APPENDIX 18 2024 AQUATIC EFFECTS MONITORING PROGRAM (AEMP) REPORT

Aquatic Effects Monitoring Program 2024 Annual Report

Meliadine Gold Mine

Prepared for:



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PLAIN LANGUAGE SUMMARY

This document summarizes the findings of the 2024 Aquatic Effects Monitoring Program (AEMP) for Agnico Eagle's Meliadine Gold Mine near Rankin Inlet, Nunavut. The AEMP is required each year under the Mine's Type A Water Licence (2AM-MEL1631) to assess whether mining activities are affecting nearby lakes. The program includes two key monitoring studies:

- Meliadine Lake Study – The main focus of the AEMP, as Meliadine Lake receives treated surface contact water from the Mine. The scope of the Meliadine Lake study in 2024 included the following components:
  - Surface water quality
  - Phytoplankton community
  - Sediment chemistry and benthic invertebrate community health
  - Threespine Stickleback tissue chemistry and health assessment
  - Lake Trout tissue chemistry and health assessment
- Peninsula Lakes Study – Examines changes in water quality in smaller lakes near the Mine that could be affected by alteration of watersheds during construction and aerial emissions during operations.

Together, the Meliadine Lake and Peninsula Lakes studies help determine if the Mine is operating as planned to ensure water quality remains safe for people and aquatic life.

Meliadine Lake Study

The Meliadine Lake study follows a control-impact design with a gradient approach, where water quality and biological monitoring are conducted at multiple locations to assess potential mining-related effects. Sampling focuses on the near-field area (MEL-01), where treated water is released, the mid-field area (MEL-02) downstream, and far-field reference areas beyond the Mine's influence.

The program includes annual monitoring of surface water quality and the phytoplankton community, while assessments of the benthic invertebrate community, sediment quality, and fisheries occur every three years. In addition to the study areas in Meliadine Lake, two regional reference lakes (Peter Lake and Atulik Lake) are included in the Lake Trout study to assess whether the health and tissue chemistry of Lake Trout in Meliadine Lake differ from those in other lakes in the region.

Regional Climate Considerations

Water quality in Meliadine Lake can change due to both natural processes and human activities. While mining-related influences are closely monitored, climate-driven factors can also play a significant role. A

key objective of the AEMP is to distinguish between mining-related changes in water quality and ecological conditions and those driven by regional climate patterns.

The summer of 2024 was one of the warmest on record since 1981, with very little precipitation. As a result, minimal runoff was collected, treated, and discharged to Meliadine Lake after the initial spring freshet. The prolonged dry period in June, July, and August led to a temporary suspension of water discharge for approximately six weeks, from mid-July to early September. Due to the lack of discharge, water quality in the East Basin (MEL-01) remained relatively stable throughout the summer.

By September, weather patterns shifted importantly, bringing one of the highest monthly rainfall totals on record. This increased precipitation allowed for the resumption of treated water discharge to Meliadine Lake. The potential effects of this record rainfall on water quality will be closely monitored as part of the 2025 AEMP.

Meliadine Lake Water Quality

In 2024, there were no effluent quality issues, with all measured concentrations remaining below the limits set by the Water Licence. Monthly effluent toxicity tests confirmed no effects on Rainbow Trout or aquatic invertebrates. This year also marked ten consecutive years of water quality monitoring in Meliadine Lake under the AEMP. No exceedances of Health Canada's drinking water quality guidelines or aquatic life guidelines were reported, and most parameters continue to remain well below limits to protect human health and aquatic life.

Long-term monitoring data indicate that regional climate patterns play a significant role in influencing temporal trends for water quality parameters. As expected, effluent discharge has contributed to increased concentrations of certain major ions, nutrients, and metals in the East Basin; however, total dissolved solids (TDS) and chloride concentrations remain well below predictions outlined in the 2014 Final Environmental Impact Statement (FEIS) and subsequent water quality modeling conducted in 2020.

Given these findings, no additional management actions are required based on the 2024 surface water quality monitoring results, and routine monitoring will continue as planned in 2025.

Phytoplankton Community

Effluent contains nutrients and minerals that can stimulate algal growth and contribute to changes in primary productivity. The phytoplankton study was expanded in 2024 to include sampling in July and September, in addition to the annual August sampling event.

In 2024, phosphorus concentrations in Meliadine Lake remained stable, consistent with trends observed throughout operations, particularly since 2020. Chlorophyll-*a* concentrations, which had been increasing from 2018 to 2023 at MEL-01 (near-field) and MEL-02 (mid-field), did not follow this pattern in 2024. Instead, the average chlorophyll-*a* concentration at MEL-01 was similar to levels observed before and

during early Mine operations, while concentrations at MEL-02 remained comparable to the past two years. Chlorophyll-*a* levels at reference locations were slightly higher than in previous years but remained lower than those at MEL-01.

Phytoplankton biomass in 2024 was lower in the East Basin than in 2023 but remained within the range of values recorded in past monitoring years. Unlike previous years, biomass in MEL-01 was not higher than in the mid-field and reference areas at one sampling event. However, total biomass at MEL-01 was higher than in other areas during other sampling events, suggesting that the East Basin may naturally support greater productivity.

Indicators of phytoplankton community structure showed that the algal community in MEL-01 differed from the communities in the mid-field and reference areas. Additionally, slight shifts were observed in the phytoplankton communities across all sampling areas compared to 2023. It remains unclear whether these differences are linked to effluent discharge as predicted in the 2014 FEIS, or if they result from other local or regional environmental factors.

Routine monitoring of chlorophyll-*a* and phytoplankton community structure will continue in 2025 to assess potential changes in primary productivity and community composition.

Sediment Chemistry

Sediment monitoring in Meliadine Lake is conducted every three years, in coordination with the benthic invertebrate program. While water chemistry provides a snapshot of conditions at a given time, sediment chemistry reflects the long-term accumulation of compounds, offering insight into trends that may not be immediately evident in water samples. Additionally, sediment characteristics such as grain size and total organic carbon play a key role in shaping the benthic invertebrate community. In 2024, sediment samples were collected in August from the near-field (MEL-01), mid-field (MEL-02), and reference areas (MEL-03, MEL-05) to assess physical habitat characteristics and metal concentrations.

Some metals occur at naturally elevated concentrations at MEL-01 compared to other areas of Meliadine Lake. However, variability in metal concentrations within and between study areas is primarily influenced by natural habitat differences—such as grain size—and spatial variation in iron and manganese levels. There is no evidence that mining activities have contributed to a measurable increase in metal concentrations or changes in sediment quality in Meliadine Lake.

Benthic Invertebrate Community

In 2024, the benthic invertebrate community at MEL-01 showed statistically significant differences in density compared to reference areas (MEL-03 and MEL-05), but the magnitude of this difference remained below the Critical Effect Size (CES) threshold for biological significance. No differences in species richness were detected between exposure and reference areas.

Community composition indicators showed that MEL-01 and MEL-02 differed from the reference areas, suggesting some variation in species structure and taxonomic composition. However, despite these differences, the benthic invertebrate community at MEL-01 has remained stable since 2018, consistently dominated by chironomid larvae and fingernail clams. This long-term stability suggests that effluent discharge to Meliadine Lake has not caused adverse effects on the benthic invertebrate community at MEL-01.

These findings align with predictions from the 2014 FEIS, which anticipated no significant changes to benthic invertebrate structure despite increased nutrient concentrations in the East Basin and potential shifts in primary productivity.

Small-bodied Fish (Threespine Stickleback)

Health Assessment

Threespine Stickleback is the small-bodied sentinel fish species for the harmonized fish health assessment under the AEMP and Environmental Effects Monitoring (EEM) program. Unlike Lake Trout, which migrate throughout the lake, Threespine Stickleback have a small home range, making them well-suited for assessing potential effects of effluent discharge in Meliadine Lake. The study includes one exposure area (MEL-01) and two reference areas (MEL-03 and MEL-04) to compare fish health indicators such as survival, growth, and condition. The 2024 health assessment marked the third monitoring cycle since the Mine transitioned to operations in 2018.

Results from 2024 showed notable differences in growth between MEL-01 and the reference sites. Males at MEL-01 were significantly longer, heavier, and older than those at reference sites, with weight differences between MEL-01 and both reference areas exceeding the critical effect size of 25%. In contrast, females showed smaller differences in weight at age, and the only significant differences were also observed between the two reference areas.

Both males and females at MEL-01 were heavier for their length and had larger livers, with most differences exceeding CES thresholds. While male liver weight did not differ significantly between MEL-01 and MEL-03, female total weight and liver weight were significantly higher at MEL-01 than at both reference sites. Collectively, these results suggest that fish at MEL-01 have greater access to energy or use it more efficiently than those in the reference areas. This aligns with 2014 FEIS predictions, which anticipated that nutrients from effluent discharge could enhance food availability and habitat suitability for forage fish such as Threespine Stickleback.

Tissue Chemistry

Threespine Stickleback tissue chemistry monitoring is conducted alongside the health assessment study to evaluate bioaccumulation and the trophic transfer of contaminants within the food web, linking lower trophic levels to predatory fish species such as Lake Trout.

For most parameters monitored under the AEMP, there is no evidence that mining activities have contributed to elevated metal concentrations in Threespine Stickleback from the East Basin of Meliadine Lake. However, arsenic—and to a lesser extent, uranium—were consistently higher in fish from MEL-01 compared to reference areas in both 2021 and 2024, suggesting the increase is localized to the East Basin. The available data do not confirm whether this trend is linked to effluent discharge, climate-related factors, or both. Regardless of the source, findings from the Threespine Stickleback health assessment confirm that the population in the East Basin is not showing signs of toxicological impairment.

Large-bodied Fish (Lake Trout)

Health Assessment

The 2024 assessment marked the second cycle of monitoring during operations to evaluate potential effects of mining activities on Lake Trout health, a key species in northern freshwater ecosystems. The study followed the same design as EEM Cycle 2, comparing survival, growth, and condition between Meliadine Lake and two regional reference lakes (Peter Lake and Atulik Lake).

In 2024, mean age of Lake Trout was 17.4 years in Meliadine Lake, 18.6 years in Peter Lake, and 12.1 years in Atulik Lake. While fish in Meliadine and Peter Lakes were significantly older than those in Atulik Lake, there was no difference between Meliadine and Peter Lakes. This contrasts with 2021, when Lake Trout in Meliadine Lake were significantly older than those in the reference lakes. The younger fish observed in 2024 may be due to the timing of the survey, which followed a four-week shutdown of effluent discharge. Larger Lake Trout may preferentially inhabit the area near the diffuser during discharge, benefiting from greater ionic strength, which reduces the energy needed for osmoregulation.

Growth results showed no significant difference in age-adjusted weight between Meliadine and Peter Lakes, while Lake Trout in Meliadine Lake were 31.6% heavier than those in Atulik Lake. This pattern, also observed in 2021, suggests that growth differences reflect regional variability rather than mine-related effects.

There were no significant differences in condition (weight-to-length ratio) between Meliadine Lake and the reference lakes, though fish in Atulik Lake had 11% higher condition values than those in Peter Lake, highlighting natural variation. Liver weight was 16.6% higher in Meliadine Lake compared to Atulik Lake, but remained below the 25% CES threshold.

The absence of significant differences in key health indicators and the lack of consistent trends over time reinforce that Lake Trout health in Meliadine Lake is not adversely affected by mining activities. These findings emphasize the importance of multiple reference lakes in distinguishing natural fluctuations from potential mine-related effects.

Tissue Chemistry

Domestic fishing is an important part of Inuit life, and Lake Trout are valued both for subsistence use and as a sport fish. To ensure the Mine does not impact traditional fisheries, a fish tissue sampling program is conducted every three years, coinciding with the Lake Trout health assessment.

Results from the 2024 monitoring program show that most metal concentrations in Lake Trout muscle from Meliadine Lake have remained stable or decreased since the baseline and pre-construction phase. For parameters showing an increasing trend, similar changes were observed in the regional reference lakes, suggesting that these patterns are not mine-related.

Findings from two monitoring cycles (2021 and 2024) confirm predictions from the 2014 FEIS, which anticipated no changes in fish tissue quality due to mining operations.

Summary for Meliadine Lake

The 2024 AEMP findings indicate that while effluent discharge has contributed to localized nutrient increases, particularly in the East Basin (MEL-01), there is no evidence of toxicological impairment to aquatic life in Meliadine Lake. Fish health indicators remain stable, and the benthic invertebrate community has shown long-term stability, with no signs of decline.

There is some evidence that the East Basin of Meliadine Lake is more productive than other areas, as reflected in phytoplankton biomass variability and shifts in community composition. However, phosphorus concentrations remain stable, and observed biomass and chlorophyll-*a* fluctuations suggest that mining activities have not contributed to widespread or persistent changes in productivity. While the extent of effluent influence on nutrient dynamics remains uncertain, current data indicate that any enrichment effects are localized and unlikely to result in adverse effects to fish.

Routine surface water and phytoplankton community monitoring is planned for 2025 to track long-term trends in water quality and primary productivity. In addition, Agnico Eagle has committed to a three-year water quality study at Peter Lake and another reference lake to evaluate natural variability in regional lakes. This study will help distinguish mine-related effects from broader environmental trends, providing valuable context for future assessments.

The EEM Cycle 3 interpretive report will be submitted to Environment and Climate Change Canada in August 2025. This report will include Threespine Stickleback and Lake Trout health assessment chapters, along with other required information under the Metal and Diamond Mining Effluent Regulations

(MDMER). The conclusions from the EEM Cycle 3 interpretive report will inform study design considerations for the next cycle of biological monitoring for both the AEMP and EEM in 2027.

Peninsula Lakes Study

Peninsula Lakes Water Quality

Water quality monitoring was conducted in Lake D7, Lake A8, and Lake B7 in July and August, with additional sampling at Lake B7 in September and October. Lake A8 is located south of Tiriganiaq Pits 1 and 2, while Lake B7 is west of the Tailings Storage Facility (TSF). Lake D7, situated in a watershed not directly impacted by the Mine, serves as a baseline comparison to differentiate mine-related effects from natural variability and climate-driven changes.

Monitoring results from 2024 indicate that mining activities have not directly impacted water quality in Lake D7. While some parameters have increased compared to baseline, these changes are likely due to natural variability, interannual climate fluctuations, and broader climate change effects rather than mine-related influences.

In contrast, construction and operation of the Mine have contributed to water quality changes in Lake A8 and Lake B7, with major ions (calcium, sodium, chloride, and sulphate), arsenic, and barium being the most affected parameters.

No early-warning water quality triggers (Action Levels) were exceeded in 2024 for Lake D7 or Lake A8. However, in August 2024, arsenic concentrations in Lake B7 were above the AEMP Action Level, reaching 25 µg/L. This increasing trend has been noted in previous AEMP reports, with the likely source being dust from the TSF that migrated offsite during winter 2019/2020. Snow core chemistry results suggest that mitigation measures put in place in recent years have helped reduce the movement of dust. However, arsenic levels in Lake B7 have continued to increase, and one possible explanation is that arsenic in the lake sediment is released into the water after ice melts in the spring. Agnico Eagle conducted additional surface water sampling in 2023 and 2024 to understand the seasonal trend, and the results show arsenic concentrations peak in August before declining in the fall. Monitoring will continue in 2025 to track these trends.

Starting in 2025, Lake A8 will no longer be included in the AEMP, as it will be dewatered and fished out before development of nearby open pit deposits. A new study lake (Lake E3) will be added to the monitoring program to replace Lake A8 in the study design.

TABLE OF CONTENTS

PLAIN LANGUAGE SUMMARY II
TABLE OF CONTENTS IX
LIST OF FIGURES XII
LIST OF TABLES XIX
LIST OF APPENDICES XXIII
ACKNOWLEDGEMENTS XXIV
USE & LIMITATIONS OF THIS REPORT XXV
ACRONYMS & GLOSSARY OF TERMS XXVI

1 INTRODUCTION 1
1.1 Background 1
1.2 Scope of the 2024 AEMP 2
1.3 Objectives and Key Questions 4
1.4 Report Structure 4
1.5 References 12
2 SOURCE CHARACTERIZATION 13
2.1 Introduction 13
2.2 Findings from the 2024 Effluent Quality and Snow Chemistry Programs 13
2.3 Temperature and Precipitation Patterns in 2024 14
2.4 MEL-14 Effluent Monitoring Program 20
2.5 Snow Core Monitoring Program 26
2.6 References 42
3 WATER QUALITY – MELIADINE LAKE 43
3.1 Introduction 43
3.2 Findings from the 2024 Water Quality Program 44
3.3 Methods 47
3.4 Results and Discussion 52
3.5 Conclusions 76
3.6 Condensed Temporal Water Quality Plots 77
3.7 References 84
4 WATER QUALITY – PENINSULA LAKES 85
4.1 Introduction 85

4.2 Findings from the 2024 Peninsula Lakes Water Quality Program 85
4.3 Methods 86
4.4 Results and Discussion 90
4.5 Conclusions 95
4.6 Supplemental Water Quality Plots 105
4.7 References 112
5 PHYTOPLANKTON COMMUNITY 113
5.1 Introduction 113
5.2 Findings from the 2024 Phytoplankton Study 114
5.3 Methods 115
5.4 Results and Discussion 121
5.5 Conclusions 151
5.6 References 152
6 SEDIMENT CHEMISTRY 155
6.1 Introduction 155
6.2 Findings from the 2024 Sediment Chemistry Program 157
6.3 Methods 157
6.4 Quality Assurance and Quality Control 159
6.5 Results and Discussion 160
6.6 Conclusions 168
6.7 References 173
7 BENTHIC INVERTEBRATE COMMUNITY 174
7.1 Introduction 174
7.2 Findings from the 2024 Benthic Invertebrate Community Program 175
7.3 Methods 175
7.4 Results and Discussion 180
7.5 Conclusions 189
7.6 Benthic Invertebrate Community Tables and Figures 190
7.7 References 200
8 THREESPINE STICKLEBACK HEALTH 201
8.1 Introduction 201
8.2 Findings from the 2024 Threespine Stickleback Health Assessment 203
8.3 Methods 203
8.4 Results 209
8.5 Conclusions 230

8.6 References 233
9 THREESPINE STICKLEBACK CHEMISTRY 234
9.1 Introduction 234
9.2 Findings from the 2024 Threespine Stickleback Chemistry Study 235
9.3 Methods 235
9.4 Results and Discussion 237
9.5 Conclusions 239
9.6 References 247
10 LAKE TROUT HEALTH 248
10.1 Introduction 248
10.2 Findings from the 2024 Lake Trout Health Assessment 249
10.3 Methods 252
10.4 Results 256
10.5 Conclusions 270
10.6 References 273
11 LAKE TROUT CHEMISTRY 274
11.1 Introduction 274
11.2 Findings from the Lake Trout Tissue Chemistry Study 274
11.3 Methods 275
11.4 Results and Discussion 277
11.5 Conclusions 278
11.6 References 289
12 RESPONSE FRAMEWORK AND LOW ACTION LEVEL ASSESSMENT 290
12.1 Meliadine Lake Low Action Level Assessment 291
12.2 Peninsula Lakes Water Quality Summary 296
12.3 Scope of the 2025 AEMP 297
12.4 References 297

LIST OF FIGURES

Figure 1-1. Study Area for the Aquatic Effects Monitoring Program. 5
Figure 1-2. Meliadine Mine (2024). 6
Figure 2-1. Average monthly temperatures (°C) since 2013. 17
Figure 2-2. Annual precipitation (mm) from 1981-2024. 18
Figure 2-3. Annual rainfall (mm) from 1981-2024. 19
Figure 2-4. Cumulative annual precipitation as rain from 2013 to 2024. 20
Figure 2-5. Daily Discharge (m^3) from CP1 to Meliadine Lake, 2018-2024. 22
Figure 2-6. Total dissolved solids and constituent ions in end-of-pipe effluent at MEL-14, 2018-2024. 31
Figure 2-7. Concentrations of nutrients measured in end-of-pipe samples from MEL-14, 2018-2024... 32
Figure 2-8. Concentrations of metals measured in end-of-pipe samples from MEL-14, 2018-2024..... 33
Figure 2-9. Percent composition of major ions in effluent from MEL-14. 34
Figure 2-10. Annual loadings (kg) from CP1 to Meliadine Lake for selected parameters. 35
Figure 2-11. Sublethal toxicity test results for *Lemna minor* compared to measured concentrations of TDS in effluent from MEL-14. 36
Figure 2-12. Snow core chemistry – total suspended solids, turbidity, and sulphate, 2020–2024. 37
Figure 2-13. Snow core chemistry – arsenic, iron, and manganese, 2020–2024. 38
Figure 2-14. Snow core chemistry – aluminum, barium, and copper, 2020–2024. 39
Figure 2-15. Snow core chemistry – cobalt, lead, molybdenum, 2020–2024. 40
Figure 2-16. Snow core chemistry – nickel, strontium, uranium, 2020–2024. 41
Figure 3-1. Surface Water, Phytoplankton, and Fish Sampling Locations in Meliadine Lake. 45
Figure 3-2. Surface water temperature results from limnology profiles taken during the open water season since 2013. 54
Figure 3-3. Average temperature, dissolved oxygen, pH, and specific conductivity by month in 2024.. 55
Figure 3-4. Specific conductivity (µS/cm) results from the 2024 limnology profiles. 56
Figure 3-5. Specific conductivity (µS/cm) profiles during the open water season from 2013 to 2024. .. 57
Figure 3-6. Water chemistry results from 2024 compared to the Normal Range, AEMP Action Levels, AEMP Benchmarks. 59
Figure 3-7. Temporal trend for TDS, chloride, and sulphate at MEL-01, MEL-02, and MEL-03. 69
Figure 3-8. Temporal trend for TDS (calculated and measured) and constituent major ions at MEL-01, MEL-02, and MEL-03. 70

Figure 3-9. Temporal trends for organic carbon (DOC and TOC), phosphorus, and TKN at MEL-01, MEL-02, and MEL-03 since 2013. 71
Figure 3-10. Temporal trends for arsenic, strontium, and uranium at MEL-01, MEL-02, and MEL-03..... 72
Figure 3-11. Predicted versus measured concentrations of Total Dissolved Solids (measured; mg/L) in the East Basin of Meliadine Lake. 74
Figure 3-12. Predicted versus measured concentrations of chloride (mg/L) in the East Basin of Meliadine Lake. 75
Figure 3-13. Concentrations of TDS and constituent ions (Ca, Mg, K, Na, Cl, SO_4) since 2013. 78
Figure 3-14. Conductivity, hardness, and concentrations of selected nutrients since 2013. 79
Figure 3-15. Concentrations of aluminum, arsenic, barium, and boron since 2013. 80
Figure 3-16. Concentrations of cobalt, copper, iron, and lead since 2013. 81
Figure 3-17. Concentrations of lithium, manganese, molybdenum, and nickel since 2013. 82
Figure 3-18. Concentrations of strontium, titanium, uranium, and zinc since 2013. 83
Figure 4-1. Average surface water temperatures at the Peninsula Lakes, 2015-2024. 91
Figure 4-2. *In-situ* water quality at the Peninsula Lakes, 2015-2024. 92
Figure 4-3. Lake D7 – temporal trends for parameters that exceeded the Normal Range in 2024. 98
Figure 4-4. Lake A8 – temporal trends for parameters that exceeded the Normal Range in 2024..... 100
Figure 4-5. Lake B7 – temporal trends for parameters that exceeded the Normal Range in 2024..... 102
Figure 4-6. Temporal trends for key parameters of interest in the Peninsula Lakes since 2015..... 103
Figure 4-7. Temporal trends for arsenic, iron, and manganese in Lake B7..... 104
Figure 4-8. Concentration of total dissolved solids and constituent major Ions in the Peninsula Lakes since 2015. 106
Figure 4-9. Conductivity, alkalinity, and the concentration of selected nutrients in the Peninsula Lakes since 2015. 107
Figure 4-10. Aluminum, arsenic, barium, and boron concentrations in the Peninsula Lakes since 2015. 108
Figure 4-11. Cobalt, copper, iron, and lead concentrations in the Peninsula Lakes since 2015. 109
Figure 4-12. Lithium, manganese, molybdenum, and nickel concentrations in the Peninsula Lakes since 2015. 110
Figure 4-13. Strontium, titanium, uranium, and zinc concentrations in the Peninsula Lakes since 2015. 111
Figure 5-1. Annual loadings (kg/year) of nitrogen and total phosphorus to Meliadine Lake 122

Figure 5-2 Chlorophyll-a Concentrations (µg/L) in Meliadine Lake during the August field sampling event since 2015. 124
Figure 5-3 Chlorophyll-a (µg/L) in Meliadine Lake in July, August and September 2024 125
Figure 5-4 Phytoplankton richness, biomass (mg/m^3), and density (cells/L), August sampling event 2013-2024. 130
Figure 5-5. Mean phytoplankton richness, biomass (mg/m^3), and density (cells/L) by major taxa, August 2013-2024. 131
Figure 5-6. Relative richness, biomass (mg/m^3), and density (cells/L) by major taxa, August 2013-2024. 132
Figure 5-7. Mean phytoplankton richness, biomass (mg/m^3), and density (cells/L) by major taxa, July, August and September 2024..... 133
Figure 5-8. Mean phytoplankton richness, biomass (mg/m^3), and density (cells/L) by major taxa, July, August and September 2017..... 134
Figure 5-9. Bray-Curtis Dissimilarity, Simpson's Diversity, and Simpson's Evenness, August 2013-2024. 136
Figure 5-10. Ordination of the reference and exposure area phytoplankton results by phase and location for Meliadine Lake. 140
Figure 5-11. Non-metric multidimensional scaling (nMDS) results showing ordination of the phytoplankton results by year and location for Meliadine Lake. 141
Figure 5-12. Relationship between chlorophyll-a and phytoplankton biomass for Meliadine Lake by year, August 2016 through 2024. 144
Figure 5-13. Relationship between chlorophyll-a and phytoplankton biomass for Meliadine Lake by monitoring location during the August sampling event, 2015 through 2024. 145
Figure 5-14. Relationship between chlorophyll-a and phytoplankton biomass for Meliadine Lake by month, July, August and September 2024. 146
Figure 5-15. Relationship between chlorophyll-a and phytoplankton biomass for Meliadine Lake by monitoring location during seasonal sampling in 2024 (July, August, and September)..... 147
Figure 5-16. Relationship between nutrient concentrations (DOC, nitrogen, and phosphorus) and phytoplankton biomass and chlorophyll-a in Meliadine Lake, August 2013-2024..... 148
Figure 5-17. Relationship between nutrient concentrations (DOC, nitrogen, and phosphorus) and phytoplankton biomass and chlorophyll-a at the near-field area (MEL-01), August 2013-2024. 149
Figure 5-18. Trophic Status Index values for Meliadine Lake, 2013 through 2024..... 150
Figure 6-1. Sediment and Benthic Invertebrate Stations in Meliadine Lake. 156

Figure 6-2. Cumulative particle size distribution for the sediment samples collected in 2024. 161
Figure 6-3. Clay, sand, silt and total organic carbon content in sediment collected from the Meliadine Lake AEMP study areas. 162
Figure 6-4. Particle size distribution in the various stations sampled in Meliadine Lake since 2015. ... 163
Figure 6-5. Sediment chemistry results compared to the CCME Interim Sediment Quality Guideline (ISQG) and Probable Effect Level (PEL) concentration. 166
Figure 6-6. Temporal trends in the concentrations of select metals of interest at the Meliadine Lake study areas, 2015-2024. 169
Figure 6-7. Temporal trends in the concentrations of select metals of interest at the Meliadine Lake study areas compared to sediment grain size. 170
Figure 6-8. Relationship between arsenic, iron, and manganese concentrations in sediment samples from Meliadine Lake from 2015-2024. 171
Figure 6-9. Concentrations of select metals of interest at the MEL-01 stations during operations (2018, 2021, and 2024). 172
Figure 7-1. Scatter plot of Axis 1 and Axis 2 scores and associated taxa scores for Non-Metric Multidimensional Scaling (nMDS) analysis. 187
Figure 7-2. nMDS ordination plot for benthic invertebrate community (family level) for Meliadine Lake stations since 2015 188
Figure 7-3. Benthic invertebrate density in Meliadine Lake since 2015. 193
Figure 7-4. Benthic invertebrate richness in Meliadine Lake since 2015. 194
Figure 7-5. Absolute benthic invertebrate density by major taxa, 2018, 2021, and 2024. 195
Figure 7-6. Relative benthic invertebrate density by major taxa, 2018, 2021, and 2024. 196
Figure 7-7. Benthic invertebrate richness by major taxa, 2018, 2021, and 2024. 197
Figure 7-8. Relative benthic invertebrate richness by major taxa, 2018, 2021, and 2024. 198
Figure 7-9. Benthic community diversity indices by year for Meliadine Lake stations since 2015. 199
Figure 8-1. Length-frequency distributions of mature, parasitized Threespine Stickleback. 213
Figure 8-2. Weight-frequency distributions of mature, parasitized Threespine Stickleback 213
Figure 8-3. Age-frequency distributions of mature, parasitized Threespine Stickleback. 214
Figure 8-4. Length (mm) of mature, parasitized Threespine Stickleback and results of Tukey post-hoc pairwise comparison of means. 216
Figure 8-5. Weight (g) of mature, parasitized Threespine Stickleback and results of Tukey post-hoc pairwise comparison of means. 216

Figure 8-6. Age of mature, parasitized Threespine Stickleback and results of Tukey post-hoc pairwise comparison of means. 217
Figure 8-7. Length at age four and weight at age four of mature, parasitized Threespine Stickleback and results of Tukey post-hoc pairwise comparison of means 220
Figure 8-8. Relationship between total weight and total length in mature, parasitized Threespine Stickleback from Meliadine Lake in 2024 225
Figure 8-9. Relationship between liver weight and total length in mature, parasitized Threespine Stickleback from Meliadine Lake in 2024 226
Figure 8-10. Relationship between liver weight and total weight in mature, parasitized Threespine Stickleback from Meliadine Lake in 2024 227
Figure 8-11. Relationship between gonad weight and total length for mature, parasitized Threespine Stickleback from Meliadine Lake in 2024 228
Figure 8-12. Relationship between gonad weight and total weight in mature, parasitized Threespine Stickleback from Meliadine Lake in 2024 229
Figure 9-1. Arsenic concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA. 242
Figure 9-2. Cobalt concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA. 242
Figure 9-3. Copper concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA. 243
Figure 9-4. Iron concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA. 243
Figure 9-5. Manganese concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA. 244
Figure 9-6. Phosphorus concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA. 244
Figure 9-7. Strontium concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA. 245
Figure 9-8. Uranium concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA. 245
Figure 9-9. Zinc concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA. 246
Figure 10-1. Peter Lake – Reference Area for the Lake Trout Study. 250
Figure 10-2. Atulik Lake – Reference Area for the Lake Trout Study. 251

Figure 10-3. Length-frequency distributions of Lake Trout. 260
Figure 10-4. Weight-frequency distributions of Lake Trout. 261
Figure 10-5. Age-frequency distributions of Lake Trout. 261
Figure 10-6. Length, weight, and age of Lake Trout and results of Tukey post-hoc pairwise comparison of means. 262
Figure 10-7. Relationship between fork length and age, and weight and age, for Lake Trout from Meliadine Lake, Atulik Lake, and Peter Lake in 2024. 267
Figure 10-8. Total weight vs fork length for Lake Trout from Meliadine Lake, Atulik Lake, and Peter Lake in 2024. 268
Figure 10-9. Relationship between liver weight and fork length, and between liver weight and total weight, for Lake Trout from Meliadine Lake, Atulik Lake, and Peter Lake in 2024. 269
Figure 11-1. Arsenic concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA. 281
Figure 11-2. Calcium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA. 281
Figure 11-3. Cesium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA. 282
Figure 11-4. Copper concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA. 282
Figure 11-5. Iron concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA. 283
Figure 11-6. Magnesium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA. 283
Figure 11-7. Manganese concentrations (mg/kg ww) in Lake Trout muscle and results of Tukey post-hoc pairwise comparisons following ANOVA. 284
Figure 11-8. Phosphorus concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA. 284
Figure 11-9. Potassium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA. 285
Figure 11-10. Selenium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA. 285
Figure 11-11. Sodium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA. 286

Figure 11-12. Strontium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA. 286
Figure 11-13. Thallium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA. 287
Figure 11-14. Zinc concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA. 287
Figure 11-15. Mercury concentrations in muscle tissues of Lake Trout along with results of ANCOVA model fits and Tukey post-hoc pairwise comparisons of size-adjusted concentrations. 288

LIST OF TABLES

Table 1-1. Summary of Major Development Activities Since the Start of Construction in 2015..... 7
Table 1-2. Overview of the Meliadine Lake 2024 AEMP and EEM Cycle 3. 9
Table 1-3. Key Questions for the Aquatic Effects Monitoring Program..... 10
Table 1-4. Overview of the 2024 AEMP. 11
Table 2-1. Average monthly temperature and cumulative precipitation reported in Rankin Inlet from 2013 to 2024. 16
Table 2-2. Surface Contact Water Management Plan (2024). 21
Table 2-3. Monthly discharge (m^3) from CP1 to Meliadine Lake, 2018-2024..... 21
Table 2-4. MEL-14 effluent limits in the Type A Amended Water Licence (2AM-MEL1631)..... 23
Table 2-5. MEL-14 effluent chemistry results in 2024. 28
Table 2-6. The fraction of total dissolved solids comprised of chloride in effluent samples from MEL-14 in 2024..... 30
Table 3-1. Meliadine Lake water sampling events in 2024..... 46
Table 3-2. Water quality parameters collected for the AEMP..... 47
Table 3-3. TDS (mg/L) from difference method based on water quality data from MEL-01-01 in March, 2024. 49
Table 3-4. Normal Range assessment for Meliadine Lake in 2024. 61
Table 3-5. Annual mean concentrations at MEL-01 for parameters that exceed the Normal Range in 2024. 62
Table 3-6. Tukey post-hoc results and percent change in concentration at MEL-01, MEL-02, and MEL-03 from 2023 to 2024. 63
Table 4-1. Overview of sampling completed in Lake A8, Lake B7, and Lake D7 in 2024. 86
Table 4-2. Updated Normal Range for select parameters. 89
Table 4-3. Lake D7 water quality screening assessment, 2024. 97
Table 4-4. Lake A8 water quality screening assessment, 2024..... 99
Table 4-5. Lake B7 water quality screening assessment, 2024..... 101
Table 5-1 Secchi depth from the open-water sampling events in 2024. 115
Table 5-2. Trophic classification for lakes based on total phosphorus trigger ranges (CCME, 2004)... 120
Table 5-3. Trophic classification for lakes based on ranges of total phosphorus, chlorophyll-a and Secchi depth (Vollenweider, 1968). 120

Table 5-4. Trophic status index and general trophic classifications for lakes (Carlson, 1977). 120
Table 5-5. Phytoplankton Community Data from Meliadine Lake in 1997 and 1998..... 121
Table 5-6. Chlorophyll-a (µg/L; mean ± 1SD) in Meliadine Lake during the August sampling event ... 124
Table 5-7. Phytoplankton biomass (mg/m^3; mean ± 1SD) in August in Meliadine Lake since 2013 126
Table 6-1 Percent fines and TOC in sediment from Meliadine Lake (mean ±1SD). 161
Table 6-2. Summary statistics for available phosphorus (mg/kg) in sediment samples analyzed using the Modified Kelowna and Olsen Methods. 164
Table 6-3. Arsenic, chromium, and copper concentrations in 2024 compared to the CCME sediment quality guidelines. 165
Table 7-1. Benthic Invertebrate Community Endpoints. 178
Table 7-2. Summary of t-test results comparing benthic invertebrate metrics between the two reference areas (MEL-03 and MEL-05) in 2024..... 178
Table 7-3. Control / Impact status for the benthic invertebrate community study areas. 180
Table 7-4. Summary of ANOVA tests for benthic invertebrate community endpoints in 2024. 183
Table 7-5. Summary of the Tukey post-hoc comparisons for benthic invertebrate community endpoints in 2024. 184
Table 7-6. Effect sizes for the benthic invertebrate community endpoints. 184
Table 7-7. List of taxa that were significantly correlated in the Non-Metric Multidimensional Scaling (nMDS) analysis. 186
Table 7-8. Summary statistics for total density and taxonomic richness of the benthic invertebrate community in Meliadine Lake since 2015. 191
Table 7-9. Summary statistics for Simpson's Evenness and Bray-Curtis Index for the benthic invertebrate community in Meliadine Lake since 2015..... 192
Table 8-1. Sample size of parasitized and unparasitized Threespine Stickleback processed by area, sex, and maturity..... 205
Table 8-2. Statistical procedures used for various monitoring endpoints to compare Threespine Stickleback populations between exposure and reference areas 206
Table 8-3. Catch per unit effort (CPUE) in number of fish per hour soak time of Minnow traps. 209
Table 8-4. Incident of parasitism in all Threespine Stickleback examined. 210
Table 8-5. Descriptive statistics of mature, parasitized Threespine Stickleback that were fully processed, by site and sex. 211
Table 8-6. Pairwise comparison of length, weight and age distributions for mature, parasitized Threespine Stickleback based on two-sample Kolmogorov-Smirnov tests. 212

Table 8-7. ANOVA results for mean length, weight and age in mature, parasitized Threespine Stickleback, by sex, along with results of Tukey post-hoc tests and calculated effect sizes. 215
Table 8-8. Number of fish per age group for mature, parasitized Threespine Stickleback. 218
Table 8-9. ANOVA results for length and weight at age in mature, parasitized Threespine Stickleback, by sex, along with results of Tukey post-hoc tests and calculated effect sizes. 219
Table 8-10. Selection of ANCOVA modeling approach for condition, liver, and gonad endpoints in mature, parasitized Threespine Stickleback, by sex. 222
Table 8-11. Results of ANCOVA and Tukey post-hoc comparisons for condition, liver, and gonad endpoints in mature, parasitized Threespine Stickleback. 223
Table 8-12. Summary of findings from the study of Threespine Stickleback health in 2024. 232
Table 9-1. Number of Threespine Stickleback carcass samples analyzed for tissue chemistry..... 236
Table 9-2. Parameters with significantly increased concentrations ($p < 0.05$) in Threespine Stickleback carcass tissue from MEL-01 between 2015 and 2024. 240
Table 9-3. Spatial comparisons for Threespine Stickleback tissue chemistry in 2024 (Tukey post-hoc $p < 0.05$). 241
Table 10-1. Statistical procedures used for various monitoring endpoints to compare Lake Trout populations between exposure and reference lakes..... 254
Table 10-2. *In-situ* water quality in Meliadine Lake, Peter Lake, and Atulik Lake during the August Lake Trout field program. 256
Table 10-3. Gill net catch and catch per unit effort (CPUE; number of fish caught per net per hour soak time) by species for each lake. 257
Table 10-4. Sample size of Lake Trout captured and processed. 258
Table 10-5. Descriptive statistics of Lake Trout data. 258
Table 10-6. Pairwise comparison of length, weight and age distributions for Lake Trout based on two-sample Kolmogorov-Smirnov tests. 260
Table 10-7. ANOVA results for mean length, weight and age in Lake Trout, along with results of Tukey post-hoc tests and calculated effect sizes 263
Table 10-8. Selection of ANCOVA modeling approach for growth, condition, and liver endpoints in Lake Trout. 265
Table 10-9. ANCOVA results for growth, condition, and liver endpoints in Lake Trout, along with results of Tukey post-hoc tests and calculated effect sizes. 266

Table 10-10. Summary of findings for the EEM effect indicators from the 2024 Lake Trout health study. 272
Table 11-1. Number of Lake Trout muscle samples analyzed for tissue chemistry in 2024. 275
Table 11-2. Temporal assessment of Lake Trout muscle chemistry results from Meliadine Lake in 1997/98, 2015, and 2024 (Tukey post-hoc $p < 0.05$). 279
Table 11-3. Spatial and temporal assessment of Lake Trout muscle chemistry results from Meliadine Lake, Atulik Lake, and Peter Lake in 2021 and 2024 (Tukey post-hoc $p < 0.05$). 280

LIST OF APPENDICES

APPENDIX A QUALITY ASSURANCE / QUALITY CONTROL

APPENDIX B SOURCE CHARACTERIZATION – SUPPORTING INFORMATION

Appendix B1 CP1 Discharge Volumes, MEL-14 Effluent Quality Results, and SNOCOR Chemistry Results from 2024

Appendix B2 Supplemental Figures – MEL-14 Effluent Chemistry and Loadings to Meliadine Lake (2018-2024)

APPENDIX C MELIADINE LAKE WATER QUALITY – SUPPORTING INFORMATION

Appendix C1 Meliadine Lake Water Quality – 2024 Data and Summary Statistics

Appendix C2 Meliadine Lake Water Quality – Temporal Plots

Appendix C3 Meliadine Lake Water Quality – Statistical Comparisons

APPENDIX D PENINSULA LAKES WATER QUALITY – SUPPORTING INFORMATION

Appendix D1 Peninsula Lakes Water Quality – 2024 Data and Summary Statistics

APPENDIX E PHYTOPLANKTON – SUPPORTING INFORMATION

Appendix E1 Phytoplankton Taxonomy – Supporting Metrics

Appendix E2 2024 Phytoplankton Taxonomy and Chlorophyll-a Lab Reports

APPENDIX F SEDIMENT CHEMISTRY – SUPPORTING INFORMATION

Appendix F1 Meliadine Lake Sediment Chemistry – 2024 Data and Summary Statistics

Appendix F2 Meliadine Lake Sediment Chemistry – Supplemental Figures

APPENDIX G BENTHIC INVERTEBRATES – SUPPORTING INFORMATION

Appendix G1 Benthic Invertebrate Community – Summary Statistics

Appendix G2 2024 Benthic Invertebrate Taxonomy Report

APPENDIX H THREESPINE STICKLEBACK– SUPPORTING INFORMATION

Appendix H-1 Threespine Stickleback Health Assessment

Appendix H-2 Threespine Stickleback Tissue Chemistry

APPENDIX I LAKE TROUT – SUPPORTING INFORMATION

Appendix I-1 Lake Trout Health Assessment

Appendix I-2 Lake Trout Tissue Chemistry

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ACRONYMS & GLOSSARY OF TERMS

Acronym / Term	Definition
AEMP	Aquatic Effects Monitoring Program is the primary instrument for determining if the mine is causing changes in the aquatic environment
AEMP Benchmark	The AEMP Benchmarks are screening guidelines that are protective of aquatic life and human drinking water quality for the project
AEMP Action Level	The AEMP Action Level is an early warning trigger equal to 75% of the AEMP Benchmark
ANOVA	Analysis of Variance: A statistical method used to compare means among three or more groups to determine if at least one group mean is significantly different
ANCOVA	Analysis of Covariance: An extension of ANOVA that includes one or more covariates (continuous variables) to control for their effects, improving the accuracy of comparisons among group means
AWAR	All-weather Access Road between the Meliadine Mine and Rankin Inlet
Benthic Invertebrates	The diverse community of small animals that live in lake bottom sediments; "benthic" means bottom, and "invertebrates" are animals without bones
Biomass	Biomass is the amount or weight of phytoplankton in per unit of water (µg/L)
Bray Curtis Index (BCI)	A statistical measure of similarity or dissimilarity between two ecological communities based on species composition and abundance; values range from 0 (identical communities) to 1 (completely dissimilar communities)
CCME	Canadian Council of Ministers of the Environment
CES	Critical effect size – A threshold above which an effect may indicate a higher risk to the environment, used in Environmental Effects Monitoring (EEM) studies to assess the ecological significance of changes in effect endpoints for fish populations and benthic invertebrate communities
CIRNAC	Crown Indigenous Relations and Northern Affairs Canada
Condition (K)	A common fish health metric that relates weight to length, used to assess overall body condition or “plumpness”
CP	Collection Pond: Pond constructed for the collection and temporary storage of surface contact water that is eventually treated and discharged to Meliadine Lake.
CPUE	Catch per unit effort, a measure of the abundance or density of a fish population, calculated as the number of fish caught per standardized unit of effort (e.g., per net, per hour)
DO	Dissolved oxygen
DOC	Dissolved organic carbon: a measure of the amount of organic matter present in water that passes through a 0.45 µm filter.

Acronym / Term	Definition
DQO	Data quality objective: are statements that define the degree of confidence in conclusions from data produced from a sampling program.
ECCC	Environment and Climate Change Canada
EEM	Environmental Effects Monitoring is a science-based monitoring program developed by Environment and Climate Change Canada. EEM describes monitoring that mining companies must undertake to detect and measure changes in aquatic ecosystems (i.e., receiving environments)
EWTP	Effluent Water Treatment Plant treats surface contact water from Collection Pond 1 (CP1) to lower TSS prior to discharge to Meliadine Lake
FEIS	Final Environmental Impact Statement
FEQG	Federal Environmental Quality Guidelines are water quality guidelines developed by Environment and Climate Change Canada
GSI	Gonadosomatic Index: A measure of reproductive investment in fisheries studies, calculated as the ratio of gonad weight to total body weight or body length
HSI	Hepatosomatic Index: An indicator of energy storage or liver health in fisheries studies, calculated as the ratio of liver weight to total body weight or body length
IQ	Inuit Qaujimaningit: Inuit traditional knowledge (including variations such as Inuit Qaujimajatuqangit), local and community-based knowledge, and Inuit epistemology as it relates to Inuit Inuit Qaujimajatuqangit: guiding principles of Inuit social values (NIRB 2018)
KivIA	Kivalliq Inuit Association
MDMER	Metal and Diamond Mining Effluent Regulations
MF	Mid-field area in Meliadine Lake (MEL-02)
NF	Near-field in Meliadine Lake (MEL-01); East Basin of Meliadine Lake
nMDS	Non-Metric Multidimensional Scaling: A multivariate statistical method that condenses complex data with multiple variables into a two-dimensional plot. Used here to visually assess differences in phytoplankton and benthic invertebrate community structure across areas and years
NIRB	Nunavut Impact Review Board: The government agency responsible for reviewing and assessing the potential ecosystemic and socio-economic effects of the Meliadine Gold mine Project presented in the Final Environmental Impact Statement
Normal Range	The range of baseline/reference conditions within the study area lakes; in the water quality monitoring program, the Normal Range is used to identify parameters that may have increased in concentration due to mining activities

Acronym / Term	Definition
NWB	Nunavut Water Board: The government agency responsible for regulating water use and management in the Nunavut Settlement Area. Terms and Conditions regarding water use for the Meliadine Gold Project are outlined in Water Licence No: 2AM-MEL1631
Overburden	Overburden is soil and till that need to be removed prior to developing the open pits.
Parameters	The term used to describe what gets measured in samples of surface water, sediment, and fish tissue collected in the various monitoring programs. Calcium, magnesium, iron, and aluminum are examples of parameters.
Phytoplankton	Phytoplankton are a diverse group of aquatic plant species (algae) that form the base of the food web in Meliadine Lake. Like other plants, they use sunlight, nutrients, and carbon sources to grow
QA/QC	Quality Assurance: Practices employed (e.g., use of experienced field staff, standard operating procedures (SOPs), field data sheets, and certified laboratories) to collect scientifically defensible samples meeting pre-defined data quality objectives (DQOs); Quality Control: Samples used to evaluate whether field sampling methods and laboratory analytical procedures are producing data that meet DQOs
REF	Reference areas in Meliadine Lake (MEL-03, MEL-04, and MEL-05)
Safe drinking water	In the context of the AEMP, water is considered safe for drinking if measured concentrations of parameters are below guidelines published by Health Canada
Significance threshold	Significance thresholds are narrative statements that represent attributes of the aquatic environment that must be preserved as the Project develops
Simpson's Diversity (SDI)	A measure of species diversity in a community, accounting for both richness (number of species) and evenness (distribution of individuals among species); formula (1-D) with higher values indicate greater diversity
Simpson's Evenness (SEI)	A measure of how evenly individuals are distributed among species in a community; values range from 0 (dominated by one species) to 1 (equal distribution among species)
Species richness	The number of different (distinct) species in a sample, used to describe the diversity of biological communities such as phytoplankton and benthic invertebrates
SSWQO	Site-Specific Water Quality Objectives: guidelines developed specifically for the lakes around Meliadine, considering background water quality in the region; SSWQOs were established for fluoride, arsenic, and iron as part of the AEMP (Golder 2014)
Surface contact water	Runoff from rain and snowmelt that is collected on-site; this water is collected, treated, and discharged to Meliadine Lake

Acronym / Term	Definition
Tailings	Residual particulate waste left over after ore is processed to extract gold
TDS	Total Dissolved Solids: the total concentration of dissolved substances in water, including inorganic salts and small organic matter (e.g., calcium, magnesium, potassium, carbonates, chlorides)
TGD	Technical Guidance Document for Environmental Effects Monitoring published by Environment Canada
TKN	Total Kjeldahl nitrogen: the sum of organic nitrogen in water and total ammonia
TN	Total nitrogen: the sum of organic and inorganic nitrogen in water (TKN + nitrate + nitrite)
TOC	Total Organic Carbon, a measure of the amount of organic matter present in a sample (water or sediment)
TP	Total phosphorus: the sum of all forms of phosphorus in aquatic systems: inorganic phosphorus, particulate organic phosphorus, and dissolved (soluble) organic phosphorus
TSF	Tailings Storage Facility is the engineered structure used to store and contain tailings produced during the milling of ore
TSI	A numerical scale used to classify the nutrient status and productivity of a water body, typically based on chlorophyll-a concentrations, total phosphorus, and/or Secchi depth — higher TSI values indicate more eutrophic conditions, while lower values indicate more oligotrophic conditions
TSS	Total Suspended Solids: the total concentration of suspended solids that are undissolved in water, including silt, clay, metals, and other organic and inorganic materials
Tukey's HSD test	Tukey's Honestly Significant Difference: A post-hoc test used after ANOVA or ANCOVA to find out which groups are different from each other
Waste rock	Waste rock is fragment rock with no economic value that is initially removed during development of the open pit and underground mine workings
WQG	Water quality guideline: generic term referring to guidelines developed by various agencies for protection of aquatic life
Water Licence	The Amended Type A Water Licence (2AM-MEL1631) authorizes Agnico Eagle to use waters and deposit waste in support of mining operations at Meliadine
WRSF	Waste rock and overburden storage facilities

1 INTRODUCTION

This report presents the findings of the 2024 Aquatic Effects Monitoring Program (AEMP) for the Meliadine Gold Mine (the Mine), as required under Nunavut Impact Review Board (NIRB) Project Certificate No. 006 (NIRB, 2022) and the Nunavut Water Board (NWB) amended Type A Water Licence (NWB, 2024). The AEMP is the integrated monitoring program designed to assess the potential effects of mining activities on the aquatic environment.

The AEMP was developed in consultation with communities, stakeholders, and regulators, and incorporates components of the federal Environmental Effects Monitoring (EEM) program, as required under the Metal and Diamond Mining Effluent Regulations (MDMER; Government of Canada, 2024). Inuit Qaujimajatuqangit (Traditional Knowledge) played a key role in shaping and refining the AEMP, as documented in the Main Application for the Type A Water Licence (Agnico Eagle, 2015).

The AEMP has been conducted annually in Meliadine Lake and nearby small lakes, collectively referred to as the Peninsula Lakes since 2015.

1.1 Background

The Mine is located in the Kivalliq District of Nunavut, near the western shore of Hudson Bay in Northern Canada (**Figure 1-1**). The Project was approved by the NIRB on February 26, 2015, subject to the terms and conditions outlined in Project Certificate No. 006 (amended in 2022) and the Type A Water Licence (2AM-MEL1631) granted by the NWB on April 1, 2016 and subsequently amended (2021, 2024). A timeline of major construction activities since 2015 is provided in **Table 1-1**, and the Mine layout as of 2024 is shown in **Figure 1-2**.

The Mine became subject to the Metal and Diamond Mining Effluent Regulations (MDMER) on August 21, 2016, with the onset of dewatering of Lake H17 to create Collection Pond 1 (CP1). CP1 is the primary collection pond for precipitation and runoff – surface contact water – collected at the Mine. The dewatering of Lake H17 occurred between August 21 and October 1, 2016, using a temporary diffuser located in the 'Narrows' north of the Mine. In August 2017, a permanent diffuser was installed in the East Basin of Meliadine Lake. Since June 21, 2018, surface contact water has been diverted to CP1, where it undergoes treatment at the Effluent Water Treatment Plant (EWTP) before being discharged into Meliadine Lake.

The Mine began commercial gold production in 2019, utilizing both underground and open-pit mining methods to develop the Tiriganiaq deposit. Additional deposits—Wesmeg, Wesmeg North, Pump, F Zone, and Discovery—were included in Project Certificate No. 006 (NIRB, 2022). Approval to develop

these deposits was granted under the Type A Water Licence Amendment, issued by the NWB in October 2024.

The Pump deposit is the first of these deposits scheduled for open-pit mining. During the summer of 2024, an access road was constructed, and a fish salvage program was completed in several small ponds immediately south of Lake A8. Before winter, these lakes were dewatered, and the water was transferred to CP1 before being discharged into Meliadine Lake.

Aside from routine mining operations and infrastructure maintenance, there were no other notable activities in 2024 that would significantly impact the AEMP.

1.2 Scope of the 2024 AEMP

The AEMP consists of two distinct monitoring programs: the Meliadine Lake Study and the Peninsula Lakes Study. The two programs share common field and analytical methods, quality assurance and control protocols, and data evaluation strategies, but they differ in scope and focus. The Meliadine Lake Study is the more substantive of the two, as Meliadine Lake serves as the receiving environment for treated surface contact water collected at the Mine. In contrast, the Peninsula Lakes Study monitors potential changes in smaller lakes resulting from aerial emissions (including dust) and physical alterations to local watersheds associated with development of the Mine. Together, these studies provide a comprehensive understanding of the spatial extent of potential mining-related impacts on the aquatic environment.

An overview of each study is provided below, as described in Version 3 of the AEMP Design Plan (Azimuth, 2024; hereafter referred to as the 'AEMP Design Plan').

1.2.1 Meliadine Lake Study

The 2024 Meliadine Lake study includes the following components:

- Surface water quality, including effluent quality
- Phytoplankton community
- Benthic invertebrate community and sediment quality
- Fish health
- Fish tissue chemistry

Water quality and phytoplankton community monitoring are conducted annually, while fisheries and benthic invertebrate community studies occur every three years, aligning with Environmental Effects Monitoring (EEM) required under the Metal and Diamond Mining Effluent Regulations (MDMER). The AEMP was developed based on MDMER monitoring requirements, and the updated AEMP Design Plan,

submitted prior to the field program, recommended harmonizing the AEMP and EEM fish health studies to improve efficiency and reduce redundancy.

Despite efforts to align the AEMP and EEM, certain aspects of the AEMP extend beyond MDMER requirements to fulfill additional conditions outlined in the Water Licence. Key distinctions between the AEMP and EEM Cycle 3 are summarized in **Table 1-2**.

This deliverable fulfills the aquatic monitoring requirements for Meliadine Lake under the Water Licence. EEM Cycle 3 is smaller in scope than the 2024 AEMP. As with the EEM Cycle 2, a standalone report will be submitted to Environment and Climate Change Canada (ECCC) no later than August 21, 2025, in compliance with MDMER specifications.

1.2.2 Peninsula Lakes Study

The small lakes and ponds on the peninsula do not receive direct effluent discharges. During consultations with stakeholders during the permitting phase, it was agreed that water quality monitoring on a regular basis was adequate for the Peninsula Lakes study.

Three lakes were included in the Peninsula Lakes study (Lake A8, Lake B7, and Lake D7). Lake A8 is located south of the Tiriganiaq Pits and Lake B7 is located west of the TSF (**Figure 1-2**). Lake D7 is located southwest of the Mine in the 'D Watershed', which was not directly impacted by construction of the Mine, and therefore provides insight into background changes in water quality for the small lakes. At least two sampling events are completed in each lake during the open water period, one in July and one in August. Additional sampling events may be completed to verify temporal trends.

Agnico Eagle plans on developing the Wesmeg and Pump deposits in 2025 and 2026, which requires Lake A8 to be fished out and dewatered in 2025. As such, Lake A8 was removed from the Peninsula Lakes study design starting in 2025. Lake B7 will eventually be converted into a containment pond to store saline water from the underground mine. For now, Lake B7 is retained in the Peninsula Lakes study design. No construction or mining activities are planned for the area adjacent to Lake D7 (located west and south of Lake B7). Lakes that are potential candidates to replace Lakes A8 and B7 are discussed in the proposed AEMP Design Plan (Azimuth, 2025) that was submitted to the NWB in February 2025 and is currently under review by regulatory parties.

1.3 Objectives and Key Questions

The objectives of the AEMP are to:

- Determine the short- and long-term effects of the Mine on aquatic receiving environments,
- Evaluate the accuracy of predictions made in the Final Environmental Impact Statement (FEIS),
- Provide a Response Framework (**Section 12**) with mechanisms to ensure that environmental monitoring results trigger timely and appropriate actions to mitigate potential impacts on aquatic receiving environments.

Key questions were developed in Version 1 of the AEMP Design Plan (Golder, 2016) to guide the methods, data analyses, and interpretation of monitoring results. The key questions for each monitoring component are summarized in **Table 1-3**, while an overview of the monitoring components collected in each study area is provided in **Table 1-4**.

1.4 Report Structure

The results of the 2024 AEMP are organized into the following chapters. Supplemental information, including raw data, summary statistics and supporting figures, is provided in appendices to streamline the main document.

- Introduction
- Source Characterization (**Appendix B**)
- Meliadine Lake Water Quality (**Appendix C**)
- Peninsula Lakes Water Quality (**Appendix D**)
- Phytoplankton Community (**Appendix E**)
- Sediment Chemistry (**Appendix F**)
- Benthic Invertebrate Community (**Appendix G**)
- Threespine Stickleback Health (**Appendix H-1**)
- Threespine Stickleback Chemistry (**Appendix H-2**)
- Lake Trout Health (**Appendix I-1**)
- Lake Trout Chemistry (**Appendix I-2**)
- Integrated Summary, including the Low Action Level Assessment

The quality assurance and quality control (QA/QC) assessment results for each component are summarized in their respective chapters. Additional details on QA/QC methods and results are provided in **Appendix A**, where applicable.

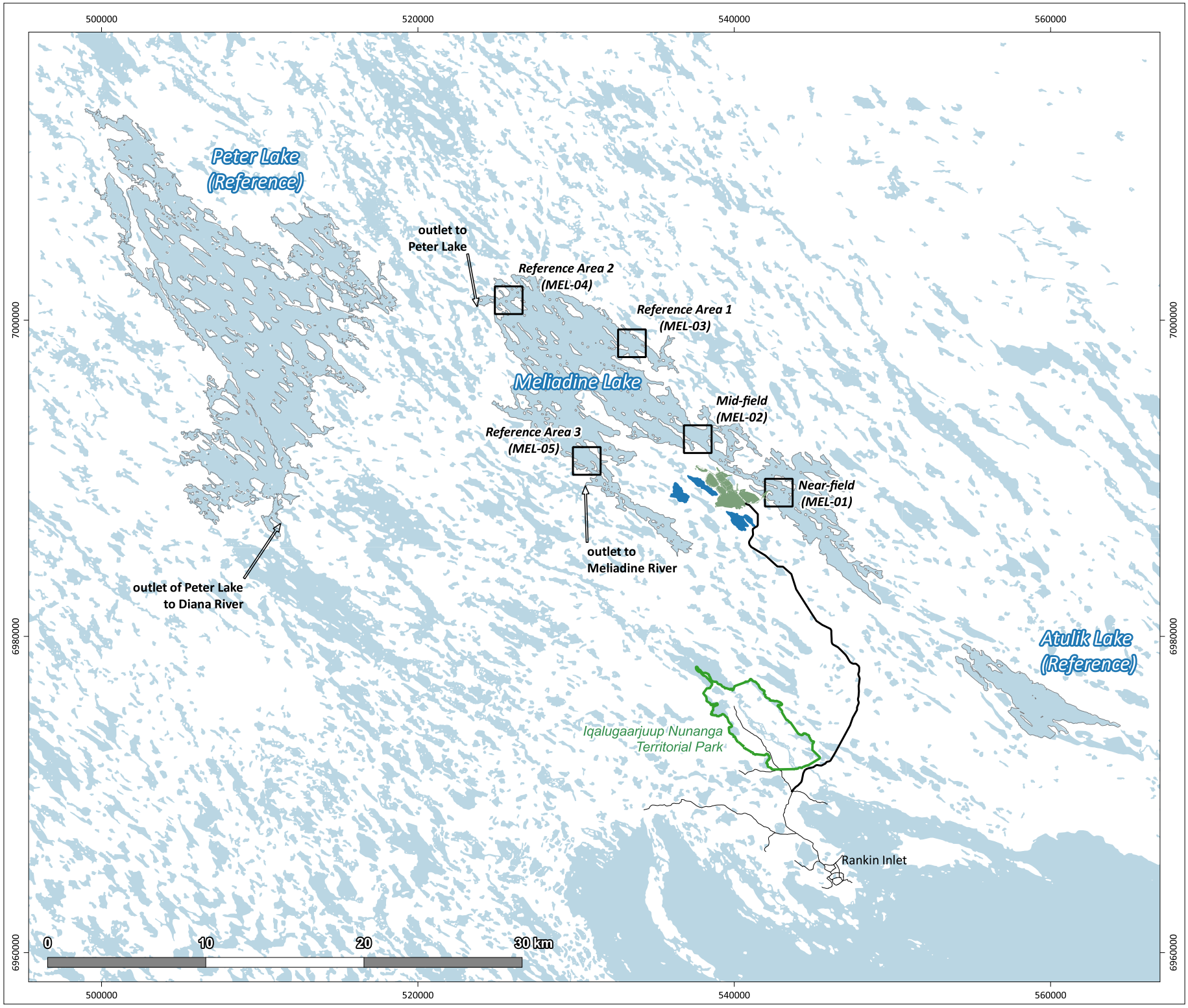


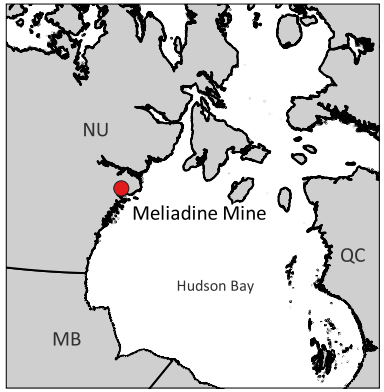
Figure 1-1
Study Area for the Aquatic Effects Monitoring Program

Meliadine Gold Mine
Aquatic Effects Monitoring Program
2024 Annual Report

AZIMUTH

Date: March 15, 2025
Datum: NAD 83; UTM Zone 15N
Scale: 1:310,000
Software: 3.22.11-Białowieża
Produced by: E. Franz

REFERENCES:
1. Basemap imagery from ESRI
2. Mine Plan provided by Agnico Eagle
3. Roads and waterbodies from NRC



Legend

- Extent of the Meliadine Mine (2024)
- All-weather access road
- Peninsula Lakes (see Figure 1-2)



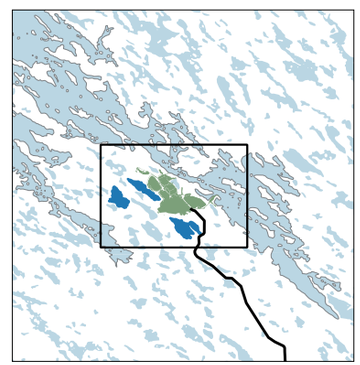
Figure 1-2
Meliadine Mine (2024)

Meliadine Gold Mine
Aquatic Effects Monitoring Program
2024 Annual Report

AZIMUTH

Date: March 15, 2025
Datum: NAD 83; UTM Zone 15N
Scale: main map 1:30,000; overview 1:400,000
Software: 3.22.11-Białowieża
Produced by: E. Franz

REFERENCES:
1. Basemap imagery from ESRI
2. Maxar (Vivid) imagery captured on July 28, 2024
3. Mine features from Agnico Eagle



Legend

- Extent of the Meliadine Mine (2024)
- All-weather access road
- Peninsula Lakes (A8, B7, D7)
- Diffuser
- Surface water station
- Snow core station

Table 1-1. Summary of Major Development Activities Since the Start of Construction in 2015.

Year	Mine Development Activities and Sequence
2015	• Started construction of industrial pad • Developed ramp to Tiriganiaq underground mine • Constructed portion of rock pad for stockpiles to store ore from Tiriganiaq underground ramp development
2016	• Continued construction of industrial pad • Constructed and operated the temporary landfill • Started temporary storage of waste rock in the future WRSF2 footprint for construction purposes • **Continuous dewatering of Lake H17 between August 21 and October 1 via a temporary diffuser located between MEL-01 and MEL-02 study areas (Golder, 2017)**
2017	• Constructed and utilized Type A landfarm • Constructed and began operation of Type A landfill • Erected and closed all main buildings except crusher, paste plant, and crushed ore storage • Erected incinerator • Erected and operated effluent water treatment plant (EWTP) • Installed fuel tanks 3 ML and 250 kL at Portal1 • Erected fuel tank 13.5 ML in Rankin Inlet • **Discharge from CP1 planned for September to October 2017 did not occur due to exceedance of the maximum average concentration (MAC) for TDS of 1,400 mg/L** • **Sewage effluent from the exploration camp STP transported to main camp STP for treatment beginning in November (Golder, 2019)**
2018	• Started construction of Ore Storage Pad 2 (OP2) • Erected and closed crusher, paste plant, and crushed ore storage buildings • Erected fuel tank 20 ML in Rankin Inlet • Erected fuel tanks 6 ML and 250 kL at industrial pad • Started process commissioning at end of Q4 • **Discharge of treated surface contact water from CP1 from June 21 to September 3**
2019	• Completed industrial pad • Completed construction of OP2 • Started to place filtered tailings in Cell 1 of TSF at end of Q1 • Started full capacity ore processing early Q2 • Created temporary waste rock storage area within footprint of Tiriganiaq Pit 2 from construction of Saline Pond 2 (SP2) • Began placement of waste materials from Saline Pond 4 (SP4) in WRSF1 • **Discharge of treated surface contact water from CP1 from July 9 to October 5**
2020	• Place waste rock from temporary storage within footprint of Tiriganiaq Pit 2 to construct haul roads for open pits and to WRSFs • Create temporary waste rock storage area between footprints of Tiriganiaq Pits 1 and 2 from construction of SP4 • Start to mine Tiriganiaq Pit 2 • Begin placement of waste materials from Tiriganiaq Pit 2 within WRSF3 • **Discharge of treated surface contact water from CP1 from June 5 to October 4**
2021	• Start to mine Tiriganiaq Pit 1 • Begin placement of waste rock and overburden from Tiriganiaq Pit 1 in WRSF1 • Continue placement of waste rock and overburden from Tiriganiaq Pit 2 in WRSF1 • Pause mining of Tiriganiaq Pit 2 • **Discharge of treated surface contact water from CP1 between July 13 and October 16**

Table 1-1. Summary of Major Development Activities Since the Start of Construction in 2015.

Year	Mine Development Activities and Sequence
2022	• Continue placement of Waste Rock and Overburden from Tiriganiaq Pit 1 in WRSF1 • Begin placement of overburden from Tiriganiaq Pit 1 in WRSF3 • Start Construction of OP2 Stage 2 • Construction of CP2 and associated CP2 Berm, Channels 9 and 10, east of WRSF3 • Continue mining of Tiriganiaq Pit 1 • **Discharge of treated surface contact water from CP1 from July 1 to August 2 and August 23 to September 25**
2023	• Continue placement of Waste Rock and Overburden from Tiriganiaq Pit 1 in WRSF1 • Continue placement of overburden from Tiriganiaq Pit 1 in WRSF3 • Continue mining of Tiriganiaq Pit 1 • Construction of the Channel 2 Berm • Rehabilitation of different infrastructures on site: Channel 3 reconstruction, Channel 5 maintenance, CP6 ramp extension, thermal fill placement at CP2, CP3, CP4 and between the TSF and Channel 3 • Construction of the Operations Landfill (Stage 4) Berm Raise • Construction of the waterline for discharge to sea (commenced in 2023) • **Discharge of treated surface contact water from CP1 from June 10 to July 18, August 21 to August 25, August 29 to September 6, September 11, September 16 to September 30**
2024	• Continue placement of Waste Rock from Tiriganiaq Pit 1 in WRSF1 and WRSF3 • Continue placement of overburden from Tiriganiaq Pit 1 in WRSF3 • Continue mining of Tiriganiaq Pit 1 • Construction of the Pump Haul Road • Construction of the P3 pond backfill, ditch and sump • Rehabilitation/maintenance of different infrastructures on site: CP6 access road, Channel 4, Channel 5, downstream channel of D-CP1, CP3 and Berm 2 • **Discharge of treated surface contact water from CP1 from June 17 to July 16, and September 1 to October 15**

Table 1-2. Overview of the Meliadine Lake 2024 AEMP and EEM Cycle 3.

Monitoring Component	2024 AEMP (Water Licence)	EEM Cycle 3 (MDMER)
Surface water quality	• One winter sampling event and three open water sampling events regardless of whether the Mine is discharging water to Meliadine Lake • Five sampling areas within Meliadine Lake (near-field, mid-field, and three reference areas) with replication (stations) within each area	• Monthly sampling when the Mine is discharging water to Meliadine Lake • One exposure station at the edge of the mixing zone (MEL-13) and one reference station (MEL-03-01)
Phytoplankton community	• Annual sampling in August, concurrent with the surface water sampling event • July and September sampling events were included in 2024 to assess seasonal changes in the phytoplankton community	• Not a monitoring requirement under MDMER Schedule 5 (EEM)
Benthic invertebrate community and sediment quality	• Completed every three years regardless of the findings from previous cycles • Near-field and mid-field exposure areas and two reference areas	• Not included in the EEM Cycle 3 study design because there were no effects to the benthic invertebrate community in Cycle 1 or Cycle 2
Fish health	• Adopted the EEM Cycle 3 lethal fish population study for the AEMP (see →)	• Threespine Stickleback study with one near-field exposure area (MEL-01) and two reference areas in Meliadine Lake • Lake Trout study with one exposure area (MEL-01) and two external reference lakes
Fish tissue chemistry	• Completed every three years, regardless of the findings from previous cycles	• Not required for the EEM Cycle 3 because mercury and selenium concentrations in effluent samples from the final discharge point (MEL-14) are below thresholds for a fish tissue study under MDMER

Table 1-3. Key Questions for the Aquatic Effects Monitoring Program.

Component	Key Questions
Meliadine Lake	
Water Quality	Are concentrations of key parameters in effluent less than limits specified in the Water Licence?
	Has water quality in the exposure areas changed over time, relative to reference/baseline areas?
	Is water quality consistent with predictions in the FEIS and below guidelines to protect aquatic life and human health?
	Is water quality below guidelines to protect aquatic life and human health?
Phytoplankton Community	Is the phytoplankton community affected by potential mine-related changes in water quality in Meliadine Lake?
Benthic Invertebrate Community	Is the benthic invertebrate community affected by potential mine-related changes in water and sediment quality in Meliadine Lake?
Fish Health	Is fish health affected by changes in water and sediment quality in Meliadine Lake?
Fish Tissue Chemistry	Are tissue metal concentrations in fish from Meliadine Lake increasing due to mining activities?
	Are tissue metal concentrations in fish from Meliadine Lake increasing relative to reference areas or baseline?
Peninsula Lakes	
Water Quality	Is water quality consistent with predictions in the FEIS and below guidelines to protect aquatic life and human health?
	Has water quality changed over time relative to baseline conditions?

Table 1-4. Overview of the 2024 AEMP.

Component	Meliadine Lake Study Areas													Reference Lakes[a]	
	MEL-01				MEL-02				MEL-03			MEL-04	MEL-05	AL	PL
	Near-field				Mid-field				REF 1			REF 2	REF 3		
	Mar	Jul	Aug	Sep	Mar	Jul	Aug	Sep	Jul	Aug	Sep	Aug	Aug	Aug	Aug
Surface Water Quality	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Phytoplankton		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		
Benthic Invertebrates			✓				✓			✓			✓		
Sediment Quality			✓				✓			✓			✓		
Threespine Stickleback Health			✓							✓		✓			
Threespine Stickleback Chemistry			✓							✓		✓			
Lake Trout Health			✓											✓	✓
Lake Trout Chemistry			✓											✓	✓

Notes:
[a] The external reference lakes are Atulik Lake (AL) and Peter Lake (PL). Surface water quality data was collected in August to support the Lake Trout health assessment.

Component	Peninsula Lakes Study Areas							
	Lake B7				Lake A8		Lake D7	
	Jul	Aug	Sep	Oct	Jul	Aug	Jul	Aug
Surface Water Quality	✓	✓	✓	✓	✓	✓	✓	✓

1.5 References

Agnico Eagle. 2014. Meliadine Gold Project, Nunavut. Final Environmental Impact Statement. Submitted to the Nunavut Impact Review Board. April 2014.

Agnico Eagle (Agnico Eagle mines Ltd.) 2015. Meliadine Gold Project – Type A Water Licence Main Application Document. April 2015. Version 1.

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Golder. 2016. Aquatic Effects Monitoring Program (AEMP) Design Plan. Doc 485-1405283 Ver. 1. Submitted to Agnico Eagle mines Limited. June 2016.

Government of Canada. 2024. Metal and Diamond Mining Effluent Regulations (SOR/2002-222). Retrieved from https://laws-lois.justice.gc.ca/eng/regulations/sor-2002-222/

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2 SOURCE CHARACTERIZATION

2.1 Introduction

This section summarizes the current understanding of how mining operations may impact water quality in Meliadine Lake and the Peninsula Lakes. Mining operations have the potential to affect water quality in the aquatic receiving environment through discharge of treated effluent, accidental spills, altered hydrology due to construction activities, and aerial emissions and dust deposition. For Meliadine Lake, the main source of potential mining-related effects to water quality is the discharge of treated surface contact water. The compliance monitoring station (Final Discharge Point) is MEL-14. When the Mine is actively discharging water to Meliadine Lake, water samples are collected weekly for chemistry, monthly for acute toxicity testing, and quarterly for sublethal toxicity testing. Discharge volumes and chemistry results are used to calculate monthly and annual loadings. These results are used to help determine if spatial and temporal changes in water quality in Meliadine Lake are plausibly linked to the discharge of treated surface contact water.

Water quality in the Peninsula Lakes is potentially impacted by the cumulative effects of alterations to hydrology and flow, dust deposition, and aerial emissions. The effect of dust and aerial emissions are assessed using chemistry data from the snow core monitoring program that is completed in late winter.

2.2 Findings from the 2024 Effluent Quality and Snow Chemistry Programs

- There were no exceedances of the effluent quality limits in any of the effluent samples collected from the final discharge point (MEL-14).
- Surface contact water discharged to Meliadine Lake was not acutely toxic to Rainbow Trout or the aquatic invertebrate *Daphnia magna* in the four monthly samples.
- Sublethal toxicity tests with *Lemna minor* were conducted in June and October. No effects to frond yield or biomass were observed for the June sampling event. In October, the effluent concentrations resulting in a 25% reduction in frond yield and biomass were 56% (CI=44 to 68) and 72% (50 to 97), respectively. The IC25s are relatively high (i.e., low toxicity), indicating any potential for sublethal effects to primary producers would be quickly ameliorated by rapid dilution.
- In 2024, spatial patterns for dust-related parameters—such as TSS, sulphate, and metals—remained consistent with previous years. The highest concentrations were observed immediately south of Tiriganiaq Pit 1 (e.g., SNOCOR4), while snowpack chemistry at stations north of the main camp and east of WRSF3 was similar to background levels. Results from 2020 to 2024 indicate that the spatial extent of aerial emissions and dust is localized to areas immediately downwind of Tiriganiaq Pit 1 and the TSF.

2.3 Temperature and Precipitation Patterns in 2024

As part of the AEMP, it is important to understand whether other processes or sources have the potential to contribute to temporal changes in water quality. Other than the Mine, there are no significant anthropogenic sources that could cause detectable changes in water quality in Meliadine Lake or the Peninsula Lakes. However, water quality can respond to changes associated with both short-term weather patterns and long-term trends driven by climate variability.

The effects of climate change on northern latitude lakes are well documented, though the underlying processes are complex and difficult to quantify. Increases in air temperature, changes in precipitation patterns, and shifts in ice-cover duration can influence water temperature, stratification, and dissolved oxygen dynamics, which in turn can affect nutrient availability and aquatic ecosystem structure (Schindler et al., 1996; Smol et al., 2005; Sharma et al., 2019). For instance, climate-driven changes in precipitation and runoff can influence sediment and nutrient loading, potentially altering water clarity and productivity (Bouchard et al., 2013).

The effect of interannual climate variability on water quality in Meliadine Lake is beyond the scope of the AEMP. However, to help interpret the observed temporal trends in water quality in Meliadine Lake and the Peninsula Lakes, annual precipitation and temperature data are qualitatively assessed. This approach provides context for understanding natural climate-driven variability in relation to potential mine-related effects.

Recent climate trends for temperature and precipitation in the region have been assessed using data collected at Rankin Inlet Airport[1]. This analysis is based on daily weather records spanning from January 1, 1981, to December 31, 2024, providing insights into long-term regional changes in climate. The following tables and figures were used to support the discussion:

- **Table 2-1** presents tabulated monthly mean temperature and precipitation data.
- **Figure 2-1** shows the average temperature for each month from 2013 to 2024.
- **Figure 2-2** illustrates total annual precipitation (rain and snow combined) from 1981 to 2024.
- **Figure 2-3** displays total annual rainfall from 1981 to 2024.
- **Figure 2-4** shows cumulative annual rainfall from 2013 to 2024, highlighting the timing and magnitude of summer rainfall events.

[1] Station name = RANKIN INLET A (https://climate.weather.gc.ca/historical_data/search_historic_data_e.html). Daily weather data were downloaded from ClimateData.com. which is a collaboration between Environment and Climate Change Canada (ECCC), the Computer Research Institute of Montréal (CRIM), CLIMAtlantic, Ouranos, the Pacific Climate Impacts Consortium (PCIC), the Prairie Climate Centre (PCC), and HabitatSeven.

Temperature

Temperature data from 2024 indicate that the region is experiencing a continued warming trend. On an annual scale, 2024 was the second warmest year since 1981, with a mean temperature of -6.7°C. This was driven, in part, by record-breaking average temperatures in August, September, and November (**Figure 2-1**).

The warming trend is evident across all seasons, but May through November have been particularly warm over the past five years. Notably, four of the warmest Augusts since 1981 have occurred within this period, with monthly mean temperatures ranging from 11°C to 12.5°C. By comparison, the average August temperature during the 1980s was 9.1°C (**Table 2-1**).

Warmer temperatures in the spring and fall will result in a longer ice-free period for the lakes, altered precipitation patterns in terms of the timing of rain versus snow, and permafrost thawing (i.e., deepening of the active layer). Based on long-term monitoring in other regions of the Canadian Arctic (Smol et al., 2005), these factors are expected to continue to cause changes in water quality for lakes throughout the Kivalliq.

Precipitation

Precipitation patterns fluctuate from year to year, but recent data indicate that the amount of precipitation has become more variable and extreme. Notably, 2019 was the wettest year and 2023 was the driest year for both total precipitation and total rainfall since 1981.

2024 began with unusually dry conditions, recording less than 90 mm of precipitation from January through July. However, significant rainfall began in late August, culminating in September 2024, which became one of the wettest months on record, with 154 mm of rain recorded at Rankin Inlet Airport (**Table 2-1**). To put this into perspective, more rain fell in September 2024 than the entire annual precipitation total for 2023 (135.8 mm). The September water sampling event in Meliadine Lake took place on September 7th at MEL-01, September 8th at MEL-02, and September 9th at MEL-03. The timing of the September sampling event means these samples did not fully capture the potential impact of the high rainfall event on water quality changes in the lake.

Historically, July and August 2019 are the only other months in which more than 100 mm of rain was recorded in a single month. This extreme event triggered lake-wide changes in the concentrations of several water quality parameters, driven by the cumulative effects of increased tundra runoff and higher discharge volumes from CP1 to Meliadine Lake during the 2020 freshet. The potential impact of the September rainfall event on water quality in Meliadine Lake will be evaluated during the winter and summer sampling events in 2025.

Table 2-1. Average monthly temperature and cumulative precipitation reported in Rankin Inlet from 2013 to 2024.

Year	Monthly Average Temperature (°C) from 2013 to 2024												Annual Mean (°C)	Rank[a]
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
2013	-33.9	-30.4	-22.7	-16.8	-6.3	5.3	11.4	10.2	3.3	-4.2	-19.6	-29.4	-11.5	37
2014	-29.9	-29.1	-27.0	-17.2	-1.7	6.5	12.6	10.1	2.6	-3.6	-19.6	-22.8	-9.8	19
2015	-31.8	-33.6	-27.1	-15.8	-5.0	4.1	9.6	9.4	4.7	-6.2	-15.4	-23.1	-10.6	28
2016	-26.5	-30.9	-25.5	-19.4	-3.6	5.5	12.2	10.2	5.7	-3.9	-10.5	-26	-9.2	12
2017	-27.4	-27.8	-25.0	-17.3	-4.4	6.1	11.9	10.7	5.0	-6.3	-16.1	-25.2	-9.5	15
2018	-28.7	-33.5	-22.0	-17.3	-9.3	4.3	12.1	9.2	2.0	-6.7	-21.6	-24.3	-11.4	36
2019	-33.4	-32.4	-23.4	-16.2	-4.2	4.0	9.2	9.0	5.1	-1.7	-16.4	-24.1	-10.3	26
2020	-26.2	-30.2	-25.7	-16.4	-8.3	4.7	11.8	11.6	4.5	-3.8	-18.0	-21.7	-9.3	13
2021	-20.3	-27.0	-24.4	-15.2	-5.5	5.0	10.6	9.6	4.9	1.6	-11.7	-22.6	-6.8	3
2022	-29.1	-33.9	-24.0	-16.5	-3.2	6.9	12.9	11.6	6.2	-1.9	-18.5	-22.4	-9.4	14
2023	-26	-35.9	-24.7	-14.1	0.1	6.3	12.3	12.0	6.5	-0.7	-13.1	-17.1	-7.7	5
2024	-24.7	-27.9	-23	-12.2	-2.3	5.7	12.3	12.7	7.4	-0.5	-9.3	-20.9	-6.7	2
Decadal averages														
1980s	-31	-29.9	-26.4	-16.6	-6.7	3.5	9.9	9.1	3.3	-5.5	-18.6	-27.5	-11.2	5
1990s	-31.9	-30.5	-24.5	-15.8	-5.2	5.0	10.9	9.6	3.5	-5.1	-16.9	-25.4	-10.4	4
2000s	-29.1	-30.4	-24.7	-15.3	-5.4	4.0	10.7	10.3	4.3	-3.7	-16.2	-24.4	-9.8	2
2010s	-29.2	-29.5	-24.4	-16.2	-5.2	4.9	11.2	10.0	4.5	-3.9	-16.0	-24.2	-9.8	2
2020s	-25.2	-31	-24.4	-14.9	-3.8	5.7	12.0	11.5	5.9	-1.0	-14.1	-21	-8	1

Year	Cumulative Monthly Precipitation (mm) from 2013 to 2024												Annual Total (mm)	Rank[a]
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
2013	0.8	16.2	16.4	18	112.2	7.8	24	14	67.2	30.4	5.2	9.4	321.6	20
2014	17.2	6.8	6.2	1.8	10.2	16	16	72.4	52.2	79.4	21.4	26.8	326.4	18
2015	3.6	10.9	7.6	14.4	1.8	33.2	61.6	63.6	82	20.6	32.2	22.6	354.1	15
2016	7.2	14.6	5.8	4.4	0.6	17.6	24.4	10.1	64.7	22.8	25.2	3.2	200.6	42
2017	4.4	9.7	7.6	6.2	11.6	14.2	40.2	7.6	18.8	69.8	30.8	8.0	228.9	39
2018	7.9	10.6	13.2	8.8	38	28.4	15.8	52.8	19	24.6	19.4	8.4	246.9	34
2019	18.6	2.4	20.8	18.2	37.4	27.2	112.8	112.9	79.4	31.9	11.4	11.6	484.6	1
2020	7.6	13	7.4	11	19.3	4.8	7.6	32.5	66.8	21.6	46.7	135.2	373.5	11
2021	10	7.9	34.8	30.1	4.1	14.1	73	60.6	63.9	71.4	19.5	27.1	416.5	4
2022	13.6	0.8	16.4	3.5	10.6	41.6	6.4	46	42.2	30.8	0	0.7	212.6	41
2023	8	2.4	1.4	0	4.2	4.4	10.6	6.4	0	2.2	25.4	70.8	135.8	44
2024	21.1	6.1	11.1	2.3	15.2	9.3	17.8	40.8	154	24.7	42.1	32	376.5	9
Decadal averages														
1980s	6.6	6.3	13.5	14.8	17.6	37.3	34.3	59.9	41.2	35.7	20.6	7.7	295.7	5
1990s	7.2	10.8	9.6	13.8	20.1	25.8	45.1	53.9	48.2	34.8	20.2	13.6	303.1	3
2000s	11.9	7.7	13	30	20.9	19.5	41.4	57.2	40.1	41.6	23.4	14.9	321.7	2
2010s	10	9.8	13.4	10.8	26	23.3	47.5	45.9	52.5	44.6	27.7	17.3	328.9	1
2020s	12.1	6	14.2	9.4	10.7	14.8	23.1	37.3	65.4	30.1	26.7	53.2	303.0	4

Notes

Weather data is from the station in Rankin Inlet (RANKIN INLET A in https://climatedata.ca/download/).

[a] Annual rank for average temperature and total precipitation going back to 1981.

Shaded cells indicate the top 10 monthly precipitation totals since January 2013. September 2024 was the wettest month over this period.

Figure 2-1. Average monthly temperatures (°C) since 2013.

Notes: Precipitation data is from the weather station in Rankin Inlet (RANKIN INLET A in https://climatedata.ca/download/).
The number inside each bar indicates the temperature rank for each year since 1981 (i.e., the average temperature in January 2024 was the 5th highest since 1981).

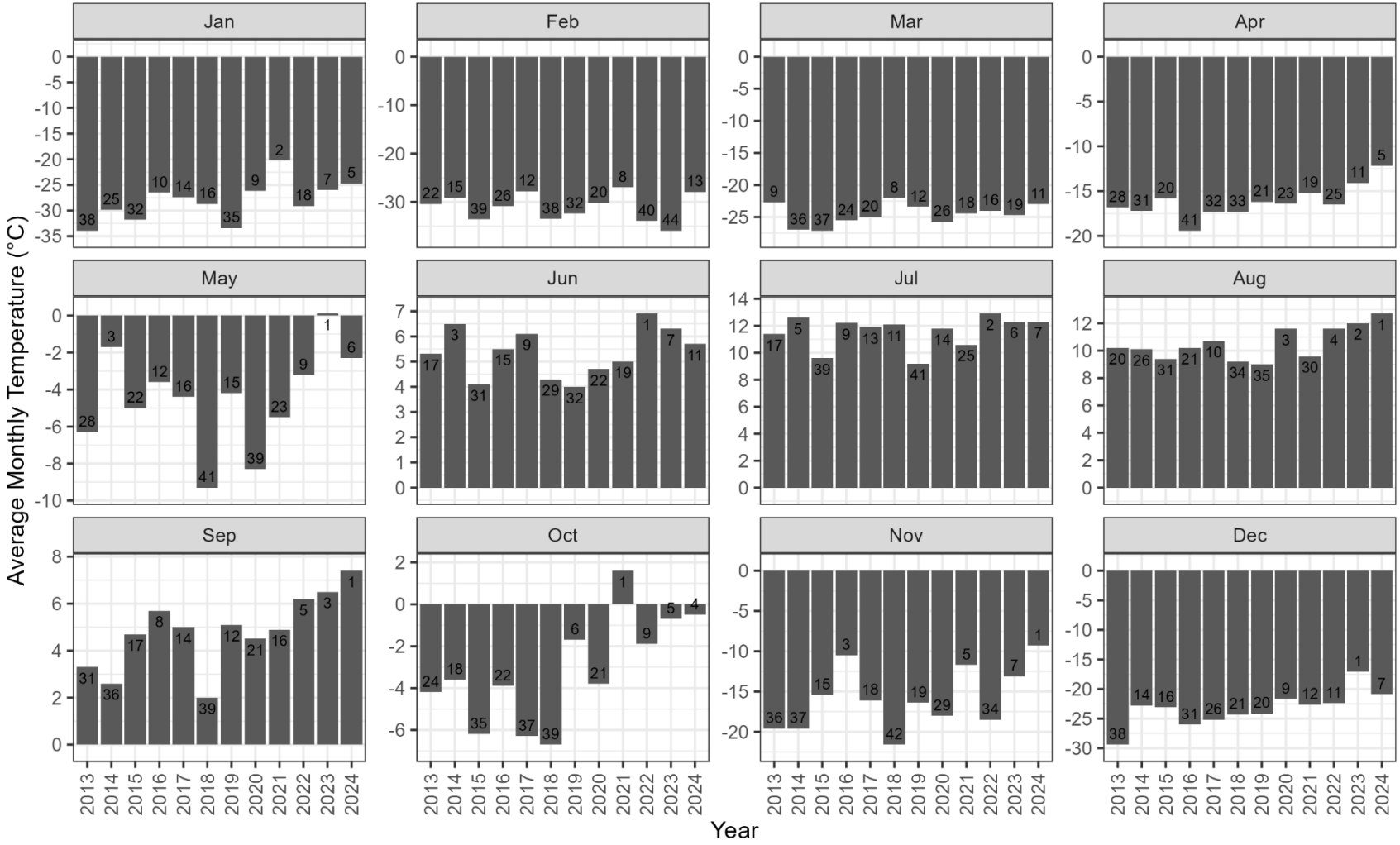


Figure 2-2. Annual precipitation (mm) from 1981-2024.

Notes: Precipitation data is from the weather station in Rankin Inlet (RANKIN INLET A in https://climatedata.ca/download/). The white number corresponds to the annual rank (i.e., precipitation in 2024 was the 9th highest since 1981).

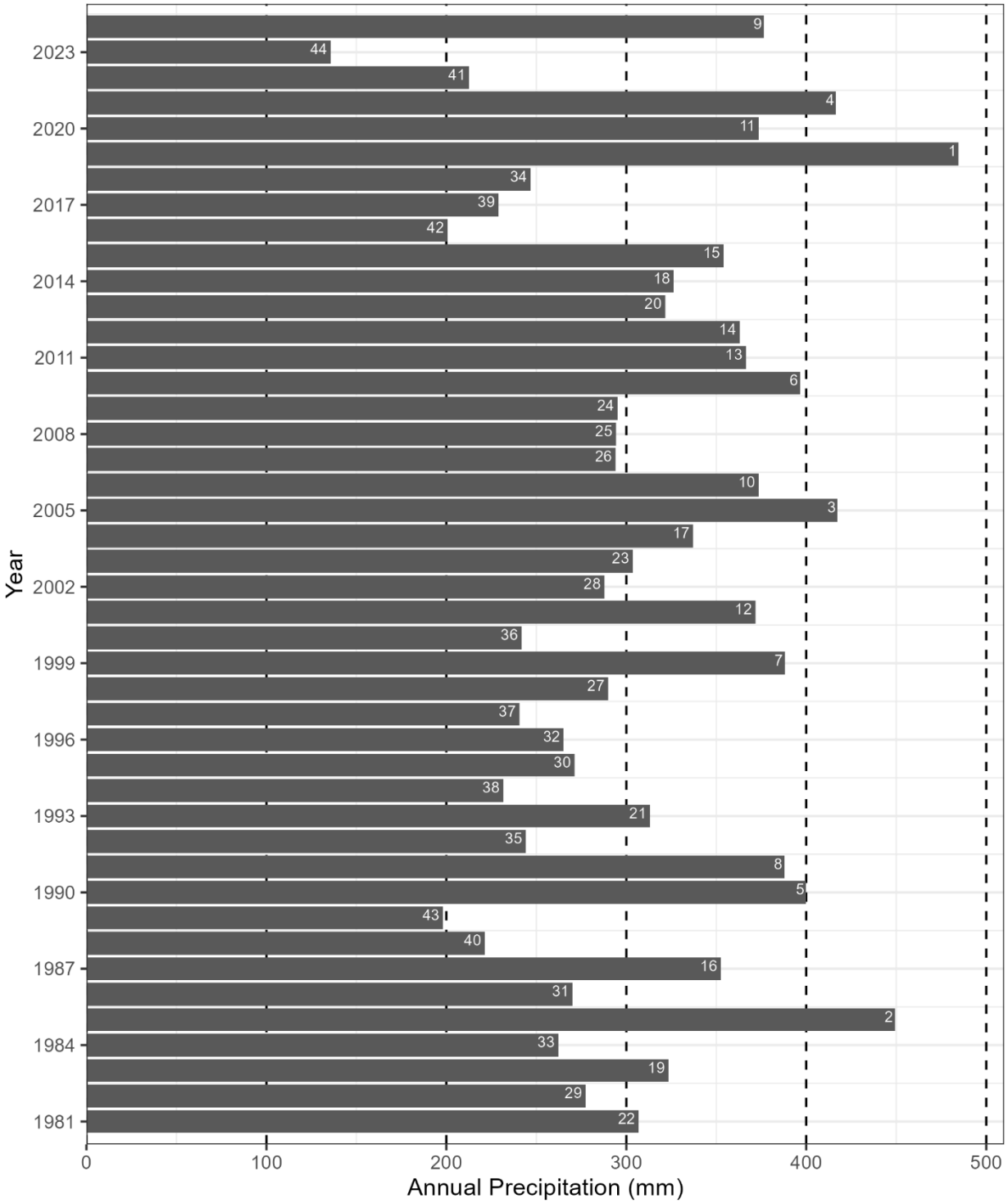


Figure 2-3. Annual rainfall (mm) from 1981-2024.

Notes: Rainfall data is from the weather station in Rankin Inlet (RANKIN INLET A in https://climatedata.ca/download/). The white number corresponds to the annual rank (i.e., rainfall in 2024 was the 7th highest since 1981).

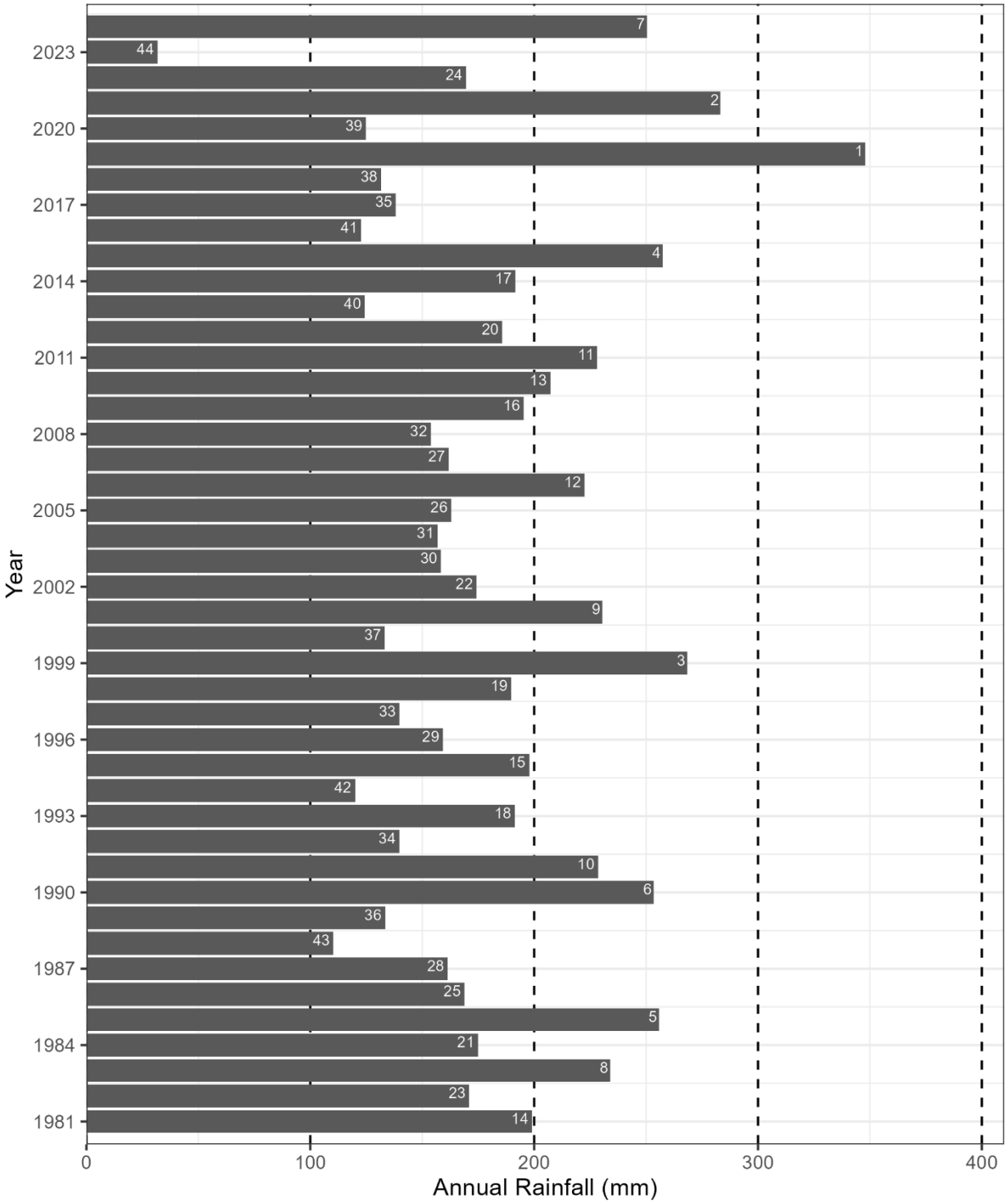
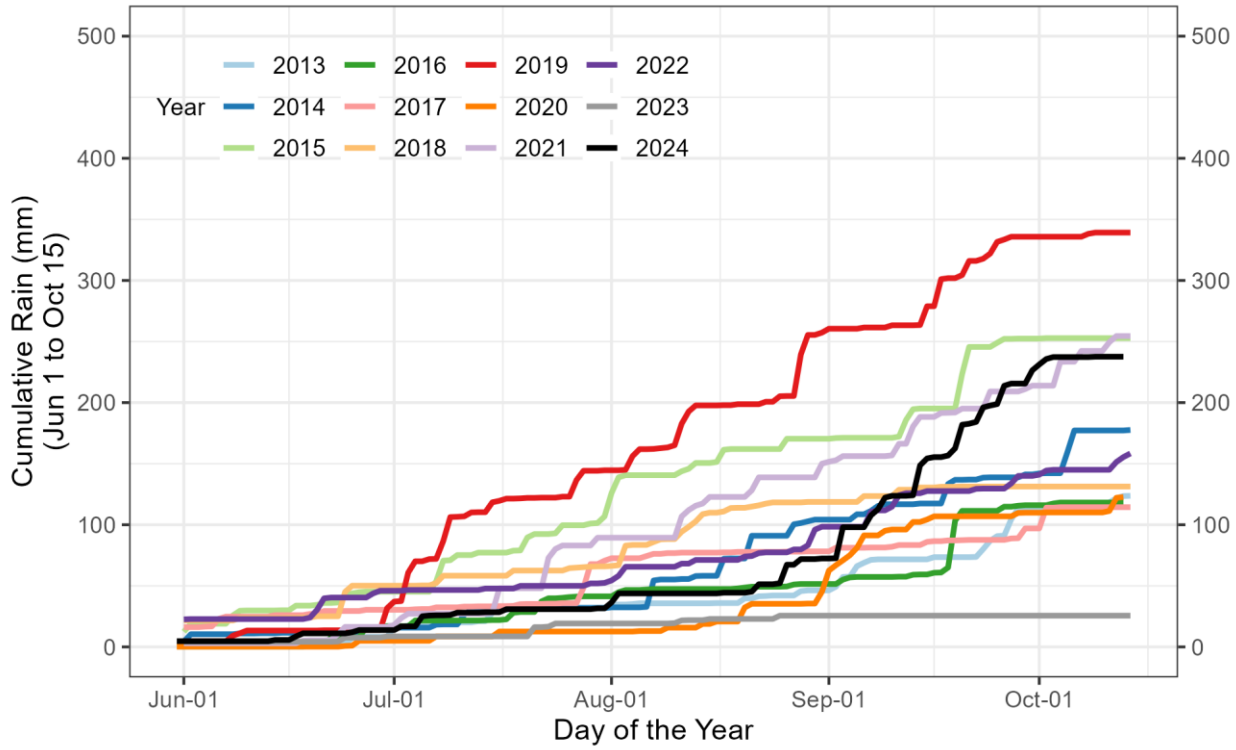


Figure 2-4. Cumulative annual precipitation as rain from 2013 to 2024.

Notes: Rainfall data is from the weather station in Rankin Inlet (RANKIN INLET A in https://climatedata.ca/download/).



2.4 MEL-14 Effluent Monitoring Program

Meliadine Lake is the receiving environment for treated surface contact water collected at the Mine. Surface contact water refers to precipitation and runoff that occurs within the footprint of the Mine. The general strategy for managing surface contact water is to intercept water that encounters infrastructure and direct it towards Collection Ponds (CPs) through a network of dikes, channels, and culverts. Six CPs are currently used to manage surface contact water collected on Site (**Table 2-2**). CP2 through CP6 are located near major infrastructure (**Figure 1-2**). Contact water from these CPs is ultimately directed toward CP1. Water in CP1 is treated at the EWTP before being discharged to Meliadine Lake. Other sources of water to CP1 include direct runoff from the CP1 catchment and treated wastewater from the Sewage Treatment Plant (STP). Water management for the CPs involves drawing down the water levels before freeze-up to create capacity to store runoff during freshet.

Table 2-2. Surface Contact Water Management Plan (2024).

Source	Closest Collection Pond (CP)
Industrial Site Pad, Ore Storage Pad 2, Landfill	CP1
Waste rock storage facility 1 (WRSF1)	CP1, CP4, CP5
Waste rock storage facility 3 (WRSF3)	CP2 and CP6
Tiriganiaq Pit 1	Salinity based: CP4/CP5, SP1, or Tiriganiaq Pit 2
Tailings Storage Facility (TSF)	CP1 and CP3

2.4.1 Discharge from CP1 to Meliadine Lake

The volume of water (m^3) discharged from CP1 to Meliadine Lake since 2018 is shown in **Figure 2-5**. Monthly discharge volumes from CP1 to Meliadine since 2018 are presented in **Table 2-3**.

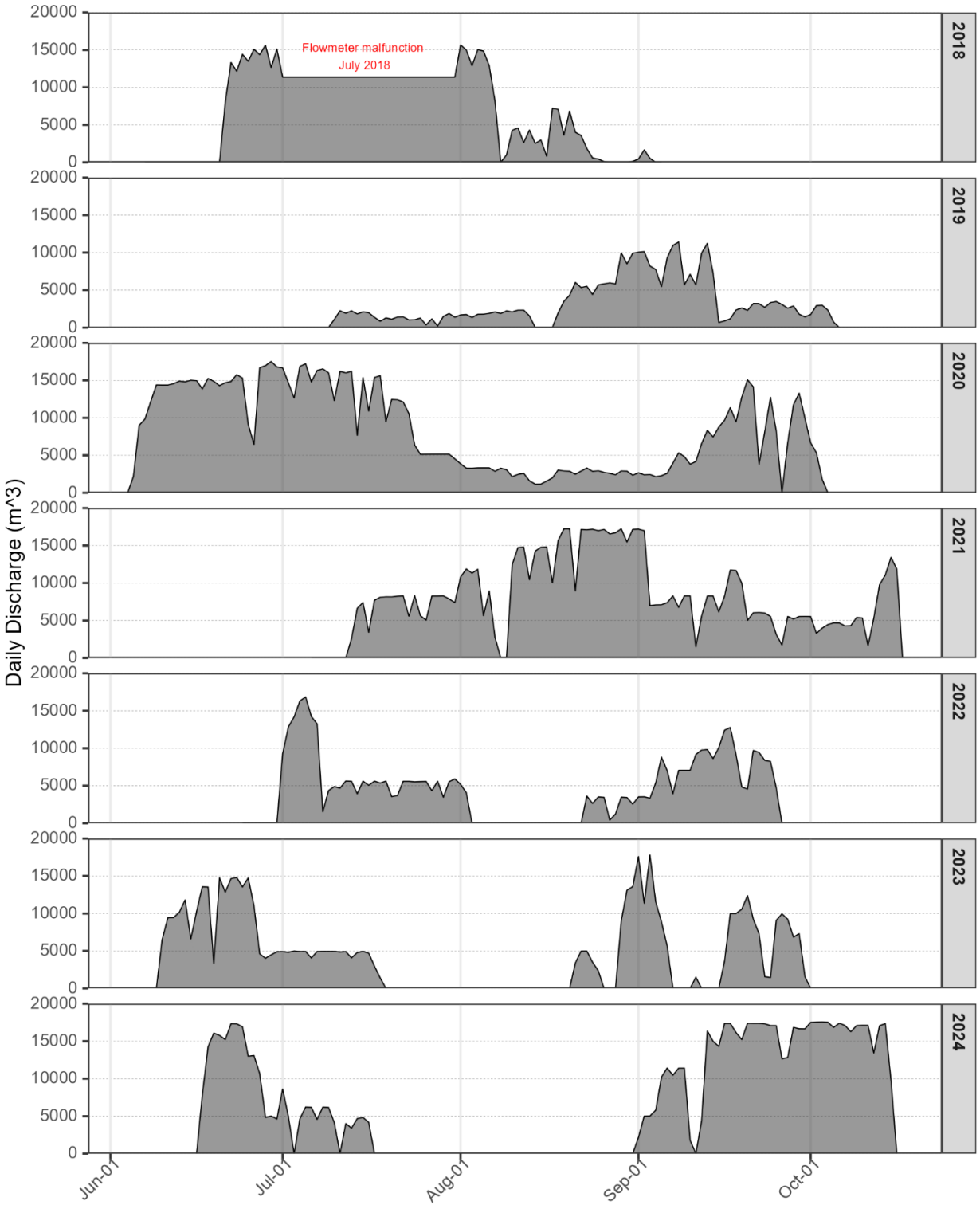
Approximately 861,500 m^3 of treated contact water was discharged to Meliadine Lake in 2024. From June 17 to June 27, the Mine discharged approximately 157,000 m^3 of water from CP1. Not much precipitation fell in June; therefore, the daily flow rate was reduced to between 4,000 and 6,000 m^3 from June 27 to July 16. The operating level in CP1 was reached on July 16 and discharge was halted until September 1. July and August were warm and relatively dry, hence the prolonged period of no water discharge to Meliadine Lake. September was one of the wettest months on record for the region with 154 mm recorded at the weather station in Rankin Inlet (**Table 2-1**). Record rainfall resulted in large volumes of water to manage on site, and the rate of discharge from CP1 to Meliadine Lake increased to draw down the water level in CP1 before freeze-up as per the Water Management Plan.

Table 2-3. Monthly discharge (m^3) from CP1 to Meliadine Lake, 2018-2024.

Year	Jun	Jul	Aug	Sep	Oct	*Annual Totals*
2018	134,270 (10)	352,550 (na*)	153,065 (26)	2,630 (3)	0 (0)	*642,520 (70)*
2019	0 (0)	30,615 (24)	107,540 (31)	157,910 (30)	10,710 (5)	*306,775 (89)*
2020	352,955 (26)	366,095 (31)	83,455 (31)	214,845 (30)	13,830 (3)	*1,031,180 (121)*
2021	0 (0)	133,440 (19)	397,400 (29)	221,210 (30)	99,080 (16)	*851,130 (94)*
2022	0 (0)	214,710 (31)	33,585 (11)	188,335 (25)	0 (0)	*436,630 (67)*
2023	209,025 (21)	81,120 (18)	54,895 (8)	184,510 (22)	0 (0)	*529,550 (67)*
2024	171,940 (14)	72,725 (14)	0 (0)	370,145 (29)	246,675 (15)	***861,485 (72)***

Notes:
Values within parenthesis indicate the number of days in which discharge was occurring.
Monthly and annual discharge rounded to the nearest 5 m^3.
* No daily discharge date for July 2018 because of a malfunction with the flow meter.

Figure 2-5. Daily Discharge (m^3) from CP1 to Meliadine Lake, 2018-2024.



2.4.2 Effluent Chemistry at MEL-14

Effluent monitoring at the Final Discharge Point (MEL-14) is required under the MDMER and the Water Licence. The purpose of the effluent monitoring program is to ensure that water discharged to Meliadine Lake is safe for aquatic life. The conditions regarding disposal of contact water from CP1 to Meliadine Lake are outlined in Part F of the Water Licence:

- Effluent quality limits are not exceeded for parameters listed in **Table 2-4**, and
- Water from MEL-14 is not acutely lethal to Rainbow Trout as per the Environment Canada's Biological Test Method (EPS/1/RM/13).

Table 2-4. MEL-14 effluent limits in the Type A Amended Water Licence (2AM-MEL1631).

Parameter	Units	Maximum Average Concentration	Maximum Concentration in a Grab Sample
pH [a]	-	6.0 | 9.5	6.0 | 9.5
Total Dissolved Solids (calculated) [b]	mg/L	3,500	4,500
Total Suspended Solids [a]	mg/L	15	30
Total Phosphorus [c]	mg/L	2	4
Total Ammonia [c]	mg/L	14	18
Aluminum [c]	mg/L	2	3
Arsenic	mg/L	0.3	0.6
Copper [d]	mg/L	0.2	0.4
Nickel [a]	mg/L	0.5	1
Lead [a]	mg/L	0.1	0.2
Zinc [d]	mg/L	0.4	0.8
Total Cyanide	mg/L	0.5	1
Total Petroleum Hydrocarbons [c]	mg/L	5	5

Notes:
All concentrations are total values (i.e., unfiltered).
[a] Adopted from Metal and Diamond Mining Effluent Regulations (Government of Canada, 2024).
[b] The limit for TDS increased in 2020 as per the Amendment of the Water Licence (NWB, 2024).
[c] Not a parameter included in MDMER Schedule 4 (authorized limits of deleterious substances).
[d] Limit for the Water Licence is lower than authorized limits in MDMER.

Sixteen (16) effluent samples were collected from MEL-14 between June 17 and October 14 when the Mine was actively discharging water to Meliadine Lake. Water samples were sent to Bureau Veritas laboratory (Nepean, ON) for analysis. Sampling at MEL-14 is typically completed on Monday so that samples arrive at the lab within the week. Two samples were collected in June, three in July, none in August, eight in September, and three in October. In addition to the five weekly samples in September, the Environment Department also collected a sample on Sunday September 1, the first day of discharge

since July 16. The Environment Department also collected duplicate samples when inspectors visited the Mine on Thursday September 5 (CIRNAC) and Wednesday September 18 (ECCC).

Chemistry results for individual samples are provided in **Table 2-5**. The concentrations of key parameters are shown in **Figure 2-6** (TDS and constituent ions), **Figure 2-7** (nutrients), and **Figure 2-8** (metals). Summary statistics are provided in **Appendix B1**.

The key findings from the 2024 effluent chemistry data are summarized below:

- No exceedances of effluent limits were reported in 2024 (**Table 2-5**). The Water Management Plan has been effective at keeping TDS concentrations in surface contact water well below the maximum authorized concentration in a grab sample of 4,500 mg/L for calculated TDS.
- Total dissolved solids (TDS) concentrations were lowest in June (890 to 905 mg/L) and trended higher throughout the summer to a maximum of 2,180 mg/L in September (**Table 2-6**). The seasonal pattern of lower TDS during freshet and higher concentrations of TDS in the fall has been observed annually since 2020.
- Chloride is the dominant major ion in surface contact water collected at the Mine. In 2024, chloride comprised between 29 and 38 % of TDS (**Table 2-6**, **Figure 2-6**). Chloride remains below the 60% threshold that would trigger development of a site-specific water quality objective (SSWQO) under the Adaptive Management Plan for Water Management (Version 2B; Agnico Eagle, 2024).
- From 2018 to 2022, sodium was consistently the second most abundant major ion in treated surface contact water from MEL-14. In 2023 and 2024, sulphate concentrations were approximately equal to or slightly higher than sodium (**Figure 2-9**).

2.4.3 Toxicity Testing

Acute Toxicity Testing

Water samples were collected for acute toxicity testing with Rainbow Trout (96-hr survival) and *D. magna* (48-hr survival) on June 17, July 8, September 2, September 18, and October 1. Acute toxicity testing for *D. magna* is required under MDMER and the Type A Water Licence. Acute toxicity tests were conducted at AquaTox Testing & Consulting, in Puslinch (ON) according to standard test methods in the MDMER.

The 2024 test results are presented in **Table 2-5** along with the MEL-14 chemistry results. Water from MEL-14 was not acutely toxic to Rainbow Trout or *D. magna* in the four tests conducted in 2024. These findings add to the multi-year dataset that shows effluent discharged to Meliadine Lake does not pose a direct risk to the survival of fish or aquatic invertebrates.

Chronic (Sublethal) Toxicity Testing

Effluent samples were collected from MEL-14 on June 17, July 8, and October 1 for sublethal toxicity testing with *L. minor* (duckweed). There were no effects to *L. minor* biomass or growth endpoints in the June and July tests, however fewer fronds (leaves) were produced relative to the control treatments in the October test. The concentration of effluent that caused a 25% reduction biomass and number of fronds (IC25) was 72% and 56%, respectively. Reductions to *L. minor* frond yield have occurred in full-strength effluent with TDS concentrations as low as 1,140 mg/L, but as shown in **Figure 2-11**, the dose-response relationship is highly variable. For example, in 2020, there was no impairment to *L. minor* frond yield at TDS concentrations between 1,400 mg/L and 1,850 mg/L. Based on the available sublethal test results, effects to frond yield are more likely when TDS and chloride concentrations exceed 2,000 mg/L and 750 mg/L, respectively.

2.4.4 Loadings to Meliadine Lake

Loadings from CP1 to Meliadine Lake are calculated monthly (during discharge months) as per the MDMER (Government of Canada, 2024). Monthly loadings are calculated according to the following equation:

$$ML = \frac{(C \times V)}{1{,}000}$$

Where:

ML = monthly loading in kg,

C = monthly mean concentration of parameters measured in MEL-14 samples in mg/L, and

V = is the total monthly volume of water discharged to Meliadine Lake from CP1 in m^3.

Annual loadings for selected parameters of interest for the Meliadine Lake are shown in **Figure 2-10**. Monthly and cumulative loadings since 2018, the first year of discharge from CP1 to Meliadine Lake, are provided in **Appendix B2**. A high-level overview of the loadings information is provided below, but the results for individual parameters of interest are discussed in greater detail within the Meliadine Lake water quality chapter and, in the case of nutrients, the phytoplankton community chapter.

Annual loadings in 2024 were higher compared to 2023 for most parameters. The comparatively large volume of water discharged in 2024 compared to 2022 and 2023 resulted in predictably higher mass loading to Meliadine Lake for some parameters, notably, the constituent ions that make up TDS (e.g., chloride and sulphate) and uranium which reached peak loading since 2018. Since the NWB Emergency Authorization and amendment to the Type A Water Licence in 2020 and 2021, annual loadings for most parameters have remained higher compared to early discharge period (2018-2019). Parameters with noticeably higher annual loadings to Meliadine Lake in recent years include sulphate, copper, molybdenum, and uranium.

2.5 Snow Core Monitoring Program

Snow core samples were collected on April 8, 2024 at five dustfall monitoring locations. The monitoring stations are shown in **Figure 1-2**. Station SNOCOR6 is located approximately 1.6 km west of WRSF1 between Lake B7 and Lake D7. This location is used to characterize background chemistry in the snow pack. The other four stations are located around the perimeter of the Mine. SNOCOR7 is northwest of the emulsion plant, SNOCOR Boundary is located north of the main camp, SNOCOR4 is located north of the Lake A8, and SNOCOR5 is located east of WRSF3 and south of the Exploration Camp. Off-site dust migration is most likely to be detected at SNOCOR4 given its proximity to Tiriganiaq Pits 1 and 2 and the prevailing wind direction from the northwest.

The snow samples were collected according to the standard procedure developed by the Environment Department. Snow samples were analyzed for conventional parameters, organic carbon, and total and dissolved metals at Bureau Veritas Labs (Nepean, ON).

The potential for off-site dust migration to impact water quality is qualitatively assessed by comparing the snow chemistry results from the four stations close to the Mine against the background results from SNOCOR6. The tabulated snow core chemistry results are provided in **Appendix B1**. Concentrations for select parameter of interest from 2020–2024 are shown in the following figures:

- Total suspended solids, turbidity, and sulphate: **Figure 2-12**
- Metals (total and dissolved fractions): **Figure 2-13** to **Figure 2-16**

Snow Core Chemistry Results

The key findings from the 2024 snow core chemistry monitoring program are summarized below:

- In 2024, concentrations of TSS, turbidity, sulphate, and metals in snowpack samples were highest at SNOCOR4 (south of Tiriganiaq Pit 1) and lowest at SNOCOR5 and the SNOCOR Boundary station. SNOCOR7 (near the Emulsion Plant) showed intermediate values—lower than SNOCOR4 but elevated relative to background levels. While absolute concentrations vary from year to year, the spatial pattern has remained consistent since the first sampling event in February 2020.
- Most metals of interest showed strong covariance with TSS, iron, and manganese, indicating a shared association with particulate matter. Dissolved metal concentrations were consistently lower than total concentrations, suggesting that metals in the snowpack are primarily bound to particulates.
- Concentrations across all parameters have declined significantly since the peak observed in April 2020, suggesting that dust control measures have been effective. The elevated results from 2020 now appear to represent an isolated event.

The 2024 snow core chemistry results align with predictions made in the FEIS (Agnico Eagle, 2014). Specifically, the FEIS projected that aerial deposition of particulates—modelled as TSS—and associated metals would increase from background levels during pre-production, peak during open pit development, and decline as the Mine approached closure. The observed trends in snowpack chemistry, including the temporal peak in 2020 and the subsequent decline, are consistent with this prediction. Potential linkages between elevated snowpack chemistry and recent changes in water quality in Lake A8 and Lake B7 are explored further in the Peninsula Lakes water quality assessment (**Section 4**).

Table 2-5. MEL-14 effluent chemistry results in 2024.

Parameter	Units	Water Licence Limits		June		July			September								October		
		Max Grab	Monthly Mean	06-17	06-24	07-01	07-08	07-15	09-01	09-02	09-05	09-09	09-16	09-18	09-23	09-30	10-01	10-07	10-14
Field Parameters																			
pH (field)	pH units	6 | 9.5	6 | 9.5	7.21	7.24	7.74	6.98	7.17	7.56	7.56	7.13	7.49	7.61	7.82	7.6	7.6	7.52	7.55	7.33
Sp. Conductivity (field)	µS/cm	-	-	1333	1575	1569	1750	1882	-	2534	2484	2518	2493	2512	2571	3248	2137	3434	3380
Temperature	C	-	-	10.6	13.2	15.9	12.7	14.4	9.1	9.5	8.3	7.8	8.1	7.3	9.1	7.5	7.1	6.3	2.8
Conventional Parameters																			
Conductivity (lab)	µS/cm	-	-	1333	1575	1580	1770	1900	2490	2534	2520	2600	2540	2570	2630	3248	3350	3450	3380
Hardness (T)	mg/L	-	-	267	304	264	311	331	425	430	445	469	435	449	572	627	713	667	638
pH (lab)	pH units	-	-	7.34	7.3	7.22	7.27	7.54	7.73	7.76	7.52	7.71	7.76	7.83	7.8	7.69	7.66	7.61	7.57
Total Dissolved Solids	mg/L	4,500	3,500	905	890	980	1140	1240	1620	1630	1600	1640	1520	1670	1980	2040	2130	2180	2170
Total Dissolved Solids (Calculated)	mg/L	-	-	700	820	830	930	990	1400	1400	1400	1400	1400	1400	1500	1900	2000	2100	1900
Total Suspended Solids	mg/L	30	15	2	3	6	4	2	2	2	3	4	3	5	5	5	5	5	5
Major Ions and Nutrients																			
Alkalinity, Total	mg/L	-	-	39	40	27	43	60	74	76	69	83	87	88	88	97	94	93	91
Chloride	mg/L	-	-	270	340	350	380	410	570	550	580	590	570	570	570	700	730	740	680
Sodium	mg/L			141	152	169	187	195	282	285	271	257	275	283	267	313	336	347	345
Sulphate	mg/L	-	-	130	160	160	180	190	240	240	240	250	260	260	320	390	420	460	420
Calcium	mg/L			81.8	84.2	77.7	84.9	91.3	122	122	123	133	131	132	154	193	204	187	199
Magnesium	mg/L			22.7	24	26.7	30.8	31.2	42.4	43.6	41.3	39.8	43.8	44.1	43.3	56.7	61.2	66.3	65.2
Potassium	mg/L			13.4	14	14.8	16.5	17.4	22.9	23.2	23	21.4	22	21.7	22	26.1	28.3	27	33
Ammonia (as N)	mg/L	18	14	0.16	0.3	*< 0.05*	0.17	0.4	0.13	0.13	0.15	0.26	0.24	0.17	0.42	2.3	2.7	3.3	3.7
Nitrate (as N)	mg/L	-	-	4.38	5.55	5.03	4.94	5.78	3.91	3.95	4.63	5.02	5.55	5.57	7.34	14.6	15.1	19.2	19.4
Total Phosphorus	mg/L	4	2	0.023	0.024	0.043	0.052	0.031	*< 0.02*	0.04	*< 0.02*	*< 0.02*	0.055	0.046	0.025	0.044	*< 0.02*	0.033	*< 0.02*
Unionized Ammonia (calculated)	mg/L	-	-	0.0005	0.0012	*< 0.00079*	*< 4e-04*	0.0015	0.0008	0.0009	*< 4e-04*	0.0013	0.0015	0.0017	0.0029	0.014	0.013	0.016	0.0083
Metals (Unfiltered)																			
Aluminum (T)	mg/L	3	2	0.394	0.58	0.496	0.37	0.35	0.31	0.319	0.354	0.466	0.422	0.398	0.622	0.505	0.677	0.649	0.838
Arsenic (T)	mg/L	0.6	0.3	0.0131	0.0141	0.0131	0.0108	0.00568	0.00533	0.00574	0.00415	0.00757	0.0105	0.0115	0.00882	0.00968	0.00725	0.00633	0.00437
Cadmium (T)	mg/L	-		0.000016	0.00002	0.00001	0.000019	0.000023	0.000017	0.000017	0.000015	0.000019	0.000012	*< 2e-05*	*< 1e-05*	0.000023	*< 2e-05*	*< 2e-05*	0.000025
Chromium (T)	mg/L	-		*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.002*	*< 0.001*	*< 0.002*	*< 0.002*	*< 0.002*	*< 0.001*
Cobalt (T)	mg/L	-		0.00136	0.00159	0.00138	0.00149	0.00146	0.001	0.00102	0.00098	0.00099	0.00091	0.00095	0.00125	0.0019	0.00225	0.00204	0.00189
Copper (T)	mg/L	0.4	0.2	0.00205	0.00213	0.00204	0.00231	0.00266	0.00229	0.00234	0.0019	0.00225	0.00199	0.0023	0.00224	0.002	0.0022	0.0021	0.00223

Table 2-5. MEL-14 effluent chemistry results in 2024.

Parameter	Units	Water Licence Limits		June		July			September								October		
		Max Grab	Monthly Mean	06-17	06-24	07-01	07-08	07-15	09-01	09-02	09-05	09-09	09-16	09-18	09-23	09-30	10-01	10-07	10-14
Iron (T)	mg/L	-		0.021	0.017	0.028	0.027	0.025	0.013	0.023	0.015	0.02	0.044	0.048	0.031	0.049	0.039	0.027	0.028
Lead (T)	mg/L	0.2	0.1	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 4e-04*	*< 2e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	0.00021
Manganese (T)	mg/L	-		0.0243	0.0163	0.0121	0.0497	0.0798	0.0297	0.0359	0.0293	0.0358	0.0457	0.0501	0.0883	0.166	0.201	0.182	0.148
Mercury (T)	mg/L	-		*< 1e-05*	*< 1e-05*	*< 1e-05*	0.00001	0.00018	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*
Molybdenum (T)	mg/L	-		0.0043	0.0048	0.0043	0.0053	0.0052	0.0061	0.0064	0.0055	0.005	0.005	0.0049	0.0051	0.005	0.0057	0.005	0.0044
Nickel (T)	mg/L	1	0.5	0.0038	0.0043	0.0035	0.0035	0.0038	0.0045	0.0046	0.0043	0.0052	0.0047	0.0049	0.0072	0.0107	0.0133	0.0125	0.0119
Selenium (T)	mg/L	-		0.00054	0.00071	0.0006	0.00067	0.0007	0.00055	0.00054	0.00053	0.00052	0.00046	0.00052	0.0006	0.00102	0.00132	0.00126	0.00121
Thallium (T)	mg/L	-		0.000012	0.000016	0.000016	0.000017	0.000016	0.000015	0.000015	0.000013	0.000016	0.000011	*< 2e-05*	0.000021	*< 2e-05*	0.000024	0.000026	0.000021
Uranium (T)	mg/L	-		0.00018	0.00032	0.00019	0.00036	0.00072	0.00149	0.00166	0.00084	0.00259	0.00286	0.00287	0.00323	0.00465	0.00424	0.00446	0.00361
Zinc (T)	mg/L	0.8	0.4	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	0.0099	0.0052	0.0052	*< 0.005*	*< 0.01*	*< 0.005*	*< 0.01*	*< 0.01*	*< 0.01*	0.0065
Cyanide and Radium-226																			
Cyanide (Total)	mg/L	1	0.5	0.00551	0.00335	0.00363	0.00151	0.00144	0.00342	0.0031	0.00104	0.00124	0.00124	0.00076	0.00108	0.00241	0.00146	0.00354	0.00207
Radium-226	Bq/L	-		*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	0.006	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	0.01	*< 0.005*
Toxicity Tests																			
Rainbow trout survival	LC50	-		100	-	-	100	-	-	100	-	-	-	-	-	-	100	-	-
D. magna survival	LC50	-		100	-	-	100	-	-	100	-	-	-	-	-	-	100	-	-
L. minor biomass	IC25	-		>97	-	-	>97	-	-	>97	-	-	-	-	-	-	72 (49.7-96.5)	-	-
L. minor frond number	IC25	-		>97	-	-	>97	-	-	>97	-	-	-	-	-	-	55.9 (41.1-67.6)	-	-

Notes:
Italicized values are below the limit of detection
LC50 = the concentration that causes a 50% reduction in survival.
IC25 = the concentration that causes a 25% reduction in endpoints for the *L. minor* test; 95% confidence intervals in parentheses.

Table 2-6. The fraction of total dissolved solids comprised of chloride in effluent samples from MEL-14 in 2024.

Month and Day	Chloride	TDS (Measured)		TDS (Calculated)	
	mg/L	mg/L	% Cl	mg/L	% Cl
17-Jun	270	905	30%	700	10%
24-Jun	340	890	38%	820	10%
01-Jul	350	980	36%	830	8%
08-Jul	380	1,140	33%	930	8%
15-Jul	410	1,240	33%	990	9%
01-Sep	570	1,620	35%	1,400	8%
02-Sep	550	1,630	34%	1,400	8%
05-Sep	580	1,600	36%	1,400	8%
09-Sep	590	1,640	36%	1,400	8%
16-Sep	570	1,520	38%	1,400	8%
18-Sep	570	1,670	34%	1,400	9%
23-Sep	570	1,980	29%	1,500	10%
30-Sep	700	2,040	34%	1,900	9%
01-Oct	730	2,130	34%	2,000	9%
07-Oct	740	2,180	34%	2,100	8%
14-Oct	680	2,170	31%	1,900	9%

Figure 2-6. Total dissolved solids and constituent ions in end-of-pipe effluent at MEL-14, 2018-2024.

Notes: Calculated TDS was added to the Amended Water Licence in 2020. The limit for TDS applies to calculated TDS. Prior to 2020, calculated TDS was not reported by the laboratory.

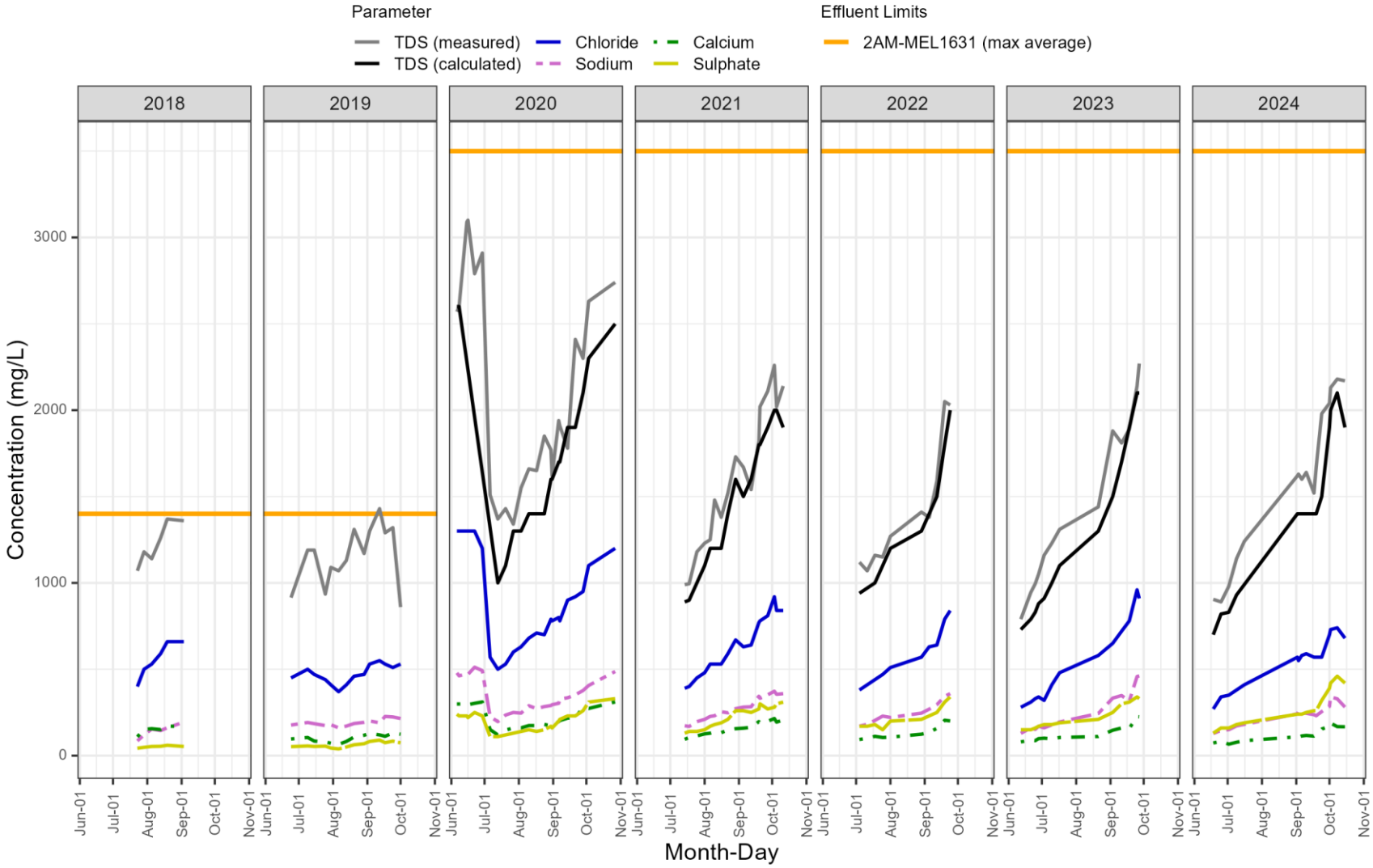


Figure 2-7. Concentrations of nutrients measured in end-of-pipe samples from MEL-14, 2018-2024.

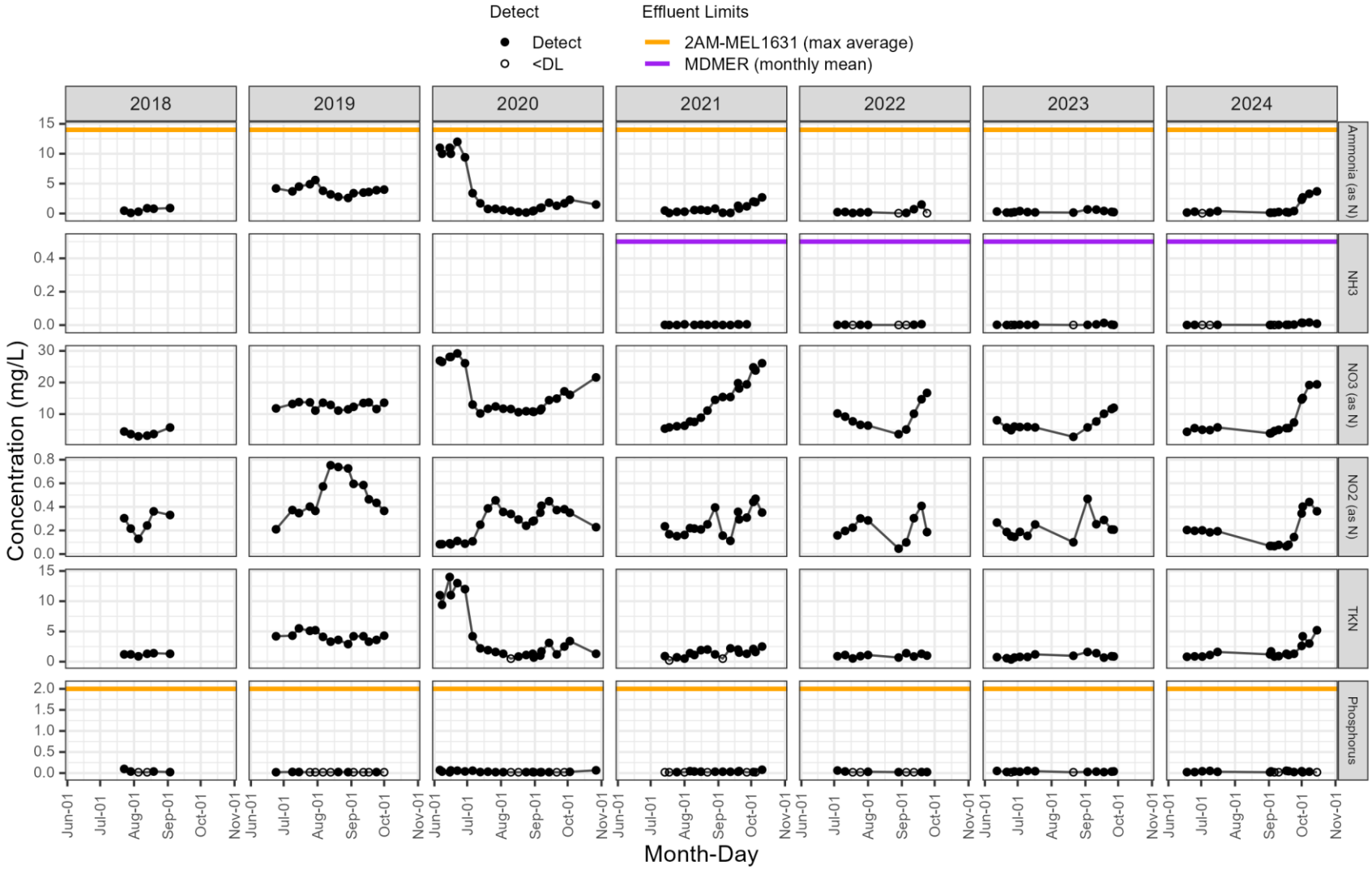


Figure 2-8. Concentrations of metals measured in end-of-pipe samples from MEL-14, 2018-2024.

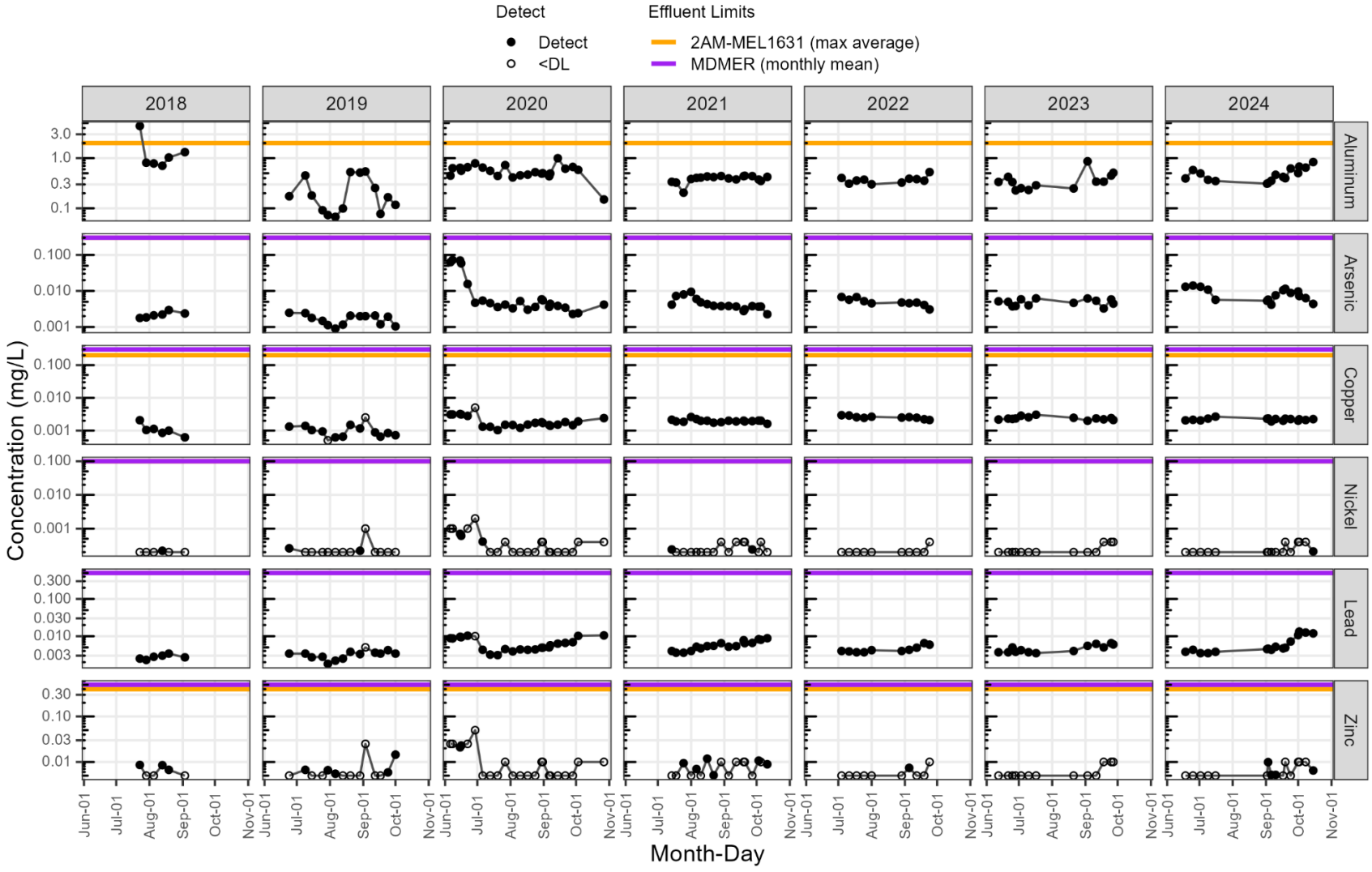


Figure 2-9. Percent composition of major ions in effluent from MEL-14.

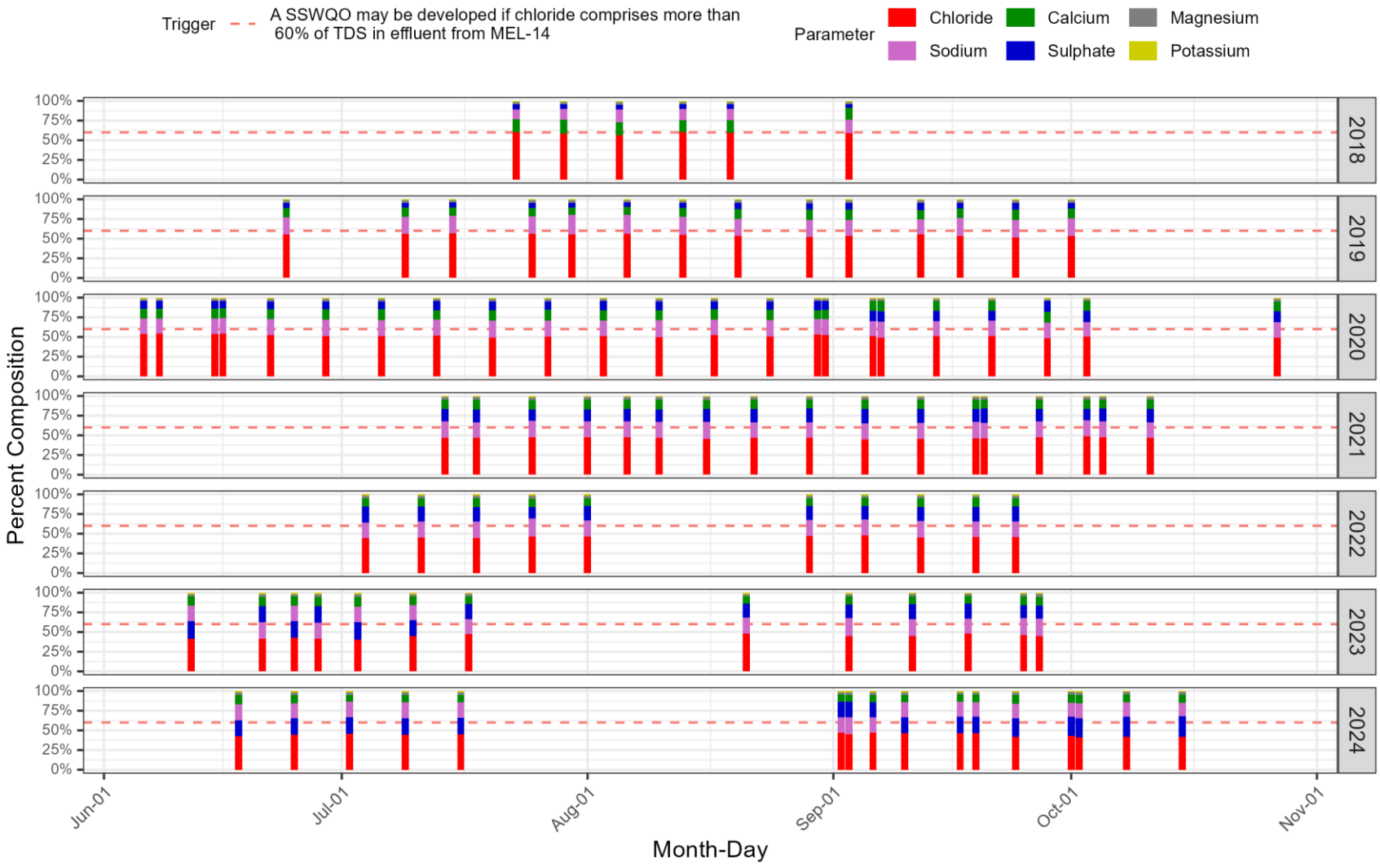


Figure 2-10. Annual loadings (kg) from CP1 to Meliadine Lake for selected parameters.

Notes: The numbers above each bar indicate the percent contribution to the cumulative load (e.g., the annual load of chloride in 2024 accounts for 16% of the cumulative loading from 2018-2024).

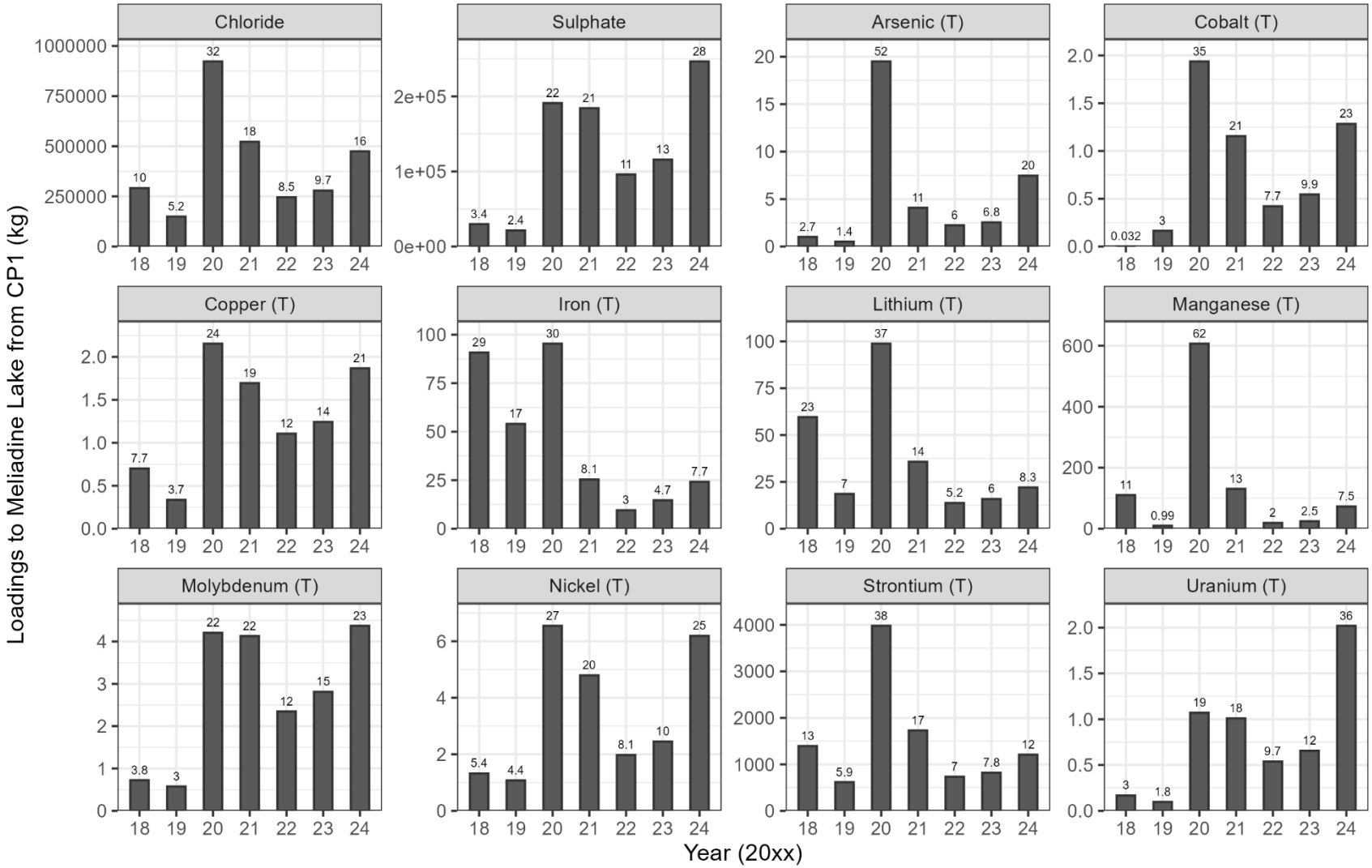


Figure 2-11. Sublethal toxicity test results for *Lemna minor* compared to measured concentrations of TDS in effluent from MEL-14.

Notes: The vertical bars represent the 95th percent confidence interval for samples where effects to biomass or frond yield were observed at less than full strength effluent. The green outlined symbols represent the sublethal toxicity test results from the three sampling events in 2024.

