg/kg	0.482 mg/kg	84.6	70.0	130	----
		Thallium	7440-28-0	E464	3.86 mg/kg	4.82 mg/kg	80.2	70.0	130	----
		Tin	7440-31-5	E464	2.04 mg/kg	2.41 mg/kg	84.5	70.0	130	----
		Tungsten	7440-33-7	E464	0.40 mg/kg	0.482 mg/kg	83.6	70.0	130	----
		Uranium	7440-61-1	E464	0.019 mg/kg	0.024 mg/kg	79.5	70.0	130	----
		Vanadium	7440-62-2	E464	2.01 mg/kg	2.41 mg/kg	83.6	70.0	130	----
		Zinc	7440-66-6	E464	ND mg/kg	----	ND	70.0	130	----
		Zirconium	7440-67-7	E464	0.37 mg/kg	0.482 mg/kg	76.9	70.0	130	----
Metals (QCLot: 1844974)										
WT2437881-021	BA-IKLL-AC-LIV-24-AUG-27	Mercury	7439-97-6	E524	0.074 mg/kg	0.08 mg/kg	92.6	70.0	130	----
Metals (QCLot: 1847480)										
WT2437881-048	BA-IKLL-AC-MUS-29-AUG-28	Aluminum	7429-90-5	E464	7.5 mg/kg	8.4 mg/kg	89.5	70.0	130	----
		Antimony	7440-36-0	E464	3.30 mg/kg	4.2 mg/kg	78.6	70.0	130	----
		Arsenic	7440-38-2	E464	3.75 mg/kg	4.2 mg/kg	89.3	70.0	130	----
		Barium	7440-39-3	E464	0.85 mg/kg	1.05 mg/kg	80.8	70.0	130	----
		Beryllium	7440-41-7	E464	0.338 mg/kg	0.42 mg/kg	80.4	70.0	130	----
		Bismuth	7440-69-9	E464	3.32 mg/kg	4.2 mg/kg	79.1	70.0	130	----
		Boron	7440-42-8	E464	3.2 mg/kg	4.2 mg/kg	77.5	70.0	130	----
		Cadmium	7440-43-9	E464	0.341 mg/kg	0.42 mg/kg	81.1	70.0	130	----