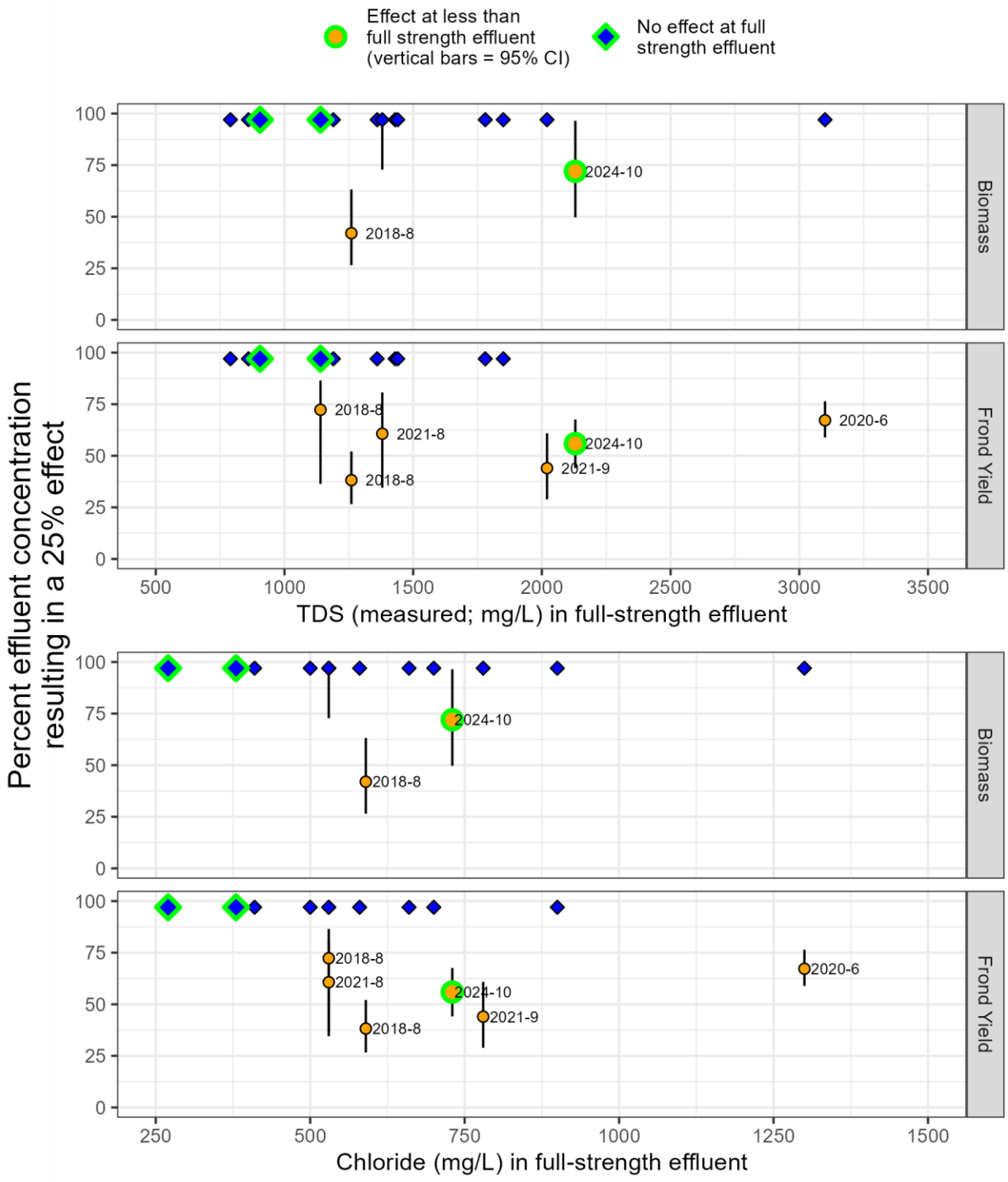


Figure 2-12. Snow core chemistry – total suspended solids, turbidity, and sulphate, 2020–2024.

Notes: The sampling areas correspond to the following SNOCOR stations:
Background = SNOCOR6, E of WRSF3 = SNOCOR5; N of Camp = SNOCOR Boundary; NW of Emulsion Plant = SNOCOR7, and S of Tiriganiaq Pits 1 and 2 = SNOCOR4.

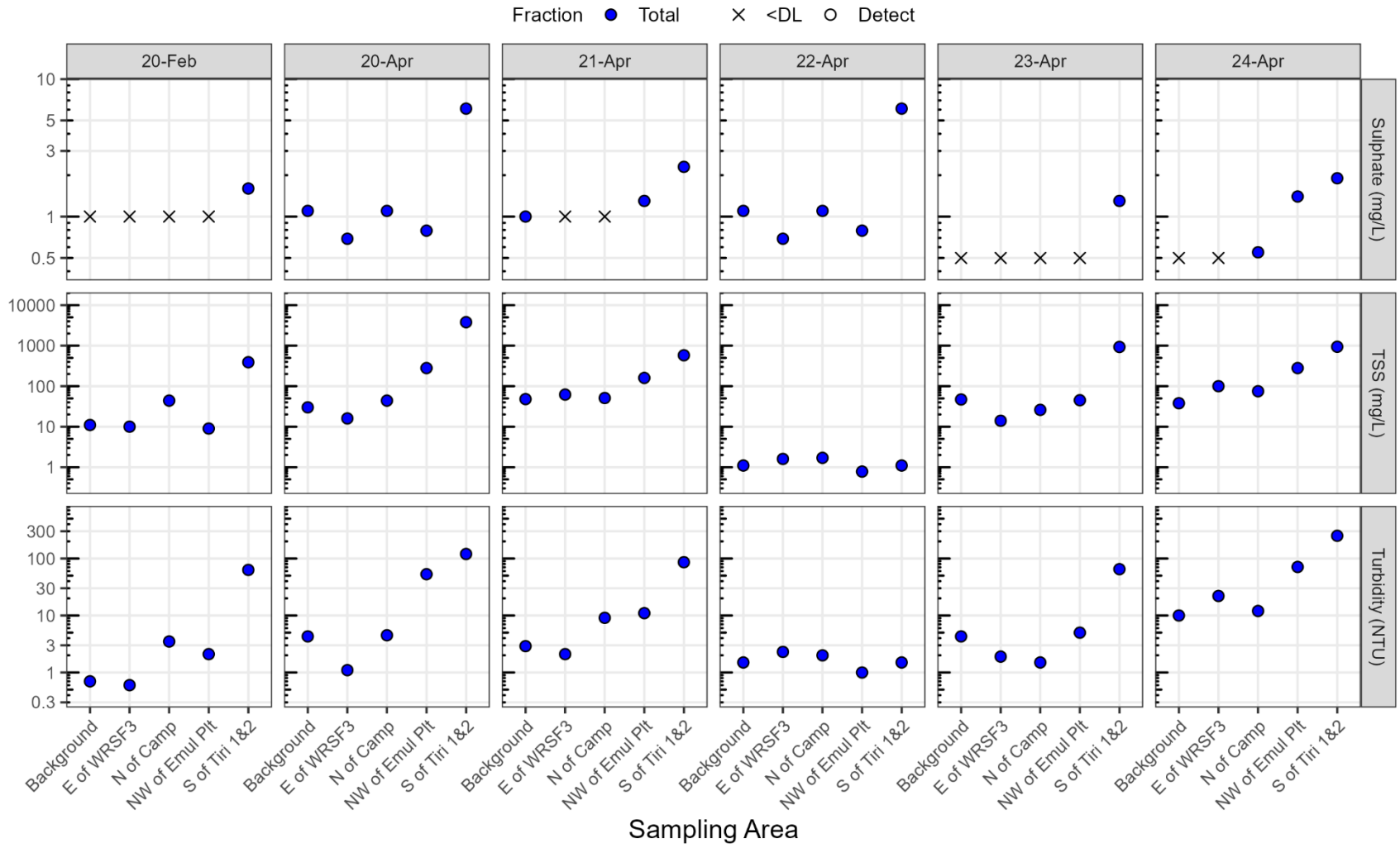


Figure 2-13. Snow core chemistry – arsenic, iron, and manganese, 2020–2024.

Notes: The sampling areas correspond to the following SNOCOR stations:
Background = SNOCOR6, E of WRSF3 = SNOCOR5; N of Camp = SNOCOR Boundary; NW of Emulsion Plant = SNOCOR7, and S of Tiriganiaq Pits 1 and 2 = SNOCOR4.

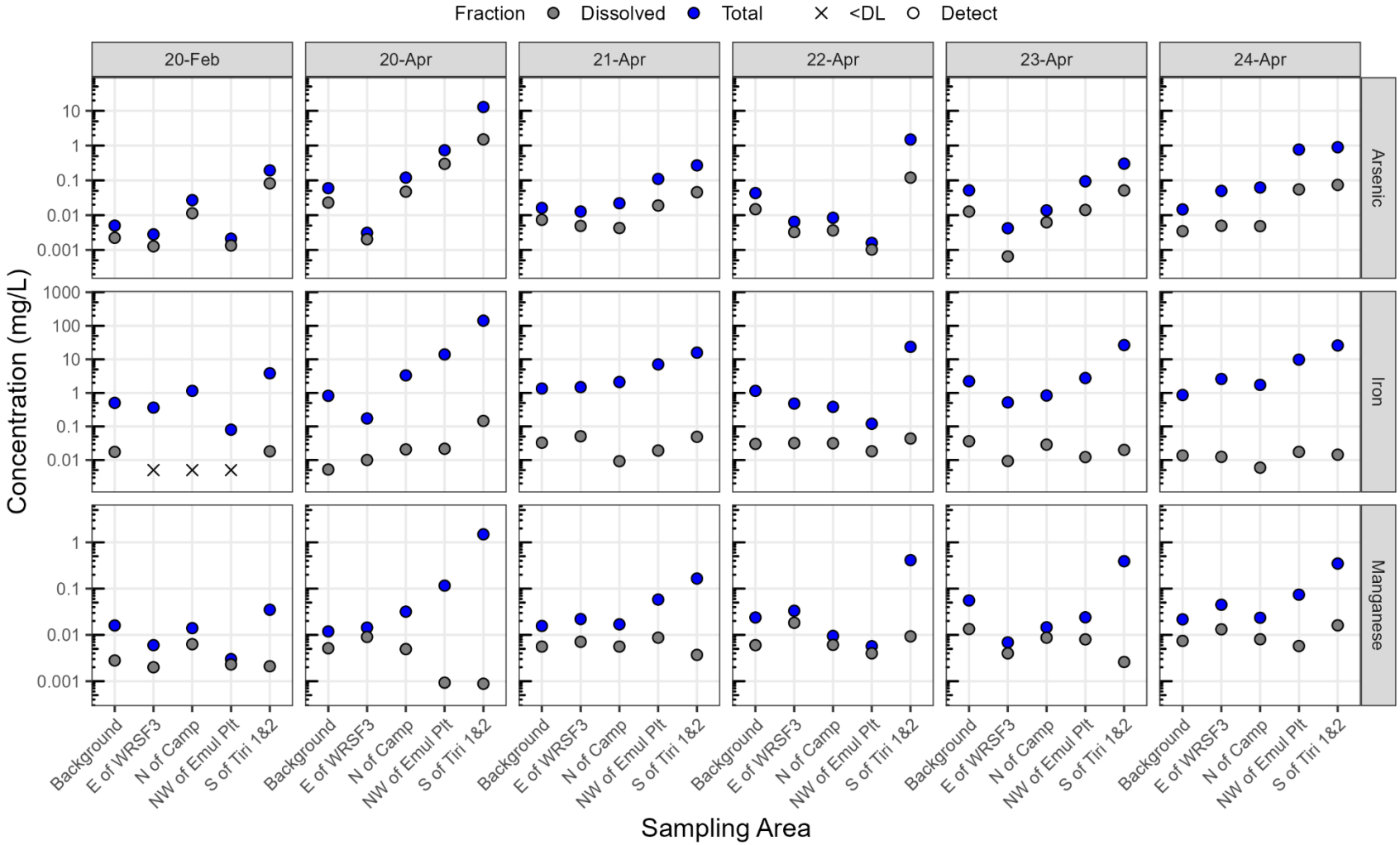


Figure 2-14. Snow core chemistry – aluminum, barium, and copper, 2020–2024.

Notes: The sampling areas correspond to the following SNOCOR stations:
Background = SNOCOR6, E of WRSF3 = SNOCOR5; N of Camp = SNOCOR Boundary; NW of Emulsion Plant = SNOCOR7, and S of Tiriganiaq Pits 1 and 2 = SNOCOR4.

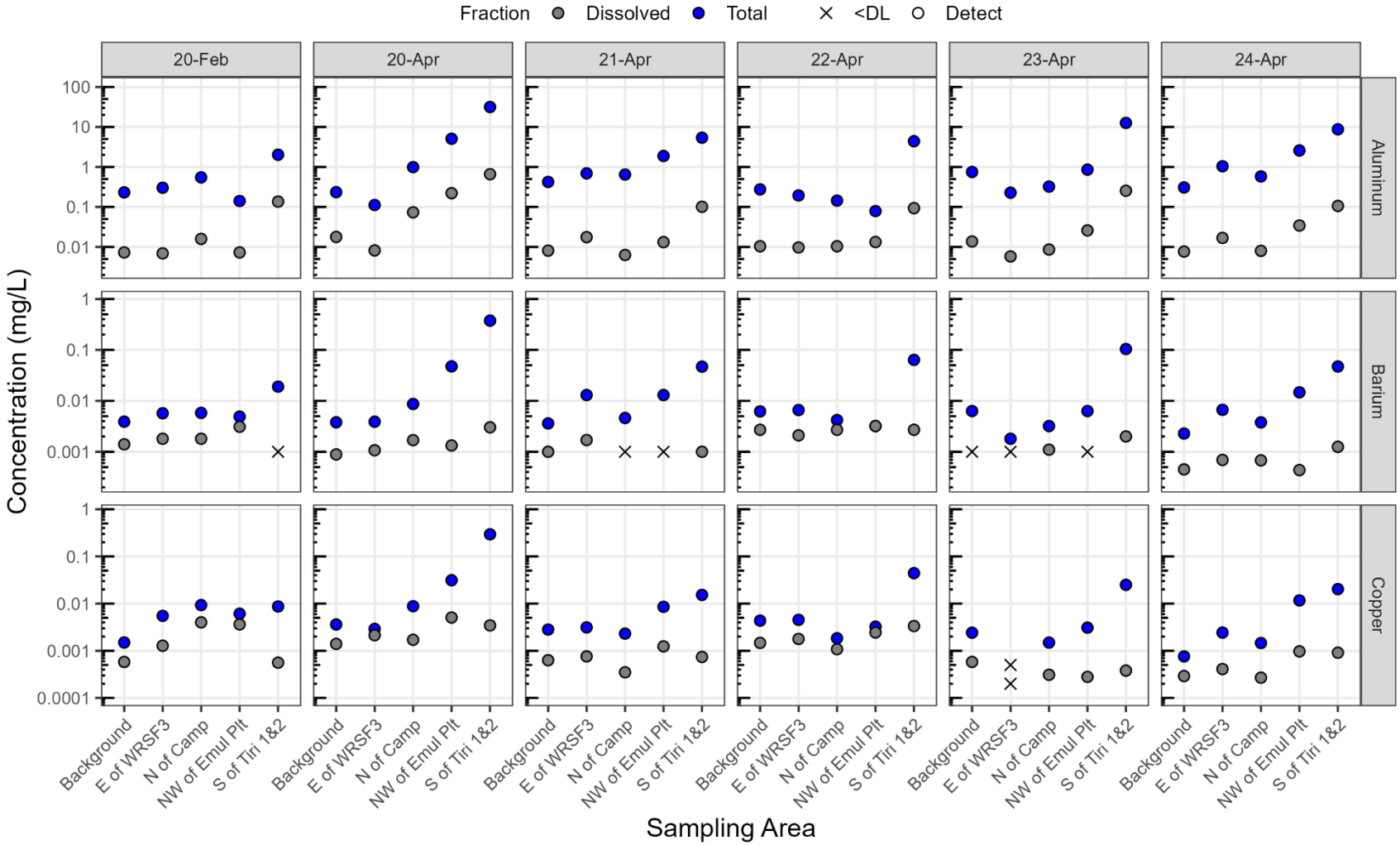


Figure 2-15. Snow core chemistry – cobalt, lead, molybdenum, 2020–2024.

Notes: The sampling areas correspond to the following SNOCOR stations:
Background = SNOCOR6, E of WRSF3 = SNOCOR5; N of Camp = SNOCOR Boundary; NW of Emulsion Plant = SNOCOR7, and S of Tiriganiaq Pits 1 and 2 = SNOCOR4.

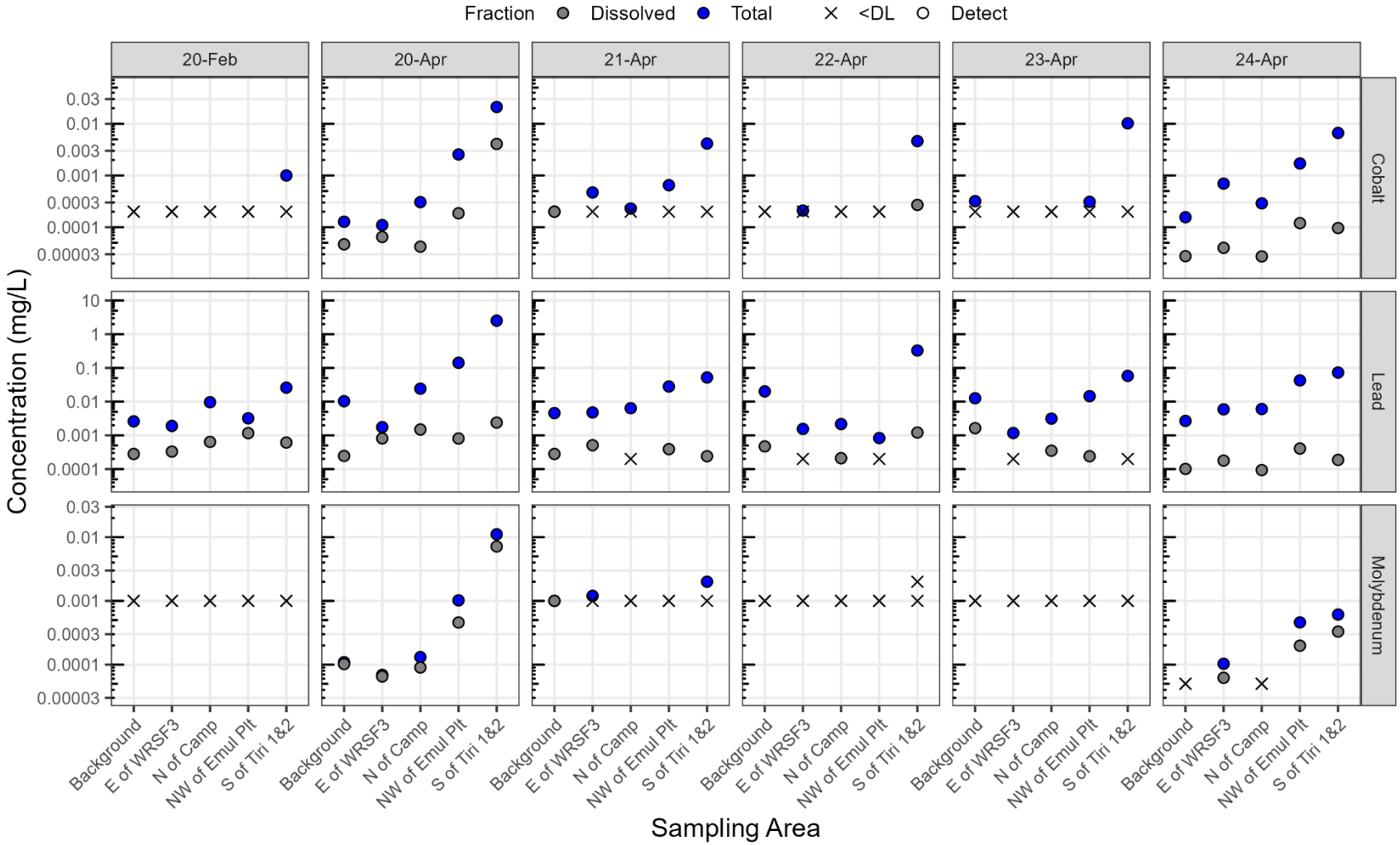
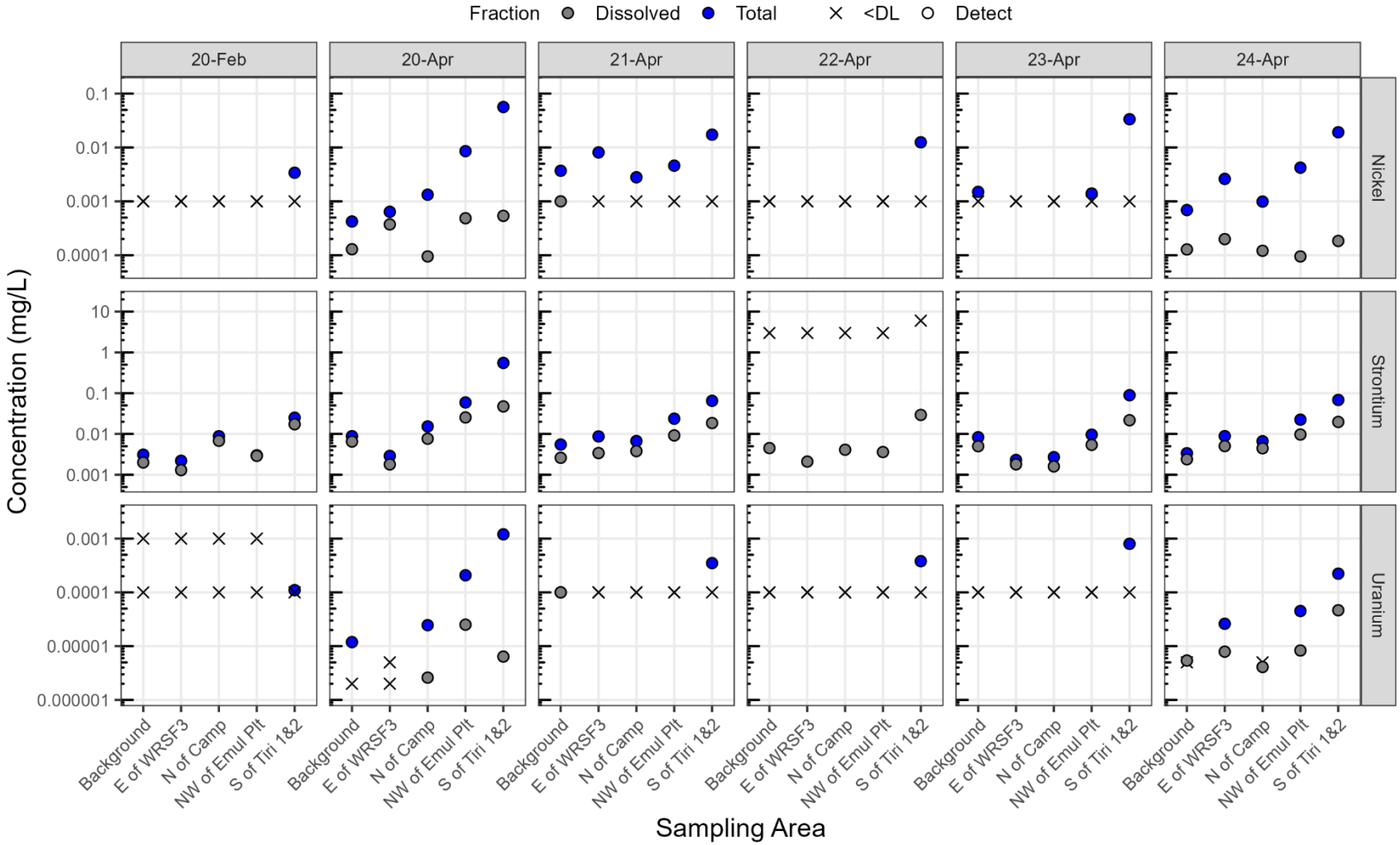


Figure 2-16. Snow core chemistry – nickel, strontium, uranium, 2020–2024.

Notes: The sampling areas correspond to the following SNOCOR stations:
Background = SNOCOR6, E of WRSF3 = SNOCOR5; N of Camp = SNOCOR Boundary; NW of Emulsion Plant = SNOCOR7, and S of Tiriganiaq Pits 1 and 2 = SNOCOR4.



2.6 References

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3 WATER QUALITY – MELIADINE LAKE

3.1 Introduction

This chapter presents findings of the 2024 surface water quality monitoring program in Meliadine Lake. Sampling areas and stations within each area are shown in **Figure 3-1**. Water sampling was carried out according to the schedule in the AEMP Design Plan and recommendations in the 2023 AEMP report (Azimuth, 2024). Sampling dates, coordinates, and depths are provided in **Table 3-1**.

The Meliadine Lake water sampling program is designed to monitor changes in water quality caused by effluent discharge and other activities at the Mine. Surface water samples were collected monthly in July, August, and September from the near-field area around the diffuser (NF; MEL-01), the mid-field area (MF; MEL-02) located to the northwest, past the narrows, and Reference Area 1 (REF1; MEL-03). Reference Areas 2 and 3 (MEL-04 and MEL-05) were sampled in August to bolster the dataset for looking at lake-wide changes in water quality. Under ice sampling was completed in late March at MEL-01 and MEL-02 as in previous years.

Objectives and Key Questions

The water quality monitoring program has four objectives:

- Determine if the Mine is causing changes to water quality in Meliadine Lake,
- Evaluate the accuracy of predicted changes in water quality,
- Assess whether mitigation measures are effective at reducing impacts to the aquatic environment, and
- Provide recommendations (as required) for follow-up monitoring or mitigation to lower the impact of mining-related activities on changes in water quality.

The following key questions are used to meet the objectives of the AEMP:

Are concentrations of parameters in the effluent less than limits specified in the Water Licence?

This question was answered in **Section 2.4.2**. There were no exceedances of limits in the Water Licence in 2024.

Has water quality in the exposure areas changed over time, relative to reference/baseline areas?

This question is explored using plots and statistical analyses in **Section 3.4.3**.

Is water quality consistent with predictions outlined in the Final Environmental Impact Statement (FEIS) and less than AEMP Action Levels[2]?

This two-part question relies on information presented in **Section 3.4.3** (i.e., is water quality similar to, or different from baseline) and the water quality screening against the AEMP Action Levels (aka trigger values).

3.2 Findings from the 2024 Water Quality Program

- 2024 marked the 10th consecutive year of water quality monitoring in Meliadine Lake under the AEMP. Long-term data indicate that regional climate patterns play a significant role in the temporal trends for most parameters.
- Effluent has contributed to higher concentrations of some major ions, nutrients, and metals in the East Basin, as predicted. However, TDS and chloride concentrations in the East Basin remain well below predicted concentrations in the 2014 FEIS (Agnico Eagle, 2014) and the 2020 hydrodynamic model (Tetra Tech, 2020).
- There were no exceedances of the AEMP Action Levels linked to mining activities in 2024, with most parameters remaining well below their respective limits.
- The 2024 water quality results do not require additional management actions based on the Low Action Level assessment and AEMP Response Framework.

[2] AEMP Action Levels refer to 75 % of the AEMP Benchmark for a given parameter. The AEMP Benchmarks correspond to the lowest water quality guideline for protection of aquatic life and human health, or site-specific water quality objectives in the case of fluoride, arsenic, and iron. AEMP Action Levels and Benchmarks for the Meliadine Lake AEMP are listed in **Table C1-1**.

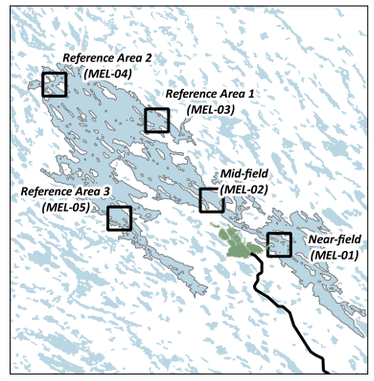
Figure 3-1
Surface Water, Phytoplankton, and Fish Sampling Locations in Meliadine Lake

Meliadine Gold Mine
Aquatic Effects Monitoring Program
2024 Annual Report

AZIMUTH

Date: March 15, 2025
Datum: NAD 83; UTM Zone 15N
Scale: main map 1:95,000
Software: 3.22.11-Białowieża
Produced by: E. Franz

REFERENCES:
1. Basemap imagery from ESRI
2. Mine Plan provided by Agnico Eagle
3. Roads and waterbodies from NRC



Legend

- Extent of the Meliadine Mine (2024)
- All-weather access road
- Peninsula Lakes (see Figure 1-2)
- Surface water station
- Gill net locations for the Lake Trout study
- Minnow trap areas for the Threespine Stickleback study

Table 3-1. Meliadine Lake water sampling events in 2024.

Area	Station ID	Depth[a]	Coordinates[b]		Distance to the Diffuser	Sampling Event			
			Easting	Northing		April	July	August	September
MEL-01 Near-field	MEL-01-01	9.4	542690	6989132	109 m	**March 29** LP, WQ	**July 5** LP, WQ, Phyto	**August 13** LP, WQ, Phyto	**September 7** LP, WQ, Phyto
	MEL-01-06	8.8	542952	6988993	219 m				
	MEL-01-07	7.7	542873	6989218	102 m				
	MEL-01-08	7.5	543044	6989067	259 m				
	MEL-01-09	7.1	542555	6989188	246 m				
	MEL-01-10	10.5	542861	6989059	110 m				
MEL-02 Mid-field	MEL-02-02	10.0	537093	6992642	6,689 m	**March 30** LP, WQ	**July 13** LP, WQ, Phyto	**August 12** LP, WQ, Phyto	**September 8** LP, WQ, Phyto
	MEL-02-03	9.8	537497	6992332	6,183 m				
	MEL-02-05	9.4	537831	6992692	6,101 m				
	MEL-02-06	10.2	536922	6992853	6,946 m				
	MEL-02-08	9.7	538342	6991952	5,264 m				
MEL-03 Reference Area 1	MEL-03-01	9.5	533321	6998540	16 km	Not sampled	**July 13** LP, WQ, Phyto	**August 11-12** LP, WQ, Phyto	**September 12** LP, WQ, Phyto
	MEL-03-02	10.5	533253	6998664					
	MEL-03-03	10.5	532954	6998860					
	MEL-03-04	8.0	533629	6998660					
	MEL-03-05	8.1	533997	6998265					
MEL-04 Reference Area 2	MEL-04-01	8.3	525634	7000884	21 km	Not sampled	Not sampled	**August 20-21** LP, WQ, Phyto	Not sampled
	MEL-04-02	9.8	526151	7001525					
	MEL-04-03	10.7	525343	7001363					
	MEL-04-04	8.9	525401	7001085					
	MEL-04-05	8.5	525727	7001134					
MEL-05 Reference Area 3	MEL-05-01	9.6	530922	6990859	19.5 km	Not sampled	Not sampled	**August 14** LP, WQ, Phyto	Not sampled
	MEL-05-02	9.8	530675	6990883					
	MEL-05-03	8.6	530737	6991365					
	MEL-05-04	9.9	530573	6991231					
	MEL-05-05	10.5	530241	6991156					

Notes:
[a] Depth in meters at the fixed monitoring locations.
[b] UTM Zone 15V (NAD83); coordinates are for the fixed sampling stations
LP = limnology profile (temperature, dissolved oxygen, pH, and specific conductivity).
WQ = water chemistry; Phyto = phytoplankton community survey and chlorophyll-a (results are discussed in **Section 5**).

3.3 Methods

3.3.1 Field and Laboratory Procedures

The Meliadine Lake water quality monitoring program was conducted according to methods and procedures outlined in the proposed AEMP Design Plan (Azimuth, 2025).

- **Limnology profiles** – Temperature, dissolved oxygen, pH, and specific conductivity readings were recorded at 1 m depth intervals from the lake surface to within approximately 1 m of the sediment at each station. Coordinates, depth, Secchi depth (open-water), and ice thickness are also recorded at each station.
- **Surface water sampling** – Surface water samples were collected from approximately mid-depth at each station (~4 to 5 m below the surface) using a Kemmerer grab sampler during the open-water sampling events or an electric submersible pump connected to a length of C-Flex (Cole Parmer) silicon tubing for the winter sampling event. Water samples were collected according to specifications provided by ALS Environmental. Dissolved analyses were filtered in the field.
- **Lab analysis** – Water samples were sent to ALS Environmental for analysis of parameters listed in **Table 3-2**.
- **Data management** – Water quality data for the Meliadine project are managed within the EQuIS database administered by Agnico Eagle. The technicians entered limnology data; laboratory results are uploaded directly to EQuIS by partner laboratories.

Table 3-2. Water quality parameters collected for the AEMP.

Parameter Class	Parameters
Conventional Parameters and Major Ions	pH, alkalinity species, chloride, conductivity, hardness, calcium, potassium, magnesium, sodium, fluoride, sulphate, total dissolved solids (TDS), total suspended solids (TSS), and turbidity
Nutrients and Organic Carbon	Ammonia-nitrogen, total Kjeldahl nitrogen, nitrate-nitrogen, nitrite-nitrogen, orthophosphate, total phosphorus, total organic carbon, dissolved organic carbon, and reactive silica.
Metals (total and dissolved)[a]	Aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, thallium, tin, titanium, uranium, vanadium, and zinc.
Cyanides	Total cyanide, free cyanide, and weak acid dissociable (WAD) cyanide.

Notes:
ALS also includes several other metals that are not parameters of interest for the AEMP.

3.3.2 Quality Assurance and Quality Control

The methods and results used to evaluate the accuracy and precision of the surface water quality data are provided in **Appendix A**. The key findings from the 2024 water quality QA/QC assessment for Meliadine Lake and the Peninsula Lakes are summarized below:

- ***In-situ* profiles** – None of the field measurements from 2024 were flagged as unreliable.
- **Sample Integrity** –The lab did not report any lost or damaged bottles in 2024. Hold-times were exceeded for some parameters, and the temperature inside the coolers was often above 10°C due to the travel time from Site to the laboratory. Long-term monitoring results from the AEMP and other monitoring programs in Nunavut indicate hold-time exceedances and sample temperatures greater than 10°C are unlikely to affect data quality.
- **Laboratory QC Assessment** –There were no data quality issues with the laboratory blanks, spikes, duplicates, and reference material that indicate potential issues with the accuracy and reliability of the results.
- **Field QC Blanks** – Similar to previous years, there were a few parameters detected above their respective DLs in the blanks. The equipment blank samples had more detected parameters compared to the deionized water blank and travel blank samples. None of the water quality results from 2024 were flagged as unreliable for use in the report when comparing the 2024 results from Meliadine Lake against historical results for the lake.
- **Field Duplicates** – One duplicate sample was collected for approximately every 10 samples. There were 12 duplicate samples in 2024. Out of nearly 1,500 comparisons, only 36 instances did not meet the DQO, representing less than 3% of the comparisons[3]. The relatively few DQO exceedances in 2024 indicates the field and laboratory procedures produced reliable data for the AEMP.
- **Outliers / Unreliable Results** – The following 6 parameters were flagged as outliers based on comparisons with other samples collected within each study area/sampling event:
  - MEL-04-01 in August (all unfiltered): aluminum, cobalt, iron, lead, titanium
  - MEL-04-02 in August: copper (T)

[3] Two DQOs are used to evaluate precision between field duplicates depending on the concentrations in the samples. If the concentrations in the samples and duplicate are > 5-times the DL, the DQO is a relative percent difference (RPD) between the two samples of <30 %. If the concentration between sample and duplicate is < 5-times the DL, the DQO is a difference between the sample and duplicate of <2-times the DL. This approach is based on how ALS Environmental evaluates precision between laboratory duplicate samples.

Total Dissolved Solids (Measured vs Calculated)

Total Dissolved Solids (TDS) are analyzed by ALS using both measured and calculated approaches. Measured TDS concentrations are determined using the gravimetric method, which involves filtering a standard volume of water (1–2 µm pore size), evaporating it at 180°C, and weighing the residual dissolved solids (ALS, 2022). TDS concentrations can also be estimated by summing the concentrations of major ions or by using the relationship between TDS and conductivity (TDS calc = 0.65 × lab conductivity). Calculated TDS methods are useful for providing an estimate of TDS and for real-time monitoring of water treatment systems. However, neither of these test methods are accredited, which is why ALS recommends the gravimetric method for regulatory applications.

From 2015-2022, measured and calculated TDS results reported by ALS for the AEMP showed the same pattern of change, albeit with slightly higher concentrations for measured compared to calculated TDS. In 2023 and 2024, ALS changed its approach for calculating TDS, replacing the summation of major ions with estimation from laboratory conductivity. As shown in **Figure 3-8**, this change led to a divergence between measured and calculated TDS results in 2023 and 2024.

Table 3-3 compares the different methods ALS uses to report TDS concentrations, using water quality data from MEL-01-01 in March 2024. As shown, TDS estimates based on conductivity overestimate concentrations by 20–25 mg/L compared to other methods. To ensure consistency and avoid potential misinterpretation, measured TDS values from the gravimetric method were used to assess spatial and temporal trends in 2024. However, calculated TDS values derived from conductivity are included in figures and tables for comparison.

Table 3-3. TDS (mg/L) from difference method based on water quality data from MEL-01-01 in March, 2024.

Test Name	Details	TDS (mg/L)
TDS-Calc (from conductivity)	Multiply lab conductivity result by 0.65; lab conductivity at MEL-01-01 in March was 156 µS/cm	101.4
TDS-Calc (major ions only)	Sum of Na, K, Ca, Mg, [total alkalinity*0.6], Cl, SO_4, silicate [Si*2.71], and nitrate	77.7
TDS-Calc (major ions + minors)	Sum of major ions + F, NO_3, ammonium, Al, Fe, Cu, Mn, Zn, and DOC	82.1
TDS-low (gravimetric)	DL = 3 mg/L	78.7

Notes:
For total alkalinity, a conversion factor of 0.6 is applied to account for the molecular weight ratio of CO_3 / $CaCO_3$, because only the carbonate portion of alkalinity is included with TDS (ALS, 2022).

3.3.3 Data Analysis

The water quality assessment for Meliadine Lake includes the following components:

- Screening against aquatic life and human health drinking water guidelines (AEMP Benchmarks),
- Assessing temporal and spatial trends, and
- Evaluating current water quality against predictions in the FEIS.

Water Quality Screening Assessment

Water quality results from individual water samples were screened against the AEMP Benchmarks and corresponding Low-Action-Levels (aka triggers); the triggers of all water quality parameters are provided in **Appendix C1**. Descriptive statistics (mean, median, standard deviation, standard error, minimum, and maximum) were calculated for each sampling area and separately for the winter and open-water sampling events. Those tables are also provided in **Appendix C1**. Plots showing the temporal trends across sampling years and areas (1997 to 2024; MEL-01 to MEL-05) are provided in **Appendix C2**.

Temporal and Spatial Trends

Temporal and spatial trends for surface water quality in Meliadine Lake are evaluated using data collected during open water season for three reasons: (1) reference areas are not sampled during the winter, (2), conditions under ice at the reference areas were not characterized during the baseline period, and (3) effluent is only discharged from approximately mid-June to early October each year.

The temporal and spatial trend assessment includes comparing current water quality to the Normal Range of baseline/reference conditions, statistical comparisons among areas and between years (analysis of variance [ANOVA]), and plots. Together, these three approaches help discern changes in water quality in Meliadine Lake caused by mining activities from changes in water quality that are related to wider regional trends.

The following workflow was used to short-list the number of parameters that are carried forward for closer examination:

- *Step 1: Identify parameters that are consistently measured above laboratory detection limits*

  Parameters with fewer than 50% detected concentrations are excluded from the spatial and temporal trend assessment. Monthly water quality results are examined to verify that the frequency of non-detects is consistent in each month.

- *Step 2: Identify parameters that exceeded the Normal Range*

  Water quality results from MEL-01 and MEL 02 are compared to the Normal Range of baseline/reference conditions. Sample-by-sample screening is a coarse tool for assessing changes in water quality because in any given event there may be results that naturally exceed the Normal

Range. Parameters measured in water from the MEL-01 and MEL 02 are considered outside the Normal Range if the mean or median concentration from the open water period exceeds the Normal Range. The mean calculation can be affected by outliers (high or low concentrations) that do not influence the median. Therefore, the median concentration serves as a "check" for potential outliers in the Normal Range assessment.

- *Step 3: Comparing concentrations among years in Meliadine Lake*

  Analysis of variance (ANOVA) and Tukey's Honestly Significant Difference (HSD) test ($\alpha = 0.05$) are completed on the list of parameters where the mean concentration at either MEL-01 or MEL-01 exceeds the Normal Range. This process identifies if there are statistically significant changes from year-to-year and the magnitude of change within each area.

The results of the statistical comparisons are provided in **Appendix C3**.

Comparison to Model Predictions

An important aspect of the water quality assessment for Meliadine Lake is determining if the pattern, timing, and magnitude of changes in water quality generally align with the predicted changes based on the approved design plan for the Mine. Comparing current versus predicted water quality provides insight about whether the Mine is effectively managing surface contact water on Site.

Two sets of predictions are available for the East Basin of Meliadine Lake:

- **2014 FEIS** – The first set of predictions came from the effluent mixing model in the 2014 FEIS in 2014. Predicted concentrations were developed for several parameters at the edge of the mixing zone (100 m from the diffuser), as well as for TDS, chloride, and sodium beyond the mixing zone in the East Basin of Meliadine Lake. The model was based on the extent of the approved mine plan in the 2014 FEIS, conservative assumptions regarding effluent quality, and the preliminary diffuser design. The *far-field*[4] effluent mixing model in Volume 7 of the FEIS predicted TDS, chloride, and sodium would increase gradually over time in the East Basin to maximum concentrations of 176 mg/L for TDS, 66 mg/L for chloride, and 19 mg/L for sodium in the last year of operations.
- **2020 Hydrodynamic Model** – In 2020, Agnico Eagle commissioned Tetra Tech to complete a multi-year simulation of effluent mixing in the sub-basin of the East Basin (termed the *model domain* in Tetra Tech, 2020). The model incorporated the final diffuser design, updated bathymetry for the East Basin, and the conservative assumption that effluent discharged to Meliadine Lake would have a maximum average concentration of TDS of 3,500 mg/L, equal to the current limit in the Water Licence. Two multi-year scenarios were modelled, a base case "normal" precipitation scenario, in

[4] Far-field in this case means the broader east basin. This is not to be confused with the reference areas in Meliadine Lake

which TDS concentrations were predicted to increase to 170 mg/L, and a wet-year scenario, in which where TDS concentrations were predicted to increase to 183 mg/L, to provide a more accurate prediction of changes in TDS within the East Basin.

TDS and chloride are used as indicator parameters for assessing whether water management and mitigation built into the mine plan are effective at keeping water quality within the predicted range.

3.4 Results and Discussion

Water quality results for Meliadine Lake are discussed in the following sections:

- *In-situ* water quality from the limnology profiles in 2024 (**Section 3.4.1**),
- Descriptive statistics and comparisons to AEMP triggers (**Section 3.4.2**),
- Temporal and spatial changes of water quality parameters (**Section 3.4.3**), and
- Comparison to water quality predictions (**Section 3.4.4**).

3.4.1 *In-situ* Water Quality

Water Temperature

Water temperature in Meliadine Lake during the open water season varies depending on the weather. From year to year, surface water temperatures can vary by nearly 8°C on the same calendar date (**Figure 3-2**). For example, in 2019, the surface water temperature in MEL-01 in mid-July was between 6°C and 8°C; however, in mid-July 2022, the water temperature in MEL-01 was 14°C. Comparatively large differences in surface water temperatures from year to year were also evident in other areas of Meliadine Lake.

2024 was another year of above-average water temperatures in Meliadine Lake. Early August was particularly warm in the region **(Table 2-1**). Warm days in late July and early August translated into surface water temperatures in the 16-17°C range by mid-August. 2022 and 2023 were also warm years, but 2024 was the first year under the AEMP that surface water temperatures exceeded 17°C throughout Meliadine Lake. By September, water temperatures measured at MEL-01, MEL-02, and MEL-03 were in the range of previous years (~8-10°C).

Dissolved Oxygen

Meliadine Lake was well oxygenated in the winter and open water sampling events in 2024. As in previous years, dissolved oxygen concentrations during the winter were stratified, with higher concentrations measured near the ice compared to the bottom of the lake (**Figure 3-3**). Dissolved oxygen concentrations were in the 9.5-10.5 mg/L range in August, marginally lower than concentrations measured in July and September due to the comparatively high surface water temperatures.

pH

The pH of Meliadine Lake in 2024 was in the range of 7.0-7.75. Throughout the AEMP, going back to 2013, pH has remained stable and within this range.

Specific Conductivity

Conductivity is an indirect measure of the concentration of dissolved ions in water. As total dissolved solids (TDS) increase, so does water conductivity. Specific conductivity is a reliable indicator for tracking effluent movement within the East Basin and assessing broader lake-wide water quality changes. Average conductivity readings by area and sampling event in 2024 are presented in **Figure 3-3**. Individual profiles for each station are shown in **Figure 3-4**. Lastly, year-over-year changes in specific conductivity for each area, dating back to 2013, are displayed in **Figure 3-5**.

Key findings from the field-measured specific conductivity profiles are as follows:

Season Patterns –Conductivity is higher under ice compared to the open water season because the formation of ice concentrates ions in a smaller volume of water. At the end of March 2024, conductivity at MEL-01 was in the range of 140 to 155 µS/cm. Downstream at MEL-02, conductivity ranged from approximately 105 to 120 µS/cm. The effect of cyro-concentration is evident at MEL-01 and MEL-02, with higher conductivity readings under the ice compared to near the bottom of the lake. Conditions at MEL-01 appeared well-mixed in the late winter (**Figure 3-4**).

Effluent Mixing – During the open-water season, conductivity at MEL-01 was higher and more variable in July and September 2024—when the mine was discharging—compared to mid-August, following approximately four weeks of no discharge (**Figure 3-4**). Among the six stations, there was evidence of stratification in July and September at MEL-01-10 and MEL-01-06. These two stations are located SE of the diffuser at 100 m and 250 m, respectively. Conductivity readings at the other four sampling stations were relatively uniform. The July and September conductivity profiles show that the effluent plume migrates to the SE, which is consistent with the plume delineation study in 2021 (Azimuth, 2022).

Interannual Variability – In August 2013, specific conductivity in MEL-01 measured approximately 60 µS/cm. In the ensuing 12 years, specific conductivity at MEL-01 increased to 120 µS/cm (**Figure 3-5**). There was evidence of gradual increases from 2015 to 2017 before the mine started discharging surface contact water from CP1 to Meliadine Lake in 2018. However, the most noticeable year-over-year change in conductivity occurred between 2019 (red profile in the figure) and 2020 (orange profile). Since 2020, specific conductivity readings in MEL-01 have remained relatively stable during the open water season (105 to 120 µS/cm).

Conductivity readings at MEL-02 and the reference areas have gradually increased from the pre-construction phase (2015–2016) to 2024. At the three reference areas, conductivity levels were comparable to or only slightly higher than those recorded in 2022 and 2023 (85 to 90 µS/cm).

Figure 3-2. Surface water temperature results from limnology profiles taken during the open water season since 2013.

Notes: Each "point" represents the water temperature taken at the various discrete stations and depth in each area.

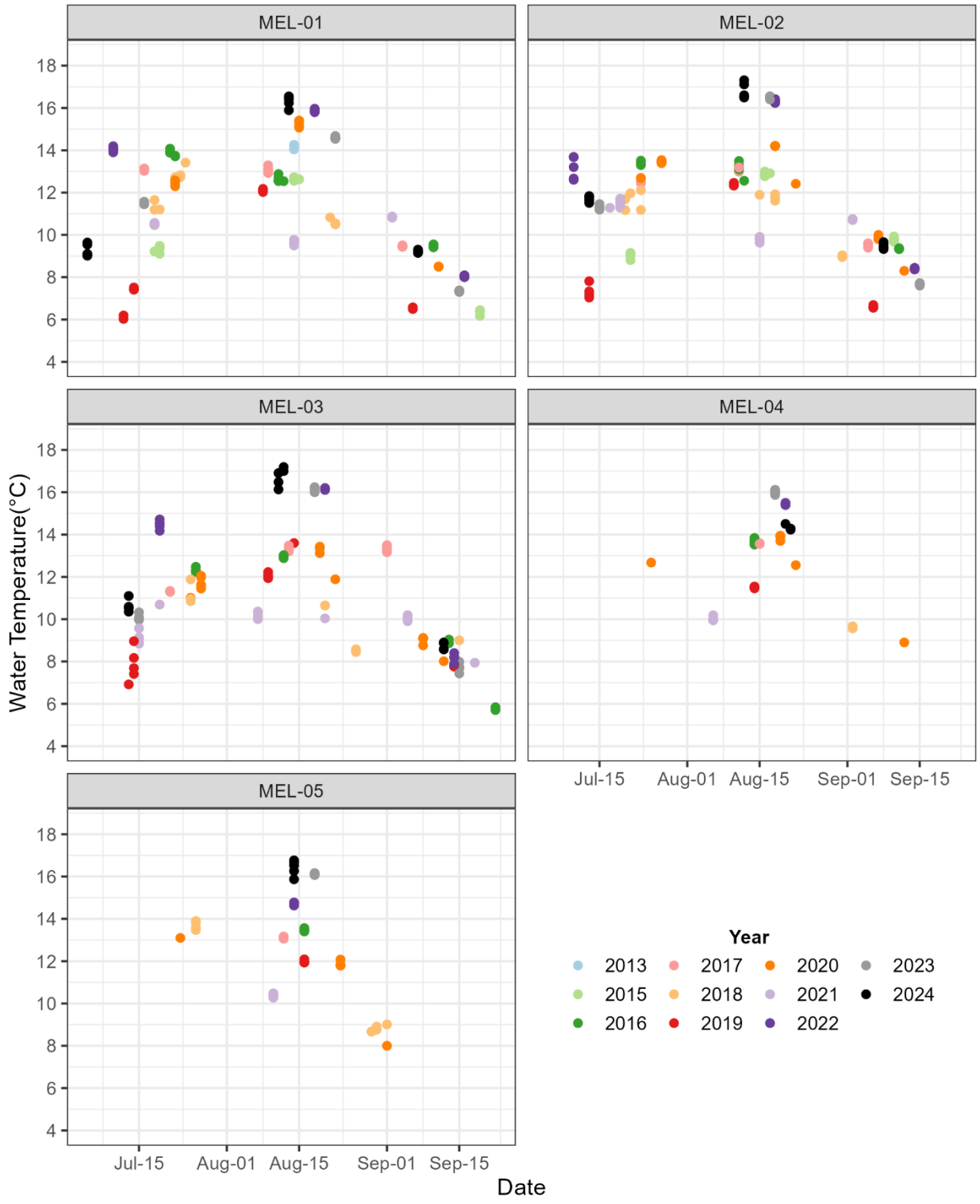


Figure 3-3. Average temperature, dissolved oxygen, pH, and specific conductivity by month in 2024.

Notes: The average value was computed for each month/area/depth (n=6 profiles at MEL-01; n=5 profiles at the other areas).
The data were smoothed using Locally Estimated Scatterplot Smoothing (LOESS).

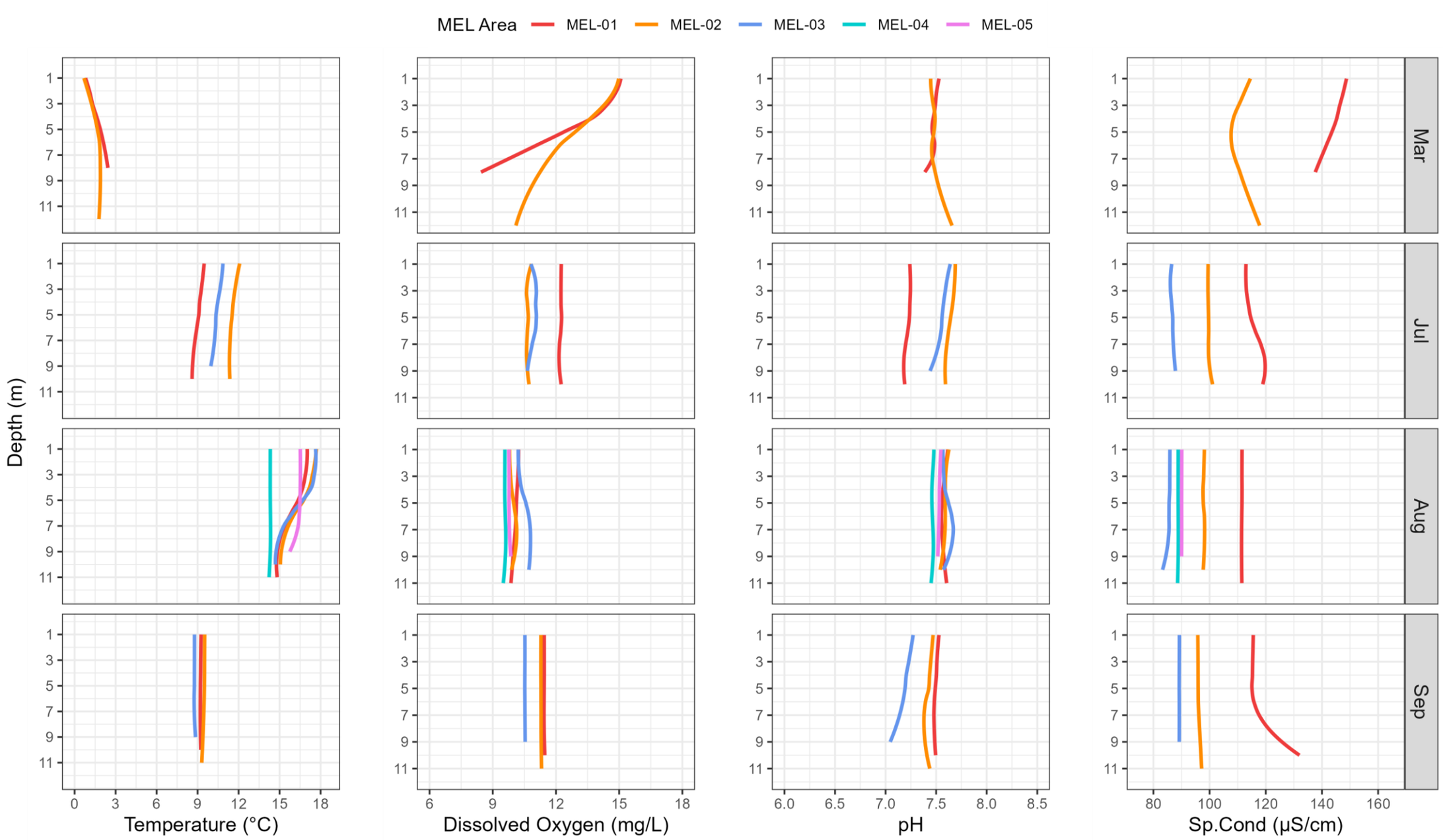


Figure 3-4. Specific conductivity (µS/cm) results from the 2024 limnology profiles.

Notes: n=6 limnology profiles at MEL-01; n=5 limnology profiles at the other areas.

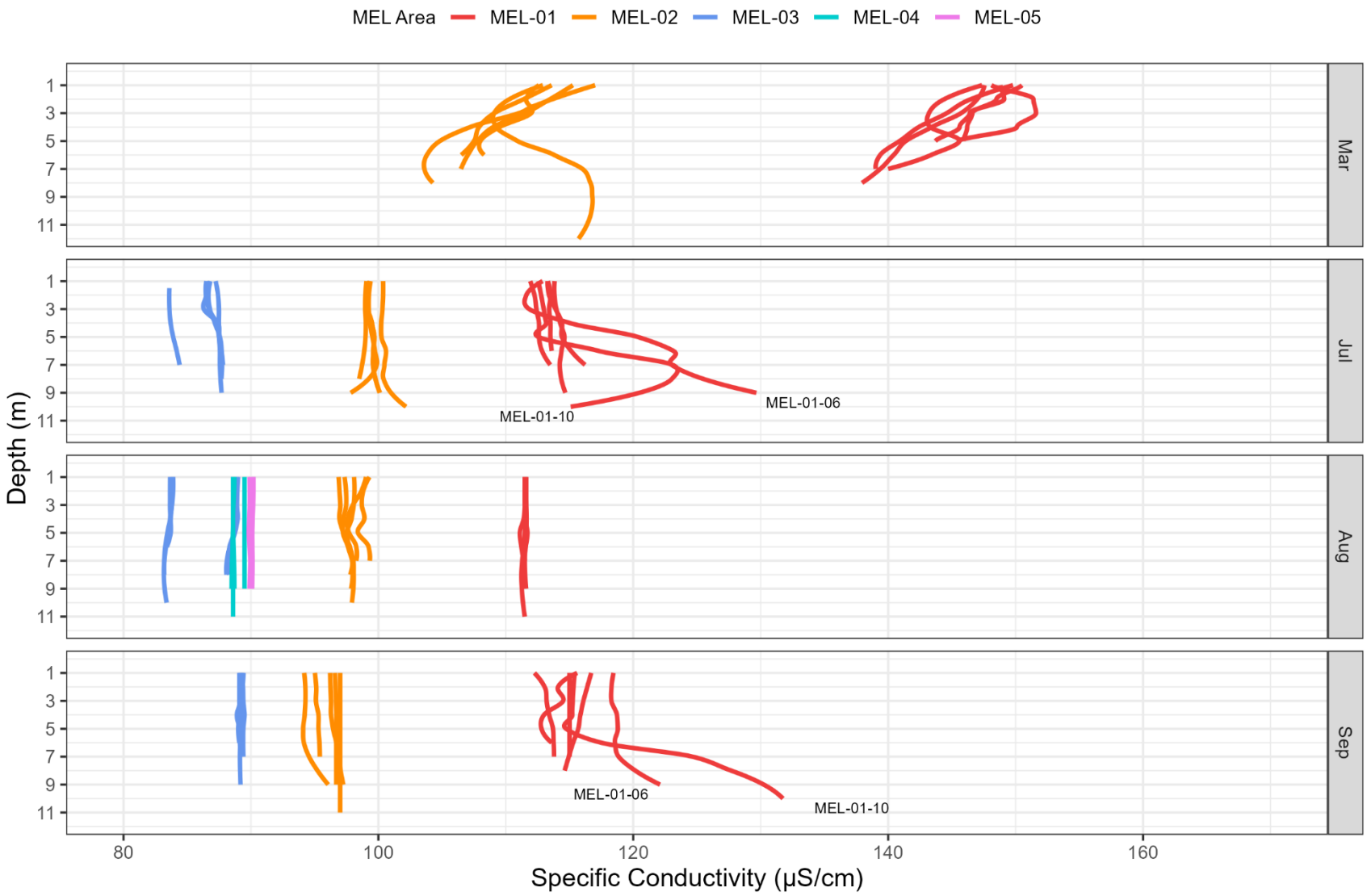
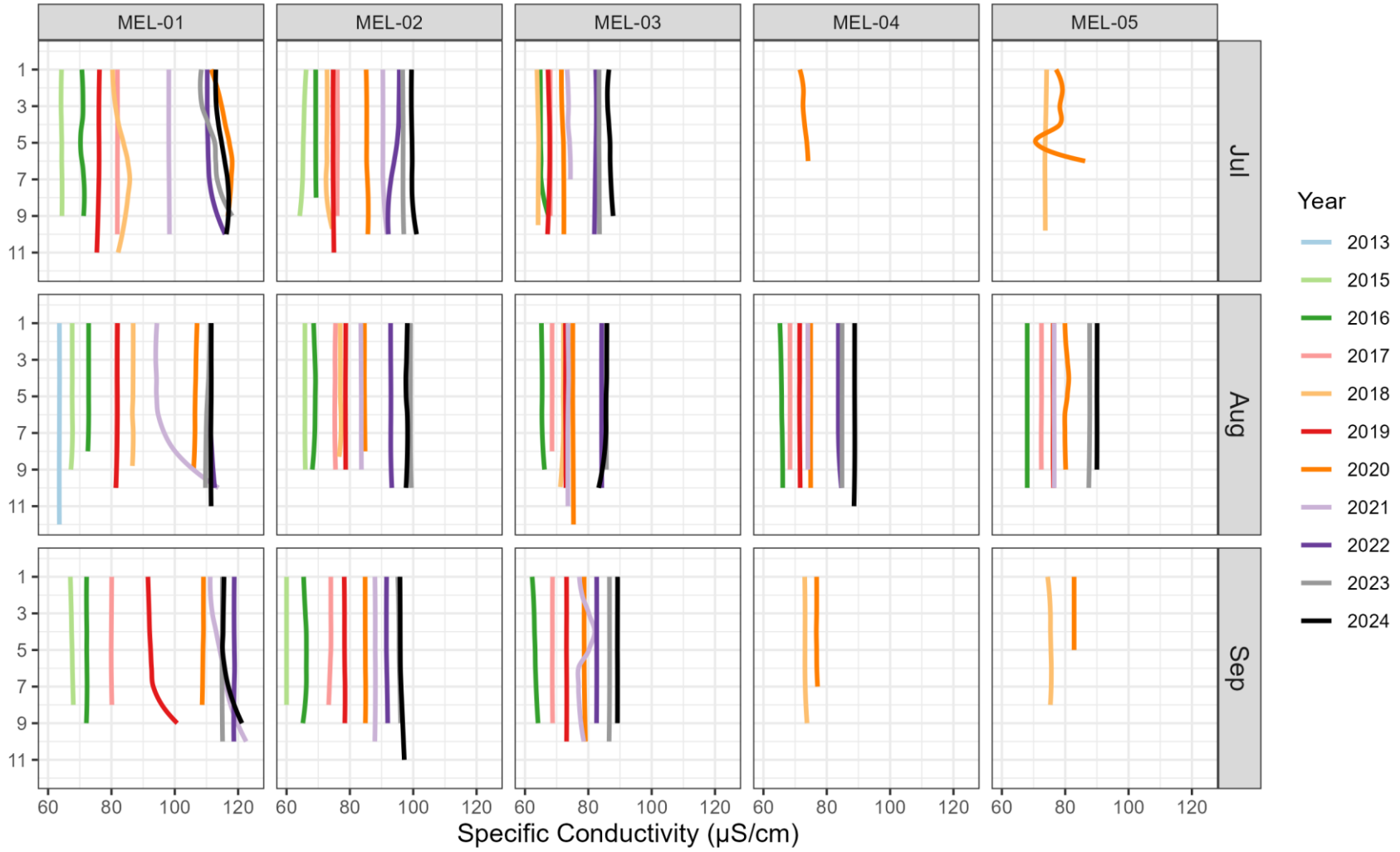


Figure 3-5. Specific conductivity (µS/cm) profiles during the open water season from 2013 to 2024.

Notes: The average value was computed for each month/area/depth (n=6 profiles at MEL-01; n=5 profiles at the other areas).
The data were smoothed using Locally Estimated Scatterplot Smoothing (LOESS).



3.4.2 Water Quality Screening Assessment

Descriptive statistics and results of the 2024 screening assessment are provided **Appendix C1**. Plots showing the concentrations of each parameter by area from 1997 to 2024 are provided in **Appendix C2**.

There were no exceedances of AEMP Action Levels (triggers) in any of the samples collected in Meliadine Lake in the winter and open water sampling events. AEMP Action Levels for most parameters are determined by the lower of the aquatic life guidelines[5] or Health Canada's drinking water guidelines, implying water quality is safe for people and aquatic life. The AEMP Action Levels (trigger) for fluoride, arsenic, and iron are based on the specific water quality objectives (SSWQOs). As part of its review of the 2023 AEMP report, Health Canada requested a secondary screening of arsenic concentrations against the Guidelines for Canadian Drinking Water Quality (GCDWQ) of 10 µg/L. In 2024, the highest measured arsenic concentration was 0.89 µg/L, recorded at MEL-02 in mid-August—more than ten times lower than the GCDWQ threshold.

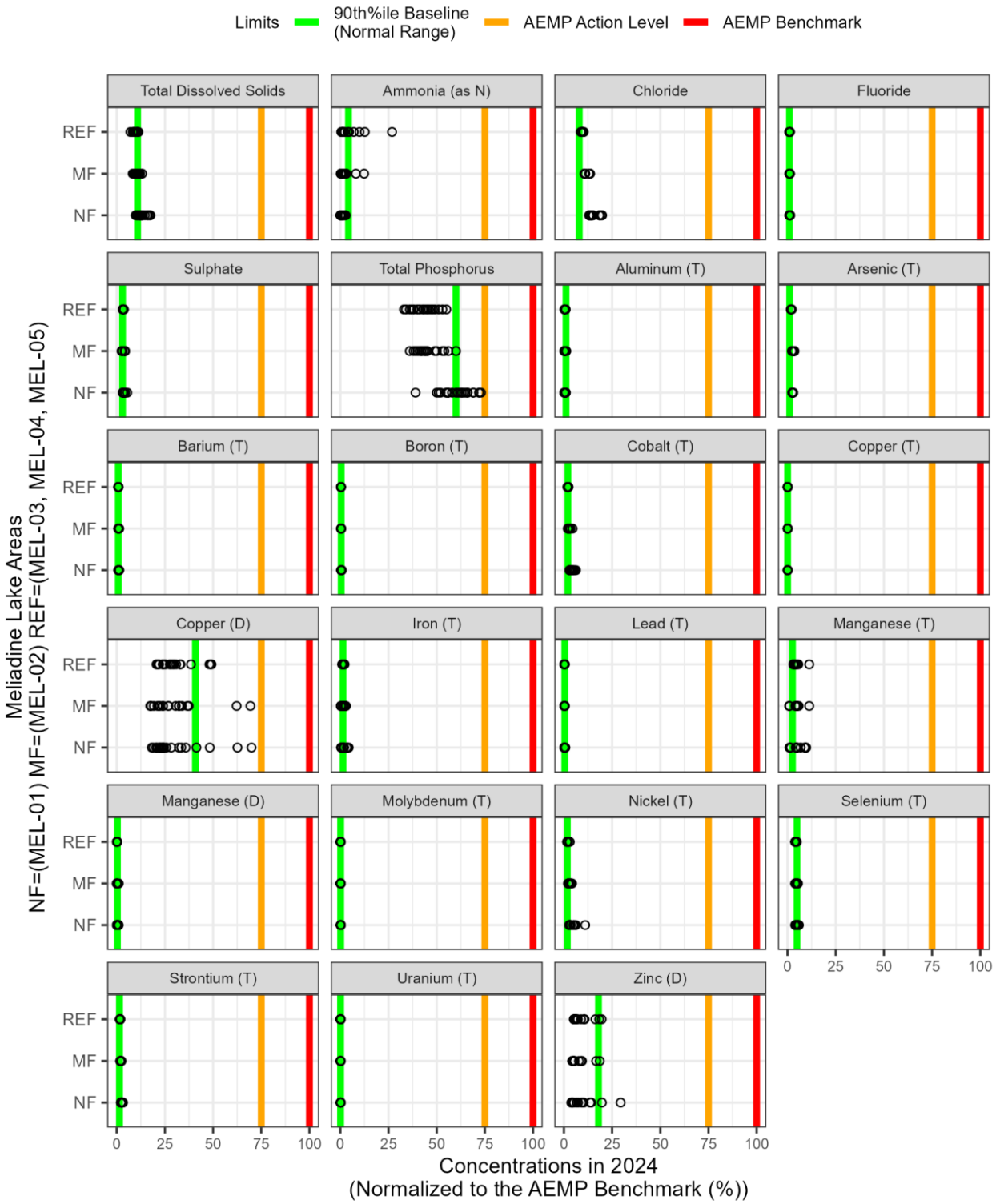
The concentrations of most parameters of interest in 2024 were a small percentage of their respective AEMP Action Levels (triggers) and Benchmarks (**Figure 3-6**). Phosphorus and dissolved copper are naturally-elevated in Meliadine compared to their respective aquatic life guidelines, but there were no exceedances of the AEMP Action Levels for either parameter in 2024.

3.4.3 Spatial and Temporal Changes

An important aspect of the AEMP is differentiating water quality changes caused by mining activities from those driven by natural variations, such as weather patterns and climatic shifts in the region. Water quality in northern latitude lakes is subject to change based on the timing, magnitude, and duration of the runoff regime and temperature (Wrona et al., 2016). While the AEMP was not designed to monitor the effect of climatic changes on water quality in Meliadine Lake, the loading and climate data presented in **Section 2.3** are incorporated into the discussion to help assess if spatial and temporal trends are related solely to mining activities or if other factors may be affecting temporal and spatial changes in Meliadine Lake.

[5] Canadian Council of Ministers of the Environment (CCME), Federal Environmental Quality Guidelines (FEQGs), or in the case of sulphate, British Columbia Approved Water Quality Guidelines.

Figure 3-6. Water chemistry results from 2024 compared to the Normal Range, AEMP Action Levels, AEMP Benchmarks.



Normal Range Assessment

Thirty-one (31) parameters exceeded the Normal Range of baseline/reference conditions at MEL-01 or MEL-02 in 2024 (**Table 3-4**). Looking specifically at MEL-01, the concentrations of most of the 31 parameters exceeded their respective Normal Ranges by more than 20 % (N = 21). For fluoride, boron, and lithium, the annual mean was less than 2-times the detection limit. These three parameters were not carried forward for further assessment.

In 2024, the average concentrations of 23 of the 31 parameters that exceeded the Normal Range at MEL-01 were lower than those observed in 2023 (**Table 3-5**). However, eight parameters—TDS (calculated), conductivity (lab), fluoride, potassium, reactive silica, dissolved organic carbon (DOC), total organic carbon (TOC), and total arsenic—recorded their highest mean concentrations since 2013. These parameters have consistently exceeded the Normal Range since at least 2013, with more pronounced exceedances occurring since 2018. The increase for calculated TDS over the past two years is attributed to the change in the test method used by ALS. For this reason, measured TDS rather than calculated TDS was used to evaluated spatial and temporal trends in Meliadine Lake.

Statistical Comparisons

Detailed analysis of spatial and temporal trends within each area was completed on the 31 parameters that exceeded the Normal Range at MEL-01 in 2024. Statistical comparisons focused on results from the open-water sampling events at MEL-01, MEL-02, and MEL-03, as these locations are sampled monthly during July, August, and September. ANOVA and Tukey post-hoc comparisons were conducted among years within each area to assess whether there were statistically significant differences in the annual mean concentration between 2023 and 2024 (**Table 3-6**). Plots and tabulated results of the ANOVA and Tukey post-hoc pairwise comparisons for all years are provided in **Appendix C3**.

Statistical comparisons among years within each area indicated that, for most parameters, there was no significant difference in the annual mean concentration between 2023 and 2024 (**Table 3-6**). Of the 31 parameters that exceeded the Normal Range in 2024, only three parameters showed statistically significant increases ($p < 0.05$) from 2023 to 2024 in at least one of the sampling areas: TDS (calculated) at MEL-03, DOC at MEL-01, and arsenic at MEL-02 and MEL-03.

Spatial and temporal trends for select major ions, nutrients, and metals are discussed below.

Table 3-4. Normal Range assessment for Meliadine Lake in 2024.

Parameter	Units	DL	Normal Range	Average Concentration (Open-Water Season)				
				MEL-01 N=18	MEL-02 N=15	MEL-03 N=15	MEL-04 N=5	MEL-05 N=5
Conventional Parameters								
Conductivity (lab)	uS/cm	1	77.5	117	100	90.3	91.5	92.1
Hardness	mg/L	0.5	23.37	32.9	29.7	26.4	24.2	27.8
Total Dissolved Solids	mg/L	10	54	59.9	51.7	44.8	53.9	52.7
TDS (Calculated)[a]	mg/L	1	39.61	76.2	65.2	58.7	59.4	59.9
Major Ions								
Alkalinity, Total	mg/L	1	20.5	20.5	20.1	19.6	19.6	20.7
Calcium (T)	mg/L	0.01	7.334	9.82	9.15	8.37	7.71	8.77
Chloride	mg/L	0.1	9.564	16.7	13.1	11.5	11.3	11.5
Fluoride	mg/L	0.02	0.028	*0.0307*	*0.0303*	*0.0297*	*0.0268*	*0.0326*
Magnesium (T)	mg/L	0.004	1.18	1.8	1.54	1.36	1.29	1.38
Potassium (T)	mg/L	0.02	0.954	1.2	1.1	1.04	0.999	1.05
Reactive Silica (SiO2)	mg/L	0.01	0.2684	0.571	0.41	0.347	0.372	0.359
Sodium (T)	mg/L	0.02	4.847	8.03	6.58	5.74	5.33	5.78
Sulphate	mg/L	0.3	3.867	7.15	5.4	4.44	4.3	4.52
Nutrients & Organic Carbon								
Total Kjeldahl Nitrogen	mg/L	0.05	0.2497	0.3	0.227	0.225	0.233	0.266
Total Phosphorus	mg/L	0.001	0.006	0.00622	0.00459	0.00415	0.00478	0.004
Dissolved Organic Carbon	mg/L	0.5	2.72	4.78	3.98	3.49	3.55	3.55
Total Organic Carbon	mg/L	0.5	3	4.42	3.92	3.27	3.1	3.05
Metals								
Arsenic (T)	ug/L	0.02	0.275	0.668	0.844	0.464	0.456	0.475
Barium (T)	ug/L	0.02	8.054	9.22	9.04	8.63	8.95	8.74
Boron (T)	ug/L	5	6.52	*7.18*	*5.7*	*5.05*	*5.04*	*5.24*
Cobalt (T)	ug/L	0.005	0.016	0.0289	0.0208	0.0161	0.016	0.0169
Copper (T)	ug/L	0.05	0.86	1.05	1	1.01	0.887	0.782
Iron (T)	ug/L	1	15.02	25.4	19.7	15	14.8	12
Lithium (T)	ug/L	0.5	0.72	*0.994*	*0.866*	*0.819*	*0.854*	*0.844*
Manganese (T)	ug/L	0.05	3.062	7.56	5.68	4.06	6.34	5.94
Molybdenum (T)	ug/L	0.05	0.107	0.136	0.105	*0.0942*	0.106	0.1
Nickel (T)	ug/L	0.05	0.4412	0.772	0.631	0.474	0.529	0.452
Strontium (T)	ug/L	0.02	36.1	57.2	49.3	43.2	40.7	45.3
Uranium (T)	ug/L	0.001	0.0164	0.0246	0.0197	0.0177	0.0206	0.0168
Copper (D)	ug/L	0.05	0.8614	0.918	0.855	0.852	0.721	0.769
Manganese (D)	ug/L	0.05	1.196	1.34	0.476	0.514	0.442	0.372

Notes:
[a] ALS estimated TDS-Calc from lab conductivity in 2024; the measured TDS results are considered more reliable.
Italicized numbers indicate the mean concentration was <2*DL.
Light shaded values indicate the mean concentration exceeded the normal range.
Dark shaded values indicate the mean concentration exceeded the normal range by 20% or more.

Table 3-5. Annual mean concentrations at MEL-01 for parameters that exceed the Normal Range in 2024.

Parameter	Normal Range	Average Concentration (Open-Water Season)											2024 Rank	% Change from		
		2013	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		Normal Range	Initial year	Previous year
Conventional Parameters																
Conductivity (lab)	77.5	64.4	68.9	74.1	80.7	86.2	82.6	109	107	116	116	117	**1**	51%	82%	1%
Hardness	23.4	19.3	20	22.5	24.1	24.7	22.7	29.5	28.1	31.3	33.5	32.9	2	41%	70%	-2%
Total Dissolved Solids	54	40.3	38	45.1	53.4	54.4	49.2	70.6	56.9	64.5	64	59.9	4	11%	49%	-6%
TDS (Calculated)	39.6		33.1	37	41.5	42.4	41	55.3	51.8	56.4	75.6[a]	76.2[a]	**1**	92%	130%	1%
Major Ions																
Alkalinity, Total	20.5	16.9	14.1	15.8	17.3	16.1	16.5	19.5	17.5	21.7	21	20.5	3	0%	21%	-2%
Calcium (T)	7.33	6.17	6.36	7.22	7.85	7.77	7.16	8.79	8.4	9.56	10.2	9.82	2	34%	59%	-4%
Chloride	9.56	7.57	8.6	9.35	10.6	12.7	11.9	17.8	16.2	16.2	16.6	16.7	2	75%	121%	1%
Fluoride	0.028	0.0228	0.0203	0.0231	0.0273	0.0224	0.0253	0.0255	0.0251	0.0275	0.0303	0.0307	**1**	10%	35%	1%
Magnesium (T)	1.18	1.05	1.1	1.23	1.37	1.39	1.31	1.74	1.63	1.79	1.88	1.8	2	53%	71%	-4%
Potassium (T)	0.954	0.83	0.847	0.886	1.01	0.979	0.98	1.16	1.12	1.19	1.19	1.2	**1**	26%	45%	1%
Reactive Silica (SiO2)	0.268	0.5	0.358	0.427	0.546	0.39		0.333	0.357	0.399	0.544	0.571	**1**	113%	14%	5%
Sodium (T)	4.85	3.85	4.37	4.8	5.32	5.63	5.58	8.17	7.7	8.01	8.24	8.03	3	66%	109%	-3%
Sulphate	3.87	3.27	3.6	4.02	4.73	4.23	4.31	5.68	5.8	6.43	7.21	7.15	2	85%	119%	-1%
Nutrients & Organic Carbon																
Total Kjeldahl Nitrogen	0.25	0.207	0.168	0.138	0.221	0.233	0.218	0.267	0.244	0.313	0.273	0.3	2	20%	45%	10%
Total Phosphorus	0.006	0.0037	0.0064	0.0085	0.0065	0.0062	0.0062	0.0079	0.0073	0.0068	0.006	0.0062	8	4%	68%	4%
Dissolved Organic Carbon	2.72	2.68	2.88	2.69	3.32	3.07	2.8	3.44	3.47	4.19	4.28	4.78	**1**	76%	78%	12%
Total Organic Carbon	3	2.77	2.94	2.69	3.28	3.15	2.85	3.44	3.4	3.92	4.20	4.42	**1**	47%	60%	5%
Metals																
Arsenic (T)	0.275	0.42	0.338	0.4	0.434	0.385	0.398	0.523	0.524	0.576	0.642	0.668	**1**	143%	59%	4%
Barium (T)	8.05	6.57	6.82	7.33	7.95	8.33	7.68	8.49	8.44	8.62	9.53	9.22	2	15%	40%	-3%
Boron (T)	6.52	10	4.74	6.88	5.03	4.95	5.49	7.6	7.46	7.44	7.67	7.18	6	10%	-28%	-6%
Cobalt (T)	0.016	0.1	0.0207	0.025	0.0225	0.0244	0.0275	0.0302	0.0361	0.0269	0.0295	0.0289	5	81%	-71%	-2%
Copper (T)	0.86	1.15	0.706	0.77	0.984	0.832	0.806	0.848	1.07	0.949	0.992	1.05	3	22%	-9%	6%
Iron (T)	15	24	19.7	22.2	25.4	25.1	32.4	25.9	31.4	23.2	24.6	25.4	4	69%	6%	3%
Lithium (T)	0.72	0.712	0.624	0.928	0.696	1.51	1.12	1.53	1.28	1.18	1.11	0.994	7	38%	40%	-10%
Manganese (T)	3.06	3.37	5.63	7.27	5.85	5.97	9.33	8.32	9.46	7.3	9.5	7.56	5	147%	124%	-20%
Molybdenum (T)	0.107	0.0968	0.0621	0.0565	0.0827	0.077	0.0766	0.155	0.437	0.138	0.145	0.136	5	27%	40%	-6%
Nickel (T)	0.441	0.692	0.534	0.566	0.699	0.672	0.638	0.781	0.733	0.795	0.829	0.772	4	75%	12%	-7%
Strontium (T)	36.1	29	29	32.6	37.3	50.7	45.4	67.1	58.5	59.4	59.2	57.2	5	58%	97%	-3%
Uranium (T)	0.0164	0.0166	0.0139	0.0148	0.0185	0.0174	0.0155	0.0189	0.0215	0.0265	0.0284	0.0246	3	50%	48%	-13%
Copper (D)	0.861									0.939	0.972	0.918	3	7%	-2%	-6%
Manganese (D)	1.2	1.03	1.77	0.984	0.693	1.21	4.72	3.69	1.2	0.648	0.628	1.34	4	12%	30%	113%

Notes:
[a] ALS switched methods in 2023 for reporting TDS-Calc. The measured TDS results are considered more reliable for evaluating long-term temporal trends.
% Change from = the difference between the annual mean concentration in 2024 and the normal range or mean concentration in the initial (normally 2013) or previous (2023) year.
Light shaded values indicate the mean concentration exceeded the normal range;
Dark shaded values indicate the mean concentration exceeded the normal range by 20% or more.

Table 3-6. Tukey post-hoc results and percent change in concentration at MEL-01, MEL-02, and MEL-03 from 2023 to 2024.

Parameter	P value (left) | % change (right)		
	MEL-01	MEL-02	MEL-03
Conventional Parameters			
Conductivity (lab)	1.000 | +0.9	0.683 | +4	0.157 | +6
Hardness	0.901 | -2	0.520 | +3	0.999 | +2
Total Dissolved Solids	0.804 | -6	0.841 | -6	0.999 | -7
TDS – Calculated[a]	1.000 | +0.9	0.609 | +4	0.007 | +6
Alkalinity, Total	0.974 | -2	1.000 | +0.2	0.999 | +1
Major Ions			
Calcium (T)	0.265 | -3	0.591 | +3	0.975 | +1
Chloride	1.000 | +0.7	1.000 | -0.4	0.997 | +3
Fluoride	1.000 | +1	0.998 | +2	0.893 | +4
Magnesium (T)	0.171 | -5	1.000 | +1	0.981 | -3
Potassium (T)	1.000 | +0.1	0.254 | +4	0.997 | +1
Reactive Silica (SiO_2)	0.979 | +5	0.693 | -6	1.000 | +2
Sodium (T)	0.993 | -3	1.000 | +3	0.992 | +4
Sulphate	1.000 | -0.8	0.932 | -3	1.000 | -0.4
Nutrients & Organic Carbon			
Total Kjeldahl Nitrogen	0.971 | +10	0.967 | -10	1.000 | +0.2
Total Phosphorus	1.000 | +4	1.000 | +5	1.000 | +7
Dissolved Organic Carbon	< 0.001 | +12	1.000 | -0.3	1.000 | +0.6
Total Organic Carbon	0.261 | +5	0.988 | +2	0.986 | +3
Metals			
Arsenic (T)	0.971 | +4	< 0.001 | +13	< 0.001 | +14
Barium (T)	0.312 | -3	0.999 | -1	0.721 | -2
Boron (T)	0.773 | -6	1.000 | -2	1.000 | +0.6
Cobalt (T)	1.000 | -2	0.995 | +11	0.988 | +6
Copper (T)	0.989 | +6	0.997 | -8	0.997 | +11
Iron (T)	1.000 | +3	0.965 | +22	0.998 | +8
Lithium (T)	0.535 | -10	0.997 | -5	0.997 | -2
Manganese (T)	0.855 | -20	0.998 | +6	1.000 | +3
Molybdenum (T)	1.000 | -6	1.000 | -1	1.000 | +1
Nickel (T)	0.260 | -7	0.433 | -10	0.757 | -10
Strontium (T)	0.968 | -3	0.973 | +2	0.973 | +2
Uranium (T)	0.013 | -13	0.302 | -9	0.538 | -13
Copper (D)	0.999 | -6	0.221 | -29	1.000 | +0.8
Manganese (D)	0.998 | +114	0.940 | -36	1.000 | -3

Notes:
[a] ALS switched methods in 2023 for reporting TDS-Calc. The measured TDS results are considered more reliable for evaluating long-term temporal trends.
Shaded values indicate a significant increase ($p < 0.05$) in concentration from 2023 to 2024.

Major Ions

Major ions (dissolved salts) are the ionic compounds found in the greatest abundance in freshwater systems. These include cations (e.g., calcium, magnesium, potassium, and sodium) and anions (e.g., chloride, bicarbonate, and sulfate). The concentrations of these major ions are also reflected in composite water quality parameters, such as conductivity, hardness, total alkalinity, and total dissolved solids (TDS). As a result, measurements of major ions and compound water quality parameters typically covary.

Eight major ions (Ca, Mg, K, Na, Cl, F, SO_4, SiO_2) and five compound parameters (conductivity, hardness, TDS (measured and calculated), and total alkalinity exceeded their respective Normal Range's in 2024 (**Table 3-4**). As shown in the condensed temporal plot (**Figure 3-13** and **Figure 3-14**), the temporal trends were similar for the major ions and composite parameters. This section includes a closer examination of spatial and temporal trends for TDS, chloride, and sulphate. **Figure 3-7** illustrates the interannual variability for each parameter.

Total Dissolved Solids – TDS concentrations increased steadily at MEL-01 during the pre-construction and early operations phases (2015–2019). The largest year-over-year change (43%) occurred from 2019 to 2020, coinciding with historic rainfall in 2019 (**Figure 2-4**) and above-average discharge during the 2020 freshet (**Figure 2-5**). TDS concentrations then declined significantly between 2020 and 2021 (19%) and have remained stable during the open-water period since, with average concentrations of 56.9 mg/L (2021), 64.5 mg/L (2022), 64.0 mg/L (2023), and 59.9 mg/L (2024).

Farther downstream at MEL-02, measured TDS concentrations have shown a gradual increasing trend since 2015, without significant year-over-year changes. At the reference site MEL-03, TDS concentrations in 2024 (44.6 mg/L) are not statistically different from 2016 (41.0 mg/L).

Chloride – Other than bicarbonate[6], chloride is the most abundant major ion in Meliadine Lake (**Figure 3-8**). Since the start of the AEMP in 2015, the biggest annual change in chloride concentrations in Meliadine Lake occurred between 2019 and 2020 (50% increase), coinciding with record rainfall throughout 2019. The cumulative effect of (a) natural runoff in 2019 and (b) discharge of comparatively large volumes of water from CP1 to Meliadine Lake in June and July 2020 contributed to the 50% increase in chloride concentrations at MEL-01. Farther downstream at MEL-02, chloride concentrations have increased more gradually as water from MEL-01 mixes with the rest of the East Basin before flowing northwest. At reference area MEL-03, chloride concentrations increased approximately 22% from 2019 to 2024.

[6] Total alkalinity in Meliadine Lake is comprised entirely of bicarbonate (HCO_3).

Sulphate – Sulphate concentrations have increased steadily at MEL-01 since the baseline period (2013). From 2013 to 2017, sulphate concentrations in MEL-01 during the summer increased approximately 40%, from 3.3 to 4.7 mg/L (**Table 3-5**). Surface water monitoring at MEL-02 and MEL-03 during the open water period started in 2015 and 2016, respectively. Sulphate concentrations also increased at MEL-02 and MEL-03 during the construction phase (2015-2017; **Figure 3-7**). Collectively, the sulphate data from MEL-01, MEL-02, and MEL-03 indicate sulphate concentrations were increasing lake-wide before the Mine started discharging water from CP1 through the permanent diffuser in 2018.

During early operations in 2018 and 2019, sulphate loadings to Meliadine Lake were low (**Figure B2-8**) and concentrations in MEL-01 were relatively stable compared to the pre-construction phase. The biggest annual increase in sulphate concentrations in MEL-01 occurred from 2019 to 2020 (32%), coinciding with record rainfall in 2019 and subsequent discharge from CP1 to Meliadine Lake during spring freshet in 2020. The upward trend at MEL-01 continued from 2021 to 2022 (11%) and 2022 to 2023 (12%) despite nearly a 50% reduction in sulphate loadings in 2022 and 2023 compared to 2020 and 2021 (**Figure 2-10**). Less pronounced increases were observed at MEL-02 and MEL-03 over the same period, as indicated by more overlap in the year-over-year statistical comparison (**Figure 3-7**). Compared to 2023, sulphate concentrations in all three areas were stable.

Major Ions Summary – Since 2018, rising concentrations of major ions in the East Basin of Meliadine Lake reflect the cumulative effects of mining activities and regional climate trends, including warming temperatures and increasingly variable, extreme precipitation. Farther downstream at MEL-02 and at the reference site MEL-03, temporal trends in TDS, chloride, and sulphate suggest that regional climatic factors are the primary drivers of the gradual increases observed since the start of the AEMP in 2015.

Nutrients and Organic Carbon

Three parameters from the category of nutrients and organic carbon were carried forward for closer examination of mining-related effects on water quality: DOC, total phosphorus, and total Kjeldahl nitrogen (TKN; the sum of organic nitrogen and ammonia). Interannual variability in the concentration of each parameter is presented in **Figure 3-9**.

Dissolved organic carbon – DOC concentrations throughout Meliadine Lake remained relatively stable during the pre-construction except from 2016 to 2017 when DOC increased approximately 20% on average at MEL-01 and MEL-02. The increase in DOC was likely caused when Lake H17 was dewatered to form CP1. Water from Lake H17 was discharged into the 'Narrows' between MEL-01 and MEL-02 between August 21 and October 1 via a temporary diffuser (Golder, 2017). At reference area MEL-03, DOC concentrations were stable from 2016 to 2017, indicating that the increase in DOC was localized to the area near the diffuser. From 2017 to 2019, DOC concentrations at MEL-01 and MEL-02 decreased on average between 6 and 9% per year.

Since 2019, there has been a statistically significant lake-wide trend increase in DOC of approximately 50%. The catalyst for the increase in DOC was likely runoff from record rainfall in July through September 2019. Summer 2021 was also an uncharacteristically wet season, second only to 2019 in annual rainfall (**Figure 2-3**). Given the similarity in the timing and magnitude of year-over-year increases in DOC among the three study areas, the combined effect of record precipitation and warming of the tundra (i.e., deepening of the active layer) is the most likely explanation for the observed increase in DOC since 2019 (Turetsky et al., 2020).

Total phosphorus – Phosphorus is a critical nutrient for primary productivity, influencing algal growth and aquatic ecosystem health. Understanding long-term phosphorus trends helps assess potential anthropogenic impacts and natural variability in nutrient dynamics.

During the baseline period (1997-2013), phosphorus concentrations in Meliadine Lake were typically in the range of 3-5 µg/L, at the transition between ultra-oligotrophic and oligotrophic status according to the framework published by CCME (2004). During the baseline and construction period, staff were housed at the Exploration Camp, and sewage and gray water was treated and released to Meliadine Lake. From 2013 to 2016, phosphorus levels doubled from 4 to 8 µg/L. Starting in November 2017, effluent from the Exploration Camp STP was trucked to the main camp STP for treatment. Since then, total phosphorus concentrations at MEL-01 during the open water period have remained stable at around 6 µg/L (**Table 3-5**).

At MEL-02, phosphorus concentrations have been slightly lower than MEL-01, reflecting dilution as water moves downstream from the East Basin. The reference site, MEL-03, has shown stable phosphorus concentrations (3-5 µg/L) over the past decade, with no significant long-term changes.

Total Kjeldahl nitrogen – Total Kjeldahl Nitrogen includes both organic nitrogen and ammonia, making it an important indicator of nitrogen loading to Meliadine Lake. TKN concentrations show high variability both within and between years at all three study areas (**Figure 3-9**). TKN concentrations appear to be trending higher at MEL-01 and MEL-03, although the variability within each year makes it difficult to discern a clear trend (i.e., overlapping letters indicating differences between years are not statistically significant). The similar magnitude, variability, and direction of change at MEL-01 and MEL-03 suggest that changes in TKN are primarily driven by natural or climate-related factors. At MEL-02, TKN concentrations in 2024 were similar to those observed in the first year of monitoring in 2015.

Nutrient Summary – Overall, while localized changes in organic carbon, phosphorus, and nitrogen have been observed at MEL-01, the long-term trends indicate that interannual climate variability is the primary driver of lake-wide trends over the past 10 years. Importantly, the nutrient status in Meliadine Lake appears to be stable, with no evidence of widespread eutrophication. A more thorough assessment of primary productivity is presented in **Section 5**.

Metals

In 2024, there were 14 metals that exceeded their respective Normal Range's at MEL-01 (**Table 3-4**). The temporal trend for each metal at MEL-01 was classified as 'increasing' or 'stable' based on the statistical comparisons and plots presented in **Appendix C3**. Temporal trends for the various metals are also shown in the condensed temporal plots in **Section 3.6**.

- **Arsenic (T) = increasing**
- **Barium (T) = increasing**
- Boron (T) = stable
- Cobalt (T) = stable
- Copper (D&T) = stable
- Iron (T) = stable
- Lithium (T) = decreasing
- Manganese (D&T) = stable
- Molybdenum (T) = stable
- Nickel (T) = stable
- **Strontium (T) = increasing**
- **Uranium (T) = increasing**

The concentrations of most of the metals that exceeded their Normal Range's at MEL-01 in 2024 were stable compared to previous years. Arsenic, barium, strontium, and uranium were the only metals that showed increasing temporal trends in at least one of the study areas. The key findings for each of these metals are presented below.

Arsenic –Arsenic concentrations in Meliadine Lake have been monitored closely since the 2020 AEMP report (Azimuth, 2021). From 2013 to 2019, arsenic concentrations at MEL-01 were relatively stable at approximately 0.4 µg/L. From 2019 to 2020, arsenic concentrations increased 31% to 0.52 µg/L (see **Table C3-1** for the statistical results). Downstream at MEL-02, arsenic concentrations increased by 60% from 2019 to 2020 (0.3 to 0.47 µg/L). A statistically significant increase in the concentration of arsenic was also observed at reference area MEL-03, although the magnitude of the increase was smaller (22%).

The significant increase in arsenic at MEL-01 and MEL-02 from 2019 to 2020 was attributed to (a) runoff from the tundra in the summer of 2019, and (b) comparatively high loadings to Meliadine Lake when water levels in CP1 were drawn down starting in early June (annual loadings in **Figure 2-10**; monthly and cumulative loadings in **Figure B2-20**). The 22% increase at MEL-03 was considered 'representative of background' given the far distance between the reference area and the diffuser.

Since 2020, arsenic concentrations have increased steadily throughout Meliadine Lake, with statistically significant year-over-year increases at MEL-02 and MEL-03 in 2023 and 2024 (**Figure 3-10**). From 2020 to 2024, arsenic concentrations at MEL-02 and MEL-03 during the open water season increased by 79% (0.471 to 0.844 µg/L) and 72% (0.271 to 0.464 µg/L), respectively. Arsenic concentrations also increased at MEL-01, but by a smaller magnitude of 27% (0.523 to 0.668 µg/L).

Barium – Barium concentrations have increased gradually throughout Meliadine Lake since the baseline period, but the magnitude, timing, and pattern of change among the exposure and reference areas

strongly suggests that the increasing temporal trend is unrelated to mining activities. In 2016, average barium concentration at MEL-01, MEL-02, and MEL-03 during the summer were 7.33, 7.66, and 7.48 µg/L, respectively. By 2024, concentrations had increased to 9.23 µg/L at MEL-01, 9.04 µg/L at MEL-02, and 8.63 µg/L at MEL-03.

Strontium – Strontium was included in the detailed assessment due to observed mining-related changes in water quality at MEL-01 and a gradual increasing trend at both the mid-field (MEL-02) and reference (MEL-03) areas.

Since the start of the AEMP in 2015, strontium concentrations have increased throughout Meliadine Lake, with the most pronounced rise occurring at MEL-01. From 2015 to 2018, concentrations at MEL-01 increased by approximately 65% (from 30 to 50 µg/L), followed by a nearly 50% increase from 2019 to 2020 (from 45 to 67 µg/L). In contrast, the magnitude of increase was lower at MEL-02 (10%) and MEL-03 (6%) over the same period (**Figure 3-10**).

Like many other parameters, strontium concentrations increased throughout Meliadine Lake between 2019 and 2020. The more substantial increase at MEL-01 in 2020 suggests a localized influence of effluent, while the gradual rise at MEL-02 and MEL-03 indicates broader regional trends, potentially driven by natural geochemical processes or climate-related factors. Since 2020, strontium concentrations at MEL-01 have remained relatively stable (i.e., no statistically significant differences among years), while concentrations at MEL-02 and MEL-03 have trended steadily higher.

Uranium – Spatial and temporal trends for uranium indicate that water quality in MEL-01 is influenced primarily by natural, climate related factors and not effluent. From 2020 to 2023, uranium concentrations at MEL-01 increased by approximately 44% (**Figure 3-10**). At MEL-02 and MEL-03, the magnitude of increase over the same 4-year period was 34% and 40%, respectively. Last year, uranium concentrations in all three areas decreased compared to 2023: 13% at MEL-01, 9% at MEL-02, and 13% at MEL-03. Effluent may have a minor effect on uranium concentrations in MEL-01, but wider regional trends appear to be the primary source for the lake-wide increasing trend observed to date.

Metals Summary – Climate-related factors appear to be the leading cause of increased concentrations for many of the metals that exceeded their respective Normal Range's in 2024. Arsenic was the only metal where mining-related changes in water quality at MEL-01 and MEL-02 seem likely. However, the observation that arsenic concentrations at MEL-02 have exceeded those at MEL-01 for the past two years suggests that factors other than effluent discharge may be responsible for the increasing trend. Ongoing monitoring in 2025, combined with the three-year regional reference lake study, should help distinguish between mining-related effects to water quality from regional climatic trends.

Figure 3-7. Temporal trend for TDS, chloride, and sulphate at MEL-01, MEL-02, and MEL-03.

Note: The green line is the Normal Range of baseline/reference conditions for Meliadine Lake.
2015 was the first full year of surface water monitoring for the AEMP at MEL-01 and MEL-02. Water samples were collected in the East Basin (MEL-01) in August 2013 to characterize baseline conditions. 2016 was the first year of monitoring at MEL-03 (reference area 1).
ANOVA results (model fits ± 95% confidence intervals) are shown along with pairwise comparisons from Tukey post hoc tests; within each sampling area, different letters indicate statistically significant differences among years (α=0.05). The magnitude of the change in concentrations from year to year is presented below each letter (red = increase; blue = decrease).

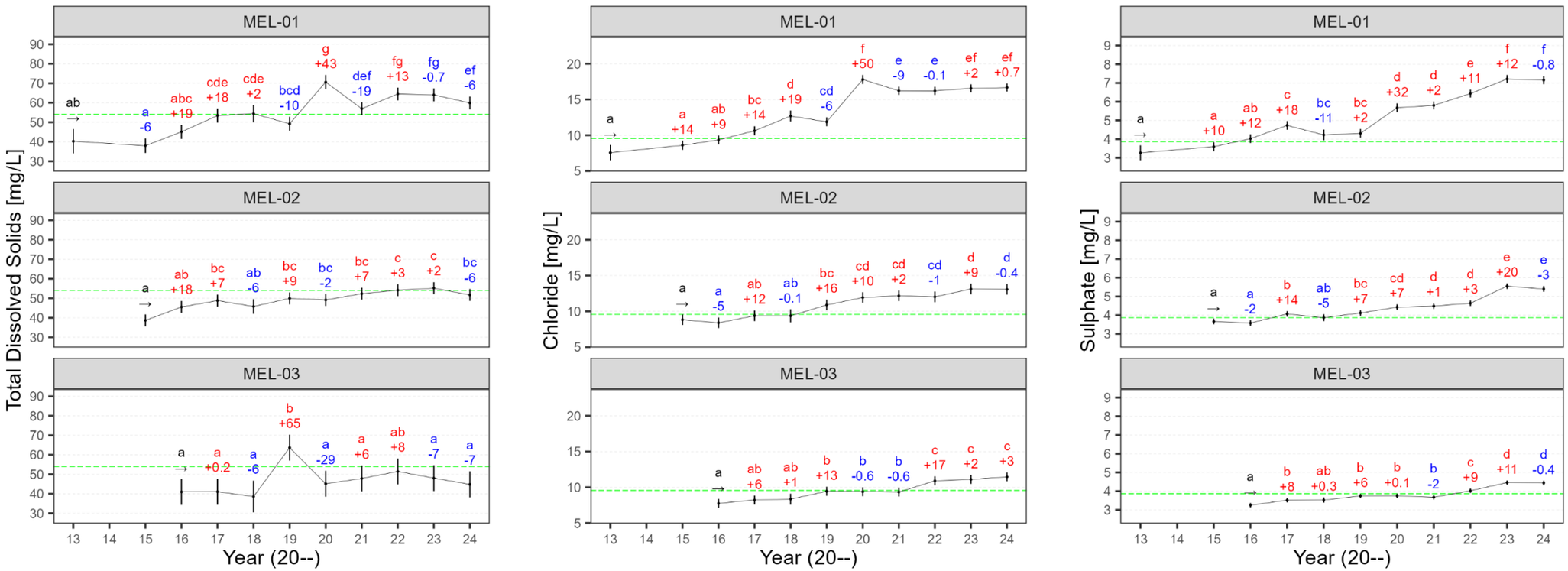


Figure 3-8. Temporal trend for TDS (calculated and measured) and constituent major ions at MEL-01, MEL-02, and MEL-03.

Note: 2015 was the first full year of surface water monitoring for the AEMP at MEL-01 and MEL-02. Water samples were collected in the East Basin (MEL-01) in August 2013 to characterize baseline conditions. 2016 was the first year of monitoring at MEL-03 (reference area 1).

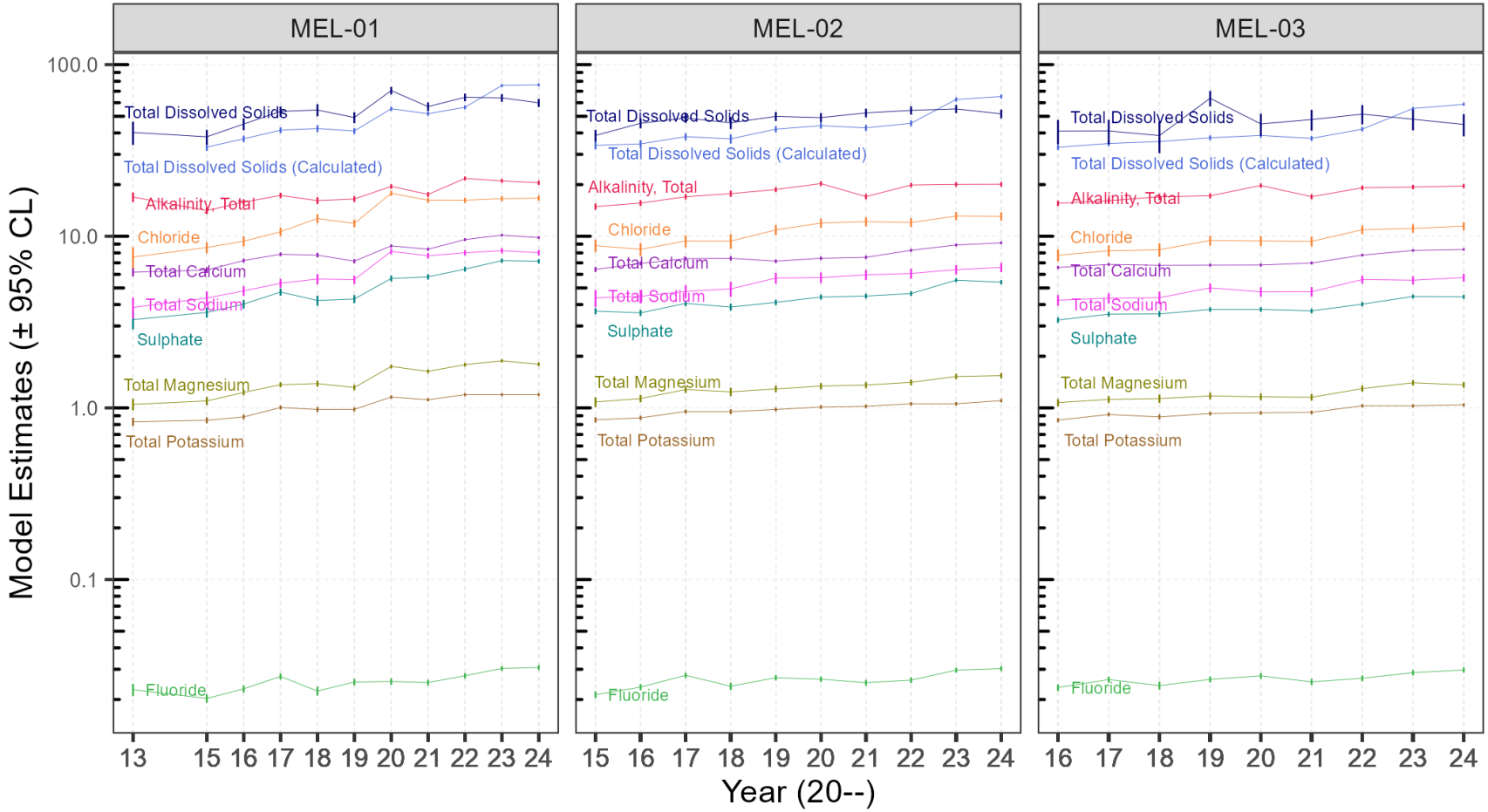


Figure 3-9. Temporal trends for organic carbon (DOC and TOC), phosphorus, and TKN at MEL-01, MEL-02, and MEL-03 since 2013.

Note: The green line is the Normal Range of baseline/reference conditions for Meliadine Lake.
2015 was the first full year of surface water monitoring for the AEMP at MEL-01 and MEL-02. Water samples were collected in the East Basin (MEL-01) in August 2013 to characterize baseline conditions. 2016 was the first year of monitoring at MEL-03 (reference area 1).
ANOVA results (model fits ± 95% confidence intervals) are shown along with pairwise comparisons from Tukey post hoc tests; within each sampling area, different letters indicate statistically significant differences among years (α=0.05). The magnitude of the change in concentrations from year to year is presented below each letter (red = increase; blue = decrease).

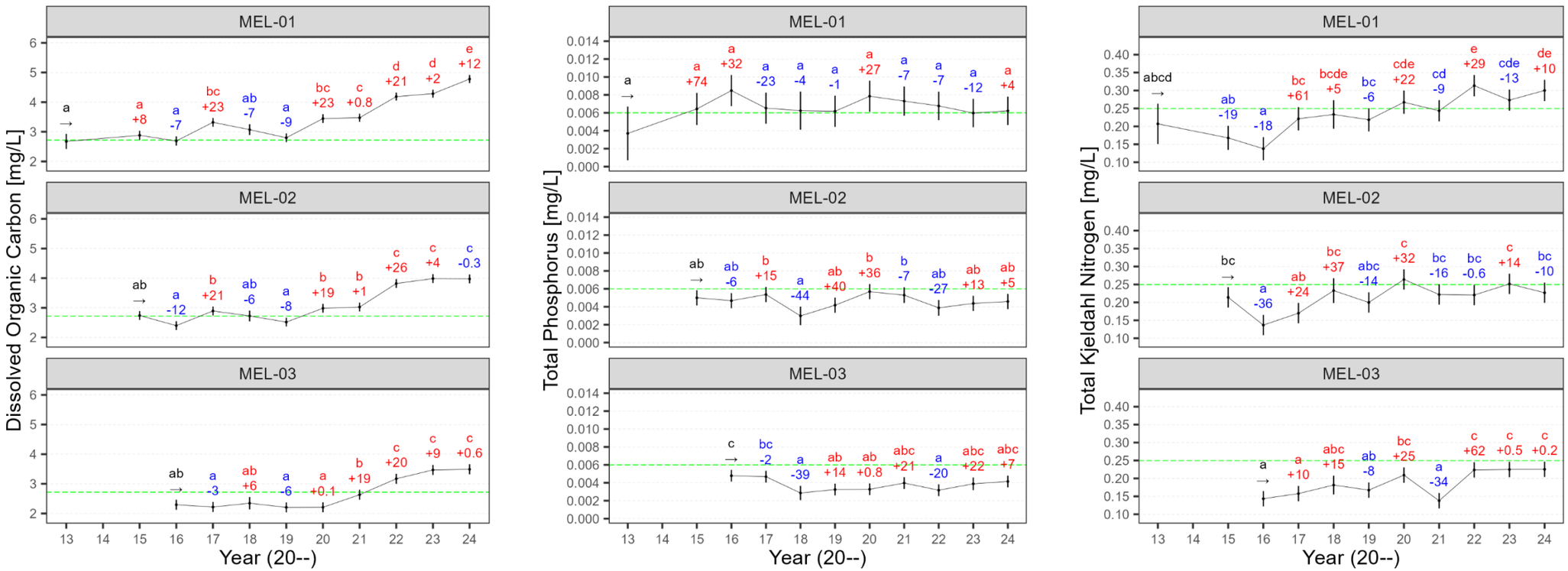
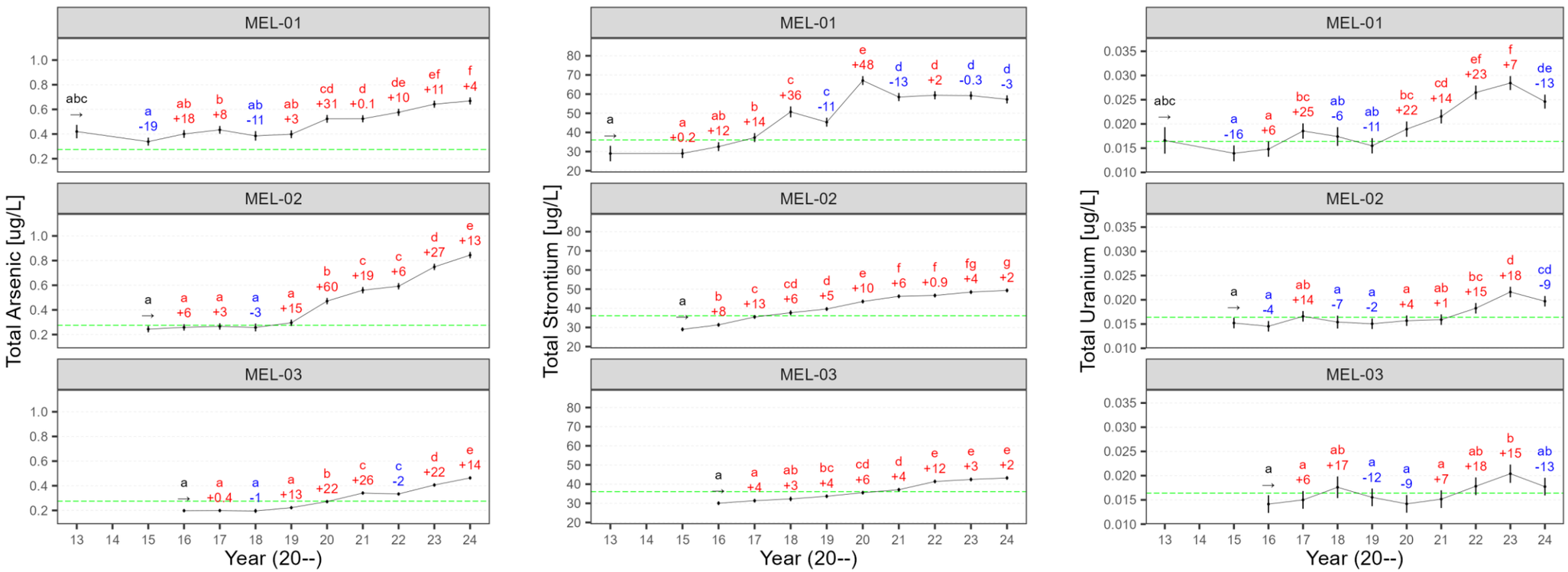


Figure 3-10. Temporal trends for arsenic, strontium, and uranium at MEL-01, MEL-02, and MEL-03.

Note: The green line is the Normal Range of baseline/reference conditions for Meliadine Lake.
2015 was the first full year of surface water monitoring for the AEMP at MEL-01 and MEL-02. Water samples were collected in the East Basin (MEL-01) in August 2013 to characterize baseline conditions. 2016 was the first year of monitoring at MEL-03 (reference area 1).
ANOVA results (model fits ± 95% confidence intervals) are shown along with pairwise comparisons from Tukey post hoc tests; within each sampling area, different letters indicate statistically significant differences amongyears (α=0.05). The magnitude of the change in concentrations from year to year is presented below each letter (red = increase; blue = decrease).



3.4.4 Comparison to Model Predictions

TDS and chloride concentrations compared to predictions in the 2014 FEIS (Agnico Eagle, 2014) and the 2020 hydrodynamic model are shown in **Figure 3-11** and **Figure 3-12**, respectively.

Total Dissolved Solids – Measured TDS concentrations have been stable for the past four years and well below predicted concentrations in the 2014 FEIS and 2020 hydrodynamic model developed by Tetra Tech (**Figure 3-11**). Monthly mean TDS concentrations at MEL-01 in July, August, and September 2024 were 60.2 mg/L, 61.7 mg/L, and 57.8 mg/L, respectively. By comparison, the predicted TDS concentration for 2025 in the 2014 FEIS was approximately 100 mg/L. The Tetra Tech model predicted TDS would increase more rapidly than the far-field mixing model in the 2014 FEIS, and in 2024, TDS concentrations were predicted to exceed 150 mg/L.

To date, the observed changes in TDS conform more closely to predictions in the 2014 FEIS, as opposed to the rapid increase that was predicted in the Tetra Tech model. The discrepancy between the modelled and observed increase in TDS is due to the combined effect of prolonged periods of no discharge and lower concentrations of TDS in effluent. In 2024, TDS concentrations in weekly samples from MEL-14 ranged between 900 mg/L in mid-June to 2,200 mg/L in October (**Table 2-6**). By comparison, the Tetra Model assumed a continuous concentration of 3,500 mg/L, equal to the maximum average concentration in the Water Licence.

Chloride – The average concentration of chloride at MEL-01 in July, August, and September 2024 was 17.0, 15.9, and 17.1 mg/L, respectively. By comparison, the predicted 2024 chloride concentrations in the 2014 FEIS and the 2020 hydrodynamic models were around 40 mg/L (**Figure 3-12**).

Summary – The East Basin of Meliadine Lake has shown ongoing capacity to assimilate major ions from CP1. Current monitoring data for TDS and chloride demonstrate the effectiveness of mitigation built into the Mine plan.

Figure 3-11. Predicted versus measured concentrations of Total Dissolved Solids (measured; mg/L) in the East Basin of Meliadine Lake.

Notes: The FEIS (2014) predictions (purple line) were presented in Volume 7.4-A of Agnico Eagle (2014). The blue dashed line represents the updated model prediction for changes in TDS from 2018 to 2028 (Tetra Tech 2020). The dots represent the observed TDS calculated data collected to date from MEL-01 as part of the AEMP.

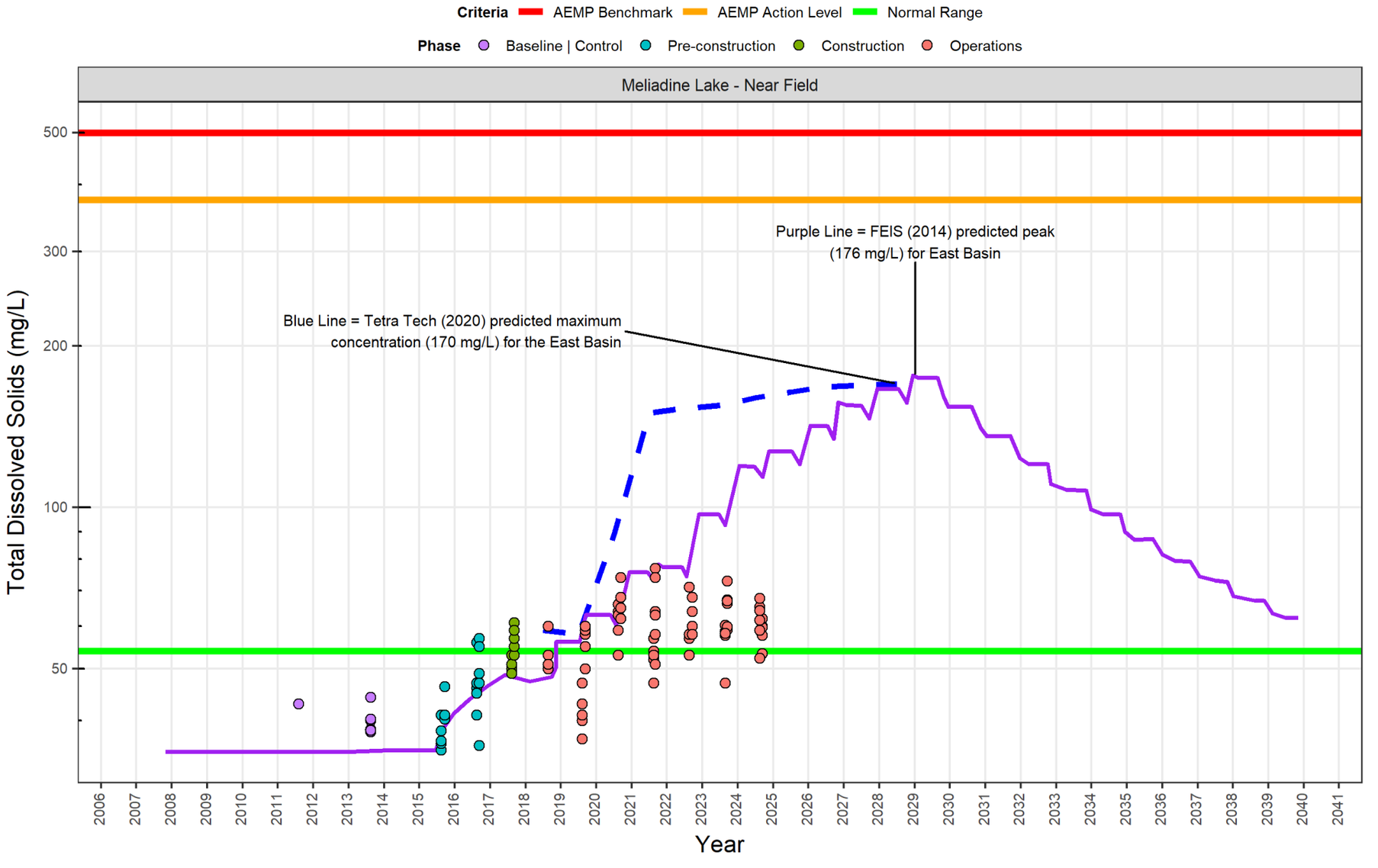
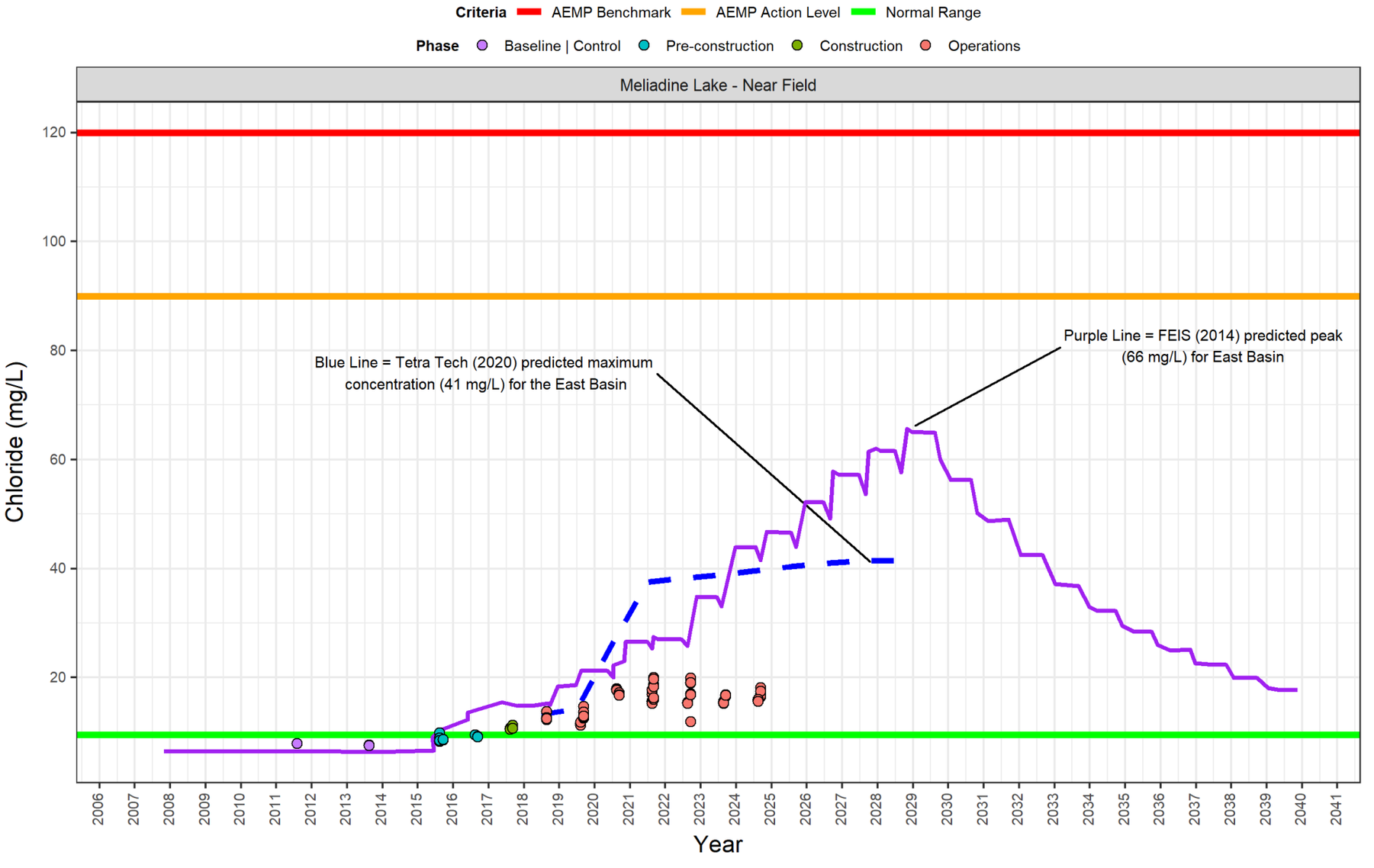


Figure 3-12. Predicted versus measured concentrations of chloride (mg/L) in the East Basin of Meliadine Lake.

Notes: The FEIS (2014) predictions (purple line) were presented in Volume 7.4-A of Agnico Eagle (2014). The blue dashed line represents the updated model prediction for changes in chloride from 2018 to 2028 (Tetra Tech 2020). The dots represent the observed chloride data collected to date from MEL-01 as part of the AEMP.



3.5 Conclusions

Results of the 2024 Meliadine Lake water quality monitoring program are summarized below in the context of the key questions. The Low Action Level assessment for the Meliadine Lake water quality results is presented in **Section 12**.

Key Question: Are concentrations of parameters in the effluent less than limits specified in the Water Licence?

There were no exceedances of limits in the Water Licence in 2024 (**Section 2.4.2**). Effluent was also non-toxic to Rainbow Trout and daphnids in the four monthly acute toxicity tests.

Key Question: Has water quality in the exposure areas changed over time, relative to reference/baseline areas?

Concentrations of several major ions, TKN, organic carbon, and a few metals have increased throughout Meliadine Lake since the baseline period. For most of the parameters of interest, upward temporal trends were evident before the mine began discharging effluent into Meliadine Lake in 2018. Results to date suggest that natural factors—such as increased runoff associated with permafrost thaw and record rainfall in 2019 and 2021—were primarily responsible for the observed changes in water quality in recent years. Ongoing water quality monitoring, combined with a three-year regional reference lakes study starting in 2025, will help provide a better understanding of the potential causes of these changes.

Key Question: Is water quality consistent with predictions outlined in the Final Environmental Impact Statement (FEIS) and less than AEMP Action Levels?

The 2014 FEIS predicted *minor changes* in water quality at the edge of the mixing zone and no residual impacts from effluent discharge in Meliadine Lake outside the mixing zone (e.g., at the NF area)[7]. *Minor changes* were defined as a measurable increase in a parameter that is outside the range of baseline values (e.g., above the Normal Range) but below guidelines for the protection of aquatic life and drinking water quality.

TDS and chloride concentrations remain below predictions in the 2014 FEIS and predictions in the 2020 update to the hydrodynamic model. Furthermore, water quality in Meliadine Lake is safe for aquatic life and human health based on there being no exceedances of AEMP Benchmarks or the early warning Action Levels in 2024.

[7] See Section 7.4.7 (Residual Impact Summary) in the FEIS for more information (Volume 7; Agnico Eagle 2014)

3.6 Condensed Temporal Water Quality Plots

The condensed temporal plots show concentrations of major ions, nutrients, and metals in surface water samples from Meliadine Lake going back to 2013. The dates on the x-axis are *condensed* to show the results for samples collected during the open water sampling events (July through September) each year. The green line indicates the normal range, which corresponds to the upper 90th percentile concentration for samples collected during baseline and from the reference areas.

List of Condensed Temporal Plots

Figure 3-13. Concentrations of TDS and constituent ions (Ca, Mg, K, Na, Cl, SO_4) since 2013

Figure 3-14. Conductivity, hardness, and concentrations of selected nutrients since 2013

Figure 3-15. Concentrations of aluminum, arsenic, barium, and boron since 2013

Figure 3-16. Concentrations of cobalt, copper, iron, and lead since 2013

Figure 3-17. Concentrations of lithium, manganese, molybdenum, and nickel since 2013

Figure 3-18. Concentrations of strontium, titanium, uranium, and zinc since 2013

Figure 3-13. Concentrations of TDS and constituent ions (Ca, Mg, K, Na, Cl, SO_4) since 2013.

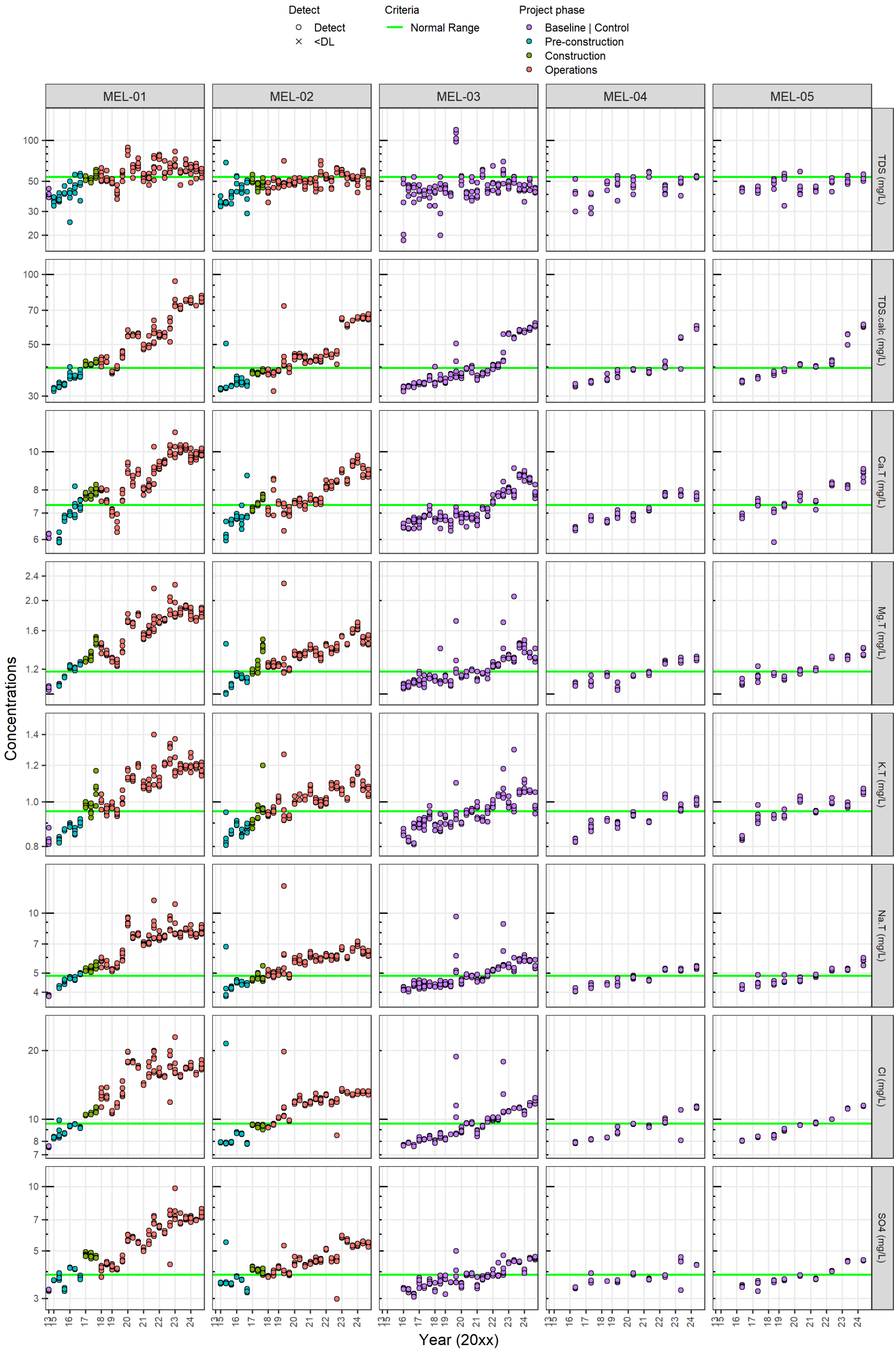


Figure 3-14. Conductivity, hardness, and concentrations of selected nutrients since 2013.

Notes: Ammonia (NH3) concentrations in August and September 2021 should be interpreted with caution because of elevated detection limits at the lab during these two sampling events (see “x” symbols for non-detects in 2021).

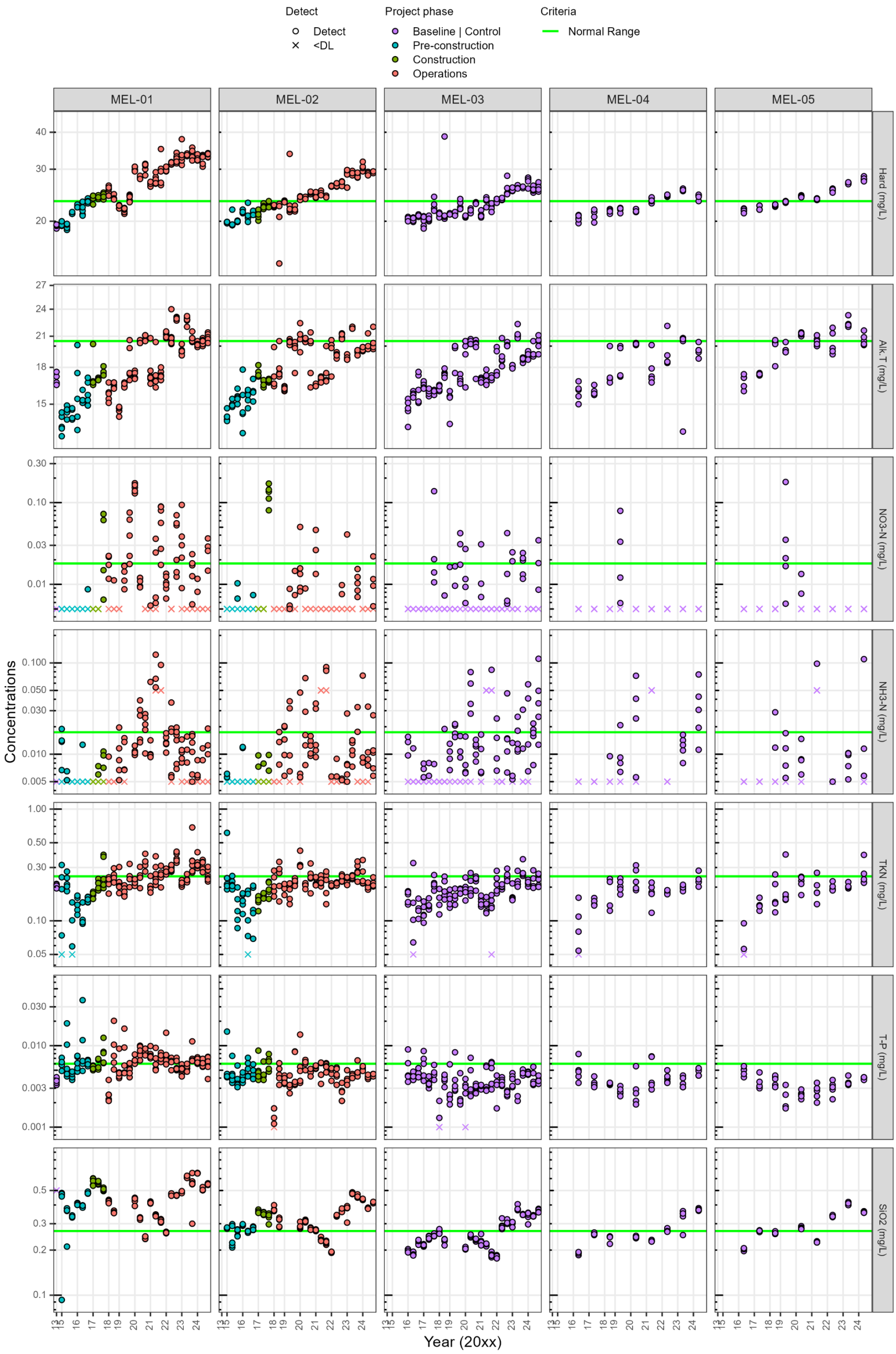


Figure 3-15. Concentrations of aluminum, arsenic, barium, and boron since 2013.

Notes: Detection limits have changed over time for some parameters.

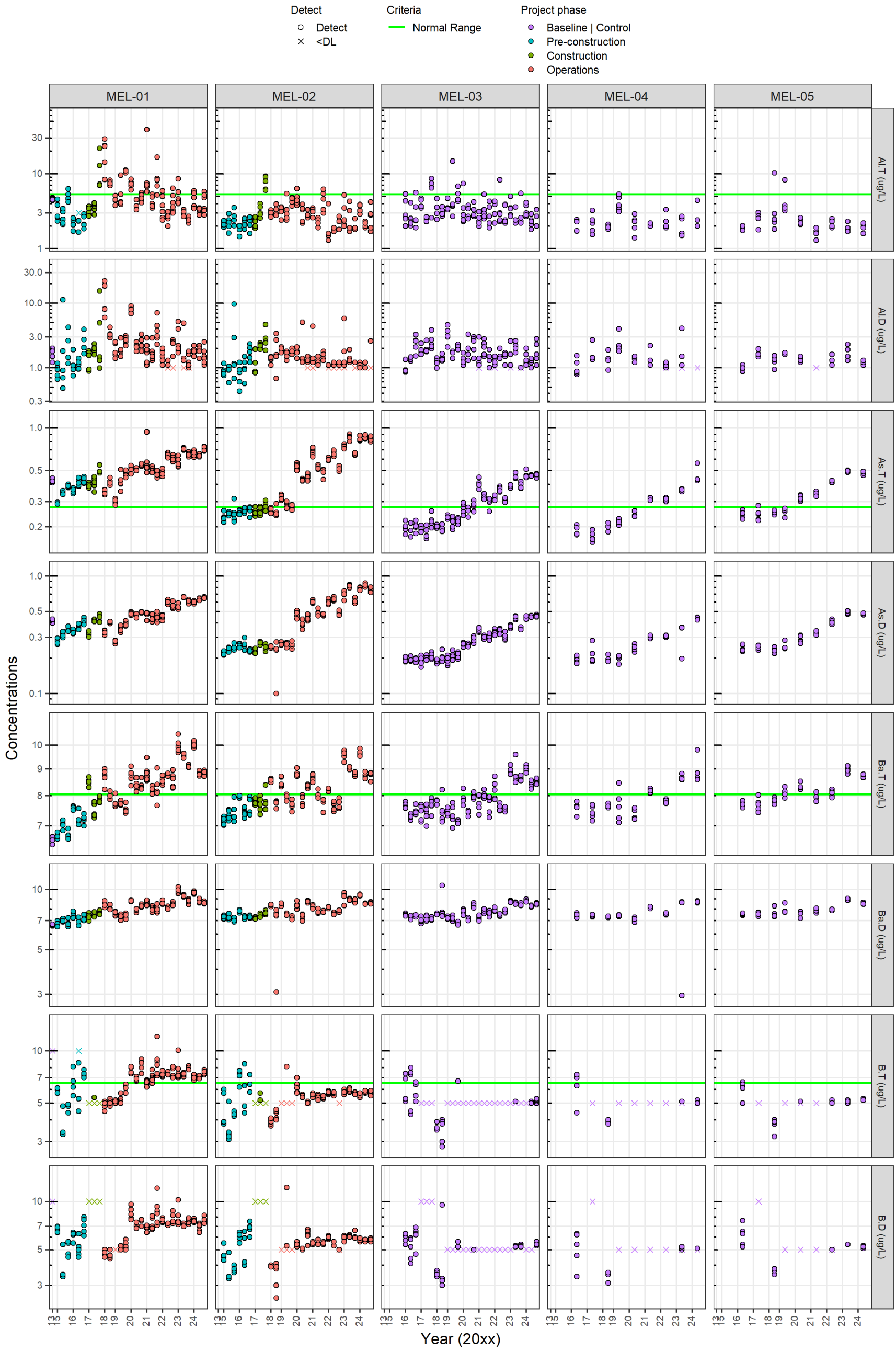


Figure 3-16. Concentrations of cobalt, copper, iron, and lead since 2013.

Notes: Detection limits have changed over time for some parameters.

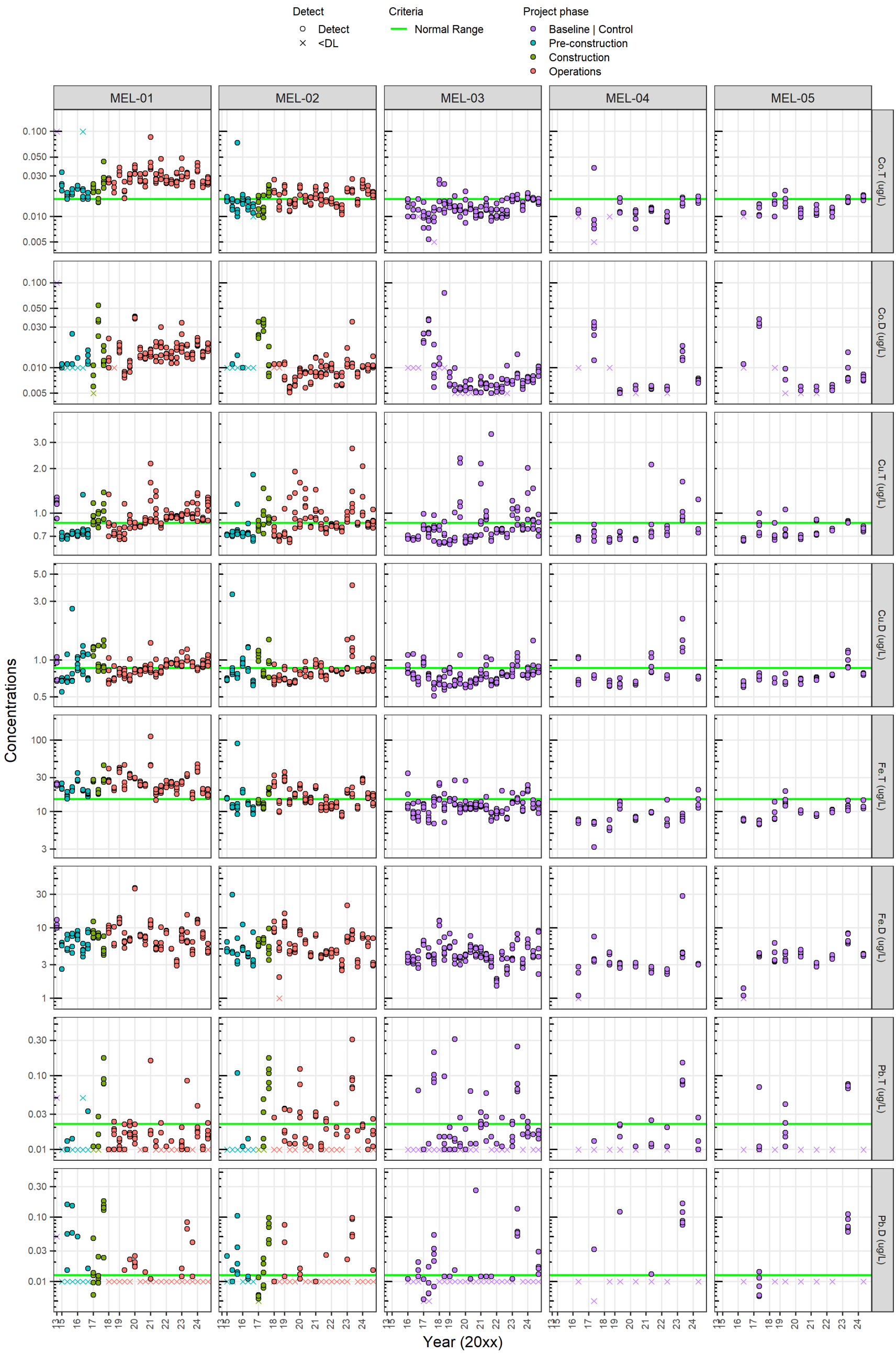


Figure 3-17. Concentrations of lithium, manganese, molybdenum, and nickel since 2013.

Notes: Detection limits have changed over time for some parameters.

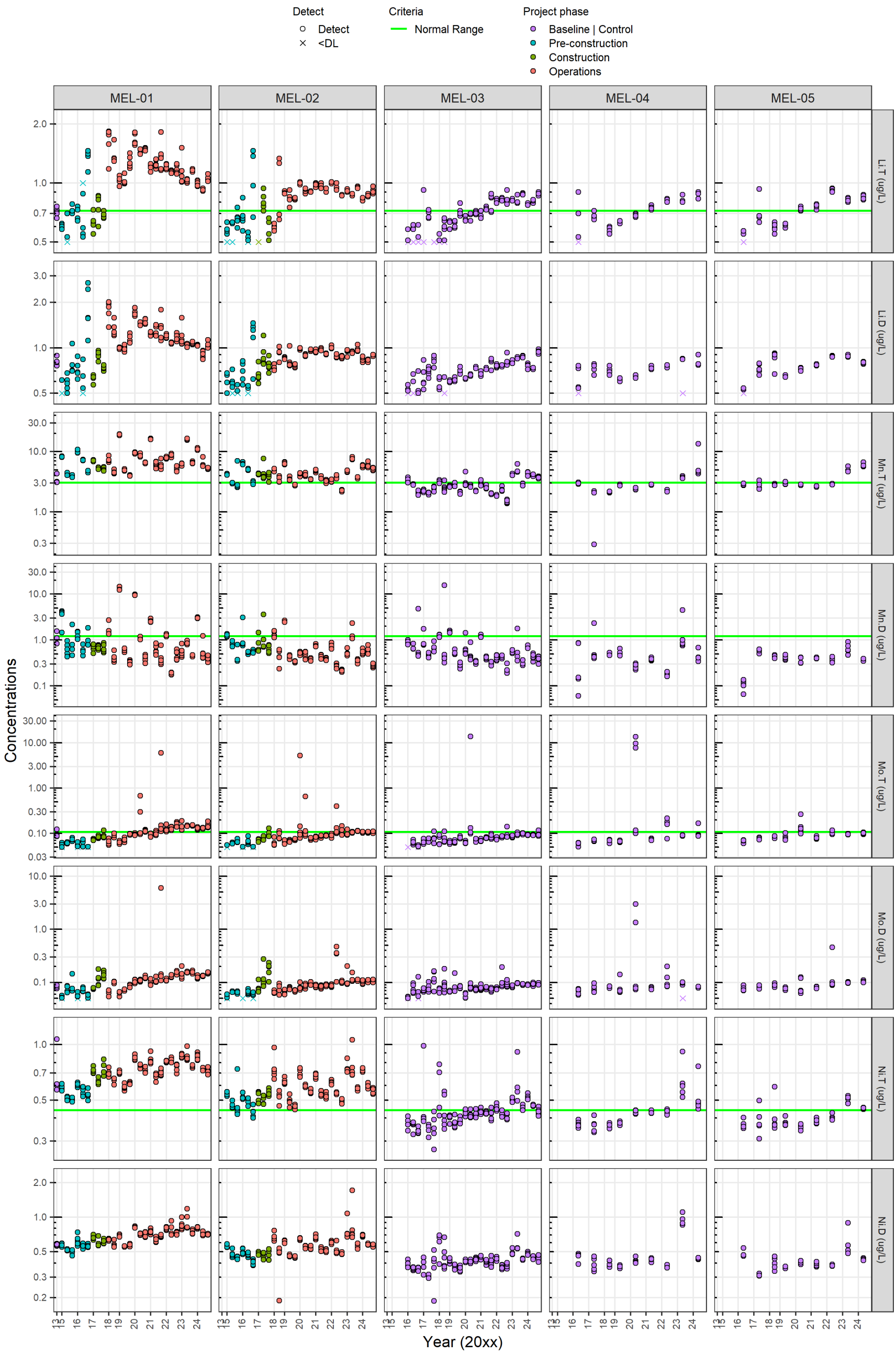
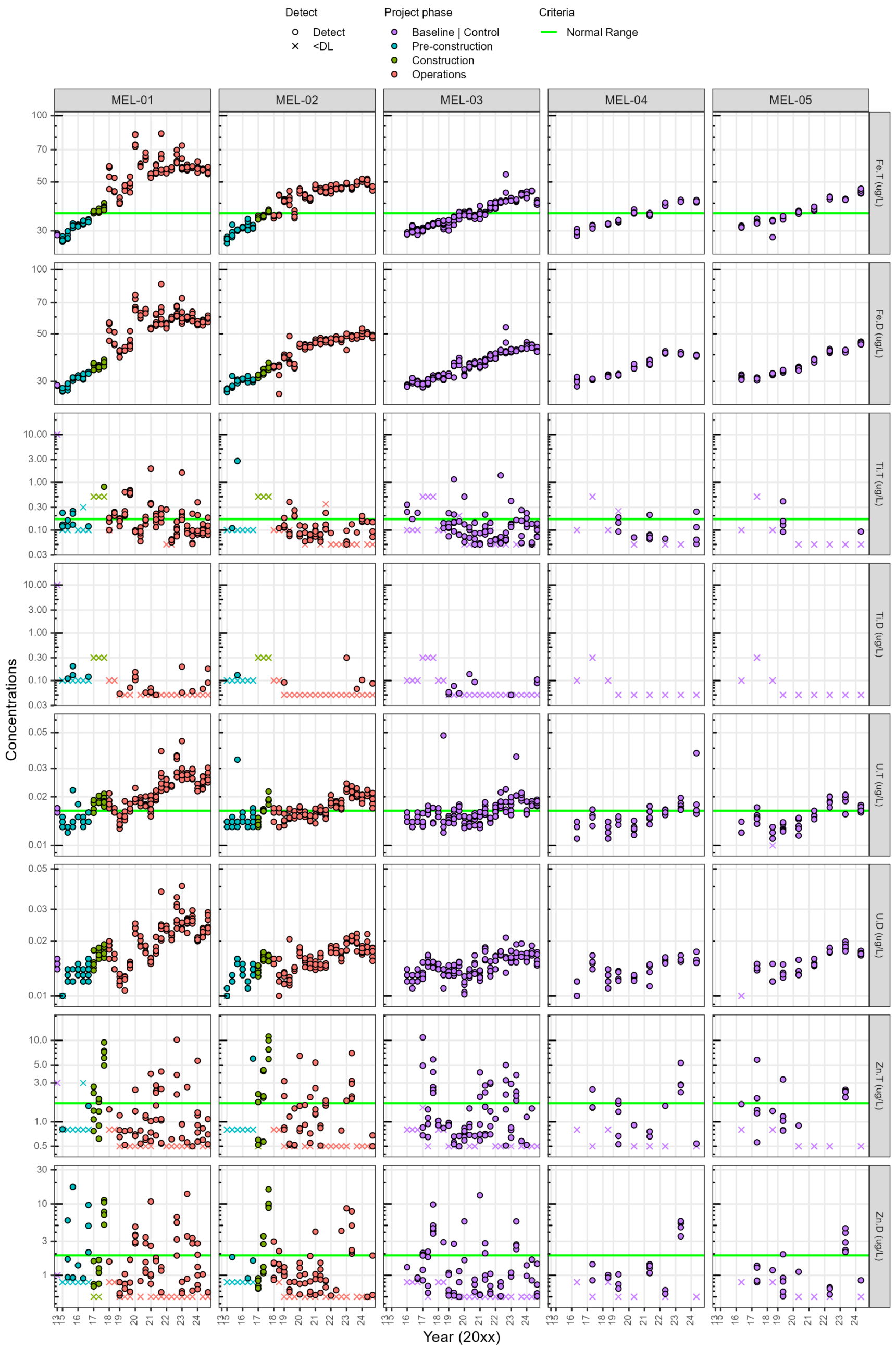


Figure 3-18. Concentrations of strontium, titanium, uranium, and zinc since 2013.

Notes: Detection limits have changed over time for some parameters.



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4 WATER QUALITY – PENINSULA LAKES

4.1 Introduction

The Peninsula Lakes water quality monitoring program assesses impacts from mining activities (aerial emissions and altered hydrology) on small lakes near the Mine. Annual monitoring specifically evaluates cumulative impacts using water quality data from three lakes:

- Lake A8: Located south of Tiriganiaq Pit 1.
- Lake B7: Adjacent to the Tailings Storage Facility (TSF).
- Lake D7: Southwest of Lake B7, within a separate watershed. Lake D7 serves as a spatial control to define the geographic extent of mining impacts.

The sampling stations are shown in **Figure 1-2**.

Objectives and Key Questions

The Peninsula Lakes water quality program has four objectives:

- Determine if water quality in lakes close to the Mine is changing,
- Evaluate the accuracy of predicted changes in water quality,
- Assess if mitigation measures are effective at reducing impacts to the aquatic environment, and
- Provide recommendations (as required) for follow-up monitoring or mitigation to lower the impact of mining-related activities on changes in water quality.

The approach to meeting these objectives is centered around answering the following key questions:

Has water quality changed over time relative to baseline conditions?

Is water quality consistent with predictions in the FEIS and below guidelines to protect aquatic life and human health?

4.2 Findings from the 2024 Peninsula Lakes Water Quality Program

- There is no evidence that mining activities have directly impacted water quality in Lake D7. While some parameters have increased compared to baseline, these changes are likely due to natural variability, interannual climate fluctuations, and broader climate change effects, rather than mine-related influences.
- Construction and operation of the Mine have contributed to changes in water quality in Lake A8 and Lake B7. The parameters most strongly linked to mining-related effects include major ions (calcium, sodium, chloride, and sulphate), arsenic, and barium.

- No exceedances of AEMP Action Levels were reported in 2024 for Lake D7 or Lake A8. However, arsenic exceeded the AEMP Action Level in Lake B7 in August 2024, with concentrations reaching 25 µg/L. Follow-up monitoring in September and October showed a decline in arsenic levels to approximately 15 µg/L, returning to early summer levels.
- The primary source of arsenic to Lake B7 and Lake A8 was likely off-site migration of dust during the winter of 2019/2020. This is supported by snow chemistry data from 2020, which indicated elevated metal concentrations in snow north of Lake A8. Recent reductions in snowpack metal concentrations suggest that dust mitigation measures implemented since 2021 have been effective.

4.3 Methods

4.3.1 Field and Laboratory Procedures

Surface water sampling was completed in all three lakes in July and August according to the AEMP Design Plan. Two additional sampling events occurred in Lake B7 on September 29 and October 10 to assess seasonal changes leading into winter, consistent with the approach taken in 2023.

At each station, i*n-situ* water quality measurements (temperature, dissolved oxygen (% and mg/L), pH, and specific conductivity) were recorded just below the surface and every 0.5 m through the water column to within 0.5 m of the lake bottom.

Surface water samples were collected from mid-depth at each station using a Kemmerer grab sampler. Samples were processed and analyzed according to methods described previously for Meliadine Lake.

Table 4-1. Overview of sampling completed in Lake A8, Lake B7, and Lake D7 in 2024.

Area	Station ID	Water Depth (m)	UTM (zone 15V)		Sampling Dates			
			Easting	Northing	Jul	Aug	Sep	Oct
Lake B7	B7-01	1.0	538631	6989096	12-Jul	23-Aug	29-Sep	10-Oct
	B7-02	1.7	538195	6989436				
	B7-03	1.7	537713	6989798				
Lake A8	A8-01	2.3	540007	6987659	12-Jul	23-Aug	Not sampled	Not sampled
	A8-02	2.2	540211	6987204				
	A8-03	1.7	540925	6987421				
Lake D7	D7-01	1.7	536390	6989340	14-Jul	21-Aug	Not sampled	Not sampled
	D7-02	1.7	536567	6988868				
	D7-03	1.8	536852	6988689				

4.3.2 Quality Assurance and Quality Control

The QA/QC assessment results described for the Meliadine Lake monitoring program (**Section 3.3.2**) also apply to the Peninsula Lakes study. Apart from the unreliable calculated TDS results estimated from laboratory conductivity, no other chemistry data were flagged as unreliable in the 2024 Peninsula Lakes study. Overall, the 2024 Peninsula Lakes water quality data are accurate and reliable for reporting purposes.

4.3.3 Data Analysis

Water Quality Screening Assessment

The AEMP Benchmarks are effect thresholds intended to protect aquatic life and drinking water quality for the Project. These benchmarks and their corresponding Action Levels apply equally at Meliadine and the Peninsula Lakes, except for parameters with aquatic life guidelines that vary based on site-specific water quality characteristics such as pH, DOC, and hardness (collectively referred to as toxicity modifying factors [TMFs]). AEMP Benchmarks in each lake are updated annually for the following parameters based on the lowest calculated aquatic life guideline across all sampling events: ammonia, sulphate, aluminum, cadmium, cobalt, copper, lead, manganese, nickel, strontium, and zinc. The phosphorus benchmark of 0.01 mg/L for oligotrophic status is not applied in the Peninsula Lakes study, as baseline phosphorus concentrations frequently exceeded this threshold.

Temporal Trend Assessment

Temporal changes in water chemistry were determined by comparing current water quality results against the Normal Ranges for each lake. The temporal trend assessment was supported by plots showing changes in water quality over time. Parameters where the annual mean or median concentration exceeded the Normal Range were carried forward for closer examination.

Updates to the Normal Ranges in 2024

The 2018 Normal Ranges were revised for select parameters in this year's report. Previously, when Normal Ranges were calculated in the 2018 AEMP, the detection limit was adopted as the Normal Range for a few parameters lacking sufficient data to compute a Normal Range using statistics. For some parameters measured below or near the detection limit, this approach was overly conservative, resulting in parameters being flagged as higher than baseline conditions when only marginally exceeding detection limits.

To better account for analytical uncertainty near detection limits, the Normal Ranges were updated according to the following criteria:

- The original 2018 Normal Range was retained if the value was greater than or equal to two times the 2024 detection limit.
- If the 2018 Normal Range was less than two times the 2024 detection limit, the Normal Range was updated to equal two times the 2024 detection limit.

This updated approach reduces the likelihood of falsely identifying baseline conditions as exceedances, thereby enhancing confidence in distinguishing actual mining-related impacts from natural variability and analytical uncertainty.

Normal Range values were developed for 51 lab-measured parameters for each lake in 2018. The Normal Range was revised to two times the detection limit for 8 parameters in Lake A8, 11 in Lake B7, and 10 in Lake D7 (**Table 4-2**). The complete list of Normal Range values for each lake is included in **Appendix D1**.

Comparison to FEIS Predictions

Water quality modeling was completed as part of the 2014 FEIS submission to predict how construction and mining activities would affect water quality in small lakes located on the peninsula[8]. Among the lakes included in the AEMP, numerical water quality predictions for the construction and operations phases were only developed for Lake D7 (Table 7.4-A34 in Appendix 7.4-A of the 2014 FEIS). Predictions for Lake A8 and Lake B7 were not developed because the mine plan in the 2014 FEIS called for dewatering of both lakes. As mentioned in **Section 1.2.2**, Lake A8 will be dewatered in 2025 to develop the deposits south of Tiriganiaq; Lake B7 will eventually be dewatered to form a containment pond to store saline water from the underground mine.

For waterbodies included in the water quality model during the construction and operations periods, changes in water quality were predicted due to factors such as water diversion, alterations to watershed size and contributing areas, natural hydrological processes, evaporation, and aerial deposition of particulate matter (modeled as TSS). Additional influences included nutrients from blasting activities and metals, which were modeled using individual parameters.

Water quality changes were expected to be most pronounced in waterbodies closest to the Mine. However, for most water quality parameters, these changes were predicted to be "minor." In the context of the FEIS, "minor" changes refer to increases from baseline conditions that remain below established guidelines for the protection of aquatic life, drinking water quality, and site-specific water quality objectives (SSWQO).

[8] Refer to Table 7.4-A2 (Inventory of Waterbodies) in Appendix 7.4-A of the FEIS (Agnico Eagle 2014) for lakes that were carried forward for water quality modelling.

Table 4-2. Updated Normal Range for select parameters.

Lake	Parameter	2018 Normal Range Information			Detection Limit Comparison		Updated NR (DLx2)
		NR DL	Method[a]	NR	'24 DL	'24 DL vs NR DL	
A8	Boron (T)	1.0	Percentile	5	5	2024 higher	10
	Cadmium (T)	0.005	DL	0.005	0.005	2024=2018	0.01
	Chromium (T)	0.06	DL	0.06	0.1	2024 higher	0.2
	Selenium (T)	0.02	DL	0.02	0.04	2024 higher	0.08
	Silver (T)	0.005	DL	0.005	0.005	2024=2018	0.01
	Thallium (T)	0.005	DL	0.005	0.005	2024=2018	0.01
	Vanadium (T)	0.01	DL	0.01	0.05	2024 higher	0.1
	Cyanide (Total)	0.001	DL	0.001	0.001	2024=2018	0.002
B7	Nitrate (as N)	0.005	Percentile	0.005	0.005	2024=2018	0.01
	Orthophosphate	0.001	DL	0.001	0.001	2024=2018	0.002
	Antimony (T)	0.02	DL	0.02	0.02	2024=2018	0.04
	Boron (T)	1.0	Percentile	8.0	5.0	2024 higher	10
	Cadmium (T)	0.005	Percentile	0.007	0.005	2024=2018	0.01
	Chromium (T)	0.06	DL	0.06	0.1	2024 higher	0.2
	Selenium (T)	0.02	Percentile	0.04	0.04	2024 higher	0.08
	Silver (T)	0.005	DL	0.005	0.005	2024=2018	0.01
	Thallium (T)	0.005	Percentile	0.005	0.005	2024=2018	0.01
	Vanadium (T)	0.01	DL	0.01	0.05	2024 higher	0.1
	Cyanide (Total)	0.001	DL	0.001	0.001	2024=2018	0.002
D7	Ammonia (as N)	0.005	PI	0.009	0.005	2024=2018	0.01
	Nitrate (as N)	0.005	DL	0.005	0.005	2024=2018	0.01
	Antimony (T)	0.02	Percentile	0.03	0.02	2024=2018	0.04
	Cadmium (T)	0.005	DL	0.005	0.005	2024=2018	0.01
	Chromium (T)	0.06	DL	0.06	0.1	2024 higher	0.2
	Selenium (T)	0.02	Percentile	0.06	0.04	2024 higher	0.08
	Silver (T)	0.005	DL	0.005	0.005	2024=2018	0.01
	Thallium (T)	0.005	DL	0.005	0.005	2024=2018	0.01
	Vanadium (T)	0.01	PI(λ)	0.07	0.05	2024 higher	0.1
	Cyanide (Total)	0.001	DL	0.001	0.001	2024=2018	0.002

Notes:
The methods used to calculate the Normal Range are described in **Appendix D1**.

4.4 Results and Discussion

4.4.1 Field-Measured Water Quality Parameters

This section presents the results from the 2024 *in-situ* water quality profiles compared to profiles that were taken from 2015-2023 (AEMP period). Temporal plots are used to support the discussion. Average surface water temperatures in each lake from 2015 to 2024 are shown in **Figure 4-1**. The temperature data are plotted for the day-of-the-month to illustrate the interannual variability in surface water temperatures. Dissolved oxygen, pH, and specific conductivity results are shown in **Figure 4-2**. The results are shown as the mean ± 1 SD of the three profiles collected in each lake in each monthly sampling event.

The Peninsula Lakes are small, shallow water bodies averaging approximately 1.5 m in depth, with most areas less than 2 m deep (Appendix SD7-2, 2014 FEIS). Due to this shallow depth, areas less than 2 m likely freeze completely to the bottom by late winter, while unfrozen areas typically experience naturally low oxygen levels. After ice-out, which usually occurs in late May or early June, wind and wave action create well-mixed conditions throughout these lakes. No evidence of stratification has been observed any sampling events since 2015 or in the baseline data presented in the 2014 FEIS.

Temperature. Surface water temperatures rise quickly after ice-off. By mid-July, water temperatures are typically in the range of 13 and 16 °C. Surface water temperatures in 2024 were within the range observed in previous years (see the red dots in **Figure 4-1**).

Dissolved oxygen. Wind and wave action during the open water season contributes to fully-oxygenated conditions in each of the Peninsula Lakes. Since 2015, there has been no indication of summer anoxia in any of the profiles. Dissolved oxygen levels likely naturally decrease during the winter because most of the areas within each lake freeze to the bottom by late winter.

pH. The Peninsula Lakes are slightly alkaline, with pH typically measuring between 7.5 and 8.5. Each of lakes exhibit seasonal variability in pH. This is particularly evident in Lake B7 in 2024 when pH decreased from approximately 8.1 in August to 7.4 in September (**Figure 4-2**). Seasonal variability in pH is also evident in Lake D7. For example, pH in mid-July 2023 was 8.25 but by mid-August pH had decreased to 7.75. The results for Lake D7 provide insight into natural fluctuations in the pH of small headwater lakes.

Conductivity. Specific conductivity has increased in Lake B7 and Lake A8 coinciding with development of the Mine. In Lake B7, conductivity has more than doubled since 2019, from 130-150 µS/cm to 350 µS/cm (**Figure 4-2**). Not all of the observed increases related to mining activities. For example, in 2024, there was noticeable increase in conductivity in Lake B7 between the August and September sampling events due to record rainfall in the area (**Figure 2-4**).

Figure 4-1. Average surface water temperatures at the Peninsula Lakes, 2015-2024.

Notes: Surface water temperatures are unstratified during the open water season with no discernable difference in temperatures recorded near the surface compared to near the bottom of the lakes.

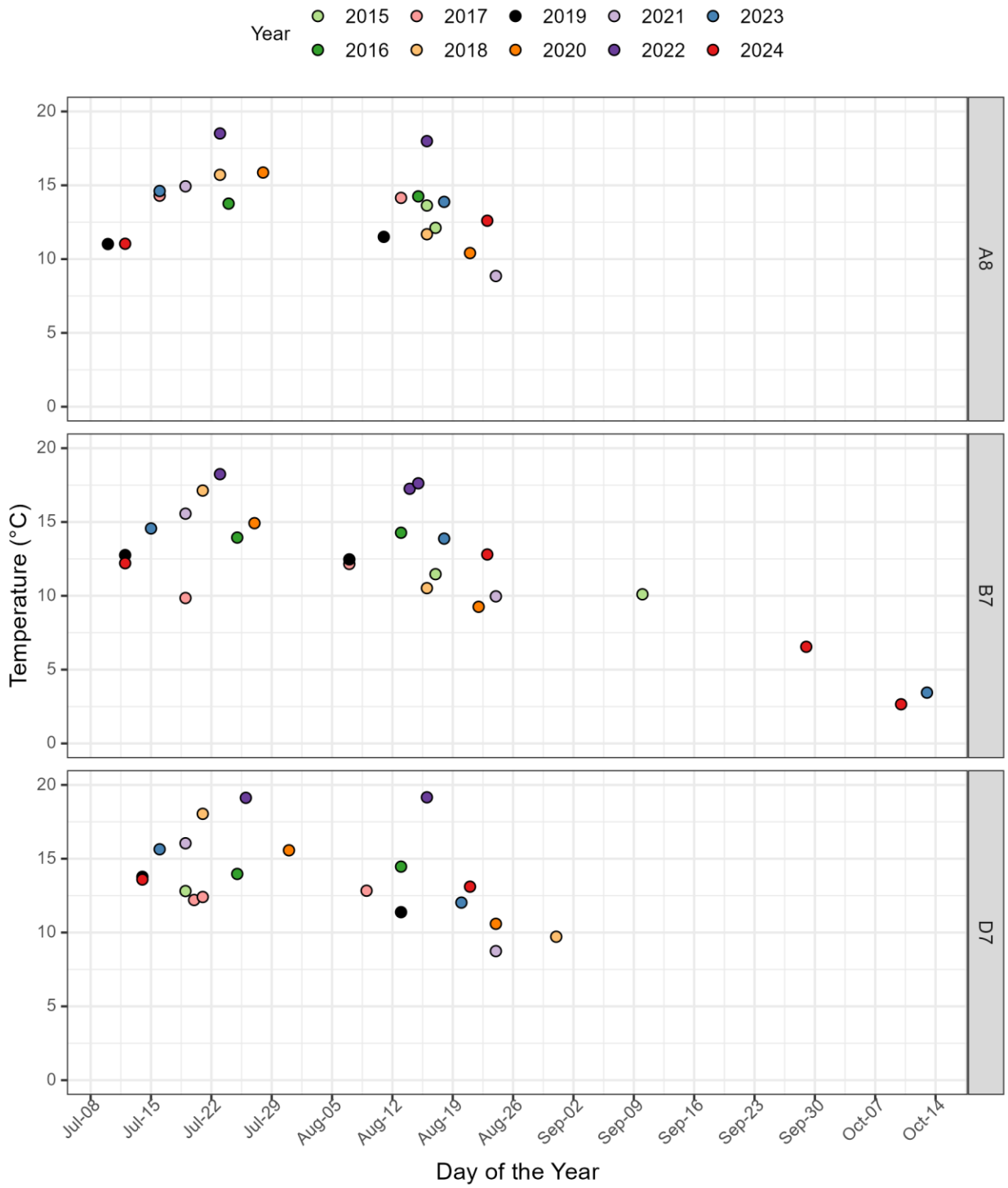
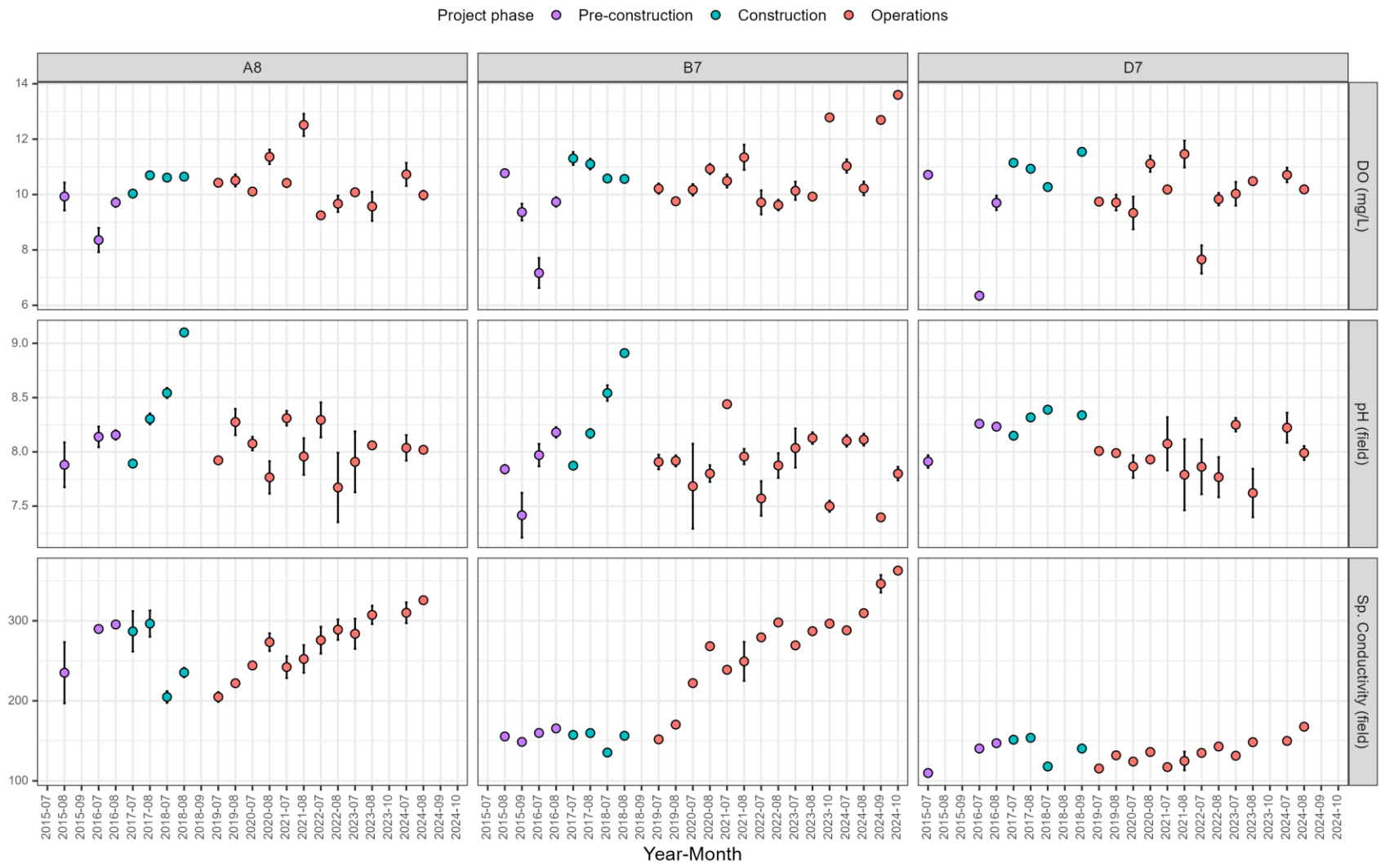


Figure 4-2. *In-situ* water quality at the Peninsula Lakes, 2015-2024.

Notes: The lakes are small, shallow, and unstratified. The results are presented as the mean ± 1 SD of the three profiles taken at each lake in each month.



4.4.2 Temporal Trends in the Peninsula Lakes

The purpose of this section is to identify parameters that appear to be increasing in the Peninsula Lakes in recent years and, if possible, determine if the cause is related to mining activities or natural variability/climate-related factors. The starting point for the temporal trend assessment is the short-list of parameters that exceeded the Normal Range of baseline conditions in 2024. The Normal Range screening results for each lake are provided in the following tables and corresponding figures.

- Lake D7: **Table 4-3** and **Figure 4-3**
- Lake A8: **Table 4-4** and **Figure 4-4**
- Lake B7: **Table 4-5** and **Figure 4-5**

The screening tables include parameters where at least one sample exceeded the Normal Range in 2024. Parameters with annual mean concentrations exceeding the Normal Range were carried forward for plotting. Supplemental plots for the various major ions, nutrients, and metals are provided in **Section 4.6**.

Overview of Natural versus Mining-Related Changes in Water Quality

Lake D7 is situated in a watershed that is not directly impacted by the Mine. Water quality results from Lake D7 provide valuable insight into regional background changes driven by natural variability and climate-related processes. Spatial and temporal trends for key parameters are illustrated in **Figure 4-6**, highlighting divergent trends among the different lakes.

Lake A8 and Lake B7 are located adjacent to major mine infrastructure, and changes in water quality are expected due to the cumulative effects of aerial emissions, dust, and hydrological changes in the A and B watersheds. Predictions were not made for these lakes during operations, as they were scheduled for dewatering to accommodate the development of the Pump and Wesmeg deposits. Without predictions, evaluating the effectiveness of mitigation measures relies primarily on comparisons to water quality criteria (Action Levels) and temporal trends observed at Lake D7.

Since 2019, several parameters have followed a similar temporal trend among all three lakes, suggesting that natural variability and climate-mediated processes are important drivers of water quality changes in the region. Among these parameters are ammonia, dissolved organic carbon (DOC), aluminum, cobalt, copper, iron, lead, molybdenum, nickel, uranium, and vanadium (**Figure 4-6**). For many of these parameters, absolute concentrations are comparable among lakes, with some—such as aluminum, molybdenum, and vanadium—being higher in Lake D7. Permafrost thawing, increased primary production, increased precipitation, and atmospheric deposition have all been identified as contributing factors to enhanced organic carbon flux (Nguyen et al., 2022; Stolpmann et al., 2021), which may influence the observed trends.

While climate-mediated processes are clearly a source of change for water quality in lakes on the Meliadine Peninsula near the Mine, distinct trends in several key parameters indicate that mining activities have also contributed to water quality changes. Parameters that show clear divergence between Lake A8 and Lake B7 compared to Lake D7 include major ions (calcium, sodium, chloride, and sulphate), arsenic, barium, and strontium (**Figure 4-6**). These parameters have increased more significantly in Lakes A8 and B7 since 2019, while remaining relatively stable or increasing gradually in Lake D7, suggesting that mining activities have influenced water chemistry in these lakes.

Lake D7 Water Quality Compared to Predictions in the 2014 FEIS

In 2024, parameters in Lake D7 that were higher than baseline levels based on the Normal Range comparison remained below the concentrations predicted in the 2014 FEIS, with the exception of fluoride and arsenic. The median fluoride concentration from six samples collected in 2024 was 0.051 mg/L, slightly exceeding the predicted concentration of 0.041 mg/L for the operations phase (years 5–8) (**Table 4-3**). For arsenic, the median concentration in 2024 was 1.85 µg/L, approximately 40% above the predicted median concentration of 1.3 µg/L.

Beyond the numerical predictions, the 2014 FEIS predicted that water quality in lakes within the D Watershed would remain similar to baseline conditions, with differences of less than 10% (Appendix 7.4-A; Agnico Eagle, 2014). Given the climate-mediate trends observed for several parameters in Lake D7 (**Figure 4-6**), the fact that only two parameters exceeded the 2014 FEIS predictions provides assurance that the mitigation measures integrated into the mine plan have been effective in maintaining water quality within the expected range for Lake D7.

Arsenic in Lake B7

In 2023 and 2024, the water quality monitoring program in Lake B7 was expanded to gain a better understanding of seasonal variations throughout the open-water period. Between 2019 and 2024, arsenic concentrations in Lake B7 increased approximately tenfold, from 2 µg/L to over 20 µg/L during some sampling events.

In mid-July 2024, arsenic concentrations ranged from 16.8 to 18.7 µg/L, increasing to 24.2 and 27.5 µg/L by mid-August. As shown in **Figure 4-7**, arsenic concentrations were similar between the total and dissolved fractions (0.45 µm), indicating that the majority of arsenic is in a freely dissolved form. All three samples collected in August exceeded the Action Level of 18.8 µg/L. By late September, concentrations had decreased to 14.4 to 17.8 µg/L, returning to levels observed just after ice-off in July. A similar seasonal pattern was observed in 2023, with peak arsenic concentrations occurring in August, followed by lower concentrations in early July and late September/October (**Figure 4-7**).

A current hypothesis is that the initial arsenic loading occurred in 2019/2020, though the exact mechanism remains uncertain. Potential source(s) include windblown dust (as suggested by snow core

chemistry results) and runoff during record rainfall in 2019. The subsequent increasing trend likely reflects internal cycling rather than ongoing external loading. A literature review on the mobility, fate, and partitioning of arsenic in aquatic environments was included in the 2023 AEMP report (Azimuth, 2024). In summary, arsenic cycling in lakes is governed by a complex interplay of physical, chemical, and biological processes, many of which are influenced by climate-related factors (Barrett et al., 2019; Hussain et al., 2019).

4.5 Conclusions

Results of the 2024 water quality monitoring program for the Peninsula Lakes are summarized below.

Key Question: Has water quality in the exposure areas changed over time compared to baseline conditions?

Water quality has changed in all three lakes compared to baseline conditions. The water quality data from Lake D7 suggest that most parameters have increased due to the combined effects of natural variability and climate-related factors. However, mining activities have likely contributed to increases in TDS, sulphate, arsenic, and barium in Lake B7 and Lake A8 since 2019. The primary source of these changes is believed to be off-site migration of dust, which has transported metals and other constituents to these lakes. Encouragingly, results from the snow chemistry monitoring program indicate that efforts to minimize dust migration have resulted in lower concentrations of metals in the snowpack in recent years.

Key Question: Is water quality consistent with predictions in the FEIS and below guidelines to protect aquatic life and human health?

- In August 2024, all three samples in Lake B7 exceeded the Action Level, with two of the three samples surpassing the SSWQO of 25 µg/L.
- The annual mean arsenic concentration in Lake B7 in 2024 was 18.7 µg/L, nearly equal to the Action Level of 18.8 µg/L.
- Other than arsenic, there were no Action Level exceedances in any of the lakes in 2024.

The CCME Water Quality Guideline (WQG) for arsenic is 5 µg/L, based on an EC50 of 50 µg/L for effects on Scenedesmus (green algae) growth (CCME, 2001). A 10-fold safety factor was applied to establish the CCME WQG at 5 µg/L. Compared to algae and invertebrates, fish are relatively tolerant to arsenic exposure. Lepper et al (2017) compiled toxicity data for several freshwater species. The most sensitive chronic endpoint was a 28-d LC10 of 134 µg/L for early-life stage Rainbow Trout survival. The tests were conducted in water that was 12-13°C, with pH 7.2-7.8, and hardness of 93-105 mg/L. These conditions are representative of Lake B7 during the summer. Overall, current arsenic concentrations in Lake B7 pose a low risk of adverse effects to fish and other aquatic life.

The Guideline for Canadian Drinking Water Quality sets a maximum acceptable concentration of 10 µg/L (Health Canada, 2006). However, community use of Lake B7 for drinking water is unlikely given its proximity to the Mine and the availability of other preferred water sources, namely Meliadine Lake. Furthermore, Lake B7 is scheduled to be dewatered to accommodate mining of the other deposits that were included in the 2014 FEIS.

While ongoing external loading cannot be completely ruled out, Agnico Eagle implemented additional mitigation measures starting in 2021 to minimize the off-site migration of dust from the TSF during winter. The approach to adaptive management in response to Peninsula Lakes water quality trends is discussed in the Response Framework (**Section 12**).

Table 4-3. Lake D7 water quality screening assessment, 2024.

Parameter	Detection Limit	Normal Range	FEIS		Action Level	Summary Statistics for Lake D7 in 2024								N>NR	N>FEIS
			Median	Peak		N	N<DL	Mean	Median	SD	SE	Min	Max		
Major Ions, Nutrients, and Organic Carbon (mg/L)															
Total Suspended Solids	1	2	8	11.7	-	6	0	**2.18**	**2.1**	0.937	0.383	1.1	3.3	3	0
Alkalinity, Total	1	55	125	164	-	6	0	**56.7**	**56.4**	3.41	1.39	53.5	60.3	3	0
Calcium (T)	0.01	17	55	72	-	6	0	**17.5**	**17.4**	0.436	0.178	17	18.3	5	0
Fluoride	0.02	0.05	0.041	0.054	2.1	6	0	**0.0507**	**0.0505**	0.00383	0.00156	0.045	0.056	3	6
Reactive Silica (SiO2)	0.01	0.28	-	-	-	6	0	0.236	0.226	0.125	0.051	0.119	0.394	3	0
Ammonia (as N)	0.005	0.01	0.125	0.28	0.148	6	1	0.00913	0.00755	0.005	0.00204	0.005	0.0186	2	0
Nitrate (as N)	0.005	0.01	0.50	0.90	2.17	6	4	0.00777	0.005	0.00536	0.00219	0.005	0.0184	1	0
Total Kjeldahl Nitrogen	0.05	0.52	1.29	1.7	-	6	0	0.471	0.463	0.105	0.0429	0.373	0.6	3	0
Dissolved Organic Carbon	0.5	5.1	-	-	-	6	0	**6**	**5.93**	0.985	0.402	5.05	7.06	4	0
Metals (µg/L)															
Aluminum (T)	1	6.7	24	40	75	6	0	**10.5**	**8.05**	4.82	1.97	6.5	17.2	5	0
Arsenic (T)	0.02	1.2	1.3	1.9	18.8	6	0	**1.85**	**1.84**	0.211	0.0861	1.64	2.2	6	6
Barium (T)	0.02	17	38	69	750	6	0	**18.9**	**18.8**	0.571	0.233	18.3	19.8	6	0
Cadmium (T)	0.005	0.01	0.071	0.11	0.0713	6	4	-	-	-	-	0.005	0.0104	1	0
Cobalt (T)	0.005	0.05	0.55	1.06	0.592	6	0	**0.0679**	**0.066**	0.0121	0.00494	0.0526	0.0884	6	0
Copper (T)	0.05	1	2.7	4.2	1.5	6	0	**1.17**	**1.16**	0.141	0.0576	0.986	1.37	5	0
Iron (T)	1	112	191	266	795	6	0	86	76.2	20.5	8.37	75.1	127	1	0
Lead (T)	0.01	0.02	0.21	0.26	3.75	6	0	**0.0445**	**0.0465**	0.00622	0.00254	0.032	0.049	6	0
Lithium (T)	0.5	1.9	4.9	6.5	-	6	0	1.87	1.88	0.188	0.0768	1.65	2.06	3	0
Manganese (T)	0.05	13	111	179	90	6	0	**13.9**	**14.8**	5.23	2.14	7.76	20	3	0
Molybdenum (T)	0.05	0.48	1	1.36	54.8	6	0	**0.608**	**0.607**	0.105	0.0429	0.499	0.712	6	3
Nickel (T)	0.05	0.75	3.5	6	18.8	6	0	**0.862**	**0.864**	0.0821	0.0335	0.743	0.952	5	0
Strontium (T)	0.02	83	200	380	1880	6	0	**87.6**	**88.8**	3.54	1.45	82.1	92.1	5	0
Tin (T)	0.02	0.05	0.21	0.29	-	6	1	0.0443	0.034	0.0261	0.0107	0.02	0.087	2	0
Titanium (T)	0.05	0.34	1.92	3.3	-	6	0	**0.456**	**0.382**	0.201	0.0821	0.332	0.862	5	0
Uranium (T)	0.001	0.1	0.21	0.28	11.2	6	0	**0.117**	**0.117**	0.00624	0.00255	0.11	0.125	6	0
Vanadium (T)	0.05	0.1	1.13	2.6	90	6	0	0.0972	0.095	0.0128	0.00523	0.084	0.121	1	0
Zinc (T)	0.5	2	8.9	12.3	-	6	1	**2.99**	1.96	3.22	1.31	0.5	8.64	3	1
Zinc (D)	0.5	1.4	-	-	10.3	6	1	**2.87**	**1.88**	2.64	1.08	0.5	7.55	4	0

Notes:
Mean, median, SD, and SE were not calculated if >50% of the samples were below the detection limit.
Bold values indicate the mean/median concentration is greater than the upper limit of the Normal Range.
Gray highlighted cells indicate the mean/median concentration exceeds the median FEIS prediction (Appendix 7.4-A; Agnico Eagle, 2014). The FEIS Predictions are for 'Operations' year 5-8, which correspond to 2022-2025.

Figure 4-3. Lake D7 – temporal trends for parameters that exceeded the Normal Range in 2024.

Notes: Data are shown as the annual mean ± 1 SD.
Measured TDS is shown instead of calculated TDS because the lab method for reporting TDS (calculated) in 2024 was inconsistent with the method used in previous years.

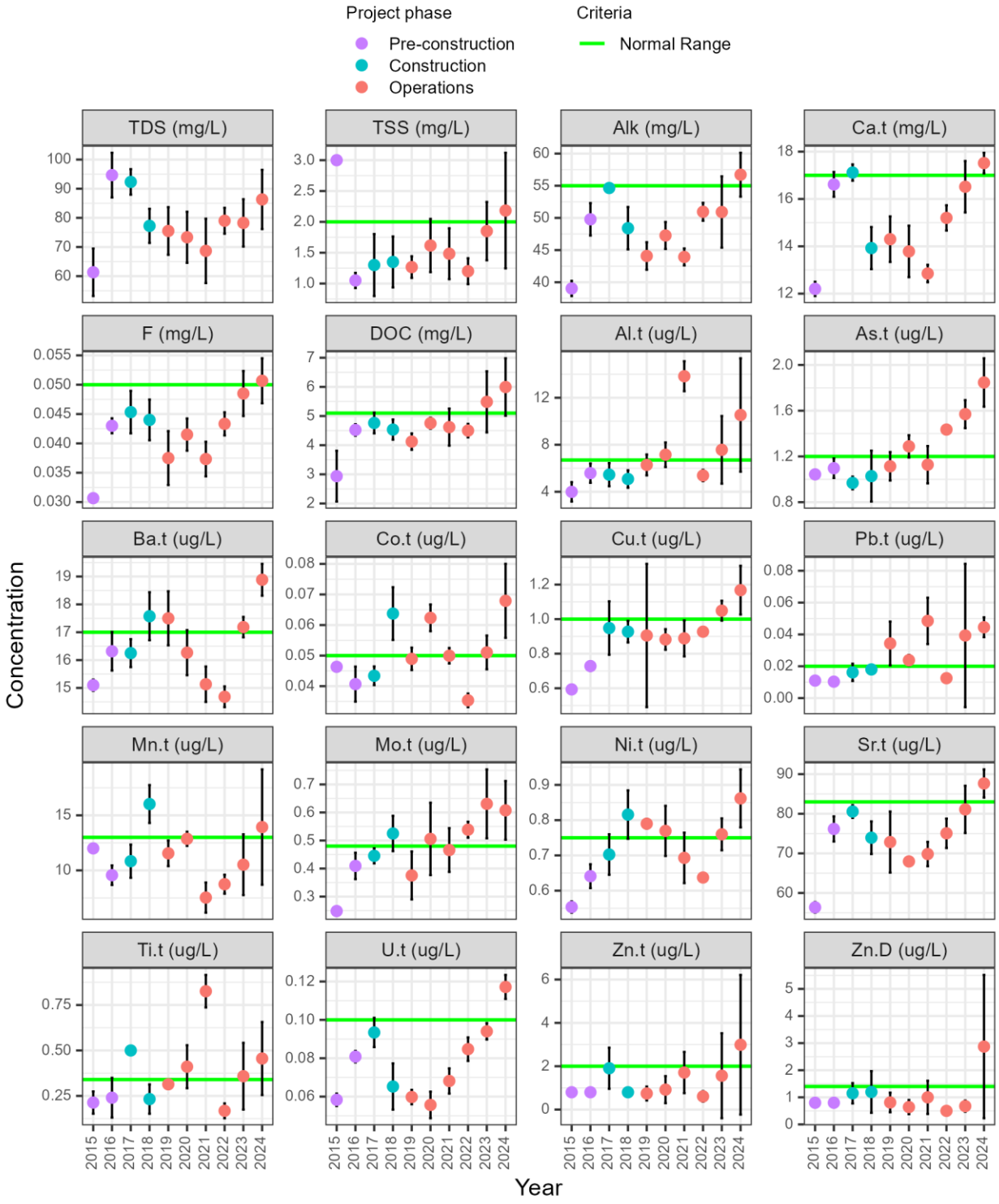


Table 4-4. Lake A8 water quality screening assessment, 2024.

Parameter	Detection Limit	Normal Range	FEIS[a]	Action Level	Summary Statistics for Lake A8 in 2024								N>NR	N>FEIS
					N	N<DL	Mean	Median	SD	SE	Min	Max		
Major Ions, Nutrients, and Organic Carbon (mg/L)														
Calcium (T)	0.01	40	-	-	6	0	38.9	39	1.54	0.629	36.9	41.4	1	0
Fluoride	0.02	0.04	-	2.1	6	0	**0.0422**	**0.042**	0.00542	0.00221	0.037	0.049	3	3
Potassium (T)	0.02	2.5	-	-	6	0	2.43	2.46	0.119	0.0486	2.22	2.54	2	5
Sodium (T)	0.02	8.4	-	-	6	0	**11.9**	**11.9**	0.547	0.223	11.2	12.7	6	6
Sulphate	0.3	9.3	-	164	6	0	**11.7**	**11**	1.33	0.543	10.8	13.5	6	2
Ammonia (as N)	0.005	0.011	-	0.148	6	1	**0.0118**	0.0091	0.00833	0.0034	0.005	0.0276	2	0
Nitrate (as N)	0.005	0.015	-	2.17	6	2	0.0088	0.00735	0.00448	0.00183	0.005	0.0161	1	0
Total Phosphorus	0.001	0.009	-	0.0075	6	0	**0.0108**	0.00865	0.00499	0.00204	0.0079	0.0207	3	0
Dissolved Organic Carbon	0.5	4.9	-	-	6	0	**6.38**	**6.7**	0.997	0.407	5.1	7.29	6	0
Total Organic Carbon	0.5	4.7	-	-	6	0	**5.95**	**6.24**	1.23	0.502	4.43	7.26	4	0
Metals (µg/L)														
Aluminum (T)	1	3	-	75	6	0	**5.08**	**4.5**	3.05	1.25	1.9	9	4	3
Arsenic (T)	0.02	2.4	-	18.8	6	0	**7.32**	**5.94**	2.66	1.09	4.81	11.1	6	6
Barium (T)	0.02	32	-	750	6	0	31.3	31.4	1.45	0.592	29.6	32.8	3	6
Cobalt (T)	0.005	0.05	-	0.78	6	0	**0.06**	**0.059**	0.0047	0.00192	0.0548	0.0681	6	0
Copper (T)	0.05	0.89	-	1.87	6	0	**0.958**	0.829	0.283	0.116	0.797	1.52	2	0
Iron (T)	1	67	-	795	6	0	**90**	**89.8**	11.6	4.74	74.7	108	6	2
Lead (T)	0.01	0.03	-	3.75	6	0	**0.0813**	**0.048**	0.0743	0.0303	0.021	0.186	3	0
Lithium (T)	0.5	10	-	-	6	0	9.4	9.4	0.855	0.349	7.86	10.2	2	6
Manganese (T)	0.05	13	-	90	6	0	**14.3**	**16.1**	5.64	2.3	6.83	19.6	4	0
Molybdenum (T)	0.05	0.22	-	54.8	6	0	**0.402**	**0.412**	0.0385	0.0157	0.331	0.444	6	0
Nickel (T)	0.05	0.92	-	74.9	6	0	**0.926**	**0.982**	0.0982	0.0401	0.789	0.996	4	0
Tin (T)	0.02	0.05	-	-	6	2	0.0332	0.029	0.0142	0.0058	0.02	0.054	1	0
Titanium (T)	0.05	0.25	-	-	6	1	0.147	0.112	0.112	0.0457	0.05	0.327	1	0
Uranium (T)	0.001	0.054	-	11.2	6	0	**0.0935**	**0.0909**	0.0121	0.00494	0.0792	0.111	6	6
Zinc (T)	0.5	1.2	-	-	6	1	1.01	0.915	0.578	0.236	0.5	2.02	1	0

Notes:
Mean, median, SD, and SE were not calculated if >50% of the samples were below the detection limit.
Bold values indicate the mean/median concentration is greater than the upper limit of the Normal Range.
[a] Predictions for Lake A8 were not developed for the operations phase because this lake was scheduled to be dewatered in the 2014 FEIS.

Figure 4-4. Lake A8 – temporal trends for parameters that exceeded the Normal Range in 2024.

Notes: Data are shown as the annual mean ± 1 SD. TDS shown for context.
Measured TDS is shown instead of calculated TDS because the lab method for reporting TDS (calculated) in 2024 was inconsistent with the method used in previous years.

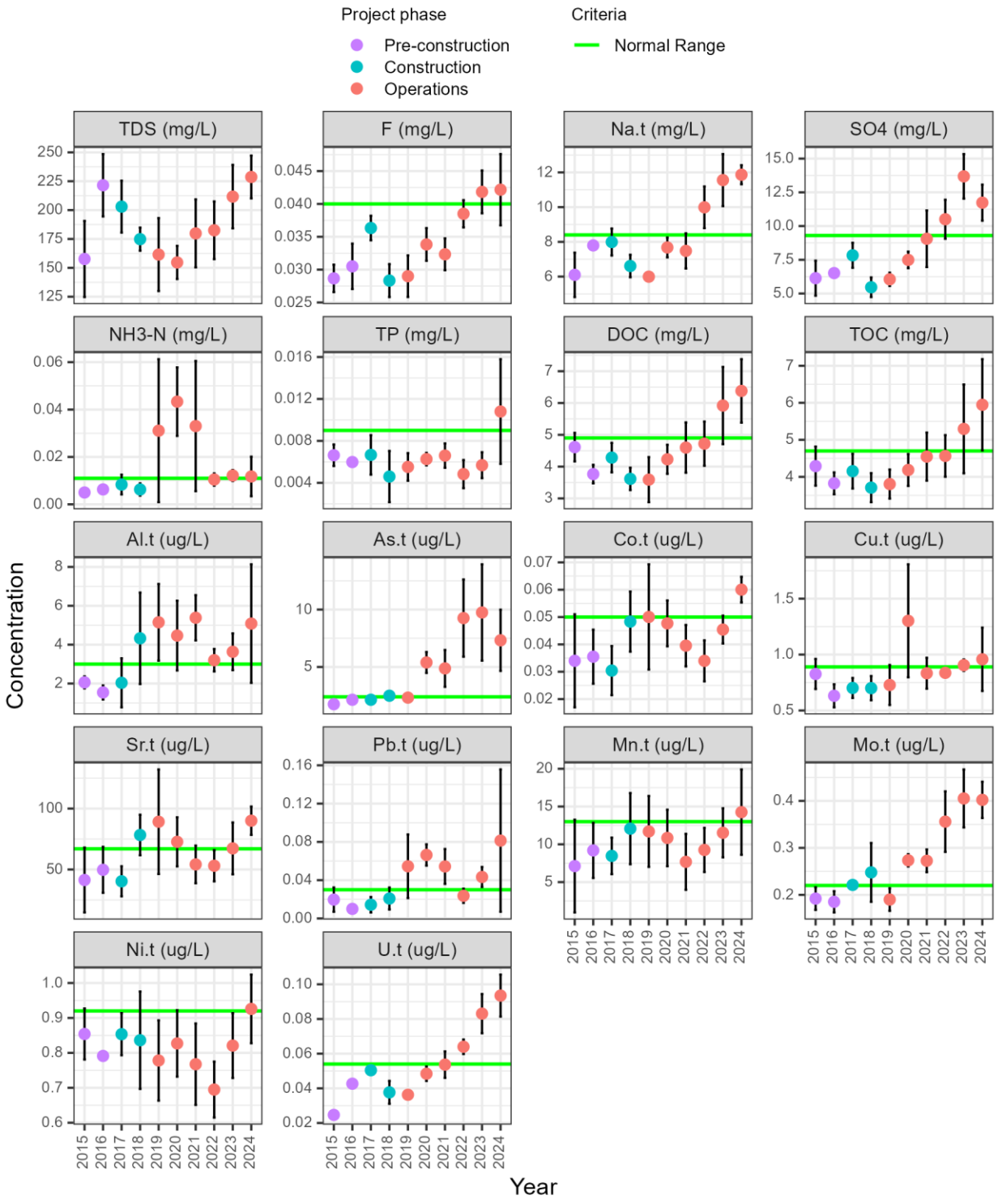


Table 4-5. Lake B7 water quality screening assessment, 2024.

Parameter	Detection Limit	Normal Range	FEIS[a]	Action Level	Summary Statistics for Lake B7 in 2024								N>NR	N>FEIS
					N	N<DL	Mean	Median	SD	SE	Min	Max		
Major Ions, Nutrients, and Organic Carbon (mg/L)														
Calcium (T)	0.01	39	-	-	12	0	**41.2**	**41.5**	3.03	0.875	37.1	46	9	0
Chloride	0.1	25	-	90	12	0	**49.1**	**49.5**	4.38	1.26	43	55.3	12	0
Fluoride	0.02	0.04	-	2.1	12	0	**0.0403**	**0.0405**	0.0029	0.00084	0.036	0.045	6	0
Magnesium (T)	0.004	5.3	-	-	12	0	4.66	4.64	0.522	0.151	4.08	5.38	1	0
Sodium (T)	0.02	7.5	-	-	12	0	**11.5**	**11.6**	0.954	0.275	10.5	13.1	12	0
Sulphate	0.3	6	-	164	12	0	**22.7**	**20.8**	10.4	3	12.8	35.9	12	0
Ammonia (as N)	0.005	0.025	-	0.148	12	2	0.0119	0.0082	0.00934	0.0027	0.005	0.0314	2	0
Nitrate (as N)	0.005	0.005	-	2.17	12	5	**0.0338**	**0.0258**	0.0313	0.00904	0.005	0.0807	6	0
Total Phosphorus	0.001	0.01	-	0.0075	12	0	0.00728	0.0073	0.00164	0.00047	0.004	0.0101	1	0
Dissolved Organic Carbon	0.5	5.5	-	-	12	0	**6.6**	**6.85**	0.579	0.167	5.4	7.16	11	0
Metals (µg/L)														
Antimony (T)	0.02	0.04	-	4.5	12	0	**0.053**	**0.053**	0.00165	0.00048	0.05	0.055	12	0
Arsenic (T)	0.02	1.8	-	18.8	12	0	**18.7**	**16.9**	4.41	1.27	14.4	27.5	12	0
Barium (T)	0.02	20	-	750	12	0	**31.7**	**31.8**	2.13	0.615	28.4	34.6	12	0
Boron (T)	5	10	-	1125	12	0	**16.8**	**17**	1.25	0.361	14.9	19.1	12	0
Cobalt (T)	0.005	0.05	-	0.765	12	0	**0.076**	**0.074**	0.0108	0.00312	0.0602	0.0918	12	0
Copper (T)	0.05	1.13	-	1.78	12	0	1.08	0.984	0.269	0.0777	0.77	1.47	5	0
Lead (T)	0.01	0.08	-	3.75	12	0	**0.1**	**0.0815**	0.0455	0.0131	0.052	0.18	6	0
Lithium (T)	0.5	7.5	-	-	12	0	**16.6**	**16.4**	1.31	0.378	15	18.9	12	0
Molybdenum (T)	0.05	0.24	-	54.8	12	0	**0.407**	**0.414**	0.0301	0.00869	0.354	0.453	12	0
Selenium (T)	0.04	0.08	-	0.75	12	2	0.0564	0.048	0.0166	0.00479	0.04	0.092	1	0
Strontium (T)	0.02	155	-	1880	12	0	**331**	**330**	13.8	3.98	315	363	12	0
Tin (T)	0.02	0.05	-	-	12	8	0.0238	0.02	0.00921	0.00266	0.02	0.052	1	0
Uranium (T)	0.001	0.03	-	11.2	12	0	**0.123**	**0.109**	0.042	0.0121	0.0828	0.188	12	0

Notes:
Bold values indicate the mean concentration is greater than the upper limit of the Normal Range.
[a] Predictions for Lake B7 were not developed because this lake was scheduled to be dewatered in the 2014 FEIS.

Figure 4-5. Lake B7 – temporal trends for parameters that exceeded the Normal Range in 2024.

Notes: Data are shown as the annual mean ± 1 SD.TDS shown for context.
Measured TDS is shown instead of calculated TDS because the lab method for reporting TDS (calculated) in 2024 was inconsistent with the method used in previous years.

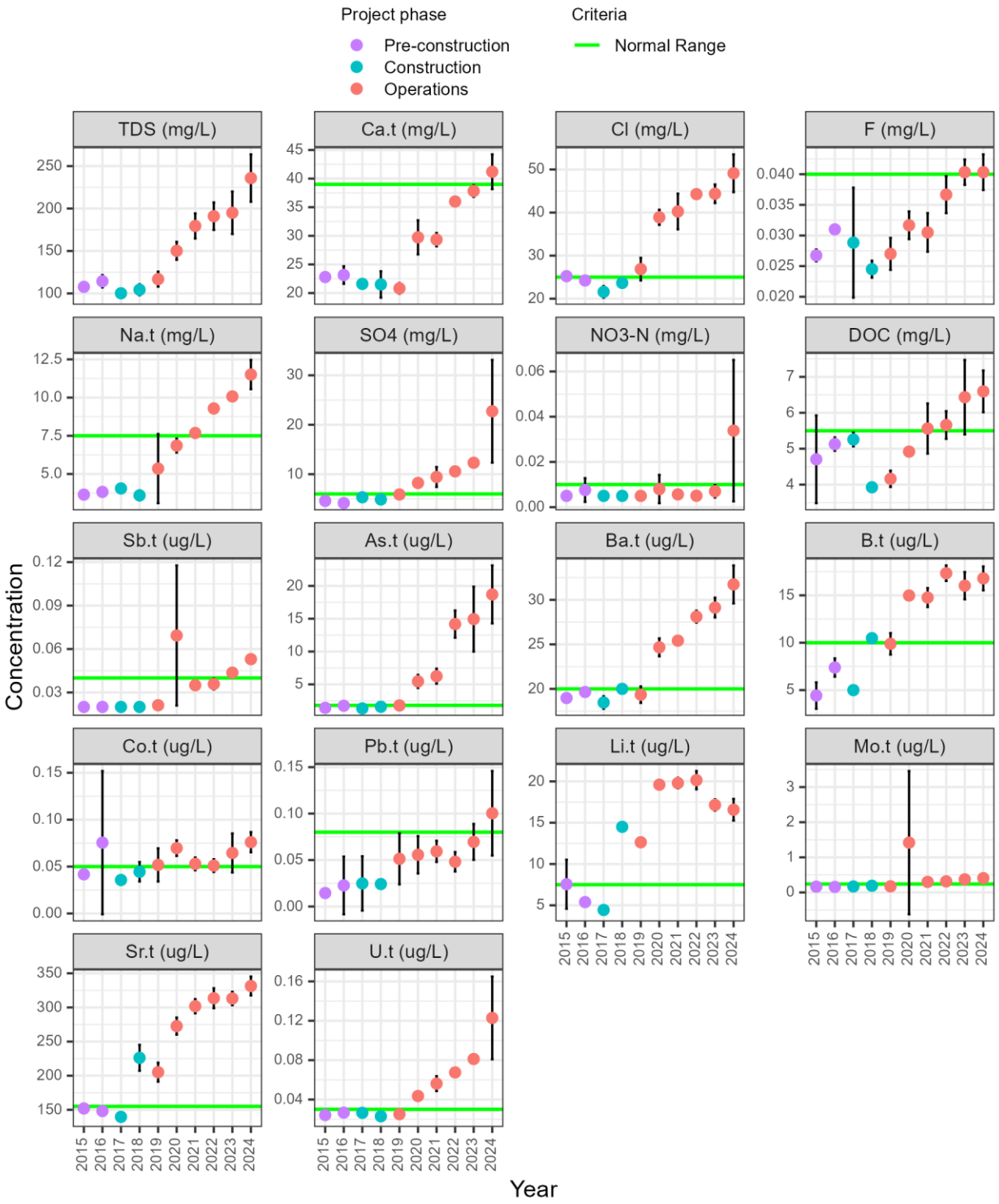


Figure 4-6. Temporal trends for key parameters of interest in the Peninsula Lakes since 2015.

Notes: Data are shown as the annual mean ± 1 SD (error bars). Points are jittered to avoid overplotting. Metals in µg/L; other parameters in mg/L
Molybdenum in Lake B7 in 2020: There were two samples in July with concentrations greater than 5 µg/L (SD error bars not shown).

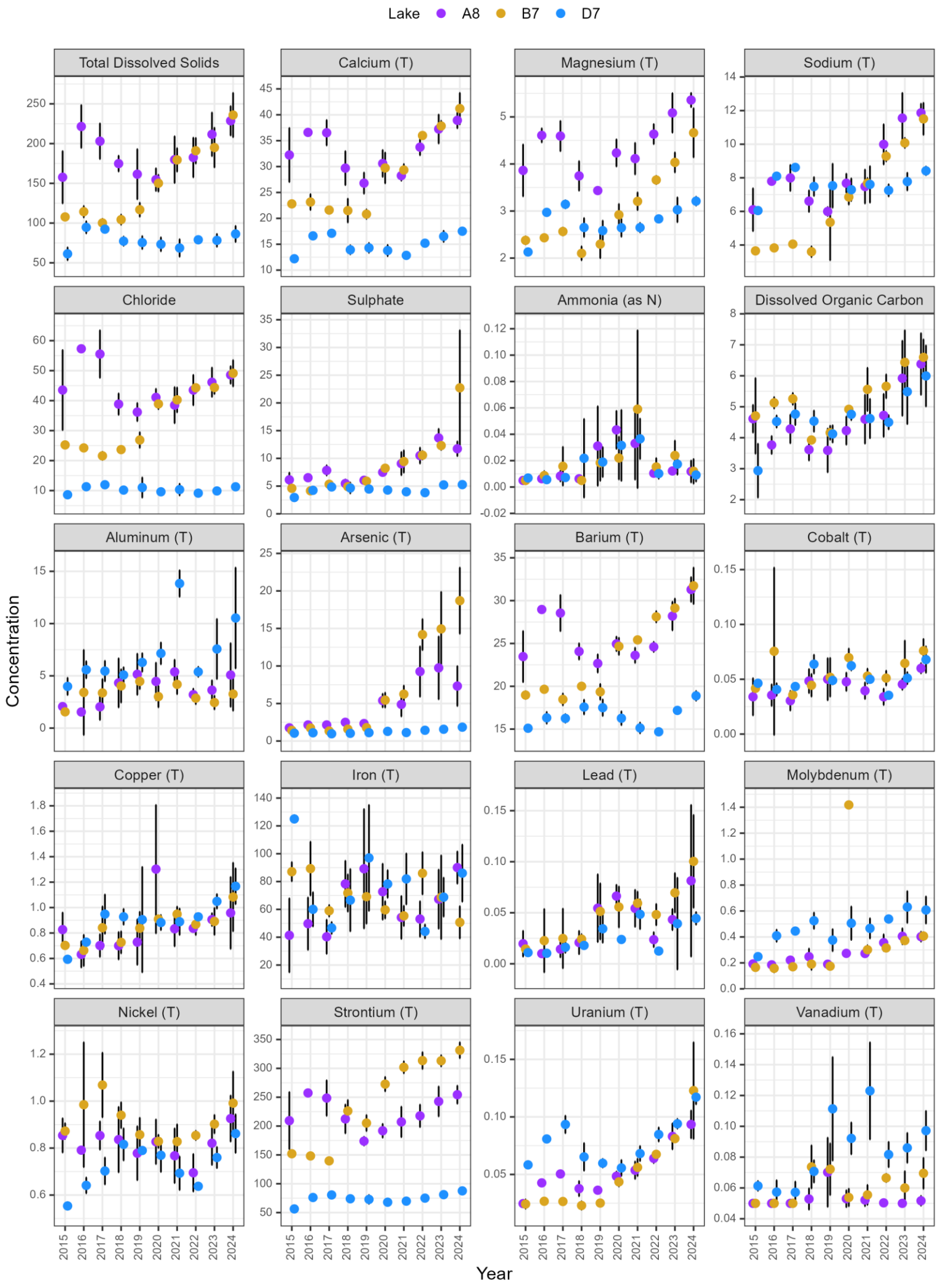
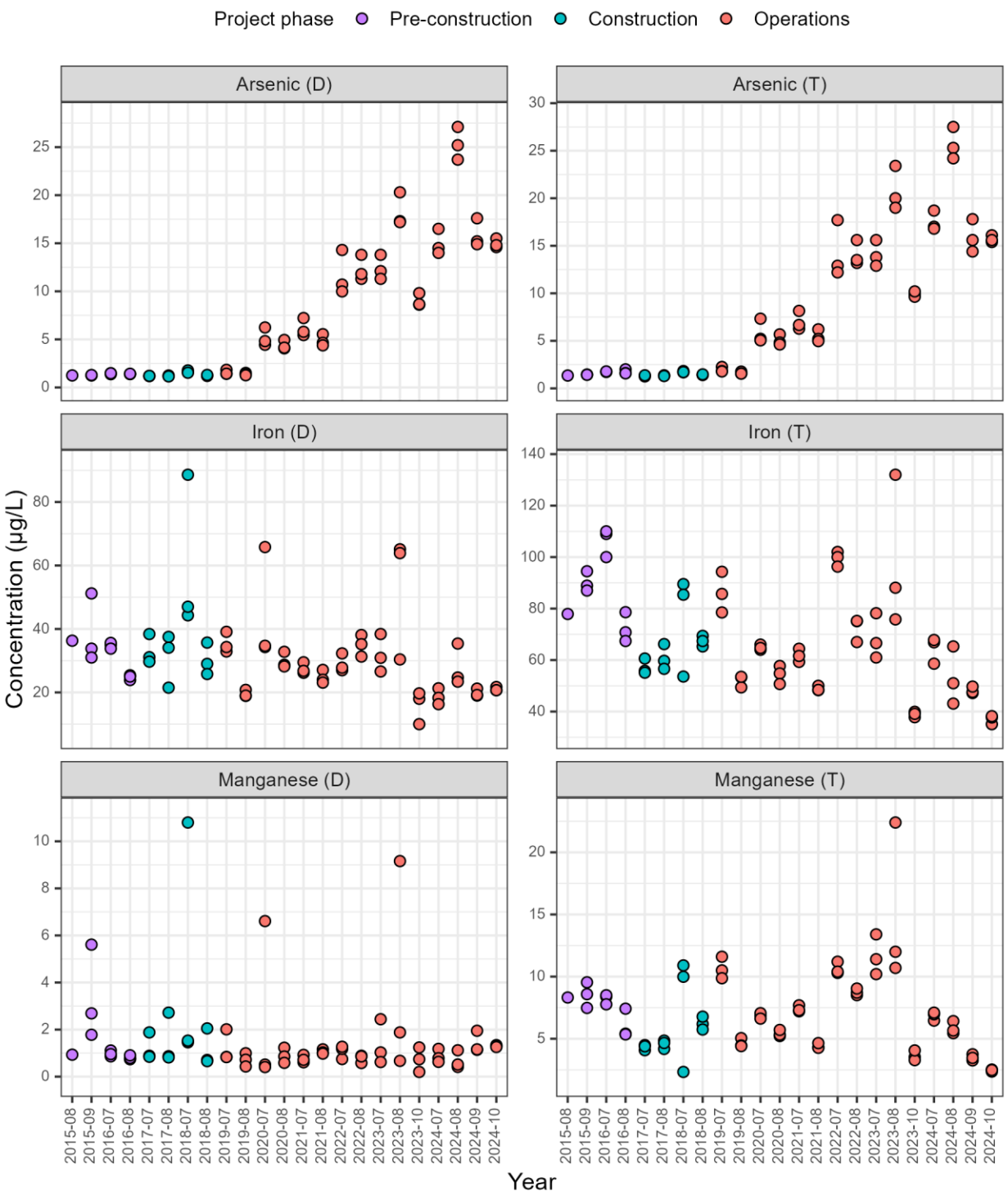


Figure 4-7. Temporal trends for arsenic, iron, and manganese in Lake B7.



4.6 Supplemental Water Quality Plots

The following figures show the concentrations of selected major ions, nutrients, and metals in surface water samples from the Peninsula Lakes since 2015. The green line indicates the Normal Range, which corresponds to the upper 90th prediction interval or percentile of samples collected prior to 2018.

List of Plots

Figure 4-8. Concentration of total dissolved solids and constituent major Ions in the Peninsula Lakes since 2015

Figure 4-9. Conductivity, alkalinity, and the concentration of selected nutrients in the Peninsula Lakes since 2015

Figure 4-10. Aluminum, arsenic, barium, and boron concentrations in the Peninsula Lakes since 2015

Figure 4-11. Cobalt, copper, iron, and lead concentrations in the Peninsula Lakes since 2015

Figure 4-12. Lithium, manganese, molybdenum, and nickel concentrations in the Peninsula Lakes since 2015

Figure 4-13. Strontium, titanium, uranium, and zinc concentrations in the Peninsula Lakes since 2015

Figure 4-8. Concentration of total dissolved solids and constituent major Ions in the Peninsula Lakes since 2015.

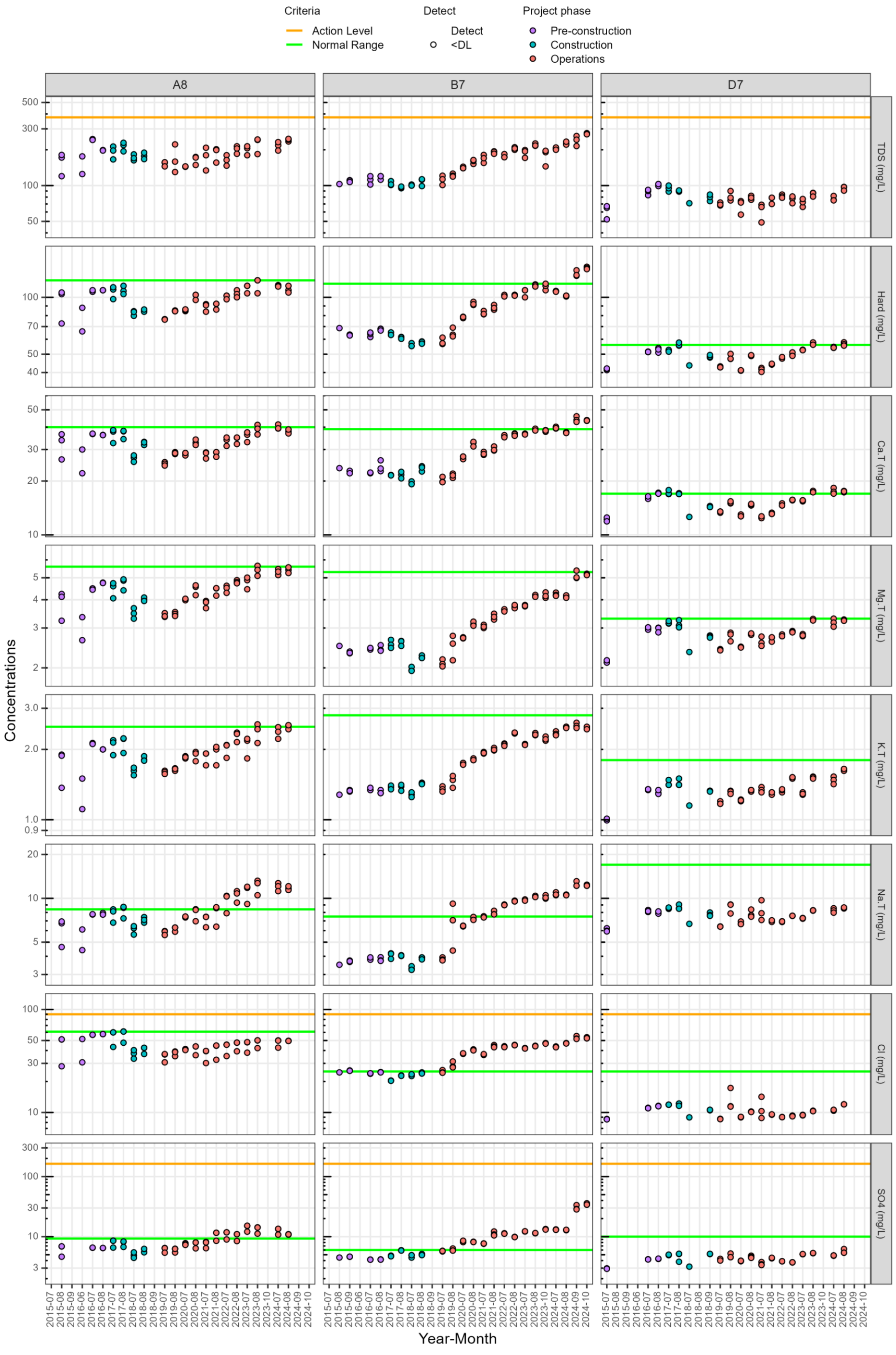


Figure 4-9. Conductivity, alkalinity, and the concentration of selected nutrients in the Peninsula Lakes since 2015.

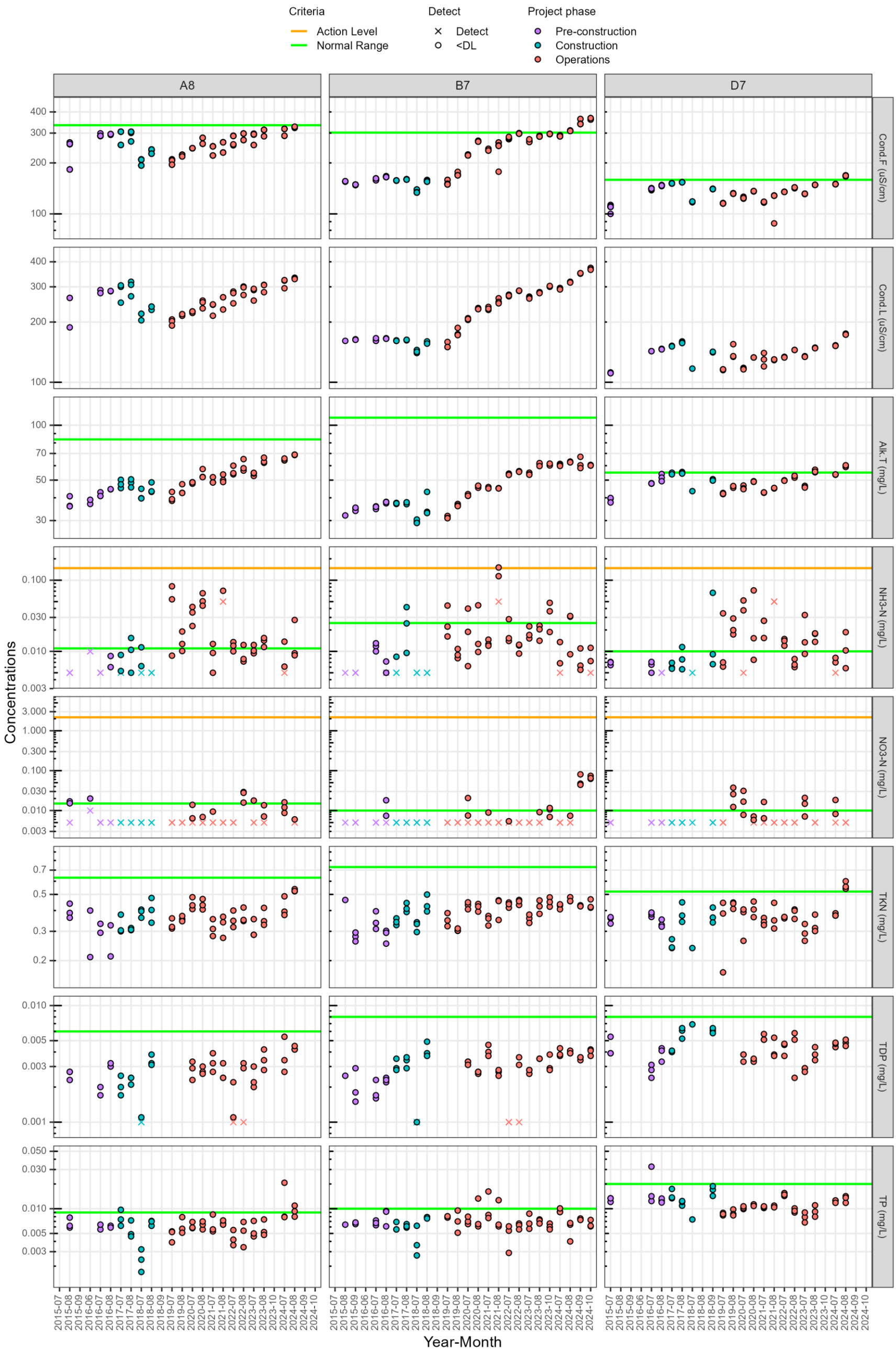


Figure 4-10. Aluminum, arsenic, barium, and boron concentrations in the Peninsula Lakes since 2015.

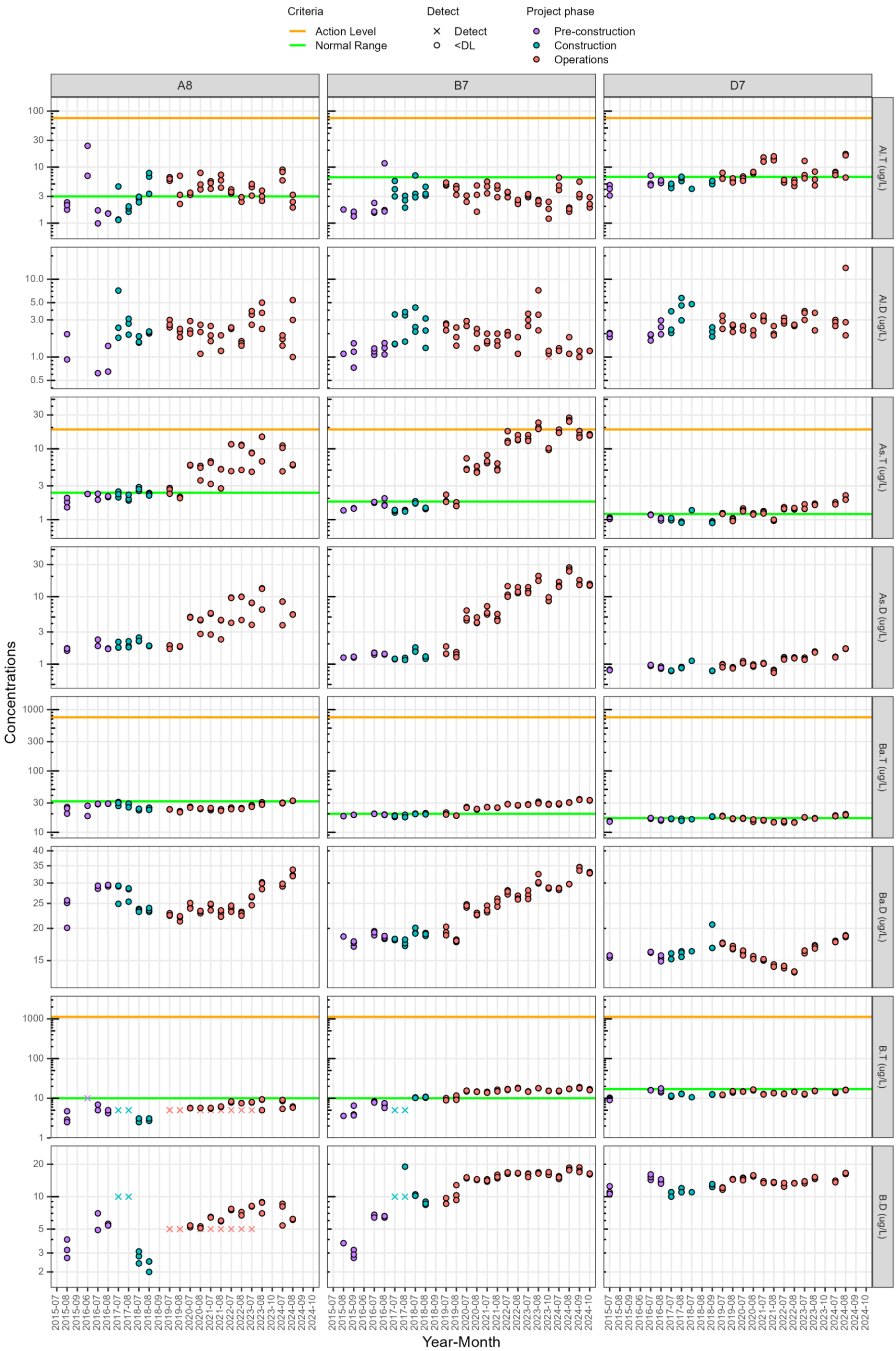


Figure 4-11. Cobalt, copper, iron, and lead concentrations in the Peninsula Lakes since 2015.

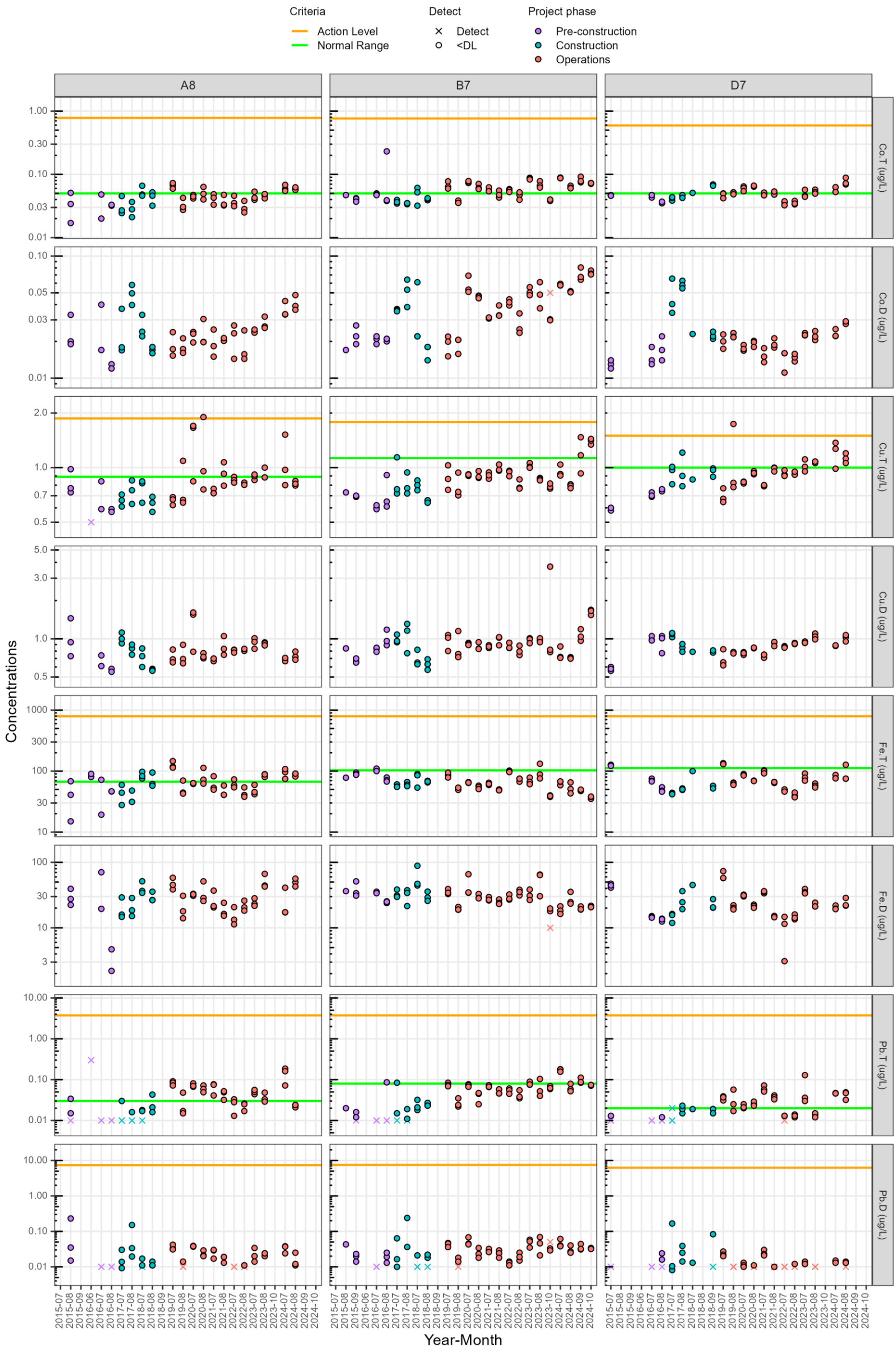


Figure 4-12. Lithium, manganese, molybdenum, and nickel concentrations in the Peninsula Lakes since 2015.

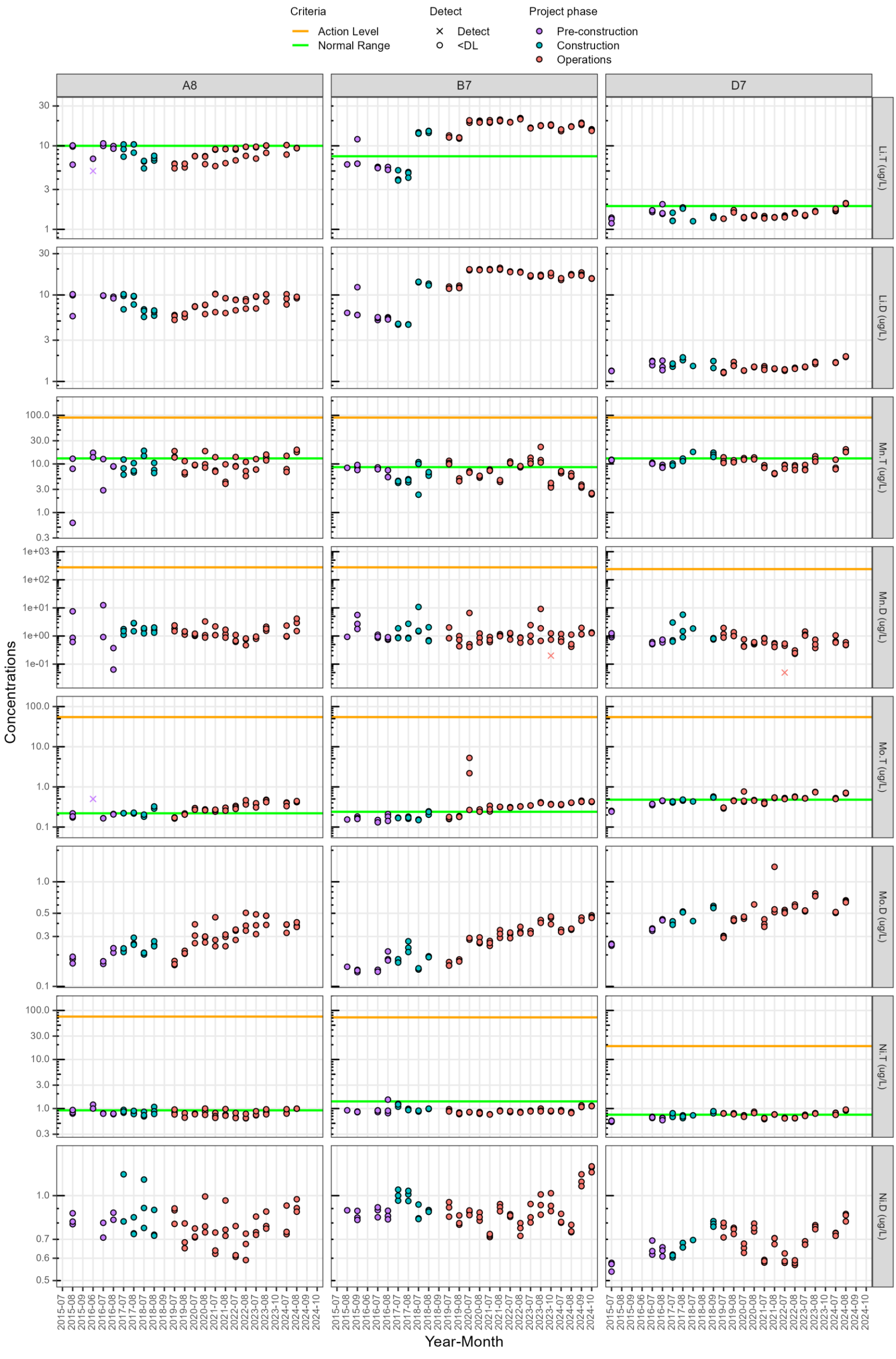
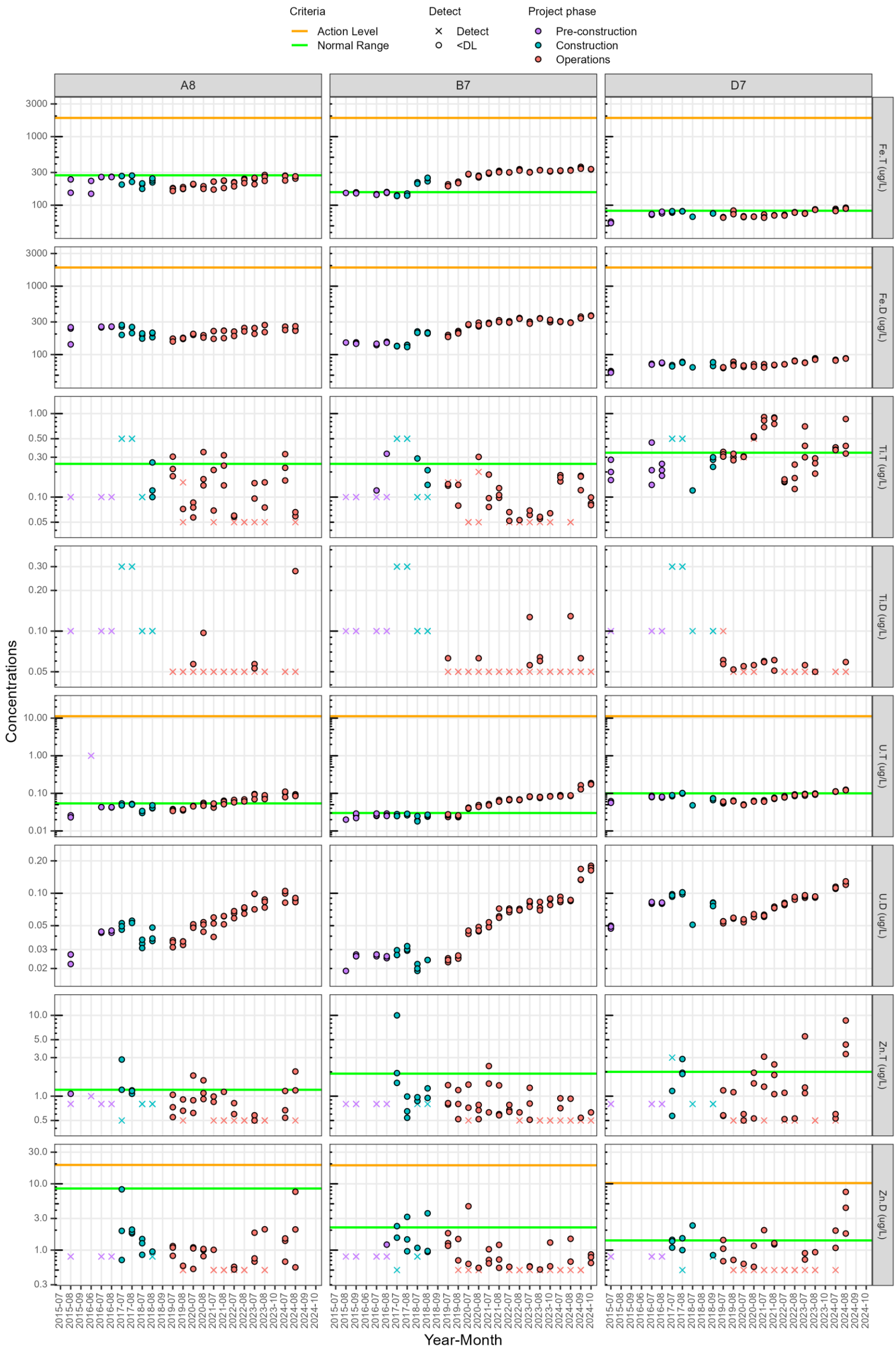


Figure 4-13. Strontium, titanium, uranium, and zinc concentrations in the Peninsula Lakes since 2015.



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5 PHYTOPLANKTON COMMUNITY

5.1 Introduction

This chapter presents the findings of the 2024 phytoplankton study in Meliadine Lake. The study aims to determine whether effluent discharged from the Mine is influencing primary productivity in the East Basin compared to other areas of the lake.

The phytoplankton study has been conducted annually since 2015. During the pre-construction and construction phases (2015–2017), monthly sampling was carried out to characterize seasonal changes in the phytoplankton community. Since 2018, sampling has been conducted once each August at water quality monitoring locations (**Figure 3-1**). August was selected as the preferred sampling period due to its lower variability in phytoplankton monitoring endpoints compared to other months (Golder, 2018).

In response to comments from CIRNAC in 2022 and 2023 regarding effluent-related increases in primary productivity, the scope of the 2024 study was expanded to include additional sampling events in July and September at MEL-01, MEL-02, and MEL-03. These additional sampling events provide an opportunity to assess within-year variability in the phytoplankton community. While July and September data are discussed where relevant, the August dataset remains the primary focus for evaluating potential mining-related impacts on the phytoplankton community and changes in primary productivity in Meliadine Lake.

Objectives and Key Question

The key question for the phytoplankton study is,

> *Is the phytoplankton community in Meliadine Lake adversely affected by potential mine-related changes in water quality?*

Various lines of evidence are explored to help answer this question, including:

- Spatial and temporal patterns in nutrient concentrations. Increased nutrient loads to Meliadine Lake could result in the stimulation of phytoplankton productivity.
- Spatial and temporal patterns in phytoplankton metrics. This includes looking at key metrics (biomass, density, and taxa richness) across all taxa (i.e., *total*) or by major taxa group (MTG), as well as looking more closely at changes in community structure using common diversity indices (Simpson's diversity index, Simpson's evenness index, and Bray-Curtis dissimilarity) and multivariate analyses.

- Nutrient-productivity relationships. These analyses involve looking at the spatial/temporal patterns in phytoplankton productivity metrics and comparing them to corresponding nutrient concentrations to determine if the patterns are linked.
- Spatial and temporal patterns in Trophic Status Index (TSI). TSI has been used to classify estimated productivity of lakes based on phosphorus, chlorophyll-a, and/or Secchi depth.

5.2 Findings from the 2024 Phytoplankton Study

- Phosphorus concentrations have remained relatively stable throughout operations and particularly since 2020.
- From 2018 to 2023, there was an increasing temporal trend in chlorophyll-a concentrations at MEL-01 and MEL-02. The 2024 results diverged from this increasing trend – the average chlorophyll-a concentration at MEL-01 was similar to levels observed during pre-construction, construction, and early operations, and the average chlorophyll-a concentration at MEL-02 was similar to the past two years. Chlorophyll-a concentrations at reference locations were slightly higher than observed in previous years but were still lower than at MEL-01. It is important to note that chlorophyll-a is only an indicator of phytoplankton productivity; phytoplankton biomass (see next bullet) is a more direct measure of primary productivity.
- Phytoplankton biomass was lower in August 2024 than 2023 at MEL-01 but within the range of values observed in previous monitoring years. Phytoplankton biomass at MEL-01 is typically higher than at MEL-02 and the reference areas, but this was not the case in August 2024. However, total biomass was higher at MEL-01 compared to MEL-02 and the reference areas during the July and September sampling events. The seasonal data and past years' monitoring data suggest that the East Basin of Meliadine Lake may be naturally more productive than the other areas of the lake.
- Multivariate analysis indicated that the phytoplankton community in MEL-01 was structurally different from the phytoplankton communities in MEL-02 and the reference areas, and that the community composition in all areas was slightly different than in 2023. The Bray-Curtis dissimilarity index calculations supported the interpretation that the phytoplankton community at MEL-01 is structurally different than the phytoplankton community in other areas. It is unclear whether the structural differences in the community were due to effluent (specifically nitrate) as was predicted in the FEIS (Agnico Eagle, 2014), or due to some other factor unique to the East Basin.

5.3 Methods

5.3.1 Field and Laboratory Procedures

The phytoplankton study was conducted alongside the AEMP water chemistry sampling program to assess algal biomass, richness, and density, as well as chlorophyll-a concentrations. Details of the sampling method are provided in the AEMP Design Plan (Azimuth, 2025). Briefly, water samples for phytoplankton taxonomy and chlorophyll-a analysis were collected as composite samples at each station. Composite sampling involved taking grab samples every 2 meters throughout the water column, extending to approximately 1 meter above the sediment (e.g., at depths of 2 m, 4 m, 6 m, etc.).

Secchi depth measurements were recorded at each station to evaluate the relationship between water clarity and primary productivity. The annual mean and standard error of Secchi depth readings for each area are presented in **Table 5-1**.

Table 5-1 Secchi depth from the open-water sampling events in 2024.

Area	Secchi Depth (m)		
	N	Mean	Standard Error
MEL-01	12	6.1	0.1
MEL-02	15	6.4	0.2
MEL-03	15	7.3	0.2
MEL-04	4	7.3	0.45
MEL-05	5	7.2	0.1

Note:
Secchi depth was typically measured concurrently with collection of phytoplankton samples, with the exception of MEL-01 and one of five stations at MEL-04 in August due to unsuitable conditions.

Water samples for taxonomic identification were collected in 50 mL plastic tubes and preserved with Lugol's iodine solution (3–4 drops) at the Environment Lab at the end of the day. As in previous years, phytoplankton taxonomic identification was conducted by David Findlay at Plankton R Us Inc. (Winnipeg, MB). Phytoplankton were identified to the lowest practical taxonomic level, with abundance estimates (cells/L) and wet weight biomass (mg/m^3) provided for each taxon per sample. Biomass was determined based on the estimated cell volume for each species, which was obtained by measuring up to 50 cells per species and applying the geometric formula best suited to the cell shape (Vollenweider, 1968; Rott, 1981). A specific gravity of 1 was assumed for cellular mass.

Phytoplankton taxonomy results were uploaded to the MS Access database for the AEMP, which is jointly administered by Azimuth and Biologica Environmental Services (Victoria, B.C.).

Water samples for chlorophyll-a were collected in 1-L plastic bottles wrapped in foil to limit exposure to UV light. The 1-L bottles were kept in cooler with ice packs while in the field. At the end of each day, 500 mL of water was filtered through glass fibre type C filters (nominal pore size of 1-2 µm) with a filtering apparatus that was configured to limit light exposure. The filters were placed in foil-wrapped petri dishes and stored in the freezer until the end of each sampling event. The frozen samples were shipped to the Biogeochemical Analytical Service Laboratory at the University of Alberta in Edmonton. Chlorophyll-a concentrations were determined using spectrophotometry according to the method in Welschmeyer (1994).

5.3.2 Quality Assurance and Quality Control

The methods and results used to evaluate the reliability of the phytoplankton and chlorophyll-a data are provided in **Appendix A**. The key findings from the QA/QC assessment are summarized below:

- **Field Duplicates** – Field duplicate samples for phytoplankton taxonomy and chlorophyll-a were collected at approximately 10% frequency (2 in July, 3 in August, and 2 in September). The data quality objective (DQO) for field duplicates is a relative percent difference (RPD) of less than 50% between the samples for phytoplankton biomass, density, and chlorophyll-a.

  There was good agreement between the duplicate samples for chlorophyll-a and phytoplankton biomass. For chlorophyll-a, RPDs ranged from 6 to 14%. The RPDs for total biomass ranged from 6 to 28%. Total density was more variable between the field duplicates, with RPDs ranging from 12 to 63%. The 50% DQO for total density was exceeded at MEL-03-05 in July (57%) and MEL-04-02 in August (63%). The DQO exceedances were attributed to relatively large differences in the density of chlorophytes (65 to 169%), which reflect the underlying heterogeneity in the phytoplankton community.

- **Laboratory Duplicates** – For each sampling event, the taxonomist randomly selected two samples as QC duplicates. The RPD DQO of 25% was marginally exceeded in laboratory duplicate sample MEL-01-01 in July (26%). between each of the sample and laboratory duplicate pairs was less than the RPD DDQ of 25% except for the laboratory duplicate for MEL-01-01 in July, which had an RPD of 26% for total density.

- **Duplicate Summary** – The field and laboratory duplicate samples met their respective DQOs for total biomass and chlorophyll-a, indicating the sampling methods produced precise and repeatable estimates for these two metrics. Total density was more variable among the field and laboratory duplicates, but overall, there was good agreement among the duplicates.

The laboratory results were screened using a process similar to that applied to water quality data. An independent reviewer verified at least 10% of the data to ensure completeness, accuracy, and the absence of data entry, transcription, or invalid data errors. The QA/QC assessment confirms that the

2024 phytoplankton and chlorophyll-a data are accurate and reliable for evaluating changes in primary productivity in Meliadine Lake.

5.3.3 Data Analysis

Data analyses were conducted using R version 4.2.2 (R Core Team, 2024). Phytoplankton metrics—including biomass, density, and taxa richness—were calculated for individual taxa, summed across all taxa (i.e., total phytoplankton community), and grouped into major taxonomic categories (dinoflagellates, diatoms, cyanophytes, cryptophytes, chrysophytes, chlorophytes, and euglenophytes). Euglenophytes comprise less than 1% of the phytoplankton community, and were therefore excluded from analysis. Summary statistics for the July, August, and September sampling events are provided in **Appendix E1**.

Nutrient data from the surface water quality monitoring program were integrated with phytoplankton and chlorophyll-a results to assess relationships between nutrient availability and primary productivity.

Temporal and Spatial Trends

Time series plots were used to evaluate spatial and temporal patterns in nutrients, chlorophyll-a, and phytoplankton metrics across years, with data organized by sampling area. Given the seasonal nature of phytoplankton populations, species richness, biomass, and density were expected to exhibit annual variation due to regional climate influences and spatial variability linked to basin-specific factors such as morphology, ice-off timing, and nutrient status.

The underlying premise of this assessment was that while natural interannual variability occurs, phytoplankton communities in the exposure areas (MEL-01 and MEL-02) and reference areas (MEL-03, MEL-04, and MEL-05) should follow similar patterns of change. However, if phytoplankton communities in MEL-01 and MEL-02 deviate from historical trends or from reference areas, it may indicate an effect of water quality on community structure.

Data from the July, August, and September 2024 sampling events were used to examine within-year variability in the phytoplankton community for select metrics.

Community Structure

Potential differences in the phytoplankton community among areas in Meliadine Lake over time were evaluated using standard diversity indices:

- **Simpson's Diversity Index** – measures the probability that two randomly selected individuals belong to different species, reflecting overall community diversity.
- **Simpson's Evenness Index** – quantifies how evenly individuals are distributed among species, with higher values indicating more uniform distribution.

- **Bray-Curtis Dissimilarity** – assesses compositional differences between two communities based on species abundance, with values ranging from 0 (identical) to 1 (completely different).

The calculations for Simpson's Diversity Index, Simpson's Evenness, and Bray-Curtis Index are provided in **Appendix G1**.

Non-metric multidimensional scaling (nMDS) analysis was used to explore potential differences in the phytoplankton community among areas and over time. This ordination technique reduces high-dimensional taxonomic data (e.g., biomass per taxon per sample) into two or three dimensions, capturing key patterns in community variability.

The nMDS approach that has been adopted for this study is based on the Reference Condition Approach (RCA) described in the EEM Technical Guidance Document (Environment Canada, 2012). The fundamental premise of RCA is that a suitably large set of baseline and/or reference data can be used to characterize biological attributes in unimpacted environments. The phytoplankton community structure in reference areas was analyzed first to establish a range of reference conditions, against which the communities at MEL-01 and MEL-02 were compared. To maintain consistency and enable comparisons over time, nMDS analysis focused on phytoplankton data from the August sampling events.

nMDS analyses were completed in R using the statistical package 'vegan' (version 2.5-6) according to the following workflow:

- **Step 1 – Data Preparation**: Biomass data were compiled for all individual samples collected in August from 2013 to 2024. To limit the influence of rarely observed taxa, individual taxa that accounted for less than 2% of any individual sample were excluded from the analysis. Raw biomass values were log(x+1) transformed to reduce the influence of dominant taxa. This data set was turned into a Bray-Curtis distance matrix.
- **Step 2 – Running the nMDS**: The nMDS was run on the Bray-Curtis matrix. Shepard plots and stress values were used to optimize results. Stress, in the context of nMDS, refers to how distorted the representation of the data are in two or three dimensions compared to the original multi-dimensionality of the data. Lower stress means a better fit of the data in the reduced dimensionality. Multiple iterations of the analysis are completed to determine which position (or ordination) of points in two or three dimensions produces the lowest stress value. The guidelines outlined in Clarke (1993) are commonly used to evaluate stress values as follows: <0.05 = excellent, <0.10 = good, <0.20 = usable, >0.20 = not acceptable.

  Stress of nMDS ordinations tends to increase with increasing sample size and decrease with an increasing number of dimensions, independent of the structure of the underlying data (Dexter et al., 2018). Given the large number of phytoplankton samples collected over the course of monitoring at Meliadine Lake, it is expected that stress of a suitable nMDS may exceed the

threshold of 0.20. Therefore, stress was considered alongside other factors such as ease of interpretation when evaluating the potential nMDS ordinations.

- **Step 3 – Visualization and Interpretation**: The nMDS results were visualized by first plotting 90th, 95th and 99th percentile probability ellipses using the reference data only. The next step involved adding nMDS scores for NF (MEL-01) and MF (MEL-02) areas for each year. The 90th, 95th and 99th percentile probability ellipses provide a concise way of visualizing whether the phytoplankton community at the NF and MF areas are within the range of baseline/reference conditions for Meliadine Lake.

Trophic Status

Trophic status estimates based on total phosphorus, chlorophyll-a, and water transparency (Secchi depth) are commonly used as a surrogate for direct measurement of phytoplankton communities in studies where such data is not available. Because the AEMP includes direct measurement of the phytoplankton community, trophic status estimates were included as a supporting line of evidence for evaluating spatial and temporal changes in primary productivity in Meliadine Lake.

The trophic status was calculated for each area based on the following frameworks/methods:

- CCME (2004) –predefined trigger ranges developed for freshwater environments in Canada (**Table 5-2**).
- Vollenweider (1968) – A general classification scheme based on ranges of total phosphorus, chlorophyll-a, and Secchi depth (**Table 5-3**).
- Carlson (1977) – Independent Trophic State Index scores for total phosphorus, chlorophyll-a and Secchi depth are calculated according to the equations below. The TSI scores correspond to general trophic classification – oligotrophic, mesotrophic, etc. – in **Table 5-4**.

Total phosphorus: $$TSI_{TP} = 10\ (6 - \left[\frac{\ln\ (^{48}/_{TP})}{\ln 2}\right])$$

Chlorophyll-a: $$TSI_{Chl} = 10\ (6 - \left[\frac{2.04 - 0.68(\ln Chl)}{\ln 2}\right])$$

Secchi: $$TSI_{Secchi} = 10\ (6 - \left[\frac{\ln\ \text{Secchi}}{\ln 2}\right])$$

Table 5-2. Trophic classification for lakes based on total phosphorus trigger ranges (CCME, 2004).

Trophic Status	Total Phosphorus (mg/L)
Ultra-oligotrophic (very nutrient-poor)	<0.004
Oligotrophic (nutrient-poor)	0.004 to 0.010
Mesotrophic (containing a moderate level of nutrients)	0.010 to 0.020
Meso-eutrophic (containing moderate to high levels of nutrients)	0.020 to 0.035
Eutrophic (nutrient-rich)	0.035 to 0.100
Hyper-eutrophic (very nutrient-rich)	>0.100

Notes:
Reference = CCME, 2004.

Table 5-3. Trophic classification for lakes based on ranges of total phosphorus, chlorophyll-a and Secchi depth (Vollenweider, 1968).

Trophic Status	Total Phosphorus (mg/L)		Chlorophyll-a (µg/L)		Secchi Depth (m)	
	Mean	Range	Mean	Range	Mean	Range
Oligotrophic	0.008	0.003 to 0.018	1.7	0.3 to 4.5	9.9	5.4 to 28.3
Mesotrophic	0.027	0.011 to 0.096	4.7	3.0 to 11.0	4.2	1.5 to 8.1
Eutrophic	0.084	0.016 to 0.386	14.3	3.0 to 78.0	2.5	0.8 to 7.0

Notes:
Reference = Vollenweider, 1968.

Table 5-4. Trophic status index and general trophic classifications for lakes (Carlson, 1977).

General Trophic Classification	Trophic State Index	Total Phosphorus (mg/L)	Chlorophyll-a (µg/L)	Secchi Depth (m)
Oligotrophic	<30 to 40	0 to 0.012	0 to 2.6	>8.0 to 4
Mesotrophic	40 to 50	0.012 to 0.024	2.6 to 20	4 to 2
Eutrophic	50 to 70	0.024 to 0.096	20 to 56	2 to 0.5
Hyper-eutrophic	70 to 100+	0.096 to 0.38+	56 to 155+	0.5 to <0.25

Notes:
Reference = Carlson, 1977.

5.4 Results and Discussion

5.4.1 Background – Historical Data

The following section provides an overview of historical phytoplankton community data from the baseline period. The historical data from the late 1990's was not formally included in the dataset for evaluating spatial and temporal trends in the AEMP because of differences in the collection methods. The data are provided for context only with phytoplankton data collected during the AEMP. One additional baseline phytoplankton sampling event was completed in the NF area in August 2013 as part of a wider program tasked with collecting data to help develop the AEMP. Phytoplankton data from this program were included in the AEMP as a point of comparisons for the recent baseline period because the same taxonomist was used for the analysis. However, due to differences in field sampling methods, the results from the 2013 baseline program should be used with caution when comparing against data collected as part of the AEMP.

Phytoplankton studies in Meliadine Lake and other lakes in the region were completed in the late 1990s to support the environmental assessment process. Four locations were sampled throughout Meliadine Lake in July, August, and September of 1997 and 1998. Chrysophytes (golden brown algae) were the dominant taxa group in terms of density and biomass. The community composition was similar throughout the lake and community succession followed a similar pattern of season change during the open water season each year (Golder, 2012). Biomass estimates in 1997 were in the range of 300 to 600 µg/L in July and August. The following year, biomass was approximately 2-fold higher, with values as high as 1,900 µg /L at the south basin in the vicinity of the current monitoring area MEL-05 (**Table 5-5**).

Table 5-5. Phytoplankton Community Data from Meliadine Lake in 1997 and 1998.

Site	AEMP Area	Date	Density (No. cells/L)	Biomass (mg/m^3)	Richness (No. taxa/site)
ML-E	MEL-01	19 Jul 97	2,008,000	529	56
		17 Aug 97	3,844,000	636	65
		17 Jul 98	2,593,000	1,887	75
		4 Sep 98	4,933,000	1,362	78
ML-S	MEL-05	20 Jul 97	1,863,000	627	73
		16 Aug 97	1,871,000	437	63
		25 Jul 98	3,736,000	1,119	67
		1 Sep 98	5,713,000	1,996	80
ML-SE	SE of MEL-05	22 Jul 98	2,991,000	1,772	83
ML-W	MEL-04	20 Jul 97	2,175,000	483	46
		16 Aug 97	1,135,000	342	52
		27 Jul 98	3,026,000	828	68

5.4.2 Nutrient Loading to Meliadine Lake

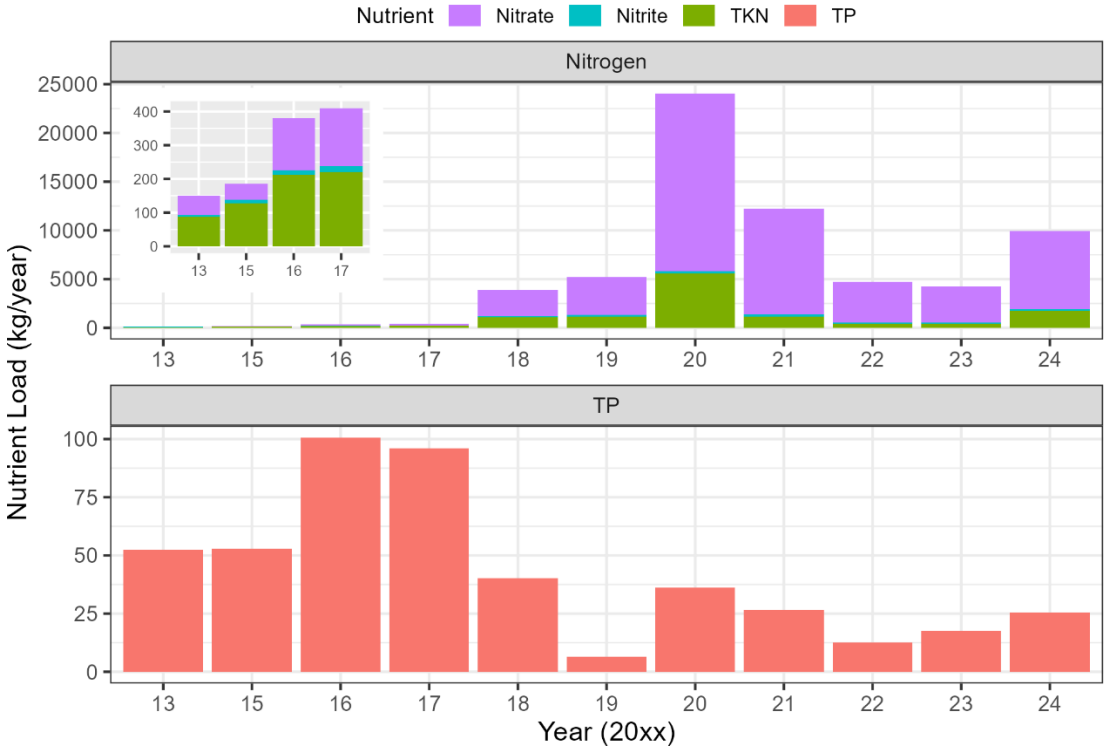
Monthly loadings for key nutrients (e.g., nitrate [NO_3], nitrite [NO_2], total Kjeldahl nitrogen [TKN][9], and total phosphorous) are presented in this section to help interpret the phytoplankton taxonomy and chlorophyll-a results. Monthly and cumulative loadings for other nutrients are provided in **Appendix B2**.

The total phosphorus load to Meliadine Lake in 2024 was marginally higher compared to 2022 and 2023. However, since the main camp STP started operating in 2018, the annual phosphorus load has consistently been less than ½ of the estimated annual load during the construction phase in 2016 and 2017 (**Figure 5-1**).

As predicted, nitrogen loadings have increased during operations due to residual nitrate-based explosives in contact water. To date, the peak load of nitrogen to Meliadine Lake occurred in 2020 during the emergency authorization. Nitrogen loadings were also comparatively high in 2021 and 2024 due to above average precipitation and discharge volumes to CP1 (**Figure 2-5**).

Figure 5-1. Annual loadings (kg/year) of nitrogen and total phosphorus to Meliadine Lake

Notes: Annual loadings in 2013, 2015, 2016, and 2017 were presented in the 2018 AEMP/EEM (Golder, 2019). Loadings from 2018 onward are calculated based on discharge volumes and concentration data from MEL-14 (**Section 2.4.4**).



[9] Total Kjeldahl nitrogen is the sum of organic nitrogen and ammonia. Total nitrogen is the sum of nitrate, nitrite, and TKN.

5.4.3 Chlorophyll-a

Between Years Comparisons

Chlorophyll-a concentrations from 2015 to 2024 for the August sampling event are shown in **Figure 5-2**. The mean and standard deviation by area and year are provided in **Table 5-6**.

Since 2018, chlorophyll-a concentrations have shown the same general year-over-year pattern of increase at MEL-01 and MEL-02. Furthermore, the same temporal trend was not observed at the reference areas. The large magnitude of increase at MEL-01, combined with the divergent temporal trend compared to the reference area, suggested effluent discharged to the East Basin of Meliadine Lake was the most likely source.

In 2024, chlorophyll-a concentrations at MEL-01 dropped significantly to 1.98 µg/L, aligning with levels observed before the Mine began discharging effluent in 2018. At MEL-02, the average concentration in August 2024 was 1.43 µg/L, comparable to values recorded in 2022 and 2023 (**Table 5-6**; **Figure 5-2**). While the August 2024 chlorophyll-a concentration at MEL-01 remained slightly higher than those in the reference areas (1.2–1.5 µg/L), the similarity in concentrations across study areas and the overall trend toward pre-operational conditions suggests effluent is not contributing to a sustained change in primary productivity.

Seasonal Variability

In 2024, chlorophyll-a concentrations were measured at MEL-01, MEL-02, and MEL-03 in July and September in addition to the routine AEMP sampling event in August. Chlorophyll-a concentrations for all sampling events in 2024 are shown in **Figure 5-3.**

Chlorophyll-a concentrations showed different seasonal patterns among the study areas. At MEL-01, chlorophyll-a concentrations were relatively stable from July-September at approximately 2 µg/L on average. At MEL-02, chlorophyll-a was lower in August (~1.4 µg/L) compared to July (~1.8 µg/L) and September (~2.1 µg/L). The average chlorophyll-a concentration at MEL-03 trended higher each month, from 1 µg/L in July to 1.4–1.7 µg/L in September. The reason for divergent trends among the different areas is unclear, but chlorophyll-a can change due to several factors other than effluent, including changes in light availability, water temperature, nutrient dynamics, stratification, runoff, and zooplankton grazing. Despite the subtle differences in chlorophyll-a, concentrations throughout Meliadine Lake are low and within the range of oligotrophic status (0.3-4.5 µg/L) defined by Vollenweider (**Table 5-3**).

Figure 5-2 Chlorophyll-a Concentrations (µg/L) in Meliadine Lake during the August field sampling event since 2015.

Notes: Triplicate samples were collected at each area/station replicate up until 2023, inclusive. In 2024, intensity of sampling was reduced to one sample per area/station replicate due to low variability observed within a given area/station.

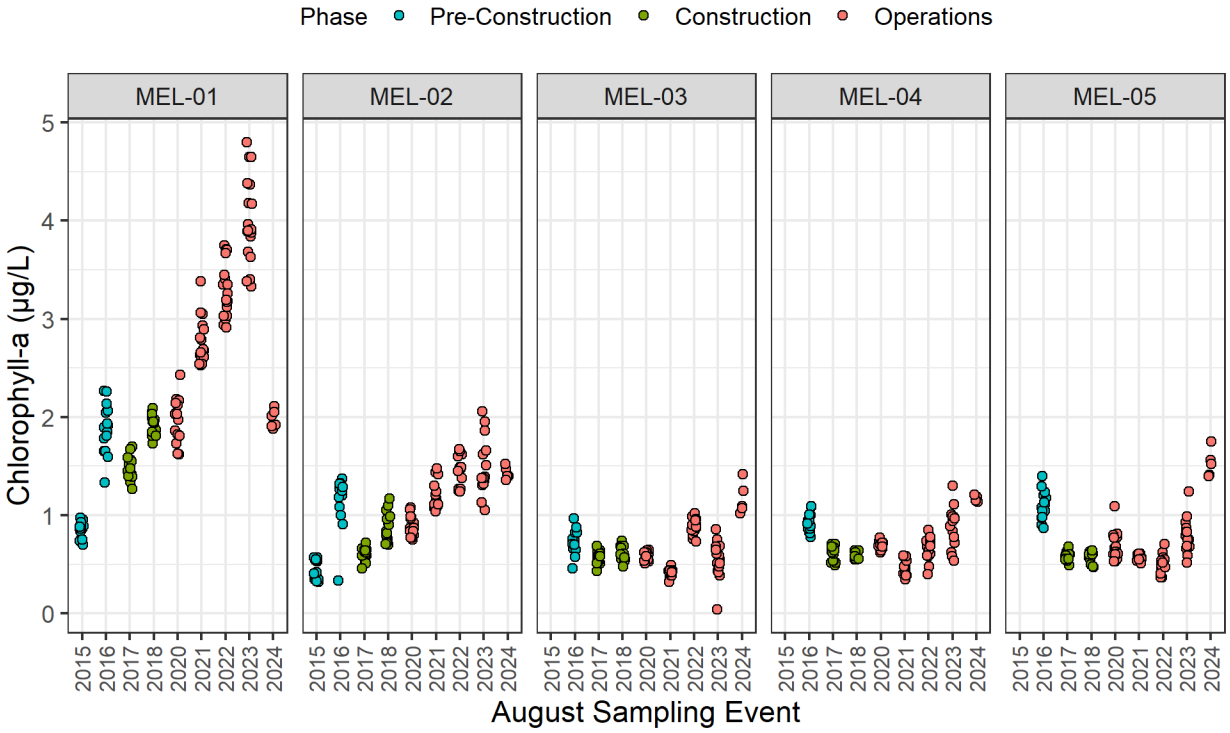
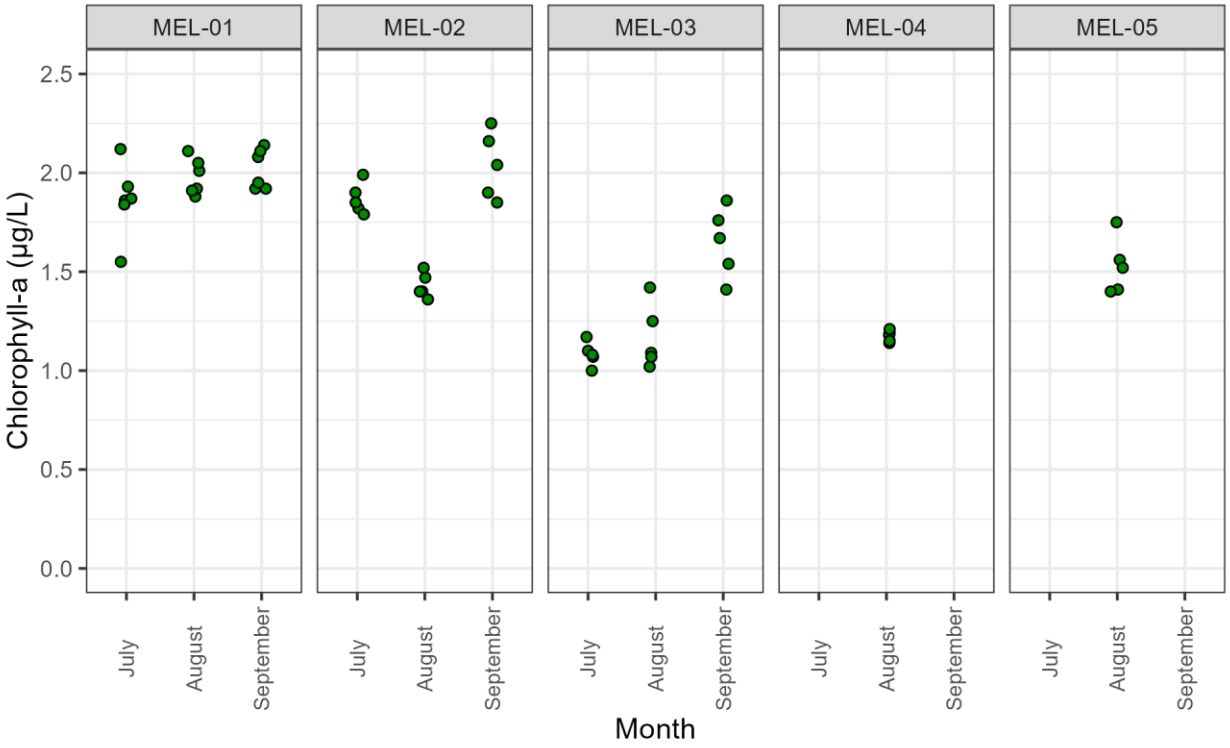


Table 5-6. Chlorophyll-a (µg/L; mean ± 1SD) in Meliadine Lake during the August sampling event

Phase	Year	MEL-01	MEL-02	MEL-03	MEL-04	MEL-05
Construction	2015	0.86 ± 0.061	0.45 ± 0.080	-	-	-
	2016	1.9 ± 0.17	1.2 ± 0.17	0.73 ± 0.099	0.93 ± 0.086	1.1 ± 0.13
	2017	1.5 ± 0.11	0.61 ± 0.040	0.57 ± 0.061	0.61 ± 0.066	0.58 ± 0.036
Operations	2018	1.9 ± 0.076	0.88 ± 0.11	0.61 ± 0.072	0.58 ± 0.035	0.58 ± 0.059
	2020	2.0 ± 0.18	0.89 ± 0.10	0.58 ± 0.042	0.69 ± 0.038	0.68 ± 0.091
	2021	2.78 ± 0.26	1.2 ± 0.15	0.42 ± 0.024	0.47 ± 0.078	0.57 ± 0.024
	2022	3.3 ± 0.14	1.5 ± 0.073	0.88 ± 0.050	0.66 ± 0.071	0.50 ± 0.022
	2023	4.0 ± 0.22	1.5 ± 0.086	0.54 ± 0.038	0.88 ± 0.16	0.79 ± 0.12
	2024	1.98 ± 0.09	1.43 ± 0.06	1.17 ± 0.16	1.17 ± 0.03	1.53 ± 0.14

Notes:
The chlorophyll-a data from 2019 were excluded from the dataset due to issues with the filter type used to collect the samples.
"-"indicates the phytoplankton study was not completed in these areas in 2015.

Figure 5-3 Chlorophyll-a (µg/L) in Meliadine Lake in July, August and September 2024



5.4.4 Phytoplankton Community

The primary metrics used to evaluate the health of the phytoplankton community in Meliadine Lake are total biomass and total richness. Phytoplankton density results are tabulated and plotted to support the discussion as needed, but are less informative on their own relative to biomass, which integrates size and density elements. Phytoplankton community structure is used as supporting line of evidence to assess potential differences between areas within Meliadine Lake. This section focuses on interannual comparisons of results for the August sampling event with previous monitoring years, but is supplemented by the results from the July and September 2024 sampling events as applicable.

Results for the phytoplankton community are presented as follows:

- Mean phytoplankton biomass from 2013 to 2024 during the August sampling event are presented in **Table 5-7**.
- Summary statistics for major taxa group biomass and density for samples collected in July, August, and September 2024 are included in **Appendix E1**.
- Per-sample richness, biomass, and density for the August sampling event are shown in **Figure 5-4**.

- Major taxa richness, biomass, and density are shown in **Figure 5-5** (absolute values) and **Figure 5-6** (percent) for the August sampling events.
- Seasonal patterns in major taxa richness, biomass, and density for the July, August, and September sampling events in 2024 and 2017 are provided in **Figure 5-7** and **Figure 5-8**, respectively. 2017 was the most recent year, other than 2024, where the phytoplankton study was conducted monthly during the open water season.
- Simpson's diversity index, Simpson's evenness index, and Bray-Curtis dissimilarity index for the August sampling event are shown in **Figure 5-9.**
- Results of the multivariate analyses of community structure for the August sampling event using nMDS are shown in **Figure 5-10** and **Figure 5-11.**

Biomass

Phytoplankton biomass has been consistently higher at MEL-01 compared to MEL-02 and the reference areas since 2015 (**Table 5-7**). This spatial pattern was not observed in August 2024; average biomass was similar across the exposure and reference areas (**Figure 5-4**).

Table 5-7. Phytoplankton biomass (mg/m^3; mean ± 1SD) in August in Meliadine Lake since 2013

Year	MEL-01	MEL-02	MEL-03	MEL-04	MEL-05
2013[a]	153 ± 8	-	-	-	-
2015	336 ± 29	220 ± 35	-	-	-
2016	350 ± 54	252 ± 44	231 ± 17	156 ± 65	227 ± 71
2017	316 ± 39	222 ± 42	206 ± 25	201 ± 22	216 ± 25
2018	339 ± 27	207 ± 88	276 ± 26	241 ± 15	147 ± 14
2019	426 ± 24	260 ± 58	229 ± 18	214 ± 28	204 ± 36
2020	211 ± 26	170 ± 28	204 ± 39	140 ± 29	147 ± 18
2021	395 ± 46	205 ± 47	185 ± 57	157 ± 23	156 ± 19
2022	248 ± 63	192 ± 31	131 ± 18	103 ± 34	107 ± 29
2023	291 ± 46	116 ± 9	145 ± 27	147 ± 36	150 ± 9
2024	223 ± 29	255 ± 39	210 ± 54	166 ± 37	206 ± 28

Notes:
"-" = the phytoplankton study was not completed in these areas.
[a] = Sampling methods were different between the baseline program in 2013 and the AEMP (discrete sampling in 2013 vs depth-integrated for the AEMP since 2015). Direct comparisons between 2013 and 2015-2024 should be made with caution.

Phytoplankton biomass has been quite variable at MEL-01 since 2019. Years with higher biomass at MEL-01 compared to MEL-02 and the reference areas have typically occurred in years with above-average rainfall (e.g., 2019, 2021). Increased precipitation associated with interannual climate variability and associated runoff can lead to higher concentrations of major ions, organic carbon, and micronutrients which can remove certain constraints on phytoplankton productivity (Pokrovsky et al., 2021). In drier years (2020, 2022, and 2023), total biomass at MEL-01 tends to be more similar to MEL-02 and the reference areas. June through August 2024 was one of the drier summers in the last decade (**Figure 2-4**), and biomass at MEL-01 (223 mg/m^3) was similar to MEL-02 (255 mg/m^3) and the reference areas (166-210 mg/m^3; **Table 5-7**).

Results from the July-September 2024 sampling events indicate that the mean phytoplankton biomass at MEL-01 in July was much higher than at MEL-02 and reference area MEL-03, but that the difference in biomass between areas did not persist into August. In September, the mean biomass at MEL-01 was once again higher than at MEL-02 and MEL-03, but the magnitude of difference was much less pronounced than in July (**Figure 5-7**). The seasonal pattern of change in phytoplankton biomass at MEL-01 broadly coincides with effluent discharge from CP1 to Meliadine Lake. However, the same seasonal pattern (July > August and September) and spatial pattern (MEL-01 > MEL-02 > Reference) was evident in 2017 before the Mine was operational. Summer precipitation patterns were also similar in 2017 and 2024 (cumulative rainfall [**Figure 2-4**], monthly precipitation [**Table 2-1**]), which helps control for precipitation as a potentially confounding factor.

As described above, an influx of ions and nutrients – either by natural runoff or anthropogenic sources – can result in increased phytoplankton growth. Effluent likely contributes to changes in phytoplankton biomass in MEL-01 when the Mine is actively discharging, but based on the results from August 2024, the duration of the change is short and reversible. Overall, the results from 2024 support the hypothesis that the timing and amount of precipitation in the summer plays is a major factor influencing seasonal changes in phytoplankton productivity in Meliadine Lake.

The relationship between water chemistry and phytoplankton community metrics is discussed further in **Section 5.4.1**.

Major Taxa Biomass

Chrysophytes have generally been the dominant major taxa in terms of biomass throughout Meliadine Lake throughout the AEMP period (since 2015) and during baseline. In August 2024, relative to total community biomass, chrysophytes comprised between 24% (MEL-01) to 60% (MEL-03) (**Figure 5-6**). The next most common major taxa by biomass were dinoflagellates, diatoms, cryptophytes, and chlorophytes (green algae; **Figure 5-5, Figure 5-6**). Diatoms accounted for 37% of the total biomass at MEL-01 but represented only 15% of the total biomass at MEL-02 and only 7% to 13% of the biomass at

the reference areas. Chrysophytes also accounted for a smaller proportion of the total biomass at MEL-01 (24%) compared to MEL-02 (37%) and the reference areas (45% to 60%). This result contrasts with the August 2023 sampling event, where chrysophytes accounted for 60% of the total biomass at MEL-01 and reflects the temporal variability in the phytoplankton community. Overall, the relative proportion of total biomass in each major taxa group in August 2024 was consistent with results observed in 2015 to 2023 (**Figure 5-6**) and similar to other studies on phytoplankton community assemblages in northern latitude lakes (Bergström et al., 2019). Chrysophytes accounted for 70% of total biomass at MEL-01 in July and 59% of total biomass in September (**Figure 5-8**), further reflecting the temporal variability of the phytoplankton community.

Since 2015, annual variability in total phytoplankton biomass in Meliadine Lake has primarily been driven by variability in chrysophyte biomass. In August 2024, this pattern continued; areas that had higher total biomass in 2024 relative to 2023 (MEL-02 and the reference areas) also had higher chrysophyte biomass and areas that had lower total biomass in 2024 relative to 2023 (MEL-01) also had lower chrysophyte biomass. At the NF station MEL-01, the diatom *Cyclotella pseudostelligera* was the dominant species in all six replicates collected in August and accounted for 25% to 37% of the total biomass at this location. *Cyclotella pseudostelligera* is a small, fast-growing species of diatom that grows well in shallow, nutrient-enriched, well-mixed, turbid aquatic habitats, particularly during periods of high light intensity (Reynolds et al., 2002). It has been used in Arctic Lakes as an indicator of climatic changes such as shorter duration of ice cover and a longer growing season (Ruhland and Smol, 2005; Saros et al., 2016). In contrast, the most dominant taxa by biomass at the MF station MEL-02 and the reference areas were typically flagellate chrysophytes (e.g. *Dinobryon sp*.) or dinoflagellates (e.g., *Gymnodinium sp*.). These taxa have flagella, which allows them to move throughout the water column. They are also capable of mixotrophy, which means they can derive energy from either photosynthesis or consumption of bacteria (Fee, 1976; Findlay et al., 2001; Ballen-Segura, 2016). Flagellated, mixotrophic algae are common in nutrient-limited oligotrophic systems due to their ability to exploit multiple sources of energy, avoid predation, and move to suitable microhabitats (Saad et al., 2016; Hazukova et al., 2021).

The dominance of *Cylcotella pseudostelligera* at MEL-01 in August 2024 compared to the prevalence of flagellated, mixotrophic algae at MEL-02 and the reference areas suggests potential differences in phytoplankton community structure and water conditions between the different areas of Meliadine Lake. However, results from the July and September 2024 sampling events indicate that these potential differences were not persistent; in July and September the most dominant taxa at all locations in Meliadine Lake were typically flagellate chrysophytes (e.g., *Dinobryon sp*., *Uroglena sp.)* or dinoflagellates (e.g., *Gymondinium sp*., *Peridinium sp*.), consistent with other Northern lakes (e.g., Forsstrom et al., 2005; Schartau et al., 2019). Phytoplankton community structure is discussed in more detail in subsequent sections of this report.

Cyanobacteria comprised less than 1% of the total phytoplankton biomass at the study areas in 2024. This is worth highlighting because cyanobacteria are commonly associated with harmful algal blooms caused by anthropogenic nutrient enrichment (Codd, 2000). This phenomenon is well documented in temperate and boreal areas in Canada, and cyanobacteria biomass is one line of evidence that researchers are using to detect eutrophication in Arctic lakes (Ayala-Borda et al., 2021). Cyanophyte biomass has been low throughout Meliadine Lake since 2015. These data show that the combined effect of effluent discharge and interannual variability in the climate are not leading to the types of algal blooms commonly associated with nutrient enrichment.

Richness

Taxa richness is generally positively correlated with total biomass in the Meliadine AEMP dataset (**Figure 5-5**). For example, years with lower biomass at MEL-01 (i.e., 2013, 2020 and 2022) had fewer taxa than observed in the years with higher biomass (e.g., 2019 and 2021). In August 2024 phytoplankton richness was higher than in August 2023 in all areas of Meliadine Lake except for MEL-01, but was within the range of values previously observed at each area. The changes in total richness observed in August 2024 relative to August 2023 were consistent with the observed changes in biomass over the same period; at MEL-02 and the reference areas, where total richness was higher in August 2024, also had higher total abundance than in August 2023. At MEL-01, both total richness and total biomass were lower in August 2024 relative to August 2023. Seasonal sampling in 2024 indicated that total richness tended to increase slightly over the growing season. Total richness was highest in September at all three locations where samples were collected (**Figure 5-7**).

Chrysophytes were the most diverse major taxa group at all locations in August 2024; the number of unique chrysophyte taxa ranged from 10 at MEL-01 to 13 at MEL-05 (**Figure 5-5**). Chlorophytes and diatoms were also well represented in terms of the number of taxa, consistent with previous years' August sampling events and the July and September 2024 sampling events (**Figure 5-7**). However, due to the comparatively small size of individual chlorophytes and diatoms relative to chrysophytes, they accounted for only a small proportion of the total biomass at most locations (**Figure 5-6; Figure 5-8**). Subtle shifts in species dominance are part of natural succession patterns that phytoplankton communities undergo in response to a variety of physical (e.g., climatic), chemical (e.g., water quality), and biological factors (e.g., trophic interactions). These subtle changes in the phytoplankton community among the different areas and over time are discussed in the following section.

Figure 5-4 Phytoplankton richness, biomass (mg/m^3), and density (cells/L), August sampling event 2013-2024.

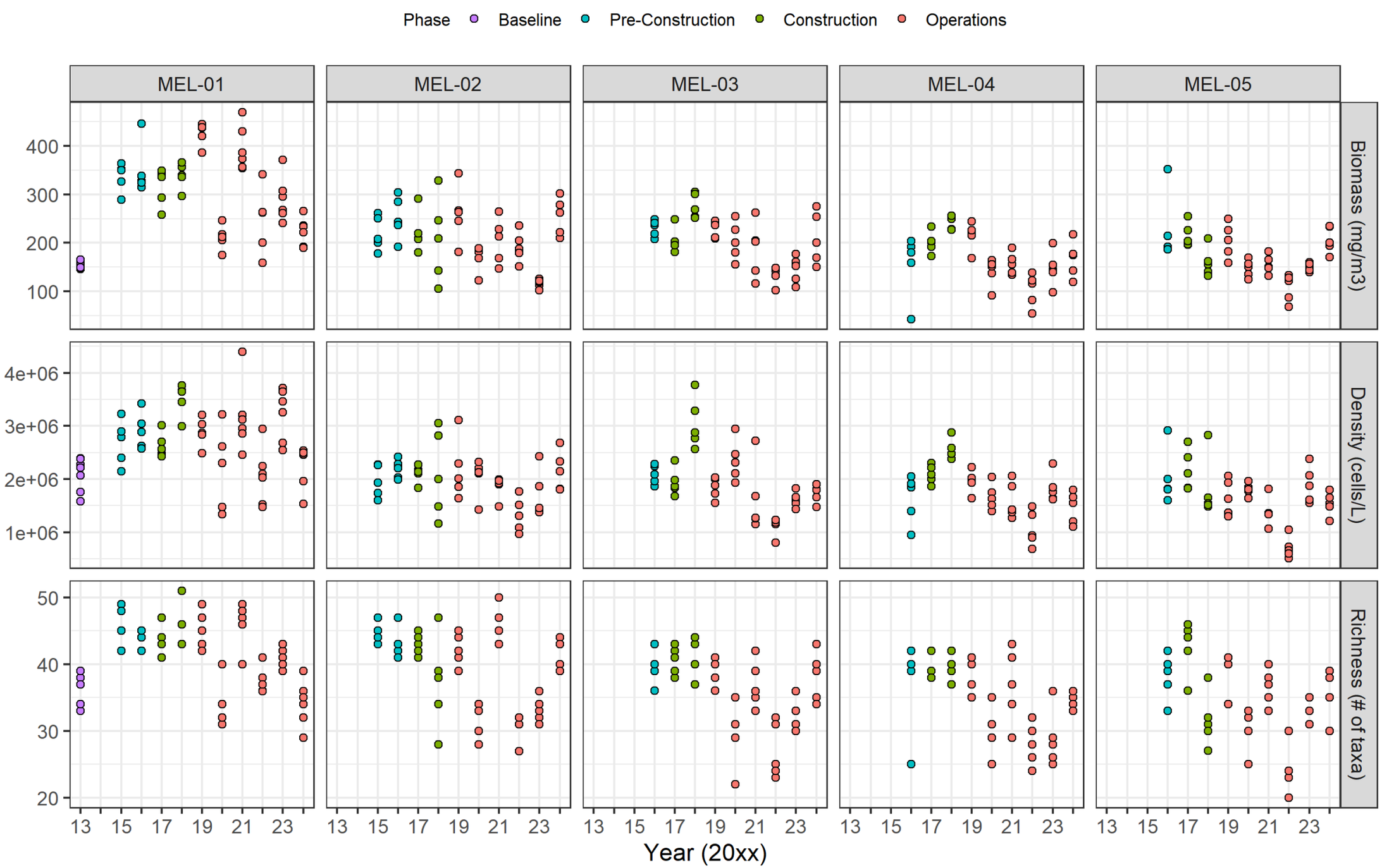


Figure 5-5. Mean phytoplankton richness, biomass (mg/m^3), and density (cells/L) by major taxa, August 2013-2024.

Notes: Major taxa group endpoints (richness, biomass, and density) for each area-year are based on the average (arithmetic mean) of the individual replicates.

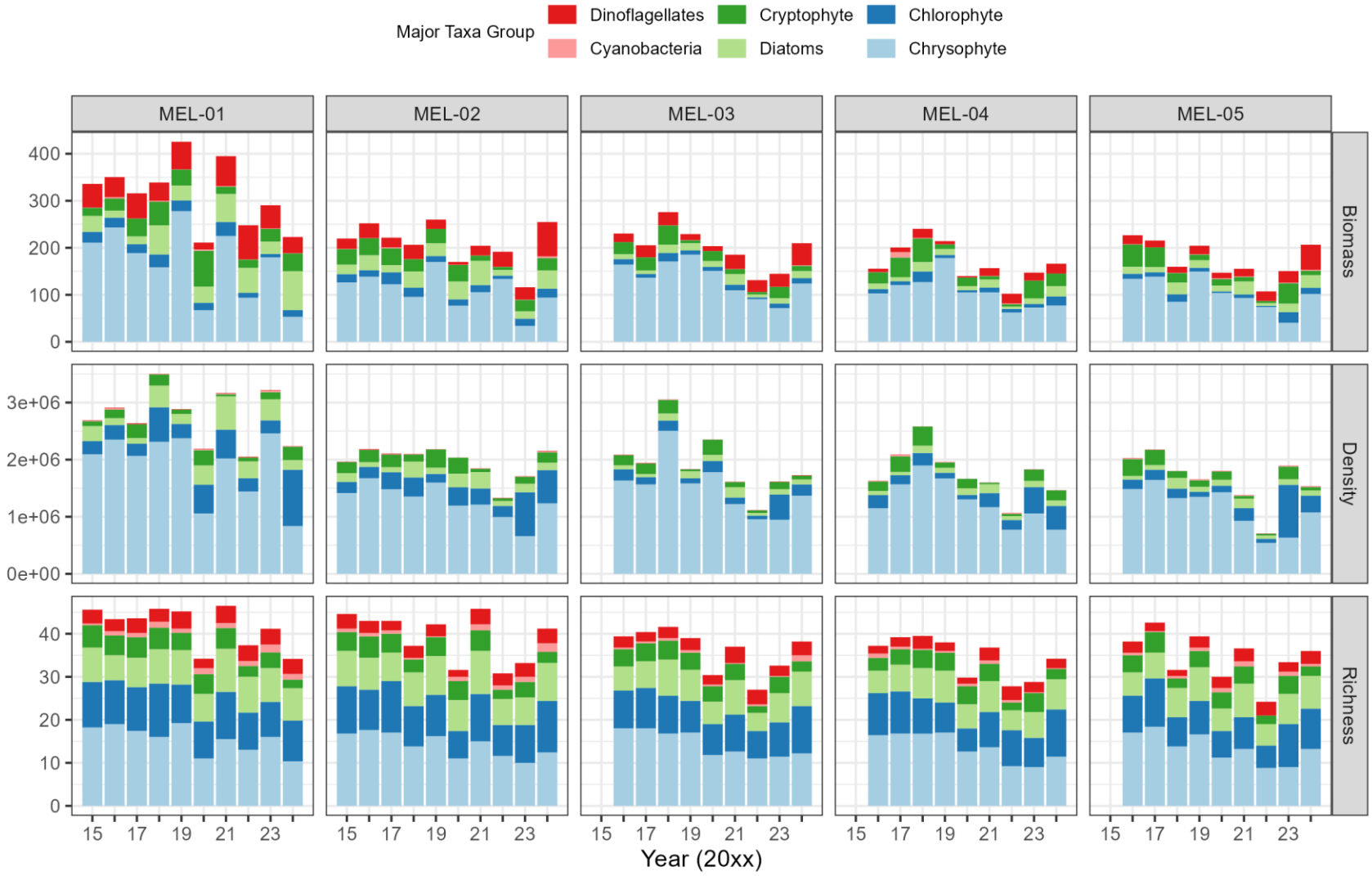


Figure 5-6. Relative richness, biomass (mg/m³), and density (cells/L) by major taxa, August 2013-2024.

Notes: Major taxa richness, biomass, and density shown as the proportion of the total based on the average for each area/year.

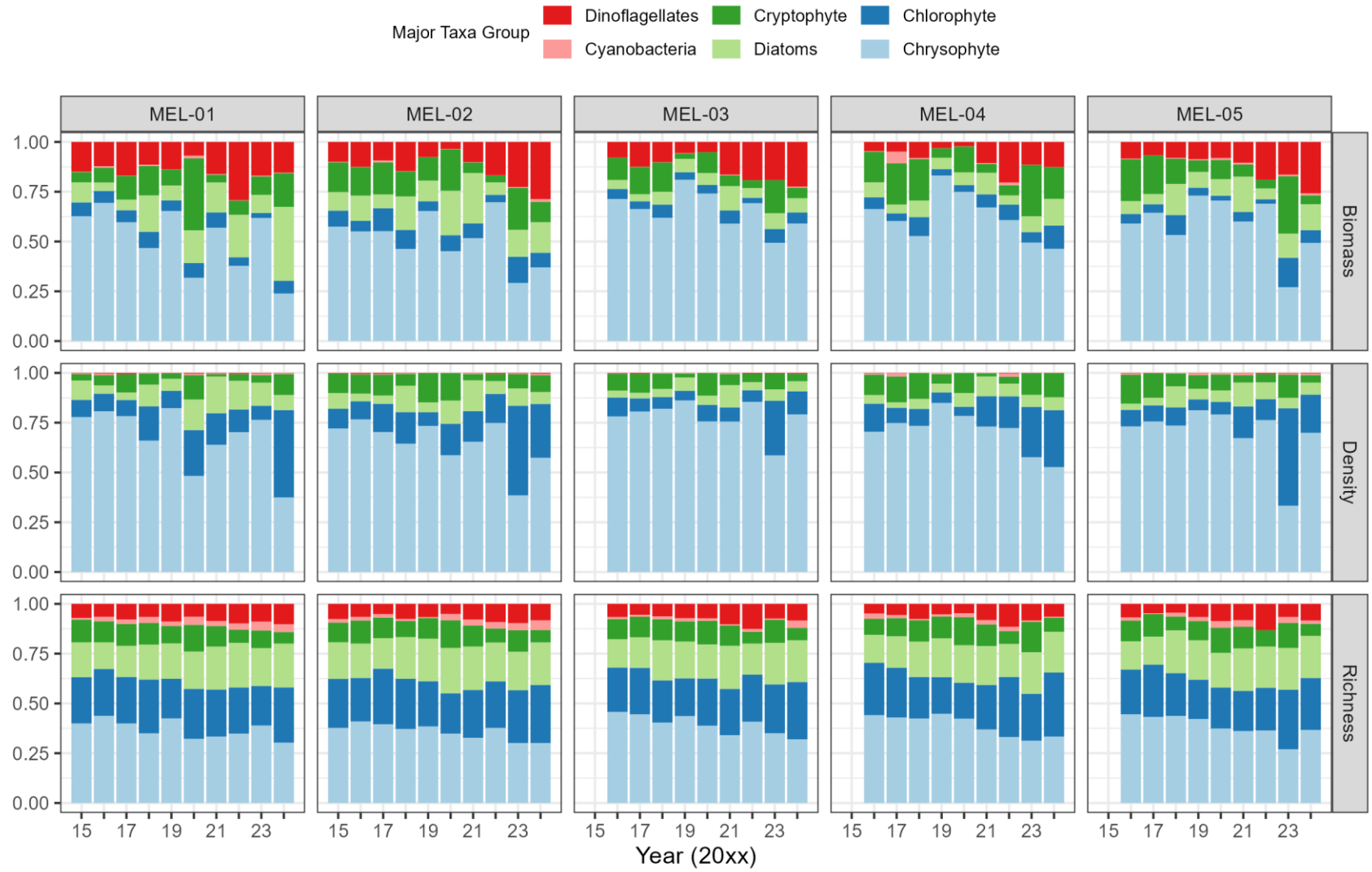


Figure 5-7. Mean phytoplankton richness, biomass (mg/m³), and density (cells/L) by major taxa, July, August and September 2024.

Notes: Major taxa group endpoints (richness, biomass, and density) for each area-year are based on the average (arithmetic mean) of the individual replicates.

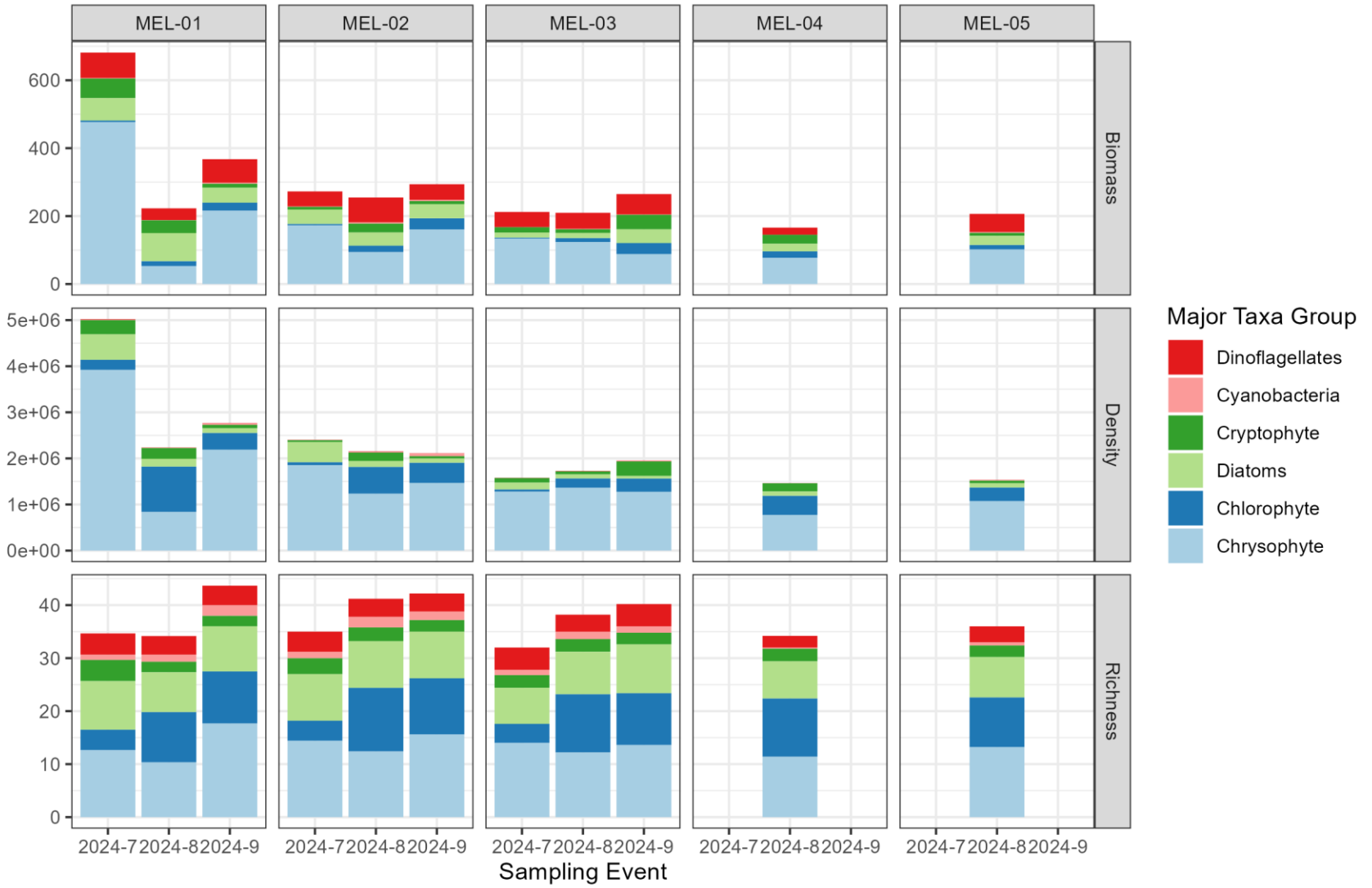
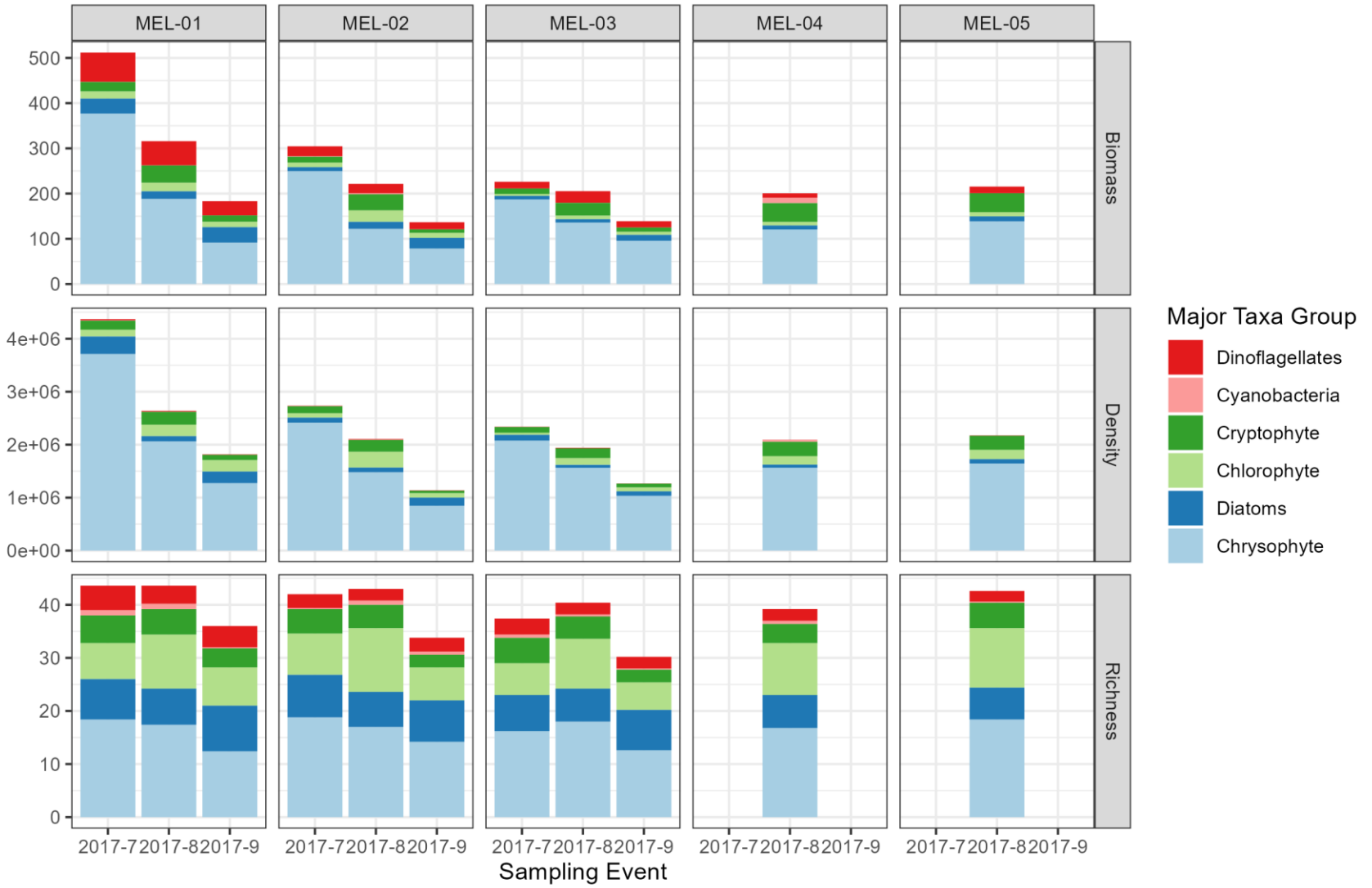


Figure 5-8. Mean phytoplankton richness, biomass (mg/m³), and density (cells/L) by major taxa, July, August and September 2017.