Sub-Matrix: Biota					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Metals (QCLot: 1847480) - continued										
WT2437881-048	BA-IKLL-AC-MUS-29-AUG-28	Calcium	7440-70-2	E464	166 mg/kg	210 mg/kg	78.9	70.0	130	----
		Chromium	7440-47-3	E464	0.861 mg/kg	1.05 mg/kg	82.0	70.0	130	----
		Cobalt	7440-48-4	E464	0.861 mg/kg	1.05 mg/kg	82.0	70.0	130	----
		Copper	7440-50-8	E464	0.90 mg/kg	1.05 mg/kg	85.7	70.0	130	----
		Iron	7439-89-6	E464	3.7 mg/kg	4.2 mg/kg	88.4	70.0	130	----
		Lead	7439-92-1	E464	1.64 mg/kg	2.1 mg/kg	78.1	70.0	130	----
		Lithium	7439-93-2	E464	0.74 mg/kg	1.05 mg/kg	70.3	70.0	130	----
		Magnesium	7439-95-4	E464	ND mg/kg	----	ND	70.0	130	----
		Manganese	7439-96-5	E464	0.88 mg/kg	1.05 mg/kg	83.8	70.0	130	----
		Molybdenum	7439-98-7	E464	0.834 mg/kg	1.05 mg/kg	79.4	70.0	130	----
		Nickel	7440-02-0	E464	1.71 mg/kg	2.1 mg/kg	81.2	70.0	130	----
		Phosphorus	7723-14-0	E464	ND mg/kg	----	ND	70.0	130	----
		Potassium	7440-09-7	E464	ND mg/kg	----	ND	70.0	130	----
		Rubidium	7440-17-7	E464	ND mg/kg	----	ND	70.0	130	----
		Selenium	7782-49-2	E464	3.68 mg/kg	4.2 mg/kg	87.5	70.0	130	----
		Silver	7440-22-4	E464	0.283 mg/kg	0.42 mg/kg	67.3	70.0	130	K
		Sodium	7440-23-5	E464	ND mg/kg	----	ND	70.0	130	----
		Strontium	7440-24-6	E464	0.81 mg/kg	1.05 mg/kg	77.2	70.0	130	----
		Tellurium	13494-80-9	E464	0.32 mg/kg	0.42 mg/kg	75.3	70.0	130	----
		Thallium	7440-28-0	E464	3.26 mg/kg	4.2 mg/kg	77.5	70.0	130	----
		Tin	7440-31-5	E464	1.69 mg/kg	2.1 mg/kg	80.5	70.0	130	----
		Tungsten	7440-33-7	E464	0.33 mg/kg	0.42 mg/kg	79.0	70.0	130	----
		Uranium	7440-61-1	E464	0.017 mg/kg	0.021 mg/kg	79.7	70.0	130	----
		Vanadium	7440-62-2	E464	1.78 mg/kg	2.1 mg/kg	84.7	70.0	130	----
		Zinc	7440-66-6	E464	ND mg/kg	----	ND	70.0	130	----
		Zirconium	7440-67-7	E464	0.32 mg/kg	0.42 mg/kg	75.4	70.0	130	----
Metals (QCLot: 1847481)										
WT2437881-048	BA-IKLL-AC-MUS-29-AUG-28	Mercury	7439-97-6	E524	0.068 mg/kg	0.07 mg/kg	96.9	70.0	130	----
Metals (QCLot: 1848876)										
WT2437881-061	BA-QURL-AC-MUS-13-AUG-30	Aluminum	7429-90-5	E464	7.3 mg/kg	8.8 mg/kg	83.0	70.0	130	----
		Antimony	7440-36-0	E464	3.54 mg/kg	4.4 mg/kg	80.5	70.0	130	----
		Arsenic	7440-38-2	E464	3.78 mg/kg	4.4 mg/kg	85.9	70.0	130	----
		Barium	7440-39-3	E464	0.88 mg/kg	1.1 mg/kg	79.9	70.0	130	----
		Beryllium	7440-41-7	E464	0.354 mg/kg	0.44 mg/kg	80.5	70.0	130	----
		Bismuth	7440-69-9	E464	3.74 mg/kg	4.4 mg/kg	85.1	70.0	130	----
		Boron	7440-42-8	E464	3.7 mg/kg	4.4 mg/kg	83.8	70.0	130	----
		Cadmium	7440-43-9	E464	0.372 mg/kg	0.44 mg/kg	84.6	70.0	130	----
		Calcium	7440-70-2	E464	172 mg/kg	220 mg/kg	78.4	70.0	130	----
		Chromium	7440-47-3	E464	0.931 mg/kg	1.1 mg/kg	84.6	70.0	130	----
		Cobalt	7440-48-4	E464	0.919 mg/kg	1.1 mg/kg	83.6	70.0	130	----
		Copper	7440-50-8	E464	1.19 mg/kg	1.1 mg/kg	108	70.0	130	----
		Iron	7439-89-6	E464	ND mg/kg	----	ND	70.0	130	----
		Lead	7439-92-1	E464	1.84 mg/kg	2.2 mg/kg	83.5	70.0	130	----





Sub-Matrix: Biota					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Metals (QCLot: 1848876) - continued										
WT2437881-061	BA-QURL-AC-MUS-13-AUG-30	Lithium	7439-93-2	E464	0.74 mg/kg	1.1 mg/kg	67.3	70.0	130	K
		Magnesium	7439-95-4	E464	ND mg/kg	----	ND	70.0	130	----
		Manganese	7439-96-5	E464	0.94 mg/kg	1.1 mg/kg	85.1	70.0	130	----
		Molybdenum	7439-98-7	E464	0.871 mg/kg	1.1 mg/kg	79.2	70.0	130	----
		Nickel	7440-02-0	E464	1.86 mg/kg	2.2 mg/kg	84.5	70.0	130	----
		Phosphorus	7723-14-0	E464	ND mg/kg	----	ND	70.0	130	----
		Potassium	7440-09-7	E464	ND mg/kg	----	ND	70.0	130	----
		Rubidium	7440-17-7	E464	ND mg/kg	----	ND	70.0	130	----
		Selenium	7782-49-2	E464	3.83 mg/kg	4.4 mg/kg	87.2	70.0	130	----
		Silver	7440-22-4	E464	0.306 mg/kg	0.44 mg/kg	69.7	70.0	130	K
		Sodium	7440-23-5	E464	ND mg/kg	----	ND	70.0	130	----
		Strontium	7440-24-6	E464	0.82 mg/kg	1.1 mg/kg	74.5	70.0	130	----
		Tellurium	13494-80-9	E464	0.35 mg/kg	0.44 mg/kg	80.0	70.0	130	----
		Thallium	7440-28-0	E464	3.64 mg/kg	4.4 mg/kg	82.8	70.0	130	----
		Tin	7440-31-5	E464	1.76 mg/kg	2.2 mg/kg	80.2	70.0	130	----
		Tungsten	7440-33-7	E464	0.36 mg/kg	0.44 mg/kg	81.8	70.0	130	----
		Uranium	7440-61-1	E464	0.018 mg/kg	0.022 mg/kg	83.7	70.0	130	----
		Vanadium	7440-62-2	E464	1.84 mg/kg	2.2 mg/kg	83.8	70.0	130	----
		Zinc	7440-66-6	E464	ND mg/kg	----	ND	70.0	130	----
		Zirconium	7440-67-7	E464	0.32 mg/kg	0.44 mg/kg	72.7	70.0	130	----
Metals (QCLot: 1848877)										
WT2437881-061	BA-QURL-AC-MUS-13-AUG-30	Mercury	7439-97-6	E524	0.068 mg/kg	0.073 mg/kg	92.3	70.0	130	----
Metals (QCLot: 1853948)										
WT2437881-081	BA-IKLL-AC-MUS-09-AUG-27	Aluminum	7429-90-5	E464	8.5 mg/kg	9.82 mg/kg	86.9	70.0	130	----
		Antimony	7440-36-0	E464	4.27 mg/kg	4.91 mg/kg	87.0	70.0	130	----
		Arsenic	7440-38-2	E464	4.36 mg/kg	4.91 mg/kg	88.9	70.0	130	----
		Barium	7440-39-3	E464	1.02 mg/kg	1.23 mg/kg	82.9	70.0	130	----
		Beryllium	7440-41-7	E464	0.421 mg/kg	0.491 mg/kg	85.7	70.0	130	----
		Bismuth	7440-69-9	E464	3.94 mg/kg	4.91 mg/kg	80.2	70.0	130	----
		Boron	7440-42-8	E464	4.5 mg/kg	4.91 mg/kg	91.8	70.0	130	----
		Cadmium	7440-43-9	E464	0.385 mg/kg	0.491 mg/kg	78.4	70.0	130	----
		Calcium	7440-70-2	E464	214 mg/kg	245 mg/kg	87.4	70.0	130	----
		Chromium	7440-47-3	E464	1.03 mg/kg	1.23 mg/kg	83.7	70.0	130	----
		Cobalt	7440-48-4	E464	1.02 mg/kg	1.23 mg/kg	83.2	70.0	130	----
		Copper	7440-50-8	E464	0.96 mg/kg	1.23 mg/kg	78.2	70.0	130	----
		Iron	7439-89-6	E464	ND mg/kg	----	ND	70.0	130	----
		Lead	7439-92-1	E464	2.02 mg/kg	2.45 mg/kg	82.3	70.0	130	----
		Lithium	7439-93-2	E464	0.89 mg/kg	1.23 mg/kg	72.7	70.0	130	----
		Magnesium	7439-95-4	E464	ND mg/kg	----	ND	70.0	130	----
		Manganese	7439-96-5	E464	1.11 mg/kg	1.23 mg/kg	90.6	70.0	130	----
		Molybdenum	7439-98-7	E464	1.12 mg/kg	1.23 mg/kg	91.0	70.0	130	----
		Nickel	7440-02-0	E464	2.02 mg/kg	2.45 mg/kg	82.1	70.0	130	----
		Phosphorus	7723-14-0	E464	ND mg/kg	----	ND	70.0	130	----