Notes: Major taxa richness, biomass, and density shown as the proportion of the total based on the average for each area/year.



Community Structure

Diversity Indices

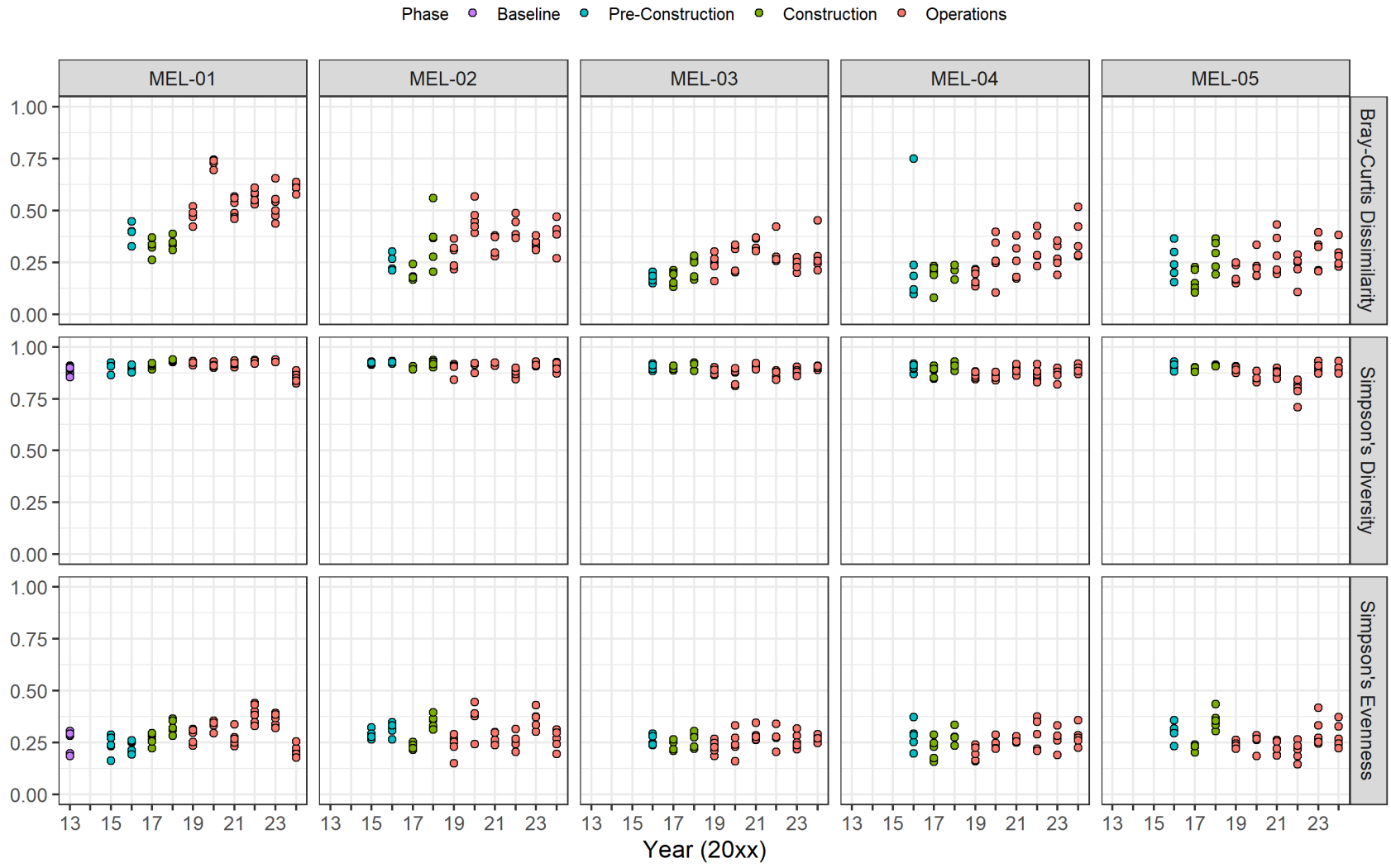
Simpson's diversity index (SDI) has generally been high (≥0.85) and stable at all monitoring areas. The relatively high SDI results indicate that the phytoplankton communities in the NF area, MF area, and reference areas are each made up of a diverse assemblage of species. In August 2024, mean SDI ranged from 0.85 at the NF location MEL-01 to 0.90 at the MF location MEL-02 and reference area MEL-03 (**Figure 5-9**; middle panel). Although the lowest observed diversity in August 2024 was at MEL-01 and diversity at MEL-01 was lower than in previous monitoring years, the difference was minor and diversity was still within the range of values observed at reference locations in previous years. Therefore, the SDI data do not support effluent-related enrichment or toxicological impairment of the phytoplankton community.

Simpson's evenness index (SEI) at all monitoring locations within Meliadine Lake has been closer to 0 than 1 throughout the monitoring program, indicating that the phytoplankton communities are not evenly distributed among taxonomic groups. In August 2024, mean SEI ranged from 0.21 at the NF location MEL-01 to 0.29 at reference location MEL-05 (**Figure 5-9**; bottom panel). Although the lowest observed evenness in August 2024 was at MEL-01 and evenness at MEL-01 was lower than in previous monitoring years, the difference was minor and evenness was still within the range of values observed at reference locations in previous years. Therefore, the SEI data do not support effluent-related enrichment or toxicological impairment of the phytoplankton community.

The Bray-Curtis dissimilarity index (BCI) was calculated by comparing the community in individual replicates to the median of the replicates collected at reference locations for a given year. Mean BCI has been variable over time in reference areas as well as the NF and MF area. However, since the start of operations in 2018, Mean BCI has tended to be highest in the NF area MEL-01. In August 2024, mean BCI ranged from 0.29 at reference location MEL-05 to 0.61 at NF area MEL-01 (**Figure 5-9**; top panel). The higher BCI at MEL-01 relative to the reference areas indicates that the phytoplankton community composition in this area differs from the phytoplankton community composition typical of the reference areas. Differences in phytoplankton community composition between areas are discussed in more detail in the following section.

Figure 5-9. Bray-Curtis Dissimilarity, Simpson's Diversity, and Simpson's Evenness, August 2013-2024.

Notes: Major taxa richness, biomass, and density shown as the proportion of the total based on the average for each area/year.



Multivariate Analyses

Finer patterns in community structure across sampling areas and years were explored using multivariate non-metric multidimensional scaling (nMDS) analysis[10]. Two nMDS dimensions were derived from the transformed phytoplankton community data. The two-dimensional ordination was selected to best represent the community. The stress value of that configuration (0.25) was slightly higher than the guideline of 0.2 outlined by Clarke (1993), but was considered acceptable for this application based on considerations of other factors such as sample size and ease of interpretation outlined in **Section 5.3.3**.

The ordination plot showing results for samples collected from *reference* areas or during baseline monitoring and their associated 90th, 95th and 99th percentile probability ellipses is presented in the left panel of **Figure 5-10**. These probability ellipses represent the phytoplankton community at the reference areas across all sampling events. The reference area ellipse helps identify those samples or areas that diverge from the normal range of reference conditions in Meliadine Lake. This approach to comparing the NF and MF areas assumes that the phytoplankton communities were similar throughout Meliadine Lake during the baseline period. This assumption cannot be tested because the reference areas were not sampled in 2013 or 2015. For this reason, the probability ellipses may not fully represent the phytoplankton community on a lake-wide basis.

Results for samples collected from *exposure* areas relative to the reference area probability ellipses are presented in the right panel of **Figure 5-10**. The ordination results are also shown by year in **Figure 5-11** to illustrate the relative change for MEL-01, MEL-02, and the reference areas within and across years. Results from MEL-01 in 2013 and MEL-01 and MEL-02 in 2015 are shown in the ordination plots for context, but should be interpreted with caution because the reference areas were not sampled concurrently.

The correlation matrix at the right of **Figure 5-11** shows the correlation between the biomass and richness of each major taxa group and Axis 1 and 2 of the nMDS. The strongest correlations between each nMDS Axis and major phytoplankton taxa are as follows:

- **Axis 1** – Within most years, samples from different areas were generally not separated much along Axis 1. In August 2024, most samples were oriented in a similar position along Axis 1 and typically had scores between 0 and 0.3. No major taxa were significantly positively correlated with nMDS Axis 1[11]. Chrysophyte richness and biomass were most strongly negatively correlated with nMDS Axis 1.

[10] A description of the nMDS analysis using the 'Vegan' software package is presented here: (Link)

[11] The Spearman critical value at a significance level of p = 0.05 is 0.197.

Apart from 2023, more variation along Axis 1 was observed when comparing between years than within years and year to year variations along Axis 1 were generally consistent among the study areas (**Figure 5-11**). In 2023, the results from MEL-01 tended to have lower Axis 1 scores than samples from the other locations and therefore tended to be ordinated in the left half of the plot in the 2023 panel of **Figure 5-11**.

- **Axis 2** – In August 2024, all 6 replicates collected from MEL-01 had positive Axis 2 scores > 0.3 and are ordinated outside of the reference ellipses towards the top of the plot in the 2024 panel of **Figure 5-11**. Conversely, most replicates from MEL-02 and the reference areas in August 2024 had Axis 2 scores closer to 0 and are ordinated within the reference ellipses. Dinoflagellate richness and biomass were the two metrics most strongly positively correlated with nMDS Axis 2. Dinoflagellate biomass and richness at MEL-01 were similar to or lower than other stations in August 2024, so these correlations were likely driven by data from previous sampling years. Diatom biomass and richness were also significantly positively correlated with nMDS Axis 2. As discussed previously, diatom biomass was significantly higher at MEL-01 in August 2024 relative to the other monitoring locations. Cryptophyte biomass and richness were the metrics most strongly negatively correlated with nMDS Axis 2.

Differences in the community composition are determined using the ordination plots and comparing the absolute position of each point relative to the probability ellipses, and the location of each point relative to other areas for a given year. For example, the position of the MEL-01 and MEL-02 relative to one another and to the reference areas varies among years.

The key messages from the nMDS analysis are as follows:

- Throughout the AEMP, variability among the exposure and reference areas has increased, as indicated by the increasing spread of the points in 2020 to 2024 shown in **Figure 5-11**.
- The composition of the phytoplankton community naturally shifts from year to year, but MEL-02 and the reference areas tend to follow a similar pattern of change from year to year.
- During pre-construction, construction, and early operations (2018 and 2019), the composition of the phytoplankton community at MEL-01 followed a similar pattern as MEL-02 and the reference areas.
- The composition of the phytoplankton community at MEL-01 has diverged from MEL-02 and the reference areas in 2020, 2022, 2023, and 2024. This divergence is consistent with higher BCI at MEL-01 compared to MEL-02 and reference areas since operations began.
- In 2020, the MEL-01 samples had lower scores on nMDS Axis 2 than the MF and reference areas, and most of the samples were outside of the ellipse representing the 99th percentile of the baseline and reference community. Although the ordination of MEL-01 samples relative to MEL-02 and the

reference areas is not always consistent year-to-year, the phytoplankton community at MEL-01 has generally diverged from MEL-02 and the reference areas during operations. However, the 2013 baseline results for MEL-01 (the only area sampled that year) were also largely outside the 90th percentile ellipse, which suggests that differences in phytoplankton community composition in the East Basin may be due, at least in part, to factors unrelated to mining.

Figure 5-10. Ordination of the reference and exposure area phytoplankton results by phase and location for Meliadine Lake.

Notes: Left panel = results for reference and baseline samples and their associated probability ellipses.
Right panel = exposure samples shown relative to reference area probability ellipses.
Green, orange, and red ellipses = 90th, 95th, and 99th percentile of the baseline/reference phytoplankton community.

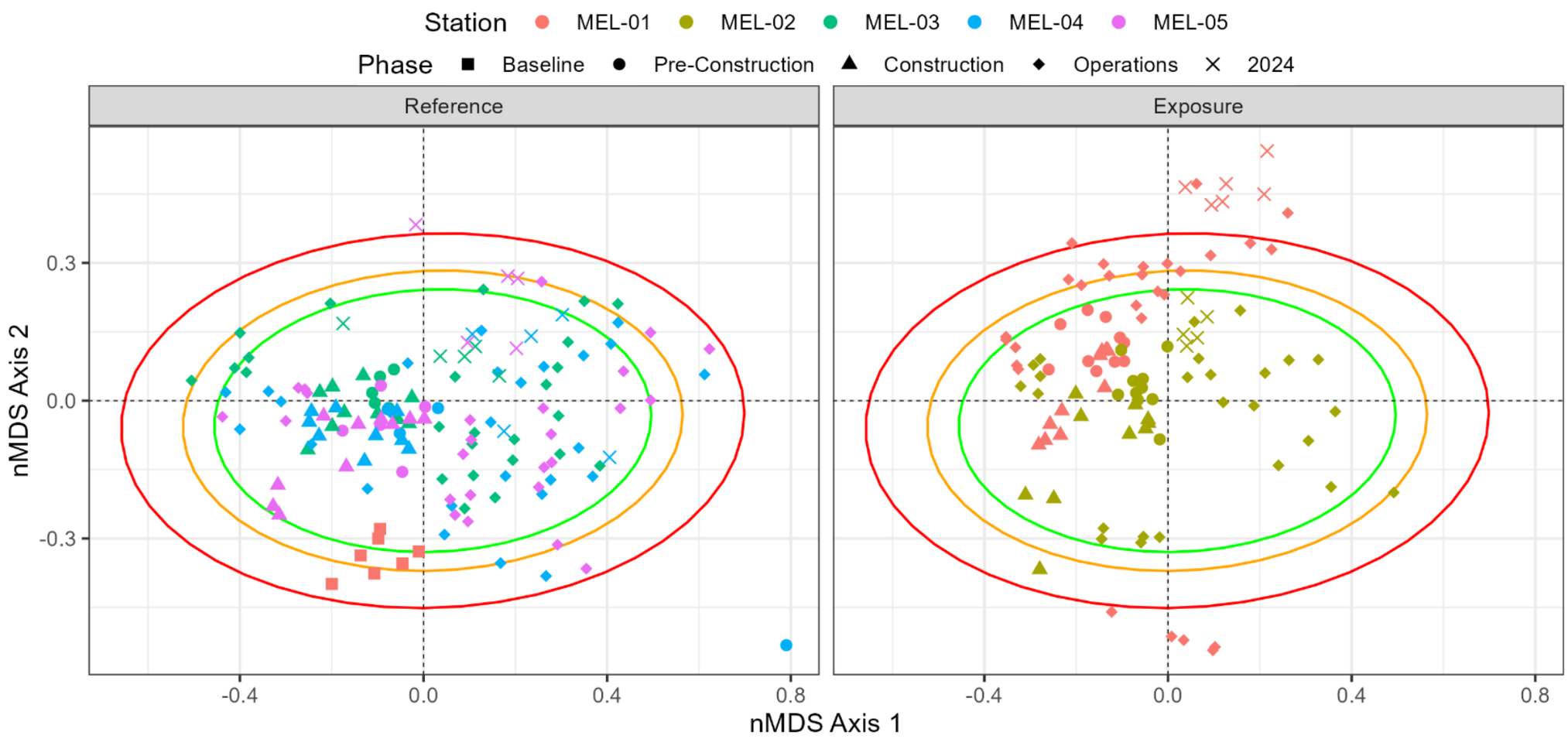
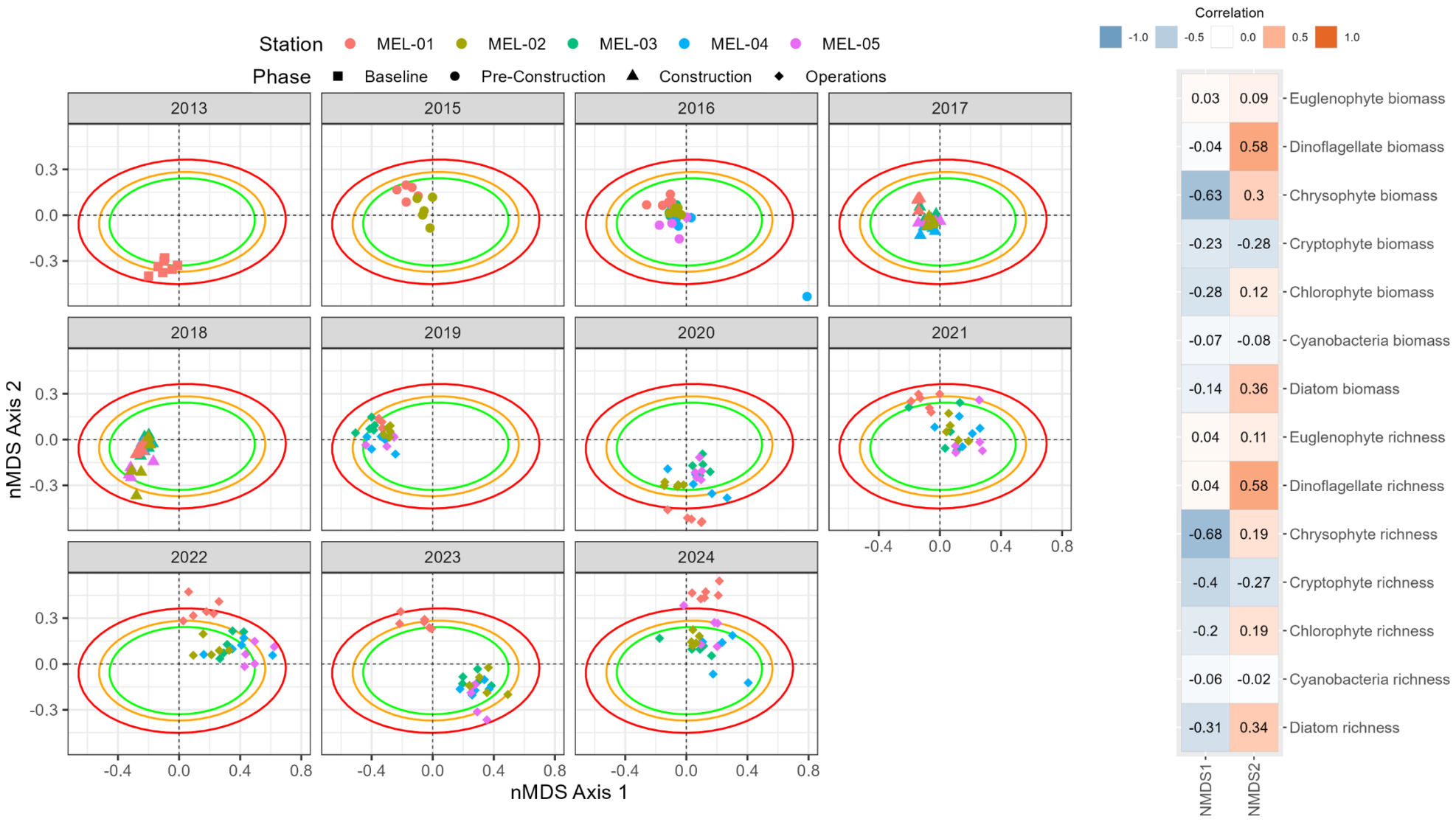


Figure 5-11. Non-metric multidimensional scaling (nMDS) results showing ordination of the phytoplankton results by year and location for Meliadine Lake.

Notes: Green, orange, and red ellipses = 90th, 95th, and 99th percentile of the baseline/reference phytoplankton community.
The correlation matrix displays correlations between the biomass and richness of each major taxa group and the nMDS scores for Axis 1 and 2. The Spearman critical value is 0.197 ($p < 0.05$).



5.4.1 Nutrient-Productivity Relationships

Nutrient-productivity relationships were explored using chlorophyll-a and total phytoplankton biomass as endpoints for primary productivity. Key nutrients DOC, nitrogen, and phosphorus were used to assess if effluent discharged to Meliadine Lake is contributing to changes in productivity. The current state of science indicates that phytoplankton productivity is co-limited by nitrogen and phosphorus (Lewis and Wurtsbaugh, 2008), with DOC also influencing primary productivity (Bergström and Karlsson, 2019). Micronutrients such as calcium, iron, silicon, and trace metals are also required for normal growth for some algal species, so can also influence productivity (Fondriest, 2014).

The 2020 AEMP Report (Azimuth, 2021) provided a concise overview of the effect of nitrogen and phosphorus on primary productivity, but new research is continually being published on changes in primary productivity in northern latitude lakes, particularly in response to climate change. DOC was added as an explanatory variable in 2021 because of possible climate-related increases in DOC concentration associated with higher rainfall, runoff, and erosion of terrestrial soils (Rawlins et al. 2021).

Phytoplankton biomass is the most important metric for productivity and chlorophyll-a and is used as a key indicator; the relationship between the two is shown by year in **Figure 5-12**. In general, there is a positive relationship between total phytoplankton biomass and chlorophyll-a within each sampling year, but this relationship is heavily influenced by results from MEL-01, where total biomass and chlorophyll-a both tend to be higher than other areas in Meliadine Lake. When the relationship between total biomass and chlorophyll-a is considered on a location-by-location basis, the positive relationship is no longer evident (**Figure 5-13**). These results imply that there are differences in the relative amount of the photosynthetic pigment per unit biomass at different areas in Meliadine Lake (i.e., the phytoplankton community has more chlorophyll-a per unit of biomass at MEL-01 relative to the reference areas). As discussed in **Section 5.4.3**, the amount of chlorophyll-a content per phytoplankton is highly variable and can be influenced by various factors, including trophic status, community composition, light availability, and water chemistry (Desortova, 1981; Felip and Catalan, 2000; Kasprzak et al., 2008). Seasonal sampling from 2024 further demonstrates the lack of a clear relationship between phytoplankton biomass and chlorophyll-a in Meliadine Lake (**Figure 5-14**; **Figure 5-15**).

To further investigate potential nutrient-productivity relationships, chlorophyll-a concentrations and total biomass were plotted against concentrations of nitrogen, DOC, and phosphorus for all locations (**Figure 5-16**) and for MEL-01 only (**Figure 5-17**). Nitrogen, DOC, and phosphorus do not appear to be strongly influencing phytoplankton biomass based on data collected at MEL-01, MEL-02, and the reference areas since 2013 (**Figure 5-16**). There is some evidence of a weak positive relationship between chlorophyll-a and both DOC and nitrogen when looking at data from all years and all areas in Meliadine Lake (**Figure 5-16**) and between chlorophyll-a and DOC when looking specifically at the results

for MEL-01 (**Figure 5-17**). However, the lack of a relationship between the nutrient concentrations and total biomass suggests that the positive relationships between DOC and nitrogen and chlorophyll-a likely reflect changes in the relative amount of chlorophyll-a per mg of phytoplankton biomass rather than a change in total productivity.

Some species of chrysophytes can increase chlorophyll-a production in response to environmental factors such as light availability (Pick and Nalewajko, 1984). Light availability can be influenced by several factors, including the concentration of dissolved organic carbon (Fee et al., 1996). Therefore, it is possible that increasing DOC concentrations in MEL-01 over time are impacting light availability and phytoplankton are increasing their amount of chlorophyll-a per unit over time. However, in August 2024, DOC concentrations were among the highest measured at MEL-01 in all AEMP monitoring years but chlorophyll-a concentrations were among the lowest measured at this location, which is a departure from the observed relationship between these two variables at MEL-01 (**Figure 5-17**). In the AEMP, light availability is primarily measured in the field using Secchi depth, which is discussed further in the following section.

5.4.1 Trophic Status Index

Trophic status index (TSI) results (mean ± 1 standard error) for total phosphorus, chlorophyll-a and Secchi depth are presented for each sampling area in **Figure 5-18**. Similar to previous years, mean TSI values for all three parameters (i.e., Secchi depth, chlorophyll-a, and total phosphorus) were higher at MEL-01 compared to MEL-02 and the reference areas, which is consistent with the narrative that the East Basin of Meliadine Lake is more productive than other areas of the lake. However, as discussed in **Section 5.4.3**, the chlorophyll-a concentration at MEL-01 was lower in 2024 than in previous monitoring years and therefore all areas of Meliadine Lake were classified as oligotrophic based on chlorophyll-a, total phosphorus, and Secchi depth (Carlson 1977; **Figure 5-18**).

Figure 5-12. Relationship between chlorophyll-a and phytoplankton biomass for Meliadine Lake by year, August 2016 through 2024.

Notes: Chlorophyll-a data from 2019 were flagged during the QC assessment because a different filter type was used in 2019, which resulted in lower-than expected results across all stations.

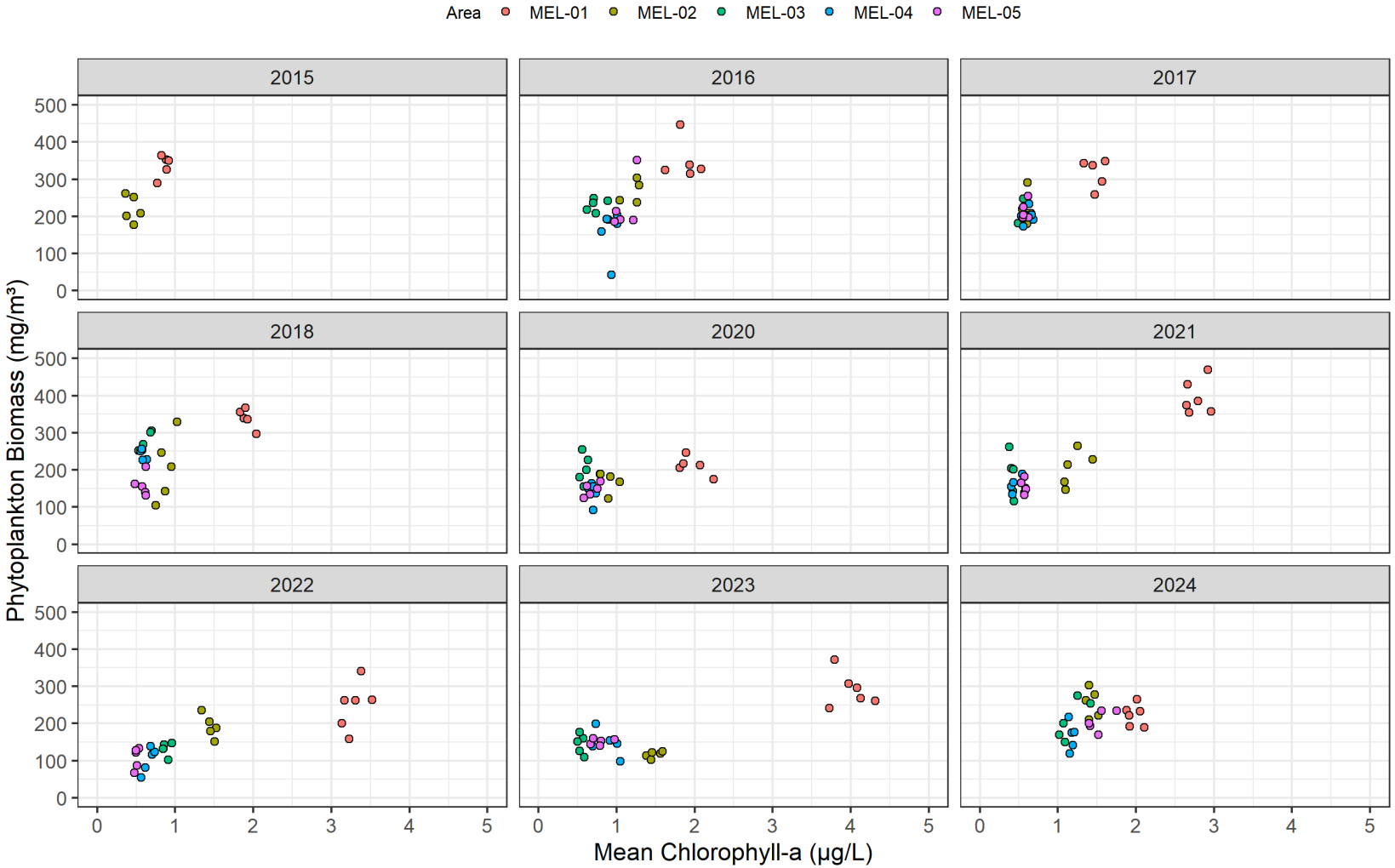


Figure 5-13. Relationship between chlorophyll-a and phytoplankton biomass for Meliadine Lake by monitoring location during the August sampling event, 2015 through 2024.

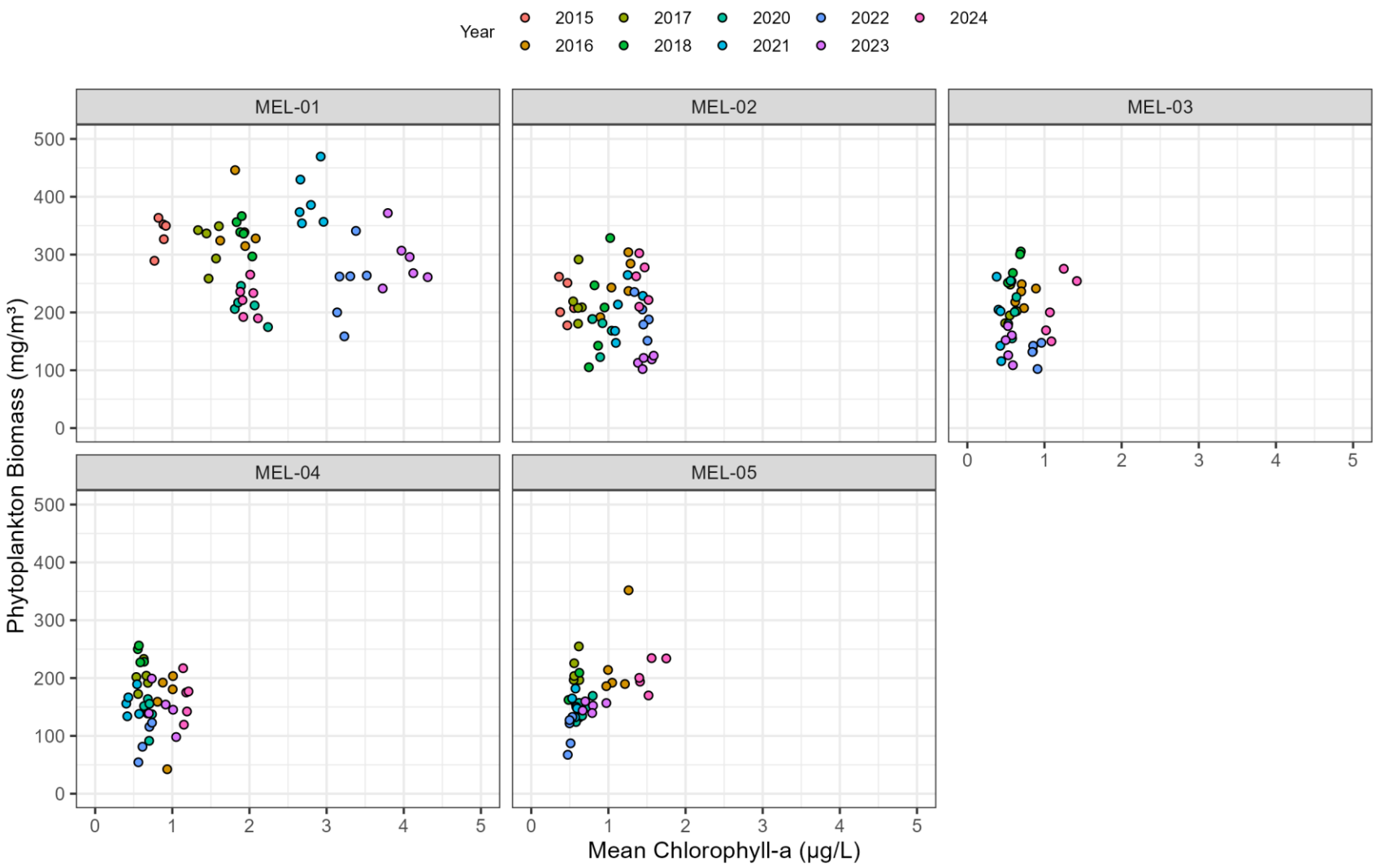


Figure 5-14. Relationship between chlorophyll-a and phytoplankton biomass for Meliadine Lake by month, July, August and September 2024.

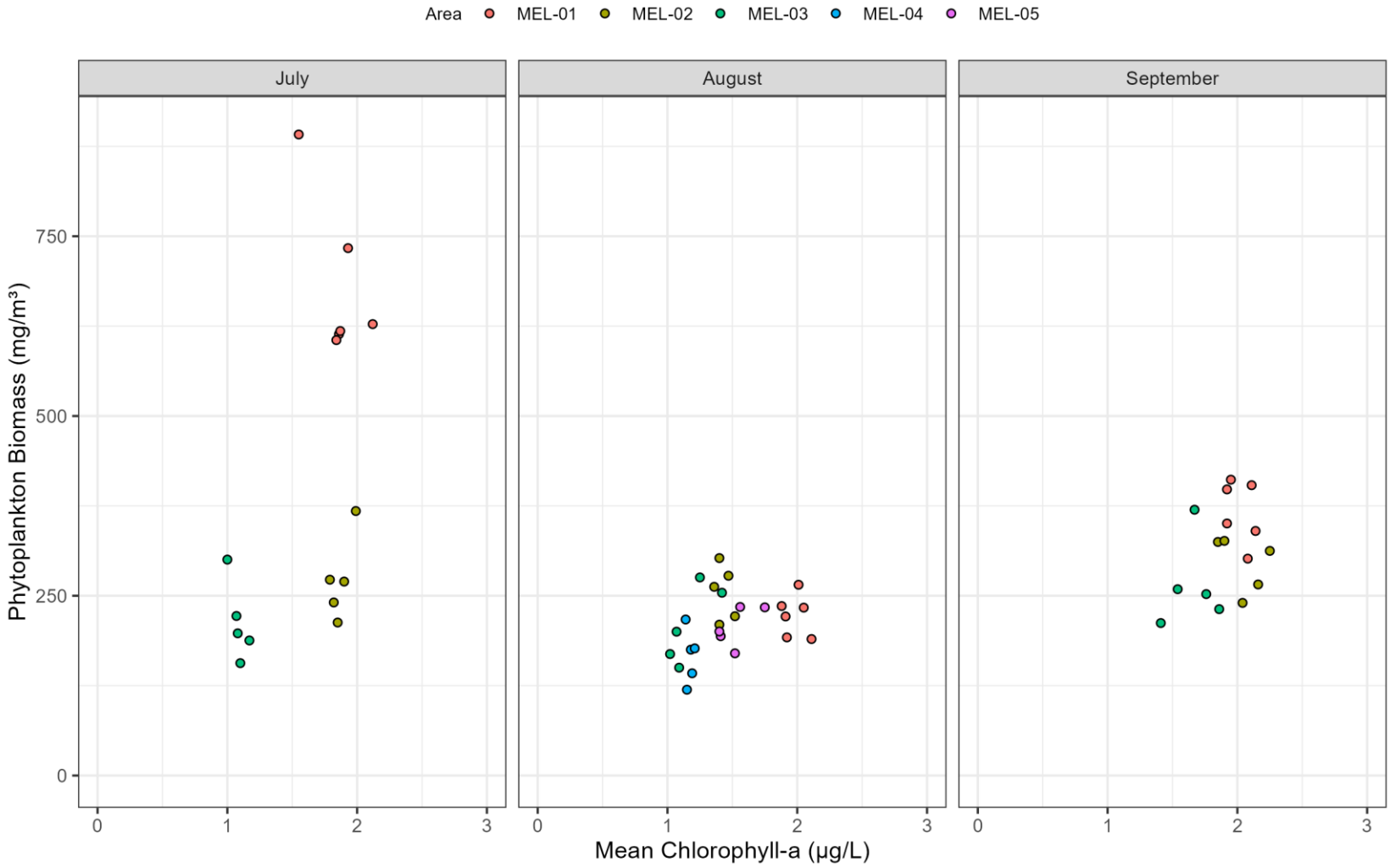


Figure 5-15. Relationship between chlorophyll-a and phytoplankton biomass for Meliadine Lake by monitoring location during seasonal sampling in 2024 (July, August, and September).

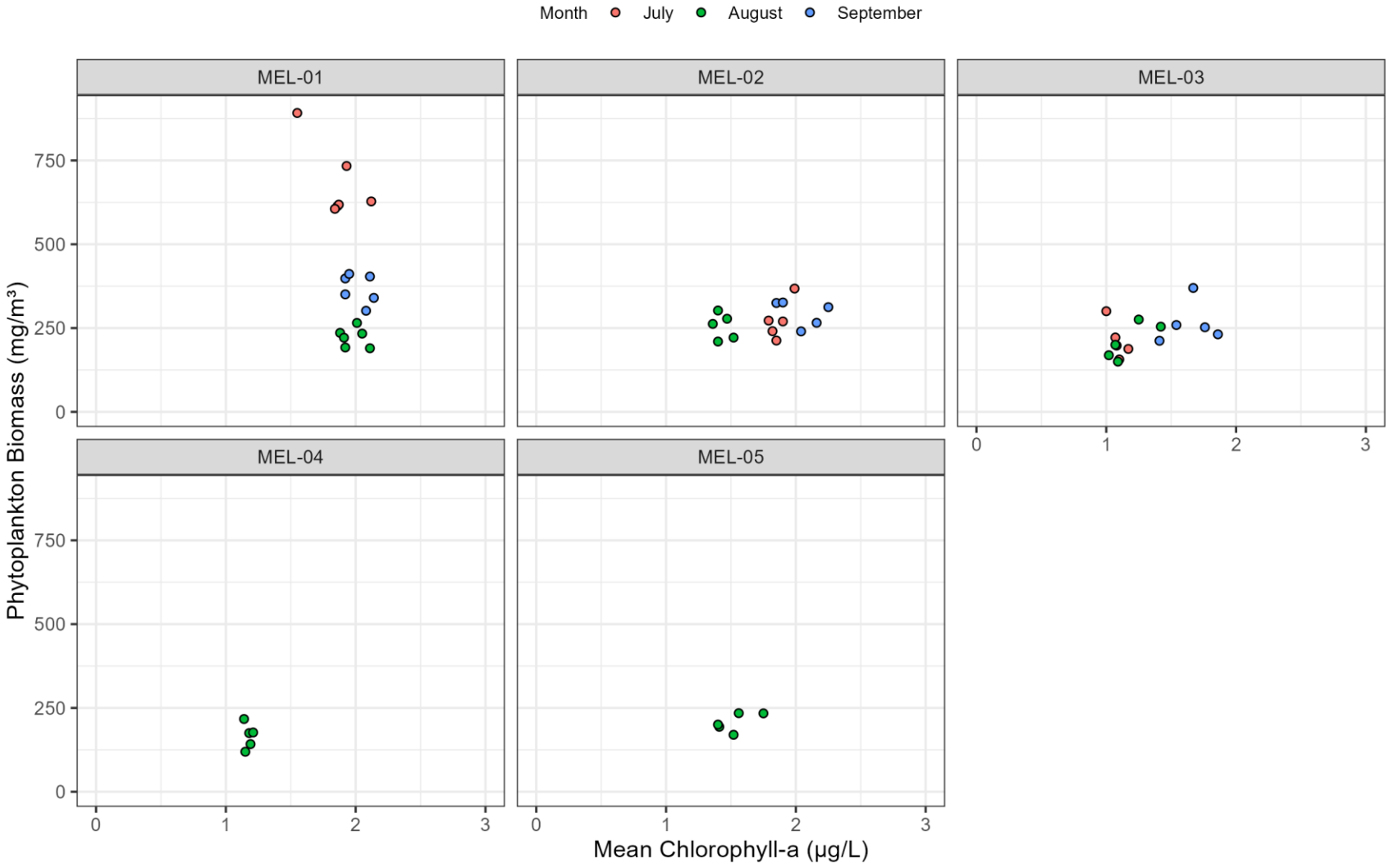


Figure 5-16. Relationship between nutrient concentrations (DOC, nitrogen, and phosphorus) and phytoplankton biomass and chlorophyll-a in Meliadine Lake, August 2013-2024.

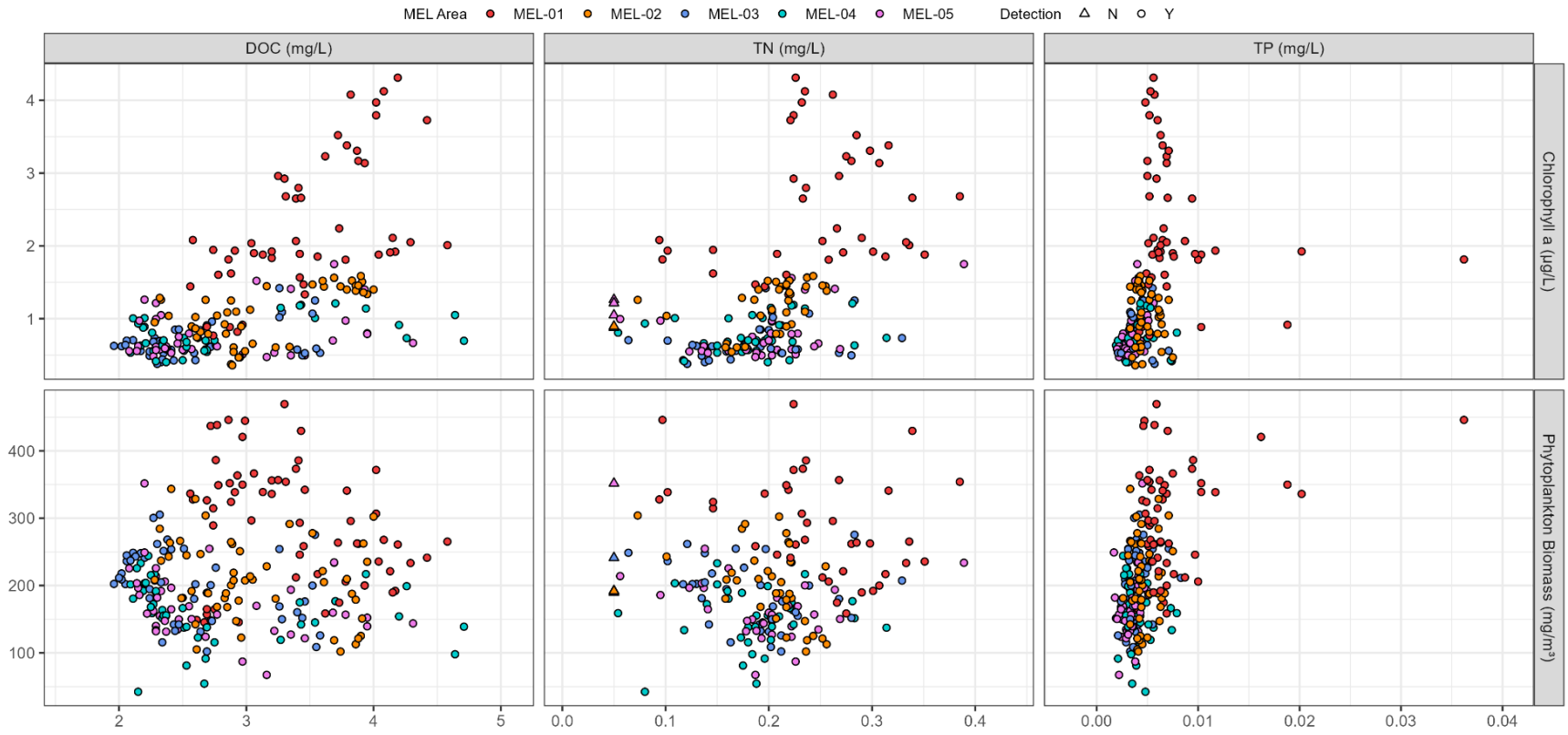


Figure 5-17. Relationship between nutrient concentrations (DOC, nitrogen, and phosphorus) and phytoplankton biomass and chlorophyll-a at the near-field area (MEL-01), August 2013-2024.

Notes: DOC = dissolved organic carbon; TN = total nitrogen; TP = total phosphorus

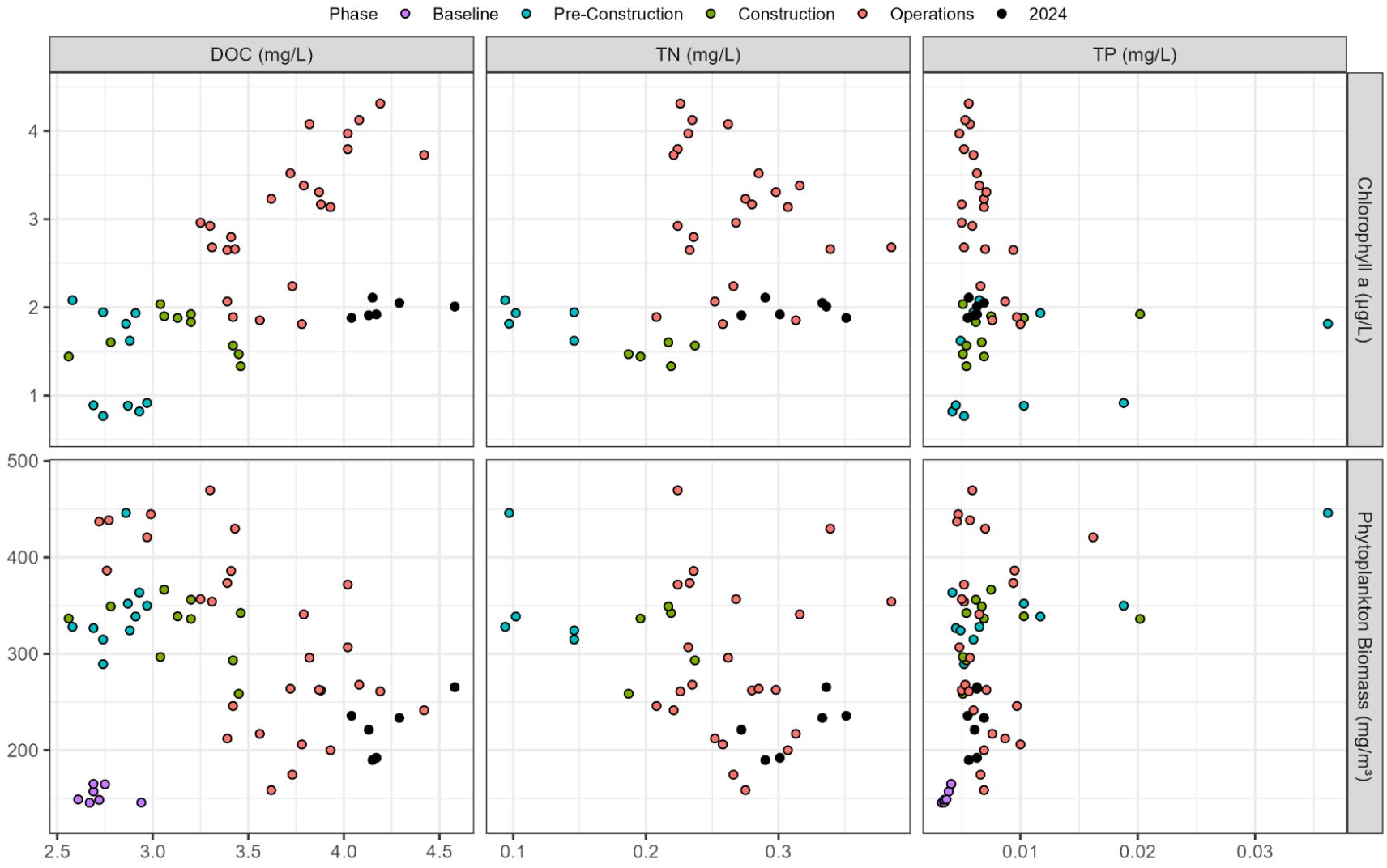
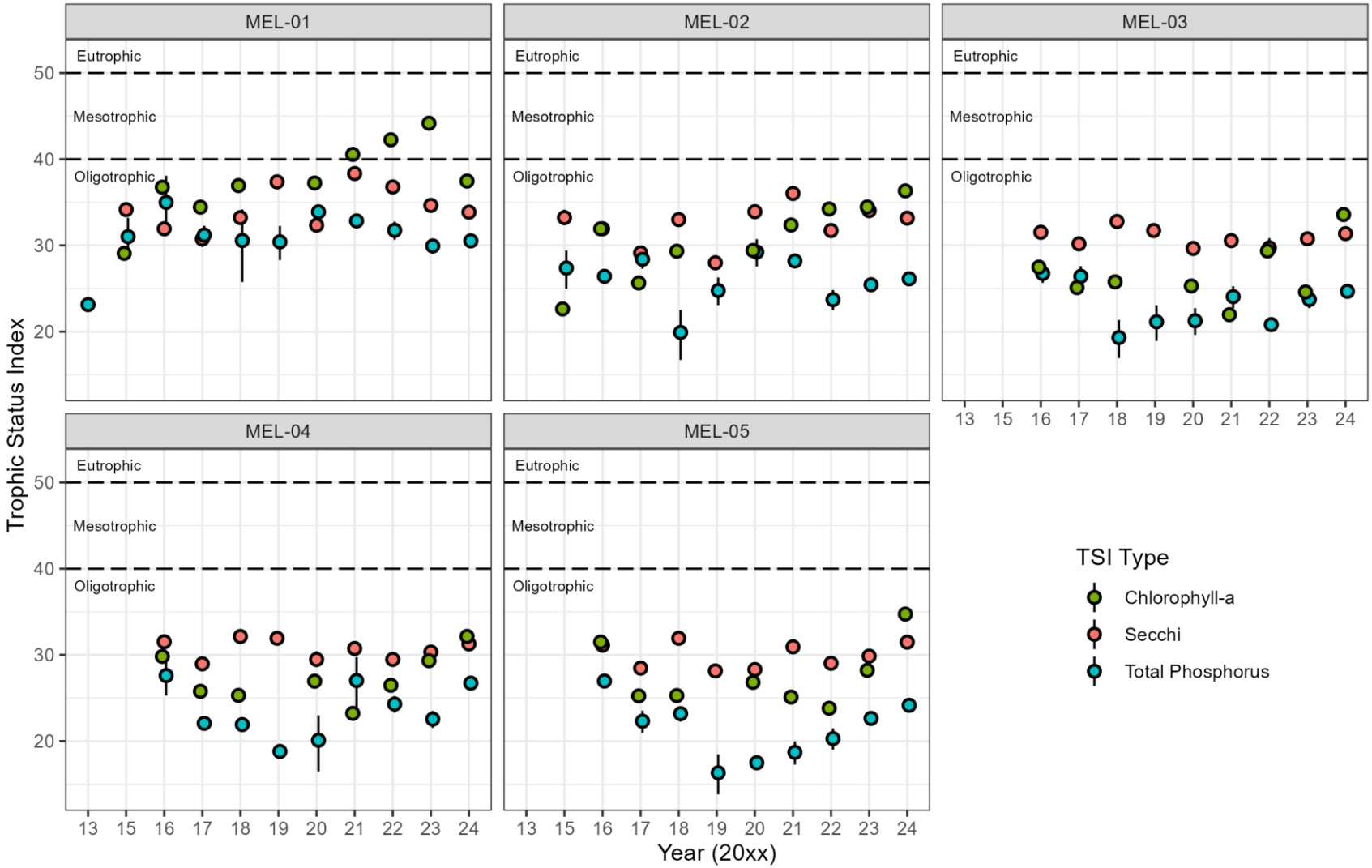


Figure 5-18. Trophic Status Index values for Meliadine Lake, 2013 through 2024.

Notes: points represent the mean; vertical bars represent 1 standard error.



5.5 Conclusions

Conclusions for the 2024 phytoplankton study are summarized below in the context of the key question:

Is the phytoplankton community in Meliadine Lake adversely affected by potential mine-related changes in water quality?

The phytoplankton community in Meliadine Lake does not appear to be adversely affected by the discharge of treated effluent. This conclusion is based on data collected for various metrics and analyses used to evaluate changes in productivity and the structure of the phytoplankton community.

Primary Productivity

Phytoplankton biomass, the most direct measure of community productivity, has been variable across years but has not shown any consistent increasing or decreasing trends related to mining. In contrast, chlorophyll-a, which is used as an indicator of productivity, has trended higher at MEL-01 and MEL-02 over most of the mine operations phase. This increasing trend in chlorophyll-a concentrations was not observed in 2024, but the overall divergent trends for chlorophyll-a and total biomass suggests that the amount of chlorophyll-a per unit phytoplankton biomass may be increasing at MEL-01 and MEL-02 relative to the reference areas. Based on the available data, the underlying cause may be related to water clarity or shifts in the phytoplankton community composition. There is some evidence of a weak positive relationship between DOC and chlorophyll-a, which may influence the amount of light available and affect the amount of chlorophyll-a per unit of biomass, but the 2024 data do not strongly support this interpretation. Overall, results from the 2024 phytoplankton study demonstrate that despite higher loadings of nitrogen coinciding with effluent discharge since 2018 (**Figure 5-1**), there is no evidence to suggest nutrient enrichment is occurring in the form of year-over-year increases in total phytoplankton biomass.

Community Structure

There is some evidence that the phytoplankton community at MEL-01 has changed in recent years based on the results of the Bray-Curtis dissimilarity index and the multivariate analyses. These findings align with the prediction that increased concentrations of nitrogen in the East Basin could lead to a shift in the structure of the phytoplankton community to taxa that efficiently assimilate nitrogen (Agnico Eagle, 2014). The changes to the community observed since 2020 appear to fit with these predictions. However, there is mounting evidence that climatic factors – notably summer rainfall patterns – likely play a critical role in influencing the structure of the phytoplankton community from year to year.

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6 SEDIMENT CHEMISTRY

6.1 Introduction

This section presents findings from the 2024 sediment quality monitoring program in Meliadine Lake. The sediment chemistry component of the AEMP is conducted every three years to track temporal changes in sediment chemistry. 2024 marked the 5th year of monitoring under the AEMP (2015, 2016, 2018, and 2021). The locations of the 2024 sediment sampling stations, along with the sediment sampling locations from 2015, 2016, 2018, and 2021, are shown in **Figure 6-1**. The sediment chemistry data support the benthic invertebrate community program, and together they inform management decisions within the Response Framework.

Objectives and Key Question

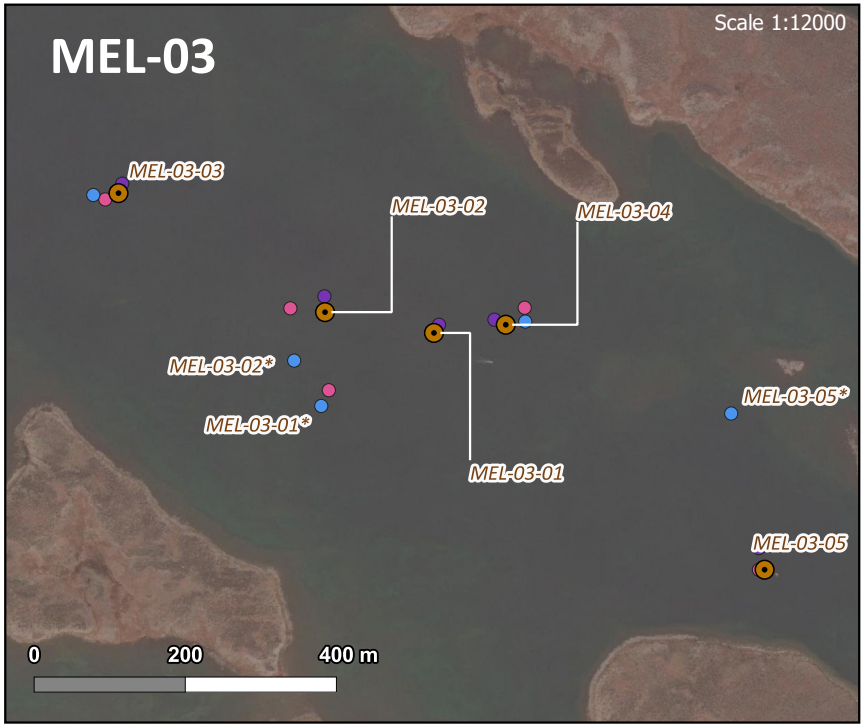
The objectives of the sediment quality monitoring program are outlined below.

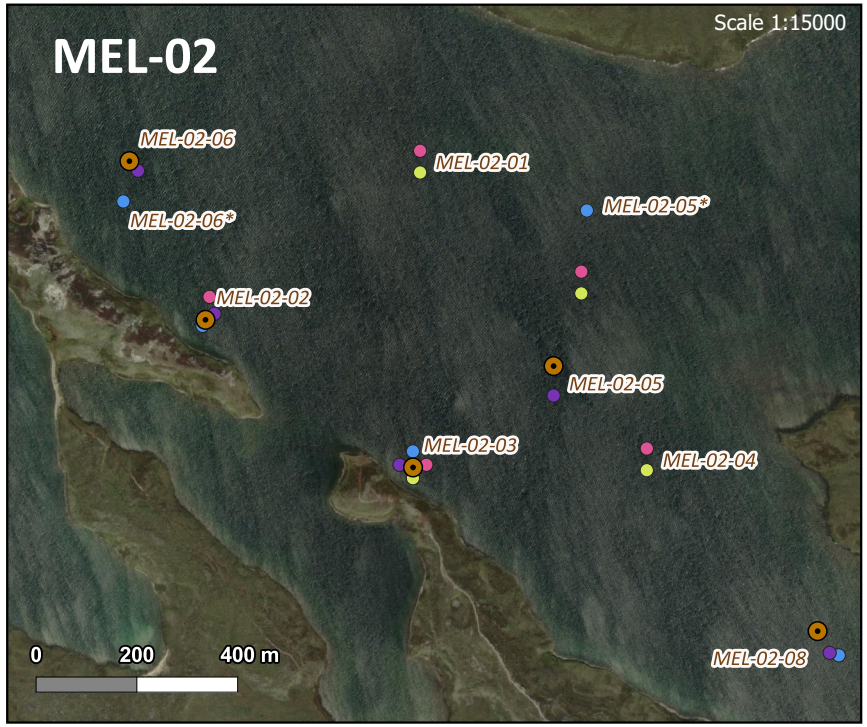
- Characterize sediment quality in Meliadine Lake.
- Verify predictions made in the FEIS[12] in relation to sediment quality in Meliadine Lake (Agnico Eagle, 2014).
- Collect supporting data for the benthic invertebrate community and water quality components to aid in interpretation of results (as per the MDMER regulations [Government of Canada, 2024]).
- Provide data to inform adaptive management intended to reduce or eliminate mine-related changes to sediment quality.

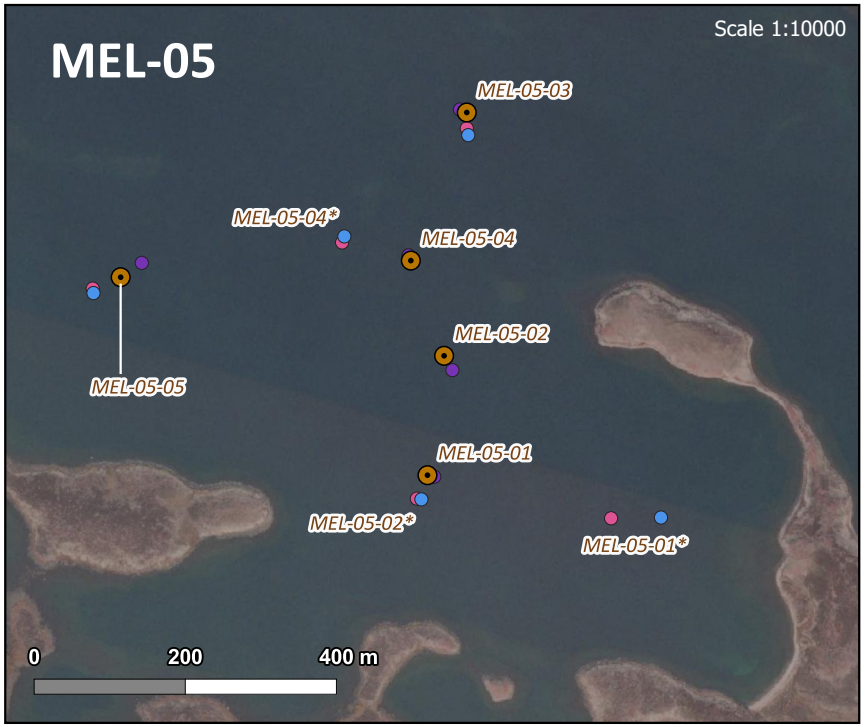
The sediment chemistry program ultimately addresses the following key questions:

> *Is mining activity causing changes in sediment chemistry*?
>
> *If so, are the changes in sediment chemistry adversely affecting the benthic invertebrate community?* (see **Section 7**).

[12] The FEIS concluded that if water quality at the edge of the mixing zone is the same or less than guidelines or ambient conditions, sediment quality will also be the same or less than guidelines. There is the potential for sediment quality within the mixing zone to change.







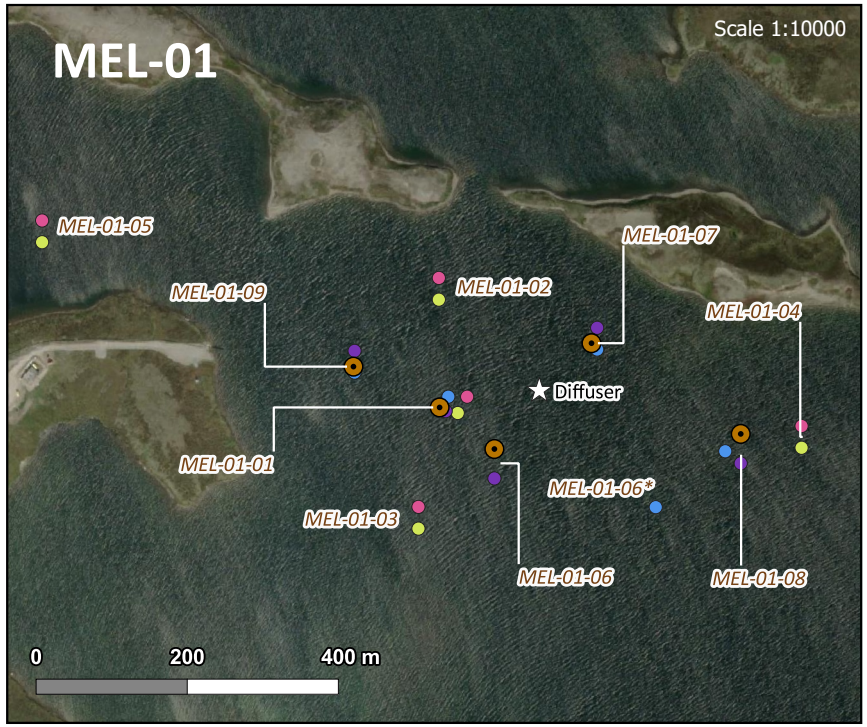


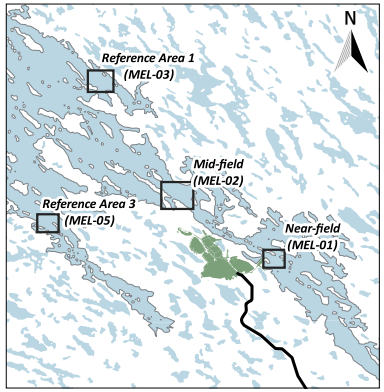
Figure 6-1
Sediment and Benthic Invertebrate Stations in Meliadine Lake

Meliadine Gold Mine
Aquatic Effects Monitoring Program
2024 Annual Report

AZIMUTH

Date: March 15, 2025
Datum: NAD 83; UTM Zone 15N
Scale: overview map 1:350,000
Software: 3.22.11-Białowieża
Produced by: E. Franz

REFERENCES:
1. Basemap imagery from ESRI
2. Mine Plan provided by Agnico Eagle
3. Roads and waterbodies from NRC



Legend

Extent of the Meliadine Mine (2024)

All-weather access road

Year

2015 2018 2024
2016 2021

Note: Stations marked with an asterisk (*) are historical stations that were relocated to more suitable habitat in 2021. Some point locations have been visually adjusted ('nudged') to reduce overplotting.

6.2 Findings from the 2024 Sediment Chemistry Program

- Some metals are naturally enriched in MEL-01 compared to other areas in Meliadine Lake. However, variability within and between areas is largely driven by habitat characteristics – such as grain size – and spatial heterogeneity in iron and manganese concentrations.
- There is no indication that mining activities have contributed to a noticeable increase in the concentrations of metals or altered the sediment habitat quality (i.e., TOC, grain size) at MEL-01 or MEL-02.

6.3 Methods

6.3.1 Field and Laboratory Procedures

The 2024 sediment sampling program was carried out in accordance with the AEMP Design Plan (Azimuth, 2025). Four study areas are included in the Meliadine AEMP: MEL-01, MEL-02, MEL-03, and MEL-05. MEL-04—located near the outlet to Peter Lake—was not sampled in 2018 (Golder, 2019) and was subsequently dropped from the study design.

Sediment characteristics are highly variable throughout Meliadine Lake, reflecting the surrounding geology (i.e., the esker that bisects the lake from northwest to southeast) and its complex morphology. To minimize the potential confounding effect of habitat on the benthic invertebrate community assessment, the field team preferentially established stations in areas where the water depth was 8–9 m, the lake bottom was relatively flat, and the sediment characteristics were predominantly silt/clay. When selecting sampling locations, areas with fine sediment were prioritized over areas where only the depth criterion (8–9 m) was met. Coordinates and depths of the 2024 sampling stations are provided in **Appendix F1**.

Sediment samples were collected using a Petite Ponar (15.24 × 15.24 cm; bottom sampling area of 0.0232 m^2). Sediment samples for chemistry analysis were collected after grab samples for benthic invertebrate taxonomy. Each sediment chemistry sample was a composite of two grabs. Before collection, each grab was inspected to ensure the jaws of the Petite Ponar were fully closed and no water was leaking. If a grab sample was deemed unacceptable or contained less than 50% sediment, the contents were discarded in a bucket, and another attempt was made.

For each successful grab, the top 5 cm of sediment was scooped out using a stainless-steel spoon and placed in a stainless-steel bowl. The top 5 cm from the two grabs were thoroughly mixed and placed in 120 mL glass jars provided by ALS Environmental. The equipment was rinsed and washed before moving to the next station. The field team recorded observations on field sheets, including grain size (sand, silt, or clay), color, presence of macrophytes or other biota, any noticeable odor or sheen, and the fullness of

the grab. The sediment samples were stored in a refrigerator at the Meliadine Mine until the end of the program.

Sediment samples were shipped to ALS Environmental for analysis. ALS was also the service provider for sediment chemistry analysis in previous years. Metals analysis was conducted in Waterloo, Ontario, while grain size, inorganic and organic carbon, and available phosphorus analyses were performed at the Saskatoon, SK, location. All analyses were conducted on the <2 mm size fraction.

Available phosphorus was added to the suite of sediment parameters in 2024 as part of the ongoing assessment of factors that may influence primary productivity in Meliadine Lake. Two methods were used to analyze available phosphorus: the 'modified Kelowna method' (Ashworth and Mrazek, 1995) and the 'Olsen method' (Olsen et al., 1954). Both methods use colourimetric analysis, but they differ in their chemical extractant and pH conditions, and are therefore optimal for different sediment types:

- Kelowna method is better suited for neutral to slightly acidic sediments as well as calcareous environments (Ashworth and Mrazek, 1995).
- Olsen method is specifically designed for alkaline soils and sediments where calcium-bound phosphorus dominates (Tiessen and Moir, 1993).

ALS recommended using analyzing the sediment samples using both methods for a more complete understanding of phosphorus availability.

The tabulated 2024 sediment chemistry results are provided in **Table F1-2**.

6.3.2 Data Analysis

Summary Statistics and Comparison to Guidelines

Data analyses were conducted using R version 4.2.2 (R Core Team, 2022). Descriptive statistics for sediment chemistry were calculated for each study area and compared to the Canadian Council of Ministers of the Environment (CCME) Interim Sediment Quality Guideline (ISQG) and Probable Effects Level (PEL) for the protection of freshwater aquatic life (CCME, 2002). These guidelines provide a general assessment of whether contaminant concentrations in sediment may pose risks to benthic invertebrates. Concentrations below the ISQG are not expected to cause adverse effects, whereas exceeding the PEL suggests that adverse effects may occur. On their own, sediment chemistry data are not a strong predictor of effects to benthic organisms.

Summary statistics and screening results for samples collected in 2024 are provided in **Appendix F1**.

Temporal Trends

Sediment chemistry in Meliadine Lake is naturally variable within each basin due to differences in underlying mineralogy. Therefore, the most relevant point of comparison is how concentrations have

changed over time within each area, rather than direct comparisons between exposure and reference areas. Mining-related changes to sediment chemistry at MEL-01 were assessed based on the following considerations:

- Higher Metal Concentrations at MEL-01 During Operations vs. Pre-Operations
  - Temporal trends in sediment concentrations were evaluated using data from pre-construction and construction periods (2015–2016) and operational years (2018, 2021, and 2024).
  - An increase in metal concentrations during operations, relative to pre-operations, would suggest a potential mining-related influence.
- Gradient Response Between MEL-01 and MEL-02 Exposure Areas
  - Since effluent is discharged at MEL-01, a greater response would be expected at MEL-01 compared to MEL-02 if mining activities were influencing sediment chemistry.
  - A weak or absent gradient between these areas would suggest that mining-related contributions are minimal.

To minimize the potential confounding effect of particle size differences on benthic invertebrate community metrics, efforts were made during each monitoring event to sample in depositional areas characterized by fine sediments. As a result, some stations were relocated between sampling events to areas with a higher proportion of fine sediment, particularly at the reference areas.

Metals have a stronger affinity for finer sediments (silt and clay) compared to sand. Therefore, some observed “temporal trends” may reflect natural heterogeneity in substrate size rather than actual changes in sediment chemistry. To account for this potential confounding effect, metal concentrations were normalized to the percent fines (<50 µm) when visualizing the data.

6.4 Quality Assurance and Quality Control

Sediment chemistry QA/QC involved following appropriate sampling procedures, collecting field duplicates, laboratory QC, and data analysis QA/QC procedures as outlined in the AEMP Design Plan. The QA/QC results for sediment chemistry are provided in **Appendix A**. The results of the sediment chemistry QA/QC program are as follows:

- **Field Duplicates** – Two grab sample field duplicates were collected in 2024. Zirconium exceeded the DQO in both field duplicates. The rest of the parameters met the DQOs, indicating the field and laboratory methods provided precise estimates for the various parameters of interest.
- **Laboratory QC** – Silver exceeded the DQO for the laboratory control sample by less than 10%. ALS classifies the results as ‘acceptable’ if the magnitude of the exceedance(s) is less than 10% for less than 10% of the parameters included in a multi-element scan.

Overall, the sediment QA/QC results indicate the sampling and analytical methods produced accurate and precise results for the AEMP.

6.5 Results and Discussion

6.5.1 Particle Size and Organic Carbon

The following tables and figures are used to support the sediment habitat discussion:

- The cumulative particle size distribution for the samples in 2024 are shown in **Figure 6-2**.
- Particle size and TOC results for 2015, 2016, 2018, 2021, and 2024 are presented in **Table 6-1** and shown in **Figure 6-3**.
- The proportion of clay, silt, and sand in each replicate sample is shown in **Figure 6-4**.

Sediment in MEL-01 is characterized by a higher percentage of fine particles (< 50 µm) compared to MEL-02 and the reference areas. The station locations in 2024 were near those sampled in 2021, and as expected, interannual variability within each basin was low. The station locations in 2021 and 2024 were more similar in terms of the percentage of fine sediment compared to the stations sampled in 2015, 2016, and 2018, particularly at the reference areas. More consistent grain size distributions among the study areas in 2021 and 2024 reduce a confounding factor that can influence the structure of the benthic invertebrate community.

In 2024, organic carbon content in Meliadine Lake ranged from 5.3% at MEL-01 to 7.4% at MEL-05. Similar to the grain size results, variability in TOC between years within each area was low. TOC concentrations have been relatively consistent at MEL-01 since 2015, whereas TOC is slightly higher at MEL-02 and the reference areas in 2021 and 2024 compared to 2015 and 2016. These ‘differences’ are indicative of natural heterogeneity in TOC content in each basin.

Table 6-1 Percent fines and TOC in sediment from Meliadine Lake (mean ±1SD).

Area	Average ± 1SD				
	2015	2016	2018	2021	2024
Percent Fines (<50 µm)					
MEL-01	63 ± 31	82 ± 10	79 ± 14	84 ± 7.1	86 ± 6.5
MEL-02	45 ± 29	46 ± 8.6	50 ± 15	75 ± 7.5	64 ± 12
MEL-03	na	38 ± 21	43 ± 21	64 ± 11	62 ± 9.1
MEL-05	na	37 ± 20	49 ± 29	65 ± 16	63 ± 16
TOC (%)					
MEL-01	4.2 ± 2.3	4.5 ± 1.8	4.5 ± 1.1	5.0 ± 1.2	5.3 ± 1.1
MEL-02	4.8 ± 4.6	4.6 ± 2.7	6.7 ± 1.6	8.8 ± 0.7	7.0 ± 1.9
MEL-03	na	3.7 ± 2.5	3.7 ± 2.9	6.4 ± 1.7	6.5 ± 1.8
MEL-05	na	5.0 ± 2.8	5.7 ± 2.8	7.6 ± 2.6	7.4 ± 2.1

Notes:
na = samples were not collected in 2015.

Figure 6-2. Cumulative particle size distribution for the sediment samples collected in 2024.

Notes: D50 refers to the median grains size for each area (interpolated from the five samples).

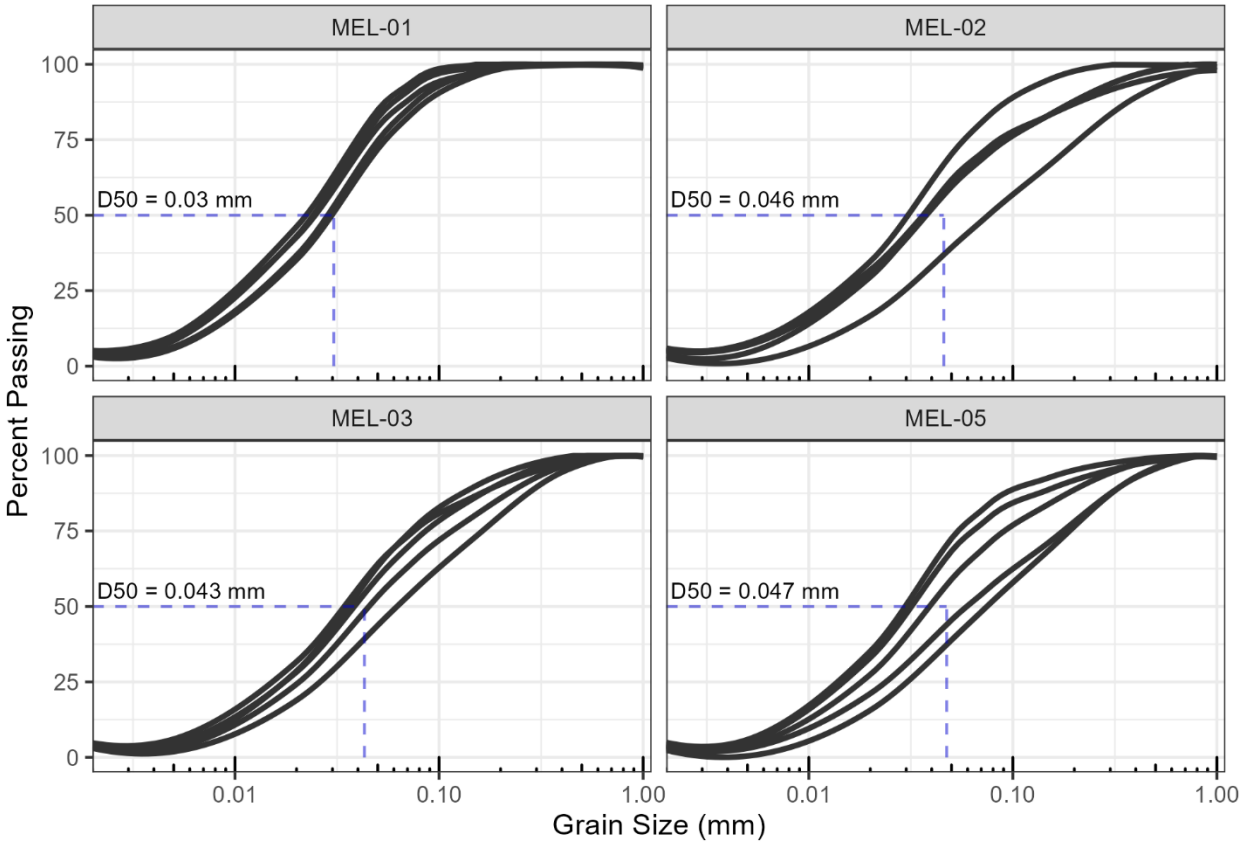


Figure 6-3. Clay, sand, silt and total organic carbon content in sediment collected from the Meliadine Lake AEMP study areas.

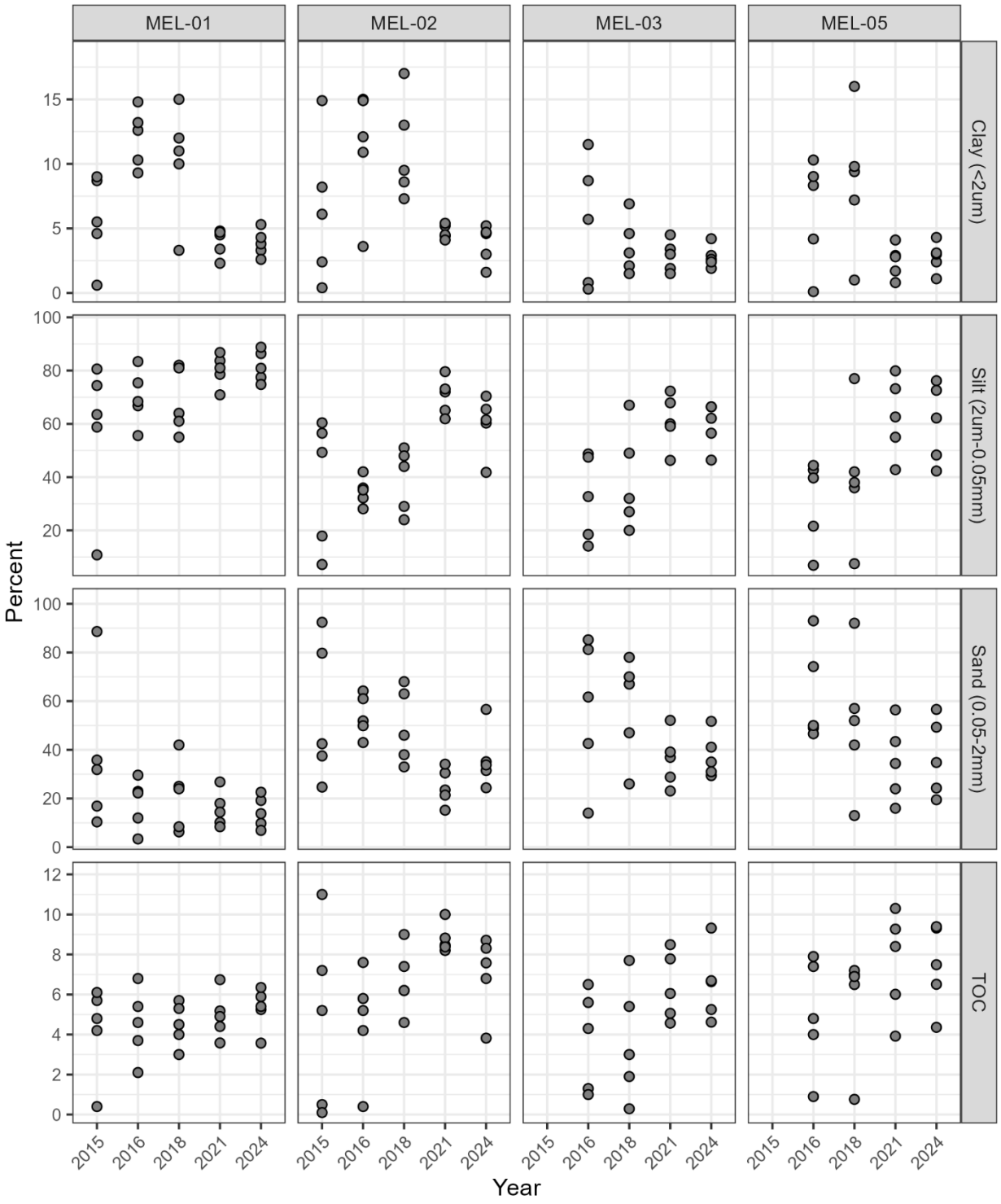
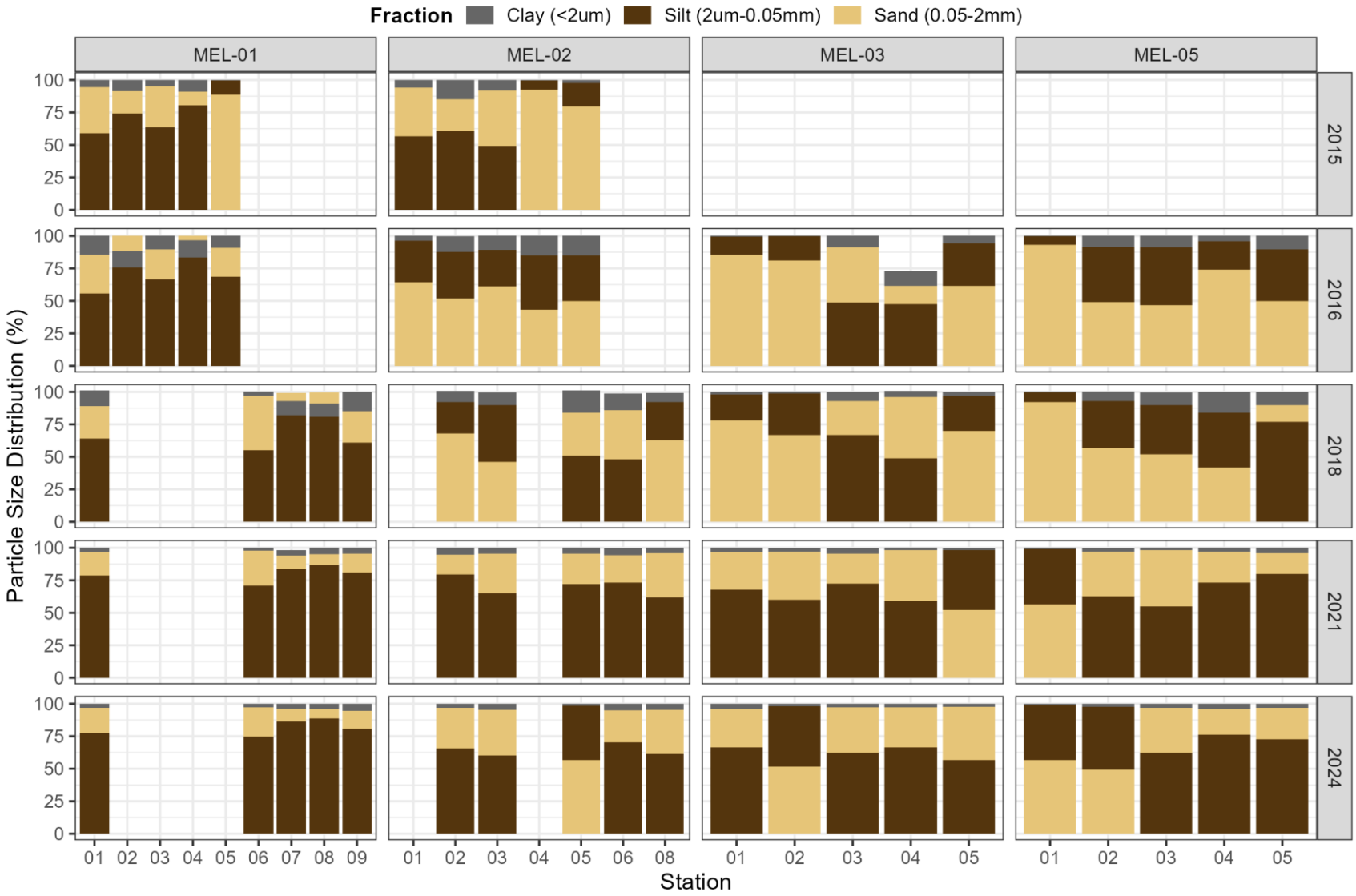


Figure 6-4. Particle size distribution in the various stations sampled in Meliadine Lake since 2015.

Notes: The location of each station is shown in **Figure 6-1**.



6.5.2 Available Phosphorus

Summary statistics for available phosphorus concentrations measured using two analytical methods (modified Kelowna and Olsen) are provided in **Table 6-2**.

Throughout Meliadine Lake, the Olsen method produced higher concentrations of available phosphorus compared to the modified Kelowna method. The Olsen method, which uses bicarbonate extraction, is specifically designed for alkaline and neutral environments, as it effectively extracts phosphorus loosely bound in calcium-phosphate complexes (Olsen et al., 1954). Given the slightly alkaline surface water conditions in Meliadine Lake (**Figure 3-3**), the results from the Olsen method likely provide a more accurate representation of the available phosphorus pool across the four study areas.

The highest concentrations of available phosphorus were measured in sediment samples from MEL-03 (mean = 18.9 mg/kg), while the lowest concentrations were observed at MEL-02 (mean = 5.6 mg/kg). Available phosphorus concentrations at MEL-01 and MEL-05 were comparable. Based on the 2024 results, effluent discharged into the East Basin does not appear to have increased available phosphorus concentrations beyond the range observed at reference areas, suggesting that phosphorus levels remain within expected natural variability.

Table 6-2. Summary statistics for available phosphorus (mg/kg) in sediment samples analyzed using the Modified Kelowna and Olsen Methods.

Area	Method used to Analyze Available Phosphorus	Detection Limit	N	N<DL	Mean	Median	Min	Max
MEL-01	Method E384 (mod Kelowna)	2	5	4	-	-	2.0	14.5
	Method E385 (Olsen)	1	5	0	12.7	14.1	6.0	17.4
MEL-02	Method E384 (mod Kelowna)	2	5	2	2.8	2.3	2.0	4.2
	Method E385 (Olsen)	1	5	0	5.6	5.7	1.8	8.8
MEL-03	Method E384 (mod Kelowna)	2	5	0	12.9	11.4	3.0	24.3
	Method E385 (Olsen)	1	5	0	18.9	19.7	8.0	36.8
MEL-05	Method E384 (mod Kelowna)	2	5	0	6.3	4.4	3.0	11.9
	Method E385 (Olsen)	1	5	0	11.4	8.4	3.1	23.9

Notes:
The mean and median concentrations were not calculated if available phosphorus was detected in less than 3 samples.

6.5.3 Metals

Seven of the metals analyzed in sediment have Canadian Council of Ministers of the Environment (CCME) Interim Sediment Quality Guidelines (ISQG) and Probable Effect Levels (PEL): arsenic, cadmium, chromium, copper, lead, mercury, and lead. In 2024, arsenic, chromium, and copper exceeded the CCME ISQG in at least one sample (**Table 6-3**). Concentrations by area and year are shown in **Figure 6-5**.

Arsenic exceeded the PEL in four of five samples from MEL-01 and three of five samples from MEL-02 in 2024. A decreasing gradient in arsenic concentrations was observed from MEL-01 to MEL-02 to the reference areas. Elevated arsenic concentrations in lake sediments near gold deposits are well-documented (Straskraba and Moran, 1990) and are associated with the Meliadine deposit (Agnico Eagle, 2014). While arsenic levels in the exposure areas exceed the PEL, concentrations remain substantially lower than those observed in the north basin of Whale Tail Lake, where sediment arsenic levels routinely exceed 1,000 mg/kg and have been recorded as high as 1,700 mg/kg (dw) (Azimuth, 2020).

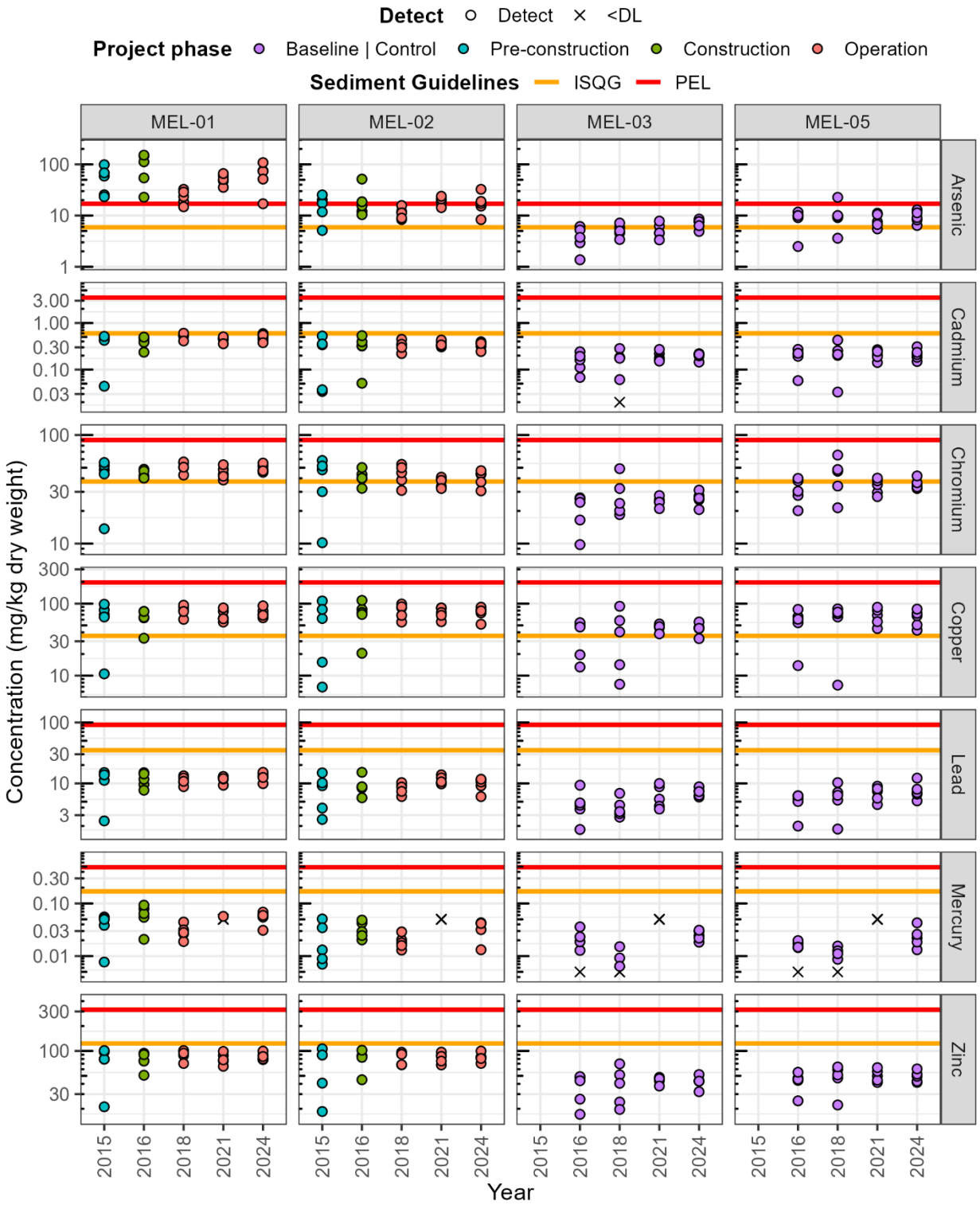
Copper and chromium exceeded their respective ISQGs at MEL-01 and MEL-02, but not their PEL thresholds. Unlike arsenic, copper and chromium concentrations were more uniform across all four study areas (**Figure 6-5**).

Table 6-3. Arsenic, chromium, and copper concentrations in 2024 compared to the CCME sediment quality guidelines.

Area	Parameter	ISQG	PEL	Mean (mg/kg)	Range (min – max)	N>ISQG	N>PEL
MEL-01	Arsenic	5.9	17	64.9	17-108	5	4
	Chromium	37.3	90	**49.4**	45-55	5	0
	Copper	35.7	197	**75.2**	64-93	5	0
MEL-02	Arsenic	5.9	17	18.5	8-33	5	3
	Chromium	37.3	90	**40.5**	31-47	3	0
	Copper	35.7	197	**75.3**	52-89	5	0
MEL-03	Arsenic	5.9	17	**7.01**	5-9	4	0
	Copper	35.7	197	**45.2**	33-56	4	0
MEL-05	Arsenic	5.9	17	**9.59**	6-13	5	0
	Chromium	37.3	90	35.7	32-42	1	0
	Copper	35.7	197	**63.7**	43-84	5	0

Notes:
ISQG = interim sediment quality guideline; PEL = probable effect level.
Bold values indicate parameters where the annual mean exceeded the ISQG.
Shaded values indicate parameters where the annual mean exceeded the PEL.

Figure 6-5. Sediment chemistry results compared to the CCME Interim Sediment Quality Guideline (ISQG) and Probable Effect Level (PEL) concentration.



6.5.4 Temporal Assessment

The following metals were selected to evaluate temporal changes in sediment chemistry caused by effluent discharge and other mining activities: arsenic, barium, strontium, and uranium. These parameters were included because increasing temporal trends were evident in the Meliadine Lake water quality assessment. Point plots showing the concentrations of other metals are included in **Appendix F2**.

The following figures were used to support the temporal assessment:

- Concentrations of each parameter by area and year are shown in **Figure 6-6**.
- A bi-plot of the concentrations of select metals compared to the percent fines (< 50 µm) is shown in **Figure 6-7**. The data are faceted by year and the points are colour-coded by area.
- **Figure 6-8** shows the relationship between arsenic, iron, and manganese in samples collected since 2015.
- Concentrations of select metals at the MEL-01 stations during operations (2018, 2021, and 2024) are shown **Figure 6-9**. The location of the stations in 2018, 2021, and 2024 were in the same general vicinity; this figure helps illustrate spatial variability within MEL-01 compared to temporal trends between years.

Arsenic

Arsenic concentrations at MEL-01 in 2024 were higher than in 2018 and 2021, yet remained within the range of concentrations measured in 2015 and 2016. Arsenic levels tended to be higher in areas with a greater proportion of fine sediments (**Figure 6-7**).

There was also a strong correlation between arsenic, iron, and manganese concentrations throughout Meliadine Lake (**Figure 6-8**). This relationship is well-documented, as arsenic is strongly associated with iron and manganese oxides in sediments from mineralized areas (Bhattacharya et al., 2007; Smedley & Kinniburgh, 2002), and all three parameters co-vary with sediment grain size.

Overall, interannual variability in arsenic concentrations throughout Meliadine Lake can be explained by natural spatial heterogeneity in grain size, iron, and manganese concentrations. There is no indication that mining activities are causing arsenic concentrations to increase at MEL-01 or MEL-02.

Barium

Long-term monitoring data from the surface water sampling program suggests that barium concentrations may be increasing across the region. However, a similar increasing temporal trend was not observed in sediment at either the exposure or reference areas from 2015 to 2024 (**Figure 6-6**).

Barium concentrations in sediment are strongly correlated with percent fines (**Figure 6-7**), indicating that natural variability in sediment composition plays a significant role in barium distribution. Given the

spatial and temporal variability within and between areas, there is no evidence that mining activities are contributing to elevated barium concentrations in sediment.

Strontium and Uranium

Strontium and uranium concentrations exhibit some fluctuations over time but show no clear increasing trends in either the exposure areas or reference areas. There is no evidence that mining activities have contributed to elevated concentrations of these metals in Meliadine Lake sediments.

6.6 Conclusions

Conclusions for the 2024 sediment chemistry monitoring program are summarized below in the context of the key question:

Is mining activity causing changes in sediment chemistry?

Based on three cycles of sediment sampling during operations, there is no evidence that mining activities have contributed to a noticeable increase in metals in sediments at exposure areas MEL-01 and MEL-02. Variability within and between areas is largely driven by natural factors, such as grain size differences and background geochemistry, in particular the concentrations of iron and manganese.

The sediment chemistry results are revisited in **Section 7** in the context of potential effects on benthic invertebrates.

Figure 6-6. Temporal trends in the concentrations of select metals of interest at the Meliadine Lake study areas, 2015-2024.

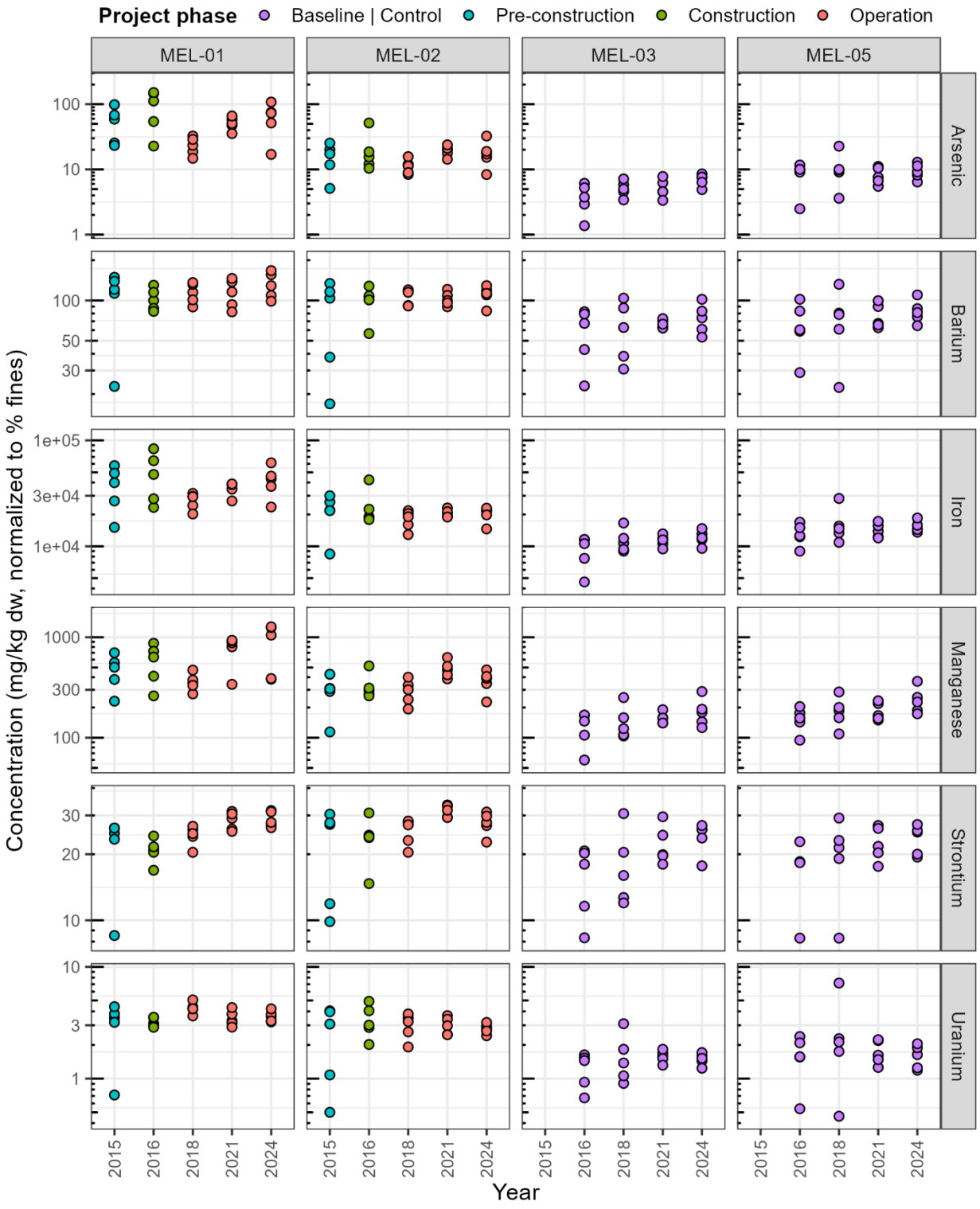


Figure 6-7. Temporal trends in the concentrations of select metals of interest at the Meliadine Lake study areas compared to sediment grain size.

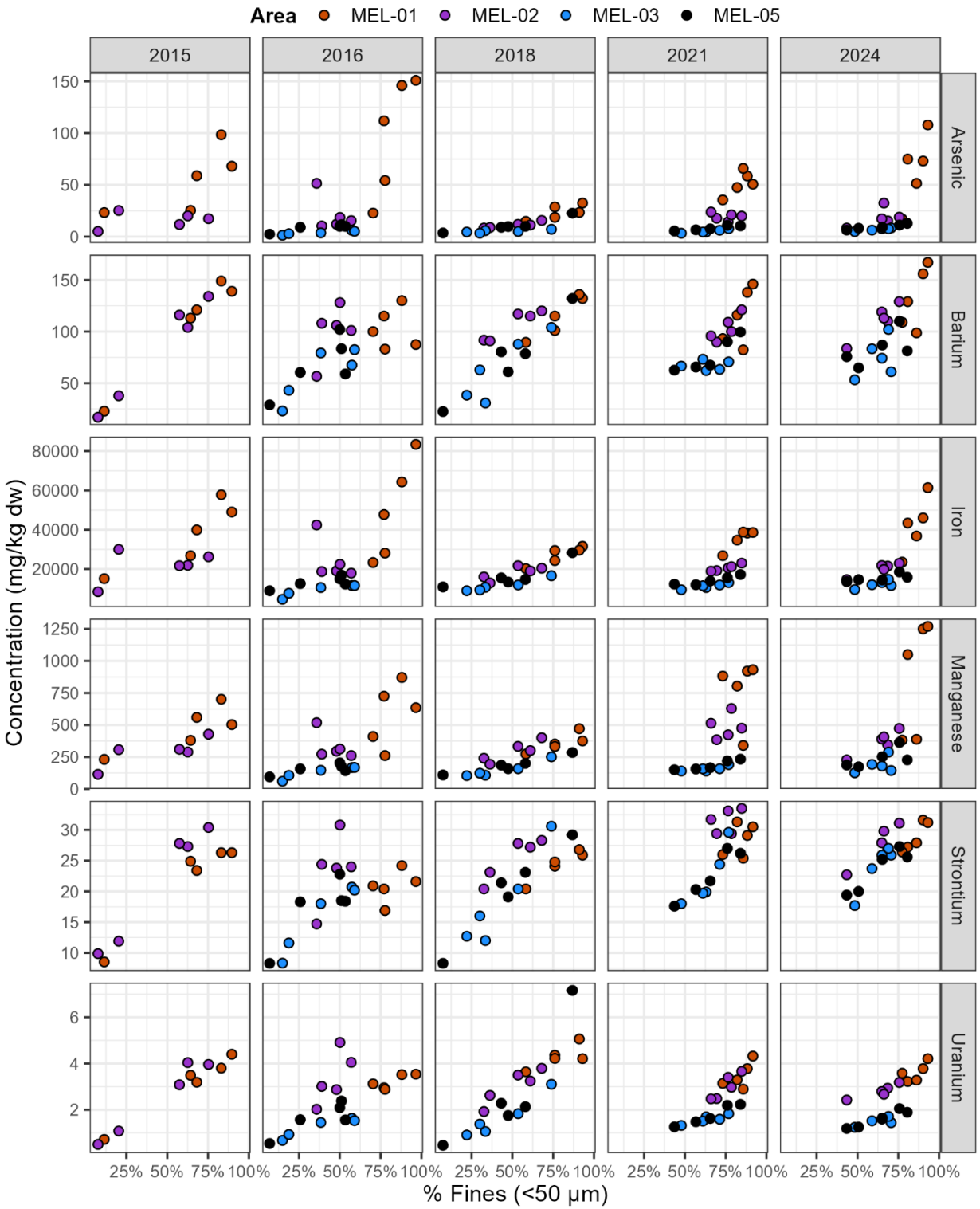


Figure 6-8. Relationship between arsenic, iron, and manganese concentrations in sediment samples from Meliadine Lake from 2015-2024.

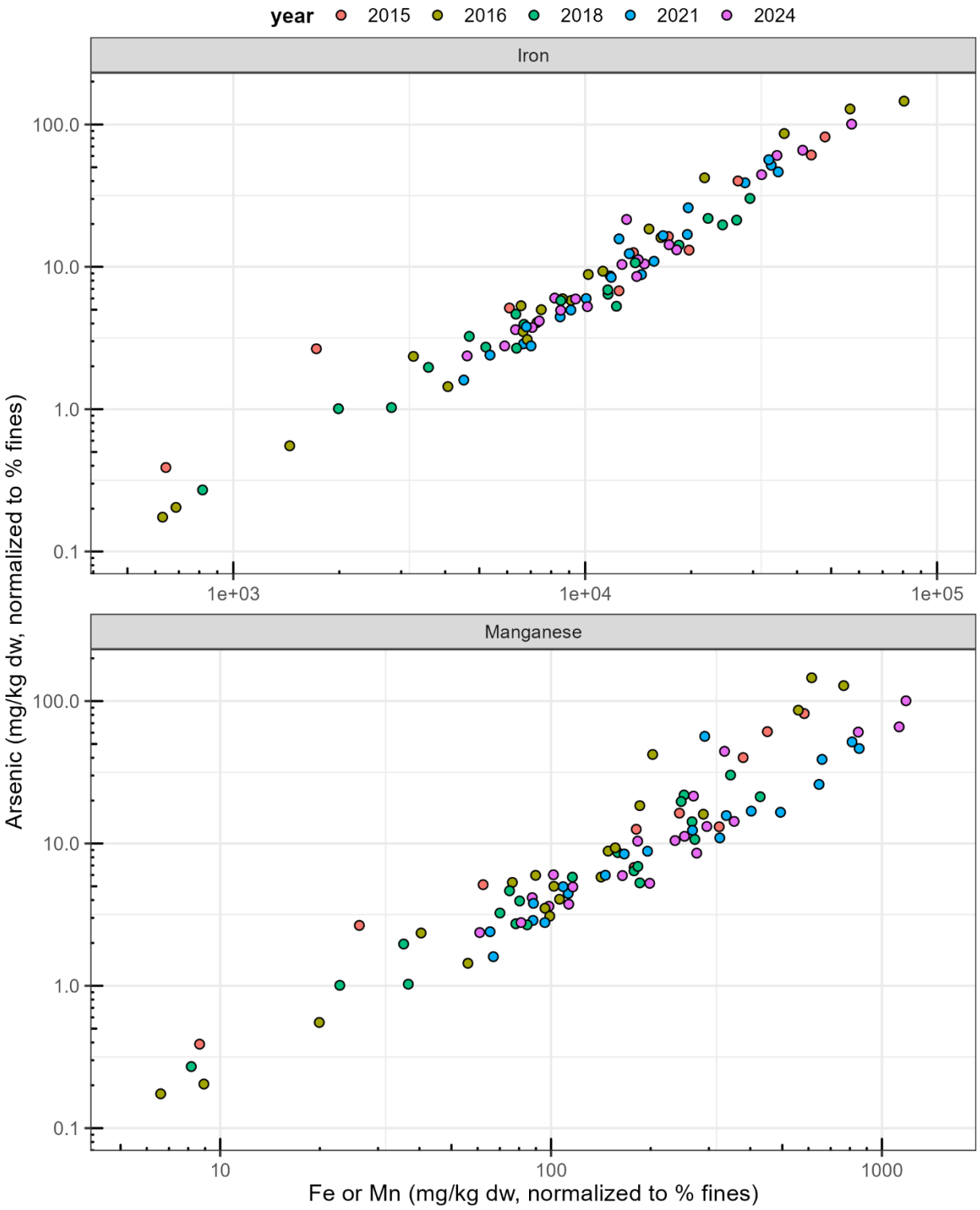
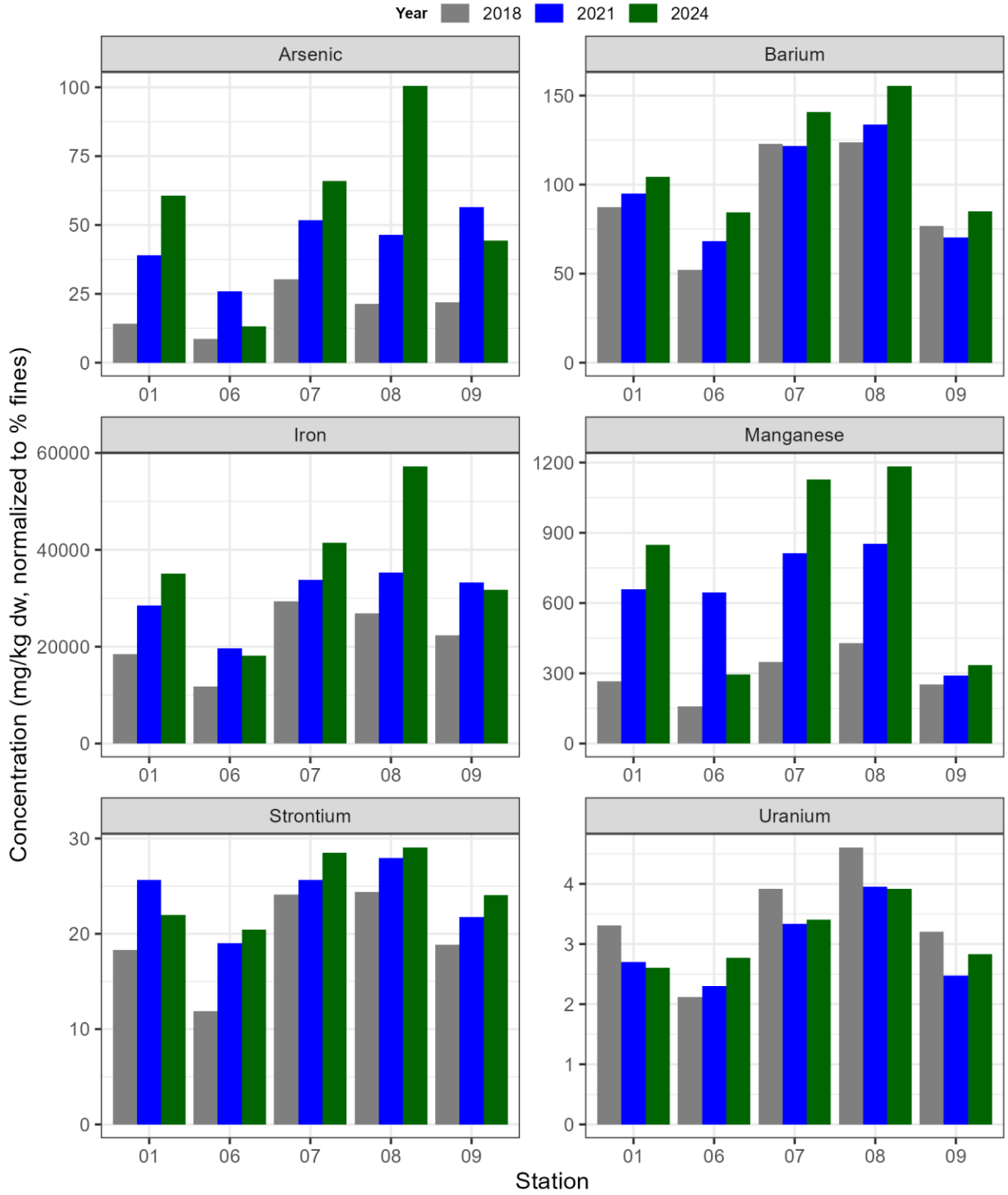


Figure 6-9. Concentrations of select metals of interest at the MEL-01 stations during operations (2018, 2021, and 2024).

Notes: See **Figure 6-1** for the sampling station locations.



6.7 References

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7 BENTHIC INVERTEBRATE COMMUNITY

7.1 Introduction

This chapter presents the findings of the August 2024 benthic invertebrate community study conducted in Meliadine Lake, as required under the Water Licence. The 2024 study marked the third cycle of benthic invertebrate community monitoring since the Mine began operations. Previous monitoring cycles were conducted in 2018 (Cycle 1) and 2021 (Cycle 2) to meet the requirements of the Water Licence and Schedule 5 of the MDMER (Environmental Effects Monitoring [EEM] studies). The benthic invertebrate community studies for the AEMP and EEM program share the same dataset for the near-field (MEL-01) and reference areas (MEL-03 and MEL-05). However, the AEMP includes an additional mid-field study area (MEL-02) and employs a finer level of taxonomic identification, typically at the genus or species level. In contrast, EEM studies classify benthic invertebrates at the family level.

No effects on the benthic invertebrate community were detected in either 2018 or 2021. As a result, under Schedule 5, Section 9(1)(b) of the MDMER, an EEM benthic invertebrate community study was not required in 2024. The Water Licence does not include a provision to reduce the frequency of benthic invertebrate sampling. Therefore, the study was conducted on the three-year cycle in mid-August as per the AEMP Design Plan.

Objectives and Key Question

The benthic invertebrate community monitoring program aims to:

- Compare benthic invertebrate communities in the exposure areas to within-lake reference areas, using benthic invertebrate effect endpoints to identify potential Project-related effects.
- Verify predictions made in the Final Environmental Impact Statement (FEIS).
- Assess the effectiveness of existing mitigation measures.
- Provide data to support adaptive management strategies aimed at reducing or eliminating mine-related effects on benthic invertebrate communities in Meliadine Lake.
- Recommend necessary and appropriate modifications to the study design for future years.

The benthic invertebrate community monitoring program is designed to address the following key question:

> *Is the benthic invertebrate community affected by potential mine-related changes in water and sediment quality in Meliadine Lake?*

To answer this, the study examined both spatial and temporal trends in the benthic invertebrate community in relation to mine development. Spatial comparisons were conducted by analyzing

differences between exposure areas (MEL-01 and MEL-02) and reference areas (MEL-03 and MEL-05) within Meliadine Lake. Temporal comparisons involved evaluating results from 2024 against data collected during the pre-construction and construction phases (2015 and 2016) and early operations (2018 and 2021). By simultaneously assessing spatial and temporal trends, the study provides a more robust evaluation of potential mine-related effects on the benthic invertebrate community.

7.2 Findings from the 2024 Benthic Invertebrate Community Program

- MEL-01 exhibited statistically significant differences in density compared to reference areas (MEL-03 and MEL-05) in 2024, but the magnitude of difference was below the Critical Effect Size (CES) threshold for biological significance. No differences in species richness were detected among exposure and reference areas in 2024.
- Bray-Curtis dissimilarity was significantly different at both MEL-01 and MEL-02 compared to reference areas, indicating differences in community structure and taxonomic composition. Multivariate analysis (nMDS) confirmed these patterns, with MEL-01 falling outside the 90th percentile of reference conditions in Meliadine Lake.
- Despite these differences, MEL-01's benthic community composition has remained stable since 2018, consistently dominated by chironomid larvae and fingernail clams. The long-term stability of the community suggests that effluent discharge to Meliadine Lake has not caused adverse effects on benthic invertebrate structure at MEL-01.
- These findings align with predictions from the FEIS (Agnico Eagle, 2014), which anticipated no significant changes to benthic invertebrate structure despite higher nutrient concentrations in the East Basin and potential shifts in primary productivity.

7.3 Methods

7.3.1 Field and Laboratory Procedures

The field program was carried out at four areas in Meliadine Lake (MEL-01, MEL-02, MEL-03, and MEL-05) from August 9 to 20, 2024. The five replicate sampling stations in each area are co-located with the sediment quality monitoring stations shown in **Figure 6-1**.

Sediment samples for benthic invertebrate taxonomy were collected using the same Petite Ponar grab as those used for sediment chemistry, TOC, and grain size analyses. At each replicate station, five subsamples were collected and sieved through a 500 µm mesh screen to form a composite sample. Immediately after sieving, each composite sample was preserved with neutral buffered formalin to a final concentration of 5–10% to ensure specimen integrity and prevent decomposition.

The samples were sent to Cordillera Consulting (Summerland, British Columbia) for taxonomic identification and enumeration to the lowest practical level (LPL), typically genus or species. Cordillera has been the service provided for benthic invertebrate taxonomy since the start of the AEMP in 2015. The taxonomists involved in the 2024 AEMP are certified by the Society of Freshwater Science (SFS) Taxonomic Certification Program at level 2, which is the required certification for CABIN projects.

Detailed laboratory methods are provided in **Appendix G2** along with the raw data from 2024.

7.3.2 Quality Assurance and Quality Control

The QA/QC procedures used in the collection, processing, and analysis of benthic invertebrate samples followed the EEM Technical Guidance Document (Environment Canada, 2012).

Field QA

The benthic invertebrate and sediment sampling program was led by the same individual who conducted the program in 2021. Samples were collected following the standard procedures outlined in the AEMP Design Plan.

Field notes were maintained throughout the sampling program, documenting key details such as the date and location of sample collection, sampler's initials, and collection methods. Each sample was labeled with a unique identifier and the date of sampling. Chain-of-custody forms were updated as samples were collected and reviewed for accuracy before shipment to verify that all recorded information was complete and correct.

Laboratory QC

Standard quality control (QC) procedures for the benthic sampling program include evaluations of both sorting efficiency and sub-sampling efficiency.

- Sorting efficiency was assessed for two benthic invertebrate samples—MEL-01-01 and MEL-05-01—to evaluate the proportion of organisms missed by the initial sorter. The data quality objective (DQO) for sorting efficiency is 95%, based on the agreement between the initial sort and the quality control (QC) re-sort. Sorting precision was 99% for both samples, with only three organisms identified during each re-sort, well within the acceptable threshold.
- Sub-sampling efficiency was evaluated for two samples—MEL-02-03 and MEL-05-02—to verify that any examined fraction of the total sample was representative of the whole. Abundance estimates for both these samples were based on sorting 50% of the sample. The laboratory's DQO for sub-sampling efficiency requires that the number of organisms in each sub-sample be within ±20% of the actual count. Sub-sampling accuracy was ±0.3% for MEL-02-03 and ±3.1% for MEL-05-02, both of which met the specified criteria.

7.3.3 Data Analysis

Processing Taxonomic Data

Benthic invertebrate taxonomy data were added to Azimuth's freshwater benthic invertebrate database (MS Access), which is jointly managed by taxonomists at Biologica Environmental Services. To ensure consistency across years, a taxonomic filter was developed to harmonize species identifications under a common naming system. As recommended by Environment Canada (2014), the following taxa were excluded from analysis before proceeding with data processing: ostracods, cladocerans/rotifers, copepods, sponges, nematodes, flatworms, vertebrates, and non-aquatic taxa.

In addition to total estimates of density and richness, the benthic invertebrate community data was also assessed at the Major Taxonomic Group (MTG) level, categorized at the Class or Order rank. Benthic invertebrates were group by Diptera (e.g., chironomids), Oligochaeta, Amphipoda, Bivalvia (clams), and Gastropoda (snails). Species that contributed minimally to the benthic invertebrate community were grouped under "Other" for the purpose of calculating summary statistics and visualizing data. To maintain consistency with the approach outlined in previous cycles, mayflies (Ephemeroptera) and caddisflies (Trichoptera) were excluded from the dataset. These taxa are uncommon in depositional lake environments in the region.

Benthic Invertebrate Effect Endpoints

The approach for determining effects to the benthic invertebrate communities in MEL-01 and MEL-02 is consistent with methods used to determine effects in EEM studies. Under MDMER, an "effect on the benthic invertebrate community" means a statistically significant difference in effect indicators (endpoints) at the exposure area compared to reference area(s) that also exceeds the CES (i.e., 2 SD of the reference mean) (Government of Canada, 2024).

The effect indicators for EEM studies were adopted for the AEMP (**Table 7-1**):

- Total density (N/m^2)
- Taxa richness (LPL of identification)
- Simpson's Evenness Index
- Bray-Curtis Index

Other metrics are often used to describe the community, including Simpson's Diversity Index, density of major taxa, proportion of dominant taxa, and presence/absence. However, none of these 'supporting endpoints' are used to determine if there is an effect to the benthic invertebrate community.

The calculations for Simpson's Evenness, Bray-Curtis Index, and Simpson's Diversity Index are provided in **Appendix G1**.

Table 7-1. Benthic Invertebrate Community Endpoints.

Endpoint		CES[a]
Effect Indicator	Total invertebrate density (number of organisms/m^2)	± 2SD
	Total taxonomic richness	± 2SD
	Simpson's evenness index	± 2SD
	Bray-Curtis index	no CES
Supporting Endpoint	Simpson's Diversity index	no CES
	Presence/absence by each taxon	no CES
	Community composition as percentages of major taxonomic groups	no CES
	Densities of dominant invertebrates	no CES

Notes
[a] Critical Effect Size (CES) = 2 standard deviations of the reference mean. There is no CES for the Bray-Curtis index.

Statistical Analyses for Effect Indicators

Statistical analyses followed the EEM Technical Guidance Document (Environment Canada, 2012). Potential differences in the benthic community between exposure areas (MEL-01 and MEL-02) and reference areas (MEL-03 and MEL-05) in 2024 were evaluated using a multiple control-impact study design, consistent with the approach used in Cycle 2 EEM (2021) (Azimuth and Portt, 2022). In EEM Cycle 2, the two reference areas were pooled after confirming normality and equal variance assumptions, increasing the reference sample size and statistical power to detect differences between exposure and reference areas.

To determine whether data from MEL-03 and MEL-05 could be pooled, Student's t-tests were conducted for each metric. No significant differences were found (**Table 7-2**), so the reference areas were pooled for comparison against exposure areas using ANOVA and Tukey post-hoc tests.

Table 7-2. Summary of t-test results comparing benthic invertebrate metrics between the two reference areas (MEL-03 and MEL-05) in 2024.

Endpoint	t-statistic	p value
Density	0.568	0.47
Richness (LPL)	0.681	0.43
Simpson's Evenness	0.252	0.63
Bray-Curtis Index	1.60	0.24

Notes
LPL = lowest practical level of taxonomic identification

Differences in the response endpoints between the exposure areas and pooled reference areas were determined by ANOVA. A difference in mean values between the exposure and reference areas was considered statistically significant at $p < 0.1$ (Environment Canada, 2012). Before completing ANOVA, normality (Shapiro-Wilk) and equal variance (Levene's test) were assessed for each endpoint. If assumptions were not met, the data were $\log_{10}$ transformed and the test was rerun. Post-hoc comparisons between MEL-01, MEL-02, and the pooled reference areas were conducted using Tukey's Honestly Significant Difference (HSD) test ($p < 0.1$).

Effect Size Calculations

Effect size calculations were used to quantify the magnitude of differences between the exposure and reference areas, providing a standardized measure of biological significance beyond statistical significance.

The % difference between the exposure areas and pooled reference areas was calculated using:

$$\%\ difference = \frac{mean_{exp} - mean_{ref}}{mean_{ref}}\ x\ 100$$

Effect size (ES), as the number of reference area standard deviations, was calculated as:

$$ES = \frac{mean_{exp} - mean_{ref}}{SD_{ref}}$$

The critical effect size (CES) for benthic invertebrate community studies is ± 2 SD of the reference area mean. Therefore, if a primary endpoint is statistically significantly different between the exposure and pooled reference area and the effect size is greater than 2 reference area SD, then the effect is biologically significant and requires further investigation.

Community Structure

Non-metric multidimensional scaling (nMDS) was used to evaluate spatial differences and temporal trends in the structure of the benthic community in Meliadine Lake, following the same general approach as the phytoplankton study (**Section 5.3.3**). The nMDS process begins with the original taxonomic dataset, from which a pairwise Bray-Curtis dissimilarity matrix is calculated for each taxonomic sample. This matrix is then reduced to a small number of dimensions that best represent variation among samples. By simplifying a multidimensional taxonomic dataset into two or three dimensions, nMDS captures the major patterns of variability in the benthic invertebrate community.

Prior to analysis, raw abundance values at the family level were $\log_{10}(x + 1)$ transformed to reduce the influence of numerically dominant taxa and achieve a more balanced representation of the community in the final ordination. Scree and Shepard's plots were used to assess the representativeness of the nMDS configuration: scree plots helped determine the optimal number of dimensions by evaluating the

rate of stress reduction, while Shepard's plots assessed the goodness-of-fit between the original dissimilarities and the reduced ordination space. Based on these evaluations, two dimensions were selected as the optimal configuration (**Appendix G1**).

The ordination for each sample was plotted alongside ellipses representing the 90th, 95th, and 99th percentiles of reference area taxonomy data, as well as data from MEL-01 and MEL-02 in 2015, when both areas were considered unimpacted by mining activities (**Table 7-3**).

Table 7-3. Control / Impact status for the benthic invertebrate community study areas.

Year	MEL-01	MEL-02	MEL-03	MEL-04	MEL-05
	Near-field	Mid-field	REF1	REF2	REF3
2015	Impact[a]	Impact[a]	Not sampled	Not sampled	Not sampled
2016	Impact[a]	Impact[a]	Control	Control	Control
2018	Impact	Impact	Control	Not sampled	Control
2021	Impact	Impact	Control	Removed from the study design	Control
2024	Impact	Impact	Control		Control

Notes:
[a] The Exploration Camp discharged treated sewage to Meliadine Lake in 2015 and 2016.

7.4 Results and Discussion

7.4.1 Benthic Invertebrate Community – General Discussion

A brief discussion of the benthic invertebrate community is provided below, supported by figures and tables at the end of this chapter (**Section 7.6**).

The abundance and species composition of benthic invertebrate communities are influenced by multiple habitat variables, including water depth, substrate size, and organic carbon content. Additionally, factors such as water temperature and nutrient influx can affect larval development rates and the timing of insect larval hatching. Collectively, these variables contribute to significant spatial and temporal variability in benthic invertebrate communities in northern lakes.

As is typical of Arctic lakes, the benthic invertebrate community in Meliadine Lake is dominated by the aquatic larval stages of insects, particularly chironomids (Family Chironomidae), both in terms of abundance (**Figure 7-3**) and taxa richness (**Figure 7-4**). The next most abundant group has been bivalves, especially at MEL-01 where densities in the range of 40-50% have been observed (**Figure 7-5**).

Oligochaete worms and gastropods (snails) are also relatively common in lake sediments, with one or both groups present in each sampled area in previous years.

Benthic invertebrate density was higher in 2024 compared to 2015, 2016, and 2018 but slightly lower than 2021 (**Figure 7-3**). In 2021, there were four samples with relatively high density (>10,000 organisms/m^2); one at MEL-01, two at MEL-03, and one at MEL-05. Not including these samples, densities observed throughout Meliadine Lake in 2024 were comparable to 2021.The increase in total density in both 2021 and 2024 was primarily due to midges (chironomids, order Diptera), with bivalves also increasing at MEL-01 in 2024 (**Figure 7-3**).

Midges (chironomids) have a four-stage life cycle (egg, larva, pupa, adult), spending most of their life in the larval stage. In northern lakes, chironomid development can take 2–3 years, but may last up to 7 years (Butler, 1982; Porinchu & MacDonald, 2003). The sampling method (500 µm mesh) selectively captures late-instar larvae, leading to expected natural variation in chironomid abundance between years. The most important trend is that MEL-01, MEL-02, and the reference areas all showed the same increase from 2018 to 2024, reinforcing that the changes are likely due to natural life-cycle fluctuations rather than external impacts.

Taxa richness has gradually increased at MEL-01 and MEL-02 since 2015 (**Figure 7-4**). The increase in richness is primarily attributed to midges. Oligochaetes and less common taxa (grouped as 'Other') can also contribute to higher richness in some samples. The same trend of increasing richness was also evident at the two reference areas, with species richness increasing from 13-15 taxa in 2016 to 17-18 taxa in 2024 (**Table 7-8**).

7.4.2 Control-Impact Assessment for the Effect Endpoints

Statistical test results from the ANOVA for the primary benthic invertebrate community endpoints in 2024 are provided in **Table 7-4**. Significance of the pairwise comparisons between the exposure and reference areas are provided in **Table 7-5**. Effect sizes compared to the CES are presented in **Table 7-6**. Results of the ANOVA and pairwise comparisons for each endpoint are summarized below.

Total Density

- Total density data passed Levene's test for equal variance but did not meet the normality assumption for untransformed ($p = 0.017$) or log_{10}-transformed data ($p = 0.033$). ANOVA is robust to mild normality violations (Environment Canada, 2012); therefore, analyses were conducted on both untransformed and transformed datasets for comparison.
- In the untransformed dataset, mean density did not differ significantly among MEL-01, MEL-02, and the pooled reference areas ($p = 0.101$). However, after log_{10} transformation, the difference became statistically significant ($p = 0.046$).

- Pairwise comparisons indicated a significant difference between MEL-01 and pooled reference areas ($p = 0.086$). There was no significant difference in density between MEL-02 and the reference areas ($p = 0.60$) or MEL-01 and MEL-02 ($p = 0.51$).
- On average, benthic invertebrate density at MEL-01 was 38% lower than in the reference areas, but the magnitude of the difference was less than the CES of 2 SD of the reference mean.

Taxa Richness

- Total richness data passed Shapiro-Wilks test for normality and Levene's test for equal variance, and the ANOVA was conducted on untransformed data.
- Mean richness did not differ significantly among the exposure and reference areas ($p = 0.278$). On average, there were 17.5 taxa at the reference areas compared to 16.2 and 18.8 taxa at MEL-01 and MEL-02.

Simpson's Evenness

- Assumptions of normality and equal variance were met for Simpson's Evenness. ANOVA was completed on the untransformed dataset.
- No differences were detected in Simpson's Evenness at MEL-01 and MEL-02 compared to the pooled reference areas ($p = 0.570$). On average, evenness was 12% higher at MEL-01 and 9.5% higher at MEL-02 compared to the pooled reference areas. Higher evenness values indicate the abundance of various taxa at MEL-01 and MEL-02 were more evenly distributed compared to the reference areas MEL-03 and MEL-05.

Bray-Curtis Index

- Assumptions of normality and equal variance were met for the Bray-Curtis Index, so ANOVA was conducted on the untransformed data.
- Bray-Curtis Index differed significantly among exposure and reference areas ($p < 0.001$). Pairwise comparisons showed significant differences between MEL-01 and MEL-02 vs. the reference areas ($p < 0.001$), but no significant difference between MEL-01 and MEL-02 ($p = 0.393$). Mean Bray-Curtis values were 0.27 in the reference areas, 0.56 at MEL-01, and 0.49 at MEL-02. The lower Bray-Curtis value at MEL-02 suggests its benthic invertebrate community is more similar to the reference areas than MEL-01.
- Unlike density, richness, and Simpson's Evenness, the Bray-Curtis Index has no assigned CES in Schedule 5 of the MDMER. Community structure differences across areas and time are discussed in **Section 7.4.3**.

Table 7-4. Summary of ANOVA tests for benthic invertebrate community endpoints in 2024.

Endpoint	Data Transformation	Normality (Shapiro-Wilk)		Equal Variances (Levene's test)		Source of Variation	ANOVA Results				
		Shapiro W	p-value	Levene F	p-value		DF	Sum of Squares	Mean Square	F statistic	p value
Density	Untransformed	0.88	**0.017**	0.66	0.53	Between Areas	2	15,852,369	7,926,184	2.63	0.101
						Within Areas (Residuals)	17	51,240,523	3,014,148		
						Total	19	67,092,892			
	log_{10}	0.90	**0.033**			Between Areas	2	0.133	0.066	3.72	**0.046**
						Within Areas (Residuals)	17	0.303	0.018		
						Total	19	0.436			
Richness	Untransformed	0.96	0.50	0.41	0.67	Between Areas	2	17	8	1.38	0.278
						Within Areas (Residuals)	17	104	6		
						Total	19	121			
Evenness	Untransformed	0.96	0.50	0.27	0.77	Between Areas	2	0.0070	0.0035	0.58	0.570
						Within Areas (Residuals)	17	0.102	0.0060		
						Total	19	0.109			
Bray-Curtis	Untransformed	0.91	0.061	1.6	0.24	Between Areas	2	0.341	0.1707	24.18	**<0.001**
						Within Areas (Residuals)	17	0.120	0.0071		
						Total	19	0.461			

Notes:
DF (Degrees of Freedom) – Represents the number of independent comparisons available in the statistical test.
F-statistic – Calculated as $MS_{Between\ Areas}$ / $MS_{Residual}$; measures variance between groups relative to variance within groups.
Significance for Normality (Shapiro-Wilk) and Equal Variance (Levene's test) was assessed at $\alpha = 0.05$.
Statistical significance for ANOVA results was assessed at $\alpha = 0.1$.

Table 7-5. Summary of the Tukey post-hoc comparisons for benthic invertebrate community endpoints in 2024.

Endpoint	Comparison	Mean Difference (Estimate)	95% Confidence Intervals		p-value	Significance
			Lower	Upper		
Density	MEL-02-MEL-01	1242	-1575	4058	0.509	Not Significant
	Pooled Ref-MEL-01	2170	-270	4609	**0.086**	**Significant**
	Pooled Ref-MEL-02	928	-1511	3368	0.601	Not Significant
Richness	MEL-02-MEL-01	2.60	-1.41	6.61	0.248	Not Significant
	Pooled Ref-MEL-01	1.30	-2.18	4.78	0.612	Not Significant
	Pooled Ref-MEL-02	-1.30	-4.78	2.18	0.612	Not Significant
Evenness	MEL-02-MEL-01	-0.012	-0.138	0.113	0.965	Not Significant
	Pooled Ref-MEL-01	-0.042	-0.151	0.066	0.585	Not Significant
	Pooled Ref-MEL-02	-0.030	-0.139	0.079	0.761	Not Significant
Bray Curtis	MEL-02-MEL-01	-0.071	-0.208	0.065	0.393	Not Significant
	Pooled Ref-MEL-01	-0.292	-0.410	-0.174	**<0.001**	**Significant**
	Pooled Ref-MEL-02	-0.221	-0.339	-0.103	**<0.001**	**Significant**

Notes:
"Mean Difference (Estimate)" shows the difference in means between the two areas.
Statistical significance at $\alpha = 0.1$

Table 7-6. Effect sizes for the benthic invertebrate community endpoints.

Endpoint	Area	Mean	SD	Observed ES	Magnitude of the Effect Size		Does the ES Exceed the CES of 2 SD?
					% ES	# SD	
Benthic Community Endpoints							
Density	Pooled Reference	5693	1908				
	MEL-01	3523	868	-2170	-38.1%	-1.14	No
	MEL-02	4764	1967	-929	-16.3%	-0.49	No
Richness	Pooled Reference	17.5	2.64				
	MEL-01	16.2	1.79	-1.3	-7.4%	-0.49	No
	MEL-02	18.8	2.68	1.3	7.4%	0.49	No
Evenness	Pooled Reference	0.35	0.077				
	MEL-01	0.39	0.060	0.044	12.5%	0.57	No
	MEL-02	0.38	0.090	0.031	9.0%	0.41	No

Notes:
Ref SD = pooled REF standard deviation
Observed Effect Size = $Mean_{Exposure\ Areaa} - Mean_{Pooled\ Reference}$
% ES = $100*(Mean_{Exposure\ Areaa} - Mean_{Pooled\ Reference})/ Mean_{Reference\ Area}$
SD = $(Mean_{Exposure\ Areaa} - Mean_{Pooled\ Reference})/SD_{Pooled\ Reference}$
The Critical Effect Size (CES) is 2 standard deviations of the pooled reference area data.

7.4.3 Spatial and Temporal Trends in the Community Structure

nMDS Overview and Data Representation

The nMDS model was used to visualize patterns in benthic community composition based on Bray-Curtis dissimilarities. The final ordination had a stress value of 0.24, which, while above the ideal threshold of 0.2, remains within an acceptable range for ecological datasets (Clarke, 1993). The Shepard's plot (**Figure G1-2**) confirms strong model performance, with a non-metric fit (R^2 = 0.943), indicating a high degree of agreement between observed dissimilarities and ordination distances. The linear fit (R^2 = 0.713) explains 71% of the variance in the original Bray-Curtis distance matrix, reinforcing that the non-metric approach captures additional structure beyond a simple linear relationship. Overall, the nMDS provides a reliable representation of the benthic community structure in Meliadine Lake for assessing differences among areas and over time.

Taxa Correlations with nMDS Axes

Figure 7-1 displays taxa scores along nMDS Axis 1 and Axis 2, illustrating how different benthic invertebrate taxa contribute to the observed patterns in community structure shown in the ordination plot in **Figure 7-2**.

- **Axis 1** separates communities dominated by amphipods (positive scores) from those dominated by snails (negative scores), reflecting differences in taxonomic composition. Amphipods (Gammaridae, Amphipoda.indet.) are strongly positively associated with Axis 1 while snails (Valvatidae) are negatively associated with Axis 1. This meaning samples with lower Axis 1 scores contain more snails.
- **Axis 2** is most positively associated with amphipods from the Gammaridae family, while higher abundance of oligochaete worms (Lumbriculidae) is associated with negative Axis 2 scores.

Spatial and Temporal Patterns in Community Structure

Figure 7-2 illustrates the similarity and differences in benthic invertebrate communities within and between years using nMDS ordination. Samples that are closer together represent more similar communities, while greater separation indicates more distinct assemblages. The ellipses represent the 90th (green), 95th (orange), and 99th (red) percentiles of the pooled reference data, providing a reference for natural variability in the benthic invertebrate community of Meliadine Lake.

Key Observations:

- From 2015 to 2018, reference stations (MEL-03, MEL-05) overlapped more with exposure sites, though there was considerable within-area variability based on the spread of the data points.

- In 2021, reference sites shifted down on axis 2, reflecting an increase in oligochaetes (**Figure 7-3**). In 2024, the reference sites remained in the same position on axis 2, but shifted slightly to the left on axis 1, indicating higher amphipod abundance. Together, this shift in reference communities to the lower right quadrant contrasts with MEL-01, which remains distinct in the upper left quadrant (i.e., higher densities of snails).
- While most MEL-01 samples fall within the 95th percentile of reference conditions, the shift in the community at the reference areas to the lower right quadrant in 2024 has increased divergence with MEL-01. This divergence is also reflected in the statistically significant differences in the Bray-Curtis Index between MEL-01 and the reference areas (**Table 7-5**).

Summary

The consistent position of MEL-01 on the left side of the nMDS plot across all years suggests the benthic invertebrate community has remained stable over time. This stability implies that effluent discharged into the lake is not significantly altering the benthic community structure.

Furthermore, MEL-01 continues to support comparatively high densities of snails (Valvatidae), a group generally considered sensitive to pollution (Beasley and Kneale, 2003; Chen et al., 2021). Snails are also known to be responsive to nutrient enrichment (Álvarez-Cabria et al., 2011; Johnson and Short, 2013), and their sustained presence suggests that nutrient conditions have remained within a range that does not negatively impact these taxa.

Table 7-7. List of taxa that were significantly correlated in the Non-Metric Multidimensional Scaling (nMDS) analysis.

Taxa	Axis 1 Score	Axis 2 Score	P value	R^2
Gammaridae	0.759	-0.045	0.001	0.578
Lumbriculidae	0.137	-0.709	0.001	0.522
Valvatidae	-0.605	-0.379	0.001	0.51
Amphipoda.indet.	0.598	-0.203	0.001	0.399
Gastropoda.indet.	-0.353	-0.191	0.002	0.161
Lebertiidae	0.276	-0.275	0.002	0.152
Pisidiidae	0.0376	-0.382	0.001	0.147
Chironomidae	0.192	-0.318	0.002	0.138
Oxidae	0.142	-0.333	0.002	0.131
Limnephilidae	0.225	-0.279	0.004	0.129
Trombidiformes.indet.	0.203	-0.167	0.037	0.0691

Figure 7-1. Scatter plot of Axis 1 and Axis 2 scores and associated taxa scores for Non-Metric Multidimensional Scaling (nMDS) analysis.

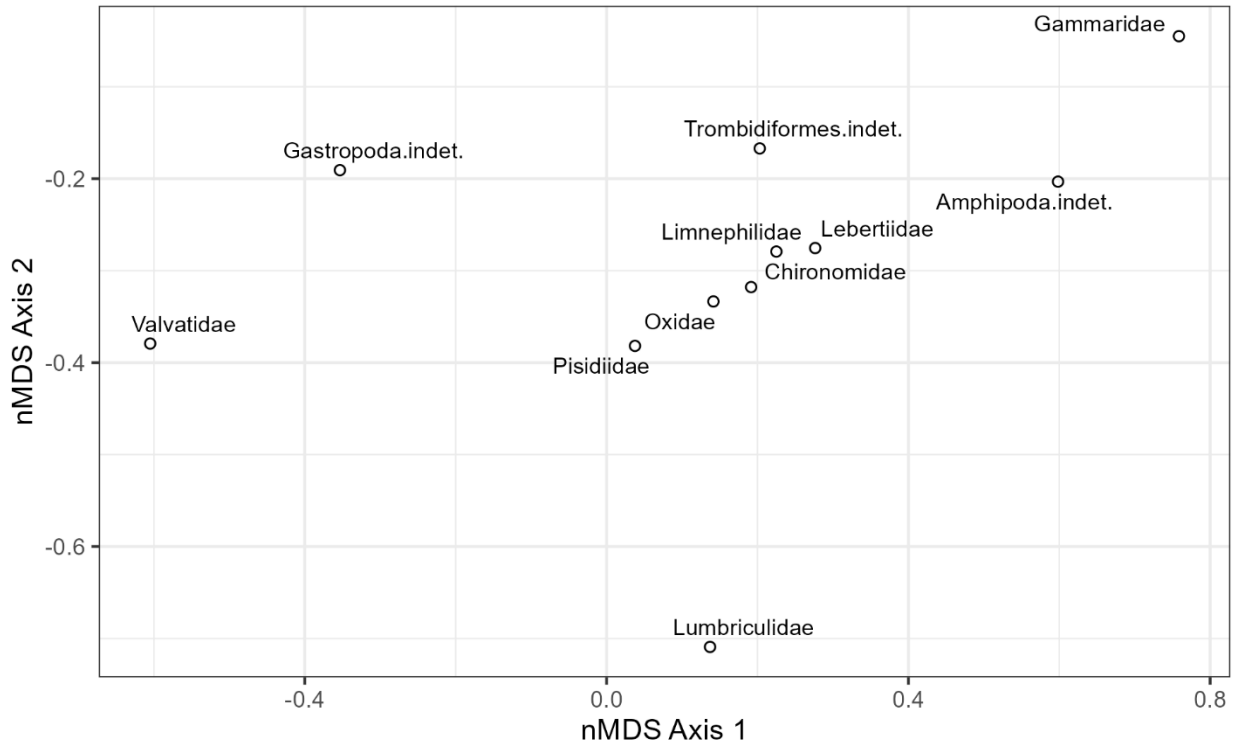
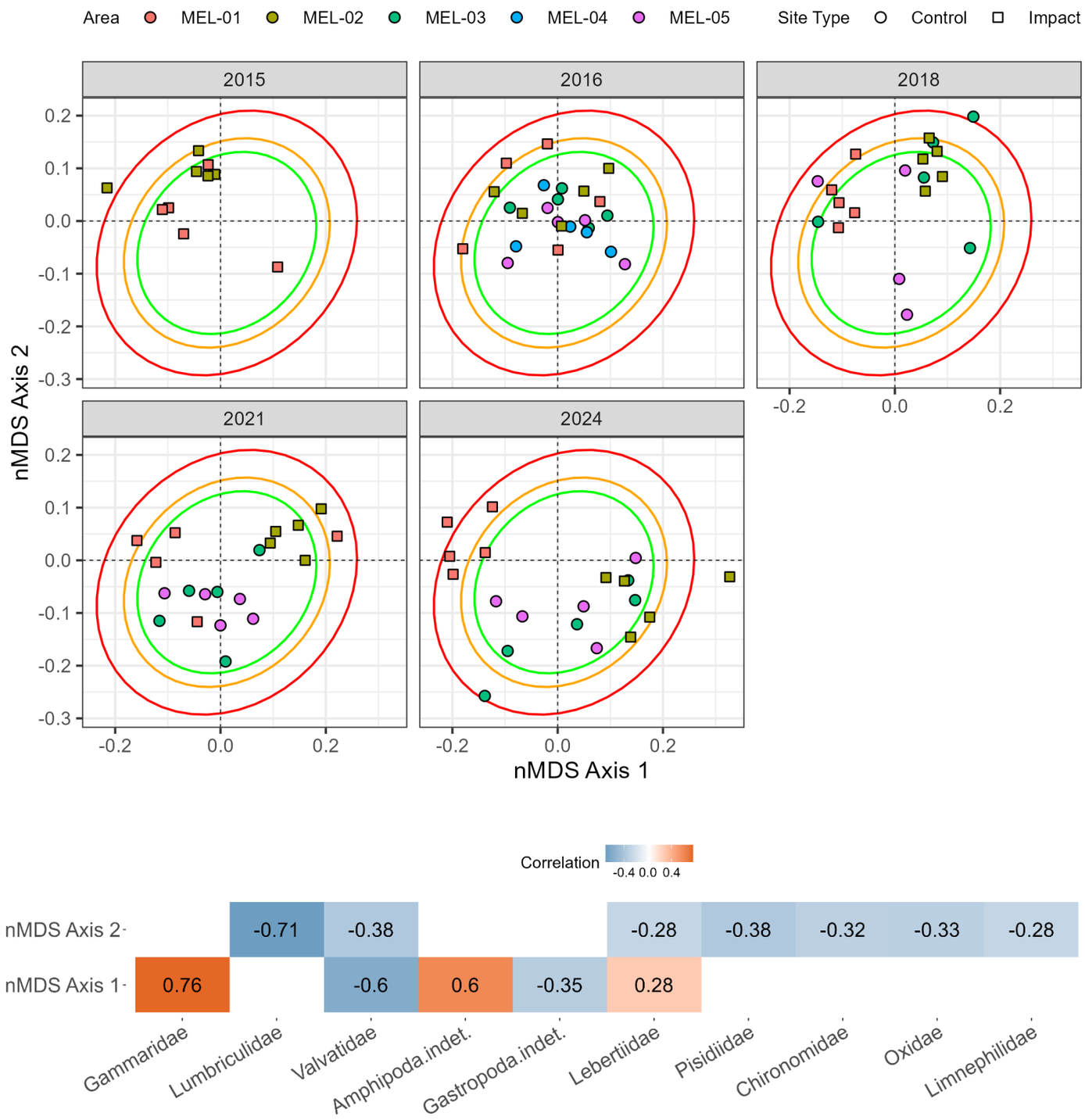


Figure 7-2. nMDS ordination plot for benthic invertebrate community (family level) for Meliadine Lake stations since 2015

Notes: Site Type *Control* refers to samples collected from the reference areas (MEL-03, MEL-04, and MEL-05). *Impact* refers to samples collected from MEL-01 and MEL-02.