Sub-Matrix: Biota					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Metals (QCLot: 1853948) - continued										
WT2437881-081	BA-IKLL-AC-MUS-09-AUG-27	Potassium	7440-09-7	E464	ND mg/kg	----	ND	70.0	130	----
		Rubidium	7440-17-7	E464	ND mg/kg	----	ND	70.0	130	----
		Selenium	7782-49-2	E464	4.28 mg/kg	4.91 mg/kg	87.3	70.0	130	----
		Silver	7440-22-4	E464	0.378 mg/kg	0.491 mg/kg	77.0	70.0	130	----
		Sodium	7440-23-5	E464	ND mg/kg	----	ND	70.0	130	----
		Strontium	7440-24-6	E464	1.05 mg/kg	1.23 mg/kg	85.4	70.0	130	----
		Tellurium	13494-80-9	E464	0.42 mg/kg	0.491 mg/kg	85.4	70.0	130	----
		Thallium	7440-28-0	E464	3.91 mg/kg	4.91 mg/kg	79.6	70.0	130	----
		Tin	7440-31-5	E464	2.03 mg/kg	2.45 mg/kg	82.5	70.0	130	----
		Tungsten	7440-33-7	E464	0.41 mg/kg	0.491 mg/kg	83.3	70.0	130	----
		Uranium	7440-61-1	E464	0.020 mg/kg	0.025 mg/kg	83.0	70.0	130	----
		Vanadium	7440-62-2	E464	2.11 mg/kg	2.45 mg/kg	85.8	70.0	130	----
		Zinc	7440-66-6	E464	ND mg/kg	----	ND	70.0	130	----
		Zirconium	7440-67-7	E464	0.40 mg/kg	0.491 mg/kg	82.1	70.0	130	----
Metals (QCLot: 1853949)										
WT2437881-081	BA-IKLL-AC-MUS-09-AUG-27	Mercury	7439-97-6	E524	0.073 mg/kg	0.082 mg/kg	89.4	70.0	130	----

Qualifiers

Qualifier	Description
E	Matrix Spike recovery outside ALS DQO due to heterogeneous analyte background in sample.
K	Matrix Spike recovery outside ALS DQO due to sample matrix effects.





res may apply)	
ply	<input type="checkbox"/>
lay [E2 -200%	<input type="checkbox"/>
mm	

[illegible]

No	<input type="checkbox"/>	TEMPERATURES °C		Time:	2-1030
No	<input type="checkbox"/>				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY      YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW CQC form**.

NOV 2018 (REV)









Chain of Custody (COC) / Analytical Request Form

COC Number: 17 -

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Affix ALS barcode label here  
(lab use only)

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

<b>Report To</b>		<b>Report Format / Distribution</b>		<b>Select Service Level Below - Contact your AM to confirm all E&amp;P TATs (surcharges may apply)</b>	
Company: Minnow Environmental Inc.		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)		Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply	
Contact: Samantha Burke		Quality Control (QC) Report with Report <input type="checkbox"/> YES <input type="checkbox"/> NO		4 day [P4-20%] <input type="checkbox"/> 1 Business day [E - 100%]	
Phone: (705) 991-2722		<input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked		3 day [P3-25%] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 - 200%]	
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		2 day [P2-50%] <input type="checkbox"/> (Laboratory opening fees may apply)	
Street: 2 Lamb Street		Email 1 or Fax: samantha.burke@minnow.ca		Date and Time Required for all E&P TATs: dd-mm-yy hh:mm	
City/Province: Georgetown, Ontario		Email 2		For tests that can not be performed according to the service level selected, you will be contacted.	
Postal Code: L7G3M9		Email 3		<b>Analysis Request</b>	
<b>Invoice To</b>		<b>Invoice Distribution</b>		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FIP) below	
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		<b>NUMBER OF CONTAINERS</b>	
Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Email 1 or Fax: apminnow@minnow.ca			
		Email 2: samantha.burke@minnow.ca			
Company:		Email 3:		<b>SAMPLES ON HOLD</b>	
Contact:		Oil and Gas Required Fields (client use)			
		PO#			
<b>ALS Account # / Quote #:</b>		Major/Minor Code:		Total Metals	
Job #: 247202.00XX (Mline 2024)		Routing Code:			
PO / AFE:		Requisitioner:			
LSD:		Location:		Total Mercury	
<b>ALS Lab Work Order # (lab use only):</b>		<b>ALS Contact: Emily Hansen</b>		<b>SAMPLER:</b>	
<b>Sample Identification and/or Coordinates</b> (This description will appear on the report)		<b>Date</b> (dd-mm-yy)		<b>Time</b> (hh:mm)	
BA-QURL-AC-LI-03-Aug-28		29-Aug-24		Tissue	
BA-QURL-AC-LI-04-Aug-29		29-Aug-24		Tissue	
BA-QURL-AC-LI-05-Aug-29		29-Aug-24		Tissue	
BA-QURL-AC-LI-06-Aug-29		29-Aug-24		Tissue	
BA-QURL-AC-LI-07-Aug-29		29-Aug-24		Tissue	
BA-QURL-AC-LI-08-Aug-29		29-Aug-24		Tissue	
BA-QURL-AC-LI-09-Aug-29		29-Aug-24		Tissue	
BA-QURL-AC-LI-10-Aug-29		29-Aug-24		Tissue	
BA-QURL-AC-LI-11-Aug-30		30-Aug-24		Tissue	
BA-QURL-AC-LI-12-Aug-30		30-Aug-24		Tissue	
BA-QURL-AC-LI-13-Aug-30		30-Aug-24		Tissue	
BA-QURL-AC-LI-14-Aug-30		30-Aug-24		Tissue	
<b>Drinking Water (DW) Samples (client use)</b>		<b>Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below</b> (electronic COC only)		<b>SAMPLE CONDITION AS RECEIVED (lab use only)</b>	
Are samples taken from a Regulated DW System?				Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>	
Are samples for human consumption/ use?				Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>	
				Cooling Initiated <input type="checkbox"/>	
				INITIAL COOLER TEMPERATURES °C	
				FINAL COOLER TEMPERATURES °C	
<b>SHIPMENT RELEASE (client use)</b>		<b>INITIAL SHIPMENT RECEPTION (lab use only)</b>		<b>FINAL SHIPMENT RECEPTION (lab use only)</b>	
Released by: Samantha Burke		Received by:		Received by:	
Date: 5-Oct-2021		Date:		Date: 19 Dec 2024	
Time:		Time:		Time: 21:03	





Chain of Custody (COC) / Analytical Request Form

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Affix ALS barcode label here  
(lab use only)

COC Number: 17 -

Page 1 of 1

<b>Report To</b>		<b>Report Format / Distribution</b>		<b>Select Service Level Below - Contact your AM to confirm all E&amp;P TATs (surcharges may apply)</b>	
Company:	Minnow Environmental Inc.	Select Report Format:	<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)	Regular [R]	<input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Samantha Burke	Quality Control (QC) Report with Report	<input type="checkbox"/> YES <input type="checkbox"/> NO	4 day [P4-20%]	<input type="checkbox"/> 1 Business day [E - 100%]
Phone:	(705) 991-2722	<input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked		3 day [P3-25%]	<input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 -200%] (Laboratory opening fees may apply) ]
Company address below will appear on the final report		Select Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	2 day [P2-50%]	<input type="checkbox"/>
Street:	2 Lamb Street	Email 1 or Fax	samantha.burke@minnow.ca	Date and Time Required for all E&P TATs: dd-mm-yy hh:mm	
City/Province:	Georgetown, Ontario	Email 2		For tests that can not be performed according to the service level selected, you will be contacted.	
Postal Code:	L7G3M9	Email 3		<b>Analysis Request</b>	
<b>Invoice To</b>		<b>Invoice Distribution</b>		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below	
Same as Report To	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Select Invoice Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	<b>NUMBER OF CONTAINERS</b>	
Copy of Invoice with Report	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Email 1 or Fax	aprinnow@minnow.ca		
Company:		Email 2	samantha.burke@minnow.ca		
Contact:		Oil and Gas Required Fields (client use)			
Project Information		AFEC/Cost Center:		Total Metals	
ALS Account # / Quote #:		Major/Minor Code:		Total Mercury	
Job #:		Routing Code:		R	
PO / AFE:		Requisitioner:		R	
LSD:		Location:		R	
ALS Lab Work Order # (lab use only):		ALS Contact: Emily Hansen		R	
Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mm-yy)		R	
ALS Sample # (lab use only)	BA-QURL-AC-LI-15-Aug-30	Time (hh:mm)		R	
	BA-QURL-AC-LI-16-Aug-30			R	
	BA-QURL-AC-LI-17-Aug-30			R	
	BA-QURL-AC-LI-18-Aug-30			R	
	BA-QURL-AC-LI-19-Aug-30			R	
	BA-QURL-AC-LI-20-Aug-30			R	
	BA-DUP-AC-LIV-05-2024-08			R	
	BA-DUP-AC-LIV-15-2024-08			R	
	BA-IKLL-AC-MUS-01-Aug-27			R	
	BA-IKLL-AC-MUS-02-Aug-27			R	
	BA-IKLL-AC-MUS-28-Aug-28			R	
	BA-IKLL-AC-MUS-29-Aug-28			R	
Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)		Sampler:		SAMPLE CONDITION AS RECEIVED (lab use only)	
Drinking Water (DW) Samples <sup>1</sup> (client use)		Date		Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>	
Are samples taken from a Regulated DW System?		Time		Ice Packs <input type="checkbox"/> Ice Cubes <input checked="" type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>	
Are samples for human consumption/ use?		Time		Cooling Initiated <input type="checkbox"/>	
SHIPPING RELEASE (client use)		Time		INITIAL COOLER TEMPERATURES °C	
Released by: Samantha Burke		Date: 5-Oct-2021		FINAL COOLER TEMPERATURES °C	
SHIPMENT RELEASE (client use)		Time		1.8°C	
Date: 5-Oct-2021		Time		19 Dec 24	
Date: 5-Oct-2021		Time		10:30	