7.5 Conclusions

Conclusions for the 2024 benthic invertebrate community study are summarized below in the context of the key question:

Is the benthic invertebrate community affected by potential mine-related changes in water and sediment quality in Meliadine Lake?

In 2024, density at MEL-01 was statistically different from the reference areas (MEL-03 and MEL-05), but the magnitude of the difference was below the CES for biological significance. Importantly, species richness was similar among all areas, indicating that community diversity remains intact.

Significant differences were also observed in Bray-Curtis dissimilarity at both MEL-01 and MEL-02 compared to the reference areas, indicating that community structure, in terms of taxonomic composition and relative abundance, differs closer to the mine. This pattern was further confirmed through multivariate analysis (nMDS), where the community at MEL-01 fell outside the range of reference conditions. However, despite these spatial differences, the composition of the benthic invertebrate community at MEL-01 has remained stable over time, dominated by chironomid larvae and fingernail clams, with no evidence of progressive change. The consistency of the MEL-01 community since 2018 suggests that effluent discharge to Meliadine Lake has not adversely affected the structure of the benthic invertebrate community.

Considering the available data and analyses used to assess differences in the benthic invertebrate community among areas and over time, the evidence suggests that natural variation, rather than mining effects, is driving the observed differences between exposure and reference areas. In summary, mine-related activities do not appear to be impacting the structure or function of the benthic invertebrate community in Meliadine Lake.

7.6 Benthic Invertebrate Community Tables and Figures

List of Tables

Table 7-8. Summary statistics for total density and taxonomic richness of the benthic invertebrate community in Meliadine Lake since 2015

Table 7-9. Summary statistics for Simpson's Evenness and Bray-Curtis Index for the benthic invertebrate community in Meliadine Lake since 2015

List of Figures

Figure 7-3. Benthic invertebrate density in Meliadine Lake since 2015

Figure 7-5. Absolute benthic invertebrate density by major taxa, 2018, 2021, and 2024

Figure 7-6. Relative benthic invertebrate density by major taxa, 2018, 2021, and 2024

Figure 7-4. Benthic invertebrate richness in Meliadine Lake since 2015

Figure 7-7. Benthic invertebrate richness by major taxa, 2018, 2021, and 2024

Figure 7-8. Relative benthic invertebrate richness by major taxa, 2018, 2021, and 2024

Figure 7-9. Benthic community diversity indices by year for Meliadine Lake stations since 2015

Table 7-8. Summary statistics for total density and taxonomic richness of the benthic invertebrate community in Meliadine Lake since 2015.

Metric	Area	Year	N	Mean	Median	SD	SE	Min	Max
Total density (organisms/m^2)	MEL-01	2015	5	493	500	97	217	190	802
		2016	5	2,290	2,430	382	854	1,170	3,490
		2018	5	695	802	194	434	233	1,280
		2021	5	5,090	3,410	1,320	2,960	3,160	10,100
		2024	5	3,523	3,182	867	388	2,836	4,965
	MEL-02	2015	5	224	207	65	145	60	457
		2016	5	759	690	250	558	224	1,670
		2018	5	859	802	225	503	276	1,450
		2021	5	5,170	4,800	473	1,060	4,340	6,930
		2024	5	4,764	3,750	1,967	880	3,339	7,931
	MEL-03	2016	5	1,680	1,230	336	750	1,110	2,770
		2018	5	1,270	1,240	326	729	241	2,300
		2021	5	7,010	5,430	2,070	4,630	2,660	12,400
		2024	5	6,159	5,145	2,494	1,115	3,888	9,899
	MEL-05	2016	5	910	1,040	171	383	500	1,390
		2018	4[b]	1,610	1,600	224	449	1,080	2,170
		2021	5	5,290	3,830	1,560	3,490	3,370	11,500
		2024	5	5,227	4,841	1,194	534	4,080	6,638
Total Richness	MEL-01	2015	5	11.8	11	1.39	3.11	9	17
		2016	5	15.4	15	0.927	2.07	13	18
		2018	5	11.2	11	1.53	3.42	8	16
		2021	5	18.2	19	1.11	2.49	14	20
		2024	5	16.0	16	1.79	0.80	14	18
	MEL-02	2015	5	9.0	9	1.22	2.74	6	13
		2016	5	11.0	9	1.45	3.24	8	15
		2018	5	11.8	11	2.08	4.66	7	18
		2021	5	16.2	17	1.43	3.19	12	20
		2024	5	19.0	19	2.68	1.20	16	23
	MEL-03	2016	5	14.8	15	1.02	2.28	12	17
		2018	5	14.2	15	1.77	3.96	8	18
		2021	5	17.4	17	1.12	2.51	14	21
		2024	5	18.0	18	2.95	1.32	14	21
	MEL-05	2016	5	13.0	13	1.58	3.54	9	17
		2018	4	16.8	16	2.06	4.11	13	22
		2021	5	16.2	17	0.86	1.92	13	18
		2024	5	17.0	17	2.39	1.07	14	20

Notes:
Density results are rounded to 3 significant figures.
[a] One sample from MEL-05 was excluded from the 2018 data set due to abnormally low abundance.

Table 7-9. Summary statistics for Simpson's Evenness and Bray-Curtis Index for the benthic invertebrate community in Meliadine Lake since 2015.

Metric	Area	Year	N	Mean	Median	SD	SE	Min	Max
Simpson's Evenness	MEL-01	2015	5	0.60	0.61	0.06	0.14	0.40	0.79
		2016	5	0.40	0.37	0.07	0.15	0.21	0.62
		2018	5	0.63	0.57	0.08	0.18	0.48	0.94
		2021	5	0.34	0.33	0.03	0.08	0.25	0.42
		2024	5	0.39	0.41	0.06	0.03	0.33	0.47
	MEL-02	2015	5	0.66	0.61	0.07	0.15	0.55	0.91
		2016	5	0.58	0.57	0.07	0.16	0.45	0.85
		2018	5	0.60	0.64	0.11	0.24	0.22	0.81
		2021	5	0.52	0.50	0.06	0.14	0.38	0.74
		2024	5	0.38	0.42	0.09	0.04	0.25	0.48
	MEL-03	2016	5	0.41	0.34	0.06	0.14	0.30	0.60
		2018	5	0.51	0.52	0.08	0.18	0.26	0.77
		2021	5	0.34	0.29	0.07	0.15	0.21	0.56
		2024	5	0.34	0.34	0.06	0.03	0.27	0.42
	MEL-05	2016	5	0.53	0.50	0.04	0.10	0.42	0.64
		2018	4[b]	0.44	0.46	0.05	0.10	0.30	0.52
		2021	5	0.29	0.34	0.04	0.09	0.16	0.36
		2024	5	0.36	0.36	0.09	0.04	0.28	0.51
Bray-Curtis Index	MEL-01	2016	5	0.64	0.65	0.05	0.12	0.47	0.80
		2018	5	0.55	0.60	0.05	0.10	0.38	0.65
		2021	5	0.55	0.56	0.03	0.07	0.43	0.61
		2024	5	0.56	0.58	0.06	0.14	0.32	0.68
	MEL-02	2016	5	0.50	0.49	0.07	0.16	0.34	0.68
		2018	5	0.50	0.51	0.04	0.09	0.35	0.58
		2021	5	0.40	0.38	0.05	0.11	0.24	0.53
		2024	5	0.49	0.49	0.02	0.04	0.44	0.52
	MEL-03	2016	5	0.50	0.45	0.06	0.14	0.33	0.66
		2018	5	0.51	0.54	0.06	0.14	0.31	0.64
		2021	5	0.50	0.42	0.05	0.12	0.40	0.66
		2024	5	0.29	0.30	0.03	0.07	0.19	0.38
	MEL-05	2016	5	0.33	0.26	0.05	0.11	0.23	0.47
		2018	4	0.39	0.40	0.04	0.08	0.29	0.47
		2021	5	0.22	0.13	0.09	0.20	0.13	0.57
		2024	5	0.25	0.25	0.02	0.05	0.19	0.31

Notes:
Bray-Curtis Index was not calculated in 2015 because no reference areas were sampled.
[a] One sample from MEL-05 was excluded from the 2018 data set due to abnormally low abundance.

Figure 7-3. Benthic invertebrate density in Meliadine Lake since 2015.

Notes: MEL-05-05 was flagged as not reportable in the 2018 AEMP (Golder, 2019) due to unusually low density.

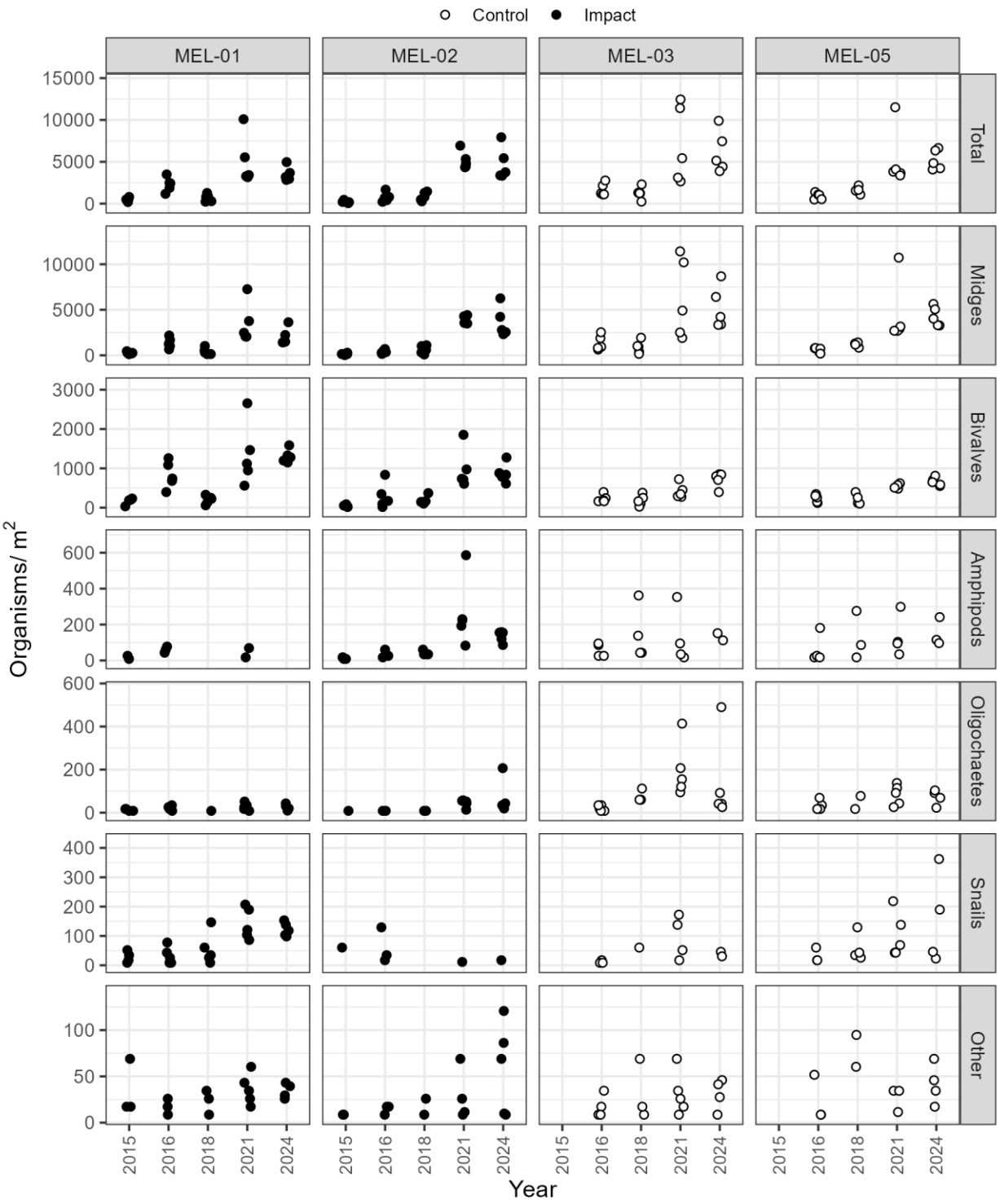


Figure 7-4. Benthic invertebrate richness in Meliadine Lake since 2015.

Notes: MEL-05-05 was flagged as not reportable in the 2018 AEMP (Golder, 2019) due to unusually low density.

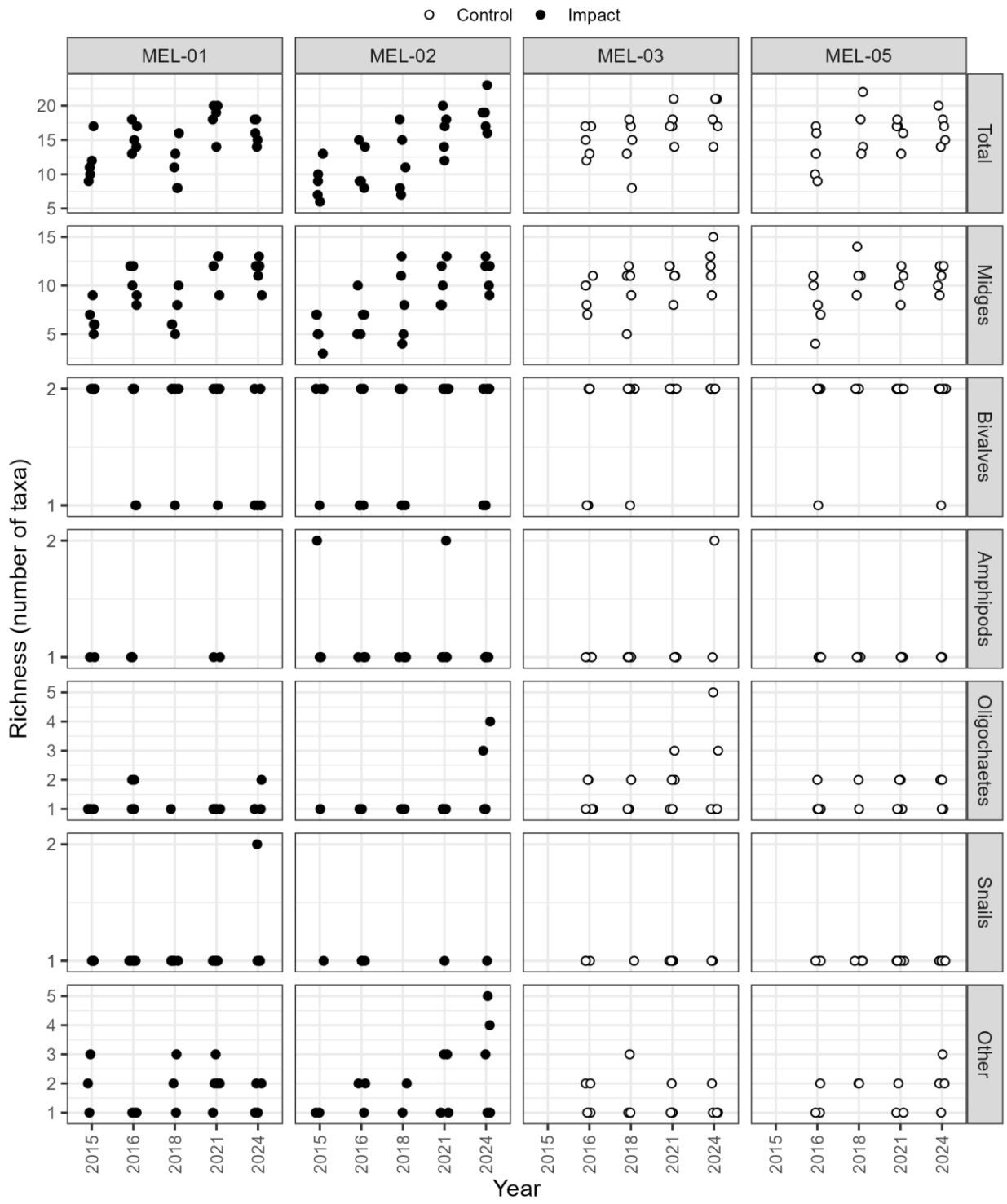


Figure 7-5. Absolute benthic invertebrate density by major taxa, 2018, 2021, and 2024.

Notes: MEL-05-05 was flagged as not reportable in the 2018 AEMP (Golder, 2019) due to unusually low density.

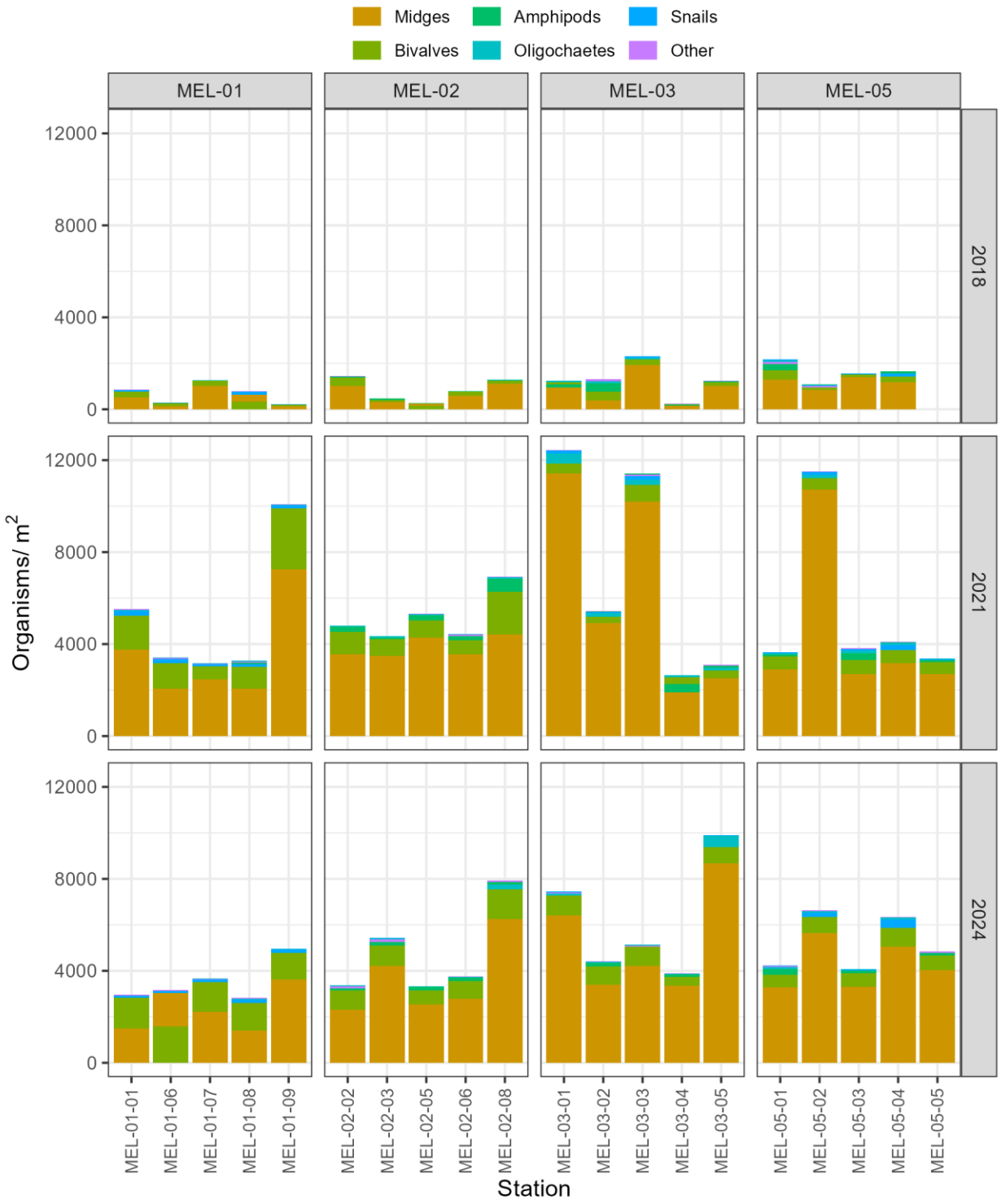


Figure 7-6. Relative benthic invertebrate density by major taxa, 2018, 2021, and 2024.

Notes: MEL-05-05 was flagged as not reportable in the 2018 AEMP (Golder, 2019) due to unusually low density.

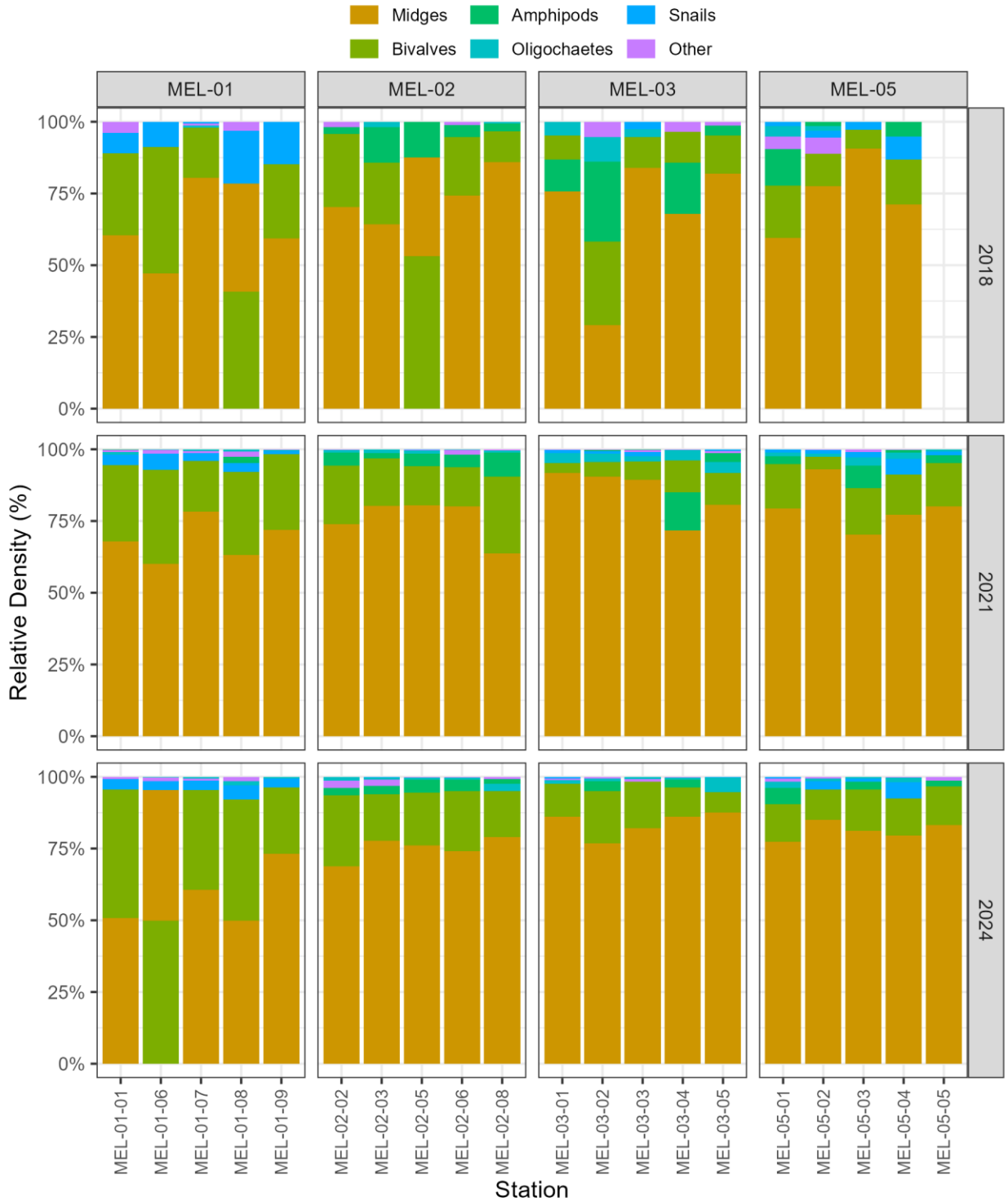


Figure 7-7. Benthic invertebrate richness by major taxa, 2018, 2021, and 2024.

Notes: MEL-05-05 was flagged as not reportable in the 2018 AEMP (Golder, 2019) due to unusually low density.

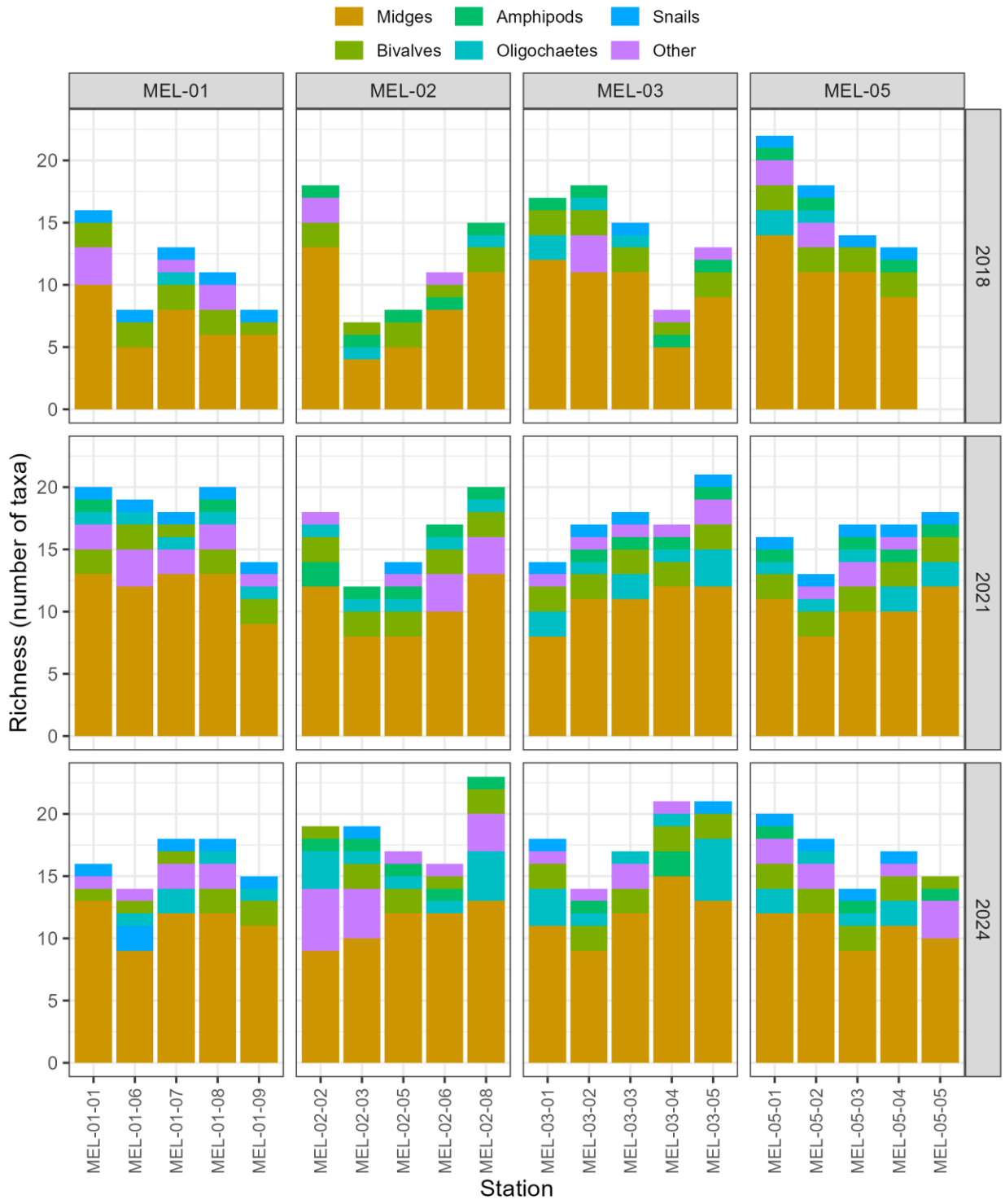


Figure 7-8. Relative benthic invertebrate richness by major taxa, 2018, 2021, and 2024.

Notes: MEL-05-05 was flagged as not reportable in the 2018 AEMP (Golder, 2019) due to unusually low density.

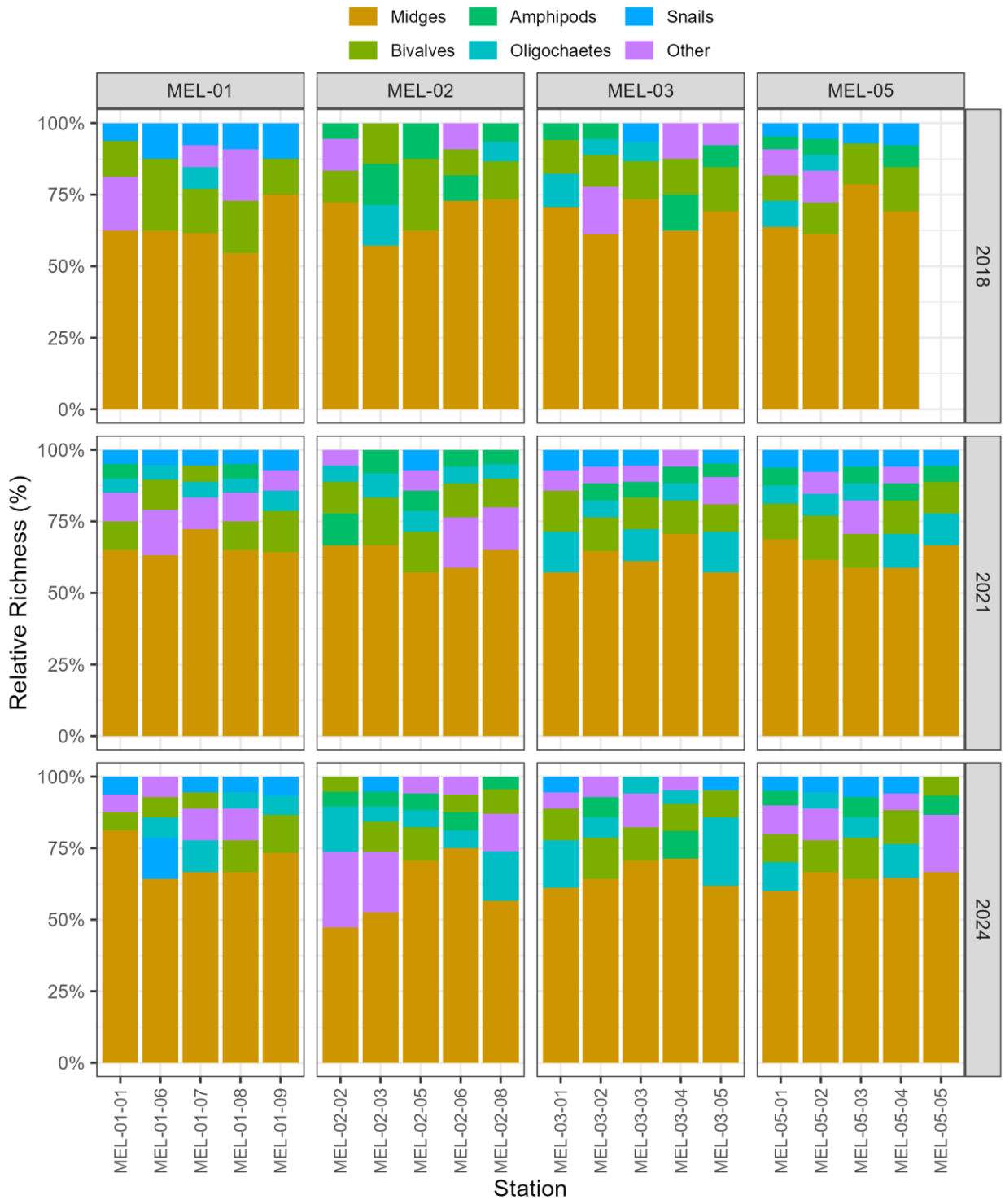
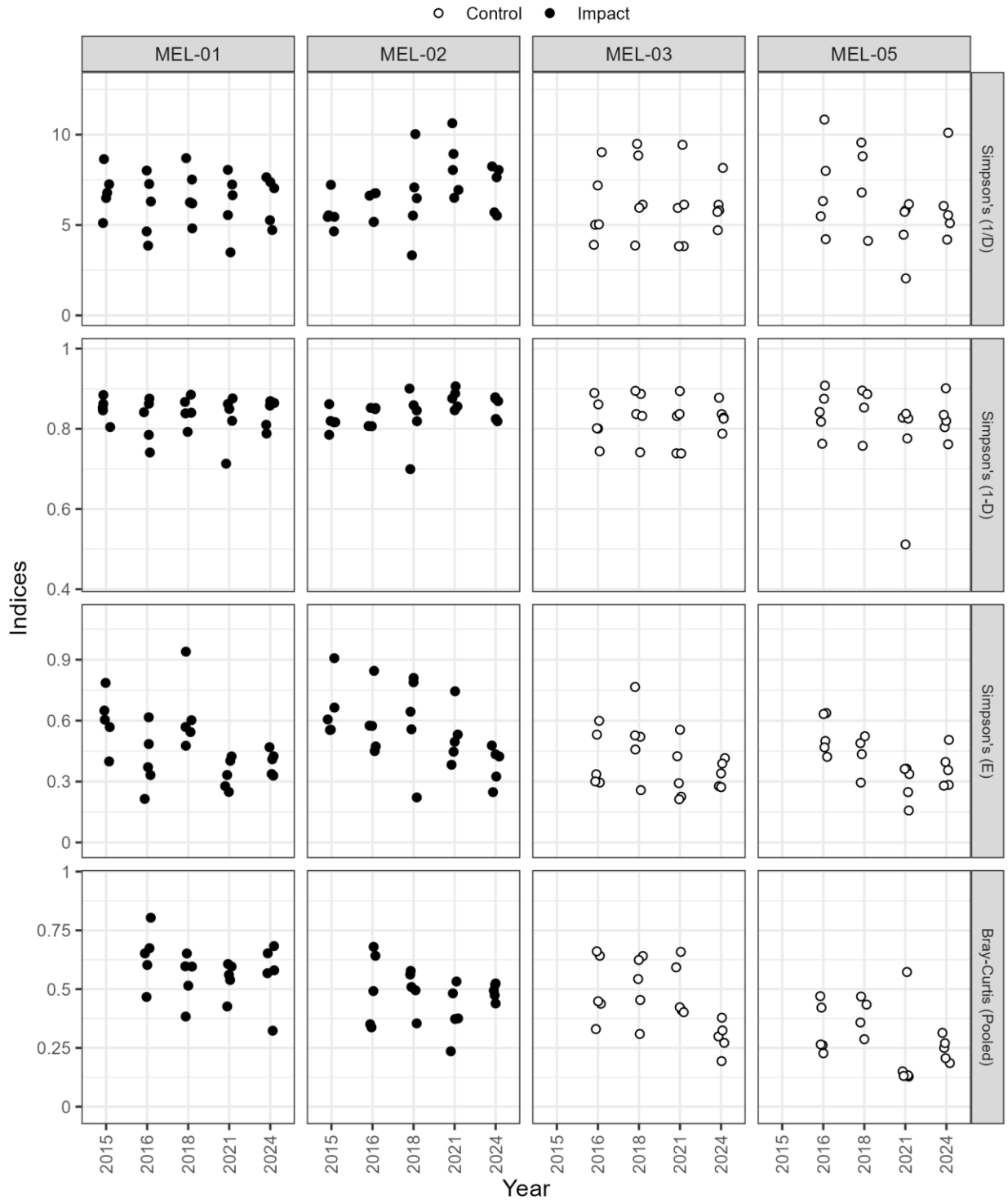


Figure 7-9. Benthic community diversity indices by year for Meliadine Lake stations since 2015.

Notes: MEL-05-05 was flagged as not reportable in the 2018 AEMP (Golder, 2019) due to unusually low density.



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8 THREESPINE STICKLEBACK HEALTH

8.1 Introduction

The Threespine Stickleback health assessment is conducted every three years, and the 2024 study marks the third monitoring cycle since the Mine became subject to MDMER on August 21, 2016[13]. The overview below outlines how the Threespine Stickleback health assessment has evolved based on results from previous cycles, and recommendations from Environment and Climate Change Canada (ECCC) following their review of the EEM study designs.

Cycle 1 (2018)

The Cycle 1 fish health survey was conducted to meet EEM sampling requirements but was not designed to fulfill the specific requirements of the Mine's AEMP, which includes a second reference area in Meliadine Lake. The Cycle 1 health assessment used a control-impact study design, with MEL-01 as the exposure area and MEL-03 as the reference area. Lethal and non-lethal studies were completed using Threespine Stickleback as the sentinel species. The non-lethal study was chosen instead of a lethal study on a second sentinel species—as recommended in the EEM Technical Guidance Document (TGD; Environment Canada, 2012)—because no other small-bodied species are captured in sufficient numbers in Meliadine Lake to meet study design considerations for EEM (Golder, 2017).

No statistically significant differences exceeding the critical effect size (CES) were observed for any EEM effect endpoints at MEL-01 compared to MEL-03 (Golder, 2019).

Cycle 2 (2021)

The Cycle 2 health assessment was completed to fulfill AEMP and EEM requirements for the Mine. The same study areas were included in the Cycle 2 study, along with a second reference station (MEL-04). The study design, as initially proposed to ECCC (Azimuth and Portt, 2021), focused on assessing effluent-related effects to Threespine Stickleback that were not infected with the tapeworm *Schistocephalus solidus* to avoid the confounding effects of parasitism on the fish health endpoints. ECCC recommended that the lethal study should also include parasitized Threespine Stickleback to determine if findings for the two populations produce similar results.

Most endpoints did not show statistically significant differences between the exposure (MEL-01) and the two reference areas (MEL-03 and MEL-04). Statistically significant differences were observed for growth endpoints (i.e., length-at-age and weight-at-age), but the findings were inconsistent when looking across

[13] The Mine triggered monitoring under MDMER when Lake H17 was dewatered into Meliadine Lake to create Containment Pond 1 (CP1).

sex, parasitism, and exposure status. The majority of observed statistically significant differences between the exposure and reference areas were below the CES.

Cycle 3 (2024)

This year's study was a repeat of Cycle 2, but focused on parasitized fish. This decision was based on two key factors: (1) there was no clear evidence that effect indicators were more or less sensitive in parasitized versus unparasitized fish across all endpoints and sexes, and (2) by targeting parasitized fish, the number of individuals sacrificed to meet sample size requirements for each sex was minimized. ECCC agreed to this approach, and Cycle 3 EEM study design was adopted for the AEMP health assessment.

The locations where minnow traps were set in Meliadine Lake are shown in **Figure 3-1**.

Objectives and Key Question

The objectives of Threespine Stickleback program, as outlined in the AEMP Design Plan, are as follows:

- Determine whether water discharged to Meliadine Lake influences survival, energy use (growth), and energy storage (condition) of small-bodied fish in Meliadine Lake,
- Verify predictions made in the FEIS pertaining to fish health (see below),
- Meet the biological monitoring requirements of the MDMER (Government of Canada, 2024),
- Recommend appropriate changes to the fish health program for future years, and
- Provide data to inform adaptive management intended to reduce or eliminate mine-related effects for fish health in Meliadine Lake.

The Threespine Stickleback health assessment is focused on answering this key question:

> *Are activities at the Mine causing changes in Meliadine Lake that are impacting the health of small-bodied fish?*

Results from other components of the 2024 AEMP are used to help interpret the Threespine Stickleback health data as needed.

The effects assessment for fish and fish habitat in the 2014 FEIS predicted that potential increases in nutrient concentrations in waterbodies in the local study area – including Meliadine Lake – could lead to increased growth and production of forage fish such as Threespine Stickleback (FEIS Volume 7). However, adverse effects from exposure to contaminants were not anticipated, as water quality was expected to meet aquatic life guidelines at the edge of the mixing zone around the diffuser.

8.2 Findings from the 2024 Threespine Stickleback Health Assessment

Potential effects on mature male and female Threespine Stickleback in the East Basin of Meliadine Lake were assessed using EEM effect endpoints for lethal studies, including age, total body weight at age (growth), total body weight at length (condition), liver weight relative to total body weight, and gonad weight relative to total body weight.

- Male fish in MEL-01 were larger and older than those in the reference areas. Age-4 males were significantly longer and heavier, with weight differences exceeding the 25% CES.
- Female fish showed smaller differences between areas. While length and weight varied between MEL-01 and the reference areas, these differences did not exceed the CES.
- Both males and females in MEL-01 were heavier for their length and had larger livers compared to the reference areas. Most differences exceeded the CES of 10% for condition and 25% for relative liver weight, suggesting fish in MEL-01 either have more energy available or use it more efficiently than those in the reference areas.
- These findings align with the FEIS prediction that nutrient input from effluent discharge could enhance food availability and habitat suitability for forage fish like Threespine Stickleback.

8.3 Methods

8.3.1 Fish Collection

Threespine Stickleback were captured from the same nearshore areas where fish were collected in August 2021 using unbaited Gee-style minnow traps (Frabill Inc.; ¼" square galvanized mesh; 9” × 16”). Minnow traps were deployed on August 9 at MEL-01, August 10 at MEL-03, and August 11 at MEL-04. The traps were set during the day and left to soak overnight for approximately 24 hours. For each trap, the deployment and retrieval times were recorded, along with the number of individuals captured by species, to calculate catch-per-unit effort (CPUE) in each area.

As stated in the Cycle 3 EEM study design (Azimuth and Portt, 2024), the target sample size in each area was 25 mature, parasitized Threespine Stickleback of both sexes. Fishing conditions were favorable for minnow trapping at MEL-01, and the target sample size was achieved by enumerating 12 of the 46 traps. Because it was evident that the sample size requirements would be met with only 12 traps, fish from the other 34 traps at MEL-01 were released on August 10 without counting them. At MEL-03, all 46 traps were deployed on August 10 and all 46 traps were enumerated on August 11. At MEL-04, 23 traps were deployed on August 11 and enumerated on August 12.

Based on findings from the 2021 study, Threespine Stickleback shorter than 40 mm were considered immature (Azimuth and Portt, 2022). Therefore, fish under 40 mm were counted and released at the

point of capture. Fish longer than 40 mm were transported to the Mine in 20-L buckets filled with ambient water. The buckets were aerated during transport and while at the Mine.

8.3.2 Processing

Fish were euthanized with a concussive blow to the head, measured for total length to the nearest 1 mm using a standard fish measuring board, and weighed to the nearest 0.0001 g using an Ohaus PR64/E electronic balance. Each fish was examined for external lesions or other anomalies. The body cavity of each fish was opened, and the viscera were examined for abnormalities, lesions, tumors, and parasites. If one or more tapeworms were present, the fish was categorized as parasitized and the tapeworms were removed, counted, and weighed to the nearest 0.0001 g. Livers and gonads were extracted and weighed to the nearest 0.0001 g. Following removal of the viscera, carcass weight was also determined to the nearest 0.0001 g. The carcass was then placed in Whirk-Pak© bag labled with a unique fish ID number and frozen for future otolith removal and tissue chemistry analysis.

Threespine Stickleback were collected and fully processed until target sample sizes of 25 fish for each area and sex were achieved. Once the target sample size of mature parasitized individuals was definitively achieved for a sex in an area, processing of samples focused on individuals of the opposite sex. Length and weight were determined for each fish but if the fish was not of the required sex, no further processing occurred (partial processing). A total of 480 Threespine Stickleback were processed to achieve the target sample size for parasitized male and female fish in each area (**Table 8-1**).

Threespine Stickleback are multiple spawners, and both spawning and resting individuals were captured during August sampling in previous years (Golder, 2016; Golder, 2019). Therefore, fish were categorized based on the developmental stage of their gonads. Females were classified as mature if eggs could be identified at 3.0 times magnification or less. If ripe females, distinguished by the presence of larger yellow eggs which could be readily separated, were captured, fecundity was calculated by counting all eggs (if less than 100) or by dividing total ovary weight by mean egg weight obtained from a minimum of 100 eggs. Males were identified by the presence of lobular testes. Individuals with opaque testes were identified as mature, while individuals with translucent testes were considered immature. Indistinguishable gonads were characterized as unknown sex.

Table 8-1. Sample size of parasitized and unparasitized Threespine Stickleback processed by area, sex, and maturity.

Parasite Status	Sex	Maturity	MEL-01		MEL-03		MEL-04		Total
			Full	Partial	Full	Partial	Full	Partial	
Parasitized	Male	Immature	0	0	0	0	0	0	0
		Mature	28	0	26	0	29	0	83
	Female	Immature	2	0	0	0	0	0	2
		Mature	30	15	30	12	31	13	131
	Unknown	Immature	3	0	0	0	0	0	3
Unparasitized	Male	Immature	0	0	0	2	0	0	2
		Mature	17	0	18	0	8	0	43
	Female	Immature	1	0	0	28	0	53	82
		Mature	23	2	4	1	6	0	36
	Unknown	Immature	2	5	0	26	0	65	98
Total			106	22	78	69	74	131	480

Notes:

Samples were collected and fully processed (Full) until target sample sizes of 25 fish for each area and sex were achieved. Once the target sample was met for each sex in an area, processing of samples focused on individuals of the opposite sex, but length and weight were measured for each fish and if the fish was not of the required sex, no further processing occurred (Partial).

Fish age was determined by North/South Consultants Inc (Winnipeg, MB). Otoliths (a calcium carbonate structure in the inner ear) were extracted from each fish, set on a slide, and placed under a microscope (50-times magnification). Age was determined by counting the number of annuli (i.e., yearly growth increments interpreted as alternating translucent and opaque zones under reflected light). Age was independently determined by a second technician for 27 of 258 samples submitted (~11%). The independent readings were identical in 23 cases (~85%) and differed by one year in four cases.

8.3.3 Data Analysis

Data for individual fish were entered into an Excel spreadsheet. Data entries were compared with field data sheets and erroneous entries errors were corrected if found.

Condition (K) was calculated using the formula:

$$K = \frac{total\ weight}{fork\ length^3} \times 100{,}000$$

Liver somatic index (LSI) was calculated using the formula:

$$LSI = \frac{liver\ weight}{total\ weight} \times 100$$

Gonad somatic index (GSI) was calculated using the formula:

$$GSI = \frac{gonad\ weight}{total\ weight} \times 100$$

Data analysis was conducted using RStudio integrated with R v4.2.2 (R Core Team, 2024). Summary statistics, including sample size, minimum, maximum, mean, median, standard deviation, and standard error, were calculated by sampling area and sex for length, weight, condition, age, liver weight, LSI, gonad weight, and GSI.

Statistical procedures used for various monitoring endpoints to compare Threespine Stickleback populations between exposure and reference areas are summarized in **Table 8-2** and described below.

Table 8-2. Statistical procedures used for various monitoring endpoints to compare Threespine Stickleback populations between exposure and reference areas

Statistical Procedure	Dependent Variable	Covariate	CES (%)
Kolmogorov-Smirnov Test (KS)	Total Length (mm) distribution	–	–
	Total Weight (g) distribution	–	–
	Age (yr) distribution	–	–
Analysis of Variance (ANOVA)	Total Length (mm)	–	–
	Total Weight (g)	–	–
	Age (yr)**	–	25
	Total Length (mm) at Age (yr)	–	–
	Total Weight (g) at Age (yr)**	–	25
Analysis of Co-variance (ANCOVA)	Total Weight (g)**	Total Length (mm)	10
	Liver Weight (g)	Total Length (mm)	–
	Liver Weight (g)**	Total Weight (g)	25
	Gonad Weight (g)	Total Length (mm)	–
	Gonad Weight (g)**	Total Weight (g)	25

Notes:
CES = critical effect size.
** Lethal effect endpoints in EEM. These endpoints are used for determining 'effects' as designated by statistically significant differences ($p < 0.1$) between exposure and reference areas.

Length, Weight, and Age Distributions

Distributions of length, weight, and age among areas were compared using two-sample Kolmogorov-Smirnov tests and pooled data (i.e., sexes combined in each area). The Kolmogorov-Smirnov test is a robust analysis to determine if two data sets differ significantly ($p < 0.05$), and can be used to look at relative distributions of data. This is a non-parametric, distribution-free test that assesses the similarity of two cumulative distribution functions of two data sets using the following equation (Environment Canada, 2012):

$$D = \sup |F_1(x) - F_2(x)|$$

$F_1(x)$ and $F_2(x)$ are the empirical cumulative distribution functions of the two groups (areas) being compared

'sup' denotes the maximum of the absolute differences over all observed values. A larger D value indicates greater divergence in the distributions between the two areas.

Mean Length, Weight, Age, and Weight/Length at Age

Mean fish length, weight, and age, as well as length-at-age and weight-at-age was compared among areas using analysis of variance (ANOVA). As Threespine Stickleback typically live four years or less, some ages classes can be poorly represented in each area. The analyses of length-at-age and weight-at-age were thus focused on data from well-represented ages (i.e., age classes with male and female samples in all sampling areas).

ANOVAs were performed sex-specifically and residuals were evaluated for equality of variance and homoscedasticity. While results of Shapiro-Wilk and Leven's tests occasionally had $p < 0.05$, visual inspections indicated that residuals of ANOVA models were sufficiently normally distributed, suggesting that ANOVA models were appropriate to perform comparisons. If present, outliers (observations producing studentized residuals > 4) were identified, recorded, and removed from data, and analyses were repeated.

Following ANOVAs and if the results indicated a significant effect ($p < 0.1$) of the area (the *Location* term in models), Tukey's Honestly Significant Difference (HSD) test at alpha = 0.1 were performed for pairwise comparisons of mean estimates and effect sizes were calculated using the following equation (Environment Canada, 2012):

$$\%Difference = \frac{\bar{X}_{exposure} - \bar{X}_{reference}}{\bar{X}_{reference}} \times 100$$

Condition, Liver Weight, and Gonad Weight

Sex-specific analysis of covariance (ANCOVA) was used to compare the following endpoints among areas:

- Condition (total weight vs total length relationship)
- Liver weight (vs total length and vs total weight relationships)
- Gonad weight (vs total length and vs total weight relationships)

ANCOVAs were conducted to test for significant differences in intercepts and slopes between the areas using $\log_{10}$-transformed data. Significant differences were evaluated using alpha = 0.1 (Environment Canada, 2012). Residuals from ANCOVA models were examined for normality and outliers. If present, observations producing studentized residuals > 4 were identified, recorded, and removed from data, and analyses were repeated.

Both full and reduced ANCOVA models were fit to assess and select the most appropriate modeling approach. Full models were run initially, which included an interaction term between area and covariate, allowing model slopes to vary by area. In cases where the interaction term was not significant (i.e., homogeneity of slopes), reduced models with no interaction term were run and used to assess significance and calculate effect sizes. In cases where the interaction term was significant but accounted for < 2% of the total variation – as indicated by less than 2% difference in adjusted R^2 between full and reduced models – the reduced model was considered appropriate (Barrett et al. 2010).

Following ANCOVAs and if the results indicated a significant effect ($p < 0.1$) of the area in reduced models or the interaction of area and covariate in full models, Tukey post-hoc tests at alpha = 0.1 were performed for pairwise comparisons of least squares means and effect sizes were calculated using the equation presented above.

8.3.4 Post-hoc Power Analysis

Under the Environmental Effects Monitoring (EEM) program, post hoc power analysis is required at the end of the study when non-significant results are observed for endpoints with a specified CES in **Table 8-2**. The post hoc power analysis results for the Threespine Stickleback and Lake Trout studies will be presented in the EEM Cycle 3 Interpretive Report to inform planning for future monitoring cycles.

8.4 Results

8.4.1 Catch Per Unit Effort

Threespine Stickleback, Ninespine Stickleback (*Pungitius pungitius*) and juvenile Burbot (*Lota lota*) were the only species captured in the minnow traps. Threespine Stickleback were the most abundant species caught in each area. A total of 1,391 fish were captured during 1,594.9 hours soak time. The CPUE for Threespine Stickleback in each area ranged from 0.66 fish/hour at MEL-03 to 1.37 fish/hour at MEL-01 (**Table 8-3**).

Table 8-3. Catch per unit effort (CPUE) in number of fish per hour soak time of Minnow traps.

Area	Minnow Trap Area	No. of Traps	Total Soak Time (hrs)	THST		NNST		BURB	
				Catch (n)	CPUE	Catch (n)	CPUE	Catch (n)	CPUE
MEL-01	MT-01	12	281.4	385	1.37	1	0.004	0	–
	Total	**12**	**281.4**	**385**	**1.37**	**1**	**0.004**	**0**	**–**
MEL-03	MT-01	23	382.4	291	0.76	3	0.008	1	0.003
	MT-02	23	543.4	326	0.60	2	0.004	0	–
	Total	**46**	**925.8**	**617**	**0.67**	**5**	**0.005**	**1**	**0.001**
MEL-04	MT-01	23	387.7	389	1.00	15	0.039	6	0.015
	Total	**23**	**387.7**	**389**	**1.00**	**15**	**0.039**	**6**	**0.015**

Notes:
Threespine Stickleback (THST), Ninespine Stickleback (NNST), and Burbot (BURB).

8.4.2 Descriptive Statistics

No lesions, deformities, or external parasites were observed on captured fish in 2024. Gonad condition was resting for all mature male and female fish.

Overall percent parasitism by tapeworms was 61%, 46%, and 36% in fish from MEL-01, MEL-03, and MEL-04 respectively (**Table 8-4**). Parasitism was lower in immature individuals, which were on average smaller and younger than those that were mature.

Descriptive statistics of all variables measured and indices calculated for male and female fish by area are presented in **Table 8-5**. Descriptive statistics for all parasitized and unparasitized fish by sex and area are provided in **Appendix H-1**.

Table 8-4. Incident of parasitism in all Threespine Stickleback examined.

Sex	Parasitism	MEL-01	MEL-03	MEL-04
Male	n parasitized	28	26	29
	n unparasitized	17	20	8
	% parasitism	62.2	56.5	78.4
Female	n parasitized	47	42	44
	n unparasitized	26	33	59
	% parasitism	64.4	56.0	42.7
Unknown	n parasitized	3	0	0
	n unparasitized	7	26	65
	% parasitism	30.0	0	0
Total	n parasitized	78	68	73
	n unparasitized	50	79	132
	% parasitism	60.9	46.3	35.6

Table 8-5. Descriptive statistics of mature, parasitized Threespine Stickleback that were fully processed, by site and sex.

Area	Endpoint	Male							Female						
		N	Min	Max	Mean	Median	SD	SE	N	Min	Max	Mean	Median	SD	SE
MEL-01	Total Length (mm)	28	49	67	61.25	62	3.8933	0.7358	30	60	72	66	65.5	3.0626	0.5591
	Total Weight (g)	28	1.1185	3.5632	2.3859	2.491	0.4786	0.0905	30	2.13	3.7736	2.7792	2.7724	0.4159	0.0759
	Age (yr)	28	3	5	3.9643	4	0.4288	0.081	30	3	5	4.0667	4	0.5208	0.0951
	Carcass Weight (g)	28	0.7651	2.5309	1.7587	1.8083	0.3648	0.0689	30	1.4478	2.9224	1.9807	1.9674	0.3347	0.0611
	Liver Weight (g)	28	0.0215	0.1003	0.0615	0.0582	0.0234	0.0044	30	0.0343	0.1492	0.0905	0.0862	0.0283	0.0052
	Gonad Weight (g)	28	0.0013	0.0398	0.0154	0.0136	0.0091	0.0017	30	0.0107	0.2373	0.0865	0.0708	0.0514	0.0094
	Parasite Weight (g)	28	0.0132	0.4537	0.3103	0.3435	0.1139	0.0215	30	0.0015	0.6445	0.3403	0.3556	0.1636	0.0299
	Parasite Count	28	1	5	1.5	1	0.923	0.1744	30	1	4	1.4	1	0.8137	0.1486
	Condition Factor	28	0.8483	1.1847	1.0251	1.0207	0.0932	0.0176	30	0.7756	1.3126	0.9661	0.9468	0.1201	0.0219
	Hepatosomatic Index	28	0.8798	4.2244	2.5799	2.3852	0.8547	0.1615	30	1.6091	4.7176	3.2183	3.142	0.7474	0.1365
	Gonadosomatic Index	28	0.1162	1.5483	0.6569	0.5642	0.3965	0.0749	30	0.4245	7.8392	3.0834	2.5567	1.763	0.3219
MEL-03	Total Length (mm)	26	52	65	56.769	56	3.0765	0.6033	30	54	77	66.933	69	6.4697	1.1812
	Total Weight (g)	26	1.2313	2.5734	1.6618	1.5855	0.3562	0.0699	30	1.3172	4.0659	2.7217	2.9194	0.7906	0.1443
	Age (yr)	26	3	4	3.3333	3	0.4815	0.0983	30	3	5	3.8333	4	0.5921	0.1081
	Carcass Weight (g)	26	0.8341	2.0936	1.243	1.1935	0.2851	0.0559	30	0.9431	3.0246	1.886	2.0765	0.5319	0.0971
	Liver Weight (g)	26	0.0185	0.0704	0.0391	0.0376	0.014	0.0027	30	0.0214	0.1072	0.0672	0.0712	0.0241	0.0044
	Gonad Weight (g)	26	0.0077	0.033	0.0175	0.0159	0.0065	0.0013	30	0.0109	0.2964	0.0944	0.0925	0.0564	0.0103
	Parasite Weight (g)	26	0.0043	0.4567	0.2297	0.2575	0.1337	0.0262	30	0.1311	1.0291	0.4624	0.4216	0.2362	0.0431
	Parasite Count	26	1	3	1.4231	1	0.6433	0.1262	30	1	5	2.1667	2	1.1769	0.2149
	Condition Factor	26	0.7575	1.1914	0.8976	0.884	0.0832	0.0163	30	0.6957	1.0452	0.8839	0.8735	0.0915	0.0167
	Hepatosomatic Index	26	1.2136	4.3355	2.3647	2.2329	0.7412	0.1454	30	1.2368	3.8213	2.4549	2.5543	0.6207	0.1133
	Gonadosomatic Index	26	0.4405	1.7108	1.069	1.0518	0.358	0.0702	30	0.3568	7.3345	3.3514	3.1046	1.5303	0.2794
MEL-04	Total Length (mm)	29	48	63	56.103	56	3.4262	0.6362	31	58	76	65.774	66	5.2327	0.9398
	Total Weight (g)	29	0.9798	2.3531	1.5958	1.5673	0.3147	0.0584	31	1.5951	4.6657	2.6006	2.5694	0.7936	0.1425
	Age (yr)	29	3	4	3.5714	4	0.504	0.0952	31	3	5	4.1935	4	0.5428	0.0975
	Carcass Weight (g)	29	0.7229	1.7684	1.158	1.1349	0.2647	0.0491	31	1.1587	2.5568	1.7558	1.6868	0.434	0.0792
	Liver Weight (g)	29	0.0097	0.0574	0.0317	0.032	0.0124	0.0023	31	0.0323	0.1653	0.0642	0.0605	0.0252	0.0045
	Gonad Weight (g)	29	0.0028	0.0506	0.0196	0.0182	0.0108	0.002	31	0.0154	0.3657	0.1091	0.0827	0.0791	0.0142
	Parasite Weight (g)	29	0.0045	0.7881	0.2483	0.2365	0.174	0.0323	31	0.0977	1.6056	0.4148	0.3367	0.2969	0.0533
	Parasite Count	29	1	7	1.8276	1	1.3381	0.2485	31	1	12	2.3871	2	2.1241	0.3815
	Condition Factor	29	0.7346	1.1657	0.8956	0.8939	0.0819	0.0152	31	0.7362	1.1661	0.8886	0.8696	0.103	0.0185
	Hepatosomatic Index	29	0.7695	3.0541	1.9788	1.9461	0.6566	0.1219	31	1.4877	4.5639	2.5066	2.3384	0.689	0.1237
	Gonadosomatic Index	29	0.1541	3.1995	1.2304	1.2168	0.6473	0.1202	31	0.8199	14.233	4.1603	3.4425	2.7007	0.4851

8.4.3 Frequency Distributions

Statistical differences ($p < 0.05$) were observed in the frequency distributions of length, weight, and age between areas. Results from two-sample Kolmogorov-Smirnov tests (**Table 8-6**) indicated that:

- **Length** (**Figure 8-1**) – The proportion of longer fish was significantly higher at MEL-01 compared to MEL-03 and MEL-04, with no significant difference between MEL-03 and MEL-04.
- **Weight** (**Figure 8-2**) – The proportion of heavier fish was significantly higher at MEL-01 compared to MEL-03 and MEL-04, with no significant difference between MEL-03 and MEL-04.
- **Age** (**Figure 8-3**) – Age distribution differed significantly between MEL-03 and the reference areas. At MEL-03, the proportions of age 2 and age 3 individuals were nearly equal, whereas at MEL-01 and MEL-04, the proportion of age 3 individuals was higher. There was no significant difference in age distribution between MEL-01 and MEL-04.

Table 8-6. Pairwise comparison of length, weight and age distributions for mature, parasitized Threespine Stickleback based on two-sample Kolmogorov-Smirnov tests.

Endpoint	Pairwise comparison	D value	P value
Total Length (mm)	MEL-01 vs MEL-03	0.3966	**< 0.0001**
	MEL-01 vs MEL-04	0.4466	**< 0.0001**
	MEL-03 vs MEL-04	0.1262	0.5374
Total Weight (g)	MEL-01 vs MEL-03	0.5025	**< 0.0001**
	MEL-01 vs MEL-04	0.5477	**< 0.0001**
	MEL-03 vs MEL-04	0.1310	0.6417
Age (yr)	MEL-01 vs MEL-03	0.3410	**< 0.0001**
	MEL-01 vs MEL-04	0.1338	0.1058
	MEL-03 vs MEL-04	0.2072	**0.0280**

Notes:
The D value represents the maximum absolute difference between the cumulative distribution functions (CDFs) of two sample populations. A larger D value indicates greater divergence between distributions.
Significant pairwise differences ($p < 0.05$) are in **bold**.

Figure 8-1. Length-frequency distributions of mature, parasitized Threespine Stickleback.

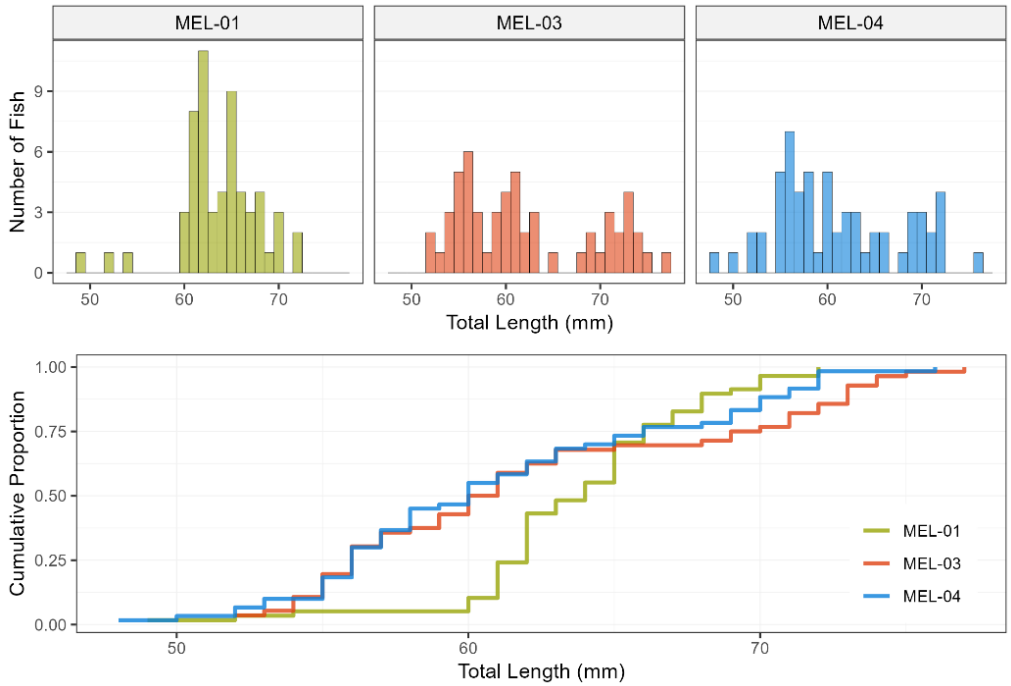


Figure 8-2. Weight-frequency distributions of mature, parasitized Threespine Stickleback.

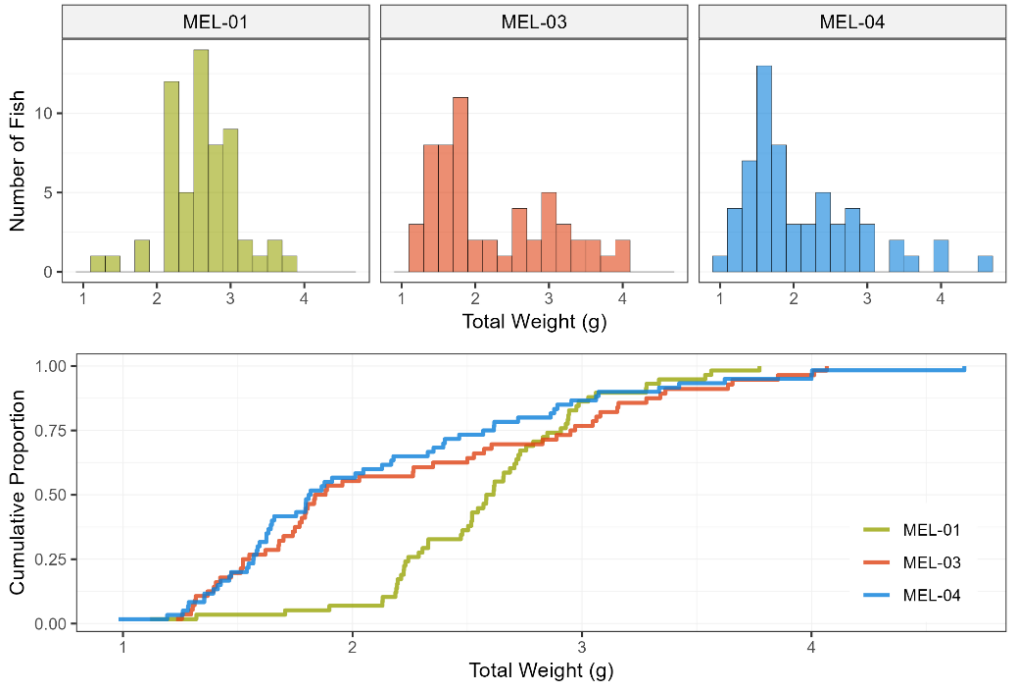
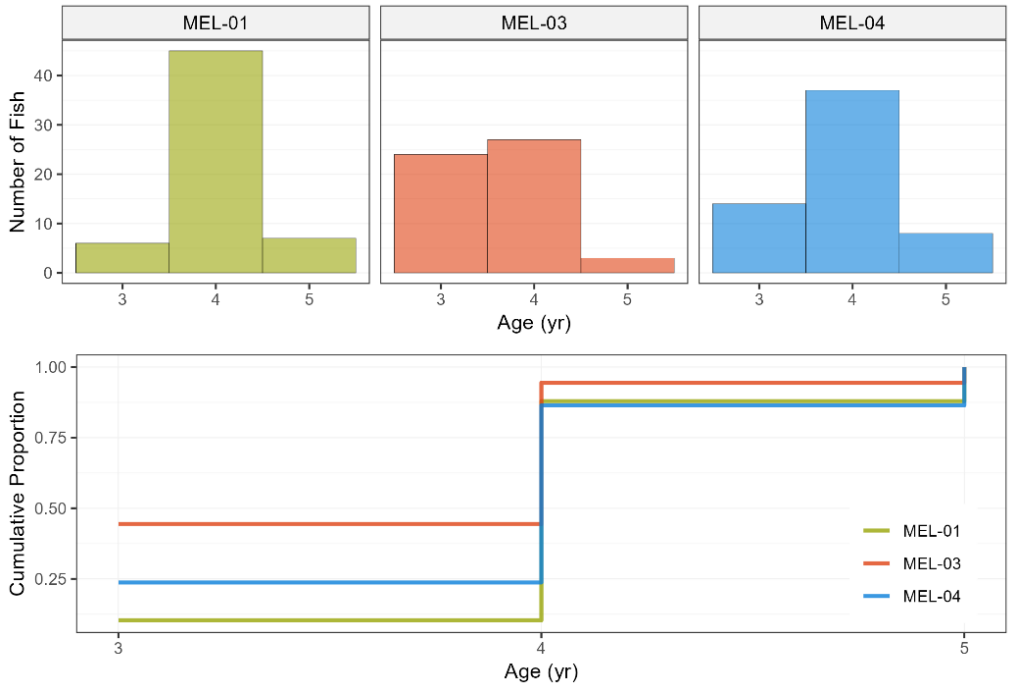


Figure 8-3. Age-frequency distributions of mature, parasitized Threespine Stickleback.



8.4.4 Mean Length, Weight, and Age

Results from the ANOVA models comparing mean length, weight, and age of male and female fish by area are presented in **Table 8-7**, along with Tukey post-hoc test results for pairwise comparisons and calculated effect sizes.

- **Length** (**Figure 8-4**)
  - **Male**: The effect of area was statistically significant ($p < 0.1$). On average, males from MEL-01 were 8% longer compared to MEL-03 and 9% longer compared to MEL-04.
  - **Female**: No significant differences among the exposure and reference areas ($p = 0.6479$).
- **Weight** (**Figure 8-5**)
  - **Male**: The effect of area was statistically significant ($p < 0.1$). On average, males from MEL-01 were 44% heavier compared to MEL-03 and 50% heavier compared to MEL-04.
  - **Female**: No significant differences among the exposure and reference areas ($p = 0.5892$).
- **Age** (**Figure 8-6**)
  - **Male**: The effect of area was statistically significant ($p < 0.1$). On average, males from MEL-01 were 19% older compared to MEL-03 and 11% older compared to MEL-04.
  - **Female**: The effect of area was statistically significant ($p < 0.1$), but the difference was between the reference areas; females from MEL-03 were 9% younger than those from MEL-04.

Table 8-7. ANOVA results for mean length, weight and age in mature, parasitized Threespine Stickleback, by sex, along with results of Tukey post-hoc tests and calculated effect sizes.

Endpoint	Sex	N	Outlier fish ID	Model statistics					Mean estimates			Tukey post-hoc P value (effect size in %)			CES (%)
				Parameter	Sum Sqr.	DF	F value	P value	MEL-01	MEL-03	MEL-04	MEL-01 vs MEL-03	MEL-01 vs MEL-04	MEL-03 vs MEL-04	
Total Length (mm)	Male	83	–	Intercept	279027.3	1	22905.0	< 0.0001	61.25	56.77	56.10	**< 0.0001 (+7.9)**	**< 0.0001 (+9.2)**	0.7605	–
				Location	439.3	2	18.0	< 0.0001							
				Residuals	974.6	80									
	Female	91	–	Intercept	399138.6	1	15223.2	< 0.0001	66.00	66.93	65.77	–	–	–	–
				Location	22.9	2	0.4	0.6479							
				Residuals	2307.3	88									
Total Weight (g)	Male	83	–	Intercept	293.1	1	1933.0	< 0.0001	2.386	1.662	1.5958	**< 0.0001 (+43.6)**	**< 0.0001 (+49.5)**	0.8051	–
				Location	10.7	2	35.4	< 0.0001							
				Residuals	12.1	80									
	Female	91	–	Intercept	663.5	1	1389.0	< 0.0001	2.779	2.722	2.601	–	–	–	–
				Location	0.5	2	0.5	0.5892							
				Residuals	42.0	88									
Age (yr)	Male	80	–	Intercept	1044.6	1	4688.6	< 0.0001	3.964	3.333	3.571	**< 0.0001 (+18.9)**	**0.0072 (+11.0)**	0.1720	25
				Location	5.3	2	12.0	< 0.0001							
				Residuals	17.2	77									
	Female	91	–	Intercept	1478.4	1	4841.6	< 0.0001	4.067	3.833	4.194	0.2363	0.6439	**0.0336 (-8.6)**	25
				Location	2.0	2	3.3	0.0406							
				Residuals	26.9	88									

Notes:
Tukey post-hoc tests were performed when there was a statistically significant effect ($p < 0.1$) of Location in the model.
Effect sizes were calculated for significant pairwise differences ($p < 0.1$) in Tukey post-hoc tests (shown in **bold**).
Significant pairwise differences that exceed the specified critical effect size (CES) for mean age are **bold and shaded**.

Figure 8-4. Length (mm) of mature, parasitized Threespine Stickleback and results of Tukey post-hoc pairwise comparison of means.

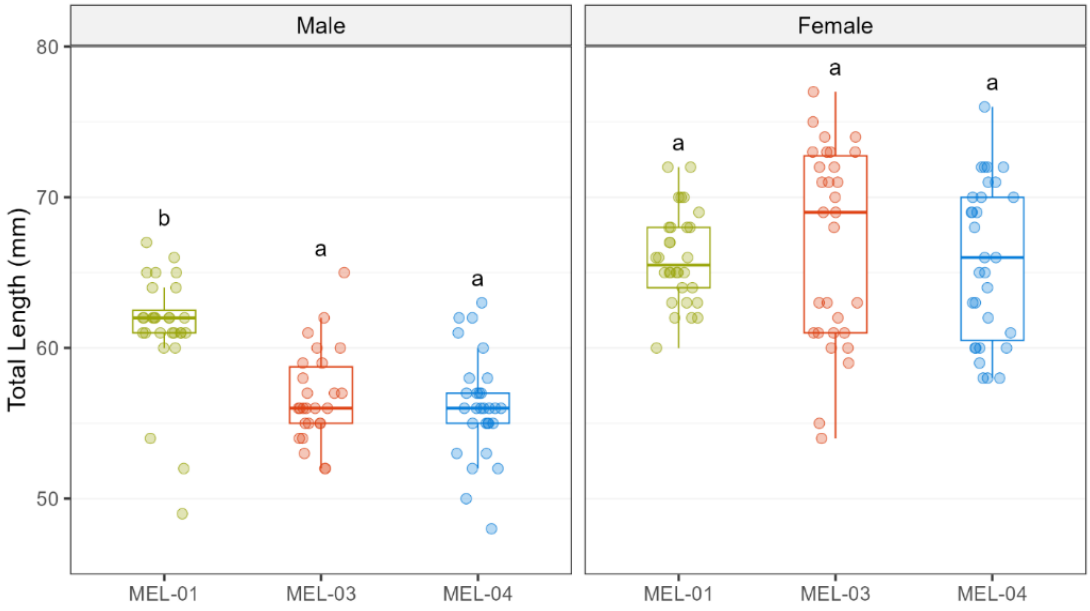


Figure 8-5. Weight (g) of mature, parasitized Threespine Stickleback and results of Tukey post-hoc pairwise comparison of means.

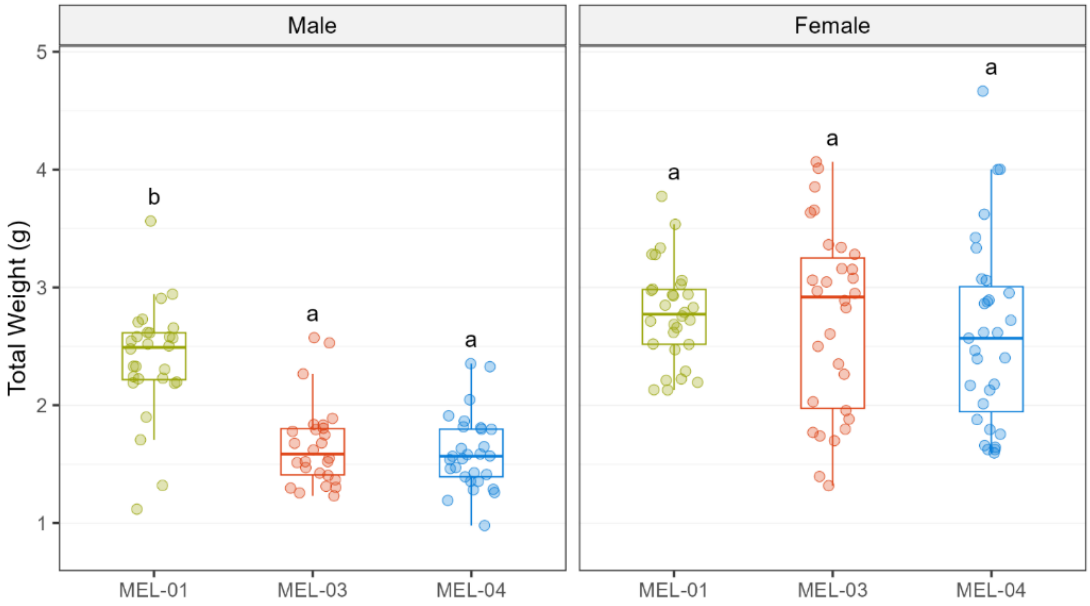
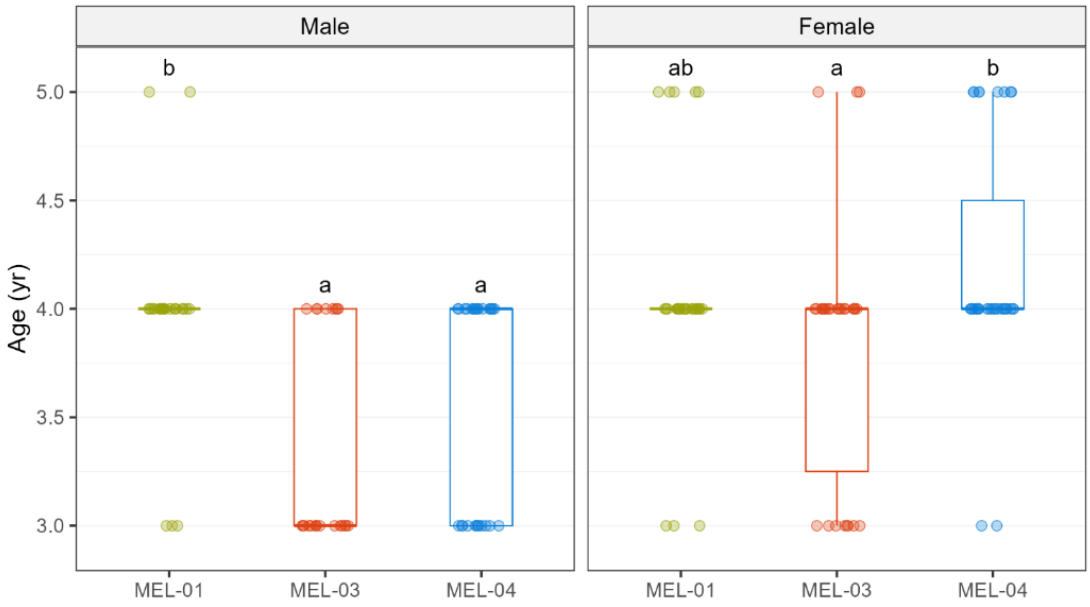


Figure 8-6. Age of mature, parasitized Threespine Stickleback and results of Tukey post-hoc pairwise comparison of means.



8.4.5 Length and Weight at Age

Age of mature, parasitized Threespine Stickleback ranged from three to five years in both males and females (**Table 8-8**). The most commonly observed age class was four years old, with n = 23 from MEL-01, n = 8 from MEL-03, and n = 16 from MEL-04. There were only 3 fish at age three and only 2 fish at age five from Meliadine Lake; therefore, potential differences in length at age and weight at age were assessed for fish aged 4.

Sex-specific comparisons of mean length-at-age 4 and mean weight-at-age 4 among areas were performed using ANOVA, followed by Tukey post-hoc pairwise tests (**Table 8-9**). Mean length and weight at age differed significantly among areas (**Figure 8-7**) and the differences in pairwise comparisons exceeded the CES of 25% in some cases:

- **Length at age 4**
  - **Male**: The effect of area was statistically significant ($p < 0.1$). On average, age 4 males from MEL-01 were 7% longer than those at MEL-03 and 10% longer than those at MEL-04. There was no significant difference in the length of age 4 males between MEL-03 and MEL-04.
  - **Female**: The effect of area was statistically significant ($p < 0.1$). On average, age 4 females from MEL-01 were 6% shorter compared to females from MEL-03. No difference in length was observed between MEL-01 and MEL-04. Age 4 females were also significantly longer (9%) at MEL-03 compared to MEL-04.

- **Weight at age 4**
  - **Male**: The effect of area was statistically significant ($p < 0.1$). Age 4 males from MEL-01 were 42% and 55% heavier than males the same age at MEL-03 and MEL-04, respectively. There was no significant difference in the weight of age 4 males between MEL-03 and MEL-04.
  - **Female**: The effect of sampling area was statistically significant ($p < 0.1$). The was no difference in the weight of female fish aged 4 between MEL-01 and MEL-03, but on average females at MEL-01 were 16% heavier than at MEL-04. Significant differences were also evident between the reference areas, with age 4 females at MEL-03 being 27% heavier than those at MEL-04.

Table 8-8. Number of fish per age group for mature, parasitized Threespine Stickleback.

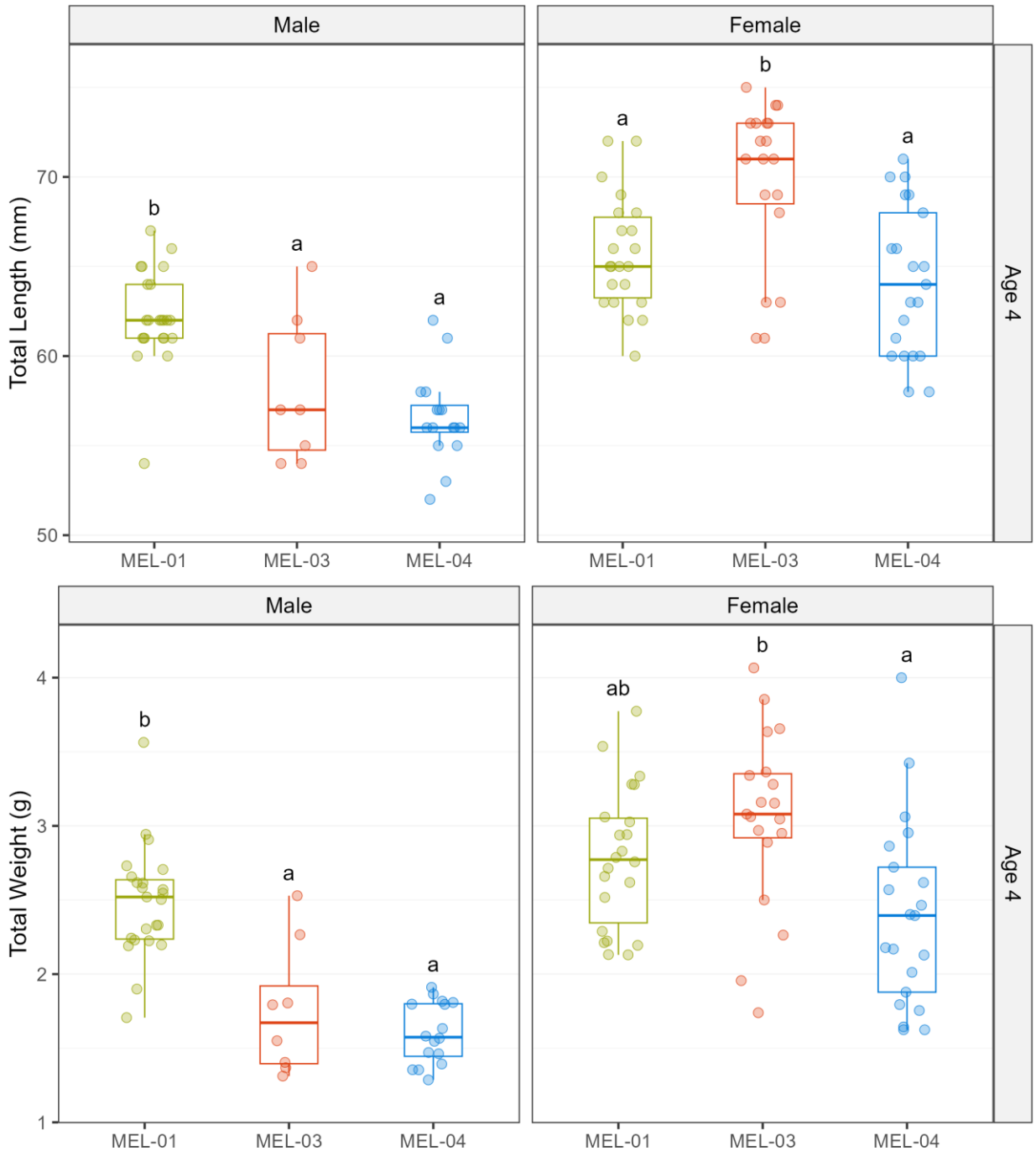
Sex	Class	MEL-01	MEL-03	MEL-04
Male	Age 3	3	16	12
	Age 4	23	8	16
	Age 5	2	0	0
Female	Age 3	3	8	2
	Age 4	22	19	21
	Age 5	5	3	8

Table 8-9. ANOVA results for length and weight at age in mature, parasitized Threespine Stickleback, by sex, along with results of Tukey post-hoc tests and calculated effect sizes.

Endpoint	Sex	N	Outlier fish ID	Model statistics					Mean estimates			Tukey post-hoc P value (effect size in %)			CES (%)
				Parameter	Sum Sqr.	DF	F value	P value	MEL-01	MEL-03	MEL-04	MEL-01 vs MEL-03	MEL-01 vs MEL-04	MEL-03 vs MEL-04	
Total Length (mm) at Age 4	Male	47	–	Intercept	135423.8	1	16364.7	< 0.0001	62.1739	58.1250	56.5625	**0.0037 (+7.0)**	**< 0.0001 (+9.9)**	0.4282	–
				Location	317.4	2	19.2	< 0.0001							
				Residuals	364.1	44									
	Female	62	–	Intercept	273723.8	1	17388.5	< 0.0001	65.7273	69.7895	64.1905	**0.0051 (-5.8)**	0.4178	**0.0001 (+8.7)**	–
				Location	330.6	2	10.5	0.0001							
				Residuals	928.8	59									
Total Weight (g) at Age 4	Male	47	–	Intercept	147.7	1	1262.0	< 0.0001	2.4835	1.7537	1.6030	**< 0.0001 (+41.6)**	**< 0.0001 (+54.9)**	0.5701	25
				Location	8.2	2	35.1	< 0.0001							
				Residuals	5.1	44									
	Female	62	–	Intercept	464.7	1	1430.7	< 0.0001	2.7834	3.0507	2.3943	0.2994	**0.0731 (+16.3)**	**0.0017 (+27.4)**	25
				Location	4.4	2	6.7	0.0023							
				Residuals	19.2	59									

Notes:
Tukey post-hoc tests were performed when there was a statistically significant effect ($p < 0.1$) of Location in the model.
Effect sizes were calculated for significant pairwise differences ($p < 0.1$) in Tukey post-hoc tests (shown in **bold**).
Significant pairwise differences that exceed the specified critical effect size (CES) are **bold and shaded**.

Figure 8-7. Length at age four and weight at age four of mature, parasitized Threespine Stickleback and results of Tukey post-hoc pairwise comparison of means.



8.4.6 Condition, Liver Weight, and Gonad Weight

Sex-specific comparisons of condition, liver weight, and gonad weight among areas were conducted using ANCOVA, followed by Tukey post-hoc pairwise tests to identify significant differences among the areas. Both full and reduced models were tested for each endpoint. If the interaction term in the full model was significant ($p < 0.1$), indicating different slopes, but accounted for less than 2% of the total variation, the reduced (simplified) model—assuming equal slopes—was selected. **Table 8-10** shows the ANCOVA results for the full and reduced models for each endpoint and sex, and which model was ultimately selected for analysis.

The results of the ANCOVA models, along with the results of Tukey post-hoc tests of pairwise comparisons and calculated effect sizes, are provided in **Table 8-11**. Results are discussed in more detail in the following sections.

Table 8-10. Selection of ANCOVA modeling approach for condition, liver, and gonad endpoints in mature, parasitized Threespine Stickleback, by sex.

Response	Covariate	Sex	Full ANCOVA Models				Reduced ANCOVA Models				Difference in Adj. R^2 (%)	Selected Model
			Outlier fish ID	Interaction term			Outlier fish ID	Location term				
				F value	P value	Adj. R^2		F value	P value	Adj. R^2		
Total Weight (g)	Total Length (mm)	Male	–	0.8542	0.4296	0.8918	–	13.0387	< 0.0001	0.8922		Reduced
		Female	–	3.8106	**0.0260**	0.8322	–	5.7460	0.0045	0.8213	1.3184	Reduced
Liver Weight (g)	Total Length (mm)	Male	–	0.6612	0.5191	0.5187	–	5.4021	0.0063	0.5228		Reduced
		Female	–	0.7388	0.4807	0.5303	–	15.6134	< 0.0001	0.5331		Reduced
Liver Weight (g)	Total Weight (g)	Male	–	0.1469	0.8636	0.4823	–	3.1686	0.0475	0.4935		Reduced
		Female	–	3.3111	**0.0412**	0.6271	–	10.0040	0.0001	0.6073	3.2080	Full
Gonad Weight (g)	Total Length (mm)	Male	–	0.7431	0.4790	0.1215	–	5.8162	0.0044	0.1272		Reduced
		Female	–	0.0464	0.9546	0.1883	–	1.4604	0.2378	0.2061		Reduced
Gonad Weight (g)	Total Weight (g)	Male	–	0.4580	0.6343	0.0937	–	5.7932	0.0045	0.1061		Reduced
		Female	–	0.3463	0.7083	0.2789	–	2.9134	0.0596	0.2897		Reduced

Notes:
Percent differences in adjusted R^2 values were calculated if the interaction term was statistically significant ($p < 0.1$) in the full model (shown in **bold**).

Table 8-11. Results of ANCOVA and Tukey post-hoc comparisons for condition, liver, and gonad endpoints in mature, parasitized Threespine Stickleback.

Response	Covariate	Sex	Model	N	Outlier fish ID	Model statistics						LS mean estimates			Tukey post-hoc P value (effect size in %)			CES (%)
						Adj. R^2	Parameter	Sum Sqr.	DF	F value	P value	MEL-01	MEL-03	MEL-04	MEL-01 vs MEL-03	MEL-01 vs MEL-04	MEL-03 vs MEL-04	
Total Weight (g)	Total Length (mm)	Male	Reduced	83	–	0.8922	Intercept	0.487	1	318.2	< 0.0001	1.9727	1.7387	1.7366	**< 0.0001 (+13.5)**	**< 0.0001 (+13.6)**	0.9986	10
							Covariate	0.537	1	350.8	< 0.0001							
							Location	0.040	2	13.0	< 0.0001							
							Residuals	0.121	79									
		Female	Reduced	91	–	0.8213	Intercept	0.832	1	347.0	< 0.0001	2.7628	2.5300	2.5446	**0.0092 (+9.2)**	**0.0150 (+8.6)**	0.9785	10
							Covariate	0.970	1	404.8	< 0.0001							
							Location	0.028	2	5.7	0.0045							
							Residuals	0.209	87									
Liver Weight (g)	Total Length (mm)	Male	Reduced	83	–	0.5228	Intercept	1.172	1	53.7	< 0.0001	0.0463	0.0399	0.0330	0.3238	**0.0052 (+40.3)**	0.1069	–
							Covariate	0.798	1	36.6	< 0.0001							
							Location	0.236	2	5.4	0.0063							
							Residuals	1.723	79									
		Female	Reduced	91	–	0.5331	Intercept	1.621	1	107.7	< 0.0001	0.0865	0.0599	0.0619	**< 0.0001 (+44.4)**	**< 0.0001 (+39.7)**	0.8938	–
							Covariate	1.145	1	76.0	< 0.0001							
							Location	0.470	2	15.6	< 0.0001							
							Residuals	1.310	87									
Liver Weight (g)	Total Weight (g)	Male	Reduced	83	–	0.4935	Intercept	24.593	1	1062.4	< 0.0001	0.0439	0.0411	0.0338	0.8425	**0.0798 (+29.9)**	0.1059	25
							Covariate	0.692	1	29.9	< 0.0001							
							Location	0.147	2	3.2	0.0475							
							Residuals	1.829	79									
		Female	Full	91	–	0.6271	Intercept	10.985	1	913.5	< 0.0001	0.0790	0.0619	0.0628	**0.0014 (+27.6)**	**0.0026 (+25.8)**	0.9776	25
							Covariate	1.099	1	91.4	< 0.0001							
							Location	0.053	2	2.2	0.1175							
							Interaction	0.080	2	3.3	0.0412							
							Residuals	1.022	85									

Table 8-11. Results of ANCOVA and Tukey post-hoc comparisons for condition, liver, and gonad endpoints in mature, parasitized Threespine Stickleback.

Response	Covariate	Sex	Model	N	Outlier fish ID	Model statistics						LS mean estimates			Tukey post-hoc P value (effect size in %)			CES (%)
						Adj. R^2	Parameter	Sum Sqr.	DF	F value	P value	MEL-01	MEL-03	MEL-04	MEL-01 vs MEL-03	MEL-01 vs MEL-04	MEL-03 vs MEL-04	
Gonad Weight (g)	Total Length (mm)	Male	Reduced	83	–	0.1272	Intercept	1.241	1	18.8	< 0.0001	0.0103	0.0177	0.0184	**0.0108 (-41.8)**	**0.0066 (-44.0)**	0.9690	–
							Covariate	0.753	1	11.4	0.0011							
							Location	0.768	2	5.8	0.0044							
							Residuals	5.215	79									
		Female	Reduced	91	–	0.2061	Intercept	2.113	1	32.3	< 0.0001	0.0730	0.0744	0.0921	–	–	–	–
							Covariate	1.592	1	24.3	< 0.0001							
							Location	0.191	2	1.5	0.2378							
							Residuals	5.699	87									
Gonad Weight (g)	Total Weight (g)	Male	Reduced	83	–	0.1061	Intercept	38.063	1	562.9	< 0.0001	0.0099	0.0182	0.0187	**0.0083 (-45.6)**	**0.0062 (-47.1)**	0.9792	25
							Covariate	0.627	1	9.3	0.0032							
							Location	0.783	2	5.8	0.0045							
							Residuals	5.342	79									
		Female	Reduced	91	–	0.2897	Intercept	17.574	1	299.9	< 0.0001	0.0676	0.0775	0.0955	0.6147	**0.0490 (-29.2)**	0.3135	25
							Covariate	2.192	1	37.4	< 0.0001							
							Location	0.342	2	2.9	0.0596							
							Residuals	5.099	87									

Notes:
Tukey post-hoc tests were performed when there was a statistically significant effect ($p < 0.1$) of Location in Reduced models or Interaction in Full models.
Effect sizes were calculated for significant pairwise differences ($p < 0.1$) in Tukey post-hoc tests (shown in **bold**).
Significant pairwise differences that exceed the specified critical effect size (CES) are **bold and shaded**.
Least squares mean for liver weight adjusted to total weight of female fish (i.e., full model with the interaction) were estimated at total weight = 2.6994 g (overall average).

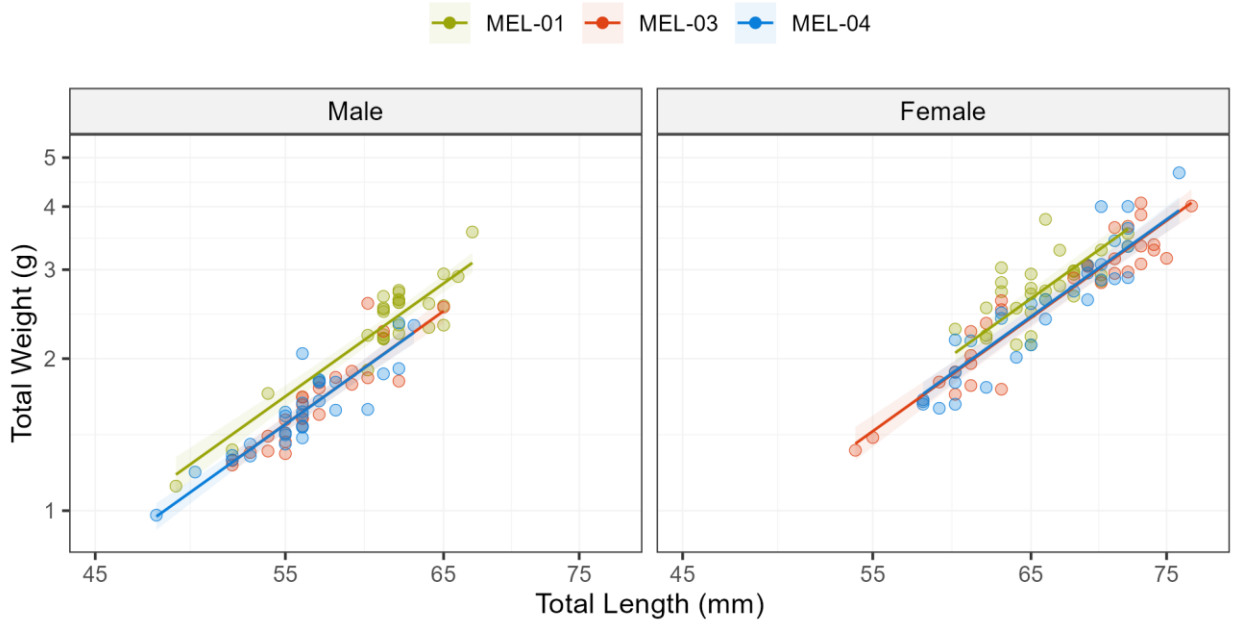
Condition

Condition (total weight adjusted for total length) was significantly different among the areas, with differences between MEL-01 and the exposure areas near the CES (10%) for females and exceeding the CES for males. The results are summarized below and shown in **Figure 8-8**.

- **Males**: The reduced model was selected for comparing total weight versus length among the areas as slopes of the relationships in the full model were not significantly different ($p = 0.4296$). The effect of area was statistically significant in the reduced model ($p < 0.1$). Tukey results showed that total weight adjusted for length for males was 14% heavier at MEL-01 compared to MEL-03 and MEL-04.
- **Females**: The slopes were significantly different among the areas in the full model ($p = 0.0260$), but the difference in the adjusted R^2 values between the full and reduced modes was less than 2%. Therefore, the reduced model was selected, which showed that the effect of area was statistically significant ($p < 0.1$). Tukey results that total weight adjusted for length for females was 9% heavier at MEL-01 compared to MEL-03 and MEL-04.

Figure 8-8. Relationship between total weight and total length in mature, parasitized Threespine Stickleback from Meliadine Lake in 2024.

Notes: The reduced ANCOVA model was used to compare differences among areas for both sexes.



Liver Weight

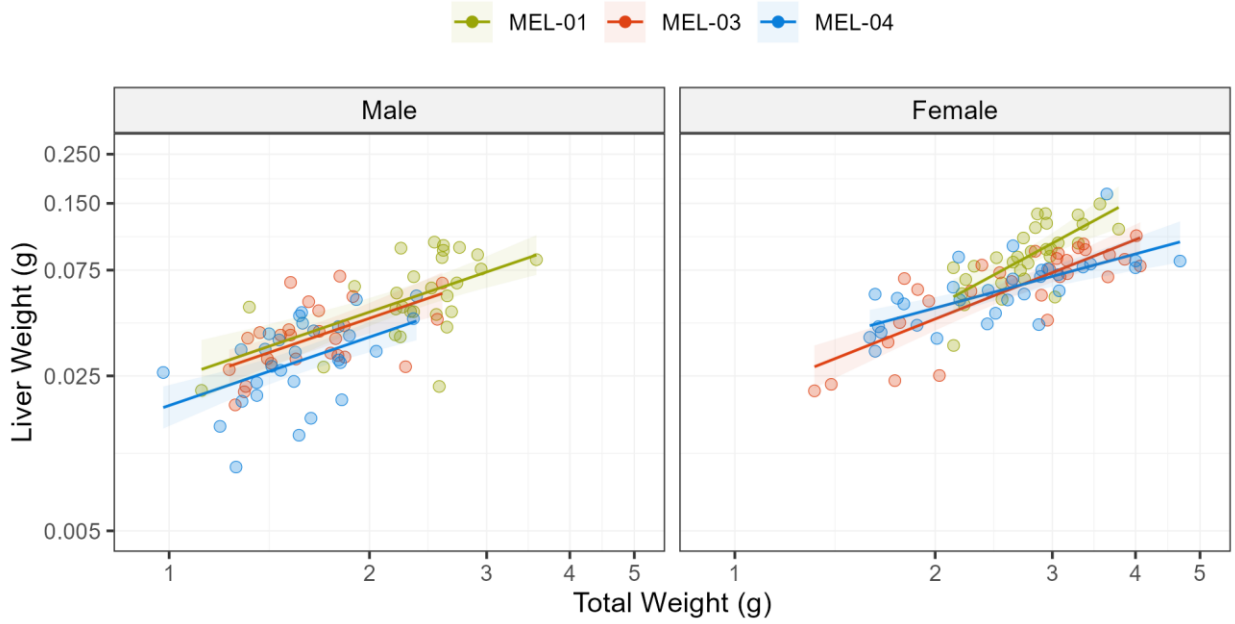
Liver-related endpoints differed significantly among sampling areas and the differences exceeded the CES of 25% for females between MEL-01 and MEL-03 and for males and females between MEL-01 and MEL-04 (**Table 8-11**),

Liver Weight vs Total Length (**Figure 8-9**)

- **Male**: The reduced model was selected for comparing liver weight adjusted to length as slopes of the relationships in the full model were not significantly different ($p = 0.5191$). The effect of area was statistically significant in the reduced model ($p < 0.1$). Tukey results showed that liver weight adjusted to length for males was 40% heavier at MEL-01 compared to MEL-04, but that there was no significant difference between MEL-01 and MEL-03.
- **Female**: The reduced model was selected for comparing liver weight adjusted to length for female fish as slopes of the relationships in the full model were not significantly different ($p = 0.4807$). The effect of area was statistically significant ($p < 0.1$). Tukey results showed that liver weight adjusted to total length for females at MEL-01 was 45% heavier compared to MEL-03 and 40% heavier compared to MEL-04.

Figure 8-9. Relationship between liver weight and total length in mature, parasitized Threespine Stickleback from Meliadine Lake in 2024.

Notes: The reduced ANCOVA model was used to compare differences among areas for males; the full model was used for females.

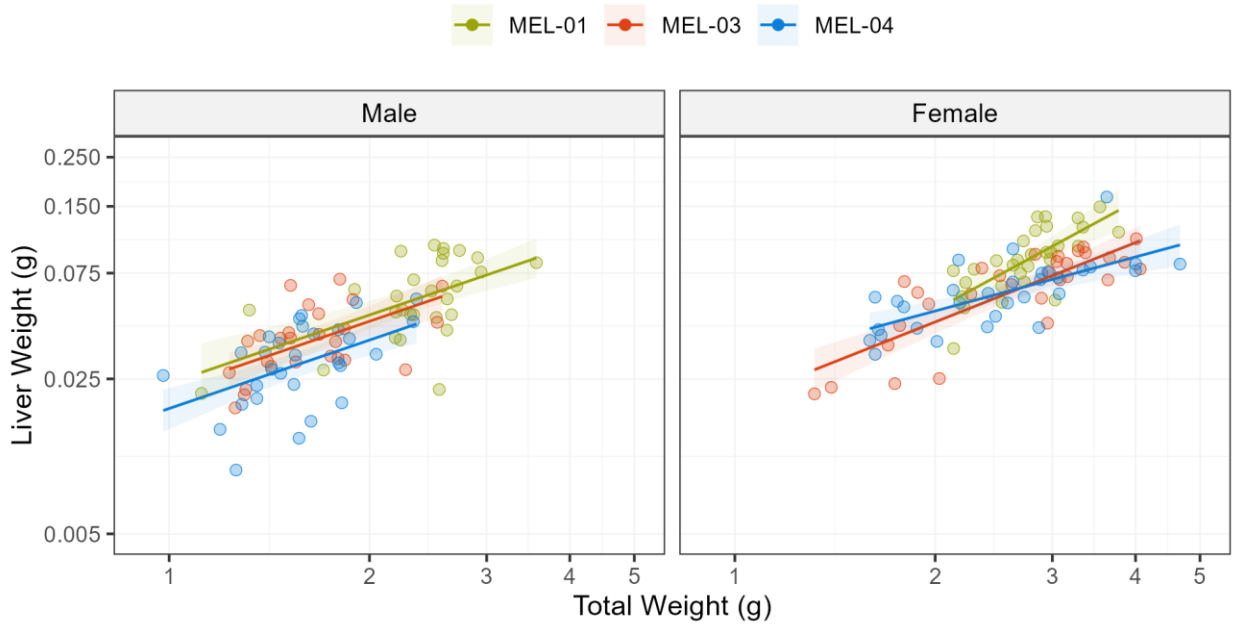


Liver Weight vs Total Weight (**Figure 8-10**)

- **Male**: The reduced model was selected for comparing liver weight adjusted to weight as slopes of the relationships in the full model were not significantly different ($p = 0.8636$). The effect of area was statistically significant in the reduced model ($p < 0.1$). Tukey results showed that liver weight adjusted to total weight for males was 31% heavier at MEL-01 compared to MEL-04, but that there was no significant difference between MEL-01 and MEL-03.
- **Female**: The interaction term was significant ($p = 0.0412$) for the full model, indicating different slopes of the regression lines among the areas. The slope accounted for 3.2% of total variation; therefore, the full ANCOVA model was used for this endpoint. Pairwise comparisons of the liver weight vs total weight relationship in female fish were performed using least squares mean estimated at 2.70 g, which was the overall average of total weight in female fish. The effect of area was statistically significant in the full model ($p < 0.1$). Tukey results showed that liver weight adjusted to a total weight of 2.7 g for females at MEL-01 was 31% heavier compared to MEL-03 and 29% heavier compared to MEL-04.

Figure 8-10. Relationship between liver weight and total weight in mature, parasitized Threespine Stickleback from Meliadine Lake in 2024.

Notes: The reduced ANCOVA model was used to compare differences among areas for males; the full model was used for females.



Gonad Weight

There were no significant differences in slopes for either gonad weight vs. total length or gonad weight vs total weight relationships in both sexes. As a result, the reduced ANCOVA model, which assumes equal slopes, was used to compare differences in gonad weight adjusted to size or weight for male and female Threespine Stickleback.

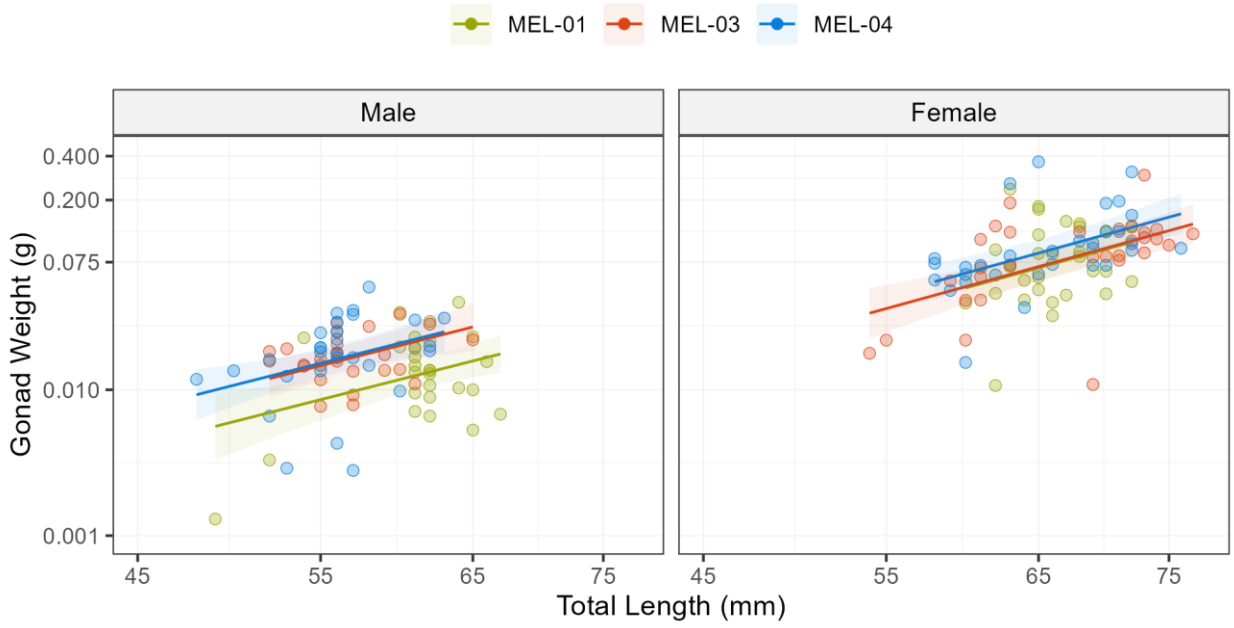
Gonad-related endpoints differed significantly among sampling areas, with some differences occasionally exceeding the CES of 25% (**Table 8-11**).

Gonad Weight vs Total Length (**Figure 8-11**)

- **Male**: The effect of area was statistically significant in the reduced model ($p < 0.1$). Tukey results indicated that gonad weight adjusted to total length for males at MEL-01 was 42% lighter compared to MEL-03 and 44% lighter compared to MEL-04.
- **Female**: The effect of area was not statistically significant in the reduced model for female fish ($p > 0.2378$).

Figure 8-11. Relationship between gonad weight and total length for mature, parasitized Threespine Stickleback from Meliadine Lake in 2024.

Notes: The reduced ANCOVA model was used to compare differences among areas for both sexes.

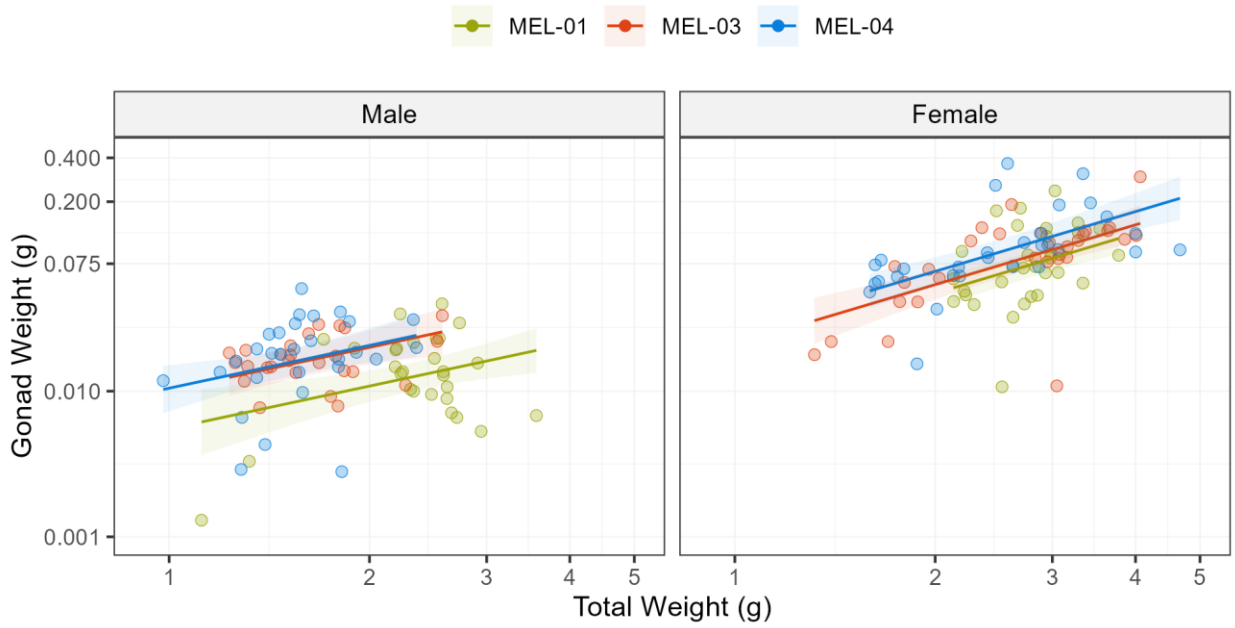


Gonad Weight vs Total Weight (**Figure 8-12**)

- **Male**: The effect of area was statistically significant in the reduced model ($p < 0.1$). Tukey results indicated that gonad weight adjusted to total weight for males at MEL-01 was 46% lighter compared to MEL-03 and 47% lighter compared to MEL-04.
- **Female**: The effect of area was statistically significant in the reduced model ($p < 0.1$). Tukey results showed that gonad weight adjusted to total weight for females at MEL-01 was 29% lighter compared to MEL-04, but that there was no significant difference between MEL-01 and MEL-03.

Figure 8-12. Relationship between gonad weight and total weight in mature, parasitized Threespine Stickleback from Meliadine Lake in 2024.

Notes: The reduced ANCOVA model was used to compare differences among areas for both sexes.



8.5 Conclusions

A summary of the results for the 2024 Threespine Stickleback health assessment are provided in **Table 8-12**. The findings of 2024 Threespine Stickleback health assessment are summarized below in the context of the key question:

Are activities at the Mine causing changes in Meliadine Lake that are impacting the health and viability of small-bodied fish populations?

Growth

Male fish from MEL-01 were significantly longer, heavier, and older than those from MEL-03 and MEL-04, while females did not show the same pattern. For age-4 males, length and weight were significantly greater in MEL-01 compared to both reference areas, with weight differences exceeding the CES of 25%. In contrast, for age-4 females, length differed significantly between MEL-01 and MEL-03, while weight differed significantly between MEL-01 and MEL-04. However, neither difference exceeded the CES of 25%. Additionally, both length and weight of age-4 females differed significantly between the two reference sites, with differences of 9% and 27%, respectively. Mean age was the only other parameter that differed significantly between MEL-03 and MEL-04. These results underline the importance of including at least two reference areas in making comparisons and drawing conclusions.

Condition and Liver Weight

Both male and female Threespine Stickleback from MEL-01 were heavier for their length and had heavier livers compared to those from MEL-04. Most of these differences exceeded the CES (10% for condition and 25% for liver weight adjusted to body weight). Compared to MEL-03, fish from MEL-01 also tended to be heavier, and female liver weight was just above the 25% CES. These findings suggest that Threespine Stickleback inhabiting MEL-01 may be storing more energy or using energy more efficiently, possibly due to differences in food availability or habitat quality.

Gonad Weight

Males from MEL-01 had approximately 40% lighter gonads (adjusted for length and weight) compared to both reference areas. Females from MEL-01 also had significantly lighter gonads compared to MEL-04 (29%), but no difference was observed when compared to MEL-03 after adjusting for body weight.

These differences in gonad weight at MEL-01 may reflect variability in spawning timing rather than true differences in reproductive investment. In particular, reduced gonad size in males could be influenced by the timing of female reproductive cycles and inter-spawning intervals, given the asynchronous nature of stickleback spawning and the life-history plasticity observed in females (Baker et al., 2015).

Summary of Findings from the 2024 Study

Overall, the results suggest that Threespine Stickleback from MEL-01 have more energy available and/or make more efficient use of the available energy than the population inhabiting the reference areas. This observation aligns with the prediction in the FEIS that nutrients in effluent discharge to Meliadine Lake could have residual effects on food availability and habitat suitability, which would include forage fish, including Threespine Stickleback (Agnico Eagle, 2014).

Table 8-12. Summary of findings from the study of Threespine Stickleback health in 2024.

Effect Indicator	Response	Covariate	Male				Female				CES (%)
			P value	Tukey post-hoc P value (effect size in %)			P value	Tukey post-hoc P value (effect size in %)			
				MEL-01 vs MEL-03	MEL-01 vs MEL-04	MEL-03 vs MEL-04		MEL-01 vs MEL-03	MEL-01 vs MEL-04	MEL-03 vs MEL-04	
Survival (ANOVA)	Total Length (mm)	–	< 0.0001	**< 0.0001 (+7.9)**	**< 0.0001 (+9.2)**	0.7605	0.6479	–	–	–	–
	Total Weight (g)	–	< 0.0001	**< 0.0001 (+43.6)**	**< 0.0001 (+49.5)**	0.8051	0.5892	–	–	–	–
	Age (yr)**	–	< 0.0001	**< 0.0001 (+18.9)**	**0.0072 (+11.0)**	0.1720	0.0406	0.2363	0.6439	**0.0336 (-8.6)**	25
Growth (ANOVA)	Total Length (mm) at Age 4	–	< 0.0001	**0.0037 (+7.0)**	**< 0.0001 (+9.9)**	0.4282	0.0001	**0.0051 (-5.8)**	0.4178	**0.0001 (+8.7)**	–
	Total Weight (g) at Age 4**	–	< 0.0001	**< 0.0001 (+41.6)**	**< 0.0001 (+54.9)**	0.5701	0.0023	0.2994	**0.0731 (+16.3)**	**0.0017 (+27.4)**	25
Condition (ANCOVA)	Total Weight (g)**	Total Length (mm)	< 0.0001	**< 0.0001 (+13.5)**	**< 0.0001 (+13.6)**	0.9986	0.0045	**0.0092 (+9.2)**	**0.0150 (+8.6)**	0.9785	10
	Liver Weight (g)	Total Length (mm)	0.0063	0.3238	**0.0052 (+40.3)**	0.1069	< 0.0001	**< 0.0001 (+44.4)**	**< 0.0001 (+39.7)**	0.8938	–
	Liver Weight (g)**	Total Weight (g)	0.0475	0.8425	**0.0798 (+29.9)**	0.1059	0.0412[a]	**0.0014 (+27.6)**	**0.0026 (+25.8)**	0.9776	25
Reproduction (ANCOVA)	Gonad Weight (g)	Total Length (mm)	0.0044	**0.0108 (-41.8)**	**0.0066 (-44.0)**	0.9690	0.2378	–	–	–	–
	Gonad Weight (g)**	Total Weight (g)	0.0045	**0.0083 (-45.6)**	**0.0062 (-47.1)**	0.9792	0.0596	0.6147	**0.0490 (-29.2)**	0.3135	25

Notes:
** Lethal effect endpoints in EEM. These endpoints are used for determining 'effects' as designated by statistically significant differences ($p < 0.1$) between exposure and reference areas.
[a] ANCOVAs were reduced models (similar slopes), except for liver weight adjusted to total weight in female fish, where full model (including the interaction) was used to estimate and compare least squares mean at total weight = 2.6994 g (overall average).
Tukey post-hoc tests were performed when there was a statistically significant effect ($p < 0.1$) for the location or interaction term in the model (shown as underlined).
Effect sizes were calculated for significant pairwise differences ($p < 0.1$) in Tukey post-hoc tests (shown in **bold**).
Significant pairwise differences that exceed the specified critical effect size (CES) are **bold and shaded**.

8.6 References

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9 THREESPINE STICKLEBACK CHEMISTRY

9.1 Introduction

The Threespine Stickleback tissue chemistry study is conducted alongside the fish health study, to assess whether effluent is contributing to changes in fish tissue chemistry in small-bodied fish. Compared to large-bodied species such as Lake Trout, Arctic Char, and Round Whitefish, Threespine Stickleback have smaller home ranges, resulting in more consistent exposure to point-source discharges. This makes them a valuable early indicator of potential changes in fish tissue chemistry in Meliadine Lake.

Tissue chemistry data from the 2024 study (MEL-01, MEL-03, and MEL-04) were compared to results from 2015 (MEL-01), 2017 (MEL-03 and MEL-04), and 2021 (MEL-01, MEL-03, and MEL-04) to evaluate temporal trends and spatial differences.

Forecasting changes in fish tissue chemistry was an area of uncertainty highlighted in the FEIS[14] (Agnico Eagle, 2014). The FEIS cited research suggesting the combined effect of warmer temperatures and increased precipitation may lead to higher concentrations of metals in Arctic fish species (Carrie et al., 2010; Barletta et al., 2012; Dijkstra et al., 2013). Ultimately, the FEIS concluded that the effect of the Project on fish, including changes in tissue chemistry, would be negligible relative to the spatial and temporal scale of climate-related changes.

Objectives and Key Question

The Threespine Stickleback tissue chemistry study is ultimately focused on answering this key question:

> *Are activities at the mine contributing to changes in Threespine Stickleback tissue chemistry relative to reference areas or baseline?*

Objectives of the Threespine Stickleback study, as outlined in the AEMP Design Plan are as follows:

- Determine whether mine effluent has an effect on metal concentrations in fish tissue in Meliadine Lake, including whether fish tissue chemistry has been altered in such a way as to limit fish use by humans,
- Verifying predictions made in the FEIS pertaining to fish tissue metal concentrations,
- Meeting the requirements of the MDMER[15],

[14] Refer to Volume 7, Section 7.5.8.3.

[15] Mercury and selenium concentrations in effluent samples from the final discharge point (MEL-14) between 2021 and 2023 were below the thresholds outlined in MDMER Schedule 5, paragraph 9(1) that would trigger a fish tissue chemistry study.

- Aiding in the interpretation of the fish health study,
- Recommending appropriate changes to the fish tissue chemistry program for future years, and
- Provide data to inform adaptive management intended to reduce or eliminate mine-related effects to fish tissue chemistry in Meliadine Lake.

9.2 Findings from the 2024 Threespine Stickleback Chemistry Study

- For most parameters, Threespine Stickleback tissue chemistry concentrations at MEL-01 were similar to or lower than in previous years, with no evidence that mining activities are contributing to elevated concentrations in this small-bodied fish species.
- Arsenic—and to a lesser extent, uranium—were consistently higher in fish from MEL-01 compared to the reference areas in 2021 and 2024, suggesting increased bioaccumulation of these metals is localized to the East Basin.
- The increasing temporal trend for arsenic at MEL-01, compared to the reference areas, may be influenced by effluent exposure, climate-related factors, or a combination of both. Regardless of the source, higher body burdens of arsenic and uranium at MEL-01 indicate potential exposure, not adverse effects. The Threespine Stickleback population study did not identify any effects consistent with toxicological impairment.

9.3 Methods

9.3.1 Field and Laboratory Procedures

At each area (MEL-01, MEL-03, and MEL-04), 10 male and 10 female Threespine Stickleback from the health assessment were selected for tissue chemistry analysis. Fish that were selected for chemistry analysis ranged in size from 47 to 77 mm and were 3 to 5 years old. This size class is consistent with fish selected for chemistry analysis in 2021 (52 to 77 mm). Sample sizes of Threespine Stickleback from previous years are shown in **Table 9-1**.

Samples were submitted frozen to ALS Environmental after the otoliths were extracted by technicians at North/South Consultants (Winnipeg, MB). Metals and moisture analyses were conducted on individual fish with their viscera removed (carcass only). Prior to chemistry analysis, ALS confirmed that fish samples were large enough to meet minimum mass requirement for tissue chemistry analysis, meaning compositing samples was not necessary.

Table 9-1. Number of Threespine Stickleback carcass samples analyzed for tissue chemistry.

Year	MEL-01	MEL-03	MEL-04	Total
2015	60	-	-	60
2017	-	67	67	134
2021[a]	40	40	40	120
2024	20	20	20	60

Notes:
"-" = Fish studies were not conducted this year.
[a] The 2021 fish health study included parasitized and unparasitized fish. 10 males and 10 females from each 'group' were submitted for chemistry; 40 per area.

9.3.2 Quality Assurance and Quality Control

Tissue chemistry data were evaluated in a manner similar to the water chemistry and sediment chemistry results. The laboratory QC results are presented in **Appendix A** and summarized below;

- Sample integrity – The 60 fish samples arrived frozen and in good condition at North/South for otolith extraction and at ALS Environmental. ALS reported the temperature inside the cooler was 2°C on arrival.
- Laboratory QC Samples – There were four instances (parameters) that exceeded the laboratory DQO for reference material / laboratory control samples: aluminum, beryllium, chromium, and tin. These parameters were measured below or near detection in 2024; the exceedance of the DQOs do not affect the reliability of the results for use in the AEMP.
- Laboratory Duplicates – ALS selected 5 fish to analyze as laboratory duplicates. Of the 175 measurements reported for the 5 duplicate samples, there were 13 duplicate samples (11 parameters) where the DQO objectives were not met due to sample heterogeneity. It's not uncommon for laboratory duplicates to exceed the laboratory RPD DQO (40 or 60%, depending on the parameter) in tissue samples given the heterogeneity of tissue samples.
- Split Samples – Five Threespine Stickleback samples were randomly selected for split-sample analysis. For each selected fish, a portion of the single homogenized carcass was divided for separate analysis to assess both within-sample and analytical variability. Of the 175 comparisons of analytical precision across the five split samples, 21 exceeded the DQO criterion of 1.5 times the DQOs for laboratory duplicate. One female from MEL-03 (fish ID TS-139) accounted for 14 of the DQO exceedances. No issues were documented for this particular sample that would explain the greater number of parameters exceeding the RPD DQOs. As with the laboratory duplicates, the variability is attributed to tissue heterogeneity, minor differences in sample preparation methods, and instrument-related variability.

The Threespine Stickleback tissue chemistry data are considered accurate and reliable for reporting purposes. Sample integrity was maintained, and while some QC parameters exceeded DQO thresholds, these deviations are attributed to expected tissue heterogeneity and minor analytical variability. No systematic bias was observed that would affect the validity of the results for use in the AEMP.

9.3.3 Data Analysis

Data analysis was conducted using RStudio integrated with R v4.2.2 (R Core Team, 2024). Results were reported on wet-weight basis for all chemical parameters. Summary statistics were calculated by area and year as described for other components of the AEMP. Parameters that were detected in more than 50% of the samples were carried forward for statistical analysis. Descriptive statistics for the 2024 chemistry results by area (MEL-01, MEL-03, and MEL-04) are provided in **Appendix H-2**.

Differences in concentrations among areas and over time were determined by analysis of variance (ANOVA). If ANOVA results were significant ($P < 0.05$), pair-wise comparisons were made using Tukey honestly significant difference (HSD) test as described in the Threespine Stickleback health assessment. The magnitude of the difference in the mean concentration for the various pairwise comparisons was calculated as follows:

$$\% \, Difference = \frac{\bar{x}_{MEL-01} - \bar{x}_{reference/baseline}}{\bar{x}_{reference/baseline}}$$

The ANOVA model results and pairwise comparisons for all year and area combinations are presented in **Appendix H-2**.

Potential changes in fish tissue chemistry due to mining activities were evaluated in the following step-wise approach:

- **Temporal Assessment** – Identify patterns that have increased significantly ($p < 0.05$) at MEL-01 in 2024 compared to 2015.
- **Spatial Assessment** – Using the parameters identified in the temporal assessment, compare the 2024 tissue chemistry results from MEL-01 with those from the two reference areas.

Together, these approaches will help identify parameters exhibiting localized temporal trends in the East Basin (potential mining-related effects) versus broader regional trends driven by climatic variations.

9.4 Results and Discussion

Results of the temporal and spatial assessment are summarized below. Concentration plots showing the pairwise comparisons between areas and years are provided at the end of this chapter (**Figure 9-1** to (**Figure 9-9**).

- **Temporal Assessment** (**Table 9-2**) – The concentrations of the following parameters have increased in Threespine Stickleback from MEL-01 since 2015:
  - Arsenic, cobalt, copper, iron, manganese, phosphorus, strontium, uranium, and zinc.
- **Spatial Assessment** (**Table 9-3**) – Of the above 9 parameters that showed an increasing temporal trend at MEL-01, only arsenic—and to a lesser extent, uranium— were statistically significantly higher at MEL-01 compared to MEL-03 and MEL-04 in 2024. For all other parameters with increasing temporal trends at MEL-01, concentrations in 2024 were either comparable to or significantly lower than those observed in the reference areas.

Arsenic

On average, arsenic concentrations in Threespine Stickleback from MEL-01 were 69% higher in 2024 compared to 2015. In 2024, arsenic concentrations at MEL-01 were also significantly higher than at both reference areas (MEL-03 and MEL-04), with effect sizes of 117% and 135%, respectively. As shown in **Figure 9-1**, arsenic concentrations at MEL-01 remained relatively stable between 2021 and 2024, while MEL-03 and MEL-04 exhibited fluctuating concentrations over time with no consistent increasing trend. The variability in arsenic concentrations at the reference areas suggests no evidence of a lake-wide increase due to natural interannual climate variability.

Arsenic cycling, partitioning, and fate in freshwater environments are governed by complex physical, chemical, and biological interactions (Palmer et al., 2019; Sivarajah et al., 2024). In these systems, sediment can function as both a source and a sink of arsenic, depending on environmental conditions. There is growing recognition that climate change may influence arsenic mobilization (Astles et al., 2022). Sediment in the East Basin is naturally enriched in arsenic compared to the reference areas (**Figure 6-5**). While there is no evidence that mining activities have elevated arsenic concentrations in sediment, the cumulative effects of changes in the timing of ice cover, warmer water temperatures, and naturally higher primary productivity in the East Basin may be enhancing arsenic uptake at the base of the aquatic food web, leading to higher arsenic concentrations in dietary sources.

Fish primarily accumulate arsenic from their diet rather than direct exposure to surface water (Erickson et al., 2011). While there is evidence of arsenic accumulation in small fish, these concentrations do not necessarily indicate adverse effects on the Threespine Stickleback population. For instance, arsenic tissue concentrations associated with chronic effects in fish have been reported at approximately 2 to 6 mg/kg ww (McIntyre and Linton, 2012), whereas the maximum concentration recorded at MEL-01 in 2024 was 0.56 mg/kg ww. More importantly, there were no observed effects on Threespine Stickleback at MEL-01 compared to MEL-03 and MEL-04 that would be indicative of toxicological impairment (**Section 8**).

Uranium

On average, uranium concentrations in Threespine Stickleback at MEL-01 increased approximately 76% between 2015 and 2024. In 2024, uranium concentrations at MEL-01 were significantly different from MEL-03 but not significantly different than MEL-04, as indicated by overlapping statistical groupings in **Figure 9-8**. Concentrations at MEL-01 were 53% higher compared to MEL-03 and 24% higher compared to MEL-04. Similar to arsenic, uranium concentrations at MEL-01 were stable from 2021 to 2024. At the reference areas, uranium concentrations were more variable from 2017 to 2024. Overall, there is no evidence that uranium concentrations are increasing lake-wide for Threespine Stickleback.

The primary route of exposure of aquatic organisms to uranium is likely from the water as opposed to through food (CCME, 2011). Surface water concentration of uranium at MEL-01 are higher than in the reference areas[16], however, the observed spatial and temporal patterns suggest concentrations are increasing throughout Meliadine Lake primarily due to regional climatic trends rather than effluent. The observed increase in uranium concentrations in Threespine Stickleback over time and differences among the reference areas reflects the underlying change in surface water concentrations in each area.

9.5 Conclusions

Conclusions for the Threespine Stickleback chemistry program are summarized below in the context of the following key question:

Are activities at the mine contributing to changes in Threespine Stickleback tissue chemistry relative to reference areas or baseline?

For most parameters monitored under the AEMP, there is no evidence that mining activities are contributing to elevated concentrations of metals in Threespine Stickleback in the East Basin of Meliadine Lake.

However, arsenic—and to a lesser extent, uranium—were consistently higher in fish from MEL-01 compared to reference areas in both 2021 and 2024, suggesting that the observed temporal increase is localized to the East Basin. The available data do not allow for definitive attribution of this increase to effluent discharge, climate-related factors, or a combination of both. However, what is clear is that this exposure does not result in toxicological impairment to the Threespine Stickleback population inhabiting the East Basin.

Predicting future changes in fish tissue chemistry remains uncertain due to the multiple climate-related factors influencing metal mobilization and bioaccumulation. At a broad scale, findings from both the 2021 and 2024 Threespine Stickleback tissue chemistry assessments align with predictions in the FEIS,

[16] See the temporal trends for U.T and U.D by area in the condensed temporal plot (**Figure 3-18**).

which anticipated that Project-related effects on fish would be negligible in comparison to the larger temporal and spatial influences of climate change.

Table 9-2. Parameters with significantly increased concentrations (p < 0.05) in Threespine Stickleback carcass tissue from MEL-01 between 2015 and 2024.

Parameter	Mean Ratio	Std Error	DF	t-statistic	p value	Effect Size
Arsenic	1.69	0.119	365	7.46	<0.001	69%
Cobalt	1.49	0.126	365	4.72	<0.001	49%
Copper	1.28	0.063	364	5.04	<0.001	28%
Iron	1.40	0.124	363	3.85	0.004	40%
Manganese	1.35	0.092	364	4.42	<0.001	35%
Phosphorus	1.20	0.063	364	3.52	0.014	20%
Strontium	1.26	0.075	364	3.94	0.003	26%
Uranium	1.76	0.193	365	5.14	<0.001	76%
Zinc	1.77	0.102	365	9.97	<0.001	77%

Notes:
Mean Ratio: The mean concentration ratio of 2024 to 2015.
Std. Error: The standard error of the mean ratio estimate.
DF (Degrees of Freedom): The number of independent values in the ANOVA model.
t-Statistic: The test statistic for the Tukey test.

Table 9-3. Spatial comparisons for Threespine Stickleback tissue chemistry in 2024 (Tukey post-hoc p < 0.05).

Parameter	Spatial Comparison	Mean Ratio	Std Error	DF	t-statistic	p value	Effect Size	Conclusion regarding MEL-01
Arsenic	MEL-01 vs MEL-03	2.17	0.188	365	8.985	**<0.001**	117%	MEL-01 > Reference
	MEL-01 vs MEL-04	2.35	0.203	365	9.903	**<0.001**	135%	
Cobalt	MEL-01 vs MEL-03	1.09	0.113	365	0.844	0.995	9%	Similar to Reference
	MEL-01 vs MEL-04	0.96	0.099	365	-0.428	1.000	-4%	
Copper	MEL-01 vs MEL-03	1.12	0.069	364	1.859	0.643	12%	Similar to Reference
	MEL-01 vs MEL-04	1.04	0.063	364	0.613	1.000	4%	
Iron	MEL-01 vs MEL-03	0.55	0.060	363	-5.446	<0.001	-45%	MEL-01 < Reference
	MEL-01 vs MEL-04	0.46	0.049	363	-7.233	<0.001	-54%	
Manganese	MEL-01 vs MEL-03	1.05	0.087	364	0.577	1.000	5%	Similar to Reference
	MEL-01 vs MEL-04	0.80	0.066	364	-2.716	0.146	-20%	
Phosphorus	MEL-01 vs MEL-03	0.90	0.057	364	-1.698	0.748	-10%	MEL-01 < Reference
	MEL-01 vs MEL-04	0.79	0.051	364	-3.653	0.009	-21%	
Sodium	MEL-01 vs MEL-03	0.74	0.036	364	-6.182	<0.001	-26%	MEL-01 < Reference
	MEL-01 vs MEL-04	0.74	0.036	364	-6.274	<0.001	-26%	
Strontium	MEL-01 vs MEL-03	0.90	0.065	364	-1.450	0.877	-10%	MEL-01 < Reference
	MEL-01 vs MEL-04	0.79	0.057	364	-3.316	0.028	-21%	
Thallium	MEL-01 vs MEL-03	1.13	0.115	365	1.189	0.959	13%	Similar to Reference
	MEL-01 vs MEL-04	0.84	0.085	365	-1.734	0.725	-16%	
Uranium	MEL-01 vs MEL-03	1.55	0.209	365	3.284	**0.031**	55%	MEL-01 > Reference
	MEL-01 vs MEL-04	1.24	0.166	365	1.571	0.820	24%	
Zinc	MEL-01 vs MEL-03	1.21	0.085	365	2.699	0.152	21%	Similar to Reference
	MEL-01 vs MEL-04	1.06	0.074	365	0.772	0.998	6%	

Notes:
Mean Ratio: The mean concentration ratio of 2024 to 2015.
Std. Error: The standard error of the mean ratio estimate.
DF (Degrees of Freedom): The number of independent values in the ANOVA model.
Gray values = no significant difference or significant decrease for the pairwise comparison.
Shaded values = significant increase and effect size > 25% for the pairwise comparison.

Figure 9-1. Arsenic concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

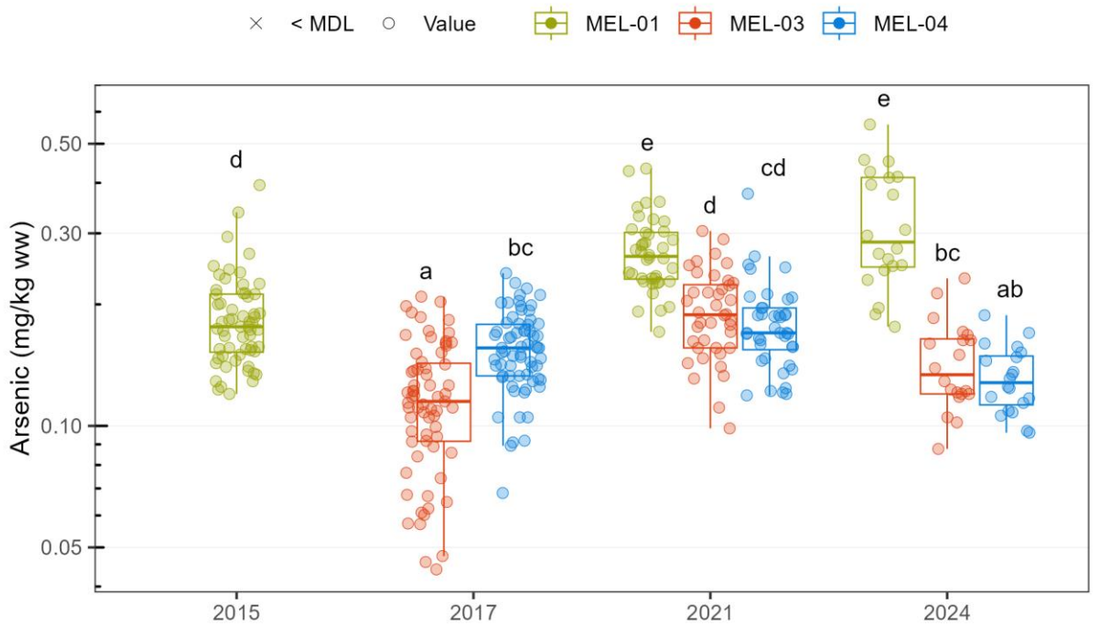


Figure 9-2. Cobalt concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).



Figure 9-3. Copper concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

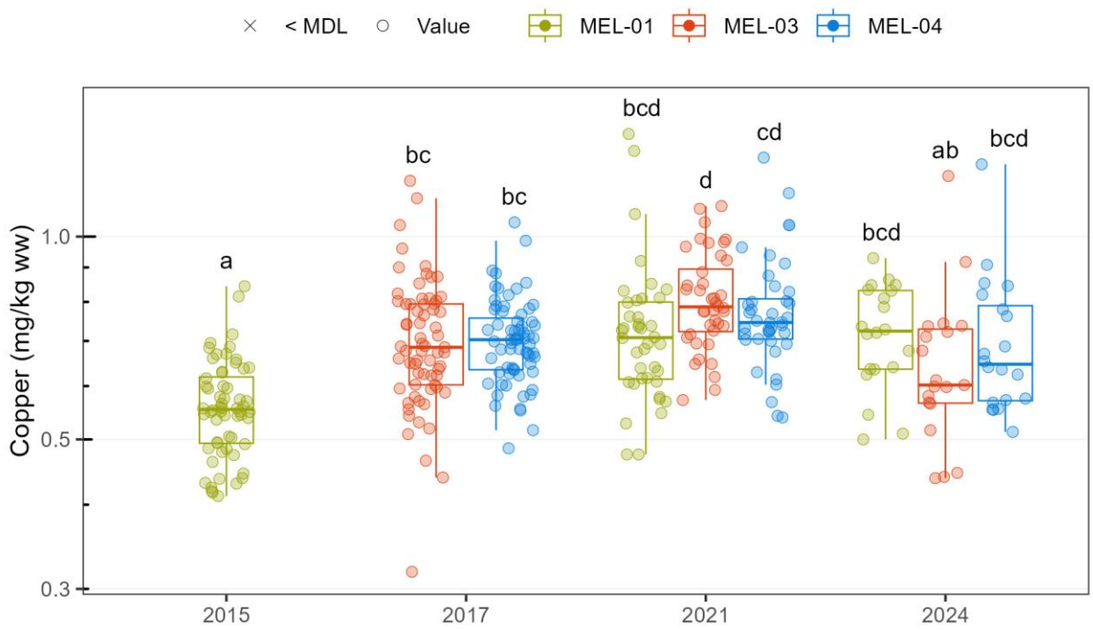


Figure 9-4. Iron concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

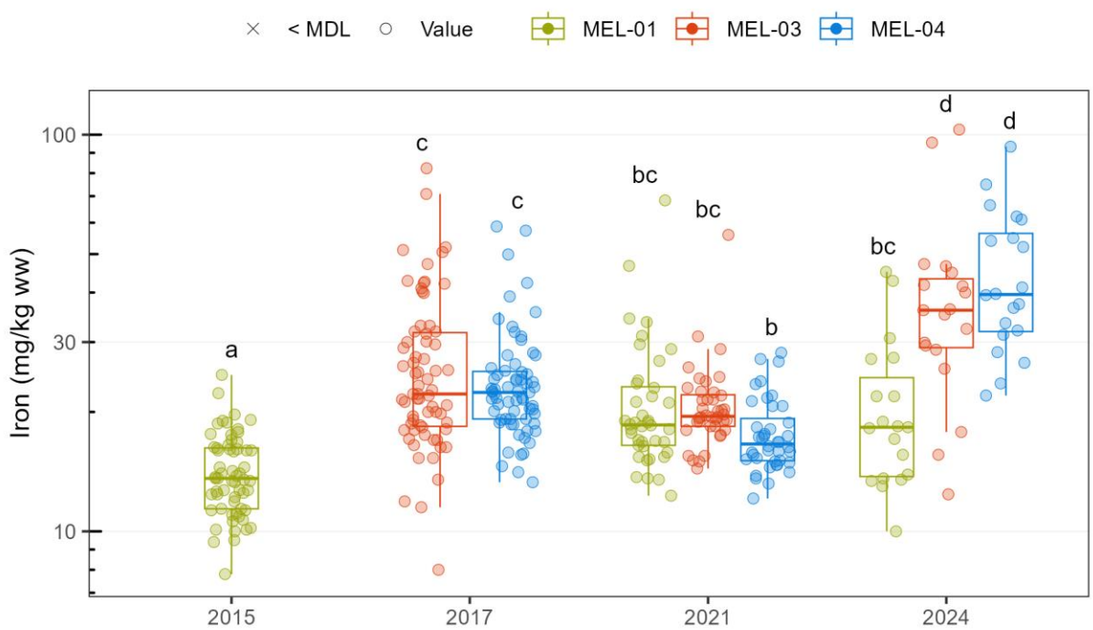


Figure 9-5. Manganese concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

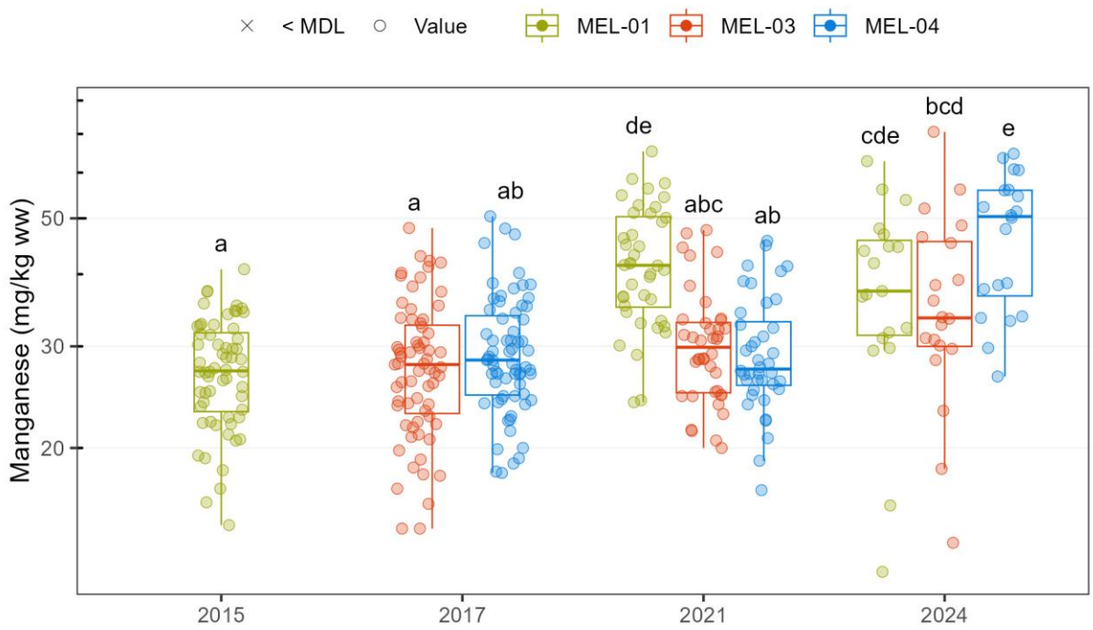


Figure 9-6. Phosphorus concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

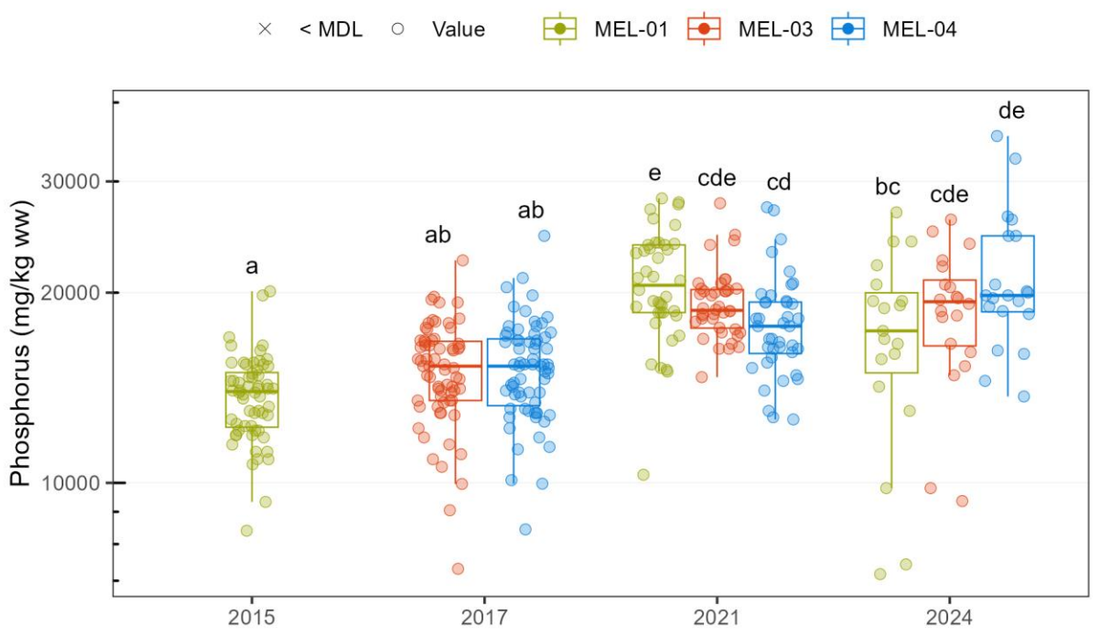


Figure 9-7. Strontium concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

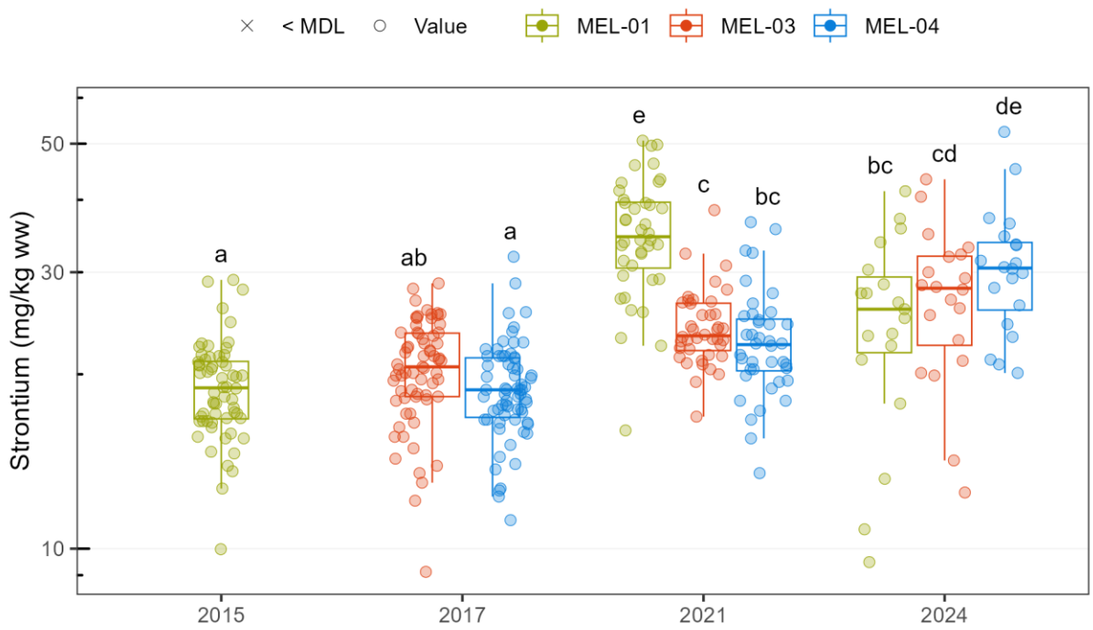


Figure 9-8. Uranium concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

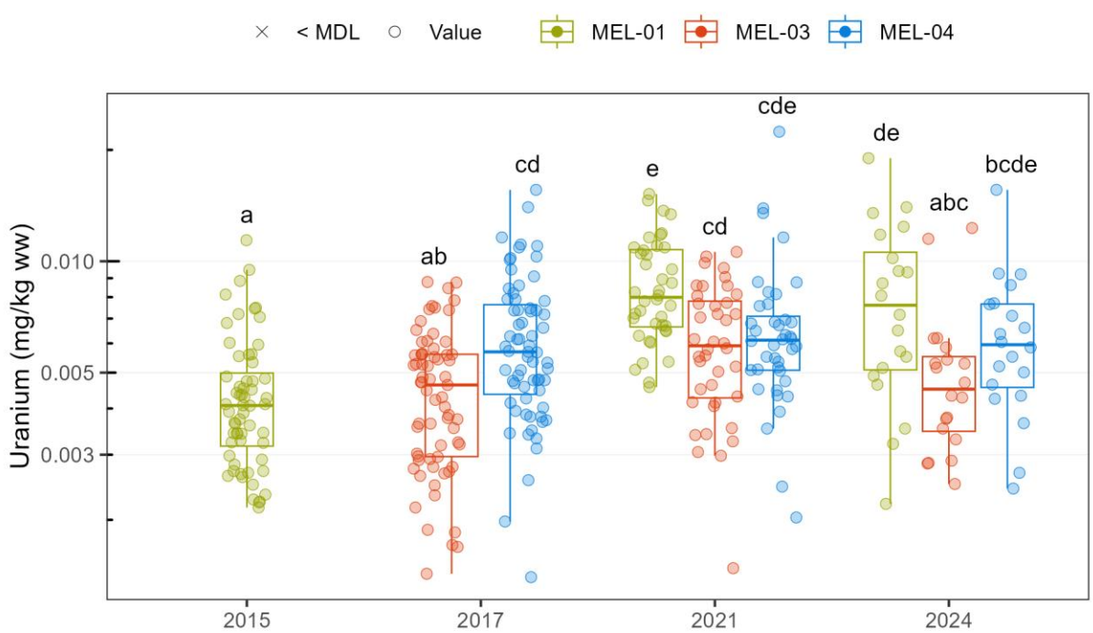
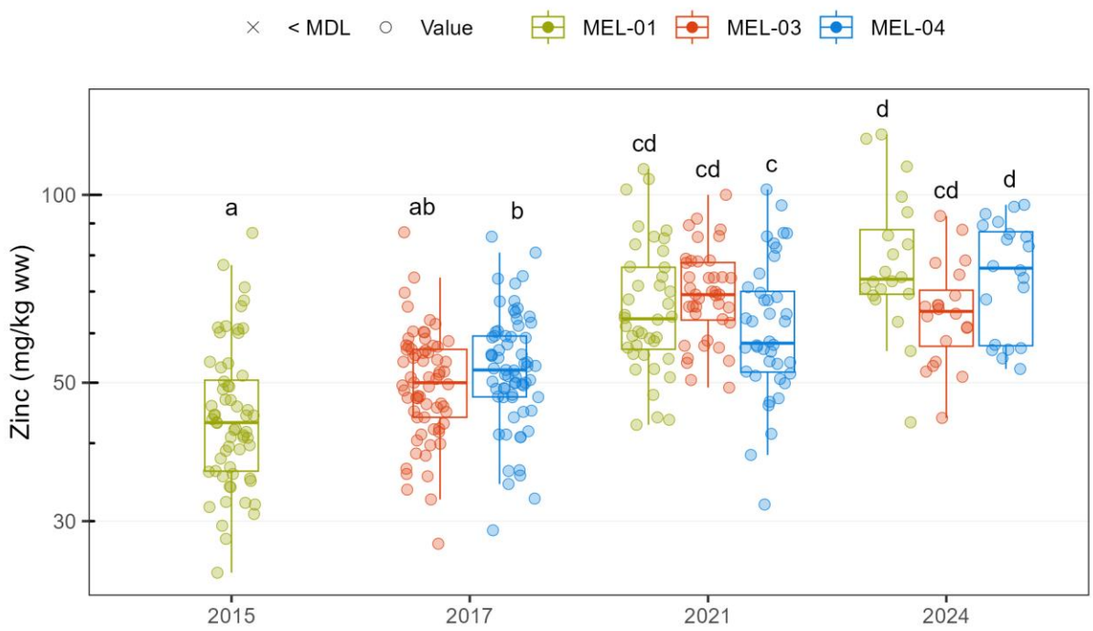


Figure 9-9. Zinc concentrations in carcass tissues of Threespine Stickleback and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).



9.6 References

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10 LAKE TROUT HEALTH

10.1 Introduction

The Lake Trout (*Salvelinus namaycush*) health assessment was conducted in August 2024 to fulfill monitoring requirements under both the Water Licence and MDMER. The Lake Trout health study for the AEMP follows the three-year EEM cycle, making this the second Lake Trout health assessment since the Mine became subject to MDMER on August 21, 2016, following the dewatering of Lake H17 to create CP1. The first assessment was conducted in August 2021.

The 2021 Lake Trout health assessment for the AEMP and EEM Cycle 2 utilized the same dataset from Meliadine Lake but differed in their approaches to evaluating effects. The 2021 AEMP (Azimuth, 2022) followed a before-after assessment approach, as outlined in version 1 of the AEMP Design Plan (Golder, 2016), to track changes in fish health over time within Meliadine Lake. In contrast, EEM Cycle 2 (Azimuth and Portt, 2022) used a multiple control-impact study design, incorporating two external reference lakes—Peter Lake and Atulik Lake—to assess whether effluent discharged into Meliadine Lake was adversely affecting fish health.

Of the two study designs, EEM Cycle 2 provided a clearer understanding of potential mining-related effects. A before-after study design cannot differentiate between natural variation and mine-related changes over time, whereas the inclusion of external reference lakes helps account for natural variability in the region. Peter Lake, in particular, was selected due to its similarity to Meliadine Lake in terms of size and morphology.

The Lake Trout study for EEM Cycle 3 (Azimuth and Portt, 2024) was adopted for the AEMP, ensuring that monitoring requirements under both the Water Licence and MDMER were fulfilled within a single, harmonized study. The 2024 study largely replicated EEM Cycle 2, maintaining the same study design and methodology. The locations of gill nets in Meliadine Lake (MEL-01) are shown in **Figure 3-1** along with the location of the minnow traps. The location of the gill nets and water sampling locations in Peter Lake and Atulik Lake are shown in **Figure 10-1** and **Figure 10-2**, respectively.

Objectives and Key Question

The objectives of the Lake Trout health assessment align with those outlined for Threespine Stickleback and include:

- Evaluating the potential effects of mining on Lake Trout in Meliadine Lake,
- Verifying predictions made in the FEIS regarding fish health,
- Meet the biological monitoring requirements of the MDMER (Government of Canada, 2024),

- Reviewing and recommending improvements to future fish health monitoring., and
- Providing data to support adaptive management strategies aimed at mitigating or preventing mine-related effects on fish health in Meliadine Lake.

The Lake Trout health assessment is focused on answering this key question:

> *Are activities at the Mine causing changes in Meliadine Lake that are impacting the health of large-bodied fish?*

10.2 Findings from the 2024 Lake Trout Health Assessment

- Fish in Meliadine Lake were generally larger and older than those in Atulik Lake, but similar in size, weight, and age to fish in Peter Lake.
  - The proportion of longer, heavier, and older Lake Trout was higher in Meliadine Lake compared to Atulik Lake, but not compared to Peter Lake.
  - Mean length, weight, and age were significantly higher in Meliadine Lake than Atulik Lake, with the difference in mean age exceeding the critical effect size (CES) of 25%, but similar results were observed between the two reference lakes. In addition, no significant differences were observed in mean length, weight, and age between Meliadine Lake and Peter Lake.
- Key Lake Trout health indicators—condition, growth, and liver weight—showed no signs of mine-related effects.
  - Condition (weight relative to length) was similar between the exposure and reference lakes, but it was different between the two reference lakes (11% higher in Atulik).
  - Growth (age-adjusted size and weight) were higher in Meliadine compared to Atulik, with the difference in adjusted weight exceeding the CES of 25%. Similar results were observed between the two reference lakes, although the observed differences were below 25%.
  - Liver weight (adjusted for length or weight) was generally similar between the exposure and reference lakes. The only exception was liver weight adjusted to total weight, which was 17% heavier in Meliadine Lake compared to Atulik Lake—a difference below the 25% CES threshold.
- In conclusion, the results from 2024 confirm that activities at the Mine are not adversely affecting the health of Lake Trout in Meliadine Lake. While fish in Meliadine Lake were generally larger, heavier, and older than those in Atulik Lake, a similar pattern was observed between Peter Lake and Atulik Lake. These findings highlight the importance of using at least two reference lakes to account for natural variability and strengthen confidence in assessing potential mine-related effects.

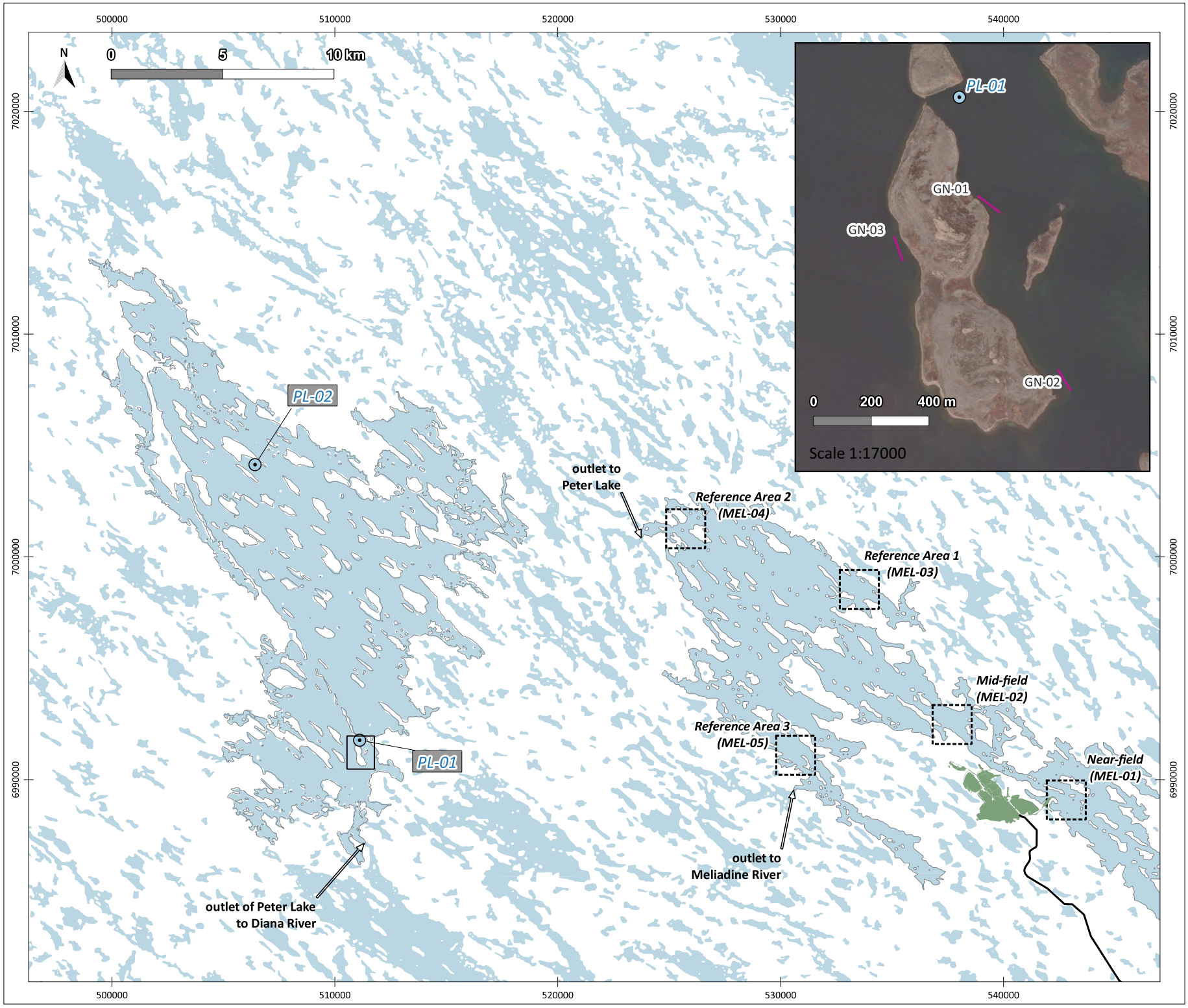


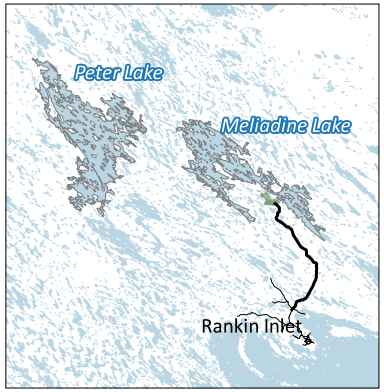
Figure 10-1
Peter Lake - Reference Area for the Lake Trout Study

Meliadine Gold Mine
Aquatic Effects Monitoring Program
2024 Annual Report

AZIMUTH

Date: March 15, 2025
Datum: NAD 83; UTM Zone 15N
Scale: main map 1:220,000
Software: 3.22.11-Białowieża
Produced by: E. Franz

REFERENCES:
1. Basemap imagery from ESRI
2. Mine Plan provided by Agnico Eagle
3. Roads and waterbodies from NRC



Legend

- Extent of the Meliadine Mine (2024)
- All-weather access road
- Surface water station
- Gill net locations for the Lake Trout study



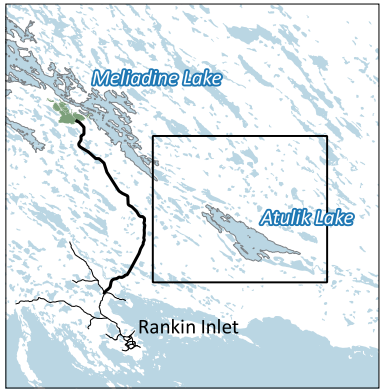
Figure 10-2
Atulik Lake - Reference Area for the Lake Trout Study

Meliadine Gold Mine
Aquatic Effects Monitoring Program
2024 Annual Report

AZIMUTH

Date: March 15, 2025
Datum: NAD 83; UTM Zone 15N
Scale: main map 1:80,000
Software: 3.22.11-Białowieża
Produced by: E. Franz

REFERENCES:
1. Basemap imagery from ESRI
2. Mine Plan provided by Agnico Eagle
3. Roads and waterbodies from NRC



Legend

- Extent of the Meliadine Mine (2024)
- All-weather access road
- Surface water station
- Gill net locations for the Lake Trout study

10.3 Methods

10.3.1 Collection

Target sample size for each area was 26 Lake Trout regardless of sex and maturity according to the study design (Azimuth and Portt, 2024). Lake Trout were captured exclusively using gill nets.

Each net consisted of a gang of three North American standard large mesh gill nets (1.83 m x 24.7 m). Each standard gill net consisted of 8 panels of different mesh sizes (76 mm, 114 mm, 51 mm, 89 mm, 38 mm, 127 mm, 64 mm, and 102 mm).

One gang was set overnight in Meliadine Lake on August 12-13. Shorter-duration daytime sets on August 13 and 16 were used to catch the rest of the Lake Trout required to achieve the necessary sample size from Meliadine lake, in order to limit mortality. Three gangs were set overnight to collect Lake Trout at Peter Lake (August 17-18) and Atulik Lake (August 18-19). Peter Lake and Atulik Lake are only accessible by helicopter.

Time of gill net deployments and lifts were recorded along with UTM coordinates at each end of each net (Garmin model GPSmap 76CSx). The number of individuals of each species captured that were dead (or killed and retained in the case of Lake Trout) and that were alive and released was recorded for each net set. At each lake, all dead Lake Trout were retained and Lake Trout captured alive were euthanized and retained until it was clear that the target sample size would be acquired. Once the target size was reached, or it was apparent that it would be, Lake Trout that were alive were released.

10.3.2 Processing

Each Lake Trout retained for assessment was examined externally and any lesions or abnormalities that were not consistent with gill net capture were recorded. Fork length and total length were measured to the nearest mm using a standard fish measuring board. Fish weighing less than 200 g were weighed to the nearest 0.01 g using an Ohaus Scout Pro Model SP202 electronic balance. Fish weighing between 200 and 6,000 grams were weighed to the nearest 1 g using an Ohaus Scout Pro Model SP6001 electronic balance. Fish weighing more than 6,000 g were weighed to the nearest 10 g using a Rapala digital hanging scale.

The body cavity of each fish was opened and viscera were examined for any anomalies or parasites. Gonads were examined to determine sex, maturity, and gonad condition. Females with opaque ovaries containing developing eggs visible to the naked eye were sexually mature. Females with translucent ovaries that did not contain eggs visible to the naked eye were immature. Mature females with opaque ovaries, and in some cases atretic eggs from the previous spawning, but which did not appear to be developing eggs to spawn in the fall of the current year are referred to as resting females. Mature females with large eggs that appeared to be ready to spawn in the current year were termed ripe

females. Males with opaque testes were mature, and males with small translucent testes were immature. Mature males with testes that discharged milt when they were extracted from the fish were termed ripe and those that did not were termed resting.

Gonads and livers were removed and weighed to the nearest 0.01 g using an Ohaus Scout Pro Model SP202 electronic balance or, if they weighed more than 200 grams, to the nearest 0.1 g using an Ohaus Scout Pro Model SP6001 electronic balance. If ripe females were captured, a sample of eggs was taken from each fish and weighed to the nearest 0.01 g using an Ohaus Scout Pro Model SP202 electronic balance. The eggs in each sample were counted twice. If the counts differed, the eggs were recounted until two identical counts occurred. Egg weight was determined by dividing the weight of egg sample by the number of eggs. Fecundity was estimated by dividing ovary weight by egg weight.

Otoliths (a calcium carbonate structure in the inner ear) were extracted from each fish and placed in envelopes for age analysis. Age was determined by Louise Stanley, a fish aging expert. Otoliths were mounted whole on a glass slide with CrystalBond thermoplastic adhesive. Otoliths which could not be aged whole were ground to the core on one side, flipped to adhere the core area to the glass, and then ground to a thin section on the other side. Age was determined by counting the number of annuli (i.e., yearly growth increments interpreted as alternating translucent and opaque zones under transmitted light) using a Leica GZ6 Stereo Zoom microscope. Age was independently determined again by Cam Portt for 11 of 114 samples submitted (~10%). The independent readings were identical in 8 cases (~73%) and differed by one year in three cases (**Appendix I-1**).

10.3.3 Data Analysis

Data for individual fish were entered into an Excel spreadsheet. Data entries were compared with field data sheets and erroneous entries errors were corrected if found. Condition (K), liver somatic index (LSI), and gonad somatic index (GSI) were calculated using the formulas presented in the data analysis section of Threespine Stickleback health study (**Section 8.3.3**).

Data analysis was conducted using RStudio integrated with R v4.2.2 (R Core Team, 2024). Statistical procedures used for various monitoring endpoints to compare Lake Trout populations between exposure and reference lakes are summarized in **Table 10-1** and described below. As was the case for EEM Cycle 2, comparisons between Meliadine Lake and reference lakes were done using the combined dataset for males and females from each lake.

Table 10-1. Statistical procedures used for various monitoring endpoints to compare Lake Trout populations between exposure and reference lakes.

Statistical Procedure	Dependent Variable	Covariate	CES (%)
Kolmogorov-Smirnov Test (KS)	Fork Length (mm) distribution	–	–
	Total Weight (g) distribution	–	–
	Age (yr) distribution	–	–
Analysis of Variance (ANOVA)	Fork Length (mm)	–	–
	Total Weight (g)	–	–
	Age (yr)**	–	25%
Analysis of Co-variance (ANCOVA)	Fork Length (mm)	Age (yr)	–
	Fork Length (mm)**	Age (yr)	25%
	Total Weight (g)**	Fork Length (mm)	10%
	Liver Weight (g)	Fork Length (mm)	–
	Liver Weight (g)**	Total Weight (g)	25%

Notes:
CES = critical effect size.

** Lethal effect endpoints in EEM. These endpoints are used for determining 'effects' as designated by statistically significant differences ($p < 0.1$) between exposure and reference areas.

Length, Weight, and Age Distributions

Distribution of length, weight, and age were compared among lakes using the combined data for both sexes. Pairwise comparisons of the distributions were conducted using two-sample Kolmogorov-Smirnov test, which is a non-parametric, distribution-free test that assesses the similarity of two cumulative distribution functions of two data sets at $p = 0.05$ using the following equation (Environment Canada, 2012):

$$D = \sup |F_1(x) - F_2(x)|$$

$F_1(x)$ and $F_2(x)$ are the empirical cumulative distribution functions of the two groups (areas) being compared

'sup' denotes the maximum of the absolute differences over all observed values. A larger D value indicates greater divergence in the distributions between the two areas

Mean Length, Weight, and Age

Mean fish length, weight, and age was compared among lakes using analysis of variance (ANOVA). If the results of the ANOVAs indicated a significant effect ($p < 0.1$) of the lake (the *Location* term in models), Tukey's Honestly Significant Difference (HSD) test was performed for pairwise comparisons of mean estimates at alpha = 0.1. Effect sizes were calculated using the following equation (Environment Canada, 2012):

$$\%Difference = \frac{\bar{X}_{exposure} - \bar{X}_{reference}}{\bar{X}_{reference}} \times 100$$

Residuals from ANOVA models were assessed for equality of variance and homoscedasticity. While Shapiro-Wilk and Levene's tests occasionally produced p-values < 0.05, visual inspection confirmed that ANOVA residuals were sufficiently normally distributed, supporting the appropriateness of ANOVA models for comparing data among sampling lakes. Outliers, defined as observations with studentized residuals > 4, were identified, recorded, and removed, and analyses were subsequently repeated.

Growth, Condition, and Liver

Analysis of covariance (ANCOVA) was used to compare the following endpoints among lakes:

- Growth (fork length vs age and total weight vs age relationships)
- Condition (total weight vs fork length relationship)
- Liver (liver weight vs total length and liver weight vs total weight relationships)

ANCOVAs were conducted to test for significant differences in intercepts and slopes between the lakes using log_{10}-transformed data. Significant differences were evaluated using alpha = 0.1 (Environment Canada, 2012). Residuals from ANCOVA models were examined for normality and outliers. If present, observations producing studentized residuals > 4 were identified, recorded, and removed from data, and analyses were repeated.

Both full and reduced ANCOVA models were fit to assess and select the most appropriate modeling approach. Full models were run initially, which included an interaction term between lake and covariate, allowing model slopes to vary by lake. In cases where the interaction term was not significant (i.e., homogeneity of slopes), reduced models with no interaction term were run and used to assess significance and calculate effect sizes. In cases where the interaction term was significant but accounted for < 2% of the total variation – as indicated by less than 2% difference in adjusted R^2 between full and reduced models – the reduced model was considered appropriate (Barrett et al. 2010).

Following ANCOVAs and if the results indicated a significant effect ($p < 0.1$) of the lake in reduced models or the interaction of lake and covariate in full models, Tukey post-hoc tests at alpha = 0.1 were performed for pairwise comparisons of least squares means and effect sizes were calculated using the equation presented above.

10.3.4 Post-hoc Power

Results of the Lake Trout power analysis will be presented in the EEM Cycle 3 interpretive report as part of recommendations to improve the Lake Trout study for future AEMP and EEM cycles.

10.4 Results

10.4.1 Water Quality

Effluent discharge to Meliadine Lake was discontinued from July 17 to September 1, resulting in uniform conductivity readings among the six profiles taken around the diffuser (**Figure 3-4**). In August, specific conductivity in the East Basin of Meliadine Lake was measured at 111 µS/cm (**Table 10-2**).

Two profiles were taken in each of the reference lakes to broadly characterize spatial differences within each lake. Within each lake, conductivity was consistent between the two profiles. Of the two lakes, conductivity was higher in Atulik Lake (98 µS/cm) compared to Peter Lake (60 µS/cm). Dissolved oxygen and pH readings were similar among the three lakes.

Early August 2024 was notably warm, and a distinct thermal gradient was observed in Meliadine Lake based on vertical profiles collected on August 13 (**Figure 3-3**). In contrast, similar thermal stratification was not evident in Peter Lake (August 17) or Atulik Lake (August 18). On average, surface water temperatures at station MEL-01 were 2–3°C warmer than those recorded at Peter and Atulik Lakes. This difference in surface temperatures can be attributed to regional weather conditions in mid-August.

From August 8 to 12, Rankin Inlet experienced unseasonably warm weather, with daytime highs reaching 26–30°C and daily average temperatures around 20°C. By August 14, however, air temperatures had dropped by approximately 10°C, which was reflected in cooler surface water temperatures in Peter Lake, Atulik Lake, and in Meliadine Lake, as shown in the MEL-04 profiles collected on August 20–21 (**Figure 3-3**).

Laboratory water quality results from two samples collected in both Peter Lake and Atulik Lake are summarized in **Appendix C1**.

Table 10-2. *In-situ* water quality in Meliadine Lake, Peter Lake, and Atulik Lake during the August Lake Trout field program.

Parameter	*In-situ* Water Quality Readings (min – max)		
	Meliadine Aug 13	Peter Aug 17	Atulik Aug 18
Water Temp (°C)	17.1 – 14.8	14.3 – 14.4	13.6 – 14.3
DO (mg/L)	9.86 – 10.26	9.94 – 10.03	9.67 – 9.83
Sp. Cond (µS/cm)	111.1 – 111.9	59.8 – 60.9	97-9 – 98.0
pH	7.52 – 7.63	7.32 – 7.68	7.35 – 7.42

Notes:
Day-time high recorded at the weather station at the Mine.

10.4.2 Catch Per Unit Effort

Total soak time of gill nets (sum of 3 gangs, each consisting of 3 nets) was 31.2 hours in Meliadine Lake, 40.9 hours in Atulik Lake, and 57.1 hours in Peter Lake.

Overall, the catch per unit effort (CPUE) of Lake Trout was the highest, with a total of 144 fish captured during 129.2 hours soak time of gill nets. For Lake Trout, CPUE was 0.90 fish/hour Meliadine Lake, 1.32 fish/hour in Atulik Lake, and 1.09 fish/hour in Peter Lake (**Table 10-3**). Cisco was the second most abundant species in the catches overall, and was the most abundant species in the catches from Atulik. There were a few Arctic Char (*Salvelinus alpinus*), Arctic Grayling (*Thymallus arcticus*), and Round Whitefish (*Prosopium cylindraceium*) captured in one or more of the lakes (**Table 10-3**).

Table 10-3. Gill net catch and catch per unit effort (CPUE; number of fish caught per net per hour soak time) by species for each lake.

Lake	Meliadine		Atulik		Peter	
Total Soak Time (hrs)	31.2		43.9		57.1	
Fish Species	Catch (n)	CPUE	Catch (n)	CPUE	Catch (n)	CPUE
Arctic Char	0	–	0	–	4	0.07
Arctic Grayling	4	0.13	5	0.11	1	0.02
Cisco	20	0.64	51	1.16	27	0.47
Round Whitefish	11	0.35	0	–	5	0.09
Lake Trout	**28**	**0.90**	**54**	**1.23**	**62**	**1.09**

10.4.3 Descriptive Statistics

The target minimum sample size of 26 Lake Trout per lake was achieved in each lake (**Table 10-4**). A total of 144 Lake Trout were processed from the three lakes. No lesions, deformities, or external parasites were observed on Lake Trout in 2024 samples, but encysted cestodes were present in most fish, which is not uncommon for such a long-lived fish species.

Summary statistics of all variables measured and indices calculated for Lake Trout by lake are presented in **Table 10-5**. The same statistics calculated for Lake Trout by lake, sex, and maturity are provided in **Appendix I-1**.

The ratio of male to female was 0.47 in Meliadine Lake, 0.95 in Atulik Lake, and 0.77 in Peter Lake. There were only a few ripe fish among the 111 fish that could be sexed confidently (**Table 10-4**). One ripe female was captured in Meliadine Lake and three ripe females were captured from Peter Lake. Fecundity (egg count) was 3,507 for the ripe female captured in Meliadine Lake and 3,046, 4,270, and 4,371 eggs for the three ripe females from Peter Lake.

As anticipated by the study design (Azimuth and Portt, 2024), gonad-related endpoints were not investigated for Lake Trout due to an insufficient number of ripe individuals (**Table 10-4**).

Table 10-4. Sample size of Lake Trout captured and processed.

Sex	Maturity	Gonad Status	Meliadine	Atulik	Peter	Total
Male	Immature	Undeveloped	3	15	5	23
	Mature	Resting	4	1	4	9
		Ripe	1	2	8	11
Female	Immature	Undeveloped	14	17	8	39
	Mature	Resting	2	2	11	15
		Ripe	1	0	3	4
Unknown	Immature	Undeveloped	3	8	2	13
Total			28	45	41	114

Table 10-5. Descriptive statistics of Lake Trout data.

Lake	Variable	N	Min	Max	Mean	Median	SD	SE
Meliadine	Fork Length (mm)	28	267	804	514.7143	515	141.3286	26.7086
	Total Weight (g)	28	178	6110	1860.321	1516	1528.872	288.9296
	Age (yr)	28	4	37	17.3571	14	9.7647	1.8454
	Liver Weight (g)	28	1.75	65.4	22.1321	17.9	17.2039	3.2512
	Gonad Weight (g)	27	0.17	345	31.1352	4.13	70.5646	13.5802
	Condition Factor	28	0.8111	1.3204	1.0955	1.0995	0.131	0.0248
	Hepatosomatic Index	28	0.6267	2.241	1.2231	1.1214	0.4043	0.0764
	Gonadosomatic Index	27	0.0338	7.2403	0.9537	0.2911	1.5605	0.3003
	Fecundity (eggs/female)	1	3507	-	-	-	-	-
Atulik	Fork Length (mm)	45	182	667	396	360	125.3267	18.6826
	Total Weight (g)	45	65.8	3783	898.5644	513	862.2253	128.533
	Age (yr)	45	4	25	12.0667	11	5.2846	0.7878
	Liver Weight (g)	45	0.51	38.1	9.5202	5.5	9.2747	1.3826
	Gonad Weight (g)	44	0.05	69.19	5.6675	0.83	14.7414	2.2223
	Condition Factor	45	0.5121	1.298	1.0726	1.0918	0.1252	0.0187
	Hepatosomatic Index	45	0.5351	1.8992	1.0148	0.9724	0.283	0.0422
	Gonadosomatic Index	44	0.0208	3.1724	0.3505	0.1121	0.6295	0.0949
	Fecundity (eggs/female)	0	-	-	-	-	-	-

Table 10-5. Descriptive statistics of Lake Trout data.

Lake	Variable	N	Min	Max	Mean	Median	SD	SE
Peter	Fork Length (mm)	41	175	775	558.0488	580	135.9594	21.2333
	Total Weight (g)	41	59.3	4470	2227.863	2279	1288.425	201.2181
	Age (yr)	40	2	35	18.6	18	7.7948	1.2325
	Liver Weight (g)	41	0.42	67.7	26.0846	23.8	18.3355	2.8635
	Gonad Weight (g)	41	0.05	467.4	56.8576	32.13	98.0091	15.3064
	Condition Factor	41	0.5113	1.3232	1.0599	1.0745	0.177	0.0276
	Hepatosomatic Index	41	0.6234	2.0813	1.1773	1.0714	0.3754	0.0586
	Gonadosomatic Index	41	0.0595	12.3415	1.9477	1.1895	2.9016	0.4532
	Fecundity (eggs/female)	3	3046	4371	3896	-	-	-

Notes:
Median, standard deviation, and standard error were not calculated for fecundity because of low sample sizes.

10.4.4 Frequency Distributions

Results of the two-sample Kolmogorov-Smirnov tests comparing length, weight, and age distributions among the three lakes are provided in **Table 10-6**. The results indicate that frequency distributions for all three endpoints (fork length, total weight, and age) for Lake Trout from Meliadine Lake were generally within the range observed at Peter Lake and Atulik Lake.

- **Length** (**Figure 10-3**) – Meliadine Lake and Peter Lake had a higher proportion of longer fish compared to Atulik Lake. Pairwise comparisons were statistically significant between Meliadine Lake vs Atulik Lake ($p = 0.0023$) and Peter Lake vs Atulik Lake ($p < 0.0001$). No difference in length frequency distribution was observed between Meliadine Lake and Peter Lake ($p = 0.127$).
- **Weight** (**Figure 10-4**) – Weight distributions followed a similar pattern to length. Peter Lake had a greater proportion of heavier Lake Trout compared to Meliadine Lake, but the difference was not statistically significant ($p = 0.101$). Weight distributions were significantly different between Meliadine and Atulik ($p = 0.0045$) and between Atulik and Peter ($p < 0.0001$).
- **Age** (**Figure 10-5**) – Peter Lake had a greater proportion of older fish compared to Meliadine Lake and Atulik Lake. Age distributions were statistically different between Atulik and Peter ($p = 0.0004$), but not between Meliadine and Atulik ($p = 0.0603$) and between Meliadine and Peter ($p = 0.0995$).

Table 10-6. Pairwise comparison of length, weight and age distributions for Lake Trout based on two-sample Kolmogorov-Smirnov tests.

Variable	Pairwise	D value	P value
Fork Length (mm)	Meliadine vs Atulik	0.4262	**0.0023**
	Meliadine vs Peter	0.2753	0.1272
	Atulik vs Peter	0.5317	**< 0.0001**
Total Weight (g)	Meliadine vs Atulik	0.404	**0.0045**
	Meliadine vs Peter	0.2866	0.1011
	Atulik vs Peter	0.5339	**< 0.0001**
Age (yr)	Meliadine vs Atulik	0.2786	0.0603
	Meliadine vs Peter	0.275	0.0995
	Atulik vs Peter	0.425	**0.0004**

Notes:
The Kolmogorov-Smirnov (K-S) test D value represents the maximum absolute difference between the cumulative distribution functions (CDFs) of two sample populations. A larger D value indicates greater divergence between distributions.

Significant pairwise differences ($p < 0.05$) are in **bold**.

Figure 10-3. Length-frequency distributions of Lake Trout.

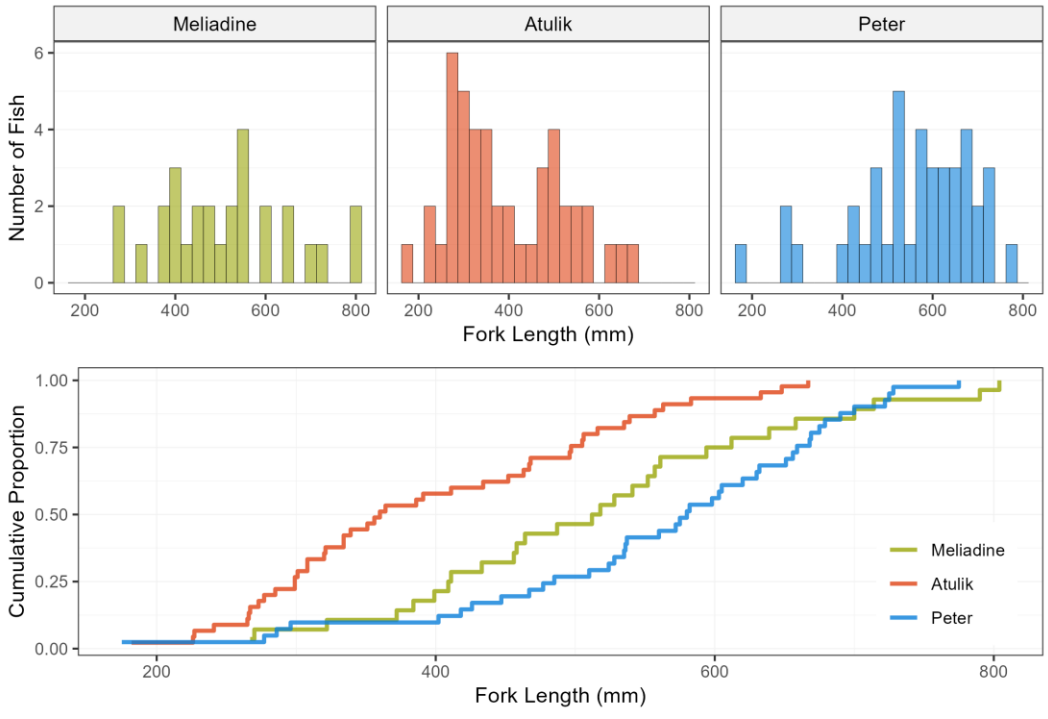


Figure 10-4. Weight-frequency distributions of Lake Trout.

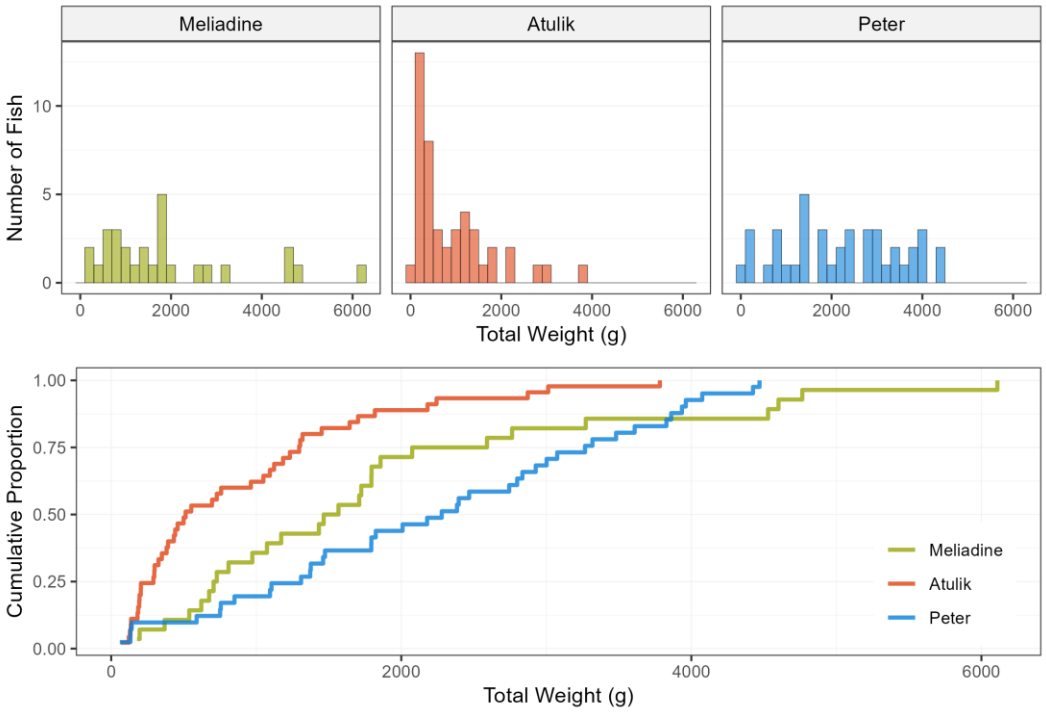
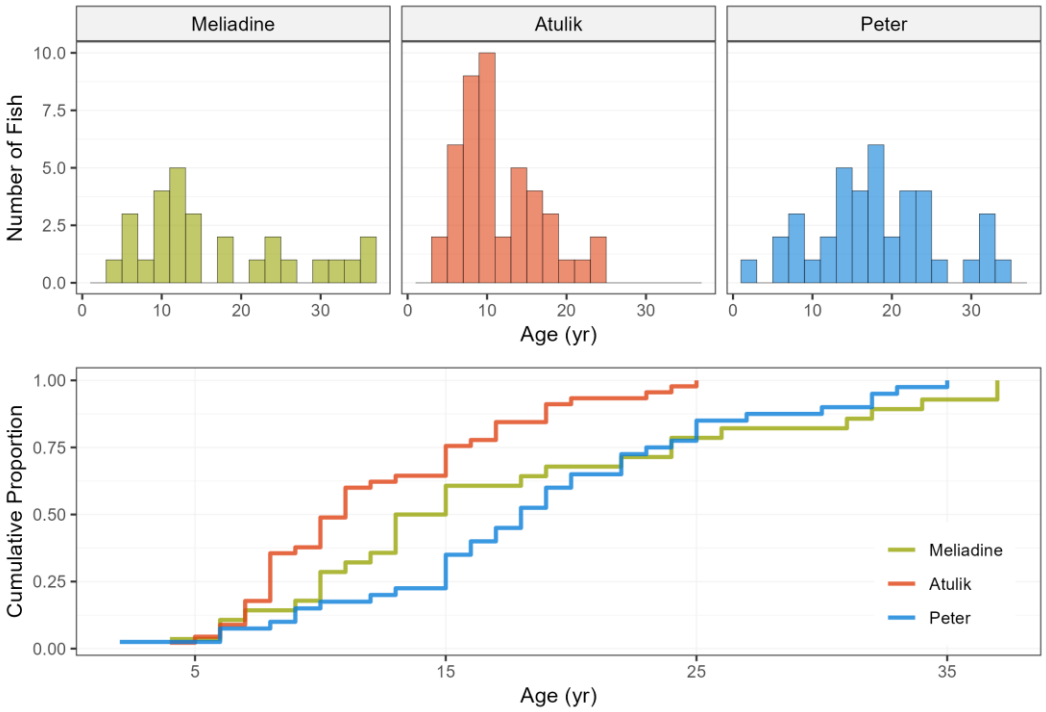


Figure 10-5. Age-frequency distributions of Lake Trout.



10.4.5 Mean Length, Weight, and Age

ANOVA followed by Tukey post-hoc pairwise tests were used to compare mean length, weight, and age of fish among lakes. Results of ANOVA models, along with the results of Tukey post-hoc tests of pairwise comparisons and calculated effect sizes, are provided in **Table 10-7**. Boxplots of the data are shown in **Figure 10-6**.

Mean length, weight, and age differed significantly among lakes and observed differences in pairwise comparisons of mean age sometimes exceeded the CES of 25 %. Lake Trout from Meliadine Lake and Peter Lake were similar in terms of average fork length, total weight, and age. Compared to Atulik Lake, fish from Meliadine Lake were 30% longer, 107% heavier, and 44% older.

Significant differences were also observed between the two reference lakes, with Lake Trout from Atulik Lake being on average shorter (29%), lighter (60%), and younger (35%) than fish from Peter Lake (**Table 10-7**).

Figure 10-6. Length, weight, and age of Lake Trout and results of Tukey post-hoc pairwise comparison of means.

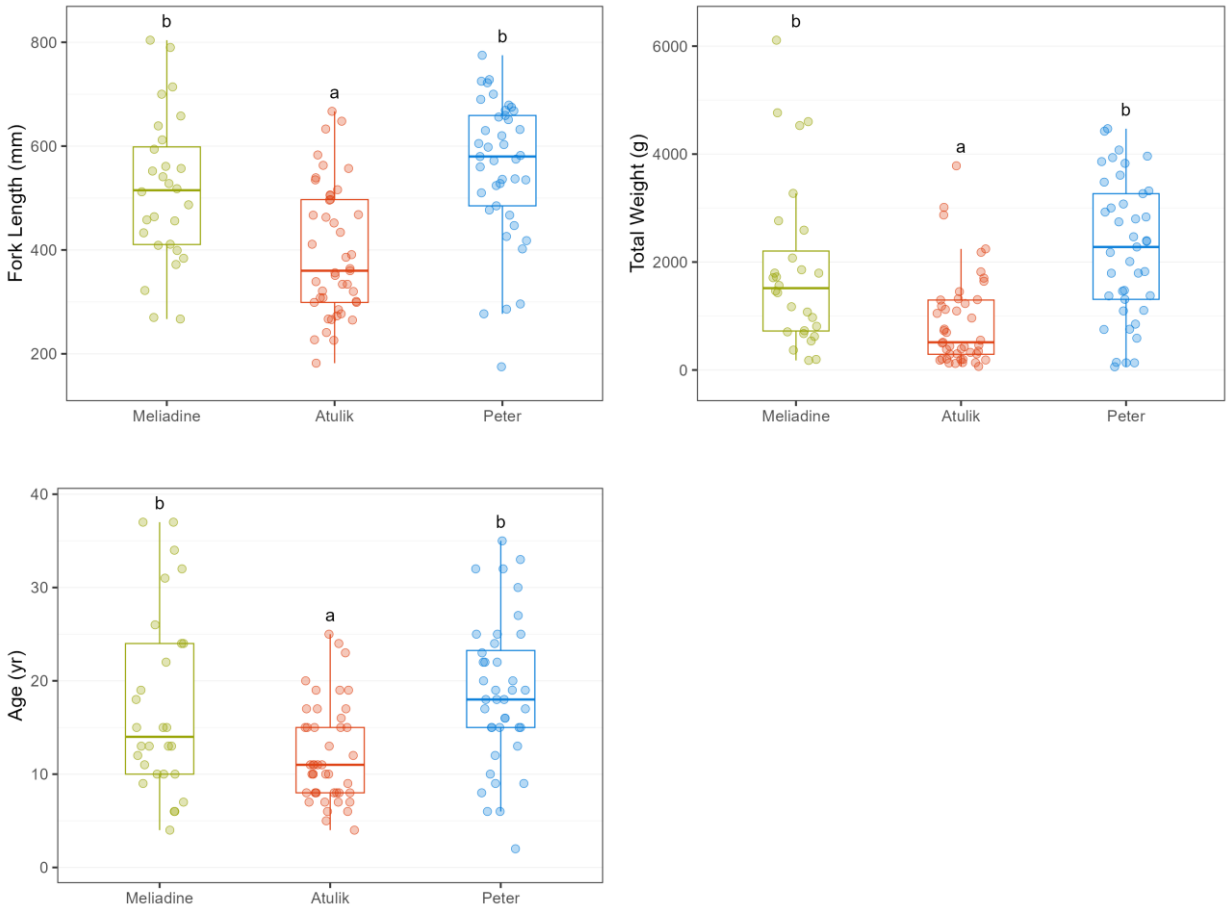


Table 10-7. ANOVA results for mean length, weight and age in Lake Trout, along with results of Tukey post-hoc tests and calculated effect sizes

Variable	N	Outlier fish ID	Model statistics					Mean estimates			Tukey post-hoc P value (effect size in %)			CES (%)
			Parameter	Sum Sqr.	DF	F value	P value	Meliadine	Atulik	Peter	Meliadine vs Atulik	Meliadine vs Peter	Atulik vs Peter	
Fork Length (mm)	114	–	Intercept	26203693.2	1	1476.6	< 0.0001	514.7	396.0	558.0	**0.0010 (+30.0)**	0.3833	**< 0.0001 (-29.0)**	–
			Location	599670.5	2	16.9	< 0.0001							
			Residuals	1969787.6	111									
Total Weight (g)	114	–	Intercept	302060604.9	1	206.7	< 0.0001	1860.3	898.6	2227.9	**0.0036 (+107.0)**	0.4322	**< 0.0001 (-59.7)**	–
			Location	40181854.0	2	13.7	< 0.0001							
			Residuals	162223674.3	111									
Age (yr)	113	–	Intercept	27807.9	1	495.5	< 0.0001	17.4	12.1	18.6	**0.0113 (+43.8)**	0.7795	**0.0003 (-35.1)**	25
			Location	1007.3	2	9.0	0.0002							
			Residuals	6172.8	110									

Notes:
Tukey post-hoc tests were performed when there was a statistically significant effect ($p < 0.1$) of Location in the model.
Effect sizes were calculated for significant pairwise differences ($p < 0.1$) in Tukey post-hoc tests (shown in **bold**).
Significant pairwise differences that exceed the specified critical effect size (CES) for mean age are **bold and shaded**.

10.4.6 Growth, Condition, and Liver Weight

Growth, condition, and relative liver size were assessed across lakes using ANCOVA on combined data for both sexes, followed by Tukey post-hoc pairwise tests. The model selection process (full or reduced) for each endpoint is detailed in **Table 10-8**. Results of the ANCOVA models, including Tukey post-hoc pairwise comparisons and calculated effect sizes, are presented in **Table 10-9** and discussed below.

Growth

As shown in **Table 10-8**, the interaction term was significant ($p < 0.1$) in the full models for length-at-age and weight-at-age, indicating different slopes of the relationships among the lakes. The slope accounted for just over 2% of total variation; therefore, the full model was used to compare differences in growth among the three lakes using least squares mean estimated at age = 13.7 yr, which was the overall average of age in Lake Trout captured. Result of ANCOVA models and Tukey post-hoc tests are presented in **Table 10-9** and **Figure 10-7**.

- **Fork Length vs Age**: On average, 13.7-year-old Lake Trout in Meliadine Lake and Peter Lake were approximately 10% longer than Lake Trout from Atulik Lake. The difference in length-at-age was not significant between Meliadine and Peter lakes.
- **Total Weight vs Age**: On average, 13.7-year-old Lake Trout from Meliadine Lake and Peter Lake were respectively 32% and 22% heavier compared to Lake Trout from Atulik Lake. The difference in weight-at-age was not significant between Meliadine and Peter lakes.

Condition

The reduced model was used to compare condition (total weight vs fork length relationships) among the lakes. The relationship between weight and length was similar between the exposure and reference lakes (**Table 10-9** and **Figure 10-8**). However, there was a significant difference between the two reference lakes. When adjusted for body size, Lake Trout in Atulik Lake were 11% heavier than those in Peter Lake.

Liver Weight

Liver endpoints (i.e., liver weight vs fork length and liver weight vs total weight relationships) were generally similar between the exposure and reference lakes. Result of reduced ANCOVA models and Tukey post-hoc tests indicated that (**Table 10-9** and **Figure 10-9**):

- **Liver Weight vs Fork Length**: No significant difference was detected among the lakes.
- **Liver Weight vs Total Weight**: When adjusted to body weight, liver weight for Lake Trout from Meliadine Lake was significantly heavier (17%) compared to Lake Trout from Atulik Lake. No difference in liver weight vs total weight was observed between Meliadine Lake and Peter Lake.

Table 10-8. Selection of ANCOVA modeling approach for growth, condition, and liver endpoints in Lake Trout.

Response	Covariate	Full ANCOVA Models				Reduced ANCOVA Models				Difference in Adj. R^2 (%)	Selected Model
		Outlier fish ID	Interaction term			Outlier fish ID	Location term				
			F value	P value	Adj. R^2		F value	P value	Adj. R^2		
Fork Length (mm)	Age (yr)		7.9651	**0.0006**	0.8587		10.4180	< 0.0001	0.8406	2.13	Full
Total Weight (g)	Age (yr)		6.4883	**0.0022**	0.8318		6.1939	0.0028	0.8148	2.07	Full
Total Weight (g)	Fork Length (mm)	38, 78	17.7611	**< 0.0001**	0.9886	78	5.4956	0.0053	0.9853	0.33	Reduced
Liver Weight (g)	Fork Length (mm)		0.7721	0.4646	0.9350		1.2937	0.2784	0.9352		Reduced
	Total Weight (g)		1.7307	0.1820	0.9404		2.4058	0.0949	0.9396		Reduced
Gonad Weight (g)	Fork Length (mm)		1.7716	0.1751	0.7705		3.9196	0.0227	0.7673		Reduced
	Total Weight (g)		1.7160	0.1847	0.7756		6.2803	0.0026	0.7726		Reduced

Notes:
Percent differences in adjusted R^2 values were calculated if the interaction term was statistically significant ($p < 0.1$) in the full model (shown in **bold**).

Table 10-9. ANCOVA results for growth, condition, and liver endpoints in Lake Trout, along with results of Tukey post-hoc tests and calculated effect sizes.

Response	Covariate	Model	N	Outlier fish ID	Model statistics						LS mean estimates			Tukey post-hoc P value (effect size in %)			CES (%)
					Adj. R^2	Parameter	Sum Sqr.	DF	F value	P value	Meliadine	Atulik	Peter	Meliadine vs Atulik	Meliadine vs Peter	Atulik vs Peter	
Fork Length (mm)	Age (yr)	Full	113	–	0.8587	Intercept	17.28	1	5454.2	< 0.0001	478.7	436.8	487.0	**0.0171 (+9.6)**	0.8603	**0.0016 (-10.3)**	–
						Covariate	1.59	1	501.5	< 0.0001							
						Location	0.07	2	11.5	< 0.0001							
						Interaction	0.05	2	8.0	0.0006							
						Residuals	0.34	107									
Total Weight (g)	Age (yr)	Full	113	–	0.8318	Intercept	4.80	1	125.3	< 0.0001	1190	904	1162	**0.0469 (+31.6)**	0.9765	**0.0529 (-22.2)**	25
						Covariate	16.10	1	420.3	< 0.0001							
						Location	0.67	2	8.7	0.0003							
						Interaction	0.50	2	6.5	0.0022							
						Residuals	4.10	107									
Total Weight (g)	Fork Length (mm)	Reduced	113	78	0.9853	Intercept	8.29	1	2531.5	< 0.0001	1040	1090	981	0.3506	0.1729	**0.0037 (+11.1)**	10
						Covariate	20.01	1	6113.5	< 0.0001							
						Location	0.04	2	5.5	0.0053							
						Residuals	0.36	109									
Liver Weight (g)	Fork Length (mm)	Reduced	114	–	0.9352	Intercept	16.71	1	971.9	< 0.0001	11.9	10.6	10.7	–	–	–	–
						Covariate	21.66	1	1259.2	< 0.0001							
						Location	0.04	2	1.3	0.2784							
						Residuals	1.89	110									
Liver Weight (g)	Total Weight (g)	Reduced	114	–	0.9396	Intercept	9.21	1	574.1	< 0.0001	11.8	10.1	11.3	**0.0990 (+16.6)**	0.8453	0.2302	25
						Covariate	21.78	1	1358.3	< 0.0001							
						Location	0.08	2	2.4	0.0949							
						Residuals	1.76	110									

Notes:
Tukey post-hoc tests were performed when there was a statistically significant effect ($p < 0.1$) of Location in Reduced models or Interaction in Full models.
Effect sizes were calculated for significant pairwise differences ($p < 0.1$) in Tukey post-hoc tests (shown in **bold**).
Significant pairwise differences that exceed the specified critical effect size (CES) are **bold and shaded**.
Least squares mean for fork length and total weight adjusted to age (i.e., full models with the interaction) were estimated at age = 13.7 yr (overall average).

Figure 10-7. Relationship between fork length and age, and weight and age, for Lake Trout from Meliadine Lake, Atulik Lake, and Peter Lake in 2024.

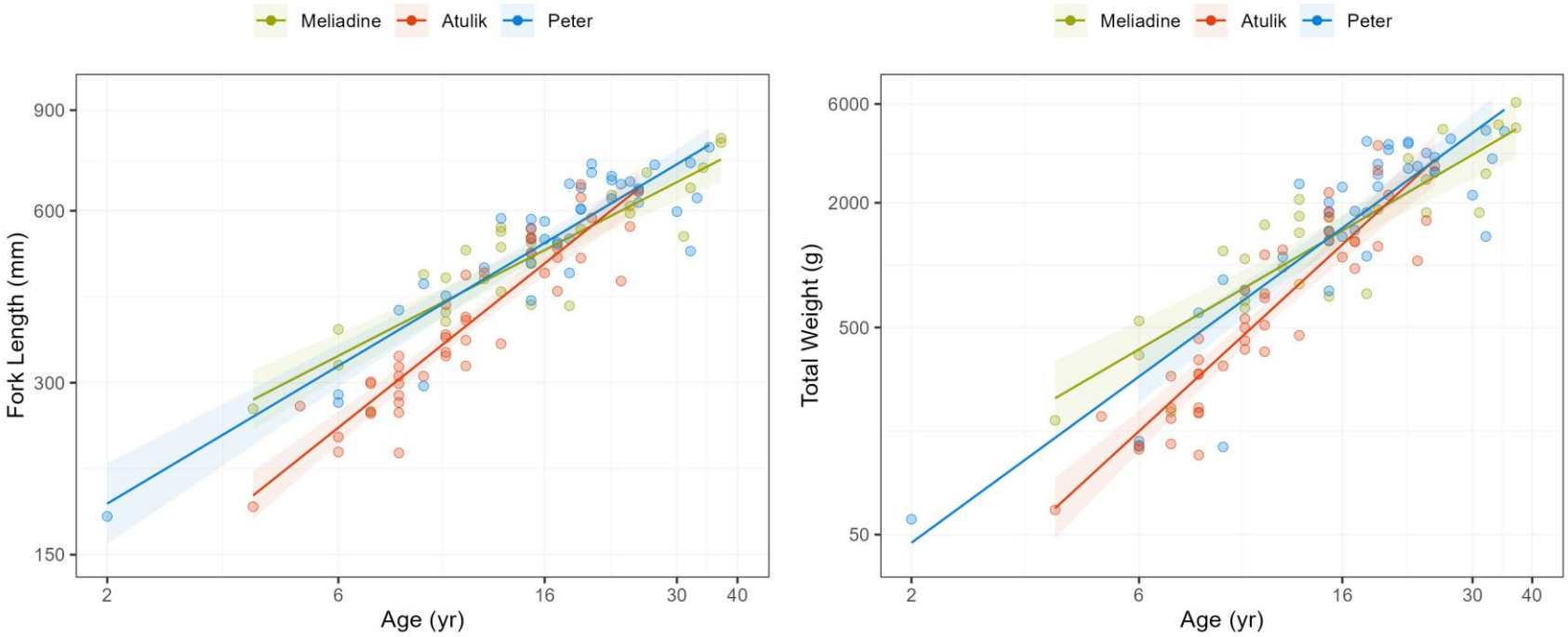


Figure 10-8. Total weight vs fork length for Lake Trout from Meliadine Lake, Atulik Lake, and Peter Lake in 2024.

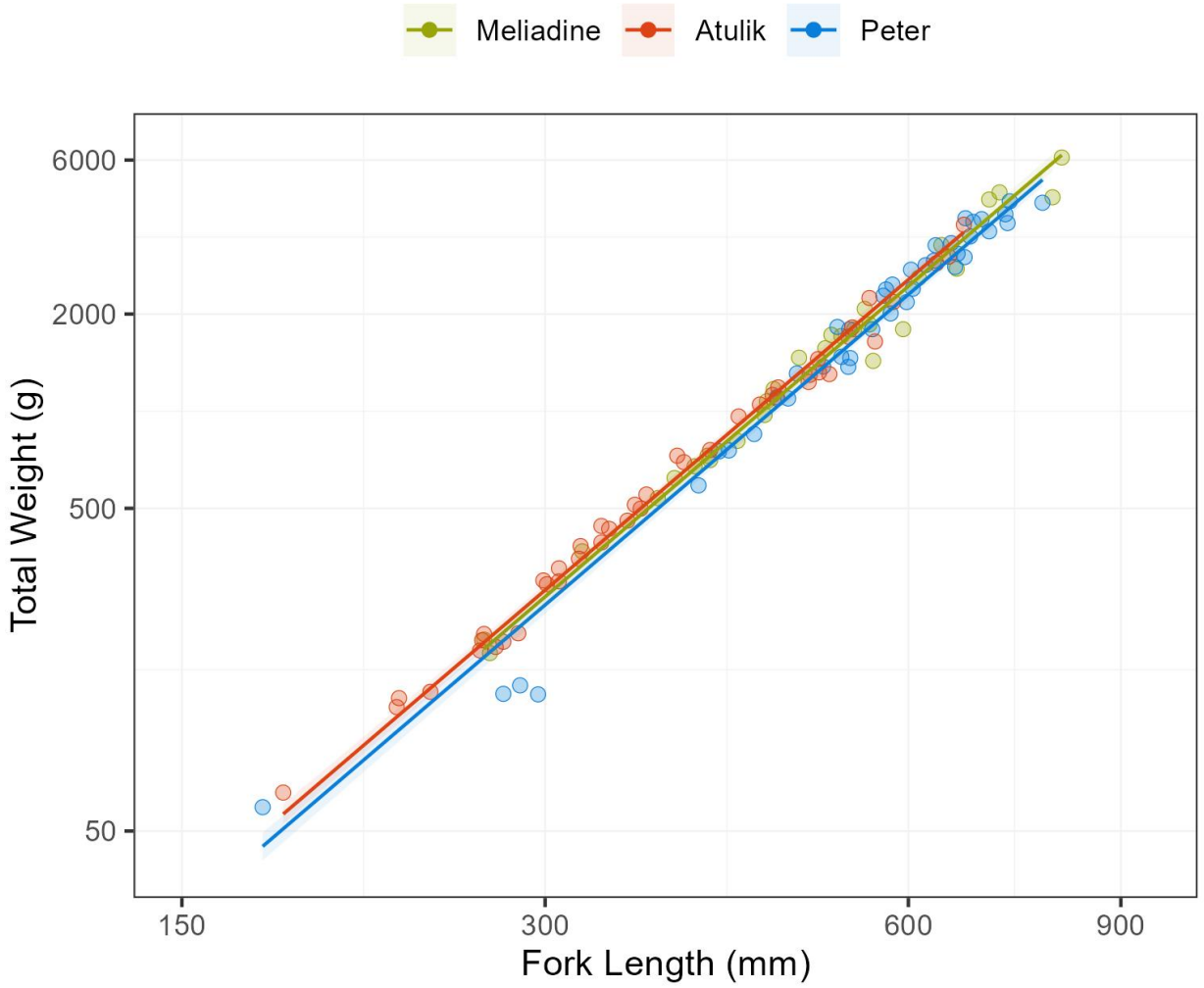
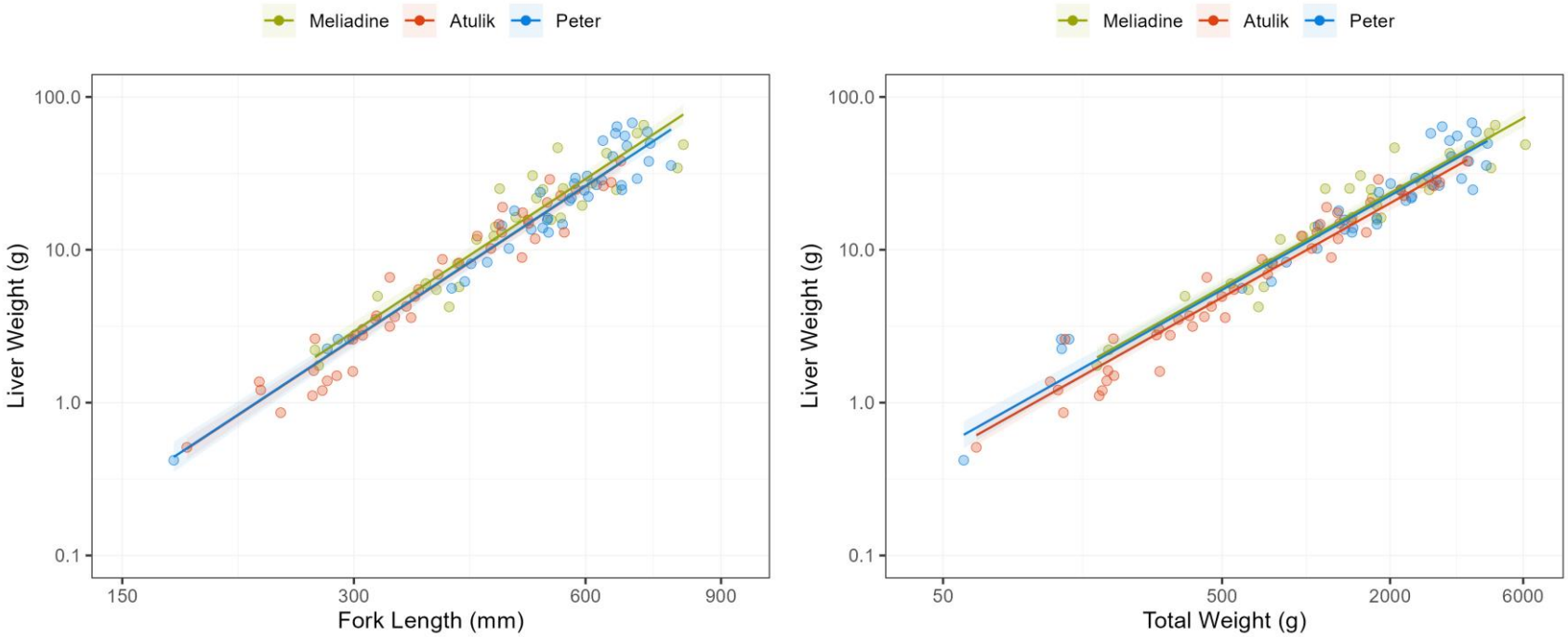


Figure 10-9. Relationship between liver weight and fork length, and between liver weight and total weight, for Lake Trout from Meliadine Lake, Atulik Lake, and Peter Lake in 2024.



10.5 Conclusions

A summary of between-lake comparisons for Lake Trout is presented in **Table 10-10**.

The findings of 2024 Lake Trout health assessment are summarized below in the context of the key question:

Are activities at the Mine causing changes in Meliadine Lake that are impacting the health of large-bodied fish?

Mining activities do not appear to be adversely impacting the health of Lake Trout in Meliadine Lake. This conclusion is based on the results comparing EEM effect indicators for survival (age), growth (weight-at-age), and condition (weight-at-length, relative liver size) between Meliadine Lake and two regional reference lakes (Peter Lake and Atulik Lake). The evidence supporting the conclusion that effluent is not having an 'effect' on Lake Trout in Meliadine Lake is presented below.

Survival

Under EEM, mean age is the primary endpoint used to assess differences in survival between exposure and reference areas in standard lethal surveys, with age-frequency distribution serving as a supporting indicator. A higher mean age in a fish population generally reflects greater survival rates, as it indicates lower mortality and the ability of individuals to reach older age classes.

In 2024, the mean ages of Lake Trout from Meliadine Lake, Peter Lake, and Atulik Lake were 17.4, 18.6, and 12.1 years, respectively. Lake Trout from Meliadine and Peter Lakes were significantly older compared to those from Atulik Lake, but no significant difference was observed between Meliadine and Peter Lakes.

These findings contrast with EEM Cycle 2 (Azimuth, 2022), where significant differences in age were observed between Meliadine Lake and both reference lakes. In 2021, the mean ages were 25.4 years in Meliadine Lake, 15.1 years in Peter Lake, and 17.3 years in Atulik Lake, indicating that Lake Trout in Meliadine Lake were substantially older than those in the reference lakes.

The younger Lake Trout observed in Meliadine Lake in 2024 may be related to the timing of the survey, which coincided with a prolonged shutdown of effluent discharge into the lake. The hypothesis in the EEM Cycle 2 interpretive report was that higher concentrations of major ions from effluent discharge may have improved osmoregulation efficiency, conserving energy, and creating more favorable conditions for larger (older) Lake Trout, potentially attracting them to the area (Azimuth and Portt, 2022). At the same time, younger Lake Trout may have avoided the area to reduce the risk of predation.

Water quality conditions were uniform throughout MEL-01 when the gill nets were deployed (**Figure 3-4**), which may explain why a broader range of age (and size) classes were observed in MEL-01

in 2024 compared to 2021. Another possible explanation is most of the Lake Trout were captured in overnight sets in August 2024, compared with daytime sets in 2021.

Growth

Fish growth is a key effect endpoint, as it reflects individual health, habitat quality, and ecosystem productivity, with differences in growth rates potentially indicating natural variability in food availability and environmental conditions, or exposure to stressors.

In 2024, there was no significant difference in age-adjusted weight between Meliadine Lake and Peter Lake for Lake Trout at age 13.7. However, compared to Atulik Lake, Lake Trout were 31.6% heavier in Meliadine Lake and 22% heavier in Peter Lake. During the previous monitoring cycle in 2021, growth rates in Meliadine Lake were also higher, with Lake Trout being 34.7% heavier at a given age than those in Atulik Lake and 33.7% heavier than those in Peter Lake.

The results from 2021 and 2024 indicate that Lake Trout at Meliadine Lake consistently exhibit greater weight-at-age compared to those at Atulik Lake, suggesting more favorable growth conditions. However, growth at Meliadine Lake remains within the natural background range when compared to Peter Lake, indicating that observed differences likely reflect regional variability rather than an external stressor.

Condition and Liver Weight

Condition (weight vs length relationships) and liver size provide insight on the availability and quality of food to fish. No difference in Lake Trout weight relative to length was observed between Meliadine Lake or the reference lakes. Differences in condition were observed between the two reference lakes (11% higher conditions at Atulik Lake compared to Peter Lake).

Liver weight, when adjusted for total weight, was 16.6% higher in Meliadine Lake compared to Atulik Lake, but this difference remained below the 25% CES threshold. No difference in liver weight was observed between Meliadine and Peter Lakes.

Summary of Findings from the 2024 Study

EEM effect endpoints for Lake Trout in Meliadine Lake in 2024 were within the range observed for the two regional reference lakes. This suggests that variations in Lake Trout size, weight, and age reflect natural variability rather than external stressors. These findings highlight the value of using multiple reference lakes to distinguish natural fluctuations from potential mine-related effects on fish populations.

Table 10-10. Summary of findings for the EEM effect indicators from the 2024 Lake Trout health study.

Effect Indicator	Response	Covariate	P value	Tukey post-hoc P value (effect size in %)			CES (%)
				Meliadine vs Atulik	Meliadine vs Peter	Atulik vs Peter	
Survival (ANOVA)	Fork Length (mm)	–	< 0.0001	**0.0010 (+30.0)**	0.3833	**< 0.0001 (-29.0)**	–
	Total Weight (g)	–	< 0.0001	**0.0036 (+107.0)**	0.4322	**< 0.0001 (-59.7)**	–
	Age (yr)**	–	0.0002	**0.0113 (+43.8)**	0.7795	**0.0003 (-35.1)**	25
Growth (ANOVA)	Fork Length (mm)	Age (yr)	0.0006[a]	**0.0171 (+9.6)**	0.8603	**0.0016 (-10.3)**	–
	Total Weight (g)**	Age (yr)	0.0022[a]	**0.0469 (+31.6)**	0.9765	**0.0529 (-22.2)**	25
Condition (ANCOVA)	Total Weight (g)**	Fork Length (mm)	0.0053	0.3506	0.1729	**0.0037 (+11.1)**	10
	Liver Weight (g)	Fork Length (mm)	0.2784	–	–	–	–
	Liver Weight (g)**	Total Weight (g)	0.0949	**0.0990 (+16.6)**	0.8453	0.2302	25

Notes:
** Lethal effect endpoints in EEM. These endpoints are used for determining 'effects' as designated by statistically significant differences (p<0.1) between exposure and reference areas.
[a] ANCOVAs were reduced models (similar slopes), except for fork length and total weight adjusted to age, where full models (including the interaction) were used to estimate and compare least squares mean at age = 13.7 yr (overall average).
Tukey post-hoc tests were performed when there was a statistically significant effect (p < 0.1) for the location or interaction term in the model (shown as underlined).
Effect sizes were calculated for significant pairwise differences (p < 0.1) in Tukey post-hoc tests (shown in **bold**).
Significant pairwise differences that exceed the specified critical effect size (CES) are **bold and shaded**.

10.6 References

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11 LAKE TROUT CHEMISTRY

11.1 Introduction

The Lake Trout tissue chemistry study is conducted every three years to verify that mining activities have not impacted the usability of the fishery for both traditional and recreational purposes. In Version 3 of the AEMP Design Plan, Atulik Lake and Peter Lake were added as reference lakes to help assess regional trends in Lake Trout tissue chemistry related to climate variability.

Objectives and Key Question

The Lake Trout tissue chemistry focuses on answering this key question:

> *Are activities at the mine contributing to changes in tissue chemistry relative to baseline and affecting the useability of the fishery by people?*

The objectives of the Lake Trout chemistry study are the same as the Threespine Stickleback study.

11.2 Findings from the Lake Trout Tissue Chemistry Study

Results from the 2024 chemistry study of Lake Trout indicated that:

- Stable or Decreasing Trends in Meliadine Lake – In 2024, concentrations of most parameters in Lake Trout muscle samples from Meliadine Lake remained stable or decreased over time. Compared to the reference lakes, no parameters showed increasing temporal trends in Meliadine Lake.
- Mercury Concentrations Within Regional Range – Mercury concentrations in Lake Trout from Meliadine Lake remained stable from 2021 to 2024. The estimated mercury concentration for a 500-mm Lake Trout in 2024 was 0.416 mg/kg (Meliadine Lake), compared to 0.160 mg/kg (Atulik Lake) and 0.600 mg/kg (Peter Lake). These findings confirm that mercury concentrations in Meliadine Lake are within the range observed at other regional lakes.
- No Impact on Fishery Usability – Results from the 2024 Lake Trout tissue chemistry study support the 2014 FEIS prediction that mining activities would not impact the usability of the fishery in Meliadine Lake.

11.3 Methods

11.3.1 Field and Laboratory Procedures

Muscle, liver, and kidney samples were collected from 114 Lake Trout from Meliadine Lake, Atulik Lake, and Peter Lake in mid-August (**Table 11-1**). Fewer fish were submitted from Meliadine Lake in 2024 compared to Atulik Lake and Peter Lake because fewer fish were sacrificed for the Lake Trout health assessment. Muscle samples were collected without skin from the left side of each fish, just behind the dorsal fin, placed in Whirl-Pak bag, and stored in a freezer until the end of the program. Liver and kidney samples were also collected and processed in a similar fashion. These samples are only analyzed if the results of the Lake Trout health assessment indicate effects consistent with toxicological impairment.

The muscle samples were sent to ALS Environmental in Burnaby, B.C. and analyzed for moisture content and metals, including mercury. The concentration data were reported in wet and dry weight units.

Table 11-1. Number of Lake Trout muscle samples analyzed for tissue chemistry in 2024.

Year	Meliadine	Atulik	Peter	Total
97-98	30	0	0	30
2015	60	0	0	60
2021	42	24	24	90
2024	28	45	41	114

11.3.2 Quality Assurance and Quality Control

- Sample integrity – No issues were flagged with submission in terms of sample integrity. The Lake Trout samples arrived frozen at ALS (1°C inside the cooler).
- Laboratory Duplicates – Five lab duplicate results did not meet RPD DQOs out of 210 measurements across 9 field duplicate samples due to heterogeneity in the tissue samples. Metals are inherently more heterogenous in tissue than water. The DQO exceedances are unlikely to bias interpretation of the data in the report.
- Laboratory QC Samples – Cobalt exceed the laboratory DQO for reference material by less than 10%. ALS concluded the data were acceptable for reporting based on ‘marginal’ exceedances in fewer than 10% of the parameters included in the metals scan.

The laboratory QC results indicate the chemistry data are accurate and precise for use in the report.

11.3.3 Data Analysis

Data analysis was conducted using RStudio integrated with R v4.2.2 (R Core Team, 2024). Data analysis was conducted on the wet-weight concentration results reported by ALS[17]. Summary statistics for 2024 samples calculated by sampling lake (Meliadine, Atulik, and Peter) are provided in **Appendix I-2**.

Parameters that were detected in more than 50% of the samples were carried forward for statistical analysis. Of the 34 parameters analyzed by ALS, 16 were detected in more than 50% of the samples:

- Arsenic, calcium, cesium, copper, iron, magnesium, manganese, mercury, phosphorus, potassium, rubidium, selenium, sodium, strontium, thallium, and zinc.

The frequency of detection for all 16 parameters was 100%. Plots showing the concentrations of each parameter by lake and year are provided at the end of this chapter (**Figure 11-1** to **Figure 11-15**) .

Potential mining-related changes in Lake Trout tissue chemistry in Meliadine Lake were evaluated using the same approach as the Threespine Stickleback chemistry dataset. The first step in the assessment was to identify parameters that showed a significant increase in Meliadine Lake in 2024 compared to baseline (1997/98) and pre-construction (2015). Lake Trout data from 2015 data were used to assess significant temporal trends because detection limits have improved for several parameters since the late 1990s. Parameters exhibiting a statistically significant increase in 2024 compared to either 1997/98 or 2015 were compared to Lake Trout from Atulik Lake and Peter Lake in 2024.

For all parameters except mercury, statistical comparisons were conducted using analysis of variance (ANOVA) followed by Tukey post-hoc tests ($p < 0.05$) to assess pairwise differences in mean concentrations. Given that mercury concentrations are known to vary with fish size due to bioaccumulation, analysis of covariance (ANCOVA) followed by Tukey post-hoc tests ($p < 0.05$) was used to compare mercury concentrations adjusted to a 500 mm Lake Trout (fork length); 500 mm was selected as the standard size because this size class was well represented in each lake and year.

The results of the ANOVA and ANCOVA statistical comparisons are provided in **Appendix I-2**.

[17] The 1997/1998 data were originally reported as dry weight concentrations without percent moisture information. For consistency in year-to-year comparisons, the results from 1997/98 were converted to wet weight concentrations using an assumed moisture content of 78 %.

11.4 Results and Discussion

- **Temporal Assessment** (**Table 11-2**) – The concentrations of the following parameters have increased significantly in Lake Trout from Meliadine Lake since 1997/98 and 2015:
  - Baseline: (1997/98): magnesium and zinc.
  - 2015: iron, magnesium, and zinc
- **Spatial Assessment** (**Table 11-3**) – There was no significant difference in concentrations of iron, magnesium, and zinc in Lake Trout from Meliadine Lake compared to either Atulik Lake or Peter Lake in 2024.

The concentrations of most parameters in Lake Trout muscle from Meliadine Lake have remained stable or decreased since the baseline period and pre-construction phase. For those parameters that did show an increasing temporal trend, similar increases were evident at the regional reference lakes. Overall, the data from the 2021 and 2024 monitoring programs confirm that Lake Trout tissue chemistry is unimpacted by effluent discharge.

Mercury

Mercury has a strong tendency to accumulate in older fish, particularly those at the top of the aquatic food web. While mercury was not identified as a contaminant of concern for the Mine in the 2014 FEIS (Volume 10; Agnico Eagle, 2014), it was carried forward for closer examination in the AEMP because of the importance of fishing for traditional and recreational purposes for people in the community.

The relationship between mercury and fish length for Meliadine Lake, Atulik Lake, and Peter Lake are shown in the top panel of **Figure 11-15**. Results of the model fit (solid line) are shown for the lake/year combinations. The bottom panel of the figure shows the mercury concentration for a standard 500 mm Lake Trout (mean and 95% confidence intervals).

As expected, there were strong positive relationships between fish length and mercury concentrations, indicating that larger Lake Trout have higher tissue mercury concentrations than smaller Lake Trout. This was evident in all lake/year combinations. Key observations about Lake Trout mercury concentrations from the 2024 study are as follows:

- At Meliadine Lake, mercury concentrations increased significantly between the baseline years 1997/1998 and 2015, but from 2015 to 2024, mercury concentrations have not increased significantly (**Figure 11-15**). The temporal change between 1997/98 and 2021 reflects changes in mercury evident in high latitude lakes in the Arctic (Obrist et al., 2018).
- In 2024, mercury concentrations were highest in Lake Trout from Peter Lake and lowest in Atulik Lake, with statistically significant differences ($p < 0.05$) observed between all three lakes (**Figure 11-15**).

- Estimated mercury concentrations for a 500 mm Lake Trout from Atulik Lake remained stable between 2021 and 2024. However, at Peter Lake, estimated mercury concentrations increased by approximately 80%, rising from 0.33 mg/kg in 2021 to 0.60 mg/kg in 2024.

The differences in mercury concentrations in Lake Trout between Meliadine Lake and the reference lakes reflect the unique physical, chemical, and biological factors that can influence mercury speciation, bioaccumulation, and biomagnification in aquatic systems (e.g., Aqdam et al., 2023). Overall, the 2024 study results indicate that mercury concentrations in Lake Trout from Meliadine Lake remain within the range observed at reference lakes in the region.

11.5 Conclusions

Conclusions for the Lake Trout chemistry program are summarized below in the context of the key question: **are activities at the mine contributing to changes in tissue chemistry relative to baseline and affecting the useability of the fishery by people?**

Results from the 2024 Lake Trout tissue chemistry monitoring program align with the prediction for fish tissue quality presented in Volume 10 of the 2014 FEIS:

> "Given that no COPCs were identified in surface water (Section 10.2.6.3.4), concentrations of chemicals were not anticipated to change in fish tissue. As a result, fish tissue quality was not assessed further with respect to potential health effects and no residual health impacts due to changes to fish tissue quality were identified."

Two cycles of fish tissue chemistry monitoring in 2021 and 2024 confirm that mining activities have not caused changes in Meliadine Lake that would affect traditional or recreational use of the fishery by people in the community.

Table 11-2. Temporal assessment of Lake Trout muscle chemistry results from Meliadine Lake in 1997/98, 2015, and 2024 (Tukey post-hoc p < 0.05).

2024 compared to Baseline (1997/98)							
Parameter[a]	**Mean Ratio**	**Std Error**	**DF**	**t-statistic**	**p value**	**Effect Size**	**Summary**
Arsenic	0.232	0.040	290	-8.44	<0.001	-77%	Significant ↓
Calcium	0.094	0.009	288	-23.49	<0.001	-91%	Significant ↓
Copper	0.854	0.052	290	-2.60	0.161	-15%	no change
Iron	0.940	0.107	289	-0.54	0.999	-6%	no change
Magnesium	1.191	0.026	289	7.99	**<0.001**	19%	**Significant ↑**
Manganese	0.760	0.061	290	-3.39	0.018	-24%	Significant ↓
Phosphorus	1.034	0.023	288	1.50	0.808	3%	no change
Potassium	0.996	0.019	288	-0.23	1.000	0%	no change
Sodium	0.857	0.046	290	-2.87	0.083	-14%	no change
Strontium	0.903	0.151	289	-0.61	0.999	-10%	no change
Zinc	1.221	0.040	289	6.12	**<0.001**	22%	**Significant ↑**

2024 compared to Pre-Construction (2015)							
Parameter	**Mean Ratio**	**Std Error**	**DF**	**t-statistic**	**p value**	**Effect Size**	**Summary**
Arsenic	0.714	0.111	290	-2.17	0.373	-29%	no change
Calcium	1.034	0.094	288	0.37	1.000	3%	no change
Cesium	0.740	0.066	256	-3.36	0.016	-26%	Significant ↓
Copper	0.957	0.052	290	-0.81	0.993	-4%	no change
Iron	1.457	0.149	289	3.68	**0.007**	46%	**Significant ↑**
Magnesium	1.073	0.021	289	3.60	**0.009**	**7%**	**Significant ↑**
Manganese	1.170	0.085	290	2.16	0.376	17%	no change
Phosphorus	0.988	0.020	288	-0.58	0.999	-1%	no change
Potassium	0.946	0.017	288	-3.20	0.033	-5%	Significant ↓
Rubidium	0.865	0.053	257	-2.36	0.222	-13%	no change
Selenium	0.927	0.038	257	-1.84	0.524	-7%	no change
Sodium	1.062	0.051	290	1.25	0.917	6%	no change
Strontium	0.981	0.147	289	-0.13	1.000	-2%	no change
Thallium	0.773	0.049	257	-4.05	0.001	-23%	Significant ↓
Zinc	1.095	0.032	289	3.10	**0.043**	10%	**Significant ↑**

Notes:
[a] Some parameters were not measured in the metals scan in 1997/98 (i.e., cesium, rubidium, selenium, and thallium).
Mean Ratio: The mean concentration ratio of 2024 to 1997/98 or 2015.
Std. Error: The standard error of the mean ratio estimate;
DF (Degrees of Freedom): The number of independent values in the ANOVA model.
Gray values = no significant difference or significant decrease for the pairwise comparison.
Bold values = significant increase for the pairwise comparison.
Shaded values = significant increase and effect size > 10% for the pairwise comparison.
Shaded values = significant increase and effect size > 25% for the pairwise comparison.

Table 11-3. Spatial and temporal assessment of Lake Trout muscle chemistry results from Meliadine Lake, Atulik Lake, and Peter Lake in 2021 and 2024 (Tukey post-hoc p < 0.05).

Parameter	Temporal Comparisons (2024 vs 2021)			Spatial Comparisons (2024)		
	Meliadine	Atulik	Peter	Meliadine vs Atulik	Meliadine vs Peter	Atulik vs Peter
Arsenic	0.002 (-49)	0.563	0.699	1.000	0.005 (+87)	0.003 (+78)
Calcium	1.000	0.999	0.786	0.487	0.979	0.023 (+33)
Cesium	0.049 (-25)	0.491	0.021 (+39)	< 0.001 (+54)	< 0.001 (-51)	< 0.001 (-68)
Copper	0.995	1.000	0.992	0.162	0.870	0.885
Iron	0.068	0.069	1.000	0.995	0.710	0.966
Magnesium	< 0.001 (+13)	< 0.001 (+10)	0.998	1.000	0.935	0.949
Manganese	0.995	0.090	0.903	0.941	0.032 (+28)	**< 0.001 (+40)**
Phosphorus	0.879	0.065	0.169	0.993	**0.039 (+7)**	**< 0.001 (+9)**
Potassium	0.801	< 0.001 (+10)	0.348	0.328	0.811	**< 0.001 (+7)**
Rubidium	0.920	0.722	0.999	0.133	< 0.001 (-24)	< 0.001 (-36)
Selenium	1.000	0.989	1.000	< 0.001 (-18)	< 0.001 (-18)	1.000
Sodium	0.002 (-19)	< 0.001 (-21)	0.817	1.000	0.107	0.108
Strontium	1.000	0.598	0.915	0.002 (-47)	1.000	**< 0.001 (+87)**
Thallium	0.816	1.000	0.999	0.948	< 0.001 (-31)	< 0.001 (-26)
Zinc	< 0.001 (+15)	0.002 (+14)	0.924	0.999	0.178	0.010 (+10)
Mercury	0.999	0.124	< 0.001 (+83)	< 0.001 (+161)	0.007 (-31)	< 0.001 (-73)

Notes:
Tukey post-hoc tests were used following ANOVA models to compare mean concentrations of all parameters, except mercury where ANCOVA models were used to compare concentrations adjusted to fork length = 500 mm. p values shown for each comparison followed by the magnitude of the change in parentheses.

Gray values = no significant difference or significant decrease for the pairwise comparison.
Bold values = significant increase for the pairwise comparison.
Shaded values = significant increase and effect size > 10% for the pairwise comparison.
Shaded values = significant increase and effect size > 25% for the pairwise comparison

Figure 11-1. Arsenic concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

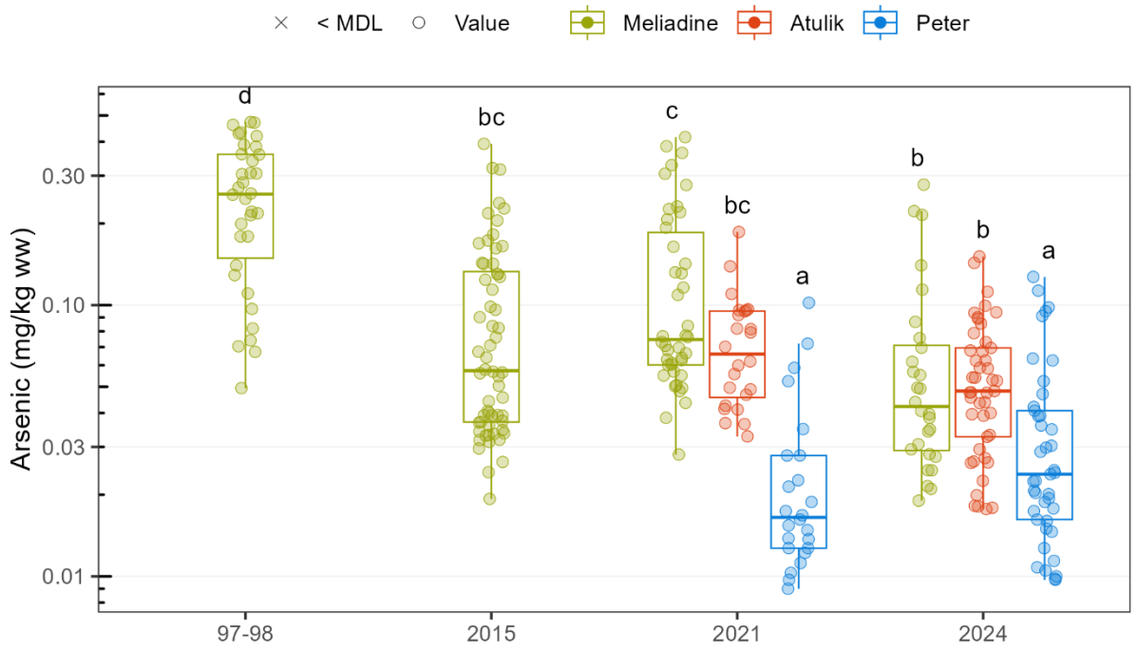


Figure 11-2. Calcium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

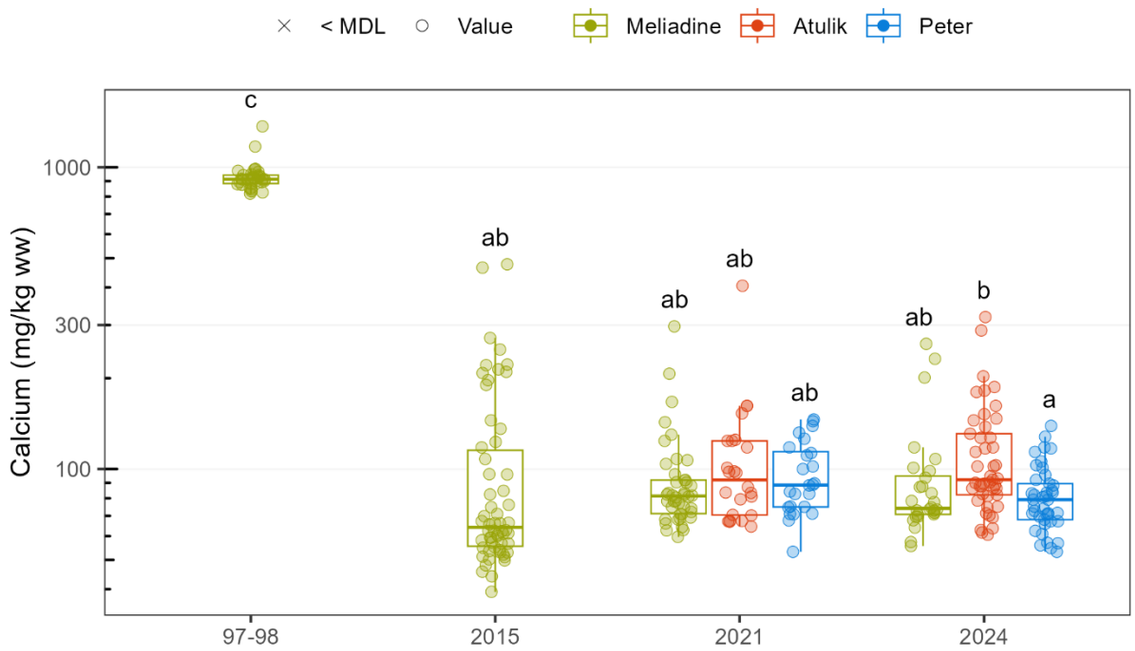


Figure 11-3. Cesium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

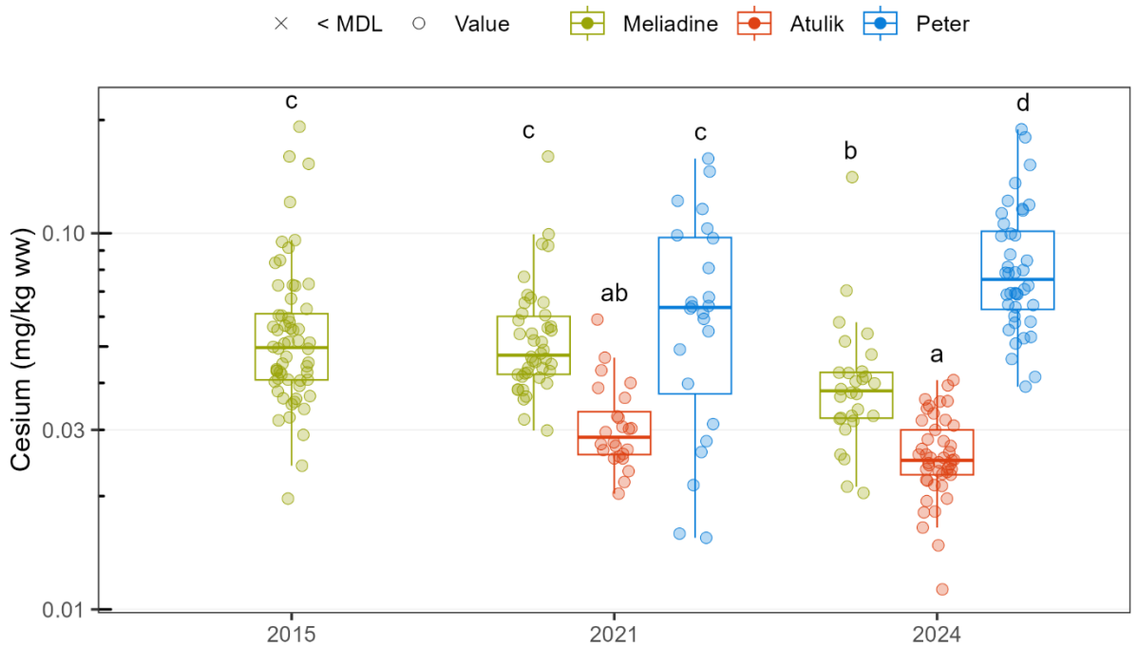


Figure 11-4. Copper concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

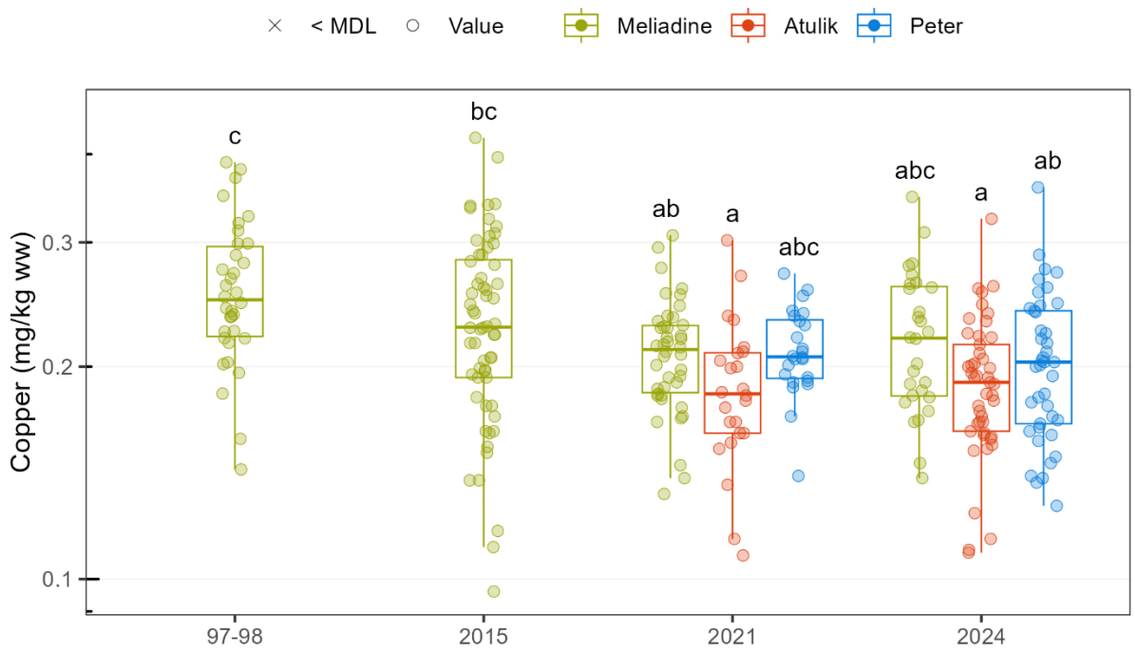


Figure 11-5. Iron concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

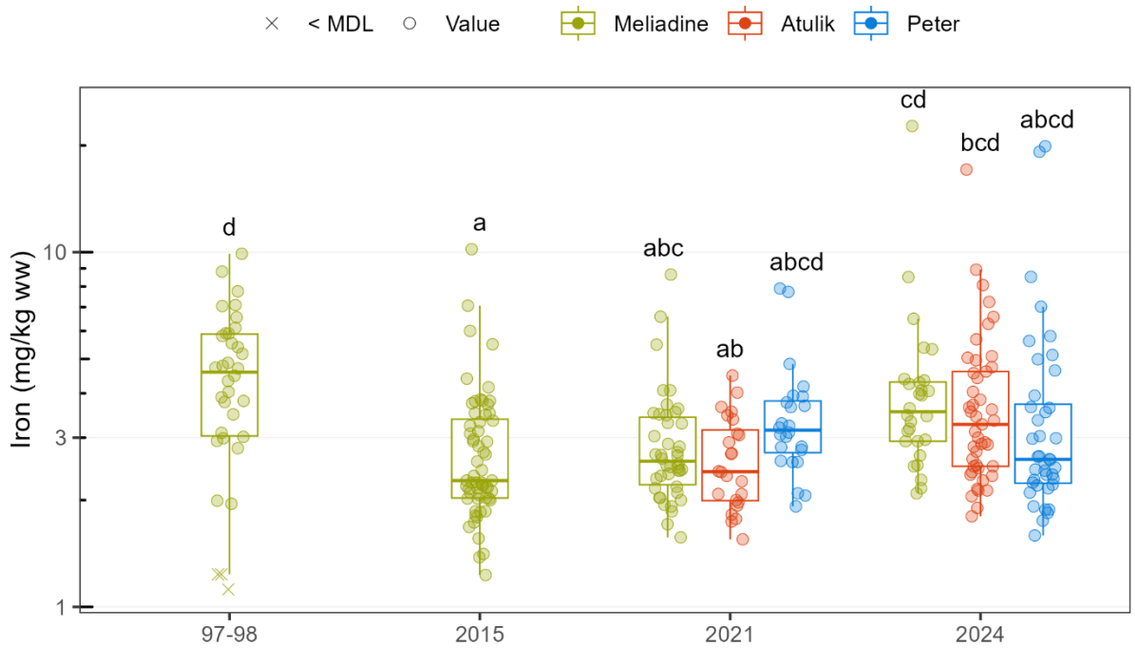


Figure 11-6. Magnesium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).



Figure 11-7. Manganese concentrations (mg/kg ww) in Lake Trout muscle and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

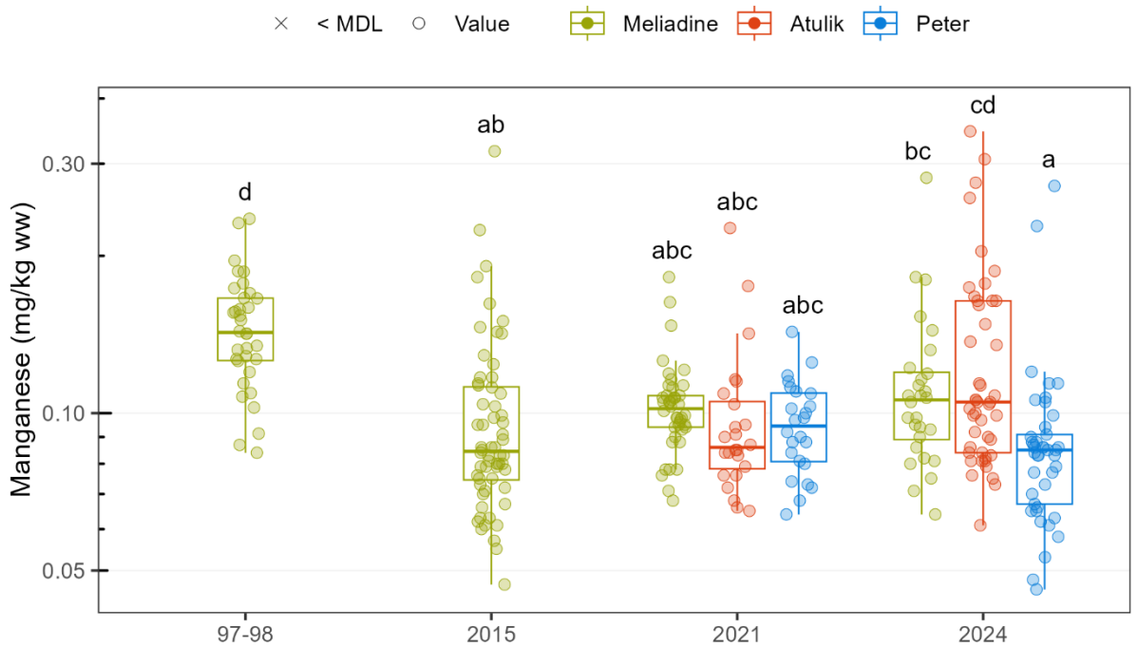


Figure 11-8. Phosphorus concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

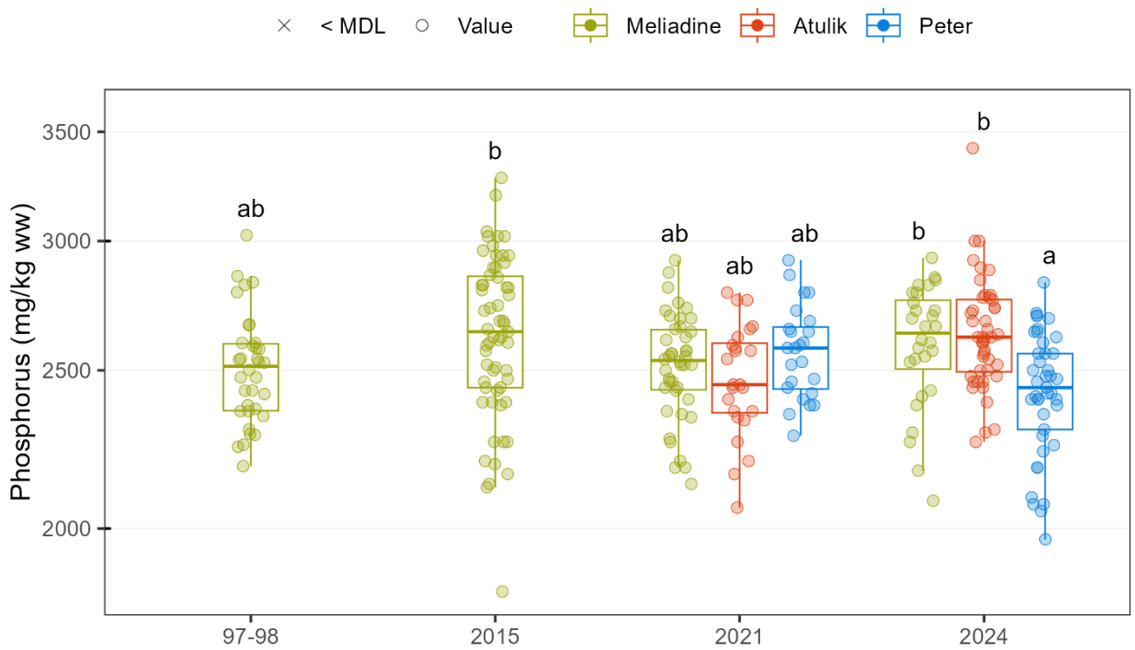


Figure 11-9. Potassium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

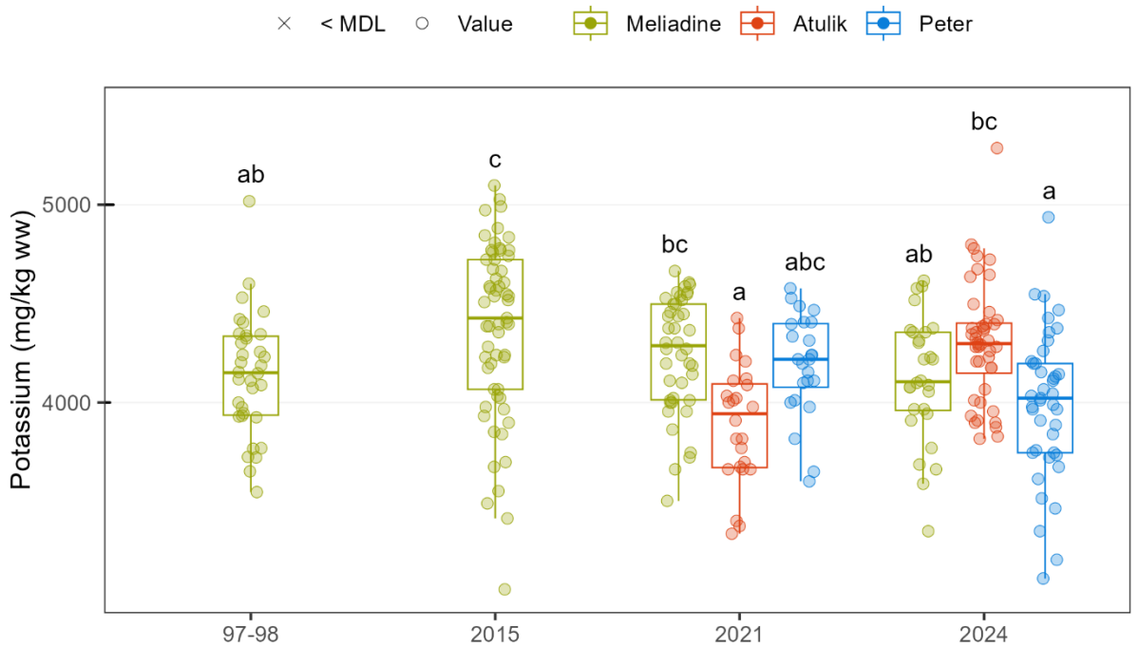


Figure 11-10. Selenium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

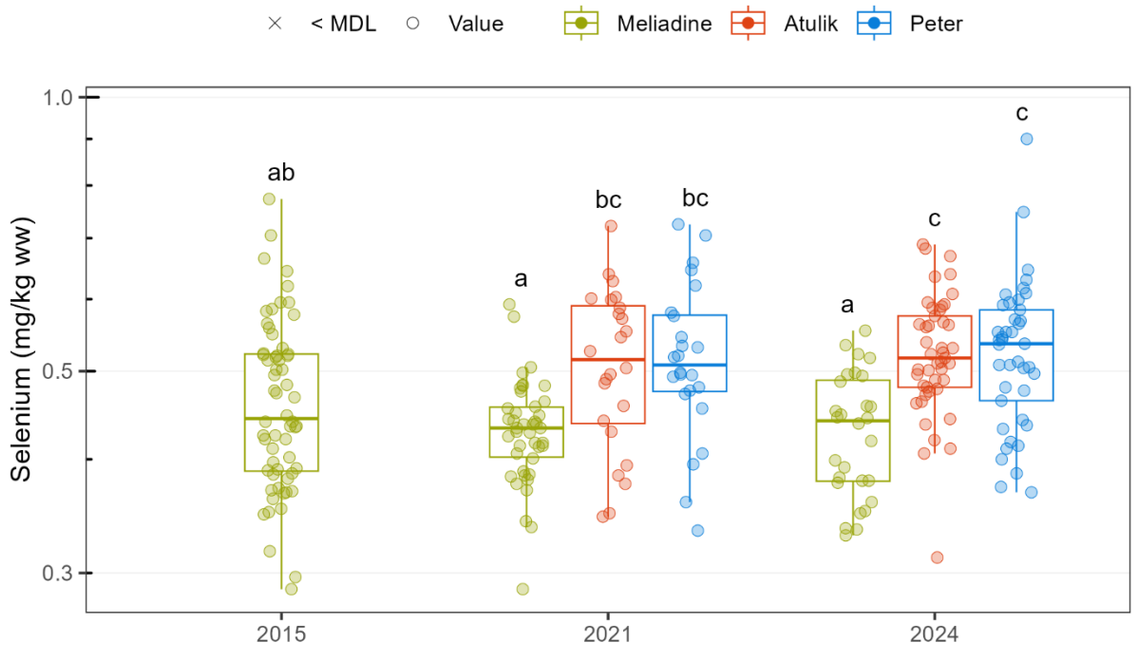


Figure 11-11. Sodium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

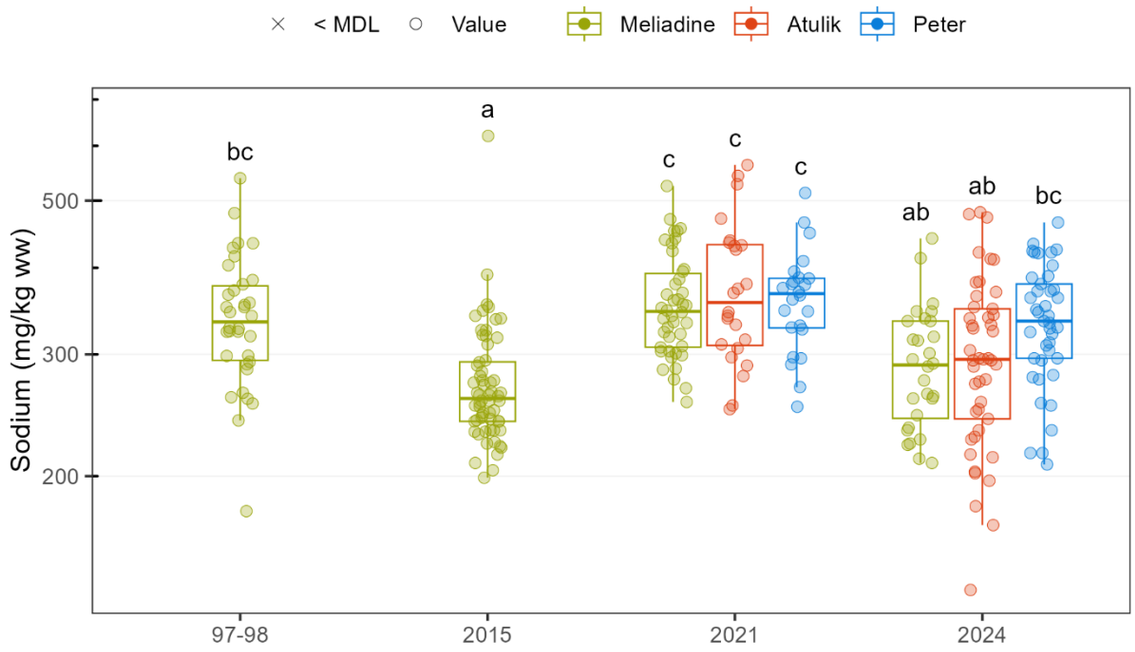


Figure 11-12. Strontium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

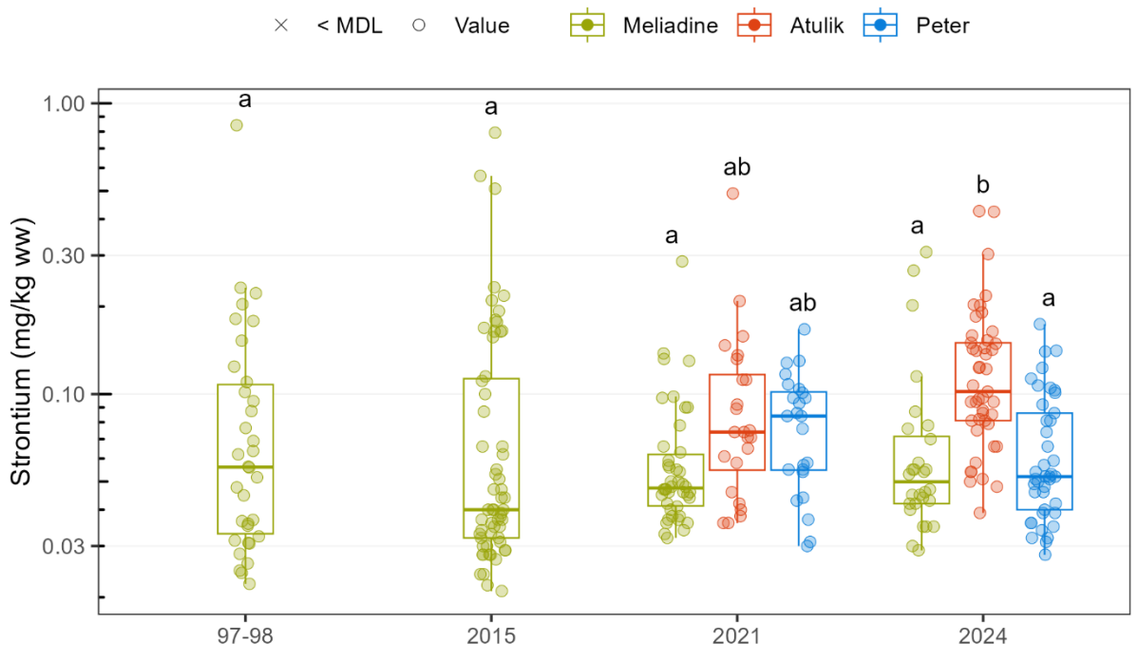


Figure 11-13. Thallium concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

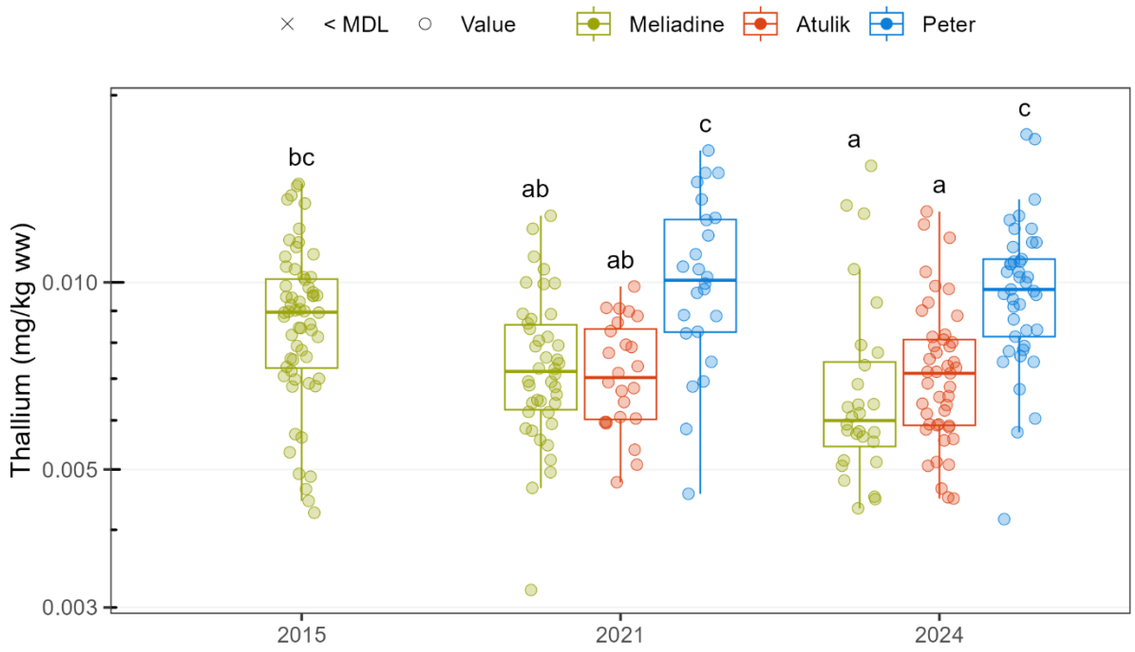


Figure 11-14. Zinc concentrations (mg/kg ww) in Lake Trout muscle samples and results of Tukey post-hoc pairwise comparisons following ANOVA.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).

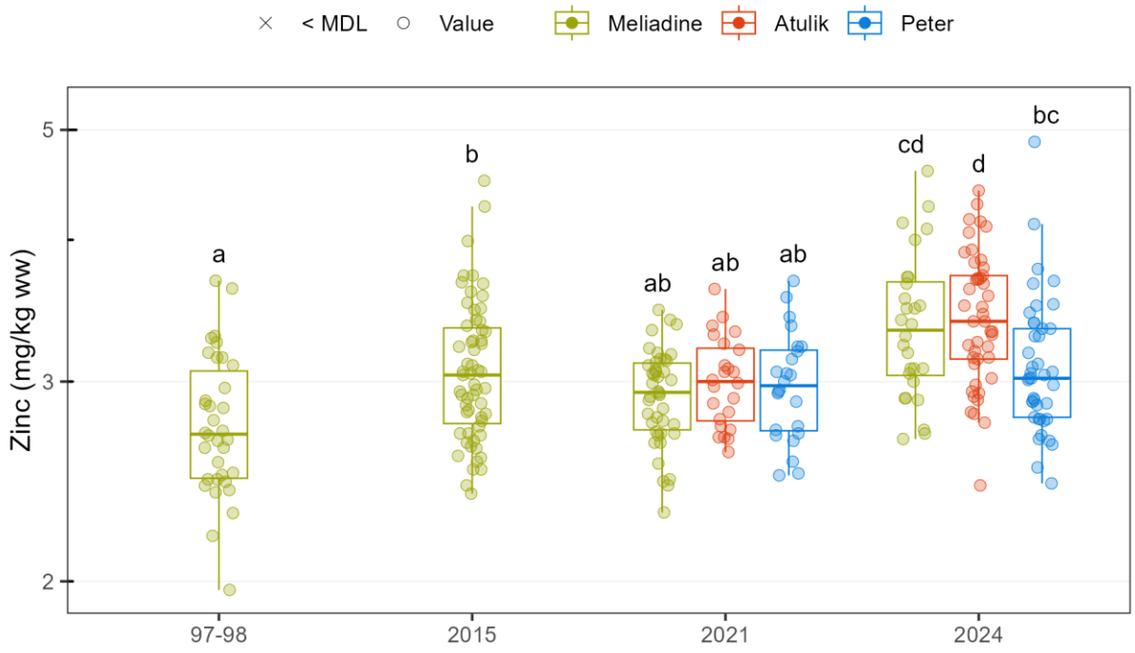
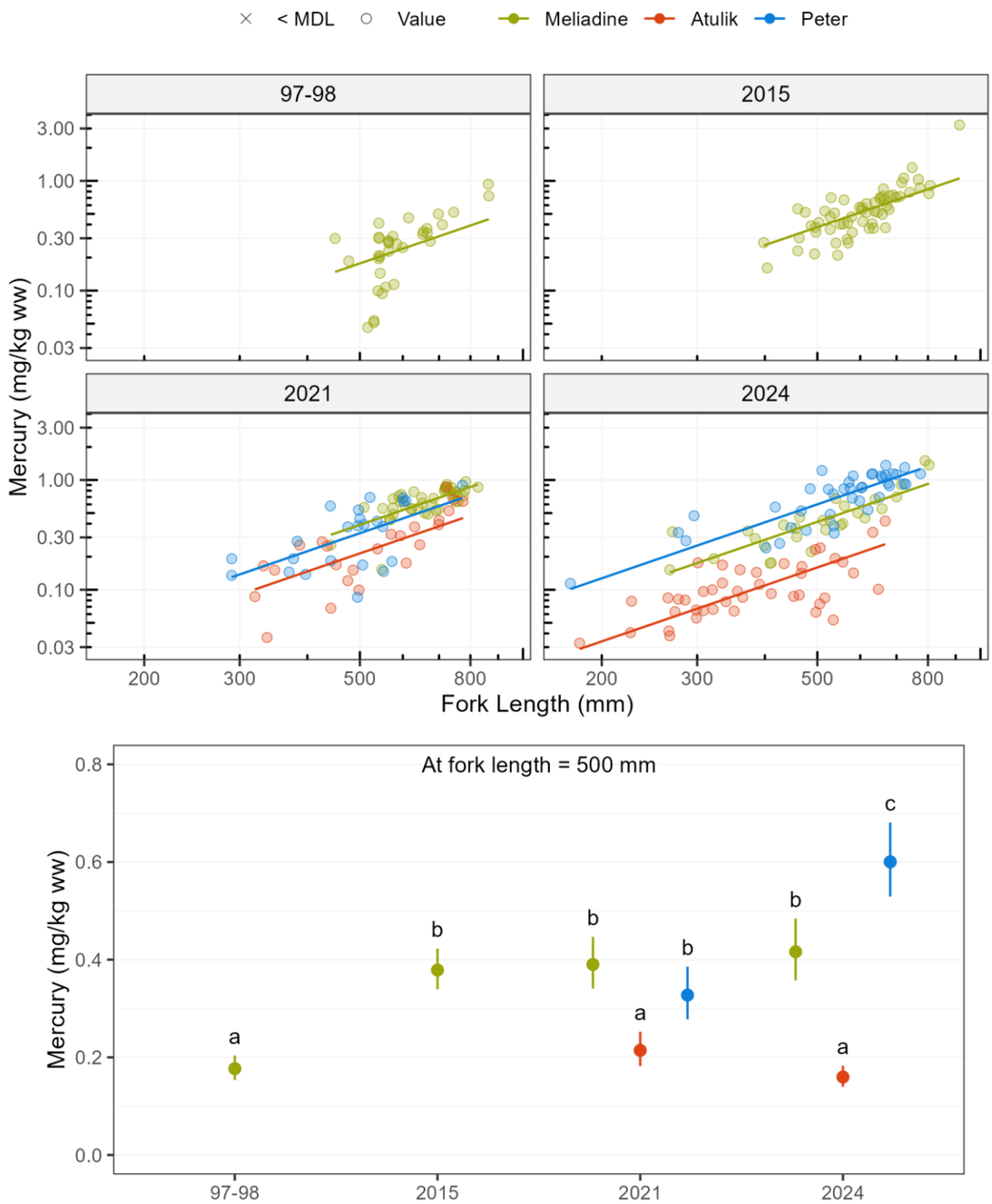


Figure 11-15. Mercury concentrations in muscle tissues of Lake Trout along with results of ANCOVA model fits and Tukey post-hoc pairwise comparisons of size-adjusted concentrations.

Notes: Different letters indicate statistically significant differences among areas and years ($p < 0.05$).



Lake	Year	Model Estimate for a 500 mm Lake Trout (Mean ± 95% CI)
Meliadine	97/98	0.18 ± 0.15-0.20
	2015	0.38 ± 0.34-0.42
	2021	0.39 ± 0.34-0.45
	2024	0.42 ± 0.36-0.48
Atulik	2021	0.21 ± 0.18-0.25
	2024	0.16 ± 0.14-0.18
Peter	2021	0.33 ± 0.28-0.39
	2024	0.60 ± 0.53-0.68

11.6 References

Agnico Eagle. 2014. FEIS Volume 10 – Environmental and Human Health Risk Assessment. Meliadine Gold Project, Nunavut. Final Environmental Impact Statement. Submitted to the Nunavut Impact Review Board. April 2014.

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12 RESPONSE FRAMEWORK AND LOW ACTION LEVEL ASSESSMENT

This section presents the findings from the 2024 AEMP within the context of the Response Framework. The Response Framework is a science-based adaptive management strategy that systematically evaluates monitoring results against pre-defined Action Levels to determine whether a change has occurred that warrants further investigation. Ultimately, the Response Framework and Action Level Assessment function to protect key attributes of the aquatic environment that were identified through public consultation for the FEIS (Traditional Use Study; FEIS Volume 9). These attributes include:

- **Water quality** – ensuring water remains safe for people and wildlife.
- **Usability of the fishery** – supporting continued traditional and recreational fishing by local residents.
- **Aquatic ecosystem health** – maintaining ecological function so that fish have adequate food and can survive, grow, and reproduce.

Low Action Levels

Low Action Levels for each component of the Meliadine Lake study were first proposed in Version 1 of the AEMP Design Plan (Golder, 2016) and updated in the 2018 AEMP (Golder, 2019). Assessment criteria are specific to each AEMP component but generally include comparisons with baseline and/or reference conditions and, for water and sediment quality, comparisons to relevant guidelines, criteria, or objectives. If a low Action Level is exceeded for a given component, follow-up actions may include further monitoring, investigations, or adaptive management responses, such as mitigation measures or modifications to Mine operations. The assessment criteria for determining whether a Low Action Level has been exceeded for the various AEMP components are presented in **Section 12.1**.

Low Action Levels were not formally developed for the Peninsula Lakes water quality program in the 2018 AEMP. However, to support adaptive management decisions, water quality data from the Peninsula Lakes study are evaluated using the same approach as Meliadine Lake. This includes comparisons to baseline conditions (Normal Range assessment), water quality guidelines, and predictions in the 2014 FEIS (if available).

Impact Hypotheses

The FEIS identified several pathways through which Mine activities could impact the aquatic receiving environment, including effluent discharge (specific to Meliadine Lake), altered watersheds, changes in hydrological processes, evaporation, and aerial emissions (FEIS, Volume 7). For Meliadine Lake, effluent

discharge is the primary pathway with the potential to alter water quality and affect aquatic life. Since effluent contains nutrients and metals, two impact hypotheses were developed to guide the Low Action Level assessment:

- **Toxicological Impairment Hypothesis**: Toxicity to aquatic organisms may occur directly or indirectly due to the release of substances of toxicological concern. Direct effects involve immediate impacts on receptors, such as fish experiencing toxicity from elevated concentrations of ions or metals. Indirect effects may occur if lower trophic level communities, such as algae or invertebrates, are affected, leading to cascading impacts on fish populations.
- **Nutrient Enrichment Hypothesis**: Increased productivity may result from the release of nutrients (primarily phosphorus and nitrogen) in effluent. Nutrient enrichment can lead to higher primary productivity (e.g., algal growth), which in turn increases decomposition rates. This process can reduce dissolved oxygen levels, potentially lowering a waterbody's capacity to support aquatic life, including invertebrates and fish.

12.1 Meliadine Lake Low Action Level Assessment

Potential mining-related effects consistent with toxicological impairment or nutrient enrichment were evaluated based on information from the following components of the 2024 AEMP:

- Sublethal toxicity tests with *Lemna minor* (duckweed)
- Surface water quality
- Phytoplankton community
- Benthic invertebrate community
- Threespine Stickleback and Lake Trout studies (health assessment and tissue chemistry)

The findings from each component are integrated into a final assessment to determine whether mining activities have contributed to toxicological impairment or nutrient enrichment in Meliadine Lake.

Effluent Quality

Assessment Criterion – Sublethal toxicity at the end-of-pipe is evaluated based on effects observed in the same test organism in three consecutive monthly samples collected from MEL-14. A sublethal effect is defined as a response occurring at an effluent concentration below the highest test concentration that causes a 25% effect on growth or reproduction relative to the control treatment.

Results –Sublethal toxicity tests were conducted in June, July, and October 2024 using *Lemna minor* (duckweed). No effects on biomass or growth endpoints were observed in the June and July tests. In the October test, a reduction in frond (leaf) production was observed compared to control treatments. The concentration causing a 25% reduction in biomass and frond number was 72% and 56%, respectively.

Conclusion – The Low Action Level for end-of-pipe toxicity was not exceeded in 2024.

Surface Water Quality

Assessment Criteria – The same approach is used to evaluate surface water quality data for toxicological impairment and nutrient enrichment. However, the human health drinking water quality assessment focuses specifically on toxicological impairment, considering only parameters with health-based guidelines from Health Canada.

A Low Action Level for potential toxicological or nutrient-related impacts is triggered if all of the following conditions are met:

- Exceedance of an AEMP Action Level – At least one parameter exceeds the AEMP Action Level, which is designed to protect aquatic life and/or human health.
- Increase Relative to Baseline/Reference Conditions – Concentrations have increased compared to baseline or reference conditions, as determined through a Normal Range assessment.
- Divergence from Reference Areas – A clear trend indicates that concentrations in exposure areas are diverging from those in reference areas, as demonstrated in temporal plots and supported by statistical comparisons.

Results – Findings from the 2024 surface water quality monitoring program are summarized below:

- Comparison to Aquatic Life and Human Health Guidelines – No exceedances of AEMP Action Levels were observed in 2024, including for total phosphorus.
- Baseline/Reference Comparison – Water quality has changed in Meliadine Lake during operations. In the East Basin, evidence suggests that concentrations of major ions and some metals have increased due to mining activities. However, total dissolved solids (TDS) and chloride concentrations remain below the predicted levels outlined in the 2014 FEIS and the 2020 hydrodynamic model update, indicating conditions remain within the expected range during operations.
- Divergent Trends? – Ten years of water quality monitoring in Meliadine Lake suggest that observed increases in some parameters are at least partly driven by climate-mediated processes affecting lakes across the Kivalliq region.

Conclusion – The Low Action Levels for toxicological impairment and nutrient enrichment were not exceeded in 2024.

Phytoplankton

The primary concern for phytoplankton is increased productivity due to nutrient inputs. However, metals in effluent can also impact aquatic primary producers, potentially reducing photosynthesis and altering community structure to favor taxa more tolerant of metals (Vendrell-Puigmitja et al. 2020).

Assessment Criteria – The Low Action Level for potential effects to phytoplankton is triggered if the following condition is met:

- Phytoplankton community metrics in the Near-field area (MEL-01) fall outside the range of baseline/reference conditions.

Results – Findings from the 2024 phytoplankton study are summarized below.

- Phytoplankton biomass at MEL-01 was lower in August 2024 than in 2023 but remained within the range of values observed in previous monitoring years. Long-term data suggest that the East Basin of Meliadine Lake may naturally be more productive than other areas of the lake.
- Chlorophyll-a concentrations were significantly lower in the East Basin in 2024. This reduction was consistent with levels observed during the pre-construction and construction phases and fell within the range observed at reference areas.
- Phytoplankton community structure in the East Basin has shifted during operations. The biomass distribution of various taxa differs from that observed in the mid-field area (MEL-02) and reference areas.

Conclusion – It remains unclear whether the observed structural differences in the phytoplankton community are a result of effluent discharge or other factors unique to the East Basin. The 2014 FEIS predicted that increased nitrogen concentrations in the East Basin could lead to shifts in community structure while maintaining overall phytoplankton productivity (FEIS, Volume 7). The observed changes in community structure at MEL-01 align with FEIS predictions, as does the finding that phytoplankton productivity—indicated by algal biomass—remains consistent with baseline conditions.

Given that the 2024 phytoplankton community data conform with FEIS predictions, the Low Action Level was not exceeded in 2024.

Benthic Invertebrates

Effluent discharged into Meliadine Lake has the potential to affect the benthic invertebrate community through both direct and indirect pathways. Based on the conceptual model, elevated metal concentrations in water and sediment may directly impact the benthic invertebrate community by causing the loss of sensitive taxa, leading to lower species richness, reduced density, and decreased diversity relative to reference areas. In contrast, moderate nutrient inputs may increase species richness

and abundance by enhancing food availability. However, excessive nutrient enrichment can alter community composition, favoring opportunistic species while reducing overall diversity.

Assessment Criteria – The Low Action Level for potential effects to benthic invertebrates is triggered if both of the following conditions are met:

- A statistically significant difference in Environmental Effects Monitoring (EEM) endpoints (abundance, richness, Simpson's Evenness, or Bray-Curtis Index) at MEL-01 compared to reference areas.
- The magnitude of the difference exceeds the critical effect size (CES; defined as 2× the standard deviation of the reference mean).

Results – Findings from the 2024 benthic invertebrate community study are summarized below:

- Density at MEL-01 was lower than at reference areas (MEL-03 and MEL-05) in 2024; however, the magnitude of the difference was below the CES for biological significance.
- Species richness did not differ significantly between exposure and reference areas in 2024.
- Bray-Curtis Index was significantly different at both MEL-01 and MEL-02 compared to reference areas, indicating that the benthic invertebrate communities in the exposure areas differ from those in the reference areas.
- Community stability – The structure of the benthic invertebrate community at MEL-01 has remained stable since 2018, with chironomid larvae and fingernail clams consistently dominating. Differences between MEL-01 and reference areas may be attributed to variations in sediment characteristics (e.g., grain size and total organic carbon) between the East Basin and reference areas.

Conclusion – The Low Action Level was not exceeded in 2024 for either toxicological impairment or nutrient enrichment. None of the effect endpoints exceeded the CES for 'effects' under EEM. Based on all available metrics, and considering the results of the surface water assessment, mining activities do not appear to have negatively impacted the structure or function of the benthic invertebrate community in the East Basin. Differences observed in community composition – as indicated by Bray Curtis dissimilarity index results – may be related to natural differences sediment characteristics such as grain size and organic carbon rather than mining-related impacts.

Fish Health

The FEIS predicted that water quality would meet aquatic life guidelines at the edge of the mixing zone. Therefore, toxicological impacts to fish populations were not anticipated. However, the FEIS did note that potential increases in nutrient concentrations in Meliadine Lake may contribute to the possibility

that the resulting fish community composition is different than baseline. Namely, there may be increased growth and production of forage species (FEIS, Volume 7).

Assessment Criteria – The Low Action Level for potential effects to fish is triggered if the following conditions are met:

- Statistically significant difference in EEM effect endpoints (age, weight at age, condition [length-weight relationship], and relative liver size vs body weight) at MEL-01 compared to the reference areas.
- The magnitude of the difference exceeds the CES specified under MDMER (10% for condition; 25% for other endpoints).

Relative gonad size was not carried forward for the Low Action Level assessment because of challenges reliability assessing effects to reproduction for Threespine Stickleback (**Section 8.3.2**) and Lake Trout (**Section 10.4.3**).

Results – Findings from the 2024 fish health assessment are provided below for each species:

- **Threespine Stickleback**
  - Male fish in MEL-01 were larger and older than those in the reference areas. Age-4 males from MEL-01 were significantly heavier and the difference exceeded the CES size. Female fish showed smaller differences between areas.
  - Both males and females in MEL-01 were heavier for their length and had larger livers compared to the reference areas. Most of the comparisons between MEL-01 and the individual reference areas (MEL-03 and MEL-04) exceeded the CES of 10 % for condition and 25 % for relative liver weight, suggesting fish in MEL-01 either have more energy available or use it more efficiently than those in the reference areas.
- **Lake Trout**
  - Lake Trout in Meliadine Lake were generally larger and older than those in Atulik Lake, but similar in size, weight, and age to fish in Peter Lake.
  - Condition (weight relative to length), age-adjusted growth, and liver weight (adjusted for length or weight) for Lake Trout from Meliadine Lake were within the range observed in fish from the two regional reference lakes.
  - Lake Trout from Liver weight adjusted to total weight was 17 % heavier in Meliadine Lake compared to Atulik Lake—a difference below the 25% CES. No difference in liver weight adjusted to total weight was observed between Meliadine Lake and Peter Lake.

Conclusions – The results of the 2024 Threespine Stickleback study—specifically, better condition (higher weight for a given length) and larger liver sizes in both male and female fish at MEL-01—are

consistent with the FEIS prediction that nutrients in the effluent could enhance food availability for forage fish. However, it remains unclear whether these differences are attributable to effluent discharge or reflect natural variability within Meliadine Lake.

Despite potential changes in forage fish, no detectable differences in survival, growth, or condition were observed in Lake Trout from Meliadine Lake compared to both reference lakes.

The implications for future fish monitoring programs will be determined following ECCC's review of the Threespine Stickleback and Lake Trout health assessment results in the EEM Cycle 3 Interpretive Report, scheduled for submission in August 2025.

Useability of the Fishery

Assessment Criteria – Potential impacts to traditional and recreational use of the fishery in Meliadine Lake were evaluated by comparing metals concentrations in edible muscle (fillets) between Meliadine Lake and the regional reference lakes.

Results – Concentrations of most parameters in Lake Trout muscle samples from Meliadine Lake remained stable or decreased over time. Compared to the reference lakes, no parameters showed increasing temporal trends in Meliadine Lake.

Conclusions – There is no evidence that effluent discharge is causing a change in tissue chemistry that would negatively impact the useability of the fishery for traditional and recreational purposes.

12.2 Peninsula Lakes Water Quality Summary

Water quality in Lake A8 and Lake B7 has changed in conjunction with Mine construction, including the placement of tailings within the Tailings Storage Facility (TSF) and the development of Tiriganiaq Pits 1 and 2. In comparison, Lake D7 appears to be minimally impacted by mining activities (no exceedance of AEMP Action Levels and most parameters less than predictions in the FEIS).

The parameters showing the clearest evidence of mining-related increases in Lake A8 and Lake B7 include major ions (e.g., chloride, calcium, and sulphate), arsenic, and barium (**Figure 4-6**). The timing of the increasing trend in Lake A8 aligns with FEIS predictions, which anticipated that aerial deposition from mine activities would peak during open pit development and return to background levels by closure. For Lake B7, the most likely source of observed changes in water quality is dust from the TSF. However, based on data from 2023 and 2024, it remains unclear whether the TSF is an ongoing source of metals and other parameters or if sediment is acting as both a source and a sink, contributing to the seasonal water quality patterns observed in 2023 and 2024.

Ongoing monitoring in Lake B7, with additional sampling events in September and October, will help determine whether concentrations are increasing or beginning to stabilize. In terms of management

actions, Agnico Eagle will continue to implement best practices outlined in the Dust Management Plan to mitigate the potential effects of off-site dust migration on small lakes adjacent to the Mine.

12.3 Scope of the 2025 AEMP

The 2025 AEMP will be carried out according to the AEMP Design Plan. The scope of the 2025 AEMP will focus on monitoring changes in water quality (limnology and chemistry) and phytoplankton community in Meliadine Lake and water quality monitoring in the Peninsula Lakes (Lake D7, Lake B7, and Lake E3). Routine effluent chemistry monitoring and sublethal toxicity testing will be completed as per the Water Licence and MDMER.

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APPENDICES

APPENDIX A
QUALITY ASSURANCE / QUALITY CONTROL

TABLE OF CONTENTS

A.1 INTRODUCTION 1
A.2 WATER CHEMISTRY 1
A.2.1 Methods 1
A.2.1.1 Field 1
A.2.1.2 Laboratory 4
A.2.1.3 Data Reliability Check 5
A.2.2 Results 5
A.3 SEDIMENT CHEMISTRY 31
A.3.1 Methods 31
A.3.1.1 Field 31
A.3.1.2 Laboratory 31
A.3.2 Results 31
A.4 PHYTOPLANKTON TAXONOMY AND CHLOROPHYLL-A 28
A.4.1 Methods 28
A.4.1.1 Field 28
A.4.1.2 Laboratory 28
A.4.2 Results 29
A.5 BENTHIC INVERTEBRATE TAXONOMY 35
A.5.1 Methods 35
A.5.1.1 Field 35
A.5.1.2 Laboratory 35
A.5.2 Results 37
A.6 FISH TISSUE CHEMISTRY 39
A.6.1 Methods 39
A.6.2 Results 39
A.7 REFERENCES 46

LIST OF TABLES – APPENDIX A

Table A-1. Laboratory QC summary for surface water quality reports from ALS Environmental in 2024. 9
Table A-2. Laboratory detection limits and blank results (travel, de-ionized, and equipment) from the 2024 surface water quality monitoring program. 10
Table A-3. Field duplicate results from the winter 2024 sampling event. 13
Table A-4. Field duplicate results from the July 2024 sampling event. 16
Table A-5. Field duplicate results from the August 2024 sampling event. 19
Table A-6. Field duplicate results from the September 2024 sampling event. 25
Table A-7. Surface water data reliability checks – dissolved vs total concentrations, 2024. 28
Table A-8. Surface water data reliability checks – within area outliers, 2024. 29
Table A-9. Field duplicates and parameters that exceeded the DQOs in 2024. 30
Table A-10. Laboratory QC summary for sediment samples analyzed at ALS Environmental in 2024. 32
Table A-11. Field duplicate results for the sediment grabs collected in 2024. 27
Table A-12. Field duplicate results for the 2024 phytoplankton samples. 30
Table A-13. Laboratory duplicate results for the 2024 phytoplankton samples. 32
Table A-14. Field duplicate results for the 2024 chlorophyll-a samples 34
Table A-15. Summary of sorting efficiency. 38
Table A-16. Summary of sub-sampling efficiency. 38
Table A-17. Laboratory QC summary for Lake Trout muscle samples submitted for tissue chemistry. 40
Table A-18. Laboratory QC summary for Threespine Stickleback carcass samples submitted for tissue chemistry. 42
Table A-19. Parameters that exceeded the duplicate DQOs in split samples of Threespine Stickleback carcasses, 2024. 43
Table A-20. Duplicate results for split samples of Threespine Stickleback carcasses, 2024. 44

A.1 INTRODUCTION

The objective of quality assurance and quality control (QA/QC) is to verify that the chemical and biological data collected are representative of the material or populations being sampled, are of known quality, have sufficient laboratory precision to be highly repeatable, are properly documented, and are scientifically defensible. *Quality Assurance* (QA) refers to the practices employed to collect scientifically defensible samples meeting pre-defined data quality objectives (DQOs). This includes the use of experienced field staff, standard operating procedures, field data sheets, and certified laboratories. *Quality Control* (QC) refers to the measures taken to verify that the specific DQOs are met.

The QA/QC program is described in detail in the AEMP Design Plan. An overview of field and laboratory QA/QC methods is provided below, followed by the results of the 2024 QA/QC assessment for each component of the AEMP.

A.2 WATER CHEMISTRY

A.2.1 Methods

A.2.1.1 Field

Field Data and Sample Collection

Standard QA procedures for the water chemistry program include rinsing the sampling equipment (pump and tubing in the winter; Kemmerer in the summer) to prevent cross-contamination between areas. QA methods used to prevent cross-contamination between locations and from the equipment itself included wearing nitrile gloves and rinsing the sample equipment with surface water prior to collecting samples.

Field collected limnology data focused primarily on measurements using a multiprobe meter. The meter is calibrated before field measures according to manufacturer instructions. The Environment Department at the Mine maintains a calibration log for each field instrument.

Careful documentation and handling of all samples and data is a key component of QA/QC in a field program. Field data were recorded on customized field data sheets. Sample bottles were labeled appropriately with the sample ID, date and project identification and sample containers were stored according to laboratory handling instructions. Field data sheets were scanned after each field program. Information that was recorded in the field (e.g., field measurements, station information, etc.) was transcribed into an EQUIS database administered by Agnico Eagle.

Sample Shipping and Handling

Samples were shipped to the analytical laboratories with a chain-of-custody (CoC) form. CoC forms not only inform the laboratory of sample details, they also help ensure that sample handling instructions are followed and that all samples are accounted for. ALS reports concerns surrounding sample submission as *sample integrity* issues in the Sample Receipt Confirmation (SRC) email after the samples are received. For ALS reports, the results are typically recorded in the sample integrity assessment for one of three reasons: (1) samples were damaged during transport, (2) the temperature inside the cooler was above 10°C when received by the laboratory, or (3) the recommend hold-time was exceeded prior to analysis. Sample integrity issues don't necessarily mean the data are unreliable.

The Meliadine Environment Department plans water sampling events to minimize the amount of time that samples are in transit between the Mine and the laboratory. ALS provides recommended hold-times for water quality parameters; hold-times range from less than one day for pH to six months for metals. Hold-times for water samples are always exceeded for pH (15 minutes) and nitrate, nitrite, orthophosphate, and turbidity (3-d). Total dissolved solids and total suspended solids often exceed the 7-d recommended hold-time. On occasion, parameters with 14-d recommended hold-times are exceeded (e.g., alkalinity, cyanides). ALS recommends using professional judgement when interpreting chemistry data for parameters that exceeded hold-times for analysis. Based on long-term monitoring programs at Meliadine and Meadowbank, exceeding the recommended hold-times does not appear to impact the reliability of the results.

Blanks

Blanks are samples that do not contain the variable to be analyzed. They are used to assess and control sample contamination (Clark, 2013). Blank samples are collected once per sample event, and are submitted *blind* to the laboratory. Blank sample collection, particularly equipment blank samples, requires careful planning, attention to detail, focuses on the importance of cleanliness and generally provides a good opportunity to refine sample collection skills. Three different types of *blank* samples are included in the AEMP: travel blanks, field blanks and equipment blanks.

Travel blanks (TB) – Travel blanks are provided by the analytical laboratory for the purpose of testing for contamination associated with travel (i.e., hold time, heat/cold, moisture, desiccation, leaching, etc.). Travel blanks consist of de-ionized (DI) water provided in sampling bottles by ALS and receive the same treatment as field samples during shipment, handling, storage, and laboratory analysis.

Field blanks (aka Deionized Water Blanks [DI]) – Field blanks are used to detect potential contamination during sample collection, handling, shipping and laboratory analysis. Field blanks are prepared by filling the sample bottles with DI water provided by ALS.

Equipment blanks (EB) – Equipment blanks are used to detect potential contamination from sampling equipment. To obtain an equipment blank, DI water is run through the equipment and then transferred to a sample bottle. Filtered analyses for the EB are collected in the same manner as the lake samples using the syringe and 0.45 µm filter.

Results from the field, equipment and travel blanks are examined for detectable concentrations of any of the parameters measured. If a parameter is detected in a blank, the results for the batch of samples submitted with the blank are compared with the measured concentration in the blank. Results that are less than 10-times the detected concentration in the equipment blank are flagged to examine the potential for cross-contamination to affect the results. This threshold does not apply to pH measurements, as DLs are not available for the pH scale.

Field Duplicates

Field duplicates are used to identify the precision of field sampling methods and laboratory analysis and within-station variability. Field duplicates are submitted *blind* to the laboratory and analyzed using the same methods and equipment as original samples. The target frequency of field duplicate sample collection is approximately 10% of the total number of samples collected.

The DQOs for water quality parameters are based on the magnitude of the concentrations in the samples. For parameters with concentrations > 5 time the DL, the field duplicates are assessed using the relative percent difference (RPD) between the duplicate samples:

$$RPD = \frac{(A - B)}{(\frac{A + B}{2})} x\ 100$$

where: A = analytical result; B = duplicate result.