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Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.  
1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



Chain of Custody (COC) / Analytical Request Form

COC Number: 17 -

Page 1 of 1

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Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here  
(lab use only)

<b>Report To</b> Contact and company name below will appear on the final report		<b>Report Format / Distribution</b> Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		<b>Select Service Level Below - Contact your AM to confirm all E&amp;P TATs (surcharges may apply)</b> Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply 4 day [P4-20%] <input type="checkbox"/> 1 Business day [E - 100%] 3 day [P3-25%] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 - 200%] 2 day [P2-50%] <input type="checkbox"/> (Laboratory opening fees may apply) Date and Time Required for all E&P TATs: dd-mm-yy hh:mm For tests that can not be performed according to the service level selected, you will be contacted.	
<b>Company:</b> Minnow Environmental Inc. <b>Contact:</b> Samantha Burke (705) 991-2722 Company address below will appear on the final report <b>Street:</b> 2 Lamb Street Georgetown, Ontario Postal Code: L7G3M9		<b>Invoice Distribution</b> Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: apminnow@minnow.ca Email 2: samantha.burke@minnow.ca Email 3: Oil and Gas Required Fields (client use) AFE/Cost Center: PO# Major/Minor Code: Routing Code: Requisitioner: Location:		<b>Analysis Request</b> Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below SUSPECTED HAZARD (see Special Instructions)	
<b>ALS Account # / Quote #:</b> 247202.00XX (Mline 2024) <b>Job #:</b> <b>PO / AFE:</b> <b>LSD:</b>		<b>Project Information</b>		<b>NUMBER OF CONTAINERS</b>	
<b>ALS Lab Work Order # (lab use only):</b>		<b>ALS Contact: Emily Hansen</b>		<b>SAMPLER:</b>	
<b>Sample Identification and/or Coordinates</b> (This description will appear on the report)		<b>Date</b> (dd-mm-yy)		<b>Time</b> (hh:mm)	
<b>Sample Type</b>					
BA-QURL-AC-MUS-01-Aug-28		28-Aug-24		Tissue	
BA-QURL-AC-MUS-02-Aug-28		28-Aug-24		Tissue	
BA-QURL-AC-MUS-03-Aug-28		28-Aug-24		Tissue	
BA-QURL-AC-MUS-04-Aug-29		28-Aug-24		Tissue	
BA-QURL-AC-MUS-05-Aug-29		28-Aug-24		Tissue	
BA-QURL-AC-MUS-06-Aug-29		28-Aug-24		Tissue	
BA-QURL-AC-MUS-07-Aug-29		28-Aug-24		Tissue	
BA-QURL-AC-MUS-08-Aug-29		28-Aug-24		Tissue	
BA-QURL-AC-MUS-09-Aug-29		28-Aug-24		Tissue	
BA-QURL-AC-MUS-10-Aug-29		28-Aug-24		Tissue	
BA-QURL-AC-MUS-11-Aug-30		28-Aug-24		Tissue	
BA-QURL-AC-MUS-12-Aug-30		28-Aug-24		Tissue	
<b>Drinking Water (DW) Samples<sup>1</sup> (client use)</b>					
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					
<b>SHIPMENT RELEASE (client use)</b> Released by: Samantha Burke Date: 5-Oct-2021		<b>INITIAL SHIPMENT RECEPTION (lab use only)</b> Received by: Date:		<b>FINAL SHIPMENT RECEPTION (lab use only)</b> Received by: PHL Date: 19-Dec-24 Time: 10:30	
<b>Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below</b> (electronic COC only)					
<b>SAMPLE CONDITION AS RECEIVED (lab use only)</b> Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input type="checkbox"/> Ice Cubes <input checked="" type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C FINAL COOLER TEMPERATURES °C 18.0					

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1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.