The DQOs for these parameters are equal to 1.5 times the laboratory RPDs. The laboratory RPDs for water chemistry for most analytes is 20% and the DQOs for field duplicate water samples were ±30%. For parameters without a laboratory RPD DQO, the field duplicate DQO was set to ±40% by default. Use of a 1.5 times multiplier for field duplicates is based on guidance from the Canadian Council of Ministers for the Environment (CCME) that states that acceptance limits for field-based QC samples are broader than laboratory QC and are typically 1.5 to 2 times the laboratory QC limits (CCME, 2016).

The uncertainty in concentrations increases near to the detection limit and the acceptance criteria are relaxed for parameters measured < 5-times the DL. For parameters with concentrations measured at < 5-times the DL, the DQO is an absolute difference between duplicates < 2-times the DL (referred to in the tables as DIFF).

The RPD and DIFF values may be either positive or negative and ideally should provide a mix of the two, clustered around zero. RPDs and DIFF values are not calculated when one of the samples (i.e., either A

or B above) is below detection and the other is not. If an RPD or DIFF value falls outside the field duplicate DQO it is flagged for review. The importance of reduced precision becomes more important when concentrations are near regulatory guidelines (CCME, 2016).

A.2.1.2 Laboratory

ALS is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA). Performance evaluations are conducted under CALA's accreditation program for laboratory methods, protocols, and QC samples. There are four types of QC samples components of the water chemistry laboratory QC program to assess analytical precision, bias, and completeness:

Laboratory Duplicate – The laboratory randomly chooses samples to re-run as duplicates. A new aliquot from the same sample is analyzed from the start in the same manner as the original aliquot taken from the bottle/jar. The difference between the two analyses is a measure of the variability associated with duplicate analyses of the same sample in the laboratory.

Results of the laboratory duplicates are assessed by measuring the RPD as a percentage between original and duplicate measurements which is referred to as a measure of precision by the laboratory. Laboratory duplicate DQOs are parameter-specific and depend on the concentration in the sample. The RPD DQOs for lab duplicates are lower than for field duplicates given that the same aliquot is split.

Method Blank (MB) – An analyte-free matrix (e.g., de-ionized water) is subjected to the entire analytical process to demonstrate that the analytical system itself does not introduce contamination. Blanks are examined for detectable concentrations of any of the parameters measured; no parameter in blanks should exceed laboratory method detection limits (MDLs). If an analyte is detected in a blank, the results for the batch of samples submitted with the blank are compared with the measured concentration in the blank. Results that are less than 10-times the detected analyte concentration in the blank are flagged to examine the potential for cross-contamination to affect the results.

Matrix Spike (MS) / Matrix Duplicate (MD) – A known amount of a compound chemically similar to the target analyte is added to samples to ascertain any matrix effects on recoveries and to determine the accuracy and precision of the method in this matrix.

Laboratory Control Sample (LCS) – An LCS is a well-characterized sample of known analytes and concentration. A reference material (i.e., certified reference material) containing certified amounts of target analytes, may be used as an LCS. Percent recovery of the target analytes in the LCS is compared to established control limits and assists in determining whether the methodology is in control and whether the laboratory is capable of making accurate and precise measurements at the required reporting limit.

Certified Reference Material (CRM) – These are parameters (e.g., metals, conductivity, etc.) with a known concentration against which the lab must achieve a precision of within ±10% of the CRM.

A.2.1.3 Data Reliability Check

Part of the QA assessment involved conducting two 'data reliability checks' to identify potentially anomalous data:

- **Dissolved vs. Total Comparison**: As part of the QA/QC assessment conducted by ALS, dissolved concentrations of metals were compared to their corresponding total concentrations. If a dissolved concentration exceeded the total concentration, the parameter was re-analyzed. If, after re-analysis, the dissolved concentration remained more than 20% higher than the total concentration—and both values were greater than 10 times the detection limit (DL)—the result was flagged.
- **Within Area Heterogeneity (Outliers)**: Concentrations from replicate samples collected within the same area of Meliadine Lake or within each of the Peninsula Lakes were compared. If the maximum or minimum concentration differed by more than threefold from other replicates those values were flagged for further review.

A.2.2 Results

Results of the QA/QC analysis are discussed below. Results are presented in the following tables:

- A summary for water chemistry QA/QC, including sample integrity observations (e.g., broken sample containers, mislabeled containers), cooler temperature upon delivery to the lab, and parameters that exceeded the recommended hold-times for analysis is provided in **Table A-1**.
- Detection limits and blanks (including travel, de-ionized, and equipment blanks) are provided in **Table A-2**.
- Field duplicate results for April, July, August, and September are provided in **Table A-3** to **Table A-6**. Exceedances of the DQOs for the field duplicate samples are provided in **Table A-9**.

Sample Integrity

No sample integrity issues were identified in 2024.

Sample temperatures received at the laboratory were variable depending on season and reflect the challenges with shipping from a remote mine site. Likewise hold time exceedances for parameters and analytes with short hold times are unavoidable but are not considered likely to impact data analysis and interpretation.

Field Blanks

Some parameters were detected in the blanks in each sampling event. The TB and DI blanks had the fewest number of exceedances. In most cases, detected concentrations were less than 10-times the DL.

The EB sample from the winter sampling event in March had the greatest number of detected parameters (31). Of these 31 parameters, total and dissolved samples for copper, nickel, and strontium were measured at concentrations greater than 10-times the detection limit. The reliability of the March water quality results is discussed below for each parameter.

Summary of parameters that were detected in blank samples in 2024

Month	Event and Blank	N	N <DL	N >DL	Parameters > 10*DL
March	DI	126	123	3	Ammonia
	FB	126	123	3	0
	EB	126	95	31	Copper (T&D) Nickel (T&D) Strontium (T&D)
July	TB	Not collected			
	DI	126	123	3	0
	EB	126	110	16	0
August	TB	126	122	4	0
	DI	126	102	24	0
	EB	126	104	22	0
September	TB	126	122	4	0
	DI	126	107	19	0
	EB	126	106	20	0

- Ammonia was measured at 0.122 mg/L in the FB sample and 0.012 mg/L in the EB sample. Concentrations in water samples from MEL-01 and MEL-02 ranged from approximately 0.02 to 0.07 mg/L. Ammonia concentrations in the EB, MEL-01, and MEL-02 samples were lower than in the FB sample, indicating potential cross-contamination associated with the sampling method does not affect the reliability of the results.
- Copper measured 6.76 µg/L in the unfiltered EB and 6.0 µg/L in the filtered sample. Copper concentrations in the MEL-01 and MEL-02 samples ranged from 1.0 to 2.5 µg/L in the unfiltered and filtered samples. Potential cross-contamination from the equipment does not appear to have impacted the reliability of the results. Copper concentrations in Meliadine Lake were similar to previous years.
- Nickel measured 0.78 µg/L in the unfiltered EB and 0.66 µg/L in the filtered sample. The potential for cross-contamination to affect the results cannot be ruled out given the concentrations in the EB are only marginally lower than concentrations reported for MEL-01 and MEL-02 in March (0.8 to 2.75 µg/L). For this reason, the nickel results in March were given a ‘cautionary flag’.

- Strontium measured 0.64 µg/L in the unfiltered EB and 0.59 µg/L in the filtered sample. At MEL-01 and MEL-02 in March, strontium concentrations were in the range of 60-80 µg/L. The comparatively low concentration in the EB does affect the reliability of the March strontium results for the AEMP.

Field Duplicates

Table A-9 lists the parameters in the field duplicates that exceeded DQOs in 2024. Out of nearly 1,500 comparisons, only 36 instances did not meet the DQO, representing less than 3% of the total.

The field duplicate results indicate high precision for most parameters. There is more uncertainty associated with concentrations measured close to the DL, however, the effect on interpretating data in the AEMP is negligible, as the AEMP Benchmarks and Action Level concentrations (i.e., water quality guidelines) are typically an order of magnitude or higher than the DLs.

Laboratory QC Samples

ALS provides a thorough account of their QC assessment in each COA that is issued[1]. Across all the surface water quality reports in 2024, there were only 24 instances where the QC results were flagged by ALS for exceeding the laboratory DQOs:

- Method blanks = 17
- Matrix spikes = 6
- Laboratory control samples = 1

None of the exceedances of the DQOs affect the reliability of the results based on the assessment (qualifiers) provided by ALS.

Laboratory Duplicates

All of the laboratory duplicate samples met the DQOs in 2024.

Data Reliability Check – Dissolved vs Total

Samples that were flagged for dissolve concentrations exceeding the total concentration are provided in **Table A-7**. In total, 36 parameters were flagged with dissolved concentrations exceeding total. For 21 of

[1] The COA may include data qualifiers that relate to the sample "batch". The sample batch may include samples that are from other projects and the qualifiers included in the COA may relate to those and not the AEMP samples. In general, this does not impact the assessment of laboratory QA; however, in some instances, data qualifiers in the COA related to sample heterogeneity may not relate to AEMP samples. The Microsoft Excel® report that accompanies the COA includes tabs with detailed assessments of laboratory QA that are project specific and can be reviewed in conjunction with the COAs.

the samples, the concentration reported for the total fraction was less than detection. These data were retained in the dataset, but only evaluated on a case-by-case basis if necessary, as part of the spatial and temporal trend assessment of changes in water quality in Meliadine Lake and the Peninsula Lakes.

Data Reliability Check – Within Area Heterogeneity (Unreliable Results)

Samples that were flagged as potential outliers within each area and event are listed in **Table A-8**. There were six results in 2024 that were flagged as unreliable, all from MEL-04 in August. These data were removed from the dataset for calculating summary statistics and evaluating spatial and temporal trends.

Table A-1. Laboratory QC summary for surface water quality reports from ALS Environmental in 2024.

Event	Lab Work Order Number	Samples	Date Sampled	Date Received	Sample Integrity Observations	Temperature on Arrival (°C)	Hold-time Exceedances	Laboratory QC Samples							
								Laboratory Duplicates		Method Blanks		Matrix Spike		Laboratory Control Samples	
								Parameters	Qualifier	Parameters	Qualifier	Parameters	Qualifier	Parameters	Qualifier
Winter	WP2407830	MEL-01 and Duplicate	29-Mar	5-Apr	None	7.6	pH, Turb, NO3, NO2, Diss O-PO4.		-	Ba (D), Cu (D), Fe (D), Ni (D), Sn (D)	MBRR	Ag (D)	MES		-
	WP2407827	MEL-02, Blanks and Duplicate	30-Mar	15-Apr	None	7.6	pH, Turb, NO3, NO2, Diss O-PO4.		-	See above	See above	See above	See above		-
July	WP2417251	MEL-01 and Duplicate	5-Jul	12-Jul	None	19.2	pH, Turb, TSS, TDS, NO3, NO2, Diss O-PO4.		-		-		-		-
	WP2417773	Lakes A8, B7, D7, duplicate and blanks	12-Jul	19-Jul	None	22.1	pH, Turb, TSS, TDS, NO3, NO2, Diss O-PO4.		-		-		-		-
	WP2417775	MEL-02	13-Jul	19-Jul	None	20.8	pH, Turb, TSS, TDS, NO3, NO2, Diss O-PO4.		-	T.Alk, Cond.	B		-		-
	WP2417778	MEL-02 and Duplicate	13-Jul	19-Jul	None	20.8	pH, Turb, TSS, TDS, NO3, NO2, Diss O-PO4.		-		-		-		-
August	WP2420157	MEL-01 and Duplicate	13-Aug	20-Aug	None	20.8	pH, Turb, TSS, TDS, NO3, NO2, Diss O-PO4, CN (T), CN (WAD) and CN (Free).		-	NH_3	B	Ag (D)	MES		-
	WP2420164	MEL-03 and Duplicate	12-Aug	20-Aug	None	21.8	pH, Turb, TSS, TDS, NO3, NO2, Diss O-PO4, Hg (T), Hg (D), CN (T), CN (WAD) and CN (Free).		-		-	Ag (D)	MES		-
	WP2420165	MEL-05	14-Aug	21-Aug	None	21.8	pH, Turb, NO3, NO2, Diss O-PO4, Hg (T), Hg (D), CN (T), CN (WAD), and CN (Free).		-	NH_3	B		-		-
	WP2420173	MEL-02	12-Aug	21-Aug	None	21.0	pH, Turb, TSS, TDS, NO3, NO2, Diss O-PO4, Hg (T), Hg (D), CN (T), CN (WAD), and CN (Free).		-	NH_3	B		-		-
	WP2421037	Lakes A8, B7, and D7	August 21 and 23	30-Aug	None	19.4	pH, Turb, TSS, TDS, NO3, NO2, Diss O-PO4, CN (T), CN (WAD), and CN (Free).		-	Mn (T)	B	Ag (D)	MES		-
	WP2421048	AL-01, AL-02, PL-01, and PL-02	August 17 and 18	30-Aug	None	19.6	pH, Turb, TSS, TDS, NO3, NO2, alkalinity, Diss O-PO4, Hg (D), CN (T), CN (WAD), and CN (Free).		-	Mn (T)	B		-		-
	WP2421056	Duplicates and blanks	August 18 - 23	30-Aug	None	19.8	pH, Turb, TSS, TDS, NO3, NO2, Diss O-PO4, CN (T), CN (WAD), and CN (Free).		-		-		-		-
	WP2421060	MEL-04	August 20 and 21	30-Aug	None	19.6	pH, Turb, TSS, TDS, NO3, NO2, Diss O-PO4, CN (T), CN (WAD), and CN (Free).		-		-	Ag (D)	MES		-
September	WP2422107	MEL-01, MEL-02, duplicates and blanks	September 7 and 8	17-Sep	None	21.9	pH, Turb, TSS, TDS, NO3, NO2, Diss O-PO4.		-		-		-		-
	WP2422601	MEL-03	12-Sep	23-Sep	None	17.3	pH, Turb, TSS, TDS, NO3, NO2, Diss O-PO4, Hg (T), Hg (D).		-		-		-		-
	WP2423406	Lake B7	29-Sep	8-Oct	None	15.2	pH, Turb, TSS, TDS, NO3, NO2, Diss O-PO4.		-		-		-	B (T)	MES
Oct	WP2424459	Lake B7	10-Oct	18-Oct	None	4.6	pH, Turb, TSS, TDS, NO3, NO2, Diss O-PO4.		-		-		-		-

Laboratory QC qualifiers:

MBRR = Initial MB for this submission had positive results for flagged analyte (data not shown). Low level samples were repeated with new QC (2nd MB results shown). High level results (>5x initial MB level) and non-detect results were reported and are defensible.

MES = Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

B = Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.

Table A-2

Laboratory detection limits and blank results (travel, de-ionized, and equipment) from the 2024 surface water quality monitoring program

Month		March				July			August				September			
Client Sample ID			DI-WINTER-01	FB-WINTER-01	EB-WINTER-01		DI-JUL-01	EB-JUL-01		TB-AUG-01	DI-AUG-01	EB-AUG-01		TB-SEP-01	DI-SEP-01	EB-SEP-01
Date Sampled			30-Mar-2024	30-Mar-2024	30-Mar-2024		12-Jul-2024	14-Jul-2024		22-Aug-2024	22-Aug-2024	23-Aug-2024		07-Sep-2024	07-Sep-2024	07-Sep-2024
Time Sampled		April DLs	00:00	00:00	00:00	July DLs	14:15	11:40	August DLs	00:00	00:00	06:15	September DLs	00:00	12:30	15:40
ALS Sample ID			WP2407827-009	WP2407827-008	WP2407827-007		WP2417773-008	WP2417773-012		WP2421056-006	WP2421056-004	WP2421056-005		WP2422107-009	WP2422107-008	WP2422107-010
Parameter	Units		Water	Water	Water		Water	Water		Water	Water	Water		Water	Water	Water
Physical Tests (Water)																
Conductivity	µS/cm	1	*<1.0*	*<1.0*	**1.5**	1	*<1.0*	*<1.0*	1	*<1.0*	**1.1**	*<1.0*	1	*<1.0*	*<1.0*	**1**
Acidity (as CaCO3)	mg/L	2	*<2.0*	*<2.0*	*<2.0*	2	*<2.0*	*<2.0*	2	**2.7**	*<2.0*	*<2.0*	2	*<2.0*	*<2.0*	*<2.0*
Alkalinity, bicarbonate (as CaCO3)	mg/L	1	*<1.0*	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	*<1.0*
Alkalinity, carbonate (as CaCO3)	mg/L	1	*<1.0*	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	*<1.0*
Alkalinity, hydroxide (as CaCO3)	mg/L	1	*<1.0*	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	*<1.0*
Alkalinity, phenolphthalein (as CaCO3)	mg/L	1	*<1.0*	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	*<1.0*
Alkalinity, total (as CaCO3)	mg/L	1	*<1.0*	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	*<1.0*
Hardness (as CaCO3), dissolved	mg/L	0.5	*<0.50*	*<0.50*	*<0.50*	0.5	*<0.50*	*<0.50*	0.5	*<0.50*	*<0.50*	*<0.50*	0.5	*<0.50*	*<0.50*	*<0.50*
Solids, total dissolved [TDS]	mg/L	3	*<3.0*	*<3.0*	*<3.0*	3	*<3.0*	*<3.0*	3	*<3.0*	*<3.0*	*<3.0*	3	*<3.0*	*<3.0*	*<3.0*
Solids, total dissolved [TDS], calculated	mg/L	1	*<1.0*	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	*<1.0*
Solids, total suspended [TSS]	mg/L	1	*<1.0*	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	*<1.0*	1	*<1.0*	*<1.0*	*<1.0*
Turbidity	NTU	0.1	*<0.10*	*<0.10*	*<0.10*	0.1	*<0.10*	**0.13**	0.1	*<0.10*	*<0.10*	*<0.10*	0.1	*<0.10*	**0.1**	**0.18**
pH	pH units	0.1	5.36	5.37	5.35	0.1	5.41	5.46	0.1	5.35	5.56	5.4	0.1	5.34	5.4	5.41
Anions and Nutrients (Water)																
Ammonia, total (as N)	mg/L	0.005	*<0.0050*	0.122	**0.0117**	0.005	*<0.0050*	*<0.0050*	0.005	**0.0125**	**0.01**	*<0.0050*	0.005	**0.005**	**0.0205**	**0.0052**
Bromide	mg/L	0.1	*<0.10*	*<0.10*	*<0.10*	0.1	*<0.10*	*<0.10*	0.1	*<0.10*	*<0.10*	*<0.10*	0.1	*<0.10*	*<0.10*	*<0.10*
Chloride	mg/L	0.1	*<0.10*	*<0.10*	*<0.10*	0.1	*<0.10*	*<0.10*	0.1	*<0.10*	*<0.10*	*<0.10*	0.1	*<0.10*	*<0.10*	*<0.10*
Fluoride	mg/L	0.02	*<0.020*	*<0.020*	*<0.020*	0.02	*<0.020*	*<0.020*	0.02	*<0.020*	*<0.020*	*<0.020*	0.02	*<0.020*	*<0.020*	*<0.020*
Kjeldahl nitrogen, dissolved [DKN]	mg/L	0.05	*<0.050*	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	0.05	*<0.050*	**0.068**	*<0.050*	0.05	*<0.050*	**0.073**	*<0.050*
Kjeldahl nitrogen, total [TKN]	mg/L	0.05	*<0.050*	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	*<0.050*	0.05	*<0.050*	**0.075**	*<0.050*
Nitrate (as N)	mg/L	0.005	*<0.0050*	*<0.0050*	*<0.0050*	0.005	*<0.0050*	*<0.0050*	0.005	*<0.0050*	*<0.0050*	*<0.0050*	0.005	*<0.0050*	**0.0058**	**0.0188**
Nitrate + Nitrite (as N)	mg/L	0.005	*<0.0051*	*<0.0051*	*<0.0051*	0.005	*<0.0051*	*<0.0051*	0.005	*<0.0051*	*<0.0051*	*<0.0051*	0.005	*<0.0051*	**0.0058**	**0.0188**
Nitrite (as N)	mg/L	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*
Nitrogen, total	mg/L	0.05	*<0.050*	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	*<0.050*	0.05	*<0.050*	**0.081**	*<0.050*
Nitrogen, total dissolved	mg/L	0.02	*<0.050*	*<0.050*	*<0.050*	0.02	*<0.050*	*<0.050*	0.02	*<0.050*	**0.068**	*<0.050*	0.02	*<0.050*	**0.079**	*<0.050*
Phosphate, ortho-, dissolved (as P)	mg/L	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*
Phosphorus, total	mg/L	0.001	*<0.0010*	*<0.0010*	**0.0012**	0.001	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	**0.0061**
Phosphorus, total dissolved	mg/L	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*
Silicate (as SiO2)	mg/L	0.01	*<0.010*	*<0.010*	*<0.010*	0.01	*<0.010*	*<0.010*	0.01	*<0.010*	*<0.010*	*<0.010*	0.01	*<0.010*	**0.012**	**0.015**
Sulfate (as SO4)	mg/L	0.3	*<0.30*	*<0.30*	*<0.30*	0.3	*<0.30*	*<0.30*	0.3	*<0.30*	*<0.30*	*<0.30*	0.3	*<0.30*	*<0.30*	*<0.30*
Cyanides																
Cyanide, free	mg/L	0.0010	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*
Cyanide, strong acid dissociable (Total)	mg/L	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*
Cyanide, weak acid dissociable	mg/L	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*
Organic / Inorganic Carbon																
Carbon, dissolved organic [DOC]	mg/L	0.5	*<0.50*	*<0.50*	*<0.50*	0.5	**0.8**	*<0.50*	0.5	*<0.50*	**1.34**	**0.83**	0.5	*<0.50*	**1.01**	**0.86**
Carbon, total organic [TOC]	mg/L	0.5	*<0.50*	**0.51**	**0.51**	0.5	*<0.50*	**0.56**	0.5	*<0.50*	*<0.50*	*<0.50*	0.5	*<0.50*	**0.83**	**0.64**
Total Mercury																
Mercury, total	ng/L	0.5	*<0.50*	*<0.50*	*<0.50*	0.5	*<0.50*	*<0.50*	0.5	*<0.50*	*<0.50*	*<0.50*	0.5	*<0.50*	*<0.50*	*<0.50*
Total Metals																
Aluminum, total	mg/L	0.001	*<0.0010*	*<0.0010*	**0.0013**	0.001	**0.0027**	*<0.0010*	0.001	*<0.0010*	**0.0012**	**0.0018**	0.001	*<0.0010*	*<0.0010*	*<0.0010*
Antimony, total	mg/L	0.00002	*<0.000020*	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	*<0.000020*
Arsenic, total	mg/L	0.00002	*<0.000020*	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	*<0.000020*

Table A-2
Laboratory detection limits and blank results (travel, de-ionized, and equipment) from the 2024 surface water quality monitoring program

Month		March				July			August				September			
Client Sample ID			DI-WINTER-01	FB-WINTER-01	EB-WINTER-01		DI-JUL-01	EB-JUL-01		TB-AUG-01	DI-AUG-01	EB-AUG-01		TB-SEP-01	DI-SEP-01	EB-SEP-01
Date Sampled			30-Mar-2024	30-Mar-2024	30-Mar-2024		12-Jul-2024	14-Jul-2024		22-Aug-2024	22-Aug-2024	23-Aug-2024		07-Sep-2024	07-Sep-2024	07-Sep-2024
Time Sampled		April DLs	00:00	00:00	00:00	July DLs	14:15	11:40	August DLs	00:00	00:00	06:15	September DLs	00:00	12:30	15:40
ALS Sample ID			WP2407827-009	WP2407827-008	WP2407827-007		WP2417773-008	WP2417773-012		WP2421056-006	WP2421056-004	WP2421056-005		WP2422107-009	WP2422107-008	WP2422107-010
Parameter	**Units**		Water	Water	Water		Water	Water		Water	Water	Water		Water	Water	Water
Barium, total	mg/L	0.00002	*<0.000020*	*<0.000020*	**0.000151**	0.00002	*<0.000020*	**0.00005**	0.00002	*<0.000020*	**0.000021**	*<0.000020*	0.00002	**0.000136**	*<0.000020*	**0.000023**
Beryllium, total	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Bismuth, total	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Boron, total	mg/L	0.005	*<0.0050*	*<0.0050*	*<0.0050*	0.005	*<0.0050*	*<0.0050*	0.005	*<0.0050*	*<0.0050*	*<0.0050*	0.005	*<0.0050*	*<0.0050*	*<0.0050*
Cadmium, total	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium, total	mg/L	0.01	*<0.010*	*<0.010*	**0.084**	0.01	*<0.010*	**0.018**	0.01	*<0.010*	**0.016**	*<0.010*	0.01	*<0.010*	*<0.010*	*<0.010*
Cesium, total	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Chromium, total	mg/L	0.0001	*<0.00010*	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	*<0.00010*
Cobalt, total	mg/L	0.000005	*<0.0000050*	*<0.0000050*	**0.0000162**	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Copper, total	mg/L	0.00005	*<0.000050*	*<0.000050*	0.00676	0.00005	*<0.000050*	**0.000065**	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*
Gallium, total	mg/L	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*
Iron, total	mg/L	0.001	*<0.0010*	*<0.0010*	**0.0016**	0.001	*<0.0010*	*<0.0010*	0.001	*<0.0010*	**0.0014**	*<0.0010*	0.001	*<0.0010*	*<0.0010*	**0.0017**
Lanthanum, total	mg/L	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*
Lead, total	mg/L	0.00001	*<0.000010*	*<0.000010*	**0.000013**	0.00001	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*
Lithium, total	mg/L	0.0005	*<0.00050*	*<0.00050*	*<0.00050*	0.0005	*<0.00050*	*<0.00050*	0.0005	*<0.00050*	*<0.00050*	*<0.00050*	0.0005	*<0.00050*	*<0.00050*	*<0.00050*
Magnesium, total	mg/L	0.004	*<0.0040*	*<0.0040*	**0.0114**	0.004	*<0.0040*	*<0.0040*	0.004	*<0.0040*	*<0.0040*	*<0.0040*	0.004	*<0.0040*	*<0.0040*	*<0.0040*
Manganese, total	mg/L	0.00005	*<0.000050*	*<0.000050*	**0.000314**	0.00005	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	**0.000074**	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*
Molybdenum, total	mg/L	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	**0.000083**	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*
Nickel, total	mg/L	0.00005	*<0.000050*	*<0.000050*	0.000778	0.00005	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*
Niobium, total	mg/L	0.0001	*<0.00010*	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	*<0.00010*
Phosphorus, total	mg/L	0.05	*<0.050*	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	*<0.050*
Potassium, total	mg/L	0.02	*<0.020*	*<0.020*	*<0.020*	0.02	*<0.020*	*<0.020*	0.02	*<0.020*	*<0.020*	*<0.020*	0.02	*<0.020*	*<0.020*	*<0.020*
Rhenium, total	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Rubidium, total	mg/L	0.000005	*<0.0000050*	*<0.0000050*	**0.0000128**	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	**0.0000071**	**0.0000078**	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Selenium, total	mg/L	0.00004	*<0.000040*	*<0.000040*	*<0.000040*	0.00004	*<0.000040*	*<0.000040*	0.00004	*<0.000040*	*<0.000040*	*<0.000040*	0.00004	*<0.000040*	*<0.000040*	*<0.000040*
Silicon, total	mg/L	0.05	*<0.050*	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	*<0.050*
Silver, total	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Sodium, total	mg/L	0.02	**0.058**	*<0.020*	**0.051**	0.02	*<0.020*	*<0.020*	0.02	*<0.020*	**0.022**	*<0.020*	0.02	*<0.020*	*<0.020*	*<0.020*
Strontium, total	mg/L	0.00002	*<0.000020*	*<0.000020*	0.00064	0.00002	*<0.000020*	**0.000084**	0.00002	*<0.000020*	**0.000049**	**0.000034**	0.00002	*<0.000020*	*<0.000020*	**0.000049**
Sulfur, total	mg/L	0.5	*<0.50*	*<0.50*	*<0.50*	0.5	*<0.50*	*<0.50*	0.5	*<0.50*	*<0.50*	*<0.50*	0.5	*<0.50*	*<0.50*	*<0.50*
Tantalum, total	mg/L	0.0001	*<0.00010*	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	*<0.00010*
Tellurium, total	mg/L	0.00002	*<0.000020*	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	*<0.000020*
Thallium, total	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Thorium, total	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Tin, total	mg/L	0.00002	*<0.000020*	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	**0.000042**	**0.000076**	0.00002	*<0.000020*	**0.000021**	**0.000043**
Titanium, total	mg/L	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*
Tungsten, total	mg/L	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*
Uranium, total	mg/L	0.000001	*<0.0000010*	*<0.0000010*	*<0.0000010*	0.000001	*<0.0000010*	*<0.0000010*	0.000001	*<0.0000010*	*<0.0000010*	*<0.0000010*	0.000001	*<0.0000010*	*<0.0000010*	*<0.0000010*
Vanadium, total	mg/L	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*
Yttrium, total	mg/L	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*
Zinc, total	mg/L	0.0005	*<0.00050*	*<0.00050*	**0.00264**	0.0005	*<0.00050*	**0.00062**	0.0005	*<0.00050*	**0.00133**	**0.00126**	0.0005	*<0.00050*	*<0.00050*	*<0.00050*
Zirconium, total	mg/L	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	**0.000027**	*<0.000010*	*<0.000010*
Dissolved Metals (Water)																
Aluminum, dissolved	mg/L	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	0.001	*<0.0010*	**0.0011**	**0.0036**	0.001	*<0.0010*	*<0.0010*	*<0.0010*
Antimony, dissolved	mg/L	0.00002	*<0.000020*	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	*<0.000020*
Arsenic, dissolved	mg/L	0.00002	*<0.000020*	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	**0.000047**	0.00002	*<0.000020*	*<0.000020*	*<0.000020*
Barium, dissolved	mg/L	0.00002	*<0.000020*	*<0.000020*	**0.000138**	0.00002	*<0.000020*	**0.00004**	0.00002	*<0.000020*	**0.000025**	**0.000091**	0.00002	*<0.000020*	*<0.000020*	**0.000022**
Beryllium, dissolved	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Bismuth, dissolved	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*

Table A-2
Laboratory detection limits and blank results (travel, de-ionized, and equipment) from the 2024 surface water quality monitoring program

Month		March				July			August				September			
Client Sample ID			DI-WINTER-01	FB-WINTER-01	EB-WINTER-01		DI-JUL-01	EB-JUL-01		TB-AUG-01	DI-AUG-01	EB-AUG-01		TB-SEP-01	DI-SEP-01	EB-SEP-01
Date Sampled			30-Mar-2024	30-Mar-2024	30-Mar-2024		12-Jul-2024	14-Jul-2024		22-Aug-2024	22-Aug-2024	23-Aug-2024		07-Sep-2024	07-Sep-2024	07-Sep-2024
Time Sampled		April DLs	00:00	00:00	00:00	July DLs	14:15	11:40	August DLs	00:00	00:00	06:15	September DLs	00:00	12:30	15:40
ALS Sample ID			WP2407827-009	WP2407827-008	WP2407827-007		WP2417773-008	WP2417773-012		WP2421056-006	WP2421056-004	WP2421056-005		WP2422107-009	WP2422107-008	WP2422107-010
Parameter	Units		Water	Water	Water		Water	Water		Water	Water	Water		Water	Water	Water
Boron, dissolved	mg/L	0.005	*<0.0050*	*<0.0050*	*<0.0050*	0.005	*<0.0050*	*<0.0050*	0.005	*<0.0050*	*<0.0050*	*<0.0050*	0.005	*<0.0050*	*<0.0050*	*<0.0050*
Cadmium, dissolved	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium, dissolved	mg/L	0.01	*<0.010*	*<0.010*	**0.09**	0.01	*<0.010*	**0.036**	0.01	*<0.010*	**0.011**	**0.04**	0.01	*<0.010*	**0.01**	**0.013**
Cesium, dissolved	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Chromium, dissolved	mg/L	0.0001	*<0.00010*	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	*<0.00010*
Cobalt, dissolved	mg/L	0.000005	*<0.0000050*	*<0.0000050*	**0.0000144**	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Copper, dissolved	mg/L	0.00005	*<0.000050*	*<0.000050*	0.006	0.00005	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	**0.000088**	0.00005	*<0.000050*	**0.000079**	**0.000243**
Gallium, dissolved	mg/L	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*
Iron, dissolved	mg/L	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	0.001	*<0.0010*	**0.0026**	**0.0057**	0.001	*<0.0010*	**0.0024**	*<0.0010*
Lanthanum, dissolved	mg/L	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*
Lead, dissolved	mg/L	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	**0.000016**	**0.000025**	0.00001	*<0.000010*	*<0.000010*	*<0.000010*
Lithium, dissolved	mg/L	0.0005	*<0.00050*	*<0.00050*	*<0.00050*	0.0005	*<0.00050*	*<0.00050*	0.0005	*<0.00050*	*<0.00050*	*<0.00050*	0.0005	*<0.00050*	*<0.00050*	*<0.00050*
Magnesium, dissolved	mg/L	0.004	*<0.0040*	*<0.0040*	**0.0111**	0.004	*<0.0040*	**0.0065**	0.004	*<0.0040*	*<0.0040*	**0.0065**	0.004	*<0.0040*	*<0.0040*	*<0.0040*
Manganese, dissolved	mg/L	0.00005	*<0.000050*	*<0.000050*	**0.000262**	0.00005	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	**0.000061**	**0.00017**	0.00005	*<0.000050*	*<0.000050*	*<0.000050*
Mercury, dissolved	ng/L	0.5	**0.68**	*<0.50*	**1.21**	0.5	*<0.50*	*<0.50*	0.5	*<0.50*	*<0.50*	*<0.50*	0.5	*<0.50*	*<0.50*	*<0.50*
Molybdenum, dissolved	mg/L	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*
Nickel, dissolved	mg/L	0.00005	*<0.000050*	*<0.000050*	0.000657	0.00005	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*
Niobium, dissolved	mg/L	0.0001	*<0.00010*	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	*<0.00010*
Phosphorus, dissolved	mg/L	0.05	*<0.050*	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	*<0.050*
Potassium, dissolved	mg/L	0.02	*<0.020*	*<0.020*	*<0.020*	0.02	*<0.020*	*<0.020*	0.02	*<0.020*	*<0.020*	*<0.020*	0.02	*<0.020*	*<0.020*	*<0.020*
Rhenium, dissolved	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Rubidium, dissolved	mg/L	0.000005	*<0.0000050*	*<0.0000050*	**0.000013**	0.000005	*<0.0000050*	**0.0000091**	0.000005	*<0.0000050*	*<0.0000050*	**0.0000164**	0.000005	*<0.0000050*	**0.0000072**	**0.0000056**
Selenium, dissolved	mg/L	0.00004	*<0.000040*	*<0.000040*	*<0.000040*	0.00004	*<0.000040*	*<0.000040*	0.00004	*<0.000040*	*<0.000040*	*<0.000040*	0.00004	*<0.000040*	*<0.000040*	*<0.000040*
Silicon, dissolved	mg/L	0.05	*<0.050*	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	*<0.050*	0.05	*<0.050*	*<0.050*	*<0.050*
Silver, dissolved	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Sodium, dissolved	mg/L	0.02	*<0.020*	*<0.020*	**0.053**	0.02	*<0.020*	**0.036**	0.02	*<0.020*	*<0.020*	**0.038**	0.02	*<0.020*	*<0.020*	*<0.020*
Strontium, dissolved	mg/L	0.00002	*<0.000020*	*<0.000020*	0.00059	0.00002	*<0.000020*	0.0002	0.00002	*<0.000020*	**0.000033**	**0.000133**	0.00002	*<0.000020*	**0.000055**	**0.000042**
Sulfur, dissolved	mg/L	0.5	*<0.50*	*<0.50*	*<0.50*	0.5	*<0.50*	*<0.50*	0.5	*<0.50*	*<0.50*	*<0.50*	0.5	*<0.50*	*<0.50*	*<0.50*
Tantalum, dissolved	mg/L	0.0001	*<0.00010*	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	*<0.00010*
Tellurium, dissolved	mg/L	0.00002	*<0.000020*	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	*<0.000020*
Thallium, dissolved	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Thorium, dissolved	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Tin, dissolved	mg/L	0.00002	*<0.000020*	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	0.00002	**0.000035**	**0.000053**	**0.000152**	0.00002	*<0.000020*	**0.00003**	**0.000032**
Titanium, dissolved	mg/L	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	**0.000143**	0.00005	*<0.000050*	*<0.000050*	*<0.000050*
Tungsten, dissolved	mg/L	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*
Uranium, dissolved	mg/L	0.000001	*<0.0000010*	*<0.0000010*	*<0.0000010*	0.000001	*<0.0000010*	*<0.0000010*	0.000001	*<0.0000010*	*<0.0000010*	*<0.0000010*	0.000001	*<0.0000010*	*<0.0000010*	*<0.0000010*
Vanadium, dissolved	mg/L	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*
Yttrium, dissolved	mg/L	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*
Zinc, dissolved	mg/L	0.0005	*<0.00050*	*<0.00050*	**0.0024**	0.0005	*<0.00050*	**0.00054**	0.0005	*<0.00050*	*<0.00050*	**0.00256**	0.0005	*<0.00050*	*<0.00050*	*<0.00050*
Zirconium, dissolved	mg/L	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<0.000010*	*<0.000010*

Notes
Shaded Travel, DI, or Equipment Blank concentration is > 10x DL.
Italicized numbers are below detection limits.
"-" analyte not measured

Table A-3
Field duplicate results from the winter 2024 sampling event

Month	Units	March DLs	Relative Percent Difference DQOs		Winter DUP-1 (MEL-01-08)					Winter DUP-2 (MEL-02-03)				
Station					MEL-01-08	DUP-01	Field Dup Method [a]	Result [b]	Outcome	MEL-02-03	DUP-02	Field Dup Method [a]	Result [b]	Outcome
Date Sampled					Mar-29					Mar-30				
ALS Sample ID			Lab	Field	WP2407830-004	WP2407830-006				WP2407827-002	WP2407827-006			
Parameter					Water	Water				Water	Water			
Physical Tests														
Conductivity	µS/cm	1.0	10	15	155	155	RPD	0	Pass RPD	124	125	RPD	-0.8	Pass RPD
Acidity (as CaCO3)	mg/L	2.0		40	*<2.0*	*<2.0*	*<DL*	*<DL*	*<DL*	*<2.0*	*<2.0*	*<DL*	*<DL*	*<DL*
Alkalinity, bicarbonate	mg/L	1.0		40	27.7	28	RPD	-1.1	Pass RPD	25.1	25.4	RPD	-1.2	Pass RPD
Alkalinity, carbonate	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, hydroxide	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, phenolphthalein	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, total (as CaCO3)	mg/L	1.0		40	27.7	28	RPD	-1.1	Pass RPD	25.1	25.4	RPD	-1.2	Pass RPD
Hardness, dissolved	mg/L	0.50		40	42.2	41.9	RPD	0.7	Pass RPD	35.5	34.8	RPD	2	Pass RPD
Total dissolved solids	mg/L	3.0		40	73	44.7	RPD	48.1	Fail	60	62.7	RPD	-4.4	Pass RPD
TDS Calculated (from Cond.)	mg/L	1.0		40	101	101	RPD	0	Pass RPD	80.6	81.2	RPD	-0.7	Pass RPD
TSS	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Turbidity	NTU	0.10		40	0.31	0.11	DIFF	0.2	Fail	*<0.10*	0.18	*<DL*	*<DL*	*<DL*
pH	pH units	0.10		40	7.2	7.2	RPD	-0.3	Pass RPD	7.2	7.2	RPD	-0.3	Pass RPD
Anions and Nutrients														
Ammonia, total (as N)	mg/L	0.0050	20	30	0.033	0.16	RPD	-130	Fail	0.038	0.14	RPD	-116.3	Fail
Bromide	mg/L	0.10	20	30	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*
Chloride	mg/L	0.10	20	30	22.2	22.2	RPD	0	Pass RPD	16.2	16.1	RPD	0.6	Pass RPD
Fluoride	mg/L	0.020	20	30	0.035	0.036	DIFF	-0.001	Pass Diff	0.034	0.033	DIFF	0.001	Pass Diff
Kjeldahl nitrogen, dissolved	mg/L	0.050	20	30	0.30	0.30	RPD	1.3	Pass RPD	0.28	0.30	RPD	-8	Pass RPD
Kjeldahl nitrogen, total	mg/L	0.050	20	30	0.29	0.29	RPD	0.7	Pass RPD	0.25	0.26	RPD	-1.2	Pass RPD
Nitrate (as N)	mg/L	0.0050	20	30	0.030	0.029	RPD	4.1	Pass RPD	0.0083	0.010	DIFF	-0.002	Pass Diff
Nitrate + Nitrite (as N)	mg/L	0.0050	20	30	0.030	0.029	RPD	4.1	Pass RPD	0.0083	0.010	DIFF	-0.002	Pass Diff
Nitrite (as N)	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Nitrogen, total	mg/L	0.050	20	30	0.32	0.32	RPD	0.9	Pass RPD	0.26	0.27	RPD	-1.9	Pass RPD
Nitrogen, total dissolved	mg/L	0.020	20	30	0.33	0.33	RPD	1.5	Pass RPD	0.29	0.31	RPD	-8.4	Pass RPD
Phosphate, ortho-, dissolved (as P)	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Phosphorus, total	mg/L	0.0010	20	30	0.0051	0.0055	RPD	-7.5	Pass RPD	0.0043	0.0044	DIFF	-0.0001	Pass Diff
Phosphorus, total dissolved	mg/L	0.0010	20	30	0.0057	0.0031	DIFF	0.0026	Fail	0.0021	0.0027	DIFF	-0.0006	Pass Diff
Silicate (as SiO2)	mg/L	0.010	20	30	0.79	0.81	RPD	-1.7	Pass RPD	0.54	0.51	RPD	4	Pass RPD
Sulfate (as SO4)	mg/L	0.30	20	30	9.3	8.9	RPD	3.6	Pass RPD	6.4	6.3	RPD	0.6	Pass RPD
Cyanides														
Cyanide, free	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Cyanide, total	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Cyanide, WAD	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Organic / Inorganic Carbon														
Dissolved Organic Carbon	mg/L	0.50	20	30	4.6	4.8	RPD	-2.3	Pass RPD	3.8	3.7	RPD	2.1	Pass RPD
Total Organic Carbon	mg/L	0.50	20	30	5.1	5.2	RPD	-1.9	Pass RPD	4.0	4.1	RPD	-0.5	Pass RPD
Mercury, total														
Mercury, total	ng/L	0.5	20	30	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*
Total Metals														
Aluminum	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Antimony	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Arsenic	mg/L	0.000020	20	30	0.00062	0.00060	RPD	3	Pass RPD	0.00060	0.00059	RPD	1	Pass RPD
Barium	mg/L	0.000020	20	30	0.013	0.012	RPD	5.8	Pass RPD	0.011	0.011	RPD	-0.9	Pass RPD
Beryllium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Bismuth	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Boron	mg/L	0.0050	20	30	0.0097	0.0098	DIFF	-1E-04	Pass Diff	0.0071	0.0071	DIFF	0	Pass Diff

Table A-3
Field duplicate results from the winter 2024 sampling event

Month	Units	March DLs	Relative Percent Difference DQOs		Winter DUP-1 (MEL-01-08)					Winter DUP-2 (MEL-02-03)				
Station					MEL-01-08	DUP-01	Field Dup Method [a]	Result [b]	Outcome	MEL-02-03	DUP-02	Field Dup Method [a]	Result [b]	Outcome
Date Sampled					Mar-29					Mar-30				
ALS Sample ID			Lab	Field	WP2407830-004	WP2407830-006				WP2407827-002	WP2407827-006			
Parameter					Water	Water				Water	Water			
Cadmium	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL
Calcium	mg/L	0.010	20	30	12.9	13.5	RPD	-4.5	Pass RPD	11.3	10.7	RPD	5.5	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000008	0.000008	DIFF	-1E-07	Pass Diff	0.000010	0.000010	DIFF	0	Pass Diff
Chromium	mg/L	0.00010	20	30	<0.00010	<0.00010	<DL	<DL	<DL	<0.00010	<0.00010	<DL	<DL	<DL
Cobalt	mg/L	0.000005	20	30	0.000025	0.000025	DIFF	8E-07	Pass Diff	0.000018	0.000018	DIFF	3E-07	Pass Diff
Copper	mg/L	0.000050	20	30	0.0018	0.0018	RPD	1.7	Pass RPD	0.0013	0.0012	RPD	1.6	Pass RPD
Gallium	mg/L	0.000050	20	30	<0.000050	<0.000050	<DL	<DL	<DL	<0.000050	<0.000050	<DL	<DL	<DL
Iron	mg/L	0.0010	20	30	0.0045	0.0045	DIFF	0	Pass Diff	0.0029	0.0025	DIFF	0.0004	Pass Diff
Lanthanum	mg/L	0.000010	20	30	0.000015	0.000014	DIFF	0.000001	Pass Diff	0.000013	0.000011	DIFF	0.000002	Pass Diff
Lead	mg/L	0.000010	20	30	0.000016	0.000015	DIFF	1E-06	Pass Diff	0.000011	0.000011	DIFF	0	Pass Diff
Lithium	mg/L	0.00050	20	30	0.0015	0.0014	DIFF	5E-05	Pass Diff	0.0012	0.0011	DIFF	2E-05	Pass Diff
Magnesium	mg/L	0.0040	20	30	2.4	2.5	RPD	-5.3	Pass RPD	2.0	1.9	RPD	5.7	Pass RPD
Manganese	mg/L	0.000050	20	30	0.0015	0.0015	RPD	4	Pass RPD	0.0011	0.0011	RPD	4.6	Pass RPD
Molybdenum	mg/L	0.000050	20	30	0.00017	0.00017	DIFF	1E-06	Pass Diff	0.00013	0.00012	DIFF	7E-06	Pass Diff
Niobium	mg/L	0.000050	20	30	0.0012	0.0013	RPD	-2.4	Pass RPD	0.00093	0.00092	RPD	1.1	Pass RPD
Nickel	mg/L	0.00010	20	30	<0.00010	<0.00010	<DL	<DL	<DL	<0.00010	<0.00010	<DL	<DL	<DL
Phosphorus	mg/L	0.050	20	30	<0.050	<0.050	<DL	<DL	<DL	<0.050	<0.050	<DL	<DL	<DL
Potassium	mg/L	0.020	20	30	1.5	1.6	RPD	-0.6	Pass RPD	1.4	1.3	RPD	5.3	Pass RPD
Rhenium	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL
Rubidium	mg/L	0.000005	20	30	0.0020	0.0020	RPD	-1.5	Pass RPD	0.0019	0.0018	RPD	1.1	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000055	0.000050	DIFF	0.000005	Pass Diff	0.000042	0.000054	DIFF	-0.000012	Pass Diff
Silicon	mg/L	0.050	20	30	0.38	0.39	RPD	-1.8	Pass RPD	0.26	0.25	DIFF	0.009	Pass Diff
Silver	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL
Sodium	mg/L	0.020	20	30	10.7	11	RPD	-2.8	Pass RPD	8.3	8.0	RPD	4.4	Pass RPD
Strontium	mg/L	0.000020	20	30	0.076	0.075	RPD	0.4	Pass RPD	0.060	0.058	RPD	2.7	Pass RPD
Sulfur	mg/L	0.50	20	30	3.3	3.2	RPD	1.8	Pass RPD	2.3	2.3	DIFF	0.04	Pass Diff
Tantalum	mg/L	0.00010	20	30	<0.00010	<0.00010	<DL	<DL	<DL	<0.00010	<0.00010	<DL	<DL	<DL
Tellurium	mg/L	0.000020	20	30	<0.000020	<0.000020	<DL	<DL	<DL	<0.000020	<0.000020	<DL	<DL	<DL
Thallium	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL
Thorium	mg/L	0.000005	20	30	0.000006	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL
Tin	mg/L	0.000020	20	30	<0.000020	<0.000020	<DL	<DL	<DL	<0.000020	<0.000020	<DL	<DL	<DL
Titanium	mg/L	0.000050	20	30	<0.000050	<0.000050	<DL	<DL	<DL	<0.000050	<0.000050	<DL	<DL	<DL
Tungsten	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL	<0.000010	<0.000010	<DL	<DL	<DL
Uranium	mg/L	0.000001	20	30	0.000028	0.000027	RPD	4.1	Pass RPD	0.000017	0.000017	RPD	1.7	Pass RPD
Vanadium	mg/L	0.000050	20	30	<0.000050	<0.000050	<DL	<DL	<DL	<0.000050	<0.000050	<DL	<DL	<DL
Yttrium	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL	<0.000010	<0.000010	<DL	<DL	<DL
Zinc	mg/L	0.00050	20	30	0.0014	0.0013	DIFF	0.00015	Pass Diff	0.0013	0.0012	DIFF	6E-05	Pass Diff
Zirconium	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL	<0.000010	<0.000010	<DL	<DL	<DL
Dissolved Metals														
Aluminum	mg/L	0.0010	20	30	0.0037	<0.0010	<DL	<DL	<DL	<0.0010	<0.0010	<DL	<DL	<DL
Antimony	mg/L	0.000020	20	30	0.000023	0.000020	DIFF	0.000003	Pass Diff	<0.000020	<0.000020	<DL	<DL	<DL
Arsenic	mg/L	0.000020	20	30	0.00064	0.00059	RPD	8.6	Pass RPD	0.00058	0.00059	RPD	-0.3	Pass RPD
Barium	mg/L	0.000020	20	30	0.012	0.012	RPD	0.8	Pass RPD	0.011	0.011	RPD	0.9	Pass RPD
Beryllium	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL
Bismuth	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL
Boron	mg/L	0.0050	20	30	0.010	0.0098	DIFF	0.0002	Pass Diff	0.0072	0.0074	DIFF	-0.0002	Pass Diff
Cadmium	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL
Calcium	mg/L	0.010	20	30	13	12.7	RPD	2.3	Pass RPD	11	10.8	RPD	1.8	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000009	0.000009	DIFF	0	Pass Diff	0.000010	0.000010	DIFF	3E-07	Pass Diff
Chromium	mg/L	0.00010	20	30	<0.00010	<0.00010	<DL	<DL	<DL	<0.00010	<0.00010	<DL	<DL	<DL
Cobalt	mg/L	0.000005	20	30	0.000024	0.000022	DIFF	0.0000023	Pass Diff	0.000017	0.000015	DIFF	0.0000019	Pass Diff
Copper	mg/L	0.000050	20	30	0.0018	0.0018	RPD	1.1	Pass RPD	0.0013	0.0013	RPD	-0.8	Pass RPD
Gallium	mg/L	0.000050	20	30	<0.000050	<0.000050	<DL	<DL	<DL	<0.000050	<0.000050	<DL	<DL	<DL

Table A-3
Field duplicate results from the winter 2024 sampling event

Month	Units	March DLs	Relative Percent Difference DQOs		Winter DUP-1 (MEL-01-08)					Winter DUP-2 (MEL-02-03)				
Station					MEL-01-08	DUP-01	Field Dup Method [a]	Result [b]	Outcome	MEL-02-03	DUP-02	Field Dup Method [a]	Result [b]	Outcome
Date Sampled					Mar-29					Mar-30				
ALS Sample ID			Lab	Field	WP2407830-004	WP2407830-006				WP2407827-002	WP2407827-006			
Parameter					Water	Water				Water	Water			
Iron	mg/L	0.0010	20	30	0.0035	0.0036	DIFF	-1E-04	Pass Diff	0.0014	0.0014	DIFF	0	Pass Diff
Lanthanum	mg/L	0.000010	20	30	0.000014	0.000012	DIFF	0.000002	Pass Diff	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Lead	mg/L	0.000010	20	30	0.000018	0.000011	DIFF	0.000007	Pass Diff	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Lithium	mg/L	0.00050	20	30	0.0015	0.0014	DIFF	1E-05	Pass Diff	0.0012	0.0012	DIFF	0.00001	Pass Diff
Magnesium	mg/L	0.0040	20	30	2.4	2.5	RPD	-4.5	Pass RPD	2.0	1.9	RPD	3.6	Pass RPD
Manganese	mg/L	0.000050	20	30	0.00053	0.00040	RPD	28.3	Pass RPD	0.00045	0.00030	RPD	39.8	Fail
Mercury	ng/L	0.50	20	30	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*	*<0.50*	*<0.50*	-	-	-
Molybdenum	mg/L	0.000050	20	30	0.00017	0.00017	DIFF	4E-06	Pass Diff	0.00012	0.00012	DIFF	5E-06	Pass Diff
Nickel	mg/L	0.000050	20	30	0.0012	0.0012	RPD	2.4	Pass RPD	0.00088	0.00090	RPD	-2	Pass RPD
Niobium	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Phosphorus	mg/L	0.050	20	30	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*
Potassium	mg/L	0.020	20	30	1.6	1.5	RPD	3.9	Pass RPD	1.3	1.3	RPD	3.1	Pass RPD
Rhenium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Rubidium	mg/L	0.000005	20	30	0.0020	0.0020	RPD	0.5	Pass RPD	0.0019	0.0018	RPD	4.4	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000056	0.000054	DIFF	0.000002	Pass Diff	0.000043	0.000044	DIFF	-1E-06	Pass Diff
Silicon	mg/L	0.050	20	30	0.40	0.37	RPD	6	Pass RPD	0.25	0.26	DIFF	-0.005	Pass Diff
Silver	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Sodium	mg/L	0.020	20	30	10.7	11	RPD	-2.8	Pass RPD	8.2	7.9	RPD	3.7	Pass RPD
Strontium	mg/L	0.000020	20	30	0.077	0.075	RPD	2.8	Pass RPD	0.059	0.057	RPD	3.3	Pass RPD
Sulfur	mg/L	0.50	20	30	3.4	3.3	RPD	5.7	Pass RPD	2.3	2.4	DIFF	-0.06	Pass Diff
Tantalum	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Tellurium	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Thallium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Thorium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Tin	mg/L	0.000020	20	30	0.000042	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Titanium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Tungsten	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Uranium	mg/L	0.000001	20	30	0.000027	0.000024	RPD	10.7	Pass RPD	0.000017	0.000016	RPD	9.1	Pass RPD
Vanadium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Yttrium	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Zinc	mg/L	0.00050	20	30	0.0054	0.0014	DIFF	0.00402	Fail	0.0013	0.0012	DIFF	0.00001	Pass Diff
Zirconium	mg/L	0.000010		40	0.000028	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*

Notes:

[a] Field Dup Methods are based on the concentrations:

RPD = relative percent difference is used to compare field duplicates when the measured concentration is > 5x the DL

DIFF = when concentrations < 5* DL

[b] Results refer to the RPD or absolute difference in concentration

DQO for RPDs is < Field RPD values

DQO for DIFF is < 2x the DL

Italicized numbers are below detection limits.

Table A-4
Field duplicate results from the July 2024 sampling event

Month					July DUP-1 (MEL-03-05)					July DUP-2 (MEL-01-01)					July DUP-3 (A8-03)				
Station			Relative Percent Difference DQOs		MEL-03-05	DUP-1				MEL-01-01	DUP-2				A8-03	DUP-3			
Date Sampled					Jul-13		Field Dup Method [a]	Result [b]	Outcome	Jul-05		Field Dup Method [a]	Result [b]	Outcome	Jul-12		Field Dup Method [a]	Result [b]	Outcome
ALS Sample ID	Units	July DLs	Lab	Field	WP2417778-005	WP2417778-006				WP2417251-001	WP2417251-007				WP2417773-003	WP2417773-007			
Parameter					Water	Water				Water	Water				Water	Water			
Physical Tests																			
Conductivity	µS/cm	1.0	10	15	86.7	86.8	RPD	-0.1	Pass RPD	118	118	RPD	0	Pass RPD	295	294	RPD	0.3	Pass RPD
Acidity (as CaCO3)	mg/L	2.0		40	*<2.0*	*<2.0*	*<DL*	*<DL*	*<DL*	2.0	2.1	DIFF	-0.1	Pass Diff	*<2.0*	*<2.0*	*<DL*	*<DL*	*<DL*
Alkalinity, bicarbonate	mg/L	1.0		40	18.7	18.5	RPD	1.1	Pass RPD	20.4	20.5	RPD	-0.5	Pass RPD	65.7	65.8	RPD	-0.2	Pass RPD
Alkalinity, carbonate	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, hydroxide	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, phenolphthalein	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, total (as CaCO3)	mg/L	1.0		40	18.7	18.5	RPD	1.1	Pass RPD	20.4	20.5	RPD	-0.5	Pass RPD	65.7	65.8	RPD	-0.2	Pass RPD
Hardness, dissolved	mg/L	0.50		40	25.8	26.7	RPD	-3.4	Pass RPD	32.2	32	RPD	0.6	Pass RPD	114	109	RPD	4.5	Pass RPD
Total dissolved solids	mg/L	3.0		40	47.1	44.4	RPD	5.9	Pass RPD	66.6	51.9	RPD	24.8	Pass RPD	197	198	RPD	-0.5	Pass RPD
TDS Calculated (from Cond.)	mg/L	1.0		40	56.4	56.4	RPD	0	Pass RPD	76.7	76.7	RPD	0	Pass RPD	192	191	RPD	0.5	Pass RPD
TSS	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	1.2	1.4	DIFF	-0.2	Pass Diff	2.0	1.8	DIFF	0.2	Pass Diff
Turbidity	NTU	0.10		40	0.31	0.30	DIFF	0.01	Pass Diff	0.43	0.46	DIFF	-0.03	Pass Diff	0.71	0.76	RPD	-6.8	Pass RPD
pH	pH units	0.10		40	7.4	7.4	RPD	0	Pass RPD	7.3	7.3	RPD	0.1	Pass RPD	8.0	8.0	RPD	0.6	Pass RPD
Anions and Nutrients (Water)																			
Ammonia, total (as N)	mg/L	0.0050	20	30	0.058	0.012	DIFF	0.0461	Fail	0.0056	0.0056	DIFF	0	Pass Diff	*<0.0050*	0.012	*<DL*	*<DL*	*<DL*
Bromide	mg/L	0.10	20	30	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*	0.19	0.21	DIFF	-0.02	Pass Diff
Chloride	mg/L	0.10	20	30	10.5	10.6	RPD	-0.9	Pass RPD	16.9	17	RPD	-0.6	Pass RPD	42.6	42.6	RPD	0	Pass RPD
Fluoride	mg/L	0.020	20	30	0.024	0.028	DIFF	-0.004	Pass Diff	0.027	0.027	DIFF	0	Pass Diff	0.038	0.038	DIFF	0	Pass Diff
Kjeldahl nitrogen, dissolved	mg/L	0.050	20	30	0.20	0.21	DIFF	-0.012	Pass Diff	0.25	0.27	DIFF	-0.026	Pass Diff	0.40	0.41	RPD	-3.7	Pass RPD
Kjeldahl nitrogen, total	mg/L	0.050	20	30	0.22	0.22	DIFF	-0.001	Pass Diff	0.33	0.34	RPD	-2.1	Pass RPD	0.49	0.48	RPD	1	Pass RPD
Nitrate (as N)	mg/L	0.0050	20	30	*<0.0050*	*<0.0050*	*<DL*	*<DL*	*<DL*	*<0.0050*	*<0.0050*	*<DL*	*<DL*	*<DL*	0.012	0.0060	DIFF	0.006	Pass Diff
Nitrate + Nitrite (as N)	mg/L	0.0050	20	30	*<0.0051*	*<0.0051*	*<DL*	*<DL*	*<DL*	*<0.0051*	*<0.0051*	*<DL*	*<DL*	*<DL*	0.012	0.0060	DIFF	0.006	Pass Diff
Nitrite (as N)	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Nitrogen, total	mg/L	0.050	20	30	0.22	0.22	DIFF	-0.001	Pass Diff	0.33	0.34	RPD	-2.1	Pass RPD	0.50	0.49	RPD	2.2	Pass RPD
Nitrogen, total dissolved	mg/L	0.020	20	30	0.20	0.21	RPD	-5.8	Pass RPD	0.25	0.27	RPD	-10	Pass RPD	0.41	0.42	RPD	-2.2	Pass RPD
Phosphate, ortho-, dissolved (as P)	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	0.0018	0.0026	DIFF	-0.0008	Pass Diff
Phosphorus, total	mg/L	0.0010	20	30	0.0045	0.0050	DIFF	-0.0005	Pass Diff	0.0072	0.0066	RPD	8.7	Pass RPD	0.021	0.044	RPD	-72.8	Fail
Phosphorus, total dissolved	mg/L	0.0010	20	30	0.0019	0.0023	DIFF	-0.0004	Pass Diff	0.0024	0.0026	DIFF	-0.0002	Pass Diff	0.0054	0.0046	DIFF	0.0008	Pass Diff
Silicate (as SiO2)	mg/L	0.010	20	30	0.30	0.30	RPD	0	Pass RPD	0.66	0.65	RPD	1.2	Pass RPD	0.39	0.39	RPD	-0.5	Pass RPD
Sulfate (as SO4)	mg/L	0.30	20	30	4.0	4.1	RPD	-2.7	Pass RPD	6.9	7.0	RPD	-1.3	Pass RPD	10.8	10.7	RPD	0.9	Pass RPD
Cyanides																			
Cyanide, free	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Cyanide, total	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Cyanide, WAD	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Organic / Inorganic Carbon																			
Dissolved Organic Carbon	mg/L	0.50	20	30	3.2	3.5	RPD	-9	Pass RPD	5.4	4.7	RPD	14.5	Pass RPD	6.4	6.4	RPD	0.6	Pass RPD
Total Organic Carbon	mg/L	0.50	20	30	3.9	3.5	RPD	11.7	Pass RPD	4.6	4.3	RPD	6.5	Pass RPD	5.6	5.9	RPD	-5.2	Pass RPD
Mercury, total																			
Mercury, total	ng/L	0.1	20	30	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*	0.77	0.92	RPD	-17.8	Pass RPD	0.55	0.57	RPD	-3.6	Pass RPD
Total Metals																			
Aluminum	mg/L	0.0010	20	30	0.0041	0.0046	DIFF	-0.0005	Pass Diff	0.0037	0.0046	DIFF	-0.0009	Pass Diff	0.0058	0.0054	RPD	7.1	Pass RPD
Antimony	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	0.000032	0.000033	DIFF	-0.000001	Pass Diff
Arsenic	mg/L	0.000020	20	30	0.00051	0.00054	RPD	-6.6	Pass RPD	0.00063	0.00062	RPD	1.6	Pass RPD	0.0048	0.0049	RPD	-1.9	Pass RPD
Barium	mg/L	0.000020	20	30	0.0089	0.0088	RPD	1	Pass RPD	0.010	0.010	RPD	0	Pass RPD	0.030	0.029	RPD	2	Pass RPD
Beryllium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Bismuth	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Boron	mg/L	0.0050	20	30	*<0.0050*	*<0.0050*	*<DL*	*<DL*	*<DL*	0.0072	0.0068	DIFF	0.0004	Pass Diff	0.0054	0.0054	DIFF	0	Pass Diff
Cadmium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Calcium	mg/L	0.010	20	30	8.4	8.4	RPD	0.7	Pass RPD	9.8	9.8	RPD	-0.3	Pass RPD	39.4	38	RPD	3.6	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000014	0.000014	DIFF	-8E-07	Pass Diff	0.000010	0.000009	DIFF	0.0000011	Pass Diff	0.000018	0.000018	DIFF	1E-07	Pass Diff
Chromium	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Cobalt	mg/L	0.000005	20	30	0.000019	0.000019	DIFF	3E-07	Pass Diff	0.000035	0.000041	RPD	-15.8	Pass RPD	0.000068	0.000066	RPD	2.5	Pass RPD
Copper	mg/L	0.000050	20	30	0.0020	0.0024	RPD	-15.1	Pass RPD	0.00088	0.00086	RPD	2.8	Pass RPD	0.0015	0.0013	RPD	18.7	Pass RPD

Table A-4
Field duplicate results from the July 2024 sampling event

Month			Relative Percent Difference DQOs		July DUP-1 (MEL-03-05)					July DUP-2 (MEL-01-01)					July DUP-3 (A8-03)				
Station					MEL-03-05	DUP-1				MEL-01-01	DUP-2				A8-03	DUP-3			
Date Sampled	Units	July DLs			Jul-13		Field Dup Method [a]	Result [b]	Outcome	Jul-05		Field Dup Method [a]	Result [b]	Outcome	Jul-12		Field Dup Method [a]	Result [b]	Outcome
ALS Sample ID			Lab	Field	WP2417778-005	WP2417778-006				WP2417251-001	WP2417251-007				WP2417773-003	WP2417773-007			
Parameter					Water	Water				Water	Water				Water	Water			
Gallium	mg/L	0.000050	20	30	<0.000050	<0.000050	<DL	<DL	<DL	<0.000050	<0.000050	<DL	<DL	<DL	<0.000050	<0.000050	<DL	<DL	<DL
Iron	mg/L	0.0010	20	30	0.024	0.025	RPD	-7.3	Pass RPD	0.037	0.050	RPD	-29.9	Pass RPD	0.11	0.11	RPD	0	Pass RPD
Lanthanum	mg/L	0.000010	20	30	0.000034	0.000032	DIFF	0.000002	Pass Diff	0.000030	0.000038	DIFF	-0.000008	Pass Diff	0.000026	0.000027	DIFF	-0.000001	Pass Diff
Lead	mg/L	0.000010	20	30	0.000020	0.000028	DIFF	-0.000008	Pass Diff	0.000018	0.000050	DIFF	-0.000032	Fail	0.000072	0.000072	RPD	0	Pass RPD
Lithium	mg/L	0.00050	20	30	0.00077	0.00075	DIFF	2E-05	Pass Diff	0.0010	0.0010	DIFF	3E-05	Pass Diff	0.0079	0.0077	RPD	2.1	Pass RPD
Magnesium	mg/L	0.0040	20	30	1.4	1.4	RPD	0	Pass RPD	1.9	1.9	RPD	-0.5	Pass RPD	5.3	5.0	RPD	5.4	Pass RPD
Manganese	mg/L	0.000050	20	30	0.0040	0.0039	RPD	2	Pass RPD	0.011	0.011	RPD	0	Pass RPD	0.015	0.014	RPD	2.1	Pass RPD
Molybdenum	mg/L	0.000050	20	30	0.000092	0.000092	DIFF	0	Pass Diff	0.00012	0.00013	DIFF	-0.000005	Pass Diff	0.00033	0.00033	RPD	1.8	Pass RPD
Niobium	mg/L	0.000050	20	30	0.00050	0.00052	RPD	-2.2	Pass RPD	0.00082	0.00085	RPD	-3.9	Pass RPD	0.00097	0.00096	RPD	1.7	Pass RPD
Nickel	mg/L	0.00010	20	30	<0.00010	<0.00010	<DL	<DL	<DL	<0.00010	<0.00010	<DL	<DL	<DL	<0.00010	<0.00010	<DL	<DL	<DL
Phosphorus	mg/L	0.050	20	30	<0.050	<0.050	<DL	<DL	<DL	<0.050	<0.050	<DL	<DL	<DL	<0.050	<0.050	<DL	<DL	<DL
Potassium	mg/L	0.020	20	30	1.1	1.0	RPD	1.9	Pass RPD	1.2	1.2	RPD	-1.7	Pass RPD	2.2	2.2	RPD	2.3	Pass RPD
Rhenium	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL
Rubidium	mg/L	0.000005	20	30	0.0015	0.0015	RPD	0.7	Pass RPD	0.0016	0.0016	RPD	-0.6	Pass RPD	0.0021	0.0021	RPD	1.4	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000046	0.000041	DIFF	0.000005	Pass Diff	0.000055	0.000041	DIFF	0.000014	Pass Diff	0.000049	<0.000040	<DL	<DL	<DL
Silicon	mg/L	0.050	20	30	0.16	0.16	DIFF	-0.006	Pass Diff	0.35	0.34	RPD	1.7	Pass RPD	0.21	0.21	DIFF	0.001	Pass Diff
Silver	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL
Sodium	mg/L	0.020	20	30	5.7	5.7	RPD	0.3	Pass RPD	8.1	8.1	RPD	0.2	Pass RPD	11.2	10.6	RPD	5.5	Pass RPD
Strontium	mg/L	0.000020	20	30	0.042	0.042	RPD	0.7	Pass RPD	0.058	0.057	RPD	1.2	Pass RPD	0.23	0.23	RPD	0	Pass RPD
Sulfur	mg/L	0.50	20	30	1.7	1.6	DIFF	0.01	Pass Diff	2.7	2.7	RPD	2.2	Pass RPD	4.2	4.2	RPD	-0.2	Pass RPD
Tantalum	mg/L	0.00010	20	30	<0.00010	<0.00010	<DL	<DL	<DL	<0.00010	<0.00010	<DL	<DL	<DL	<0.00010	<0.00010	<DL	<DL	<DL
Tellurium	mg/L	0.000020	20	30	<0.000020	<0.000020	<DL	<DL	<DL	<0.000020	<0.000020	<DL	<DL	<DL	<0.000020	<0.000020	<DL	<DL	<DL
Thallium	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL
Thorium	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000100	<0.0000100	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL
Tin	mg/L	0.000020	20	30	0.000057	0.00010	DIFF	-0.000045	Fail	<0.000020	<0.000020	<DL	<DL	<DL	0.000030	0.000021	DIFF	0.000009	Pass Diff
Titanium	mg/L	0.000050	20	30	0.00023	0.00021	DIFF	0.000016	Pass Diff	0.000081	0.000099	DIFF	-0.000018	Pass Diff	0.00016	0.00017	DIFF	-0.000015	Pass Diff
Tungsten	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL	<0.000010	<0.000010	<DL	<DL	<DL	0.000032	0.000032	DIFF	0	Pass Diff
Uranium	mg/L	0.000001	20	30	0.000016	0.000017	RPD	-9.8	Pass RPD	0.000024	0.000022	RPD	7.3	Pass RPD	0.000079	0.000074	RPD	7.2	Pass RPD
Vanadium	mg/L	0.000050	20	30	<0.000050	<0.000050	<DL	<DL	<DL	<0.000050	<0.000050	<DL	<DL	<DL	0.000050	<0.000050	<DL	<DL	<DL
Yttrium	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL	<0.000010	<0.000010	<DL	<DL	<DL	<0.000010	<0.000010	<DL	<DL	<DL
Zinc	mg/L	0.00050	20	30	0.0012	0.0016	DIFF	-0.00041	Pass Diff	0.0012	0.00072	DIFF	0.00048	Pass Diff	0.0012	0.0010	DIFF	0.00015	Pass Diff
Zirconium	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL	<0.000010	<0.000010	<DL	<DL	<DL	<0.000010	<0.000010	<DL	<DL	<DL
Dissolved Metals																			
Aluminum	mg/L	0.0010	20	30	**0.0020**	0.0022	DIFF	-0.0002	Pass Diff	0.0017	0.0024	DIFF	-0.0007	Pass Diff	0.0014	0.0015	DIFF	-0.0001	Pass Diff
Antimony	mg/L	0.000020	20	30	<0.000020	<0.000020	<DL	<DL	<DL	<0.000020	<0.000020	<DL	<DL	<DL	0.000036	0.000034	DIFF	0.000002	Pass Diff
Arsenic	mg/L	0.000020	20	30	0.00046	0.00045	RPD	2.6	Pass RPD	0.00059	0.00062	RPD	-4.6	Pass RPD	0.0038	0.0038	RPD	-1.1	Pass RPD
Barium	mg/L	0.000020	20	30	0.0087	0.0087	RPD	0.1	Pass RPD	0.0097	0.0096	RPD	1.8	Pass RPD	0.030	0.029	RPD	2.4	Pass RPD
Beryllium	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL
Bismuth	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL
Boron	mg/L	0.0050	20	30	<0.0050	<0.0050	<DL	<DL	<DL	0.0076	0.0075	DIFF	0.0001	Pass Diff	0.0054	0.0053	DIFF	0.0001	Pass Diff
Cadmium	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL	<0.0000050	<0.0000050	<DL	<DL	<DL
Calcium	mg/L	0.010	20	30	8.1	8.5	RPD	-3.7	Pass RPD	9.9	9.8	RPD	1.1	Pass RPD	37.6	35.9	RPD	4.6	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000009	0.000010	DIFF	-6E-07	Pass Diff	0.000014	0.000012	DIFF	0.0000015	Pass Diff	0.000015	0.000015	DIFF	-1E-07	Pass Diff
Chromium	mg/L	0.00010	20	30	<0.00010	<0.00010	<DL	<DL	<DL	<0.00010	<0.00010	<DL	<DL	<DL	<0.00010	<0.00010	<DL	<DL	<DL
Cobalt	mg/L	0.000005	20	30	0.000008	0.000008	DIFF	-3E-07	Pass Diff	0.000018	0.000020	DIFF	-0.0000018	Pass Diff	0.000043	0.000040	RPD	6.5	Pass RPD
Copper	mg/L	0.000050	20	30	0.00085	0.00086	RPD	-1.3	Pass RPD	0.00086	0.0016	RPD	-60	Fail	0.00071	0.00075	RPD	-5.6	Pass RPD
Gallium	mg/L	0.000050	20	30	<0.000050	<0.000050	<DL	<DL	<DL	<0.000050	<0.000050	<DL	<DL	<DL	<0.000050	<0.000050	<DL	<DL	<DL
Iron	mg/L	0.0010	20	30	0.0069	0.0075	RPD	-8.3	Pass RPD	0.013	0.013	RPD	-0.8	Pass RPD	0.041	0.040	RPD	2.2	Pass RPD
Lanthanum	mg/L	0.000010	20	30	0.000012	0.000012	DIFF	0	Pass Diff	0.000015	0.000016	DIFF	-1E-06	Pass Diff	<0.000010	<0.000010	<DL	<DL	<DL
Lead	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL	<0.000010	<0.000010	<DL	<DL	<DL	0.000024	0.000022	DIFF	0.000002	Pass Diff
Lithium	mg/L	0.00050	20	30	0.00072	0.00072	DIFF	0	Pass Diff	0.0011	0.0010	DIFF	0.00001	Pass Diff	0.0078	0.0074	RPD	4.9	Pass RPD
Magnesium	mg/L	0.0040	20	30	1.3	1.4	RPD	-2.2	Pass RPD	1.8	1.8	RPD	0	Pass RPD	4.9	4.7	RPD	3.9	Pass RPD
Manganese	mg/L	0.000050	20	30	0.00066	0.00068	RPD	-3.4	Pass RPD	0.0032	0.0031	RPD	1.9	Pass RPD	0.0023	0.0022	RPD	4.8	Pass RPD
Mercury	ng/L	0.50	20	30	<0.50	0.82	<DL	<DL	<DL	<0.50	<0.50	<DL	<DL	<DL	0.56	<0.50	<DL	<DL	<DL
Molybdenum	mg/L	0.000050	20	30	0.000088	0.000094	DIFF	-0.000006	Pass Diff	0.00012	0.00012	DIFF	0	Pass Diff	0.00033	0.00031	RPD	3.8	Pass RPD
Nickel	mg/L	0.000050	20	30	0.00047	0.00048	RPD	-2.3	Pass RPD	0.00080	0.00081	RPD	-1.9	Pass RPD	0.00092	0.00085	RPD	7.8	Pass RPD
Niobium	mg/L	0.00010	20	30	<0.00010	<0.00010	<DL	<DL	<DL	<0.00010	<0.00010	<DL	<DL	<DL	<0.00010	<0.00010	<DL	<DL	<DL
Phosphorus	mg/L	0.050	20	30	<0.050	<0.050	<DL	<DL	<DL	<0.050	<0.050	<DL	<DL	<DL	<0.050	<0.050	<DL	<DL	<DL

Table A-4
Field duplicate results from the July 2024 sampling event

Month					July DUP-1 (MEL-03-05)					July DUP-2 (MEL-01-01)					July DUP-3 (A8-03)				
Station			Relative Percent Difference DQOs		MEL-03-05	DUP-1				MEL-01-01	DUP-2				A8-03	DUP-3			
Date Sampled					Jul-13		Field Dup Method [a]	Result [b]	Outcome	Jul-05		Field Dup Method [a]	Result [b]	Outcome	Jul-12		Field Dup Method [a]	Result [b]	Outcome
ALS Sample ID	Units	July DLs	Lab	Field	WP2417778-005	WP2417778-006				WP2417251-001	WP2417251-007				WP2417773-003	WP2417773-007			
Parameter					Water	Water				Water	Water				Water	Water			
Potassium	mg/L	0.020	20	30	1.0	1.0	RPD	-2.9	Pass RPD	1.2	1.2	RPD	0.9	Pass RPD	2.1	2.0	RPD	4.8	Pass RPD
Rhenium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Rubidium	mg/L	0.000005	20	30	0.0015	0.0015	RPD	-1.4	Pass RPD	0.0015	0.0015	RPD	0.7	Pass RPD	0.0021	0.0020	RPD	4.9	Pass RPD
Selenium	mg/L	0.000040	20	30	*<0.000040*	0.000042	*<DL*	*<DL*	*<DL*	0.000052	0.000047	DIFF	0.000005	Pass Diff	*<0.000040*	*<0.000040*	*<DL*	*<DL*	*<DL*
Silicon	mg/L	0.050	20	30	0.16	0.16	DIFF	0.001	Pass Diff	0.34	0.35	RPD	-2.9	Pass RPD	0.20	0.20	DIFF	-0.003	Pass Diff
Silver	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Sodium	mg/L	0.020	20	30	5.6	5.8	RPD	-3	Pass RPD	8.0	8.1	RPD	-1.4	Pass RPD	10.4	10	RPD	3.9	Pass RPD
Strontium	mg/L	0.000020	20	30	0.043	0.044	RPD	-2.3	Pass RPD	0.055	0.055	RPD	1.1	Pass RPD	0.23	0.22	RPD	4	Pass RPD
Sulfur	mg/L	0.50	20	30	1.6	1.6	DIFF	0.01	Pass Diff	2.7	2.7	RPD	-0.7	Pass RPD	4.1	4.1	RPD	-0.7	Pass RPD
Tantalum	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Tellurium	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Thallium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Thorium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Tin	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	0.000024	0.000057	DIFF	-0.000033	Pass Diff	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Titanium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Tungsten	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	0.000027	0.000029	DIFF	-0.000002	Pass Diff
Uranium	mg/L	0.000001	20	30	0.000017	0.000017	RPD	2.9	Pass RPD	0.000021	0.000020	RPD	2.9	Pass RPD	0.000082	0.000078	RPD	5.1	Pass RPD
Vanadium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Yttrium	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Zinc	mg/L	0.00050	20	30	0.0014	0.0013	DIFF	4E-05	Pass Diff	0.0019	0.0051	DIFF	-0.00314	Fail	0.0015	0.00072	DIFF	0.00078	Pass Diff
Zirconium	mg/L	0.000010		40	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*

Notes:

[a] Field Dup Methods are based on the concentrations:

RPD = relative percent difference is used to compare field duplicates when the measured concentration is > 5x the DL

DIFF = when concentrations < 5* DL

[b] Results refer to the RPD or absolute difference in concentration

DQO for RPDs is < Field RPD values

DQO for DIFF is < 2x the DL

Italicized numbers are below detection limits.

Table A-5
Field duplicate results from the Augsut 2024 sampling event

Month			Relative Percent Difference DQOs		August DUP-1 (MEL-03-04)					August DUP-2 (MEL-01-01)					August DUP-3 (MEL-04-02)				
Station					MEL-03-04	DUP-1				MEL-01-01	DUP-2				MEL-04-02	DUP-3			
Date Sampled	Units	August DLs			2024-08-12	2024-08-12	Field Dup Method [a]	Result [b]	Outcome	2024-08-13	2024-08-13	Field Dup Method [a]	Result [b]	Outcome	2024-08-20	2024-08-20	Field Dup Method [a]	Result [b]	Outcome
ALS Sample ID			Lab	Field	WP2420164-004	WP2420164-006				WP2420157-001	WP2420157-007				WP2421060-002	WP2421056-001			
Parameter					Water	Water				Water	Water				Water	Water			
Physical Tests																			
Conductivity	µS/cm	1.0	10	15	90.1	93.3	RPD	-3.5	Pass RPD	113	113	RPD	0	Pass RPD	91.5	91.1	RPD	0.4	Pass RPD
Acidity (as CaCO3)	mg/L	2.0		40	*<2.0*	*<2.0*	*<DL*	*<DL*	*<DL*	*<2.0*	*<2.0*	*<DL*	*<DL*	*<DL*	*<2.0*	*<2.0*	*<DL*	*<DL*	*<DL*
Alkalinity, bicarbonate	mg/L	1.0		40	19.2	20.2	RPD	-5.1	Pass RPD	20.4	20.6	RPD	-1	Pass RPD	19.4	18.7	RPD	3.7	Pass RPD
Alkalinity, carbonate	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, hydroxide	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, phenolphthalein	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, total (as CaCO3)	mg/L	1.0		40	19.2	20.2	RPD	-5.1	Pass RPD	20.4	20.6	RPD	-1	Pass RPD	19.4	18.7	RPD	3.7	Pass RPD
Hardness, dissolved	mg/L	0.50		40	26.4	25.9	RPD	1.9	Pass RPD	33.5	30.7	RPD	8.7	Pass RPD	24.4	24.8	RPD	-1.6	Pass RPD
Total dissolved solids	mg/L	3.0		40	47.3	51.3	RPD	-8.1	Pass RPD	52.3	65	RPD	-21.7	Pass RPD	54.1	40.8	RPD	28	Pass RPD
TDS Calculated (from Cond.)	mg/L	1.0		40	58.6	60.6	RPD	-3.4	Pass RPD	73.4	73.4	RPD	0	Pass RPD	59.5	59.2	RPD	0.5	Pass RPD
TSS	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Turbidity	NTU	0.10		40	0.25	0.20	DIFF	0.05	Pass Diff	0.30	0.32	DIFF	-0.02	Pass Diff	0.21	0.18	DIFF	0.03	Pass Diff
pH	pH units	0.10		40	7.5	7.4	RPD	0.4	Pass RPD	7.5	7.5	RPD	0	Pass RPD	7.3	7.3	RPD	0.4	Pass RPD
Anions and Nutrients (Water)																			
Ammonia, total (as N)	mg/L	0.0050	20	30	0.019	0.0086	DIFF	0.01	Fail	*<0.0050*	*<0.0050*	*<DL*	*<DL*	*<DL*	0.011	0.014	DIFF	-0.0023	Pass Diff
Bromide	mg/L	0.10	20	30	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*
Chloride	mg/L	0.10	20	30	11.5	11.6	RPD	-0.9	Pass RPD	15.8	15.9	RPD	-0.6	Pass RPD	11.2	11.4	RPD	-1.8	Pass RPD
Fluoride	mg/L	0.020	20	30	0.032	0.032	DIFF	0	Pass Diff	0.035	0.033	DIFF	0.002	Pass Diff	0.027	0.027	DIFF	0	Pass Diff
Kjeldahl nitrogen, dissolved	mg/L	0.050	20	30	0.23	0.21	DIFF	0.021	Pass Diff	0.26	0.29	RPD	-12.2	Pass RPD	0.21	0.17	DIFF	0.041	Pass Diff
Kjeldahl nitrogen, total	mg/L	0.050	20	30	0.24	0.30	DIFF	-0.064	Pass Diff	0.35	0.34	RPD	2.3	Pass RPD	0.22	0.24	DIFF	-0.017	Pass Diff
Nitrate (as N)	mg/L	0.0050	20	30	*<0.0050*	*<0.0050*	*<DL*	*<DL*	*<DL*	*<0.0050*	*<0.0050*	*<DL*	*<DL*	*<DL*	*<0.0050*	*<0.0050*	*<DL*	*<DL*	*<DL*
Nitrate + Nitrite (as N)	mg/L	0.0050	20	30	*<0.0051*	*<0.0051*	*<DL*	*<DL*	*<DL*	*<0.0051*	*<0.0051*	*<DL*	*<DL*	*<DL*	*<0.0051*	*<0.0051*	*<DL*	*<DL*	*<DL*
Nitrite (as N)	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Nitrogen, total	mg/L	0.050	20	30	0.24	0.30	DIFF	-0.064	Pass Diff	0.35	0.34	RPD	2.3	Pass RPD	0.22	0.24	DIFF	-0.017	Pass Diff
Nitrogen, total dissolved	mg/L	0.020	20	30	0.23	0.21	RPD	9.5	Pass RPD	0.26	0.29	RPD	-12.2	Pass RPD	0.21	0.17	RPD	21.9	Pass RPD
Phosphate, ortho-, dissolved (as P)	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Phosphorus, total	mg/L	0.0010	20	30	0.0034	0.0034	DIFF	0	Pass Diff	0.0055	0.0076	RPD	-32.1	Fail	0.0049	0.0042	DIFF	0.0007	Pass Diff
Phosphorus, total dissolved	mg/L	0.0010	20	30	0.0019	0.0019	DIFF	0	Pass Diff	0.0030	0.0033	DIFF	-0.0003	Pass Diff	0.0023	0.0017	DIFF	0.0006	Pass Diff
Silicate (as SiO2)	mg/L	0.010	20	30	0.34	0.34	RPD	0	Pass RPD	0.50	0.50	RPD	0.6	Pass RPD	0.38	0.38	RPD	0.8	Pass RPD
Sulfate (as SO4)	mg/L	0.30	20	30	4.6	4.6	RPD	0.2	Pass RPD	7.0	6.9	RPD	0.7	Pass RPD	4.3	4.3	RPD	-0.7	Pass RPD
Cyanides																			
Cyanide, free	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Cyanide, total	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Cyanide, WAD	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Organic / Inorganic Carbon																			
Dissolved Organic Carbon	mg/L	0.50	20	30	3.5	3.1	RPD	13.3	Pass RPD	4.0	4.2	RPD	-4.8	Pass RPD	3.4	3.1	RPD	9.2	Pass RPD
Total Organic Carbon	mg/L	0.50	20	30	3.0	3.0	RPD	-0.3	Pass RPD	4.3	4.0	RPD	7.2	Pass RPD	3.1	2.9	RPD	3.7	Pass RPD
Mercury, total																			
Mercury, total	ng/L	0.1	20	30	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*
Total Metals																			
Aluminum	mg/L	0.0010	20	30	0.0024	0.0021	DIFF	0.0003	Pass Diff	0.0035	0.0028	DIFF	0.0007	Pass Diff	0.0020	0.0016	DIFF	0.0004	Pass Diff
Antimony	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Arsenic	mg/L	0.000020	20	30	0.00046	0.00045	RPD	2.4	Pass RPD	0.00064	0.00062	RPD	4.4	Pass RPD	0.00042	0.00045	RPD	-5.3	Pass RPD
Barium	mg/L	0.000020	20	30	0.0086	0.0083	RPD	3.1	Pass RPD	0.0089	0.0087	RPD	1.8	Pass RPD	0.0087	0.0086	RPD	0.3	Pass RPD
Beryllium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Bismuth	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Boron	mg/L	0.0050	20	30	0.0050	0.0051	DIFF	-0.0001	Pass Diff	0.0069	0.0071	DIFF	-0.0002	Pass Diff	*<0.0050*	0.0051	*<DL*	*<DL*	*<DL*
Cadmium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Calcium	mg/L	0.010	20	30	8.5	8.5	RPD	0.8	Pass RPD	9.6	9.8	RPD	-2.7	Pass RPD	7.7	7.3	RPD	5.1	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000010	0.000010	DIFF	8E-07	Pass Diff	0.000008	0.000008	DIFF	-3E-07	Pass Diff	0.000011	0.000010	DIFF	0.0000004	Pass Diff
Chromium	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	0.00042	*<0.00010*	*<DL*	*<DL*	*<DL*
Cobalt	mg/L	0.000005	20	30	0.000016	0.000015	DIFF	3E-07	Pass Diff	0.000023	0.000022	DIFF	0.0000011	Pass Diff	0.000017	0.000013	DIFF	0.0000039	Pass Diff
Copper	mg/L	0.000050	20	30	0.00083	0.00082	RPD	0.4	Pass RPD	0.00093	0.00093	RPD	0.1	Pass RPD	0.032	0.00071	RPD	191.5	Fail

Month			Relative Percent Difference DQOs		August DUP-1 (MEL-03-04)					August DUP-2 (MEL-01-01)					August DUP-3 (MEL-04-02)				
Station					MEL-03-04	DUP-1				MEL-01-01	DUP-2				MEL-04-02	DUP-3			
Date Sampled					2024-08-12	2024-08-12	Field Dup Method [a]	Result [b]	Outcome	2024-08-13	2024-08-13	Field Dup Method [a]	Result [b]	Outcome	2024-08-20	2024-08-20	Field Dup Method [a]	Result [b]	Outcome
ALS Sample ID			Lab	Field	WP2420164-004	WP2420164-006				WP2420157-001	WP2420157-007				WP2421060-002	WP2421056-001			
Parameter	**Units**	**August DLs**			Water	Water				Water	Water				Water	Water			
Gallium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Iron	mg/L	0.0010	20	30	0.011	0.012	RPD	-7.6	Pass RPD	0.020	0.019	RPD	9.2	Pass RPD	0.020	0.011	RPD	62.8	Fail
Lanthanum	mg/L	0.000010	20	30	0.000015	0.000014	DIFF	0.000001	Pass Diff	0.000025	0.000021	DIFF	0.000004	Pass Diff	0.000016	0.000014	DIFF	0.000002	Pass Diff
Lead	mg/L	0.000010	20	30	0.000016	0.000010	DIFF	0.000006	Pass Diff	0.000011	0.000011	DIFF	0	Pass Diff	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Lithium	mg/L	0.00050	20	30	0.00081	0.00078	DIFF	0.00003	Pass Diff	0.00092	0.00091	DIFF	0.00001	Pass Diff	0.00083	0.00087	DIFF	-0.00004	Pass Diff
Magnesium	mg/L	0.0040	20	30	1.4	1.4	RPD	0	Pass RPD	1.7	1.8	RPD	-2.3	Pass RPD	1.3	1.3	RPD	2.4	Pass RPD
Manganese	mg/L	0.000050	20	30	0.0039	0.0040	RPD	-3	Pass RPD	0.0059	0.0054	RPD	8.9	Pass RPD	0.0044	0.0040	RPD	11	Pass RPD
Molybdenum	mg/L	0.000050	20	30	0.000092	0.000090	DIFF	2E-06	Pass Diff	0.00013	0.00013	DIFF	2E-06	Pass Diff	0.00017	0.000080	DIFF	0.000088	Pass Diff
Niobium	mg/L	0.000050	20	30	0.00047	0.00047	RPD	1.5	Pass RPD	0.00073	0.00072	RPD	1	Pass RPD	0.00048	0.00044	RPD	7	Pass RPD
Nickel	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Phosphorus	mg/L	0.050	20	30	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*
Potassium	mg/L	0.020	20	30	1.1	1.1	RPD	0.9	Pass RPD	1.2	1.2	RPD	-1.7	Pass RPD	0.99	0.94	RPD	5.7	Pass RPD
Rhenium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Rubidium	mg/L	0.000005	20	30	0.0015	0.0015	RPD	1.3	Pass RPD	0.0016	0.0016	RPD	-0.6	Pass RPD	0.0015	0.0013	RPD	12.2	Pass RPD
Selenium	mg/L	0.000040	20	30	*<0.000040*	*<0.000040*	*<DL*	*<DL*	*<DL*	0.000044	0.000048	DIFF	-0.000004	Pass Diff	0.000040	*<0.000040*	*<DL*	*<DL*	*<DL*
Silicon	mg/L	0.050	20	30	0.17	0.17	DIFF	-0.002	Pass Diff	0.25	0.29	RPD	-11.9	Pass RPD	0.19	0.20	DIFF	-0.017	Pass Diff
Silver	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Sodium	mg/L	0.020	20	30	5.8	5.7	RPD	1.6	Pass RPD	7.6	7.9	RPD	-3.7	Pass RPD	5.3	5.1	RPD	2.9	Pass RPD
Strontium	mg/L	0.000020	20	30	0.046	0.045	RPD	1.5	Pass RPD	0.057	0.057	RPD	-0.9	Pass RPD	0.040	0.038	RPD	5.1	Pass RPD
Sulfur	mg/L	0.50	20	30	1.7	1.7	DIFF	0	Pass Diff	2.4	2.4	DIFF	0	Pass Diff	1.6	1.7	DIFF	-0.05	Pass Diff
Tantalum	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Tellurium	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Thallium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Thorium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Tin	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	0.000024	*<DL*	*<DL*	*<DL*	0.000057	0.000025	DIFF	0.000032	Pass Diff
Titanium	mg/L	0.000050	20	30	0.000051	*<0.000050*	*<DL*	*<DL*	*<DL*	0.00011	0.000071	DIFF	0.000037	Pass Diff	0.000051	*<0.000050*	*<DL*	*<DL*	*<DL*
Tungsten	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Uranium	mg/L	0.000001	20	30	0.000018	0.000019	RPD	-5.9	Pass RPD	0.000027	0.000023	RPD	15.7	Pass RPD	0.000016	0.000018	RPD	-13.6	Pass RPD
Vanadium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Yttrium	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Zinc	mg/L	0.00050	20	30	0.0015	*<0.00050*	*<DL*	*<DL*	*<DL*	0.00060	*<0.00050*	*<DL*	*<DL*	*<DL*	*<0.00050*	*<0.00050*	*<DL*	*<DL*	*<DL*
Zirconium	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Dissolved Metals																			
Aluminum	mg/L	0.0010	20	30	0.0013	0.0026	DIFF	-0.0013	Pass Diff	0.0022	0.0023	DIFF	-1E-04	Pass Diff	*<0.0010*	0.0017	*<DL*	*<DL*	*<DL*
Antimony	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Arsenic	mg/L	0.000020	20	30	0.00046	0.00047	RPD	-1.1	Pass RPD	0.00064	0.00062	RPD	3.3	Pass RPD	0.00044	0.00044	RPD	-1.4	Pass RPD
Barium	mg/L	0.000020	20	30	0.0083	0.0085	RPD	-1.3	Pass RPD	0.0086	0.0089	RPD	-3.5	Pass RPD	0.0086	0.0085	RPD	0.5	Pass RPD
Beryllium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Bismuth	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Boron	mg/L	0.0050	20	30	*<0.0050*	*<0.0050*	*<DL*	*<DL*	*<DL*	0.0073	0.0066	DIFF	0.0007	Pass Diff	*<0.0050*	0.0052	*<DL*	*<DL*	*<DL*
Cadmium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Calcium	mg/L	0.010	20	30	8.4	8.2	RPD	1.8	Pass RPD	10.3	9.5	RPD	8.3	Pass RPD	7.7	7.8	RPD	-1	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000010	0.000010	DIFF	-1E-07	Pass Diff	0.000008	0.000008	DIFF	1E-07	Pass Diff	0.000010	0.000010	DIFF	0	Pass Diff
Chromium	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Cobalt	mg/L	0.000005	20	30	0.000008	0.000008	DIFF	-3E-07	Pass Diff	0.000015	0.000015	DIFF	1E-07	Pass Diff	0.000008	0.000008	DIFF	-9E-07	Pass Diff
Copper	mg/L	0.000050	20	30	0.00081	0.00082	RPD	-1.2	Pass RPD	0.00099	0.00090	RPD	9.5	Pass RPD	0.00073	0.00076	RPD	-3.9	Pass RPD
Gallium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Iron	mg/L	0.0010	20	30	0.0040	0.0070	DIFF	-0.003	Fail	0.0083	0.0088	RPD	-5.8	Pass RPD	0.0031	0.0050	DIFF	-0.0019	Pass Diff
Lanthanum	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	0.000011	0.000013	DIFF	-0.000002	Pass Diff	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Lead	mg/L	0.000010	20	30	*<0.000010*	0.000027	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Lithium	mg/L	0.00050	20	30	0.00074	0.00075	DIFF	-0.00001	Pass Diff	0.00096	0.00083	DIFF	0.00013	Pass Diff	0.00077	0.00085	DIFF	-0.00008	Pass Diff
Magnesium	mg/L	0.0040	20	30	1.3	1.3	RPD	1.5	Pass RPD	1.9	1.7	RPD	11.1	Pass RPD	1.3	1.3	RPD	-4.7	Pass RPD
Manganese	mg/L	0.000050	20	30	0.00051	0.00051	RPD	-0.2	Pass RPD	0.00051	0.00047	RPD	9.6	Pass RPD	0.00042	0.00044	RPD	-5.1	Pass RPD
Mercury	ng/L	0.50	20	30	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*
Molybdenum	mg/L	0.000050	20	30	0.00010	0.000089	DIFF	0.000011	Pass Diff	0.00013	0.00013	DIFF	-1E-06	Pass Diff	0.000084	0.000084	DIFF	0	Pass Diff
Nickel	mg/L	0.000050	20	30	0.00046	0.00047	RPD	-2.8	Pass RPD	0.00072	0.00071	RPD	1.5	Pass RPD	0.00043	0.00045	RPD	-4.5	Pass RPD
Niobium	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Phosphorus	mg/L	0.050	20	30	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*

Table A-5
Field duplicate results from the Augsut 2024 sampling event

Month			Relative Percent Difference DQOs		August DUP-1 (MEL-03-04)					August DUP-2 (MEL-01-01)					August DUP-3 (MEL-04-02)				
Station					MEL-03-04	DUP-1				MEL-01-01	DUP-2				MEL-04-02	DUP-3			
Date Sampled					2024-08-12	2024-08-12	Field Dup Method [a]	Result [b]	Outcome	2024-08-13	2024-08-13	Field Dup Method [a]	Result [b]	Outcome	2024-08-20	2024-08-20	Field Dup Method [a]	Result [b]	Outcome
ALS Sample ID			Lab	Field	WP2420164-004	WP2420164-006				WP2420157-001	WP2420157-007				WP2421060-002	WP2421056-001			
Parameter	Units	August DLs			Water	Water				Water	Water				Water	Water			
Potassium	mg/L	0.020	20	30	1.1	1.0	RPD	1	Pass RPD	1.3	1.2	RPD	6.6	Pass RPD	0.95	0.98	RPD	-3	Pass RPD
Rhenium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Rubidium	mg/L	0.000005	20	30	0.0015	0.0015	RPD	1.4	Pass RPD	0.0016	0.0016	RPD	3.8	Pass RPD	0.0014	0.0014	RPD	0	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000041	*<0.000040*	*<DL*	*<DL*	*<DL*	0.000046	0.000042	DIFF	0.000004	Pass Diff	*<0.000040*	0.000041	*<DL*	*<DL*	*<DL*
Silicon	mg/L	0.050	20	30	0.16	0.16	DIFF	0.003	Pass Diff	0.26	0.26	RPD	1.5	Pass RPD	0.20	0.21	DIFF	-0.017	Pass Diff
Silver	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Sodium	mg/L	0.020	20	30	5.7	5.5	RPD	3.6	Pass RPD	8.5	7.5	RPD	12.5	Pass RPD	5.1	5.4	RPD	-4.4	Pass RPD
Strontium	mg/L	0.000020	20	30	0.044	0.043	RPD	2.7	Pass RPD	0.058	0.056	RPD	3	Pass RPD	0.040	0.040	RPD	-0.8	Pass RPD
Sulfur	mg/L	0.50	20	30	1.7	1.6	DIFF	0.05	Pass Diff	2.5	2.4	DIFF	0.06	Pass Diff	1.6	1.7	DIFF	-0.1	Pass Diff
Tantalum	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Tellurium	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Thallium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Thorium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	0.000007	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Tin	mg/L	0.000020	20	30	0.000027	0.000057	DIFF	-0.00003	Pass Diff	0.000027	0.000080	DIFF	-0.000053	Fail	*<0.000020*	0.000023	*<DL*	*<DL*	*<DL*
Titanium	mg/L	0.000050	20	30	*<0.000050*	0.000055	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Tungsten	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Uranium	mg/L	0.000001	20	30	0.000017	0.000018	RPD	-2.3	Pass RPD	0.000021	0.000023	RPD	-7.6	Pass RPD	0.000015	0.000017	RPD	-11	Pass RPD
Vanadium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Yttrium	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Zinc	mg/L	0.00050	20	30	0.0017	0.0020	DIFF	-0.00029	Pass Diff	0.0010	0.0017	DIFF	-0.0007	Pass Diff	*<0.00050*	*<0.00050*	*<DL*	*<DL*	*<DL*
Zirconium	mg/L	0.000010		40	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*

Notes:

[a] Field Dup Methods are based on the concentrations:

RPD = relative percent difference is used to compare field duplicates when the measured concentration is > 5x the DL

DIFF = when concentrations < 5* DL

[b] Results refer to the RPD or absolute difference in concentration

DQO for RPDs is < Field RPD values

DQO for DIFF is < 2x the DL

Italicized numbers are below detection limits.

nc = not collected

Table A-5
Field duplicate results from the Augsut 2024 sampling event

Month	Units	August DLs	Relative Percent Difference DQOs		August DUP-4 (B7-01)					August DUP-5 (AL-02)				
Station					B7-01	DUP-4	Field Dup Method [a]	Result [b]	Outcome	AL-02	DUP-5	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2024-08-23	2024-08-23				2024-08-18	2024-08-18			
ALS Sample ID			Lab	Field	WP2421037-004	WP2421056-002				WP2421048-002	WP2421056-003			
Parameter					Water	Water				Water	Water			
Physical Tests														
Conductivity	µS/cm	1.0	10	15	318	315	RPD	0.9	Pass RPD	100	nc			
Acidity (as CaCO3)	mg/L	2.0		40	*<2.0*	*<2.0*	*<DL*	*<DL*	*<DL*	*<2.0*	nc			
Alkalinity, bicarbonate	mg/L	1.0		40	63.2	62.4	RPD	1.3	Pass RPD	20.9	nc			
Alkalinity, carbonate	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	nc			
Alkalinity, hydroxide	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	nc			
Alkalinity, phenolphthalein	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	nc			
Alkalinity, total (as CaCO3)	mg/L	1.0		40	63.2	62.4	RPD	1.3	Pass RPD	20.9	nc			
Hardness, dissolved	mg/L	0.50		40	101	109	RPD	-7.6	Pass RPD	25.3	nc			
Total dissolved solids	mg/L	3.0		40	226	206	RPD	9.3	Pass RPD	56.4	nc			
TDS Calculated (from Cond.)	mg/L	1.0		40	207	205	RPD	1	Pass RPD	65	nc			
TSS	mg/L	1.0		40	1.3	1.0	DIFF	0.3	Pass Diff	1.0	*<1.0*	*<DL*	*<DL*	*<DL*
Turbidity	NTU	0.10		40	0.48	0.42	DIFF	0.06	Pass Diff	0.26	nc			
pH	pH units	0.10		40	8.0	7.8	RPD	1.6	Pass RPD	7.3	nc			
Anions and Nutrients (Water)														
Ammonia, total (as N)	mg/L	0.0050	20	30	0.031	0.14	RPD	-127.2	Fail	0.0056	*<0.0050*	*<DL*	*<DL*	*<DL*
Bromide	mg/L	0.10	20	30	0.20	0.19	DIFF	0.01	Pass Diff	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*
Chloride	mg/L	0.10	20	30	47.2	48.5	RPD	-2.7	Pass RPD	12.9	nc			
Fluoride	mg/L	0.020	20	30	0.043	0.044	DIFF	-0.001	Pass Diff	0.029	nc			
Kjeldahl nitrogen, dissolved	mg/L	0.050	20	30	0.49	0.48	RPD	1.9	Pass RPD	0.21	0.19	DIFF	0.023	Pass Diff
Kjeldahl nitrogen, total	mg/L	0.050	20	30	0.48	0.62	RPD	-24.9	Pass RPD	0.21	0.20	DIFF	0.013	Pass Diff
Nitrate (as N)	mg/L	0.0050	20	30	0.0074	0.0070	DIFF	0.0004	Pass Diff	*<0.0050*	*<0.0050*	*<DL*	*<DL*	*<DL*
Nitrate + Nitrite (as N)	mg/L	0.0050	20	30	0.0074	0.0070	DIFF	0.0004	Pass Diff	*<0.0051*	nc			
Nitrite (as N)	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Nitrogen, total	mg/L	0.050	20	30	0.49	0.63	RPD	-24.6	Pass RPD	0.21	0.20	DIFF	0.013	Pass Diff
Nitrogen, total dissolved	mg/L	0.020	20	30	0.49	0.49	RPD	1.8	Pass RPD	0.21	0.19	RPD	11.7	Pass RPD
Phosphate, ortho-, dissolved (as P)	mg/L	0.0010	20	30	0.0016	0.0010	DIFF	0.0006	Pass Diff	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Phosphorus, total	mg/L	0.0010	20	30	0.0064	0.0075	RPD	-15.8	Pass RPD	0.0039	0.012	DIFF	-0.0077	Fail
Phosphorus, total dissolved	mg/L	0.0010	20	30	0.0039	0.0040	DIFF	-0.0001	Pass Diff	0.0020	0.0018	DIFF	0.0002	Pass Diff
Silicate (as SiO2)	mg/L	0.010	20	30	1.8	1.8	RPD	0	Pass RPD	0.76	0.76	RPD	0.4	Pass RPD
Sulfate (as SO4)	mg/L	0.30	20	30	12.8	13.1	RPD	-2.3	Pass RPD	4.4	nc			
Cyanides														
Cyanide, free	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Cyanide, total	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Cyanide, WAD	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Organic / Inorganic Carbon														
Dissolved Organic Carbon	mg/L	0.50	20	30	7.0	7.4	RPD	-5.8	Pass RPD	5.0	4.6	RPD	8.6	Pass RPD
Total Organic Carbon	mg/L	0.50	20	30	6.3	6.4	RPD	-1.6	Pass RPD	4.1	4.1	RPD	-0.2	Pass RPD
Mercury, total														
Mercury, total	ng/L	0.1	20	30	*<0.50*	0.67	*<DL*	*<DL*	*<DL*	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*
Total Metals														
Aluminum	mg/L	0.0010	20	30	0.0019	0.0034	DIFF	-0.0015	Pass Diff	0.0019	0.0017	DIFF	0.0002	Pass Diff
Antimony	mg/L	0.000020	20	30	0.000054	0.000052	DIFF	0.000002	Pass Diff	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Arsenic	mg/L	0.000020	20	30	0.028	0.029	RPD	-3.9	Pass RPD	0.00036	0.00037	RPD	-2.5	Pass RPD
Barium	mg/L	0.000020	20	30	0.031	0.030	RPD	4	Pass RPD	0.0092	0.0093	RPD	-1	Pass RPD
Beryllium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Bismuth	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Boron	mg/L	0.0050	20	30	0.017	0.019	DIFF	-0.0012	Pass Diff	0.0063	0.0063	DIFF	0	Pass Diff
Cadmium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Calcium	mg/L	0.010	20	30	37.5	34	RPD	9.8	Pass RPD	7.6	7.5	RPD	2	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000031	0.000028	RPD	9.2	Pass RPD	0.000006	0.000006	DIFF	-1E-07	Pass Diff
Chromium	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Cobalt	mg/L	0.000005	20	30	0.000066	0.000060	RPD	9.5	Pass RPD	0.000015	0.000014	DIFF	0.0000011	Pass Diff
Copper	mg/L	0.000050	20	30	0.00081	0.00084	RPD	-3.9	Pass RPD	0.00078	0.00077	RPD	1.8	Pass RPD

Table A-5
Field duplicate results from the Augsut 2024 sampling event

Month	Units	August DLs	Relative Percent Difference DQOs		August DUP-4 (B7-01)					August DUP-5 (AL-02)				
Station					B7-01	DUP-4	Field Dup Method [a]	Result [b]	Outcome	AL-02	DUP-5	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2024-08-23	2024-08-23				2024-08-18	2024-08-18			
ALS Sample ID			Lab	Field	WP2421037-004	WP2421056-002				WP2421048-002	WP2421056-003			
Parameter					Water	Water				Water	Water			
Gallium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Iron	mg/L	0.0010	20	30	0.065	0.064	RPD	2	Pass RPD	0.012	0.011	RPD	6.1	Pass RPD
Lanthanum	mg/L	0.000010	20	30	0.000013	0.000016	DIFF	-0.000003	Pass Diff	0.000018	0.000018	DIFF	0	Pass Diff
Lead	mg/L	0.000010	20	30	0.000079	0.000093	RPD	-16.3	Pass RPD	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Lithium	mg/L	0.00050	20	30	0.017	0.018	RPD	-5.1	Pass RPD	0.00066	0.00066	DIFF	0	Pass Diff
Magnesium	mg/L	0.0040	20	30	4.1	4.0	RPD	3.7	Pass RPD	1.5	1.4	RPD	1.4	Pass RPD
Manganese	mg/L	0.000050	20	30	0.0064	0.0055	RPD	15.1	Pass RPD	0.0040	0.0039	RPD	2.5	Pass RPD
Molybdenum	mg/L	0.000050	20	30	0.00040	0.00035	RPD	12.7	Pass RPD	0.000088	0.000086	DIFF	2E-06	Pass Diff
Niobium	mg/L	0.000050	20	30	0.00085	0.00087	RPD	-1.5	Pass RPD	0.00043	0.00042	RPD	1.2	Pass RPD
Nickel	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Phosphorus	mg/L	0.050	20	30	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*
Potassium	mg/L	0.020	20	30	2.5	2.3	RPD	8.8	Pass RPD	1.1	1.1	RPD	0	Pass RPD
Rhenium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Rubidium	mg/L	0.000005	20	30	0.0027	0.0023	RPD	14.5	Pass RPD	0.0013	0.0013	RPD	0.8	Pass RPD
Selenium	mg/L	0.000040	20	30	*<0.000040*	0.000056	*<DL*	*<DL*	*<DL*	0.000043	0.000044	DIFF	-1E-06	Pass Diff
Silicon	mg/L	0.050	20	30	0.94	0.99	RPD	-5.1	Pass RPD	0.38	0.39	RPD	-1	Pass RPD
Silver	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Sodium	mg/L	0.020	20	30	10.6	9.9	RPD	6.4	Pass RPD	6.2	6.2	RPD	0.6	Pass RPD
Strontium	mg/L	0.000020	20	30	0.32	0.29	RPD	10.1	Pass RPD	0.038	0.038	RPD	0.8	Pass RPD
Sulfur	mg/L	0.50	20	30	4.7	4.9	RPD	-3.8	Pass RPD	1.7	1.7	DIFF	-0.04	Pass Diff
Tantalum	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Tellurium	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Thallium	mg/L	0.000005	20	30	0.000006	0.000005	DIFF	0.0000002	Pass Diff	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Thorium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Tin	mg/L	0.000020	20	30	0.000028	0.000022	DIFF	0.000006	Pass Diff	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Titanium	mg/L	0.000050	20	30	*<0.000050*	0.00012	*<DL*	*<DL*	*<DL*	0.000077	0.000080	DIFF	-3E-06	Pass Diff
Tungsten	mg/L	0.000010	20	30	0.000045	0.000045	DIFF	0	Pass Diff	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Uranium	mg/L	0.000001	20	30	0.000086	0.000083	RPD	3.6	Pass RPD	0.000021	0.000020	RPD	3.4	Pass RPD
Vanadium	mg/L	0.000050	20	30	0.000057	0.000057	DIFF	0	Pass Diff	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Yttrium	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Zinc	mg/L	0.00050	20	30	0.00093	0.0035	DIFF	-0.00261	Fail	*<0.00050*	*<0.00050*	*<DL*	*<DL*	*<DL*
Zirconium	mg/L	0.000010	20	30	*<0.000010*	0.000015	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Dissolved Metals														
Aluminum	mg/L	0.0010	20	30	0.0011	0.0026	DIFF	-0.0015	Pass Diff	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Antimony	mg/L	0.000020	20	30	0.000052	0.000054	DIFF	-0.000002	Pass Diff	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Arsenic	mg/L	0.000020	20	30	0.027	0.027	RPD	0.4	Pass RPD	0.00038	0.00037	RPD	2.7	Pass RPD
Barium	mg/L	0.000020	20	30	0.030	0.030	RPD	-0.3	Pass RPD	0.0093	0.0091	RPD	1.5	Pass RPD
Beryllium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Bismuth	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Boron	mg/L	0.0050	20	30	0.019	0.018	DIFF	0.0004	Pass Diff	0.0064	0.0065	DIFF	-1E-04	Pass Diff
Cadmium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	0.000007	*<0.0000050*	*<DL*	*<DL*	*<DL*
Calcium	mg/L	0.010	20	30	34	36.6	RPD	-7.4	Pass RPD	7.7	7.7	RPD	-0.5	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000028	0.000028	RPD	-0.4	Pass RPD	0.000006	0.000006	DIFF	3E-07	Pass Diff
Chromium	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Cobalt	mg/L	0.000005	20	30	0.000052	0.000057	RPD	-9.1	Pass RPD	0.000009	0.000007	DIFF	0.0000025	Pass Diff
Copper	mg/L	0.000050	20	30	0.00072	0.00079	RPD	-10.1	Pass RPD	0.00083	0.00078	RPD	5.3	Pass RPD
Gallium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Iron	mg/L	0.0010	20	30	0.035	0.038	RPD	-7.9	Pass RPD	0.0037	0.0036	DIFF	0.0001	Pass Diff
Lanthanum	mg/L	0.000010	20	30	*<0.000010*	0.000010	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Lead	mg/L	0.000010	20	30	0.000040	0.000046	DIFF	-0.000006	Pass Diff	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Lithium	mg/L	0.00050	20	30	0.017	0.017	RPD	0	Pass RPD	0.00066	0.00065	DIFF	0.00001	Pass Diff
Magnesium	mg/L	0.0040	20	30	3.9	4.3	RPD	-8.8	Pass RPD	1.5	1.5	RPD	0.7	Pass RPD
Manganese	mg/L	0.000050	20	30	0.0011	0.0011	RPD	-0.9	Pass RPD	0.00056	0.00054	RPD	3.1	Pass RPD
Mercury	ng/L	0.50	20	30	*<0.50*	0.64	*<DL*	*<DL*	*<DL*	*<0.50*	0.67	*<DL*	*<DL*	*<DL*
Molybdenum	mg/L	0.000050	20	30	0.00035	0.00038	RPD	-8.5	Pass RPD	0.00070	0.000089	DIFF	0.000615	Fail
Nickel	mg/L	0.000050	20	30	0.00079	0.00084	RPD	-6.4	Pass RPD	0.00044	0.00042	RPD	4	Pass RPD
Niobium	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Phosphorus	mg/L	0.050	20	30	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*

Table A-5
Field duplicate results from the Augsut 2024 sampling event

Month	Units	August DLs	Relative Percent Difference DQOs		August DUP-4 (B7-01)					August DUP-5 (AL-02)				
Station					B7-01	DUP-4	Field Dup Method [a]	Result [b]	Outcome	AL-02	DUP-5	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2024-08-23	2024-08-23				2024-08-18	2024-08-18			
ALS Sample ID			Lab	Field	WP2421037-004	WP2421056-002				WP2421048-002	WP2421056-003			
Parameter					Water	Water				Water	Water			
Potassium	mg/L	0.020	20	30	2.2	2.4	RPD	-7.4	Pass RPD	1.1	1.1	RPD	1.8	Pass RPD
Rhenium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Rubidium	mg/L	0.000005	20	30	0.0023	0.0024	RPD	-5.5	Pass RPD	0.0014	0.0014	RPD	2.2	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000045	0.000047	DIFF	-2E-06	Pass Diff	*<0.000040*	0.000041	*<DL*	*<DL*	*<DL*
Silicon	mg/L	0.050	20	30	0.98	1.0	RPD	-3.4	Pass RPD	0.41	0.39	RPD	4.8	Pass RPD
Silver	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Sodium	mg/L	0.020	20	30	9.8	10.6	RPD	-8.3	Pass RPD	6.4	6.3	RPD	1.4	Pass RPD
Strontium	mg/L	0.000020	20	30	0.30	0.31	RPD	-4	Pass RPD	0.039	0.040	RPD	-0.8	Pass RPD
Sulfur	mg/L	0.50	20	30	4.9	5.1	RPD	-3.8	Pass RPD	1.8	1.7	DIFF	0.11	Pass Diff
Tantalum	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Tellurium	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Thallium	mg/L	0.000005	20	30	*<0.0000050*	0.000005	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Thorium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Tin	mg/L	0.000020	20	30	0.000020	0.000056	DIFF	-0.000036	Pass Diff	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Titanium	mg/L	0.000050	20	30	*<0.000050*	0.000061	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Tungsten	mg/L	0.000010	20	30	0.000042	0.000044	DIFF	-0.000002	Pass Diff	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Uranium	mg/L	0.000001	20	30	0.000085	0.000089	RPD	-5.1	Pass RPD	0.000020	0.000019	RPD	5.7	Pass RPD
Vanadium	mg/L	0.000050	20	30	*<0.000050*	0.000052	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Yttrium	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Zinc	mg/L	0.00050	20	30	0.00067	0.0059	DIFF	-0.00523	Fail	0.00090	*<0.00050*	*<DL*	*<DL*	*<DL*
Zirconium	mg/L	0.000010		40	*<0.000010*	0.000014	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*

Notes:

[a] Field Dup Methods are based on the concentrations:

RPD = relative percent difference is used to compare field duplicates when the measured concentration is > 5x the DL

DIFF = when concentrations < 5* DL

[b] Results refer to the RPD or absolute difference in concentration

DQO for RPDs is < Field RPD values

DQO for DIFF is < 2x the DL

Italicized numbers are below detection limits.

nc = not collected

Table A-6
Field duplicate results from the September 2024 sampling event

Month	Units	September DLs	Relative Percent Difference DQOs		September DUP-1 (MEL-01-01)					September DUP-2 (MEL-02-08)				
Station					MEL-01-01	DUP-1	Field Dup Method [a]	Result [b]	Outcome	MEL-02-08	DUP-2	Field Dup Method [a]	Result [b]	Outcome
Date Sampled					07-Sep-2024	07-Sep-2024				08-Sep-2024	08-Sep-2024			
ALS Sample ID			Lab	Field	WP2422107-001	WP2422107-007				WP2422107-015	WP2422107-016			
Parameter					Water	Water				Water	Water			
Physical Tests														
Conductivity	µS/cm	1.0	10	15	122	120	RPD	1.7	Pass RPD	104	102	RPD	1.9	Pass RPD
Acidity (as CaCO3)	mg/L	2.0		40	3.7	2.2	DIFF	1.5	Pass Diff	*<2.0*	*<2.0*	*<DL*	*<DL*	*<DL*
Alkalinity, bicarbonate	mg/L	1.0		40	21.4	20.8	RPD	2.8	Pass RPD	22	20.4	RPD	7.5	Pass RPD
Alkalinity, carbonate	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, hydroxide	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, phenolphthalein	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, total (as CaCO3)	mg/L	1.0		40	21.4	20.8	RPD	2.8	Pass RPD	22	20.4	RPD	7.5	Pass RPD
Hardness, dissolved	mg/L	0.50		40	32.9	33.9	RPD	-3	Pass RPD	29.5	33.2	RPD	-11.8	Pass RPD
Total dissolved solids	mg/L	3.0		40	53.4	54.8	RPD	-2.6	Pass RPD	48.1	46.8	RPD	2.7	Pass RPD
TDS Calculated (from Cond.)	mg/L	1.0		40	79.3	78	RPD	1.7	Pass RPD	67.6	66.3	RPD	1.9	Pass RPD
TSS	mg/L	1.0		40	1.6	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	1.4	*<DL*	*<DL*	*<DL*
Turbidity	NTU	0.10		40	0.54	0.44	DIFF	0.1	Pass Diff	0.24	0.38	DIFF	-0.14	Pass Diff
pH	pH units	0.10		40	7.5	7.4	RPD	0.5	Pass RPD	7.5	7.4	RPD	0.3	Pass RPD
Anions and Nutrients														
Ammonia, total (as N)	mg/L	0.0050	20	30	0.019	0.019	DIFF	-0.0003	Pass Diff	0.0070	0.031	DIFF	-0.0238	Fail
Bromide	mg/L	0.10	20	30	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*
Chloride	mg/L	0.10	20	30	17.1	17	RPD	0.6	Pass RPD	13.3	13.3	RPD	0	Pass RPD
Fluoride	mg/L	0.020	20	30	0.033	0.031	DIFF	0.002	Pass Diff	0.030	0.031	DIFF	-0.001	Pass Diff
Kjeldahl nitrogen, dissolved	mg/L	0.050	20	30	0.22	0.26	DIFF	-0.041	Pass Diff	0.18	0.18	DIFF	0	Pass Diff
Kjeldahl nitrogen, total	mg/L	0.050	20	30	0.28	0.27	RPD	5.8	Pass RPD	0.21	0.17	DIFF	0.036	Pass Diff
Nitrate (as N)	mg/L	0.0050	20	30	0.015	*<0.0050*	*<DL*	*<DL*	*<DL*	*<0.0050*	0.013	*<DL*	*<DL*	*<DL*
Nitrate + Nitrite (as N)	mg/L	0.0050	20	30	0.015	*<0.0051*	*<DL*	*<DL*	*<DL*	*<0.0051*	0.013	*<DL*	*<DL*	*<DL*
Nitrite (as N)	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Nitrogen, total	mg/L	0.050	20	30	0.30	0.27	RPD	10.9	Pass RPD	0.21	0.18	DIFF	0.023	Pass Diff
Nitrogen, total dissolved	mg/L	0.020	20	30	0.24	0.26	RPD	-10.4	Pass RPD	0.18	0.20	RPD	-6.9	Pass RPD
Orthophosphate	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Phosphorus, total	mg/L	0.0010	20	30	0.0073	0.0058	RPD	22.9	Pass RPD	0.0045	0.0046	DIFF	-0.0001	Pass Diff
Phosphorus, total dissolved	mg/L	0.0010	20	30	0.0027	0.0023	DIFF	0.0004	Pass Diff	0.0024	0.0019	DIFF	0.0005	Pass Diff
Silicate (as SiO2)	mg/L	0.010	20	30	0.56	0.55	RPD	1.4	Pass RPD	0.42	0.42	RPD	0.7	Pass RPD
Sulfate (as SO4)	mg/L	0.30	20	30	7.5	7.4	RPD	1.5	Pass RPD	5.5	5.5	RPD	-0.2	Pass RPD
Cyanides														
Cyanide, free	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Cyanide, total	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Cyanide, WAD	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Organic / Inorganic Carbon														
Dissolved Organic Carbon	mg/L	0.50	20	30	5.2	4.9	RPD	5.6	Pass RPD	4.2	3.6	RPD	14	Pass RPD
Total Organic Carbon	mg/L	0.50	20	30	5.0	4.4	RPD	11.9	Pass RPD	4.6	4.3	RPD	6.8	Pass RPD
Mercury, total														
Mercury, total	ng/L	0.1	20	30	0.7	*<0.50*	*<DL*	*<DL*	*<DL*	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*
Total Metals														
Aluminum	mg/L	0.0010	20	30	0.0048	0.0034	DIFF	0.0014	Pass Diff	0.0029	0.0028	DIFF	1E-04	Pass Diff
Antimony	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Arsenic	mg/L	0.000020	20	30	0.00074	0.00071	RPD	4.4	Pass RPD	0.00088	0.00080	RPD	9.3	Pass RPD
Barium	mg/L	0.000020	20	30	0.0088	0.0088	RPD	-0.6	Pass RPD	0.0088	0.0085	RPD	3.8	Pass RPD
Beryllium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Bismuth	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*

Table A-6
Field duplicate results from the September 2024 sampling event

Month	Units	September DLs	Relative Percent Difference DQOs		September DUP-1 (MEL-01-01)					September DUP-2 (MEL-02-08)				
Station					MEL-01-01	DUP-1	Field Dup Method [a]	Result [b]	Outcome	MEL-02-08	DUP-2	Field Dup Method [a]	Result [b]	Outcome
Date Sampled					07-Sep-2024	07-Sep-2024				08-Sep-2024	08-Sep-2024			
ALS Sample ID			Lab	Field	WP2422107-001	WP2422107-007				WP2422107-015	WP2422107-016			
Parameter					Water	Water				Water	Water			
Boron	mg/L	0.0050	20	30	0.0075	0.0077	DIFF	-0.0002	Pass Diff	0.0059	0.0058	DIFF	0.0001	Pass Diff
Cadmium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Calcium	mg/L	0.010	20	30	9.9	9.8	RPD	1.1	Pass RPD	9.0	8.9	RPD	1.9	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000009	0.000009	DIFF	-0.0000004	Pass Diff	0.000010	0.000009	DIFF	6E-07	Pass Diff
Chromium	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Cobalt	mg/L	0.000005	20	30	0.000026	0.000025	DIFF	0.0000013	Pass Diff	0.000018	0.000019	DIFF	-9E-07	Pass Diff
Copper	mg/L	0.000050	20	30	0.00089	0.00085	RPD	5.2	Pass RPD	0.00088	0.0011	RPD	-18.1	Pass RPD
Gallium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Iron	mg/L	0.0010	20	30	0.018	0.018	RPD	0	Pass RPD	0.017	0.016	RPD	4.9	Pass RPD
Lanthanum	mg/L	0.000010	20	30	0.000022	0.000019	DIFF	0.000003	Pass Diff	0.000020	0.000017	DIFF	0.000003	Pass Diff
Lead	mg/L	0.000010	20	30	0.000015	*<0.000010*	*<DL*	*<DL*	*<DL*	0.000018	0.000010	DIFF	0.000008	Pass Diff
Lithium	mg/L	0.00050	20	30	0.0011	0.0011	DIFF	0	Pass Diff	0.00096	0.00092	DIFF	0.00004	Pass Diff
Magnesium	mg/L	0.0040	20	30	1.9	1.8	RPD	1.6	Pass RPD	1.6	1.6	RPD	-0.6	Pass RPD
Manganese	mg/L	0.000050	20	30	0.0052	0.0052	RPD	1	Pass RPD	0.0054	0.0055	RPD	-2	Pass RPD
Molybdenum	mg/L	0.000050	20	30	0.00014	0.00014	DIFF	3E-06	Pass Diff	0.00011	0.00011	DIFF	0.000004	Pass Diff
Niobium	mg/L	0.000050	20	30	0.00072	0.00069	RPD	3.3	Pass RPD	0.00057	0.00058	RPD	-1.6	Pass RPD
Nickel	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Phosphorus	mg/L	0.050	20	30	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*
Potassium	mg/L	0.020	20	30	1.2	1.2	RPD	-0.9	Pass RPD	1.1	1.1	RPD	-2.8	Pass RPD
Rhenium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Rubidium	mg/L	0.000005	20	30	0.0016	0.0016	RPD	1.3	Pass RPD	0.0015	0.0016	RPD	-3.3	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000053	0.000048	DIFF	0.000005	Pass Diff	0.000050	0.000042	DIFF	0.000008	Pass Diff
Silicon	mg/L	0.050	20	30	0.28	0.28	RPD	0.7	Pass RPD	0.21	0.21	DIFF	-0.001	Pass Diff
Silver	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Sodium	mg/L	0.020	20	30	8.2	8.2	RPD	0.2	Pass RPD	6.5	6.4	RPD	1.1	Pass RPD
Strontium	mg/L	0.000020	20	30	0.058	0.057	RPD	1.6	Pass RPD	0.048	0.049	RPD	-3.5	Pass RPD
Sulfur	mg/L	0.50	20	30	2.6	2.5	RPD	2.4	Pass RPD	1.9	2.0	DIFF	-0.05	Pass Diff
Tantalum	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Tellurium	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Thallium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Thorium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Tin	mg/L	0.000020	20	30	0.000048	*<0.000020*	*<DL*	*<DL*	*<DL*	0.000034	0.000050	DIFF	-0.000016	Pass Diff
Titanium	mg/L	0.000050	20	30	0.00012	0.000091	DIFF	0.000033	Pass Diff	0.000094	0.000053	DIFF	0.000041	Pass Diff
Tungsten	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Uranium	mg/L	0.000001	20	30	0.000028	0.000025	RPD	11.6	Pass RPD	0.000019	0.000020	RPD	-1.5	Pass RPD
Vanadium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Yttrium	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Zinc	mg/L	0.00050	20	30	*<0.00050*	*<0.00050*	*<DL*	*<DL*	*<DL*	*<0.00050*	0.00053	*<DL*	*<DL*	*<DL*
Zirconium	mg/L	0.000010	20	30	0.000010	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Dissolved Metals														
Aluminum	mg/L	0.0010	20	30	0.0015	0.0024	DIFF	-0.0009	Pass Diff	0.0026	0.022	DIFF	-0.0189	Fail
Antimony	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Arsenic	mg/L	0.000020	20	30	0.00066	0.00069	RPD	-3.9	Pass RPD	0.00081	0.0012	RPD	-35.3	Fail
Barium	mg/L	0.000020	20	30	0.0086	0.0087	RPD	-1.5	Pass RPD	0.0085	0.0085	RPD	0.5	Pass RPD
Beryllium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Bismuth	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Boron	mg/L	0.0050	20	30	0.0077	0.0082	DIFF	-0.0005	Pass Diff	0.0058	0.0060	DIFF	-0.0002	Pass Diff
Cadmium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Calcium	mg/L	0.010	20	30	10	10.3	RPD	-3	Pass RPD	9.2	10.4	RPD	-12.5	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000009	0.000013	DIFF	-0.0000039	Pass Diff	0.000010	0.000012	DIFF	-0.0000023	Pass Diff
Chromium	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	0.00010	*<DL*	*<DL*	*<DL*

Table A-6
Field duplicate results from the September 2024 sampling event

Month	Units	September DLs	Relative Percent Difference DQOs		September DUP-1 (MEL-01-01)					September DUP-2 (MEL-02-08)				
Station					MEL-01-01	DUP-1	Field Dup Method [a]	Result [b]	Outcome	MEL-02-08	DUP-2	Field Dup Method [a]	Result [b]	Outcome
Date Sampled					07-Sep-2024	07-Sep-2024				08-Sep-2024	08-Sep-2024			
ALS Sample ID			Lab	Field	WP2422107-001	WP2422107-007				WP2422107-015	WP2422107-016			
Parameter					Water	Water				Water	Water			
Cobalt	mg/L	0.000005	20	30	0.000016	0.000017	DIFF	-0.0000014	Pass Diff	0.000014	0.000026	DIFF	-0.0000125	Fail
Copper	mg/L	0.000050	20	30	0.0011	0.0026	RPD	-85.9	Fail	0.0010	0.0014	RPD	-27.6	Pass RPD
Gallium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Iron	mg/L	0.0010	20	30	0.0044	0.0046	DIFF	-0.0002	Pass Diff	0.0071	0.054	RPD	-153.7	Fail
Lanthanum	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	0.000042	*<DL*	*<DL*	*<DL*
Lead	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	0.000015	0.00012	DIFF	-0.000107	Fail
Lithium	mg/L	0.00050	20	30	0.0011	0.0011	DIFF	0	Pass Diff	0.00090	0.00092	DIFF	-2E-05	Pass Diff
Magnesium	mg/L	0.0040	20	30	1.9	2.0	RPD	-2.6	Pass RPD	1.6	1.8	RPD	-9.5	Pass RPD
Manganese	mg/L	0.000050	20	30	0.00034	0.00037	RPD	-8.1	Pass RPD	0.00031	0.0011	RPD	-114.5	Fail
Mercury	ng/L	0.50	20	30	0.62	*<0.50*	*<DL*	*<DL*	*<DL*	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*
Molybdenum	mg/L	0.000050	20	30	0.00015	0.00015	DIFF	-2E-06	Pass Diff	0.00011	0.00014	DIFF	-0.000026	Pass Diff
Nickel	mg/L	0.000050	20	30	0.00072	0.00071	RPD	1.4	Pass RPD	0.00058	0.00068	RPD	-15.8	Pass RPD
Niobium	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Phosphorus	mg/L	0.050	20	30	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*
Potassium	mg/L	0.020	20	30	1.2	1.2	RPD	-1.6	Pass RPD	1.1	1.4	RPD	-18.6	Pass RPD
Rhenium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Rubidium	mg/L	0.000005	20	30	0.0016	0.0017	RPD	-1.8	Pass RPD	0.0016	0.0019	RPD	-19.2	Pass RPD
Selenium	mg/L	0.000040	20	30	*<0.000040*	0.000040	*<DL*	*<DL*	*<DL*	0.000056	0.000045	DIFF	0.000011	Pass Diff
Silicon	mg/L	0.050	20	30	0.28	0.28	RPD	-1.1	Pass RPD	0.20	0.23	DIFF	-0.026	Pass Diff
Silver	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Sodium	mg/L	0.020	20	30	8.7	8.6	RPD	0.2	Pass RPD	6.7	7.5	RPD	-10.6	Pass RPD
Strontium	mg/L	0.000020	20	30	0.057	0.060	RPD	-4.3	Pass RPD	0.049	0.061	RPD	-22.4	Pass RPD
Sulfur	mg/L	0.50	20	30	2.6	2.6	RPD	-3.5	Pass RPD	1.9	1.9	DIFF	-0.05	Pass Diff
Tantalum	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Tellurium	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Thallium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Thorium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*	*<0.0000050*	0.000014	*<DL*	*<DL*	*<DL*
Tin	mg/L	0.000020	20	30	*<0.000020*	0.000060	*<DL*	*<DL*	*<DL*	0.000030	0.000047	DIFF	-0.000017	Pass Diff
Titanium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	0.000087	0.00084	DIFF	-0.000749	Fail
Tungsten	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Uranium	mg/L	0.000001	20	30	0.000026	0.000024	RPD	7.1	Pass RPD	0.000018	0.000018	RPD	-4.4	Pass RPD
Vanadium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*	*<0.000050*	0.000059	*<DL*	*<DL*	*<DL*
Yttrium	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	0.000010	*<DL*	*<DL*	*<DL*
Zinc	mg/L	0.00050	20	30	*<0.00050*	0.00078	*<DL*	*<DL*	*<DL*	0.0019	0.0026	DIFF	-0.00071	Pass Diff
Zirconium	mg/L	0.000010		40	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*	*<0.000010*	0.000031	*<DL*	*<DL*	*<DL*

Notes:

[a] Field Dup Methods are based on the concentrations:

RPD = relative percent difference is used to compare field duplicates when the measured concentration is > 5x the DL

DIFF = when concentrations < 5* DL

[b] Results refer to the RPD or absolute difference in concentration

DQO for RPDs is < Field RPD values

DQO for DIFF is < 2x the DL

Italicized numbers are below detection limits.

na = not analyzed

Table A-7. Surface water data reliability checks – dissolved vs total concentrations, 2024.

Event	Date	Sample ID	Parameter	Dissolved (µg/L)	Total (µg/L)	Percent Difference (D vs T)
March	30-Mar-24	EB-WINTER-01	Mercury	1.21	*<0.50*	142
	29-Mar-24	MEL-01-08	Aluminum	0.0037	*<0.0010*	270
	29-Mar-24	MEL-01-08	Tin	0.000042	*<0.000020*	110
	29-Mar-24	MEL-01-08	Zinc	0.00537	0.00141	281
	29-Mar-24	MEL-01-08	Zirconium	0.000028	*<0.000010*	180
	29-Mar-24	MEL-01-09	Mercury	0.97	*<0.50*	94
	29-Mar-24	MEL-01-09	Tin	0.000066	*<0.000020*	230
July	05-Jul-24	DUP-MEL-JUL-02	Copper	0.00159	0.000857	86
	05-Jul-24	DUP-MEL-JUL-02	Tin	0.000057	*<0.000020*	185
	05-Jul-24	DUP-MEL-JUL-02	Zinc	0.00508	0.00072	606
	12-Jul-24	A8-02	Tin	0.000047	*<0.000020*	135
	12-Jul-24	B7-02	Mercury	1.05	*<0.50*	110
	14-Jul-24	D7-02	Zinc	0.00197	0.0006	228
	14-Jul-24	D7-03	Zinc	0.00108	*<0.00050*	116
	13-Jul-24	MEL-03-03	Zinc	0.00098	*<0.00050*	96
	13-Jul-24	DUP-MEL-JUL-01	Mercury	0.82	*<0.50*	64
August	11-Aug-24	MEL-03-03	Zirconium	0.000039	*<0.000010*	290
	12-Aug-24	DUP-MEL-AUG-01	Tin	0.000057	*<0.000020*	185
	12-Aug-24	DUP-MEL-AUG-01	Zinc	0.00195	*<0.00050*	290
	14-Aug-24	MEL-05-05	Tin	0.000137	0.000021	552
	21-Aug-24	D7-01	Tin	0.000308	0.000087	254
	21-Aug-24	D7-01	Zinc	0.00755	0.00332	127
	21-Aug-24	D7-01	Zirconium	0.000349	0.000107	226
	23-Aug-24	B7-03	Titanium	0.000129	*<0.000050*	158
	23-Aug-24	B7-03	Zinc	0.00148	*<0.00050*	196
	23-Aug-24	A8-02	Tin	0.00012	0.000054	122
	23-Aug-24	A8-03	Aluminum	0.0054	0.0024	125
	23-Aug-24	A8-03	Tin	0.000092	0.000047	96
	23-Aug-24	A8-03	Titanium	0.000278	0.000066	321
	23-Aug-24	A8-03	Zinc	0.00759	0.00202	276
	18-Aug-24	AL-02	Molybdenum	0.000704	0.000088	700
	17-Aug-24	PL-02	Molybdenum	0.000758	*<0.000050*	1416
	23-Aug-24	DUP-MEL-AUG-04	Zinc	0.0059	0.00354	67
September	12-Sep-24	MEL-03-03	Lead	0.000029	*<0.000010*	190
	12-Sep-24	MEL-03-03	Tin	0.00005	*<0.000020*	150
	12-Sep-24	MEL-03-04	Zinc	0.00145	*<0.00050*	190

Table A-8. Surface water data reliability checks – within area outliers, 2024.

Sample ID	Date	Parameter	DL	Result	Detect?	Min	Max	Fold Difference (Result / Max)
MEL-04-01	2024-08-21	Aluminum (T)	1	46	Y	2	4.4	10.5
	2024-08-21	Cobalt (T)	0.005	0.0773	Y	0.0144	0.0172	4.5
	2024-08-21	Iron (T)	1	144	Y	11.3	20.3	7.1
	2024-08-21	Lead (T)	0.01	0.113	Y	<0.01	0.027	4.2
	2024-08-21	Titanium (T)	0.05	3.72	Y	0.051	0.243	15.3
MEL-04-02	2024-08-20	Copper (T)	0.05	32.4	Y	0.74	1.24	26.1

Notes:

Min/Max values are for the other samples in the same area and event.

Table A-9. Field duplicates and parameters that exceeded the DQOs in 2024.

Event	Sample ID	Duplicate	Parameters that exceeded DQOs	Based On
March	MEL-01-08	DUP-01	Solids, total dissolved [TDS]	RPD
			Turbidity	DIFF
			Ammonia, total (as N)	RPD
			Phosphorus, total dissolved	DIFF
			Zinc (Zn)-Dissolved	DIFF
	MEL-02-03	DUP-01	Ammonia, total (as N)	RPD
			Manganese (Mn)-Dissolved	RPD
July	MEL-03-05	DUP-01	Ammonia, total (as N)	DIFF
			Tin (Sn)-Total	DIFF
	MEL-01-01	DUP-2	Lead (Pb)-Total	DIFF
			Copper (Cu)-Dissolved	RPD
			Zinc (Zn)-Dissolved	DIFF
	A8-03	DUP-3	Phosphorus, total	RPD
August	MEL-03-04	DUP-1	Ammonia, total (as N)	DIFF
			Iron (Fe)-Dissolved	DIFF
	MEL-01-01	DUP-2	Phosphorus, total	RPD
			Tin (Sn)-Dissolved	DIFF
	MEL-04-02	DUP-3	Copper (Cu)-Total	RPD
			Iron (Fe)-Total	RPD
	B7-01	DUP-4	Ammonia, total (as N)	RPD
			Zinc (Zn)-Total	DIFF
			Zinc (Zn)-Dissolved	DIFF
	B7-01	DUP-4	Phosphorus, total	DIFF
			Molybdenum (Mo)-Dissolved	DIFF
	AL-01	DUP-5	Phosphorus, total	DIFF
September	MEL-01-01	DUP-1	Acidity (as CaCO3)	RPD
			Copper (Cu)-Dissolved	RPD
	MEL-02-08	DUP-2	Turbidity	RPD
			Ammonia, total (as N)	RPD
			Aluminum (Al)-Dissolved	DIFF
			Arsenic (As)-Dissolved	RPD
			Cobalt (Co)-Dissolved	DIFF
			Iron (Fe)-Dissolved	RPD
			Lead (Pb)-Dissolved	DIFF
			Manganese (Mn)-Dissolved	RPD
			Titanium (Ti)-Dissolved	DIFF
			Count "DIFF"	19
			Count "RPD"	17
			Total field duplicate comparisons	1496
			DQO exceedances as a percentage of total field comparisons	2.41%

A.3 SEDIMENT CHEMISTRY

A.3.1 Methods

A.3.1.1 Field

Field QA consisted of taking care between sampling areas by rinsing and cleaning the sampling gear for sediment grabs (Petite Ponar grab, stainless steel compositing bowls and spoons) using site water and phosphate-free cleaning detergent, to avoid the possibility of cross-contamination.

Field duplicates are evaluated using the same approach outlined above for water chemistry. The RPD limits were 1.5 times the laboratory RPDs unless no RPD was provided in which case a default ±40% was applied.

A.3.1.2 Laboratory

Laboratory duplicates were analyzed for sediment chemistry parameters similar to water chemistry parameters.

A.3.2 Results

Sample Integrity

The sediment samples arrived at the laboratory in good condition and all the samples on the chain of custody form were accounted for. The recommended hold-time of 28-day for mercury was exceeded for all samples by three to five days. ALS notes that measurement uncertainties may be increased for samples that exceed the recommended hold-time.

Field Duplicates

Two field duplicates were collected in 2024 for general chemistry (moisture, pH, particle size, TOC and metals). The field duplicates for grab samples are provided in **Table A-11**.

All field DQOs were met for the samples analyzed in 2024, with the exception of zirconium in both DUP-1 and DUP-2. These results were near the detection limits (<5× the DL), and the samples were flagged because the absolute difference between duplicates exceeded 2× the DL. Overall, the field duplicate results indicate good sampling techniques and a high degree of replicability in field collection.

Laboratory QC Samples

Laboratory QC for sediment samples included laboratory control samples, method blanks, matrix spikes, and reference material. No qualifiers were identified for the laboratory duplicate or method blank QC

results. Silver exceeded the DQO for the laboratory control sample by less than 10%. ALS classifies the results as 'acceptable' if the magnitude of the exceedance(s) is less than 10% for less than 10% of the parameters included in a multi-element scan.

Table A-10. Laboratory QC summary for sediment samples analyzed at ALS Environmental in 2024.

Laboratory QC Assessment	Flagged Results?	Parameter	Qualifier
Data Qualifiers	No	-	-
Adjusted Detection Limits	No	-	-
Laboratory Duplicates	No	-	-
Method Blanks	No	-	-
Laboratory Control Samples	Yes	Silver	MES

Notes:

MES = Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

Table A-11

Field duplicate results for the sediment grab samples collected in August 2024

Field DUP	Units	Lowest DL	Relative Percent Difference DQOs		DUP-1					DUP-2				
Station					MEL-01-08	DUP-1	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-02-06	DUP-2	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					09-Aug-24					20-Aug-24				
ALS Sample ID			Lab	Field	WP2421139-004	WP2421139-021				WP2421139-009	WP2421139-022			
Parameter					Sediment	Sediment				Sediment	Sediment			
Particle Size														
Gravel (>2mm)	%	1.0	15	23	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Sand (2.0mm - 0.063mm)	%	1.0	15	40	6.0	6.3	RPD	-4.9	Pass RPD	21.4	21.4	RPD	0	Pass RPD
Silt (0.063mm - 0.004mm)	%	1.0	15	40	86.5	85.3	RPD	1.4	Pass RPD	71.5	70.5	RPD	1.4	Pass RPD
Clay (<0.004mm)	%	1.0	15	40	7.5	8.4	RPD	-11.3	Pass RPD	7.1	8.1	RPD	-13.2	Pass RPD
Organic / Inorganic Carbon														
Carbon, inorganic [IC]	%	0.050	20	30	0.11	0.11	DIFF	0.001	Pass Diff	0.11	0.11	DIFF	-0.002	Pass Diff
Carbon, total [TC]	%	0.050	20	30	6.0	5.8	RPD	3	Pass RPD	8.8	8.3	RPD	6	Pass RPD
Carbon, total organic [TOC]	%	0.050	20	30	5.9	5.7	RPD	3.1	Pass RPD	8.7	8.2	RPD	6	Pass RPD
Organic matter	%	0.10	20	30	10.2	9.8	RPD	3.6	Pass RPD	15	14.1	RPD	6.2	Pass RPD
Plant Available Nutrients														
Method E384 - Modified Kelowna	mg/kg	2	30	45	*<2.0*	*<2.0*	*<DL*	*<DL*	*<DL*	*<2.0*	*<2.0*	*<DL*	*<DL*	*<DL*
Method E384 - Olsen	mg/kg	2	30	45	17.4	17.5	RPD	-0.6	Pass RPD	5.7	6.9	DIFF	-1.2	Pass Diff
Total Metals														
Aluminum	mg/kg	50	40	60	14000	13100	RPD	6.6	Pass RPD	12200	11100	RPD	9.4	Pass RPD
Antimony	mg/kg	0.10	40	60	0.19	*<0.10*	*<DL*	*<DL*	*<DL*	0.13	*<0.10*	*<DL*	*<DL*	*<DL*
Arsenic	mg/kg	0.10	30	45	108	112	RPD	-3.6	Pass RPD	18.9	17.3	RPD	8.8	Pass RPD
Barium	mg/kg	0.50	40	60	167	166	RPD	0.6	Pass RPD	129	121	RPD	6.4	Pass RPD
Beryllium	mg/kg	0.10	30	45	0.31	0.32	DIFF	-0.01	Pass Diff	0.25	0.25	DIFF	0	Pass Diff
Bismuth	mg/kg	0.20	30	45	0.37	0.36	DIFF	0.01	Pass Diff	0.23	0.22	DIFF	0.01	Pass Diff
Boron	mg/kg	5.0	30	45	7.1	7.1	DIFF	0	Pass Diff	7.6	8.2	DIFF	-0.6	Pass Diff
Cadmium	mg/kg	0.020	30	45	0.55	0.55	RPD	0	Pass RPD	0.40	0.38	RPD	4.9	Pass RPD
Calcium	mg/kg	50	30	45	5000	5200	RPD	-3.9	Pass RPD	5320	5370	RPD	-0.9	Pass RPD
Chromium	mg/kg	0.50	30	45	55.2	51.5	RPD	6.9	Pass RPD	47	41.7	RPD	12	Pass RPD
Cobalt	mg/kg	0.10	30	45	22	22.1	RPD	-0.5	Pass RPD	12.8	11.9	RPD	7.3	Pass RPD
Copper	mg/kg	0.50	30	45	93.2	95.6	RPD	-2.5	Pass RPD	89.3	86	RPD	3.8	Pass RPD
Iron	mg/kg	50	30	45	61400	60400	RPD	1.6	Pass RPD	22900	20900	RPD	9.1	Pass RPD
Lead	mg/kg	0.50	40	60	15.2	15.5	RPD	-2	Pass RPD	10.5	10.8	RPD	-2.8	Pass RPD
Lithium	mg/kg	2.0	30	45	14.3	15.1	RPD	-5.4	Pass RPD	11.4	12.8	RPD	-11.6	Pass RPD
Magnesium	mg/kg	20	30	45	8000	7720	RPD	3.6	Pass RPD	7060	6480	RPD	8.6	Pass RPD
Manganese	mg/kg	1.0	30	45	1270	1260	RPD	0.8	Pass RPD	473	430	RPD	9.5	Pass RPD
Mercury	mg/kg	0.0050	40	60	0.069	0.057	RPD	18.1	Pass RPD	0.043	0.036	RPD	18	Pass RPD
Molybdenum	mg/kg	0.10	40	60	6.8	6.9	RPD	-1.6	Pass RPD	3.9	3.8	RPD	4.1	Pass RPD
Nickel	mg/kg	0.50	30	45	88	88.9	RPD	-1	Pass RPD	57.8	54.8	RPD	5.3	Pass RPD
Phosphorus	mg/kg	50	30	45	1620	1790	RPD	-10	Pass RPD	919	936	RPD	-1.8	Pass RPD
Potassium	mg/kg	100	40	60	2500	2360	RPD	5.8	Pass RPD	1930	1780	RPD	8.1	Pass RPD
Selenium	mg/kg	0.20	30	45	1.4	1.2	RPD	16.9	Pass RPD	0.90	0.79	DIFF	0.11	Pass Diff
Silver	mg/kg	0.10	30	45	0.21	0.19	DIFF	0.02	Pass Diff	0.15	0.14	DIFF	0.01	Pass Diff
Sodium	mg/kg	50	40	60	369	333	RPD	10.3	Pass RPD	346	297	RPD	15.2	Pass RPD
Strontium	mg/kg	0.50	40	60	31.20	29.20	RPD	6.6	Pass RPD	31.10	27.90	RPD	10.8	Pass RPD
Sulfur	mg/kg	1000	30	45	2000	1900	DIFF	100	Pass Diff	2200	2400	DIFF	-200	Pass Diff
Thallium	mg/kg	0.050	30	45	0.36	0.37	RPD	-2.7	Pass RPD	0.25	0.24	DIFF	0.006	Pass Diff
Tin	mg/kg	2.0	30	45	*<2.0*	*<2.0*	*<DL*	*<DL*	*<DL*	*<2.0*	*<2.0*	*<DL*	*<DL*	*<DL*

Table A-11

Field duplicate results for the sediment grab samples collected in August 2024

Field DUP	Units	Lowest DL	Relative Percent Difference DQOs		DUP-1					DUP-2				
Station					MEL-01-08	DUP-1	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-02-06	DUP-2	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					09-Aug-24					20-Aug-24				
ALS Sample ID			Lab	Field	WP2421139-004	WP2421139-021				WP2421139-009	WP2421139-022			
Parameter					Sediment	Sediment				Sediment	Sediment			
Titanium	mg/kg	1.0	40	60	738.00	878.00	RPD	-17.3	Pass RPD	673	668	RPD	0.7	Pass RPD
Tungsten	mg/kg	0.50	30	45	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*
Uranium	mg/kg	0.050	30	45	4.2	4.3	RPD	-0.9	Pass RPD	3.2	3.2	RPD	0.6	Pass RPD
Vanadium	mg/kg	0.20	30	45	61.8	59.8	RPD	3.3	Pass RPD	48.5	43.9	RPD	10	Pass RPD
Zinc	mg/kg	2.0	30	45	99.6	99.1	RPD	0.5	Pass RPD	99.6	94.9	RPD	4.8	Pass RPD
Zirconium	mg/kg	1.0	30	45	1.8	11.60	DIFF	-9.8	Fail	1.5	4.8	DIFF	-3.3	Fail

Notes:

[a] Field Dup Methods are based on the concentrations:

RPD = relative percent difference is used to compare field duplicates when the measured concentration is > 5x the DL

DIFF = when concentrations < 5* DL

[b] Results refer to the RPD or absolute difference in concentration

DQO for RPDs is < Field RPD values

DQO for DIFF is < 2x the DL

Italicized numbers are below detection limits.