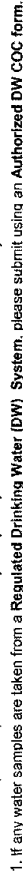
Report To		Report Format / Distribution	
Company: Minnow Environmental Inc. Contact: Samantha Burke Phone: (705) 991-2722 Company address below will appear on the final report Street: 2 Lamb Street City/Province: Georgetown, Ontario Postal Code: L7G3M9		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: samantha.burke@minnow.ca Email 2 Email 3	
<b>Project Information</b> ALS Account # / Quote #: Job #: 247202.00XX (Mile 2024) PO / AFE: LSD:		<b>Invoice Distribution</b> Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: apminnow@minnow.ca Email 2: samantha.burke@minnow.ca <b>Oil and Gas Required Fields (client use)</b> AFE/Cost Center: PO# Major/Minor Code: Routing Code: Requisitioner: Location:	
<b>ALS Lab Work Order # (lab use only):</b>		<b>ALS Contact: Emily Hansen</b> <b>Sampler:</b>	
<b>ALS Sample # (lab use only)</b>	<b>Sample Identification and/or Coordinates</b> (This description will appear on the report)	<b>Date</b> (dd-mm-yy)	<b>Time</b> (hh:mm)
	BA-QURL-AC-MUS-13-Aug-30	30-Aug-24	Tissue
	BA-QURL-AC-MUS-14-Aug-30	30-Aug-24	Tissue
	BA-QURL-AC-MUS-15-Aug-30	30-Aug-24	Tissue
	BA-QURL-AC-MUS-16-Aug-30	30-Aug-24	Tissue
	BA-QURL-AC-MUS-17-Aug-30	30-Aug-24	Tissue
	BA-QURL-AC-MUS-18-Aug-30	30-Aug-24	Tissue
	BA-QURL-AC-MUS-19-Aug-30	30-Aug-24	Tissue
	BA-QURL-AC-MUS-20-Aug-30	30-Aug-24	Tissue
	BA-DUP-AC-MUS-06-2024-08	30-Aug-24	Tissue
	BA-DUP-AC-MUS-15-2024-08	30-Aug-24	Tissue
	BA-QURL-AC-LI-01-Aug-28	28-Aug-24	Tissue
	BA-QURL-AC-LI-02-Aug-28	28-Aug-24	Tissue
<b>Drinking Water (DW) Samples<sup>1</sup> (client use)</b> Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)	
Released by: Samantha Burke      Date: 5-Oct-2021		<b>SHIPMENT RELEASE (client use)</b> Received by:      Date:      Time:	

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Report To					
Company:	Minnow Environmental Inc.				
Contact:	Samantha Burke				
Phone:	(705) 991-2722				
Company address below will appear on the final report					
Street:	2 Lamb Street				
City/Province:	Georgetown, Ontario				
Postal Code:	L7G3M9				
Invoice To					
	Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				
	Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				
Company:					
Contact:					
Project Information					
ALS Account # / Quote #:					
Job #:	247202.00XX (Milne 2024)				
PO / AFE:					
LSD:					
ALS Lab Work Order # (lab use only):					
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)				
	BA-IKLL-AC-MUS-15-Aug-27				
	BA-IKLL-AC-MUS-16-Aug-27				
	BA-IKLL-AC-MUS-19-Aug-27				
	BA-IKLL-AC-MUS-21-Aug-27				
	BA-IKLL-AC-MUS-24-Aug-27				
	BA-DUP-AC-MUS-01-2024-08				
	BA-DUP-AC-MUS-02-2024-08				
	BA-DUP-AC-MUS-03-2024-08				
Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)					
Drinking Water (DW) Samples¹ (client use) <input type="checkbox"/> Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					
SHIPMENT RELEASE (client use) Released by: Samantha Burke			Date: 5-Oct-2021		
INITIAL SHIPMENT RECEPTION (lab use only) Received by:			Date:		

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1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



