A.4 PHYTOPLANKTON TAXONOMY AND CHLOROPHYLL-A

A.4.1 Methods

A.4.1.1 Field

Sampling Procedures

Water samples for phytoplankton taxonomy and chlorophyll-a were collected in the July, August, and September sampling events. Samples were collected as depth-integrated samples every 2 m from below the surface to within 1 m of the sediment at the same locations as the surface water samples for chemistry. Sampling gear was thoroughly rinsed between sampling areas to ensure that there was no inadvertent introduction (i.e., cross-contamination) from one area to another.

Water samples for taxonomy were collected in a 50 mL falcon tube. Water samples for chlorophyll-a were collected in 1-L plastic bottles wrapped with tinfoil to keep the samples dark and were stored in a cooler with ice packs until returning to the camp. Water samples were processed back at camp within 6 hours of sampling. Processing involved filtering the water samples for chlorophyll-a and preserving 50 mL of water with Lugol's iodine solution for taxonomy. Chlorophyll-a filters were kept in a freezer until ready to ship. The preserved phytoplankton taxonomy samples were stored in dark containers at room temperature.

Field Duplicates

One field duplicate is collected for every 10 samples for phytoplankton taxonomy and chlorophyll-a in each sampling event. The data quality objective (DQO) for field duplicates is a relative percent difference (RPD) of less than 50% between the samples.

A.4.1.2 Laboratory

Filtered chlorophyll-a samples were submitted to the University of Alberta Biogeochemical Analytical Service Laboratory (BASL). Samples collected for taxonomic analysis of phytoplankton were submitted to Plankton-R-Us Inc. Both of these labs are certified reputable taxonomic laboratory.

Taxonomic QC procedures include consistent sample concentration and sub-sampling techniques. Identification accuracy is monitored in-house by a second taxonomist who re-analyses at least 10% of samples.

A.4.2 Results

Sample Integrity

Chlorophyll-a – Extra ice packs were shipped with the chlorophyll-a samples, and the technician who received the samples noted that the ice packs were frozen when the samples arrived.

Phytoplankton Taxonomy – The samples arrived at Plankton R Us in good condition.

Field and Laboratory Duplicates

Results of the RPD analysis for phytoplankton field duplicates and laboratory duplicates, as well as chlorophyll-a field duplicates are presented in **Table A-12**, **Table A-13** and **Table A-14** respectively. These results are discussed below:

Phytoplankton Taxonomy - All of the field and laboratory duplicate RPDs for total biomass and density met the DQOs indicating very good replicability in sample collection. See **Table A-12** and, **Table A-13** for the complete field duplicate results, including RPDs calculated for major taxa groups.

Chlorophyll-a – All of the field duplicate RPDs for chlorophyll-a concentrations met the DQOs (RPD < 50%) indicating very good replicability in sample collection. See **Table A-14** for the complete field duplicate results.

Table A-12. Field duplicate results for the 2024 phytoplankton samples.

Metric	Month & DUP	Station	Date	Sample	Major Taxa							TOTAL
					Cyanophytes	Chlorophytes	Euglenophytes	Chrysophytes	Diatom	Cryptophytes	Dinoflagellates	
Phytoplankton Biomass (mg/m^3)	July DUP-1	MEL-03-05	13-Jul-24	Sample	0.048	0.35	0	99	7.4	20	72	198
				Duplicate	0.048	0.79	0	124	19	14	29	186
				RPD (%)	0	**-76**	<DL	-22	**-87**	35	**85**	6
	July DUP-2	MEL-01-01	5-Jul-24	Sample	2.0	4.8	1.9	470	58	43	34	614
				Duplicate	1.3	1.9	1.9	564	51	47	48	715
				RPD (%)	42	**89**	0	-18	13	-8	-34	-15
	Aug DUP-1	MEL-03-04	12-Aug-24	Sample	0	5.0	0	127	19	9	40	200
				Duplicate	0.20	7.3	0	107	10	16	55	195
				RPD (%)	<DL	-39	<DL	18	**64**	**-54**	-32	3
	Aug DUP-2	MEL-01-01	13-Aug-24	Sample	0.30	21	0	54	87	44	30	236
				Duplicate	1.0	43	0	68	71	28	35	246
				RPD (%)	**-108**	**-71**	<DL	-22	21	43	-16	-4
	Aug DUP-3	MEL-04-02	20-Aug-24	Sample	0	10	0	81	29	26	29	175
				Duplicate	0	24	0	75	41	24	15	179
				RPD (%)	<DL	**-81**	<DL	7	-32	9	**64**	-2
	Sept DUP-1	MEL-01-01	7-Sep-24	Sample	1.1	15	0	210	42	7	65	340
				Duplicate	0.9	38	0	240	31	23	118	451
				RPD (%)	15	**-87**	<DL	-13	30	**-103**	**-58**	-28
	Sept DUP-2	MEL-02-08	8-Sep-24	Sample	7.1	20	0	161	36	6	36	266
				Duplicate	1.7	42	0	155	46	8	32	285
				RPD (%)	**122**	**-70**	<DL	3	-27	-21	13	-7
											Average RPD (absolute values)	**14**

Table A-12. Field duplicate results for the 2024 phytoplankton samples.

Metric	Month & DUP	Station	Date	Sample	Major Taxa							TOTAL
					Cyanophytes	Chlorophytes	Euglenophytes	Chrysophytes	Diatom	Cryptophytes	Dinoflagellates	
Phytoplankton Density (cells/L)	July DUP-1	MEL-03-05	13-Jul-24	Sample	200	7384	0	770488	65720	117744	8000	969536
				Duplicate	200	86408	0	1368560	173896	115544	4400	1749008
				RPD (%)	0	**-169**	<DL	**-56**	**-90**	2	**58**	**-57**
	July DUP-2	MEL-01-01	5-Jul-24	Sample	9800	266808	200	3903328	443952	224720	5000	4853808
				Duplicate	6400	136496	200	4390040	457536	283792	5200	5279664
				RPD (%)	42	**65**	0	-12	-3	-23	-4	-8
	Aug DUP-1	MEL-03-04	12-Aug-24	Sample	0	188784.0	0	1272568	133128	58472	7000	1659952
				Duplicate	400	325080	0	1293720	85224	130912	11600	1846936
				RPD (%)	<DL	**-53**	<DL	-2	44	**-77**	-49	-11
	Aug DUP-2	MEL-01-01	13-Aug-24	Sample	400	1337624	0	690864	239504	265024	4400	2537816
				Duplicate	1000	1092368	0	914168	126576	176216	4400	2314728
				RPD (%)	**-86**	20	<DL	-28	**62**	40	0	9
	Aug DUP-3	MEL-04-02	20-Aug-24	Sample	0	231488	0	689864	122144	154064	3400	1200960
				Duplicate	1000	1092368	0	914168	126576	176216	4400	2314728
				RPD (%)	<DL	**-130**	<DL	-28	-4	-13	-26	**-63**
	Sept DUP-1	MEL-01-01	7-Sep-24	Sample	1400	568736	0	2122312	125120	37520	7400	2862488
				Duplicate	1200.0	289760	0	1954896	113288	166632	11400	2537176
				RPD (%)	15	**65**	<DL	8	10	**-126**	-43	12
	Sept DUP-2	MEL-02-08	8-Sep-24	Sample	158248	619624	0	1174608	57352	43504	4000	2057336
				Duplicate	1400	412088	0	1685656	75336	30936	4800	2210216
				RPD (%)	**196**	40	<DL	-36	-27	34	-18	-7
											Average RPD (absolute values)	**27**

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Bolded RPD values exceed 50%.

RPDs were not calculated for cases where one or both of the samples is "0".

Table A-13. Laboratory duplicate results for the 2024 phytoplankton samples.

Metric	Month	Lab Dup	Date	Sample	Major Taxa							TOTAL
					Cyanophytes	Chlorophytes	Euglenophytes	Chrysophytes	Diatom	Cryptophytes	Dinoflagellates	
Phytoplankton Biomass (mg/m^3)	July	MEL-01-01	5-Jul-24	Sample	2	4.8	1.9	469.6	58.4	43.0	34.3	613.9
				Lab dup	2	5.6	0.0	556.4	60.0	38.4	39.3	702.2
				RPD (%)	-22	-14	*<DL*	-17	-3	11	-14	-13
	July	MEL-03-03	13-Jul-24	Sample	0	7.0	0.0	164.7	24.5	24.7	79.5	300.5
				Lab dup	0	1.7	0.0	177.7	19.7	35.2	78.6	313.1
				RPD (%)	-5	**122**	*<DL*	-8	22	**-35**	1	-4
	August	MEL-02-06	12-Aug-24	Sample	0	12.0	0.0	55.2	26.2	23.4	104.8	221.7
				Lab dup	0	12.3	0.0	62.4	34.2	15.1	87.0	211.1
				RPD (%)	0	-3	*<DL*	-12	-26	43	19	5
	August	MEL-04-02	20-Aug-24	Sample	0	10.2	0.0	80.9	29.4	26.1	28.7	175.2
				Lab dup	0	20.1	0.0	60.1	29.7	23.3	23.6	156.9
				RPD (%)	*<DL*	**-66**	*<DL*	**29**	-1	11	19	11
	September	MEL-01-07	7-Sep-24	Sample	2	36.1	0.0	194.3	43.9	12.9	61.8	350.8
				Lab dup	1	38.5	0.0	222.6	62.2	17.5	50.5	392.0
				RPD (%)	**81**	-7	*<DL*	-14	**-34**	**-30**	20	-11
	September	MEL-02-06	8-Sep-24	Sample	5	51.1	0.0	161.2	42.4	3.4	63.4	326.6
				Lab dup	1	59.6	0.0	159.7	36.2	3.8	83.6	344.3
				RPD (%)	**115**	-15	*<DL*	1	16	-10	**-27**	-5
											Average RPD (absolute values)	**8**

Table A-13. Laboratory duplicate results for the 2024 phytoplankton samples.

Metric	Month	Lab Dup	Date	Sample	Major Taxa							TOTAL
					Cyanophytes	Chlorophytes	Euglenophytes	Chrysophytes	Diatom	Cryptophytes	Dinoflagellates	
Phytoplankton Density (cells/L)	July	MEL-01-01	5-Jul-24	Sample	9800	266808	200	3903328	443952	224720	5000	4853808
				Lab dup	12200	230288	0	5426336	439368	189400	5200	6302792
				RPD (%)	-22	15	*<DL*	**-33**	1	17	-4	**-26**
	July	MEL-03-03	13-Jul-24	Sample	400	72640	0	1626384	254200	133112	4800	2091536
				Lab dup	400	115344	0	1604032	201912	170632	5000	2097320
				RPD (%)	0	**-45**	*<DL*	1	23	-25	-4	0
	August	MEL-02-06	12-Aug-24	Sample	200	612240	0	884432	120960	173416	9800	1801048
				Lab dup	200	461376	0	877248	144912	115344	9400	1608480
				RPD (%)	0	**28**	*<DL*	1	-18	**40**	4	11
	August	MEL-04-02	20-Aug-24	Sample	0	231488	0	689864	122144	154064	3400	1200960
				Lab dup	400	261424	0	776272	156064	105376	3000	1302536
				RPD (%)	*<DL*	-12	*<DL*	-12	-24	**38**	13	-8
	September	MEL-01-07	7-Sep-24	Sample	30736	324080	0	1810016	102152	67256	5800	2340040
				Lab dup	1000	288760	0	1915176	136288	88608	5600	2435432
				RPD (%)	**187**	12	*<DL*	-6	**-29**	**-27**	4	-4
	September	MEL-02-06	8-Sep-24	Sample	114944	238672	0	1778648	31584	8584	5600	2178032
				Lab dup	28936	411088	0	1763280	36784	22152	4800	2267040
				RPD (%)	**120**	**-53**	*<DL*	1	-15	**-88**	15	-4
											Average RPD (absolute values)	**9**

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Bolded RPD values exceed 25%.

RPDs were not calculated for cases where one or both of the samples is "0".

Table A-14. Field duplicate results for the 2024 chlorophyll-a samples

Month	DUP	Station	Chlorophyll-a (µg/L)		RPD
			Sample	Duplicate	
July	July DUP-1	MEL-03-05	1.08	1.15	-6.3
	July DUP-2	MEL-01-01	1.86	1.88	-1.1
August	Aug DUP-1	MEL-03-04	1.07	1.09	-1.9
	Aug DUP-2	MEL-01-01	1.88	1.82	3.2
	Aug DUP-3	MEL-04-02	1.18	1.14	3.4
September	Sept DUP-1	MEL-01-01	2.14	2.06	3.8
	Sept DUP-2	MEL-02-08	2.16	1.87	14.4

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Bolded RPD values exceed 50%.

RPDs were not calculated for cases where one or both of the samples is "0".

A.5 BENTHIC INVERTEBRATE TAXONOMY

A.5.1 Methods

A.5.1.1 Field

Field personnel were appropriately trained and experienced, and all safety procedures were identified and followed. The same equipment—Petite Ponar and sieve bags—was used consistently, with equipment checked regularly throughout the program. Benthic invertebrate samples were collected following the methods outlined in the AEMP Design Plan and in the same general locations as the 2021 sampling. At each site, visual descriptions of each grab sample—including sediment color, odour, texture, and debris—were recorded. Samples were preserved in 500 mL plastic containers, filled to approximately 300 mL to allow space for formalin to mix with the sediment, and internal labels were added to each jar. Detailed field notes were recorded on waterproof paper, and chain-of-custody procedures, including proper shipping and storage, were followed to ensure sample integrity.

A.5.1.2 Laboratory

A description of the QC methods used by Cordillera Consulting (Summerland, BC) is provided below. Refer to **Appendix G2** for a detailed overview of how the samples are processed and identified.

When the samples arrived at Cordillera Consulting, they were logged into their proprietary software data base (INSTAR1) and the information on the chain-of-custody was recorded along with a Cordillera Consulting sample ID for cross reference. The samples were checked to verify that all sites and replicates recorded on field sheets or packing lists have been delivered intact and with adequate preservative.

There are two components of the QA/QC program for taxonomic identification of benthic invertebrates that should be audited: sorting efficiency and identification (taxonomy).

Sorting Efficiency

Sorting efficiency is a measure of the similarity in organism counts in a given sample. The procedure used for determine is described below:

1. Once the first 10 samples are initially sorted, debris from two of the samples were randomly chosen for resorting by a second sorter.
2. The sorting efficiency is calculated using the equation:

$$\%SE = \left(1 - \frac{\#\ of\ organisms\ missed}{Total\ number\ of\ organisms}\right) * 100$$

3. The target for sorting efficiency between the two sorters is ≥ 95%. If the sorting efficiency is < 95%, then all 10 initial samples must be re-sorted.
4. If the ≥ 95% criteria for sorting efficiency is not met, all of the samples from that sorter will be resorted and the laboratory training and quality control measures will be refocused on that individual.
5. According to the CABIN Laboratory manual, sorting efficiency should be calculated on 10% of the project samples (Environment Canada, 2012).
6. If an entire class of benthic invertebrate is not identified (i.e., the taxa is in the sample but not counted by the sorter) then all samples in the project must be re-sorted, regardless of whether the sorting efficiency met the 95% criteria.

Sub-sampling Efficiency

The Environmental Effects Monitoring (EEM) protocol requires additional sorting checks in the form of sub-sampling QC. Subsampling efficiency is evaluated to ensure that any fraction of the total sample that was examined was actually an accurate representation of the number of total organisms. The following steps, taken from Environment Canada (2002) describe how the precision and accuracy of the subsampling method (i.e., Marchant Box in this case) are determined:

1. The effects of the subsampling method on abundance estimates should be done on 10% of the samples where subsampling was required.
2. Of the 10% of samples randomly selected, each is sorted in its entirety to obtain an actual abundance measurement for the sample (i.e., each of the Marchant Box cells are sorted and the organisms are enumerated and tallied for a given sample).
3. Estimates of the organism abundance are then compared to the actual abundance measurements in the sample to determine the accuracy and precision of the subsampling method according to the following equations:

   Accuracy of the subsampling method:

$$\%\ Error\ in\ the\ estimate\ = \left(1 - \frac{estimated\ \#\ in\ the\ sample}{actual\ \#\ in\ the\ sample}\right) * 100$$

   Precision between subsamples:

$$\%\ Difference\ between\ two\ subsamples\ (A\ and\ B) = \left(1 - \frac{counts\ in\ subsample\ A}{counts\ in\ subsample\ B}\right) * 100$$

4. As outlined in Environment Canada (2002), the criterion for an acceptable subsampling protocol is that the estimates of organism abundance in each group of samples should be within 20% of the actual abundance measured in the sample. If an acceptable error level is not demonstrated for a particular technique or a particular set of samples then the technique should be modified to achieve this level of precision and accuracy or the sample should be sorted in its entirety.

A.5.2 Results

Sample Integrity

All twenty samples were received by Cordillera Consulting in good condition, with each sample properly preserved, sealed, and intact upon arrival.

Sorting Efficiency

Sorting efficiency was assessed for 10% of the samples to determine the percentage of organisms missed by the initial sorter. The data quality objective for sorting efficiency—measured as the agreement between the initial sort and the QC re-sort—is 95%. In the two samples that were re-sorted, sorting efficiency was 99% (**Table A-15**).

Sub-sampling Efficiency

Sub-sampling efficiency was also evaluated for 10% of the samples to ensure that any fraction of the total sample examined was representative of the whole sample. The laboratory's data quality objective for sub-sampling efficiency requires that the number of organisms in each sub-sample be within 20% of the actual count. Both of the samples met this criterion, confirming that sub-sampling produced accurate and precise results (**Table A-16**).

Table A-15. Summary of sorting efficiency.

Sample	% Sorted	Total from sample	Organisms in Re-sort	Precision[a]	Outcome	Taxa Found in QA/QC Sorting
MEL-01-01	100%	343	3	99%	Met DQO	Chironomidae, Bivalvia
MEL-05-03	75%	355	3	99%	Met DQO	Chironomidae

Notes:

[a] Precision is calculated by: (1-(Organisms in re-sort / Total from sample))*100

Table A-16. Summary of sub-sampling efficiency.

Sample	% Sorted	Organisms in Sub-sample		Actual Total	Accuracy[a] (% Error)		Precision[b] (% Difference)
		1	2		1	2	
MEL-02-03	50%	316	314	630	0.32%	0.32%	0.63%
MEL-05-02	50%	382	359	741	3.10%	3.10%	6.21%

Notes:

[a] Accuracy = ((Estimate from Sub-sample – Actual Total)/Actual Total) *100

[b] Precision = (Sub-sample 1 – Sub-sample 2)/(Sub-sample 1 + Sub-sample 2) *100

A.6 FISH TISSUE CHEMISTRY

A.6.1 Methods

The methods used to assess the reliability and accuracy of the fish tissue chemistry data are consistent with the approaches described above for surface water and sediment chemistry, with the exception that field duplicate samples are not collected. Instead, ALS randomly selected five Threespine Stickleback samples for split-sample analysis to assess both within-sample and analytical variability. For each selected fish, a portion of the single homogenized carcass was divided for separate analysis. Precision between the split samples was evaluated using the same criteria applied to field duplicates for surface water and sediment—1.5 times the laboratory DQO for each parameter. Split samples were not requested for Lake Trout.

A.6.2 Results

Sample Integrity

No sample integrity issues were noted for the Threespine Stickleback and Lake Trout samples submitted to ALS Environmental.

The Threespine Stickleback samples were thawed at North/South Consultants to remove the otoliths (under a microscope). After the otoliths were removed, the samples were placed back in their Whirl-Pak® bags and re-frozen. All of the samples arrived at ALS in frozen condition and the sample IDs matched the chain of custody form.

Laboratory QC Samples – Lake Trout

The laboratory QC results reported by ALS for the Lake Trout muscle samples are provided in **Table A-17**. The results are summarized below.

- **Reference material** – cobalt exceeded the upper limit of the DQO range for reference material by 9%. This is classified as a 'marginal' exceedance by ALS and the results are considered acceptable for reporting.
- **Laboratory duplicates** – Eight Lake Trout muscle samples, along with one anonymous sample from another client, were selected as duplicates to assess laboratory precision. Of the 210 duplicate analyses reported for the Lake Trout submission, only five parameters across two samples were flagged as exceeding the RPD DQOs. The variability between duplicate samples was attributed to sample (tissue) heterogeneity.

Table A-17. Laboratory QC summary for Lake Trout muscle samples submitted for tissue chemistry.

Reference Material / Laboratory Control Samples					
Parameter	**Result (mg/kg ww)**	**Target (mg/kg ww)**	**%**	**Limit (%) (DQO)**	**Qualifier**
Cobalt	0.0815	0.057	144	65-135	MES

Qualifier Codes

MES: Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

Laboratory Duplicates (n = 9 Lake Trout muscle samples were selected for duplicate analyses)							
Parameter	**Sample ID**	**Sample (mg/kg ww)**	**Duplicate (mg/kg ww)**	**DL**	**RPD (%)**	**RPD Limits (DQO)**	**Qualifier**
Calcium	LT-61-Muscle	75.2	141	4	60.60%	60	DUP-H
Manganese	LT-99-Muscle	0.164	0.085	0.01	63.00%	40	DUP-H
Mercury	LT-99-Muscle	0.168	0.374	0.0012	76.00%	40	DUP-H
Strontium	LT-61-Muscle	0.053	0.119	0.01	76.10%	60	DUP-H
Thallium	LT-99-Muscle	0.00507	0.00926	0.0004	58.40%	40	DUP-H

Qualifier Codes

DUP-H: Duplicate results outside ALS DQO, due to sample heterogeneity.

Laboratory QC Samples – Threespine Stickleback

The laboratory QC results reported by ALS for the Threespine Stickleback carcass samples are provided in **Table A-18**.

- **Reference Material** – Aluminum, beryllium, chromium, and tin exceeded the limits of the DQO range. Except for tin, the concentrations measured in the reference material were within 5% of the acceptable limits. Tin— which is not a parameter of interest for the Mine—was just under twice the target concentration.
- **Laboratory Duplicates** – Five Threespine Stickleback samples were selected as duplicates to assess laboratory precision. Of the 175 duplicate analyses, there were 11 parameters (13 samples) where the DQO for analytical precisions was not met. In all 13 instances, the variability between duplicates was attributed to sample heterogeneity.
- **Split Samples** – Of the 175 comparisons of analytical precision across the five split samples, 21 exceeded the DQO criterion of 1.5 times the laboratory duplicate DQO. One split sample—TS-139 from MEL-03—accounted for 14 of these exceedances. No issues were documented for this particular sample that would explain the greater number of parameters exceeding the RPD DQOs. As with the laboratory duplicates, the variability is attributed to tissue heterogeneity, minor differences in sample preparation methods, and instrument-related variability.

Table A-18. Laboratory QC summary for Threespine Stickleback carcass samples submitted for tissue chemistry.

Reference Material / Laboratory Control Samples					
Parameter	**Result (mg/kg ww)**	**Target (mg/kg ww)**	**%**	**Limit (%) (DQO)**	**Qualifier**
Aluminum	102	147	69.1	70-130	MES
Beryllium	0.758	1	75.8	80-120	MES
Chromium	0.694	0.453	153	50-150	MES
Tin	9.43	5	189	80-120	RM-H

Qualifier Codes

MES: Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

RM-H: Reference Material recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.

Laboratory Duplicates (n = 5 Threespine Stickleback carcass samples were selected for duplicate analysis)							
Parameter	**Sample ID**	**Sample (mg/kg ww)**	**Duplicate (mg/kg ww)**	**Detection Limit**	**RPD (%)**	**RPD Limits (DQO)**	**Qualifier**
Arsenic	TS-16	0.267	0.654	0.0060	84.10%	40	DUP-H
Barium	TS-16	1.97	5.38	0.010	92.70%	40	DUP-H
Calcium	TS-16	10400	27300	4.0	89.80%	60	DUP-H
Iron	TS-16	10	19.1	1.0	62.50%	40	DUP-H
Manganese	TS-16	15.9	42.8	0.010	91.60%	40	DUP-H
Mercury	TS-16	0.154	0.0991	0.0010	43.60%	40	DUP-H
Phosphorus	TS-16	7170	16800	2.0	80.20%	40	DUP-H
Phosphorus	TS-196	16600	26800	2.0	46.80%	40	DUP-H
Phosphorus	TS-22 REP	13800	21200	2.0	42.20%	40	DUP-H
Strontium	TS-16	9.48	24.7	0.020	89.00%	60	DUP-H
Thallium	TS-16	0.00196	0.00395	0.00040	67.60%	40	DUP-H
Uranium	TS-16	0.00464	0.0129	0.00040	94.20%	40	DUP-H
Zinc	TS-16	56.2	94.4	0.20	50.80%	40	DUP-H

Qualifier Codes

DUP-H: Duplicate results outside ALS DQO, due to sample heterogeneity.

Table A-19. Parameters that exceeded the duplicate DQOs in split samples of Threespine Stickleback carcasses, 2024.

Parameter	Area	MEL-01		MEL-03		MEL-04
	Sex	Female	Female	Female	Female	Female
	Weight	3.54	3.28	3.66	2.89	2.95
	Fish ID	TS-22	TS-31	TS-139	TS-156	TS-404
Aluminum				DIFF		
Barium		RPD		RPD		RPD
Cadmium				DIFF		
Calcium				RPD		
Iron				RPD		
Magnesium				RPD		
Manganese		RPD		RPD		
Mercury				RPD		
Nickel			RPD			
Phosphorus		RPD		RPD		RPD
Sodium				RPD		
Strontium				RPD		
Thallium				RPD		
Uranium		RPD		RPD		
Zinc				RPD		

Notes:

Precisions between the split samples were evaluated depending on the concentrations in the samples:

RPD = relative percent difference is used to compare duplicates when the measured concentration is > 5x the DL.

DIFF = when concentrations < 5* DL.

Table A-20
Duplicate results for split samples of Threespine Stickleback carcasses, 2024

Split sample		Relative Percent Difference DQOs		TS-22					TS-31					TS-156				
Client Sample ID				TS-22	TS-22 REP	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	TS-31	TS-31 REP	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	TS-156	TS-156 REP	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled				10-Aug-2024	12-Aug-2024				10-Aug-2024	12-Aug-2024				11-Aug-2024	12-Aug-2024			
ALS Sample ID		Lab Dup	Split	VA24D1264-004	VA24D1264-061				VA24D1264-006	VA24D1264-062				VA24D1264-028	VA24D1264-063			
Parameter	DL			Carcass	Carcass				Carcass	Carcass				Carcass	Carcass			
Physical Tests																		
Moisture (%)	2	20	30	74.9	69.5	RPD	7.5	Pass RPD	62.2	61.2	RPD	1.6	Pass RPD	71.7	64.5	RPD	10.6	Pass RPD
Metals (mg/kg ww)																		
Aluminum	1	40	60	*<1.0*	1.4	*<DL*	*<DL*	*<DL*	1.6	1.9	DIFF	-0.3	Pass Diff	3.9	3.4	DIFF	0.5	Pass Diff
Antimony	0.002	40	60	*<0.0020*	*<0.0020*	*<DL*	*<DL*	*<DL*	0.0025	0.0026	DIFF	-1E-04	Pass Diff	0.0021	0.0022	DIFF	-0.0001	Pass Diff
Arsenic	0.006	40	60	0.249	0.32	RPD	-25	Pass RPD	0.452	0.293	RPD	42.7	Pass RPD	0.232	0.161	RPD	36.1	Pass RPD
Barium	0.01	40	60	1.52	3.26	RPD	-72.8	Fail	5.24	6.26	RPD	-17.7	Pass RPD	7.3	9.02	RPD	-21.1	Pass RPD
Beryllium	0.002	40	60	*<0.0020*	*<0.0020*	*<DL*	*<DL*	*<DL*	*<0.0020*	*<0.0020*	*<DL*	*<DL*	*<DL*	*<0.0020*	*<0.0020*	*<DL*	*<DL*	*<DL*
Bismuth	0.002	40	60	*<0.0020*	*<0.0020*	*<DL*	*<DL*	*<DL*	*<0.0020*	*<0.0020*	*<DL*	*<DL*	*<DL*	*<0.0020*	*<0.0020*	*<DL*	*<DL*	*<DL*
Boron	0.2	40	60	*<0.20*	*<0.20*	*<DL*	*<DL*	*<DL*	*<0.20*	*<0.20*	*<DL*	*<DL*	*<DL*	*<0.20*	*<0.20*	*<DL*	*<DL*	*<DL*
Cadmium	0.002	40	60	0.0036	0.0042	DIFF	-0.0006	Pass Diff	0.0045	0.0066	DIFF	-0.0021	Pass Diff	0.0056	0.0072	DIFF	-0.0016	Pass Diff
Calcium	4	60	90	11100	21900	RPD	-65.5	Pass RPD	31600	39200	RPD	-21.5	Pass RPD	31300	46100	RPD	-38.2	Pass RPD
Cesium	0.001	40	60	0.013	0.0146	RPD	-11.6	Pass RPD	0.0122	0.0137	RPD	-11.6	Pass RPD	0.0701	0.0753	RPD	-7.2	Pass RPD
Chromium	0.04	40	60	*<0.040*	*<0.041*	*<DL*	*<DL*	*<DL*	0.063	*<0.040*	*<DL*	*<DL*	*<DL*	0.049	*<0.040*	*<DL*	*<DL*	*<DL*
Cobalt	0.004	40	60	0.0125	0.0156	DIFF	-0.0031	Pass Diff	0.0189	0.0126	DIFF	0.0063	Pass Diff	0.0119	0.0096	DIFF	0.0023	Pass Diff
Copper	0.04	40	60	0.636	0.821	RPD	-25.4	Pass RPD	0.717	0.595	RPD	18.6	Pass RPD	0.71	0.51	RPD	32.8	Pass RPD
Iron	1	40	60	13.5	24.1	RPD	-56.4	Pass RPD	27.4	22.6	RPD	19.2	Pass RPD	36.1	27.9	RPD	25.6	Pass RPD
Lead	0.01	40	60	*<0.010*	*<0.010*	*<DL*	*<DL*	*<DL*	*<0.010*	0.012	*<DL*	*<DL*	*<DL*	0.025	0.021	DIFF	0.004	Pass Diff
Lithium	0.1	40	60	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*
Magnesium	0.4	40	60	332	512	RPD	-42.7	Pass RPD	574	680	RPD	-16.9	Pass RPD	600	860	RPD	-35.6	Pass RPD
Manganese	0.01	40	60	11.4	27.9	RPD	-84	Fail	44.7	47.8	RPD	-6.7	Pass RPD	45.3	54.6	RPD	-18.6	Pass RPD
Mercury	0.001	40	60	0.0739	0.0504	RPD	37.8	Pass RPD	0.0686	0.0598	RPD	13.7	Pass RPD	0.0889	0.105	RPD	-16.6	Pass RPD
Molybdenum	0.008	40	60	0.0098	0.0122	DIFF	-0.0024	Pass Diff	0.0139	0.0114	DIFF	0.0025	Pass Diff	0.0125	0.0108	DIFF	0.0017	Pass Diff
Nickel	0.04	40	60	*<0.040*	0.053	*<DL*	*<DL*	*<DL*	0.158	0.05	DIFF	0.108	Fail	0.068	0.056	DIFF	0.012	Pass Diff
Phosphorus	2	40	60	7430	13800	RPD	-60	Fail	19400	23100	RPD	-17.4	Pass RPD	19600	27000	RPD	-31.8	Pass RPD
Potassium	4	40	60	2840	2990	RPD	-5.1	Pass RPD	2890	2910	RPD	-0.7	Pass RPD	3500	3090	RPD	12.4	Pass RPD
Rubidium	0.01	40	60	2.68	2.79	RPD	-4	Pass RPD	2.11	2.19	RPD	-3.7	Pass RPD	3.04	2.96	RPD	2.7	Pass RPD
Selenium	0.02	40	60	0.526	0.56	RPD	-6.3	Pass RPD	0.631	0.558	RPD	12.3	Pass RPD	0.761	0.614	RPD	21.4	Pass RPD
Sodium	4	40	60	1220	1360	RPD	-10.9	Pass RPD	1220	1370	RPD	-11.6	Pass RPD	1930	2020	RPD	-4.6	Pass RPD
Strontium	0.02	60	90	10.8	21.7	RPD	-67.1	Pass RPD	25.9	33.9	RPD	-26.8	Pass RPD	28	40.2	RPD	-35.8	Pass RPD
Tellurium	0.004	40	60	*<0.0040*	*<0.0041*	*<DL*	*<DL*	*<DL*	*<0.0040*	*<0.0040*	*<DL*	*<DL*	*<DL*	*<0.0040*	*<0.0040*	*<DL*	*<DL*	*<DL*
Thallium	0.0004	40	60	0.00539	0.00722	RPD	-29	Pass RPD	0.00698	0.00771	RPD	-9.9	Pass RPD	0.00724	0.007	RPD	3.4	Pass RPD
Tin	0.02	40	60	*<0.020*	*<0.020*	*<DL*	*<DL*	*<DL*	*<0.020*	*<0.020*	*<DL*	*<DL*	*<DL*	*<0.020*	*<0.020*	*<DL*	*<DL*	*<DL*
Uranium	0.0004	40	60	0.00221	0.00581	RPD	-89.8	Fail	0.019	0.0216	RPD	-12.8	Pass RPD	0.00585	0.0057	RPD	2.6	Pass RPD
Vanadium	0.02	40	60	*<0.020*	*<0.020*	*<DL*	*<DL*	*<DL*	0.029	0.032	DIFF	-0.003	Pass Diff	*<0.020*	*<0.020*	*<DL*	*<DL*	*<DL*
Zinc	0.2	40	60	43.2	69.3	RPD	-46.4	Pass RPD	80.3	76	RPD	5.5	Pass RPD	78.5	76.6	RPD	2.5	Pass RPD
Zirconium	0.04	40	60	*<0.040*	*<0.041*	*<DL*	*<DL*	*<DL*	*<0.040*	*<0.040*	*<DL*	*<DL*	*<DL*	*<0.040*	*<0.040*	*<DL*	*<DL*	*<DL*

Notes:

[a] Field Dup Methods are based on the concentrations:

RPD = relative percent difference is used to compare field duplicates when the measured concentration is > 5x the DL

DIFF = when concentrations < 5* DL

[b] Results refer to the RPD or absolute difference in concentration

DQO for RPDs is < Field RPD values

DQO for DIFF is < 2x the DL

Italicized numbers are below detection limits.

Table A-20
Duplicate results for split samples of Threespine Stickleback carcasses, 2024

		Split sample		Relative Percent Difference DQOs		TS-404					TS-139				
		Client Sample ID				TS-404	TS-404 REP	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	TS-139	TS-139 REP	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
		Date Sampled				12-Aug-2024	12-Aug-2024				11-Aug-2024	12-Aug-2024			
		ALS Sample ID		Lab Dup	Split	VA24D1264-055	VA24D1264-064				VA24D1264-022	VA24D1264-065			
Parameter	DL					Carcass	Carcass				Carcass	Carcass			
Physical Tests															
Moisture (%)	2			20	30	56.2	67.8	RPD	-18.7	Pass RPD	72.6	61.4	RPD	16.7	Pass RPD
Metals (mg/kg ww)															
Aluminum	1			40	60	2.4	1.7	DIFF	0.7	Pass Diff	1.8	4.7	DIFF	-2.9	Fail
Antimony	0.002			40	60	0.0022	0.0028	DIFF	-0.0006	Pass Diff	*<0.0020*	0.0042	*<DL*	*<DL*	*<DL*
Arsenic	0.006			40	60	0.106	0.128	RPD	-18.8	Pass RPD	0.121	0.196	RPD	-47.3	Pass RPD
Barium	0.01			40	60	9.05	4.31	RPD	71	Fail	3.55	13.6	RPD	-117.2	Fail
Beryllium	0.002			40	60	*<0.0020*	*<0.0020*	*<DL*	*<DL*	*<DL*	*<0.0020*	*<0.0020*	*<DL*	*<DL*	*<DL*
Bismuth	0.002			40	60	*<0.0020*	*<0.0020*	*<DL*	*<DL*	*<DL*	0.002	0.002	DIFF	0	Pass Diff
Boron	0.2			40	60	*<0.20*	*<0.20*	*<DL*	*<DL*	*<DL*	*<0.20*	*<0.20*	*<DL*	*<DL*	*<DL*
Cadmium	0.002			40	60	0.0118	0.0135	RPD	-13.4	Pass RPD	0.004	0.01	DIFF	-0.006	Fail
Calcium	4			60	90	57600	26300	RPD	74.6	Pass RPD	14800	66000	RPD	-126.7	Fail
Cesium	0.001			40	60	0.0289	0.051	RPD	-55.3	Pass RPD	0.024	0.0321	RPD	-28.9	Pass RPD
Chromium	0.04			40	60	*<0.040*	*<0.040*	*<DL*	*<DL*	*<DL*	*<0.040*	*<0.040*	*<DL*	*<DL*	*<DL*
Cobalt	0.004			40	60	0.0114	0.0102	DIFF	0.0012	Pass Diff	0.005	0.0113	DIFF	-0.0063	Pass Diff
Copper	0.04			40	60	0.635	0.834	RPD	-27.1	Pass RPD	0.44	0.769	RPD	-54.4	Pass RPD
Iron	1			40	60	26.6	20.7	RPD	24.9	Pass RPD	12.4	55.1	RPD	-126.5	Fail
Lead	0.01			40	60	0.021	0.018	DIFF	0.003	Pass Diff	*<0.010*	0.025	*<DL*	*<DL*	*<DL*
Lithium	0.1			40	60	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*
Magnesium	0.4			40	60	842	758	RPD	10.5	Pass RPD	378	1030	RPD	-92.6	Fail
Manganese	0.01			40	60	64.7	35.1	RPD	59.3	Pass RPD	13.7	52.3	RPD	-117	Fail
Mercury	0.001			40	60	0.054	0.064	RPD	-16.9	Pass RPD	0.143	0.0761	RPD	61.1	Fail
Molybdenum	0.008			40	60	0.0139	0.0125	DIFF	0.0014	Pass Diff	0.0096	0.0223	DIFF	-0.0127	Pass Diff
Nickel	0.04			40	60	0.047	0.054	DIFF	-0.007	Pass Diff	*<0.040*	0.073	*<DL*	*<DL*	*<DL*
Phosphorus	2			40	60	32600	16500	RPD	65.6	Fail	9810	37700	RPD	-117.4	Fail
Potassium	4			40	60	3090	3730	RPD	-18.8	Pass RPD	2590	3850	RPD	-39.1	Pass RPD
Rubidium	0.01			40	60	2.26	3.24	RPD	-35.6	Pass RPD	1.9	2.65	RPD	-33	Pass RPD
Selenium	0.02			40	60	0.628	0.852	RPD	-30.3	Pass RPD	0.536	0.726	RPD	-30.1	Pass RPD
Sodium	4			40	60	1820	1900	RPD	-4.3	Pass RPD	1210	2480	RPD	-68.8	Fail
Strontium	0.02			60	90	45.2	21.4	RPD	71.5	Pass RPD	14.2	63.4	RPD	-126.8	Fail
Tellurium	0.004			40	60	*<0.0040*	*<0.0040*	*<DL*	*<DL*	*<DL*	*<0.0040*	*<0.0040*	*<DL*	*<DL*	*<DL*
Thallium	0.0004			40	60	0.00489	0.0041	RPD	17.6	Pass RPD	0.00234	0.00484	RPD	-69.6	Fail
Tin	0.02			40	60	*<0.020*	*<0.020*	*<DL*	*<DL*	*<DL*	*<0.020*	*<0.080*	*<DL*	*<DL*	*<DL*
Uranium	0.0004			40	60	0.00926	0.00564	RPD	48.6	Pass RPD	0.0025	0.00958	RPD	-117.2	Fail
Vanadium	0.02			40	60	0.024	*<0.020*	*<DL*	*<DL*	*<DL*	*<0.020*	0.053	*<DL*	*<DL*	*<DL*
Zinc	0.2			40	60	93.2	85.1	RPD	9.1	Pass RPD	43.9	104	RPD	-81.3	Fail
Zirconium	0.04			40	60	0.048	*<0.040*	*<DL*	*<DL*	*<DL*	*<0.040*	*<0.040*	*<DL*	*<DL*	*<DL*

Notes:

[a] Field Dup Methods are based on the concentrations:

RPD = relative percent difference is used to compare field duplicates when the measured concentration is > 5x the DL

DIFF = when concentrations < 5* DL

[b] Results refer to the RPD or absolute difference in concentration

DQO for RPDs is < Field RPD values

DQO for DIFF is < 2x the DL

Italicized numbers are below detection limits.

A.7 REFERENCES

Canadian Council of Ministers of the Environment (CCME). 2016. Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment. PN 1557.

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APPENDIX B
SOURCE CHARACTERIZATION – SUPPORTING INFORMATION

Appendix B1
CP1 Discharge Volumes, MEL-14 Effluent Quality Results, and SNOCOR Chemistry Results from 2024

APPENDIX B1 – TABLES

Table B1-1. Daily discharge (m^3) from the Effluent Water Treatment Plant in 2024. 1
Table B1-2. Effluent chemistry and toxicity test results from MEL-14 samples in 2024. 2
Table B1-3. Snow core chemistry results, 2024. 5

Table B1-1. Daily discharge (m^3) from the Effluent Water Treatment Plant in 2024.

Total Volume (m^3) Discharged to Meliadine Lake in 2024: 861,484					
Day of the Month	**June**	**July**	**August**	**September**	**October**
	Volume (m^3)	Volume (m^3)	Volume (m^3)	Volume (m^3)	Volume (m^3)
1		8,625	0	2,172	17,517
2		4,952	0	5,008	17,554
3		0	0	5,028	17,568
4		4,647	0	5,797	17,541
5		6,202	0	10,207	16,838
6		6,169	0	11,426	17,412
7		4,564	0	10,463	17,083
8		6,191	0	11,408	16,264
9		6,159	0	11,411	17,086
10		4,132	0	1,784	17,118
11		0	0	0	17,113
12		4,010	0	4,389	13,419
13		3,406	0	16,370	17,063
14		4,677	0	14,985	17,347
15		4,824	0	14,310	9,754
16		4,166	0	17,369	
17	7,808	0	0	17,369	
18	14,254	0	0	16,154	
19	16,084	0	0	15,214	
20	15,776	0	0	17,405	
21	15,219	0	0	17,385	
22	17,329	0	0	17,388	
23	17,318	0	0	17,320	
24	16,919	0	0	17,084	
25	12,994	0	0	17,082	
26	13,084	0	0	12,644	
27	10,682	0	0	12,833	
28	4,832	0	0	16,849	
29	5,017	0	0	16,650	
30	4,621	0	0	16,642	
31		0	0		
Total	**171,937**	**72,724**	**0**	**370,146**	**246,677**

Table B1-2. Effluent chemistry and toxicity test results from MEL-14 samples in 2024.

	Parameter	Units	Water Licence		June		July			September								October		
			Max Grab	Max Mean	06-17	06-24	07-01	07-08	07-15	09-01	09-02	09-05	09-09	09-16	09-18	09-23	09-30	10-01	10-07	10-14
Field Measures	DO (mg/L)	mg/L	-	-	10.99	9.83	10.49	7.51	6.15	11.9	8.86	11.92	9.6	12.9	11.39	12.09	11.5	11.08	14.13	13.24
	Sp. Conductivity (field)	µS/cm	-	-	1333	1575	1569	1750	1882	-	2534	2484	2518	2493	2512	2571	3248	2137	3434	3380
	Temperature	C	-	-	10.6	13.2	15.9	12.7	14.4	9.1	9.5	8.3	7.8	8.1	7.3	9.1	7.5	7.1	6.3	2.8
	Turbidity (field)	NTU	-	-	1.37	1.11	1.59	1.9	1.14	0.94	1.07	0.81	0.96	1.12	0.97	1.14	1.57	1.45	1.46	3.54
	pH (field)	pH units	6 | 9.5[a]	6 | 9.5[a]	7.21	7.24	7.74	6.98	7.17	7.56	7.56	7.13	7.49	7.61	7.82	7.6	7.6	7.52	7.55	7.33
Conventional Parameters	Conductivity (lab)	µS/cm	-	-	1333	1575	1580	1770	1900	2490	2534	2520	2600	2540	2570	2630	3248	3350	3450	3380
	Hardness (D)	mg/L	-	-	298	309	304	339	356	479	484	477	497	509	511	563	715	761	741	765
	Hardness (T)	mg/L	-	-	267	304	264	311	331	425	430	445	469	435	449	572	627	713	667	638
	Total Dissolved Solids	mg/L	4500	3,500	905	890	980	1140	1240	1620	1630	1600	1640	1520	1670	1980	2040	2130	2180	2170
	TDS (calculated)	mg/L	-	-	700	820	830	930	990	1400	1400	1400	1400	1400	1400	1500	1900	2000	2100	1900
	Total Suspended Solids	mg/L	30[a]	15[a]	2	3	6	4	2	2	2	3	4	3	5	5	5	5	5	5
	Turbidity (lab)	NTU	-	-	0.5	0.6	1.1	1.2	0.6	0.4	0.6	0.4	0.7	0.9	0.8	0.6	1	1	0.8	1.8
	pH (lab)	pH units	-	-	7.34	7.3	7.22	7.27	7.54	7.73	7.76	7.52	7.71	7.76	7.83	7.8	7.69	7.66	7.61	7.57
Major Ions	Alkalinity, Bicarbonate	mg/L	-	-	39	40	27	42	60	74	75	69	83	87	88	88	97	93	93	91
	Alkalinity, Carbonate	mg/L	-	-	*< 1*	*< 1*	*< 1*	*< 1*	*< 1*	*< 1*	*< 1*	*< 1*	*< 1*	*< 1*	*< 1*	*< 1*	*< 1*	*< 1*	*< 1*	*< 1*
	Alkalinity, Total	mg/L	-	-	39	40	27	43	60	74	76	69	83	87	88	88	97	94	93	91
	Calcium (D)	mg/L	-	-	81.8	84.2	77.7	84.9	91.3	122	122	123	133	131	132	154	193	204	187	199
	Calcium (T)	mg/L	-	-	73.2	83.3	66.4	77.4	86.6	109	107	114	117	113	120	154	170	188	168	167
	Chloride	mg/L	-	-	270	340	350	380	410	570	550	580	590	570	570	570	700	730	740	680
	Fluoride	mg/L	-	-	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	0.13	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	0.12	0.13	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*
	Magnesium (D)	mg/L	-	-	22.7	24	26.7	30.8	31.2	42.4	43.6	41.3	39.8	43.8	44.1	43.3	56.7	61.2	66.3	65.2
	Magnesium (T)	mg/L	-	-	20.5	23.3	23.8	28.5	27.8	37.1	39.6	38.8	42.8	37.2	36.5	45.6	48.9	59.3	59.9	53.6
	Potassium (D)	mg/L	-	-	13.4	14	14.8	16.5	17.4	22.9	23.2	23	21.4	22	21.7	22	26.1	28.3	27	33
	Potassium (T)	mg/L	-	-	12.1	14.2	13.3	14.9	16.1	19.9	20.4	20.2	20	18.6	19.3	22.5	22.9	27.8	24	22.8
	Reactive Silica (SiO2)	mg/L	-	-	0.19	*< 0.05*	0.15	0.48	0.4	0.35	0.31	0.42	0.66	0.58	0.66	1.2	2.4	2.6	3	3
	Sodium (D)	mg/L	-	-	141	152	169	187	195	282	285	271	257	275	283	267	313	336	347	345
	Sodium (T)	mg/L	-	-	128	146	150	172	181	242	256	248	245	237	231	255	285	340	329	281
	Sulphate	mg/L	-	-	130	160	160	180	190	240	240	240	250	260	260	320	390	420	460	420
Nutrients and Organic Carbon	Ammonia (as N)	mg/L	18	14	0.16	0.3	*< 0.05*	0.17	0.4	0.13	0.13	0.15	0.26	0.24	0.17	0.42	2.3	2.7	3.3	3.7
	Nitrate (as N)	mg/L	-	-	4.38	5.55	5.03	4.94	5.78	3.91	3.95	4.63	5.02	5.55	5.57	7.34	14.6	15.1	19.2	19.4
	Nitrate + Nitrite (as N)	mg/L	-	-	4.58	5.75	5.24	5.12	5.98	3.98	4.02	4.7	5.1	5.62	5.64	7.48	14.9	15.5	19.7	19.8
	Nitrite (as N)	mg/L	-	-	0.204	0.197	0.201	0.184	0.193	0.069	0.069	0.067	0.078	0.066	0.079	0.144	0.344	0.402	0.441	0.363
	Orthophosphate (PO4-P)	mg/L	-	-	*< 0.01*	*< 0.01*	0.014	*< 0.01*	*< 0.01*	*< 0.01*	*< 0.01*	*< 0.01*	*< 0.01*	0.026	0.015	*< 0.01*	*< 0.01*	*< 0.01*	*< 0.01*	*< 0.01*
	Total Kjeldahl Nitrogen	mg/L	-	-	0.81	0.87	0.84	1.1	1.6	1.2	1.7	0.85	0.92	1.3	1.1	1.3	2.6	4.2	3	5.2
	Total Phosphorus	mg/L	4	2	0.023	0.024	0.043	0.052	0.031	*< 0.02*	0.04	*< 0.02*	*< 0.02*	0.055	0.046	0.025	0.044	*< 0.02*	0.033	*< 0.02*
	Unionized Ammonia (calc)	mg/L	-	-	0.0005	0.0012	*< 0.00079*	*< 4e-04*	0.0015	0.0008	0.0009	*< 4e-04*	0.0013	0.0015	0.0017	0.0029	0.014	0.013	0.016	0.0083
	Dissolved Organic Carbon	mg/L	-	-	4.3	4.2	4.8	6.3	6.7	8.4	8.6	7.8	9.4	9.1	9.6	8.6	9.6	9.1	9	8.7
	Total Organic Carbon	mg/L	-	-	4.9	4.4	5.8	7.6	7.9	8.9	9.5	8.4	10	10	9.9	9.7	10	9.6	9.8	9.5

Table B1-2. Effluent chemistry and toxicity test results from MEL-14 samples in 2024.

	Parameter	Units	Water Licence		June		July			September								October		
			Max Grab	Max Mean	06-17	06-24	07-01	07-08	07-15	09-01	09-02	09-05	09-09	09-16	09-18	09-23	09-30	10-01	10-07	10-14
Total Metals	Aluminum (T)	mg/L	3	2	0.394	0.58	0.496	0.37	0.35	0.31	0.319	0.354	0.466	0.422	0.398	0.622	0.505	0.677	0.649	0.838
	Antimony (T)	mg/L	-	-	0.00079	0.00087	0.0008	0.00099	0.00087	0.00079	0.00079	0.0007	0.00068	0.00065	*< 0.001*	0.00076	*< 0.001*	0.0012	*< 0.001*	0.00093
	Arsenic (T)	mg/L	0.6[a]	0.3[a]	0.0131	0.0141	0.0131	0.0108	0.00568	0.00533	0.00574	0.00415	0.00757	0.0105	0.0115	0.00882	0.00968	0.00725	0.00633	0.00437
	Barium (T)	mg/L	-	-	0.0228	0.0264	0.0244	0.0306	0.0361	0.0445	0.0456	0.0438	0.0442	0.0444	0.0454	0.0561	0.0523	0.0636	0.0517	0.0479
	Beryllium (T)	mg/L	-	-	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 2e-04*	*< 1e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 1e-04*
	Boron (T)	mg/L	-	-	0.122	0.127	0.132	0.137	0.16	0.205	0.226	0.188	0.178	0.178	0.18	0.204	0.25	0.26	0.28	0.278
	Cadmium (T)	mg/L	-	-	0.000016	0.00002	0.00001	0.000019	0.000023	0.000017	0.000017	0.000015	0.000019	0.000012	*< 2e-05*	*< 1e-05*	0.000023	*< 2e-05*	*< 2e-05*	0.000025
	Chromium (T)	mg/L	-	-	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.002*	*< 0.001*	*< 0.002*	*< 0.002*	*< 0.002*	*< 0.001*
	Cobalt (T)	mg/L	-	-	0.00136	0.00159	0.00138	0.00149	0.00146	0.001	0.00102	0.00098	0.00099	0.00091	0.00095	0.00125	0.0019	0.00225	0.00204	0.00189
	Copper (T)	mg/L	0.4	0.2	0.00205	0.00213	0.00204	0.00231	0.00266	0.00229	0.00234	0.0019	0.00225	0.00199	0.0023	0.00224	0.002	0.0022	0.0021	0.00223
	Iron (T)	mg/L	-	-	0.021	0.017	0.028	0.027	0.025	0.013	0.023	0.015	0.02	0.044	0.048	0.031	0.049	0.039	0.027	0.028
	Lead (T)	mg/L	0.2[a]	0.1[a]	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 4e-04*	*< 2e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	0.00021
	Lithium (T)	mg/L	-	-	0.016	0.0154	0.0158	0.017	0.0199	0.0308	0.0323	0.0303	0.0264	0.0268	0.0252	0.0331	0.0286	0.0346	0.0274	0.0261
	Manganese (T)	mg/L	-	-	0.0243	0.0163	0.0121	0.0497	0.0798	0.0297	0.0359	0.0293	0.0358	0.0457	0.0501	0.0883	0.166	0.201	0.182	0.148
	Mercury (T)	mg/L	-	-	*< 1e-05*	*< 1e-05*	*< 1e-05*	0.00001	0.00018	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*
	Molybdenum (T)	mg/L	-	-	0.0043	0.0048	0.0043	0.0053	0.0052	0.0061	0.0064	0.0055	0.005	0.005	0.0049	0.0051	0.005	0.0057	0.005	0.0044
	Nickel (T)	mg/L	1[a]	0.5[a]	0.0038	0.0043	0.0035	0.0035	0.0038	0.0045	0.0046	0.0043	0.0052	0.0047	0.0049	0.0072	0.0107	0.0133	0.0125	0.0119
	Selenium (T)	mg/L	-	-	0.00054	0.00071	0.0006	0.00067	0.0007	0.00055	0.00054	0.00053	0.00052	0.00046	0.00052	0.0006	0.00102	0.00132	0.00126	0.00121
	Silver (T)	mg/L	-	-	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 4e-05*	*< 2e-05*	*< 4e-05*	*< 4e-05*	*< 4e-05*	*< 2e-05*
	Strontium (T)	mg/L	-	-	0.845	0.926	0.849	0.944	1.11	1.36	1.4	1.39	1.46	1.32	1.38	1.82	1.72	1.97	1.74	1.61
	Thallium (T)	mg/L	-	-	0.000012	0.000016	0.000016	0.000017	0.000016	0.000015	0.000015	0.000013	0.000016	0.000011	*< 2e-05*	0.000021	*< 2e-05*	0.000024	0.000026	0.000021
	Tin (T)	mg/L	-	-	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.01*	*< 0.005*	*< 0.01*	*< 0.01*	*< 0.01*	*< 0.005*
	Titanium (T)	mg/L	-	-	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.01*	*< 0.005*	*< 0.01*	*< 0.01*	*< 0.01*	*< 0.005*
	Uranium (T)	mg/L	-	-	0.00018	0.00032	0.00019	0.00036	0.00072	0.00149	0.00166	0.00084	0.00259	0.00286	0.00287	0.00323	0.00465	0.00424	0.00446	0.00361
	Vanadium (T)	mg/L	-	-	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.01*	*< 0.005*	*< 0.01*	*< 0.01*	*< 0.01*	*< 0.005*
	Zinc (T)	mg/L	0.8	0.4	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	0.0099	0.0052	0.0052	*< 0.005*	*< 0.01*	*< 0.005*	*< 0.01*	*< 0.01*	*< 0.01*	0.0065
Dissolved Metals	Aluminum (D)	mg/L	-	-	0.0855	0.154	0.14	0.126	0.118	0.12	0.134	0.112	0.149	0.177	0.207	0.145	0.199	0.148	0.126	0.132
	Antimony (D)	mg/L	-	-	0.00086	0.00085	0.00086	0.00094	0.00097	0.00085	0.00086	0.00079	0.00076	0.00077	*< 0.001*	0.00072	0.001	0.0011	0.0011	0.00108
	Arsenic (D)	mg/L	-	-	0.0128	0.0134	0.0125	0.0103	0.00471	0.00454	0.0049	0.00349	0.00601	0.00959	0.0105	0.00561	0.00787	0.00404	0.00395	0.00279
	Barium (D)	mg/L	-	-	0.0239	0.0265	0.0268	0.0335	0.0396	0.0483	0.0487	0.0475	0.0508	0.0515	0.0536	0.0522	0.0625	0.0617	0.0577	0.0577
	Beryllium (D)	mg/L	-	-	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 1e-04*	*< 2e-04*	*< 1e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 1e-04*
	Boron (D)	mg/L	-	-	0.127	0.128	0.158	0.163	0.211	0.226	0.233	0.212	0.224	0.206	0.22	0.217	0.29	0.3	0.32	0.34
	Cadmium (D)	mg/L	-	-	0.000017	0.000018	0.000013	0.000019	0.000021	0.000017	0.000019	0.000017	0.000016	0.000014	*< 2e-05*	0.000014	0.000023	0.000022	*< 2e-05*	0.00003
	Chromium (D)	mg/L	-	-	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.002*	*< 0.001*	*< 0.002*	*< 0.002*	*< 0.002*	*< 0.001*
	Cobalt (D)	mg/L	-	-	0.00146	0.00161	0.00153	0.00154	0.0015	0.00109	0.00111	0.00116	0.00113	0.00107	0.00108	0.00124	0.00201	0.00221	0.00221	0.00232
	Copper (D)	mg/L	-	-	0.00215	0.00214	0.00208	0.00234	0.00267	0.0025	0.0026	0.00248	0.00244	0.00229	0.0028	0.00229	0.00231	0.00228	0.00224	0.00231
	Iron (D)	mg/L	-	-	0.0086	0.0071	0.0163	0.0114	0.0079	0.0061	0.0121	0.0066	*< 0.005*	0.0099	0.011	*< 0.005*	*< 0.01*	*< 0.01*	*< 0.01*	*< 0.005*
	Lead (D)	mg/L	-	-	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	0.00068	*< 2e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 2e-04*

Table B1-2. Effluent chemistry and toxicity test results from MEL-14 samples in 2024.

	Parameter	Units	Water Licence		June		July			September								October		
			Max Grab	Max Mean	06-17	06-24	07-01	07-08	07-15	09-01	09-02	09-05	09-09	09-16	09-18	09-23	09-30	10-01	10-07	10-14
Dissolved Metals	Lithium (D)	mg/L	-	-	0.0176	0.0176	0.0174	0.0215	0.0227	0.0333	0.0338	0.0314	0.032	0.0306	0.0303	0.0324	0.0349	0.0347	0.0305	0.0317
	Manganese (D)	mg/L	-	-	0.0218	0.0113	0.0098	0.0516	0.0825	0.031	0.0365	0.033	0.0423	0.0517	0.051	0.0853	0.193	0.209	0.203	0.181
	Mercury (D)	mg/L	-	-	*< 1e-05*	*< 1e-05*	*< 1e-05*	0.00016	0.00014	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*	*< 1e-05*
	Molybdenum (D)	mg/L	-	-	0.0046	0.0046	0.0049	0.0058	0.0054	0.0067	0.0068	0.0061	0.0059	0.0059	0.0057	0.0053	0.0057	0.0061	0.0056	0.0054
	Nickel (D)	mg/L	-	-	0.004	0.0042	0.0037	0.0037	0.0039	0.0049	0.005	0.0052	0.0059	0.0055	0.0057	0.0071	0.0118	0.0135	0.014	0.0146
	Selenium (D)	mg/L	-	-	0.00062	0.00069	0.00071	0.00071	0.0008	0.00062	0.00063	0.00058	0.00057	0.00056	0.00053	0.00061	0.0011	0.0012	0.00139	0.00149
	Silver (D)	mg/L	-	-	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 2e-05*	*< 4e-05*	*< 2e-05*	*< 4e-05*	*< 4e-05*	*< 4e-05*	*< 2e-05*
	Strontium (D)	mg/L	-	-	0.871	0.912	0.962	1.05	1.23	1.47	1.5	1.49	1.62	1.52	1.58	1.68	2.01	2.1	1.9	2.01
	Thallium (D)	mg/L	-	-	0.000013	0.000015	0.000016	0.000017	0.000019	0.000014	0.000014	0.000015	0.000017	0.000014	*< 2e-05*	0.000019	0.00002	0.000023	0.000027	0.000029
	Tin (D)	mg/L	-	-	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.01*	*< 0.005*	*< 0.01*	*< 0.01*	*< 0.01*	*< 0.005*
	Titanium (D)	mg/L	-	-	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.01*	*< 0.005*	*< 0.01*	*< 0.01*	*< 0.01*	*< 0.005*
	Uranium (D)	mg/L	-	-	0.00011	0.00018	0.00011	0.00028	0.00074	0.00159	0.00172	0.00081	0.00252	0.00312	0.00321	0.00283	0.00533	0.00506	0.00465	0.00405
	Vanadium (D)	mg/L	-	-	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.01*	*< 0.005*	*< 0.01*	*< 0.01*	*< 0.01*	*< 0.005*
	Zinc (D)	mg/L	-	-	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.01*	*< 0.005*	*< 0.01*	*< 0.01*	*< 0.01*	0.0063
Other	Cyanide (Total)	mg/L	1[a]	0.5[a]	0.00551	0.00335	0.00363	0.00151	0.00144	0.00342	0.0031	0.00104	0.00124	0.00124	0.00076	0.00108	0.00241	0.00146	0.00354	0.00207
	Cyanide (WAD)	mg/L	-	-	0.0046	0.003	0.0033	0.0013	0.0016	0.0041	0.0016	0.0011	0.00071	*< 5e-04*	*< 5e-04*	0.0013	0.0017	0.00077	0.002	0.0013
	Cyanide (free)	mg/L	-	-	0.0057	0.0039	0.0029	*< 0.002*	0.0034	*< 0.002*	0.0022	0.0024	*< 0.002*	*< 0.002*	0.0031	*< 0.002*	0.0024	*< 0.002*	*< 0.002*	*< 0.002*
	Radium-226	Bq/l	-	-	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	0.006	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	0.01	*< 0.005*
Hydrocarbons	F1 (C6-C10)	mg/L	-	-	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*
	F1 (C6-C10)-BTEX	mg/L	-	-	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*	*< 0.025*
	F2 (C10-C16)	mg/L	-	-	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.09*	*< 0.09*	*< 0.09*	*< 0.09*	*< 0.09*	*< 0.09*	*< 0.09*
	F3 (C16-C34)	mg/L	-	-	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*
	F4 (C34-C50)	mg/L	-	-	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*	*< 0.2*
Volatile Organics	Benzene	mg/L	-	-	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*
	Ethylbenzene	mg/L	-	-	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*
	Toluene	mg/L	-	-	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*
	Xylenes	mg/L	-	-	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*
	m,p-Xylenes	mg/L	-	-	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*
	o-Xylene	mg/L	-	-	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*
Toxicity	Rainbow trout survival	LC50[b]	-	-	100	-	-	100	-	-	100	-	-	-	-	-	-	100	-	-
	D. magna survival	LC50[b]	-	-	100	-	-	100	-	-	100	-	-	-	-	-	-	100	-	-
	L. minor biomass	IC25[c]	-	-	97	-	-	-	-	-	>97	-	-	-	-	-	-	72 (49.7-96.5)	-	-
	L. minor frond number	IC25[c]	-	-	97	-	-	-	-	-	>97	-	-	-	-	-	-	55.9 (41.1-67.6)	-	-

Notes:

Italicized values are below the limit of detection

[a] Limits in the Water Licence are equal to the Maximum Monthly Mean and Maximum Grab concentration in the Metal and Diamond Mining Effluent Regulations (Schedule 4; Table 2)

[b] LC50 = the concentration that causes a 50% reduction in survival.

[c] IC25 = the concentration that causes a 25% reduction in endpoints for the *L. minor* test; 95% confidence intervals in parentheses.

Table B1-3. Snow core chemistry results, 2024.

Parameter	8 April 2024				
	Background	East of WRSF3	Emulsion Plant	North of Camp	North of Lake A8
	SNOCOR6	SNOCOR5	SNOCOR7	SNOCOR Boundary	SNOCOR4
Conventional Parameters (mg/L unless stated otherwise)					
Hardness (D)	2.43	4.55	**6.74**	3.34	17.1
Alkalinity, Bicarbonate	3.8	6.8	**12**	5.6	24
Alkalinity, Carbonate	*< 1*	*< 1*	*< 1*	*< 1*	*< 1*
pH (lab)	6.51	6.65	6.98	6.6	7.36
Alkalinity, Total	3.8	6.8	**12**	5.6	25
Conductivity (lab; µS/cm)	10	19	**29**	14	53
Total Dissolved Solids	*< 10*	*< 10*	*< 10*	*< 10*	10
Total Suspended Solids	38	**100**	280	75	940
Turbidity (NTU)	10	**22**	71	12	250
Organic Carbon (mg/L)					
Dissolved Organic Carbon	0.57	0.84	0.61	0.54	0.97
Total Organic Carbon	0.58	**1.3**	0.8	0.65	**1.5**
Major Ions (mg/L)					
Calcium (T)	1.13	**2.58**	**5.14**	1.66	22
Calcium (D)	0.84	1.62	**2.51**	1.17	6.31
Magnesium (T)	0.28	**0.78**	1.53	0.43	5.86
Magnesium (D)	0.081	0.125	0.118	0.104	**0.325**
Potassium (T)	*< 0.25*	*< 0.25*	**0.52**	*< 0.25*	1.26
Potassium (D)	0.069	0.117	**0.154**	0.069	**0.324**
Sodium (T)	0.35	0.61	**0.89**	0.35	1.75
Sodium (D)	0.316	0.593	**0.941**	0.421	**1.33**
Sulphate	*< 0.5*	*< 0.5*	**1.4**	0.55	**1.9**
Chloride	*< 1*	*< 1*	*< 1*	*< 1*	*< 1*
Total Metals (mg/L)					
Aluminum	0.307	**1.04**	2.58	0.579	8.71
Antimony	*< 0.00002*	0.000144	0.000296	**0.000053**	0.000471
Arsenic	0.0146	**0.0499**	0.772	**0.0624**	0.898
Barium	0.00228	**0.00666**	0.0147	0.00378	0.0472
Beryllium	*< 0.00001*	*< 0.00001*	**0.000036**	*< 0.00001*	0.000114
Boron	*< 0.01*	*< 0.01*	*< 0.02*	*< 0.01*	*< 0.02*
Cadmium	*< 0.000005*	0.000038	0.000069	*< 0.000005*	0.000122
Chromium	0.0005	**0.00245**	0.00414	0.00099	0.0189
Cobalt	0.000156	**0.000697**	0.00171	0.00029	0.00664
Copper	0.00076	**0.00243**	0.0117	0.00146	0.0203
Iron	0.863	**2.6**	9.81	**1.73**	25.9
Lead	0.00268	**0.0059**	0.0426	**0.00603**	0.0729
Lithium	*< 0.0005*	**0.0016**	0.0029	0.00079	0.0107
Manganese	0.0217	**0.0448**	**0.0741**	0.0235	0.348
Molybdenum	*< 0.00005*	**0.000103**	0.00046	*< 0.00005*	0.00061
Nickel	0.00069	**0.00261**	0.00422	0.00099	0.0192
Selenium	*< 0.00004*	*< 0.00004*	*< 0.00008*	*< 0.00004*	**0.00012**
Silver	*< 0.00001*	0.000016	0.00005	*< 0.00001*	0.000137

Table B1-3. Snow core chemistry results, 2024.

Parameter	8 April 2024				
	Background	East of WRSF3	Emulsion Plant	North of Camp	North of Lake A8
	SNOCOR6	SNOCOR5	SNOCOR7	SNOCOR Boundary	SNOCOR4
Strontium	0.00337	**0.00886**	0.0224	0.00663	0.0683
Thallium	*< 0.000002*	*< 0.000002*	0.0000321	*< 0.000002*	0.0000333
Tin	*< 0.0002*	*< 0.0002*	*< 0.0004*	*< 0.0002*	*< 0.0004*
Titanium	0.0043	**0.0138**	0.0492	**0.0098**	0.114
Uranium	*< 0.000005*	0.0000261	0.000045	*< 0.000005*	0.000223
Vanadium	0.00046	**0.00178**	0.00321	0.00079	0.014
Zinc	0.0074	0.0124	**0.024**	0.0054	0.0546
Dissolved Metals (mg/L)					
Aluminum	0.00767	**0.0168**	**0.0343**	0.00799	0.106
Antimony	0.000033	0.000045	0.000052	0.000032	**0.00014**
Arsenic	0.00346	0.00495	0.055	0.00482	0.0739
Barium	0.00045	0.000692	0.000437	0.000678	**0.00125**
Beryllium	*< 0.00001*	*< 0.00001*	*< 0.00001*	*< 0.00001*	*< 0.00001*
Boron	*< 0.01*	*< 0.01*	*< 0.01*	*< 0.01*	*< 0.01*
Cadmium	0.000005	0.0000061	0.0000052	*< 0.000005*	*< 0.000005*
Chromium	*< 0.0001*	0.00012	0.00011	*< 0.0001*	0.00011
Cobalt	0.0000276	0.00004	**0.00012**	0.0000273	**0.0000963**
Copper	0.000291	0.00041	**0.000971**	0.000269	**0.000911**
Iron	0.0136	0.0124	0.0174	0.0059	0.0144
Lead	0.000101	0.000178	**0.000405**	0.0000932	0.000187
Lithium	*< 0.0005*	*< 0.0005*	*< 0.0005*	*< 0.0005*	0.00051
Manganese	0.00743	0.0132	0.00575	0.00805	**0.0161**
Molybdenum	*< 0.00005*	0.000062	**0.000198**	*< 0.00005*	0.00033
Nickel	0.000128	0.000199	0.000095	0.000121	0.000184
Selenium	*< 0.00004*	*< 0.00004*	0.000051	*< 0.00004*	**0.000086**
Silver	*< 0.000005*	*< 0.000005*	*< 0.000005*	*< 0.000005*	*< 0.000005*
Strontium	0.00239	**0.00504**	**0.00967**	0.00445	0.0197
Thallium	*< 0.000002*	*< 0.000002*	*< 0.000002*	*< 0.000002*	0.0000026
Tin	*< 0.0002*	*< 0.0002*	*< 0.0002*	*< 0.0002*	*< 0.0002*
Titanium	*< 0.0005*	*< 0.0005*	*< 0.0005*	*< 0.0005*	*< 0.0005*
Uranium	0.0000054	0.0000079	0.0000083	0.0000041	0.0000465
Vanadium	*< 0.0002*	*< 0.0002*	*< 0.0002*	*< 0.0002*	*< 0.0002*
Zinc	0.00167	0.00252	0.00053	0.00135	0.00215

Notes

Italicized numbers are less than the DL

Bold italicized numbers are > 2-times background (SNOCOR6)

5 to 10-times background

10 to 20-times background

>20 times background

Appendix B2
Supplemental Figures – MEL-14 Effluent Chemistry and Loadings to Meliadine Lake (2018-2024)

APPENDIX B2 – FIGURES

The following notes apply to all the plots in this appendix.

1. The blue dot represents the monthly mean concentration at MEL-14. The blue vertical line represents the range of concentrations measured in each month.
2. Monthly loadings = monthly mean concentration (mg/L) x monthly discharge (m^3) /1,000.
3. Some parameters were not measured in June, July, and August 2018. Monthly loadings appear on the plot as 0 kg for those months (see cobalt, as an example).

Figure B2-1. Total suspended solids (TSS) 1
Figure B2-2. Total dissolved solids (TDS measured) 2
Figure B2-3. Chloride 3
Figure B2-4. Sodium 4
Figure B2-5. Calcium 5
Figure B2-6. Magnesium 6
Figure B2-7. Potassium 7
Figure B2-8. Sulphate 8
Figure B2-9. Alkalinity (Total) 9
Figure B2-10. Reactive Silica 10
Figure B2-11. Nitrate (as N) 11
Figure B2-12. Nitrite (as N) 12
Figure B2-13. Nitrate + Nitrite (as N) 13
Figure B2-14.Total Kjeldahl nitrogen (TKN) 14
Figure B2-15. Ammonia (as N) 15
Figure B2-16. Total Phosphorus 16
Figure B2-17. Orthophosphate 17
Figure B2-18. Total Organic Carbon (TOC) 18
Figure B2-19. Aluminum 19
Figure B2-19. Antimony 20
Figure B2-20. Arsenic 21
Figure B2-21. Barium 22
Figure B2-22. Beryllium 23
Figure B2-23. Bismuth 24
Figure B2-24. Boron 25

Figure B2-25. Cadmium 26
Figure B2-26. Chromium 27
Figure B2-27. Cobalt 28
Figure B2-28. Copper 29
Figure B2-29. Iron 30
Figure B2-30. Lead 31
Figure B2-31. Lithium 32
Figure B2-32. Manganese 33
Figure B2-33. Mercury 34
Figure B2-34. Molybdenum 35
Figure B2-35. Nickel 36
Figure B2-36. Selenium 37
Figure B2-37. Silicon 38
Figure B2-38. Silver 39
Figure B2-39. Strontium 40
Figure B2-40. Thallium 41
Figure B2-41. Tin 42
Figure B2-42. Titanium 43
Figure B2-43. Uranium 44
Figure B2-44. Vanadium 45
Figure B2-45. Zinc 46
Figure B2-46. Cyanide (Free) 47
Figure B2-47. Cyanide (Total) 48
Figure B2-49. Radium-226 49

Figure B2-1. Total suspended solids (TSS)

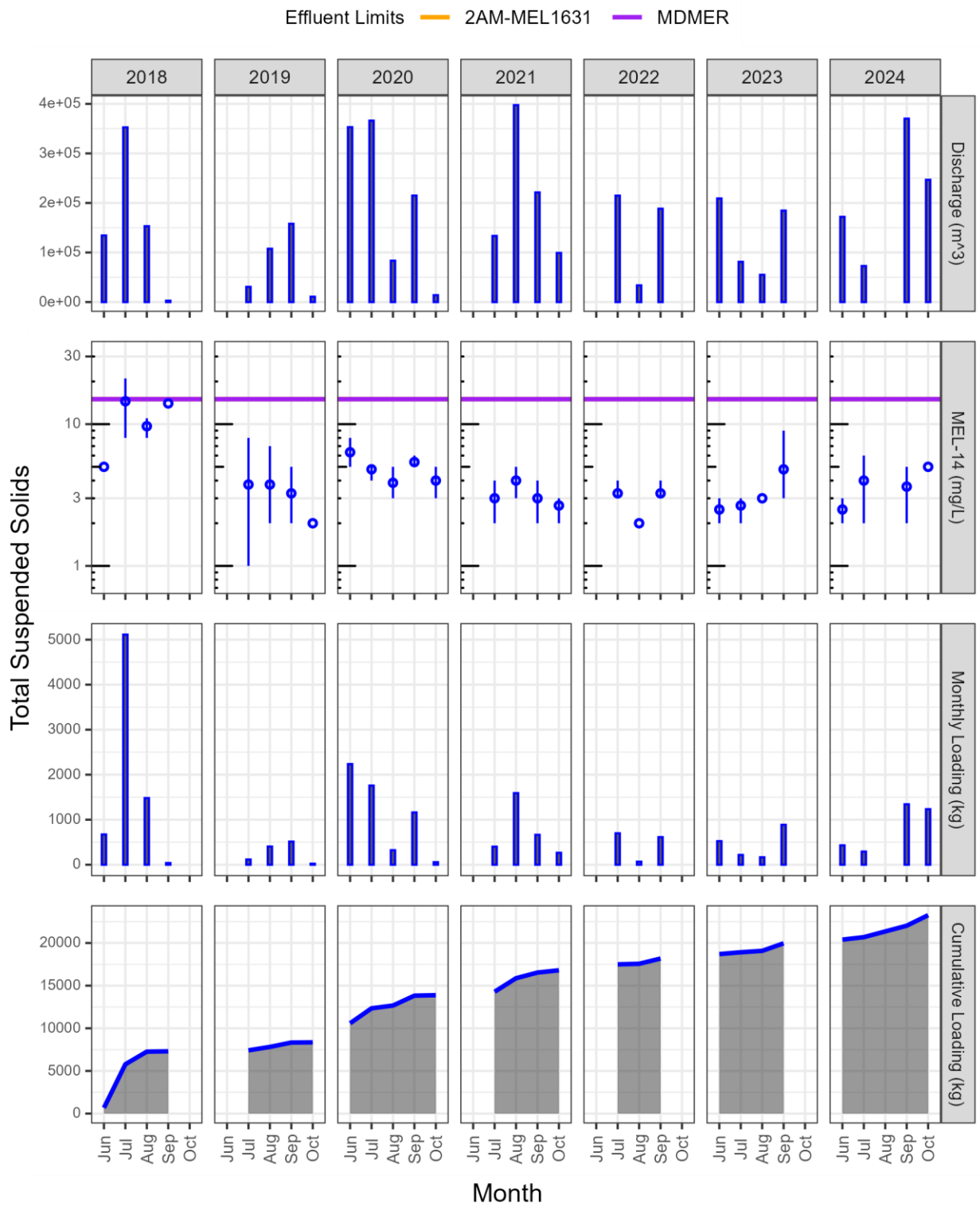


Figure B2-2. Total dissolved solids (TDS measured)

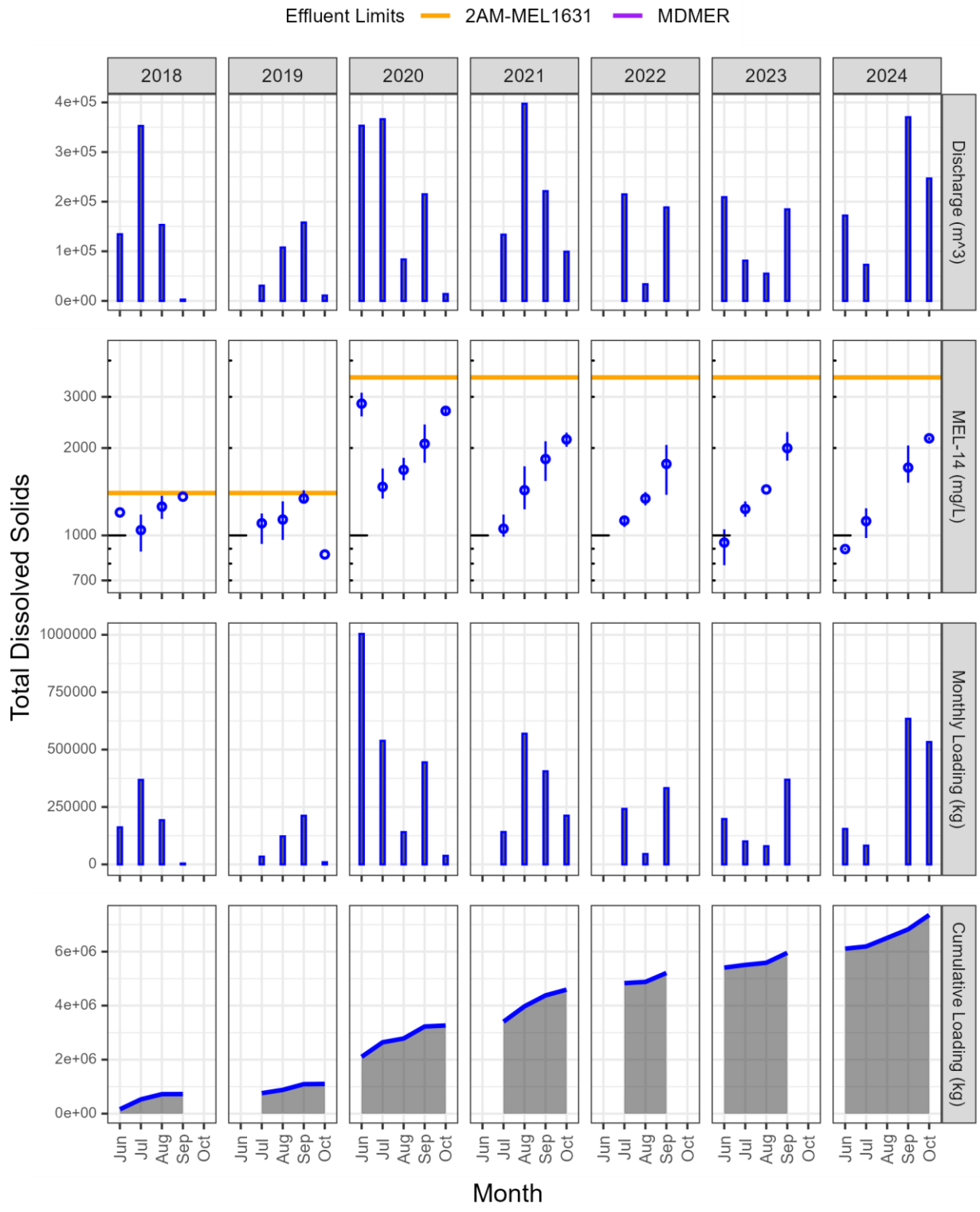


Figure B2-3. Chloride

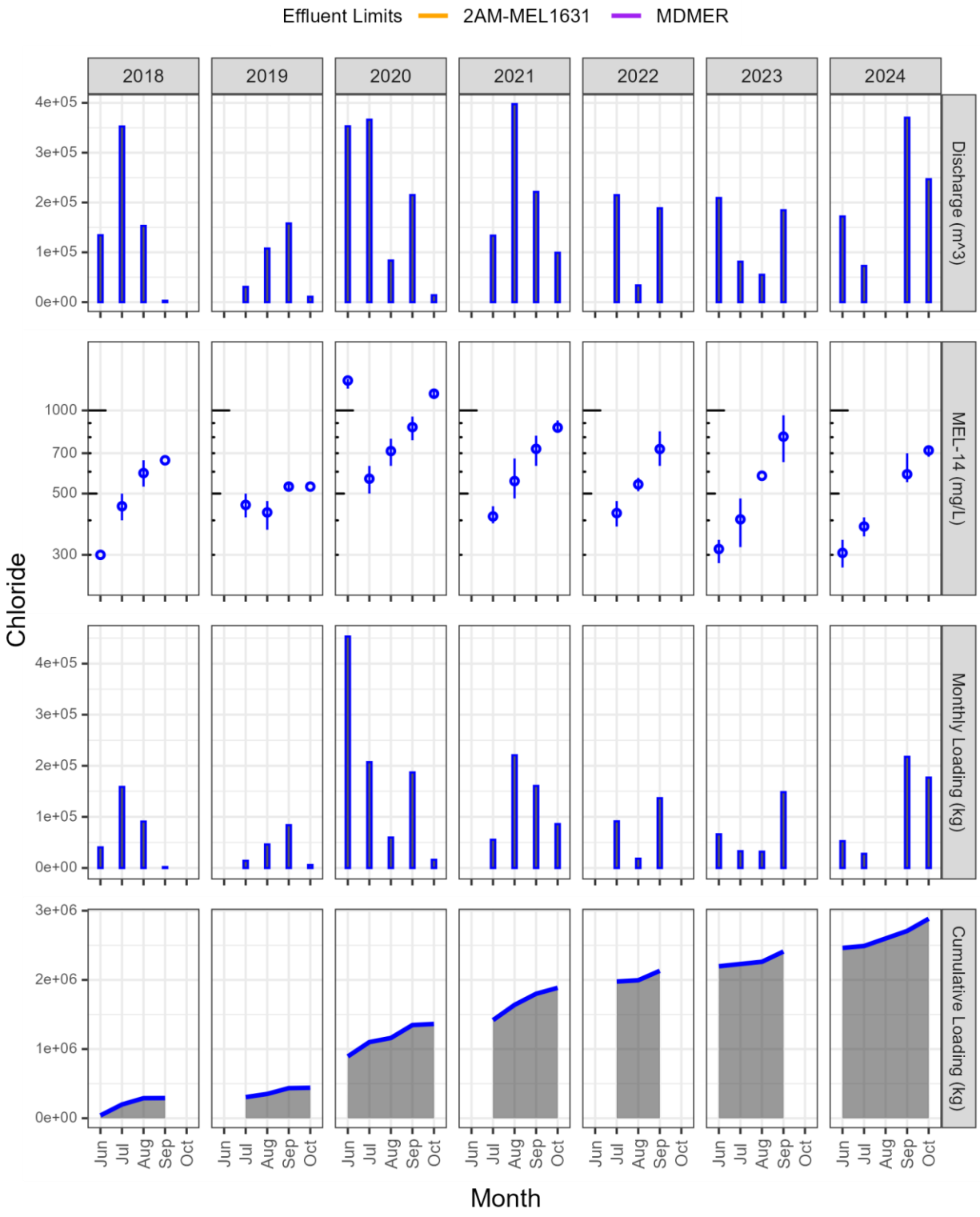


Figure B2-4. Sodium

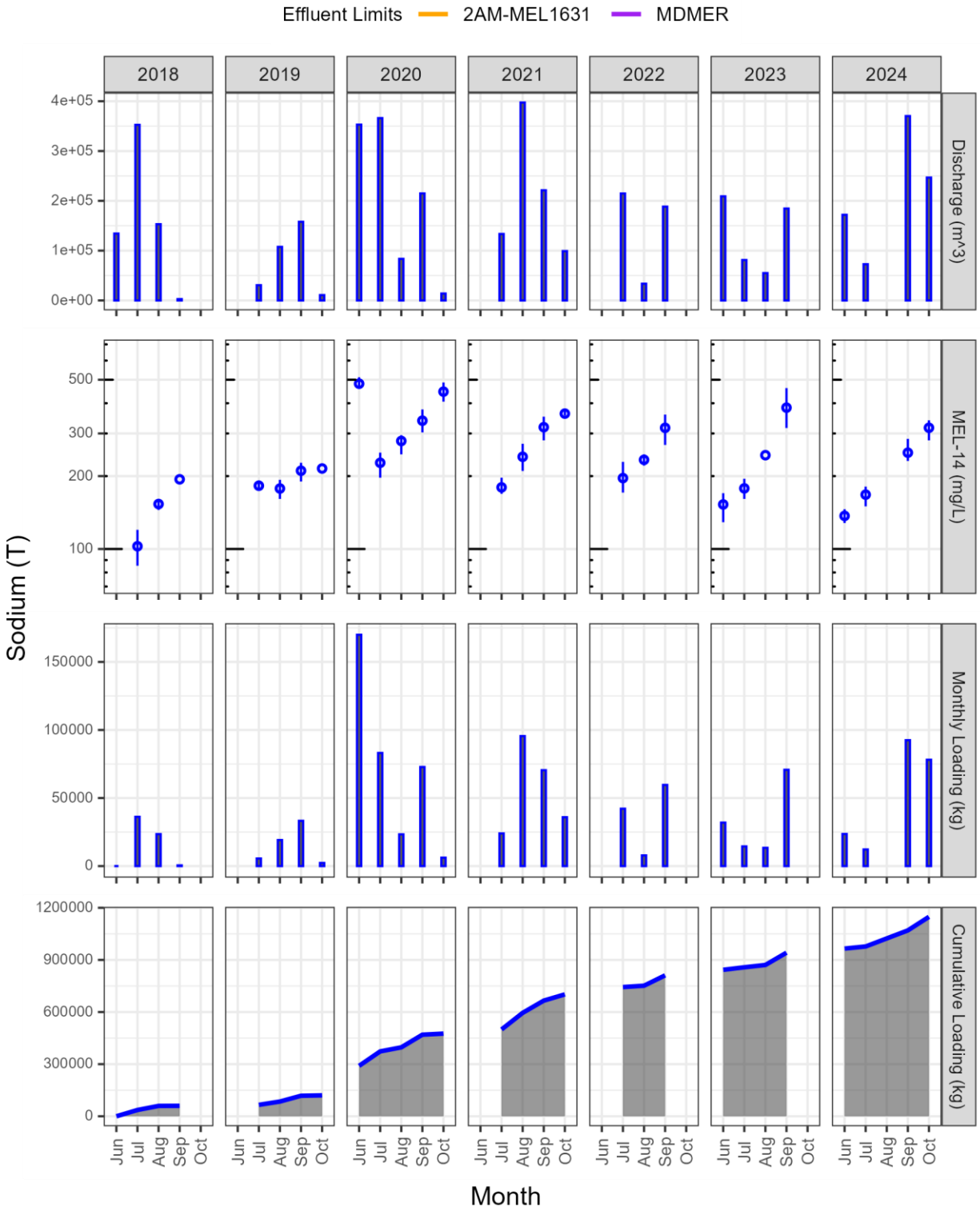


Figure B2-5. Calcium

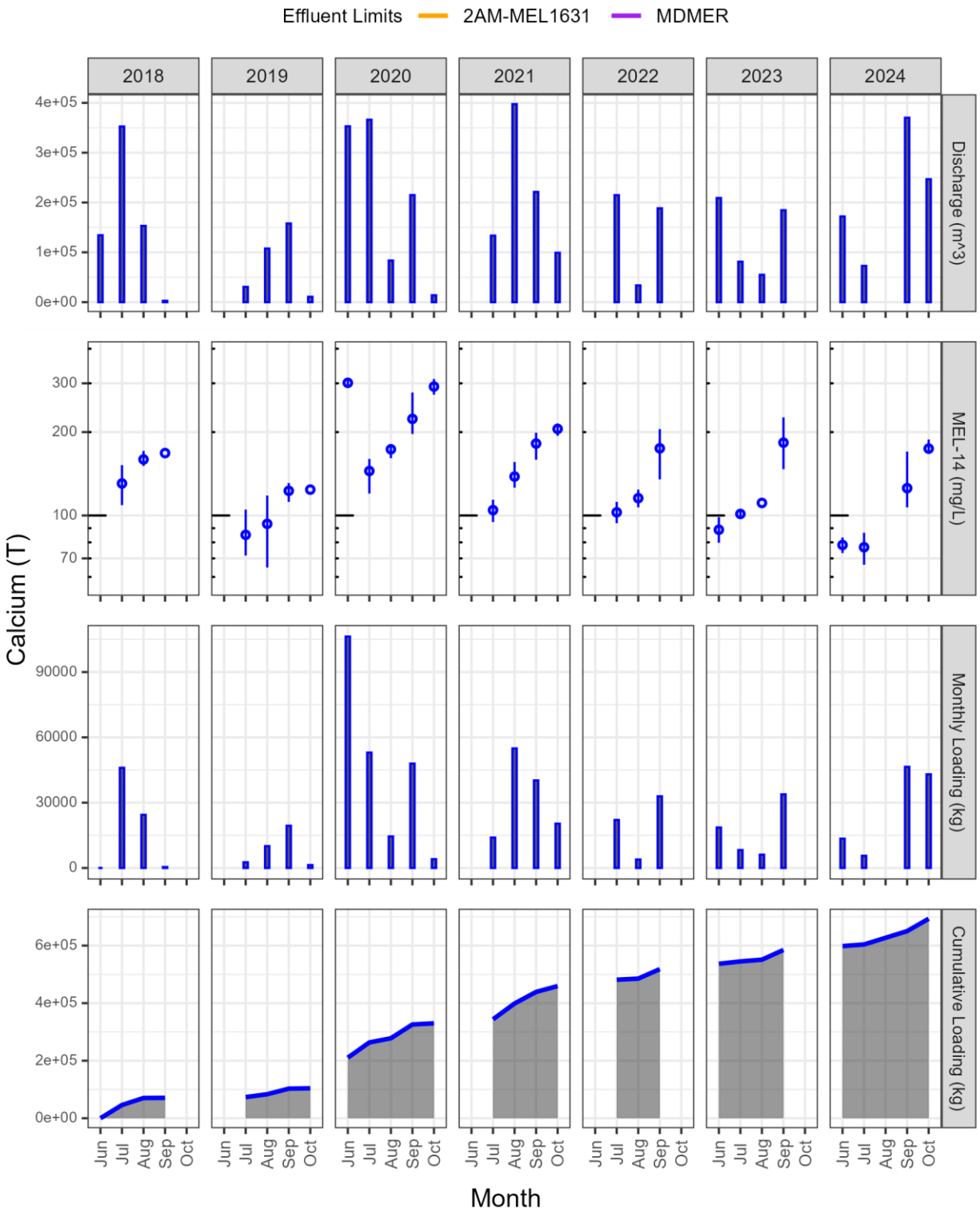


Figure B2-6. Magnesium

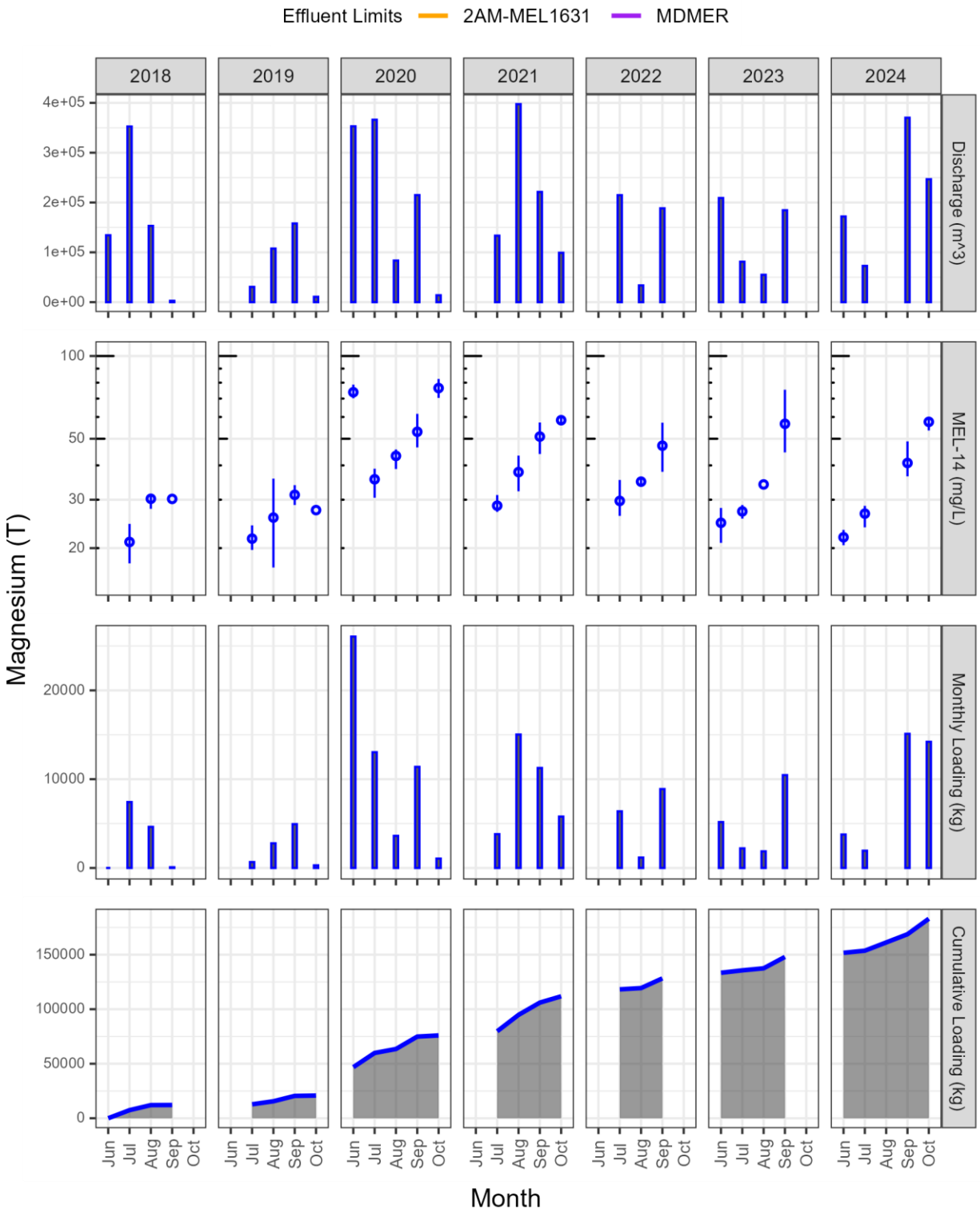


Figure B2-7. Potassium

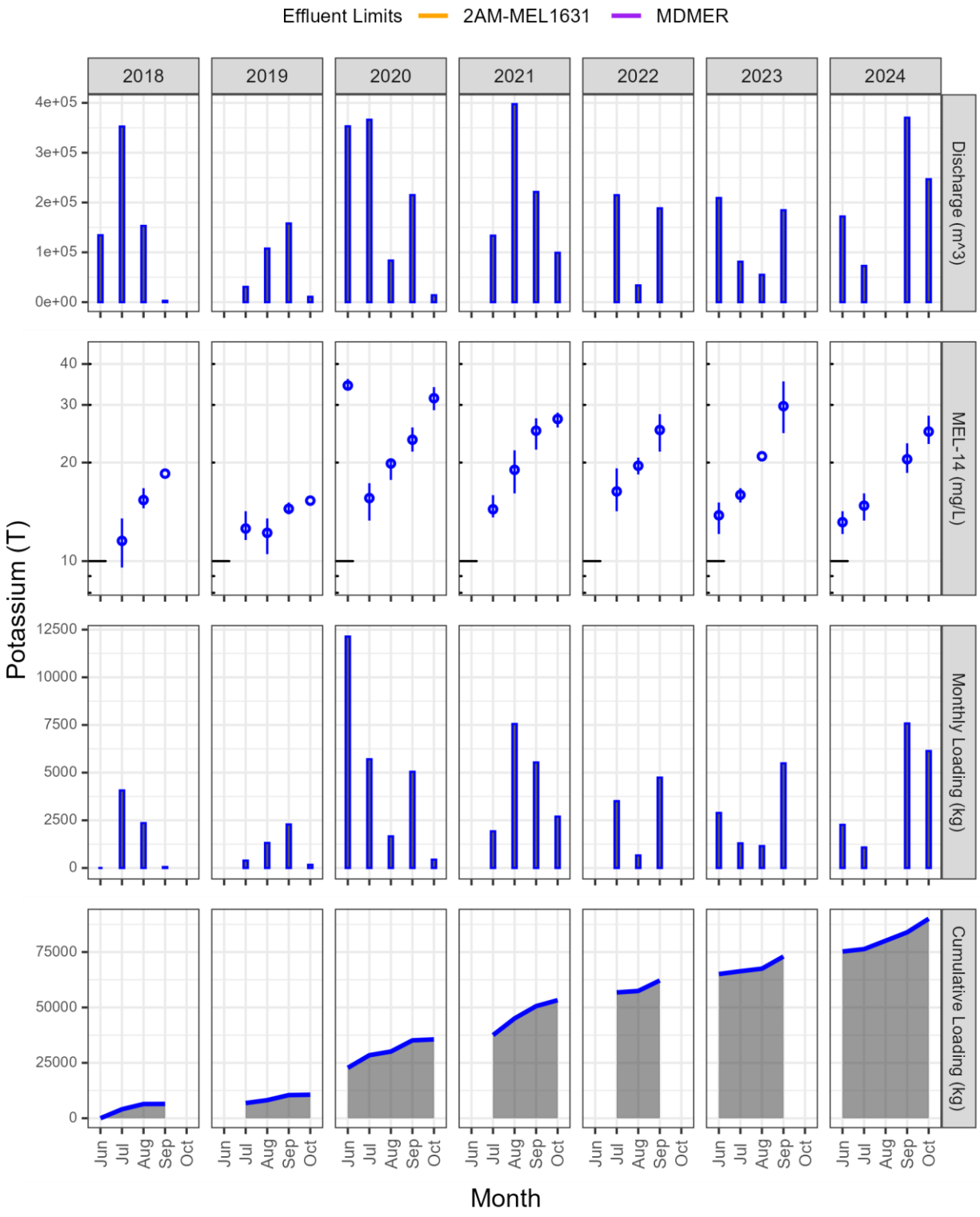


Figure B2-8. Sulphate

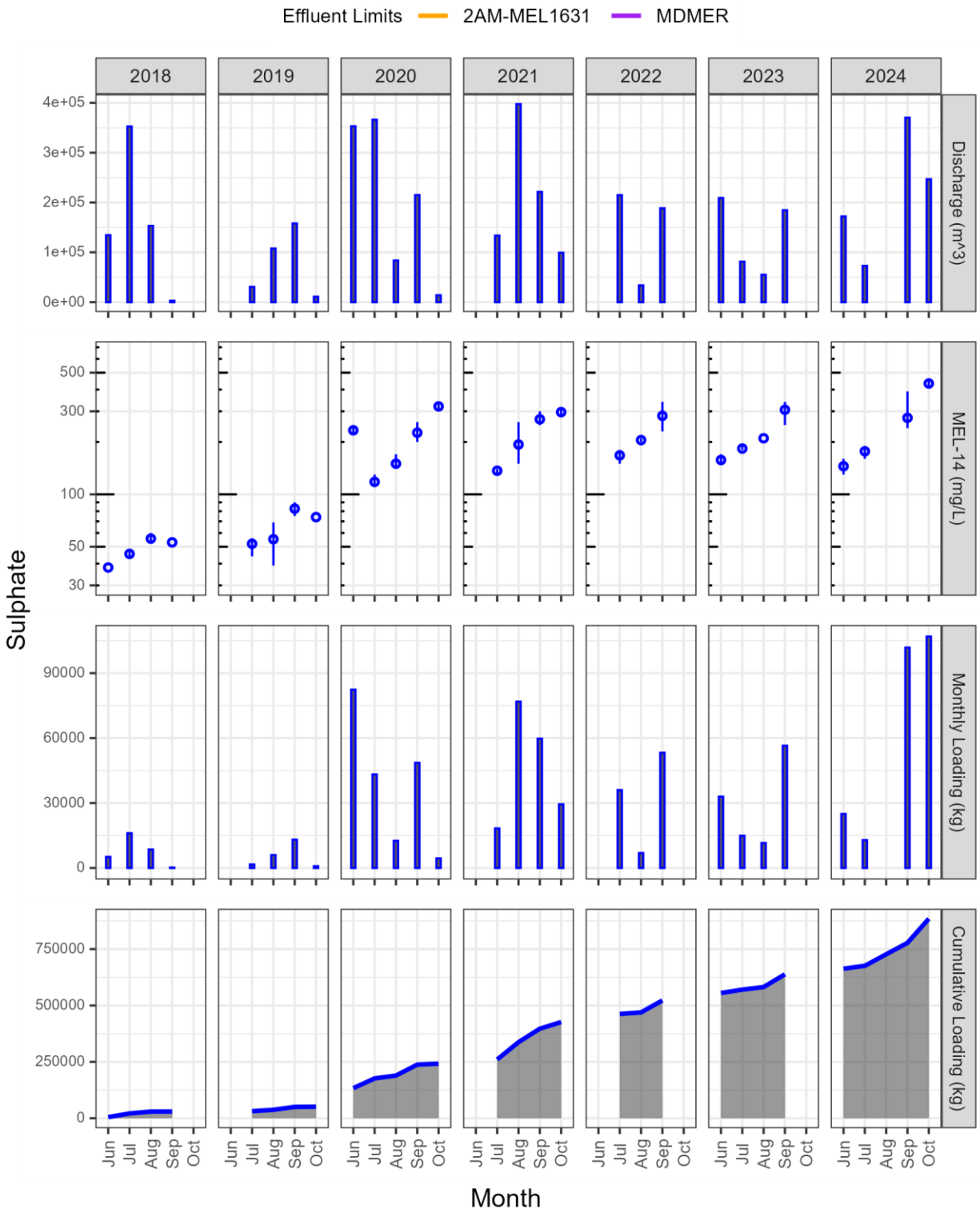


Figure B2-9. Alkalinity (Total)

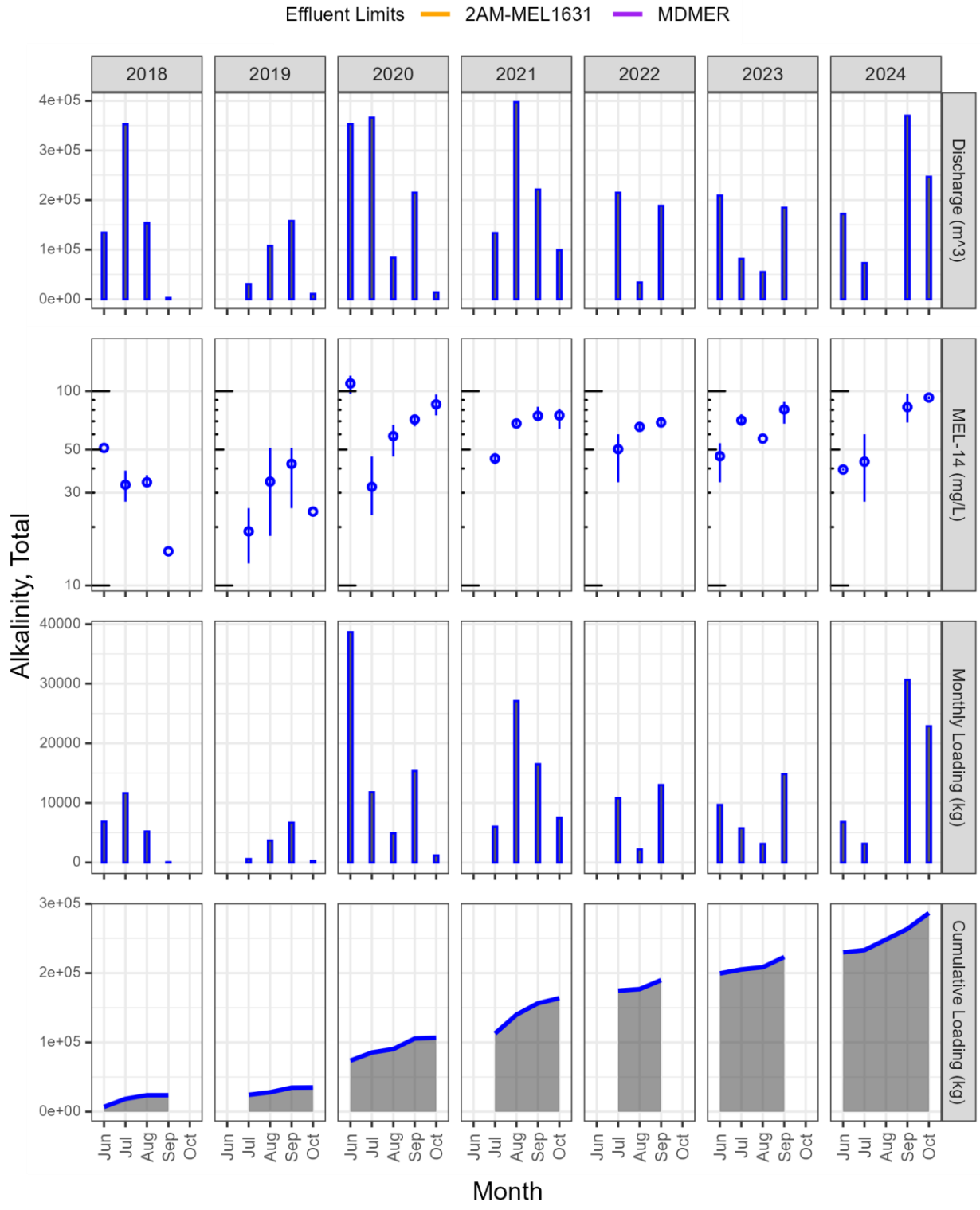


Figure B2-10. Reactive Silica

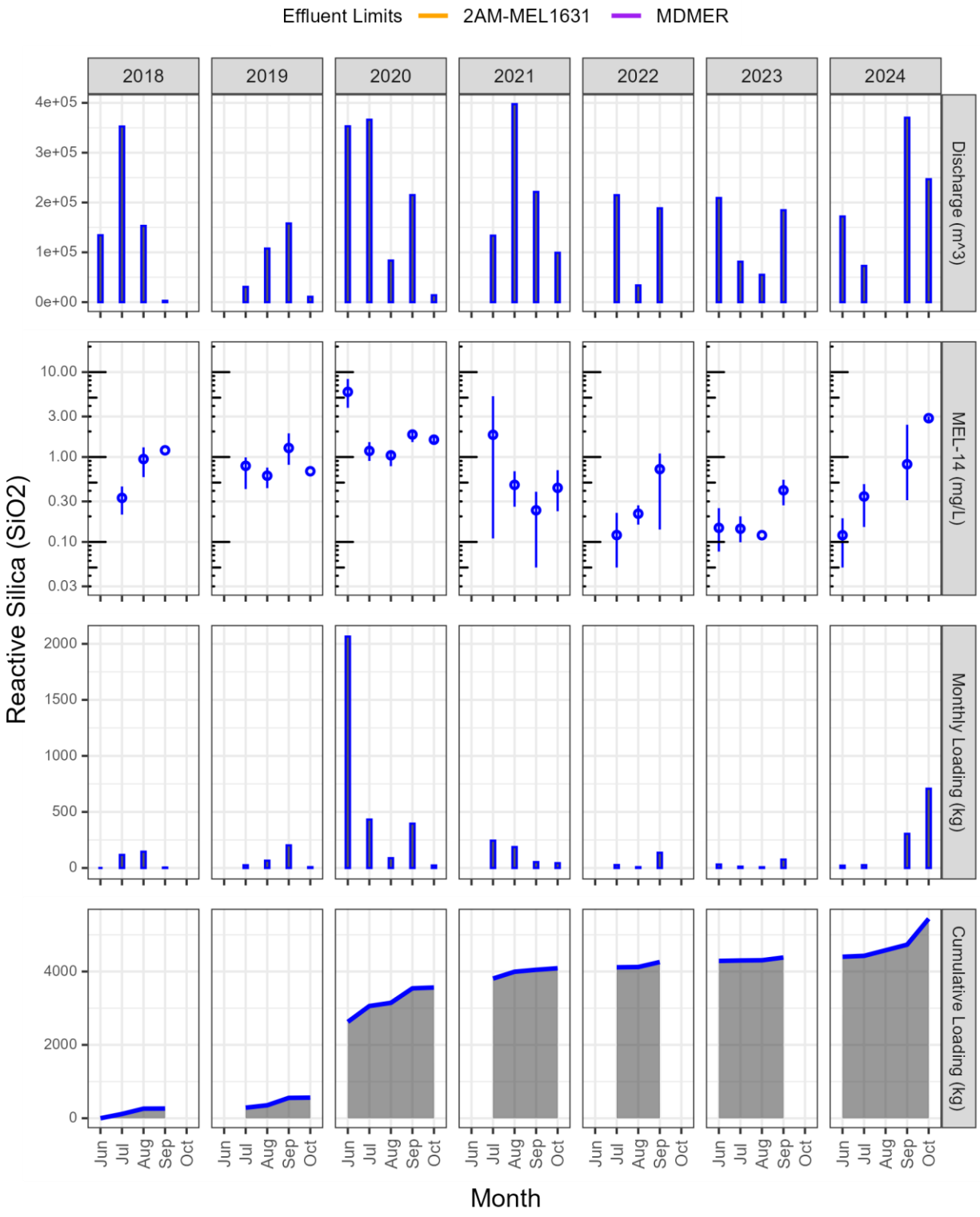


Figure B2-11. Nitrate (as N)

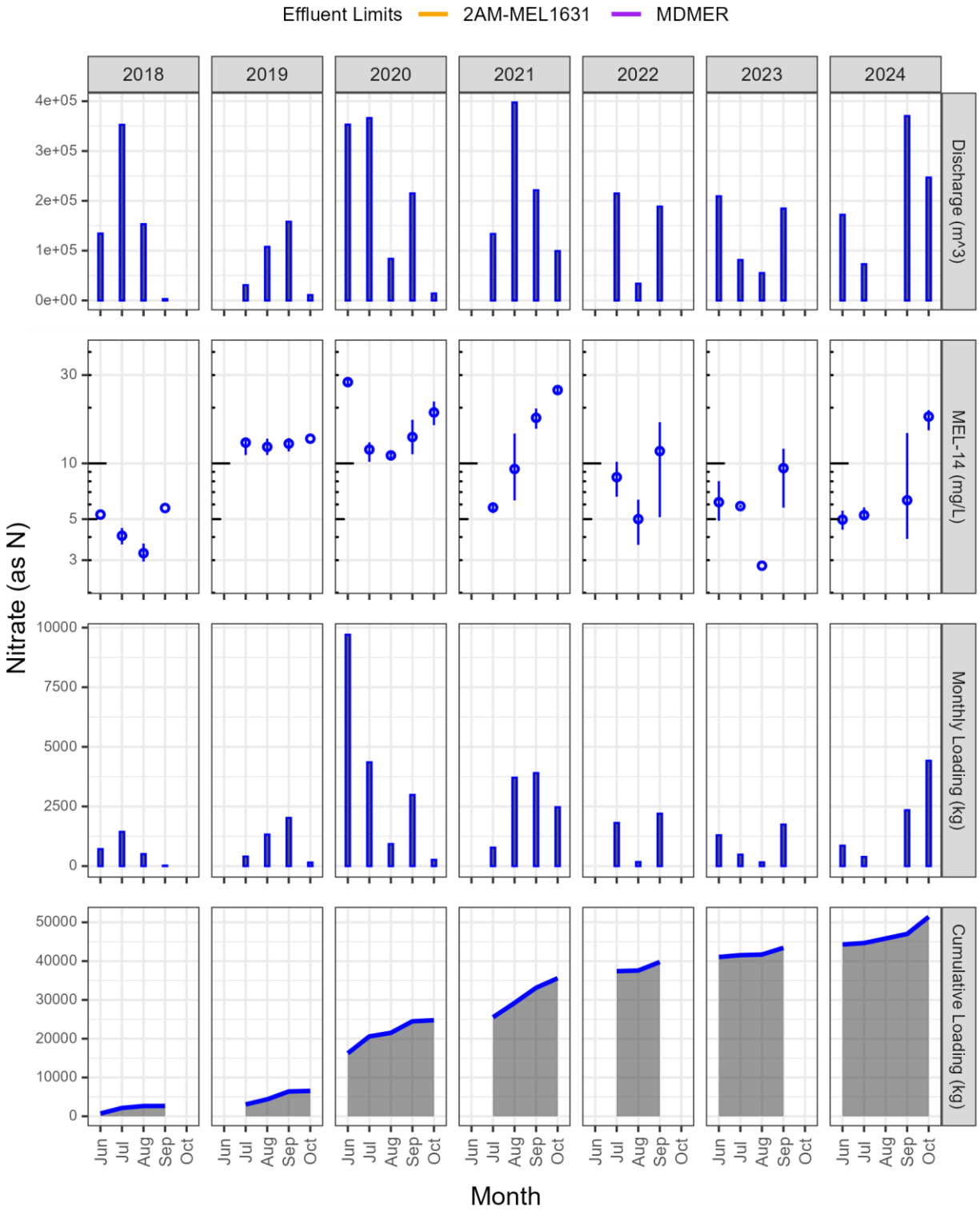


Figure B2-12. Nitrite (as N)

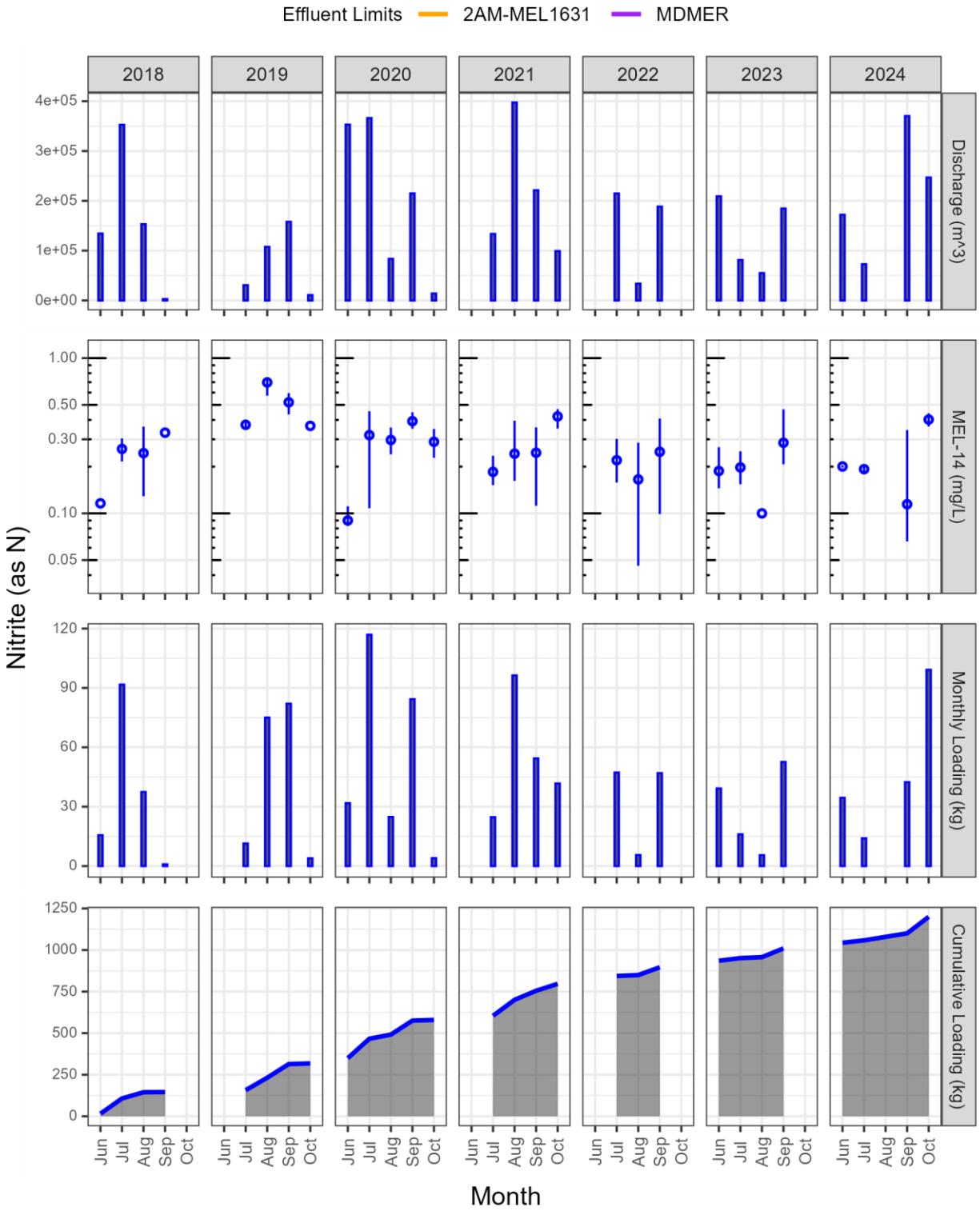


Figure B2-13. Nitrate + Nitrite (as N)

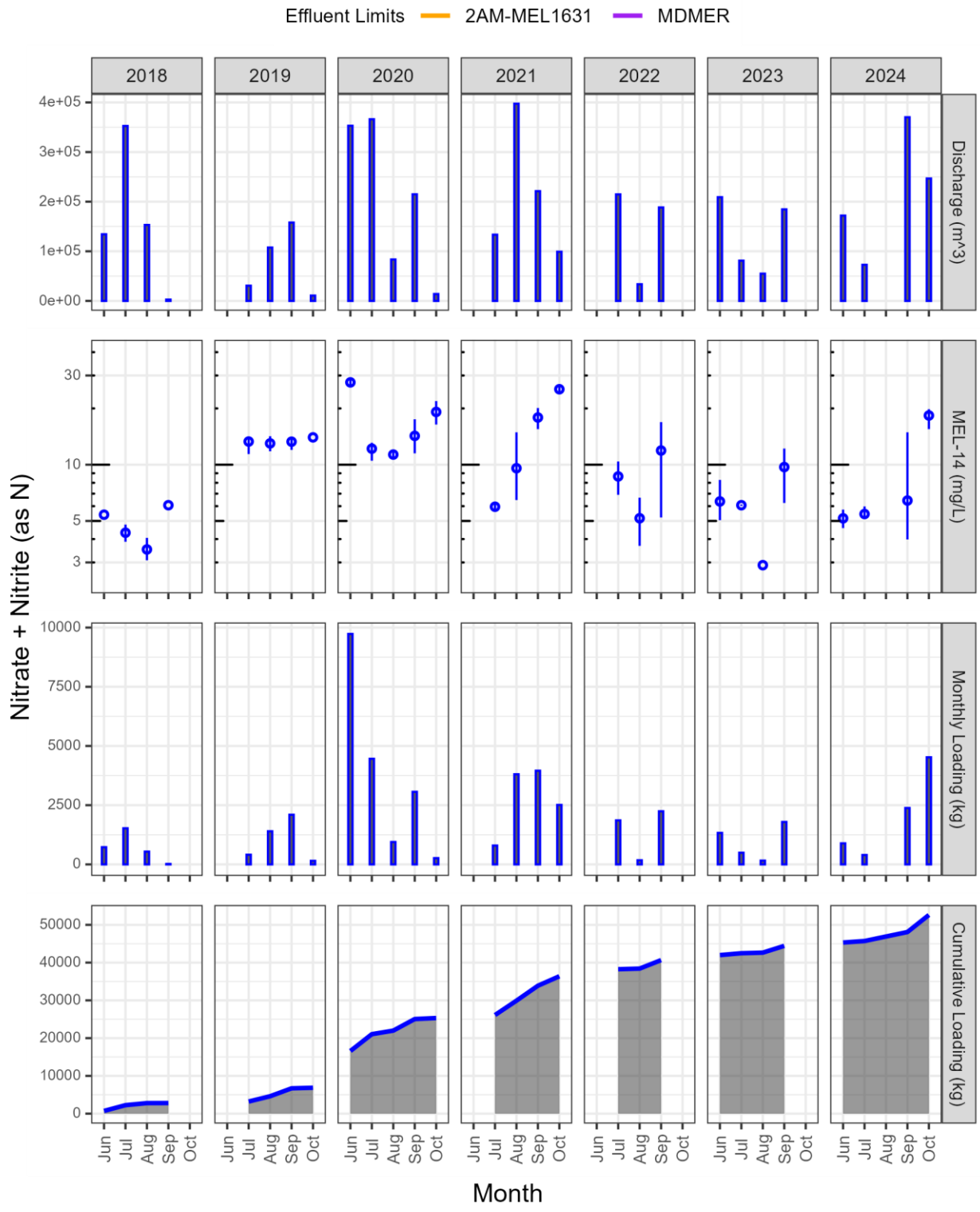


Figure B2-14.Total Kjeldahl nitrogen (TKN)

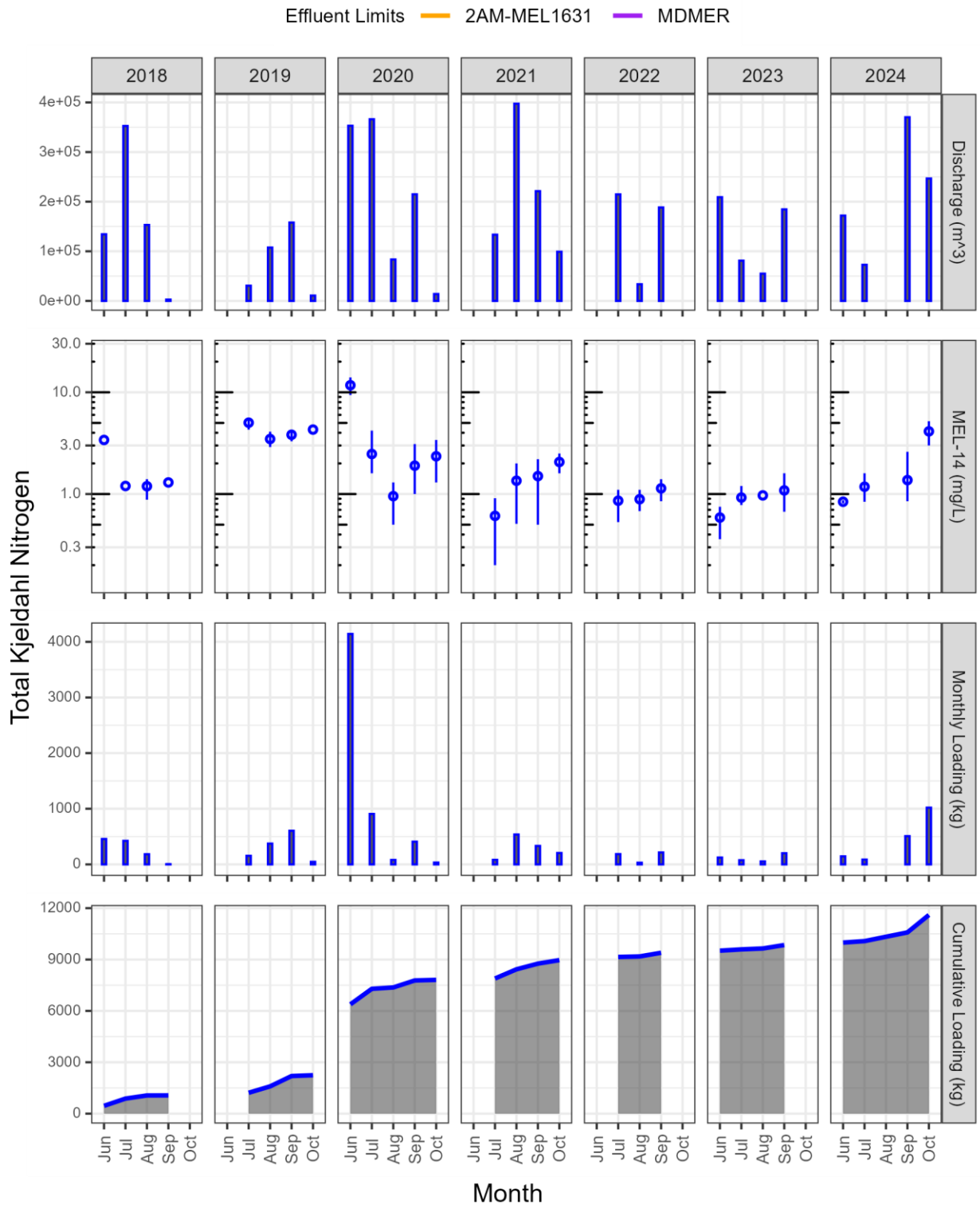


Figure B2-15. Ammonia (as N)

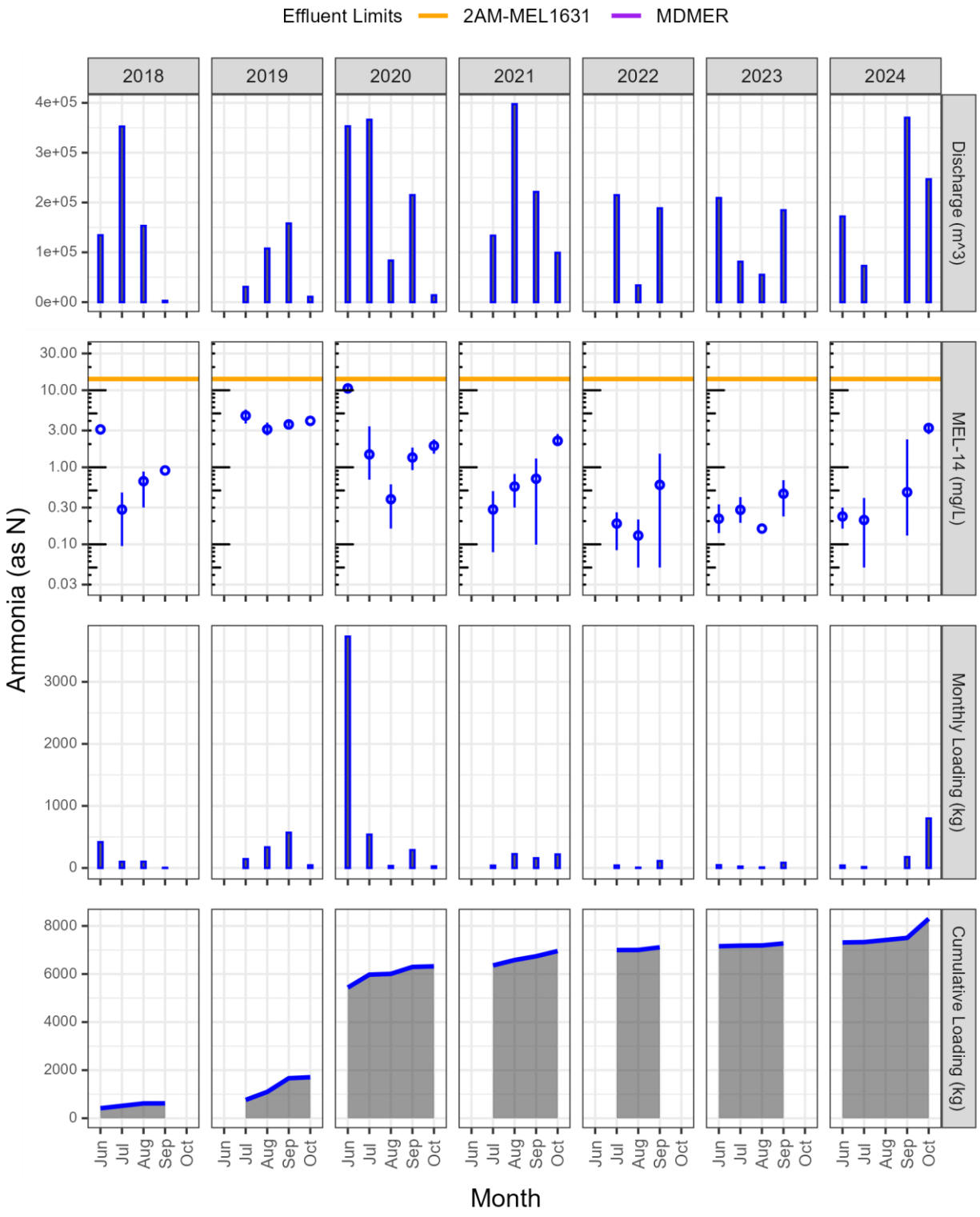


Figure B2-16. Total Phosphorus

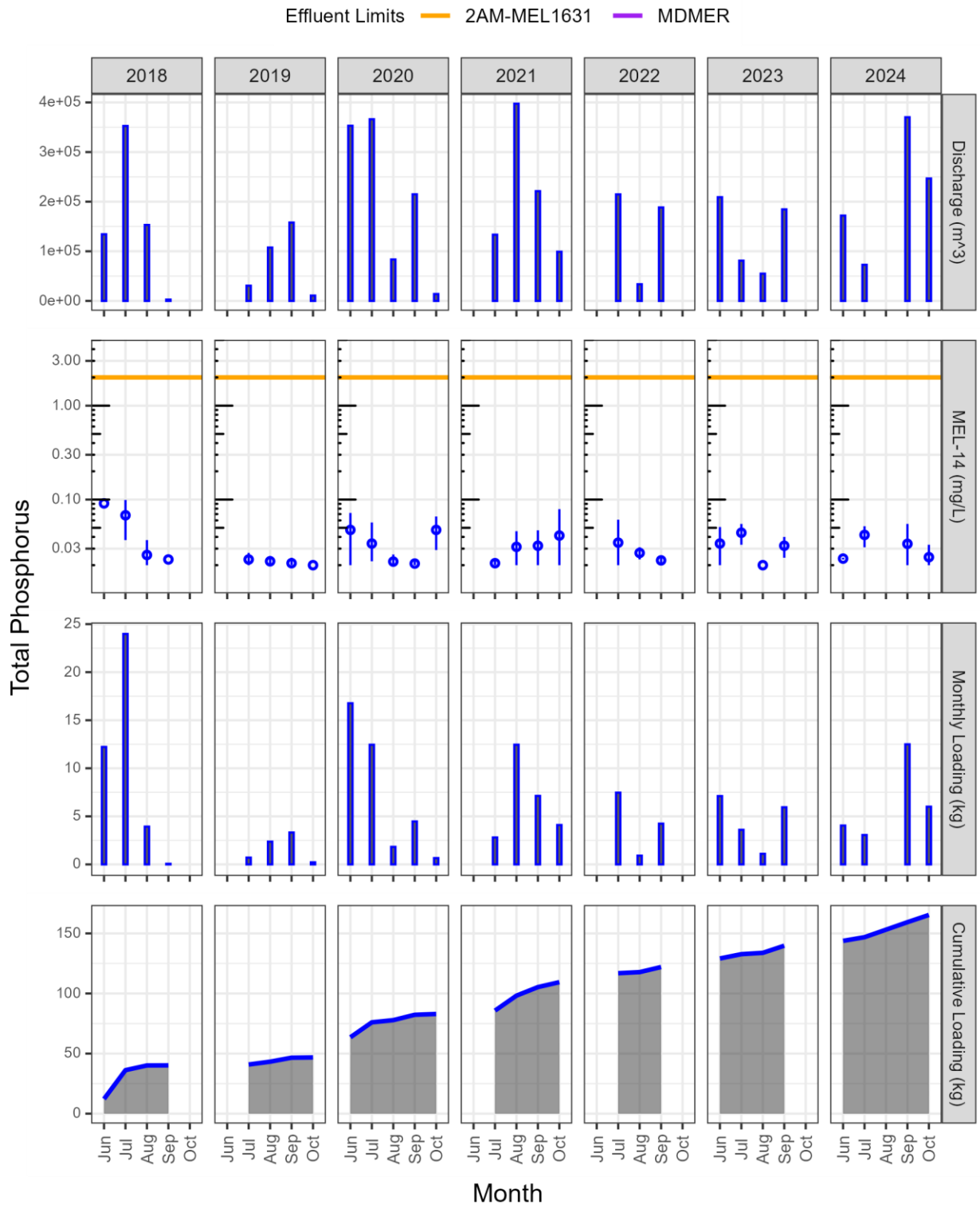


Figure B2-17. Orthophosphate

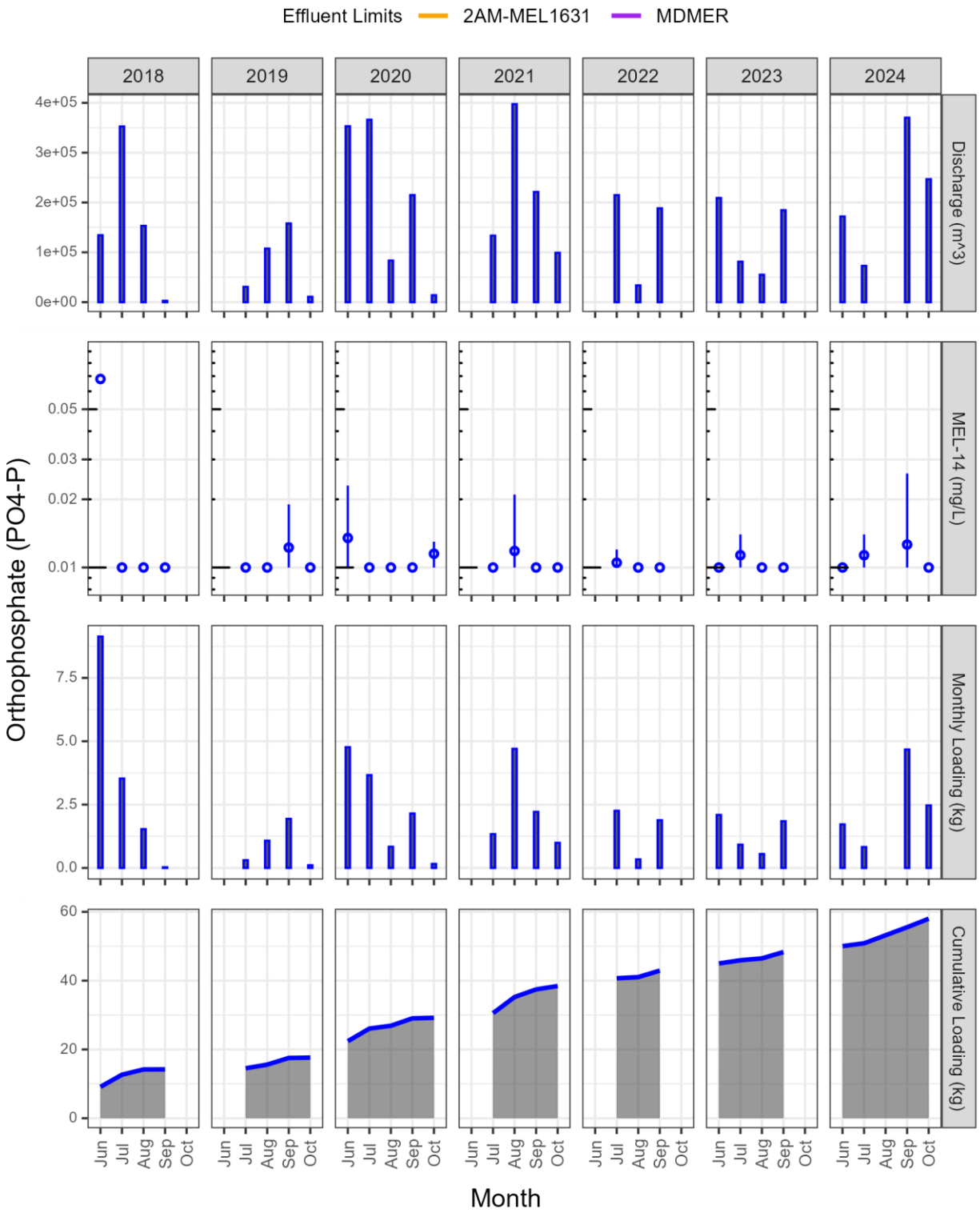


Figure B2-18. Total Organic Carbon (TOC)

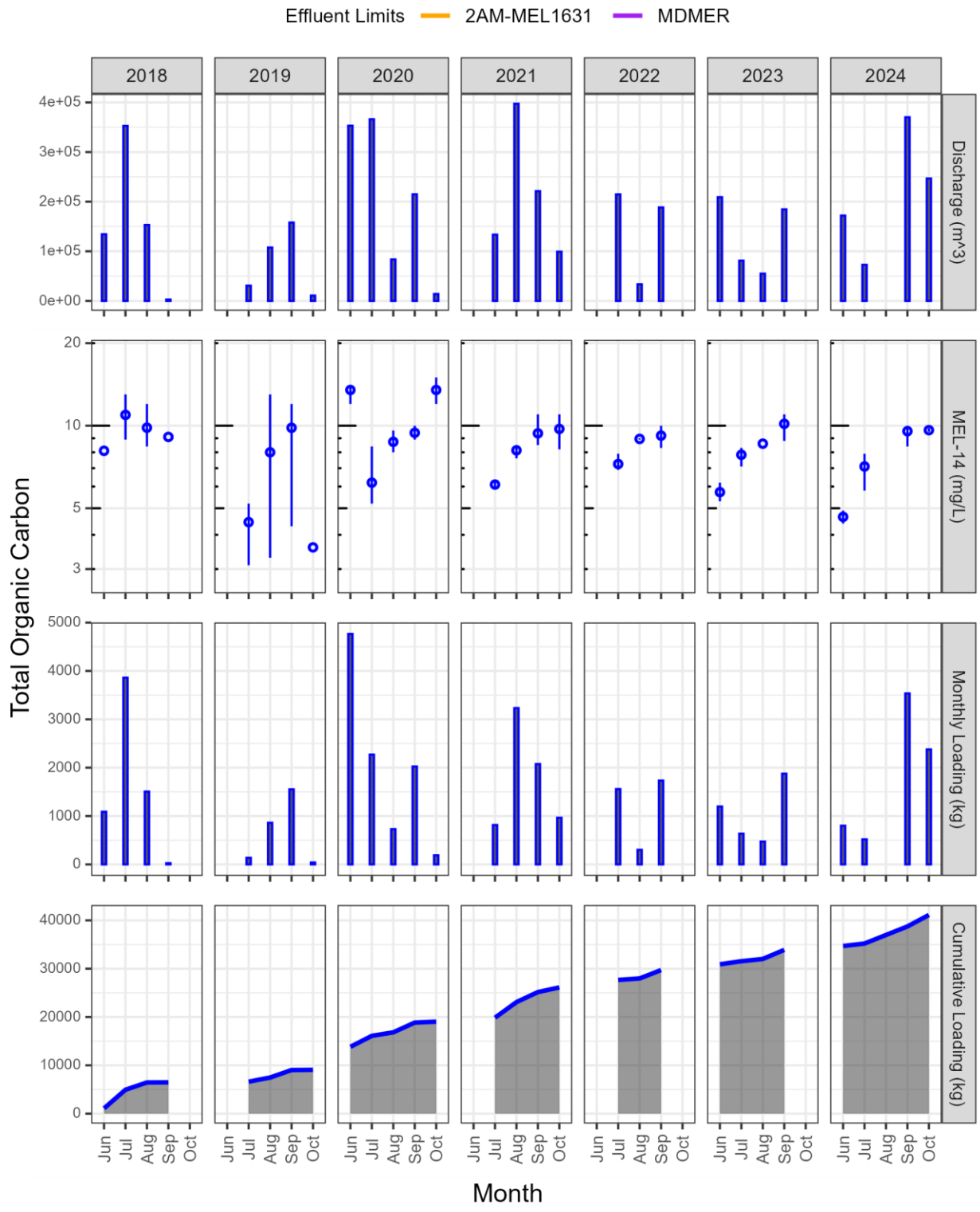


Figure B2-19. Aluminum

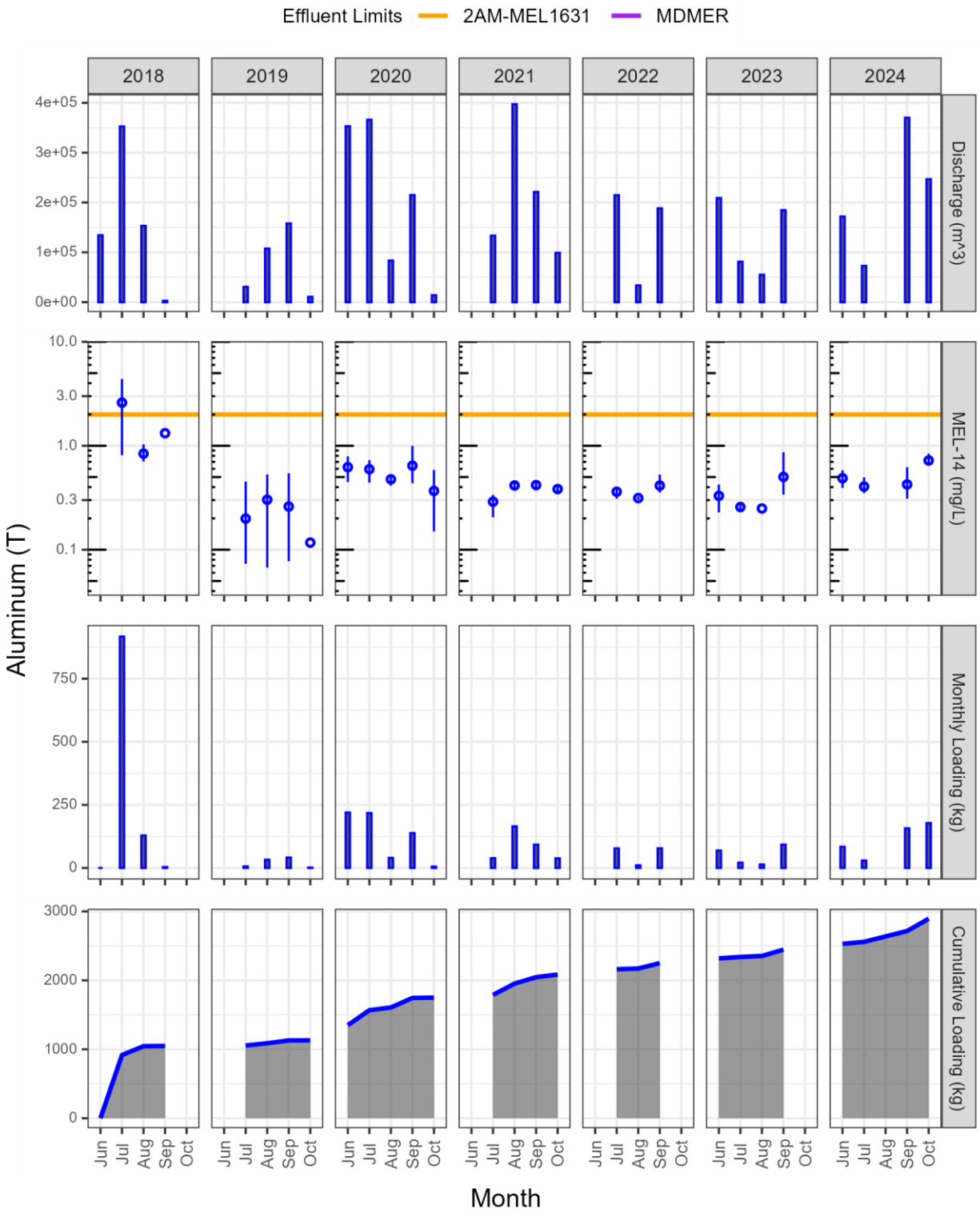


Figure B2-20. Antimony

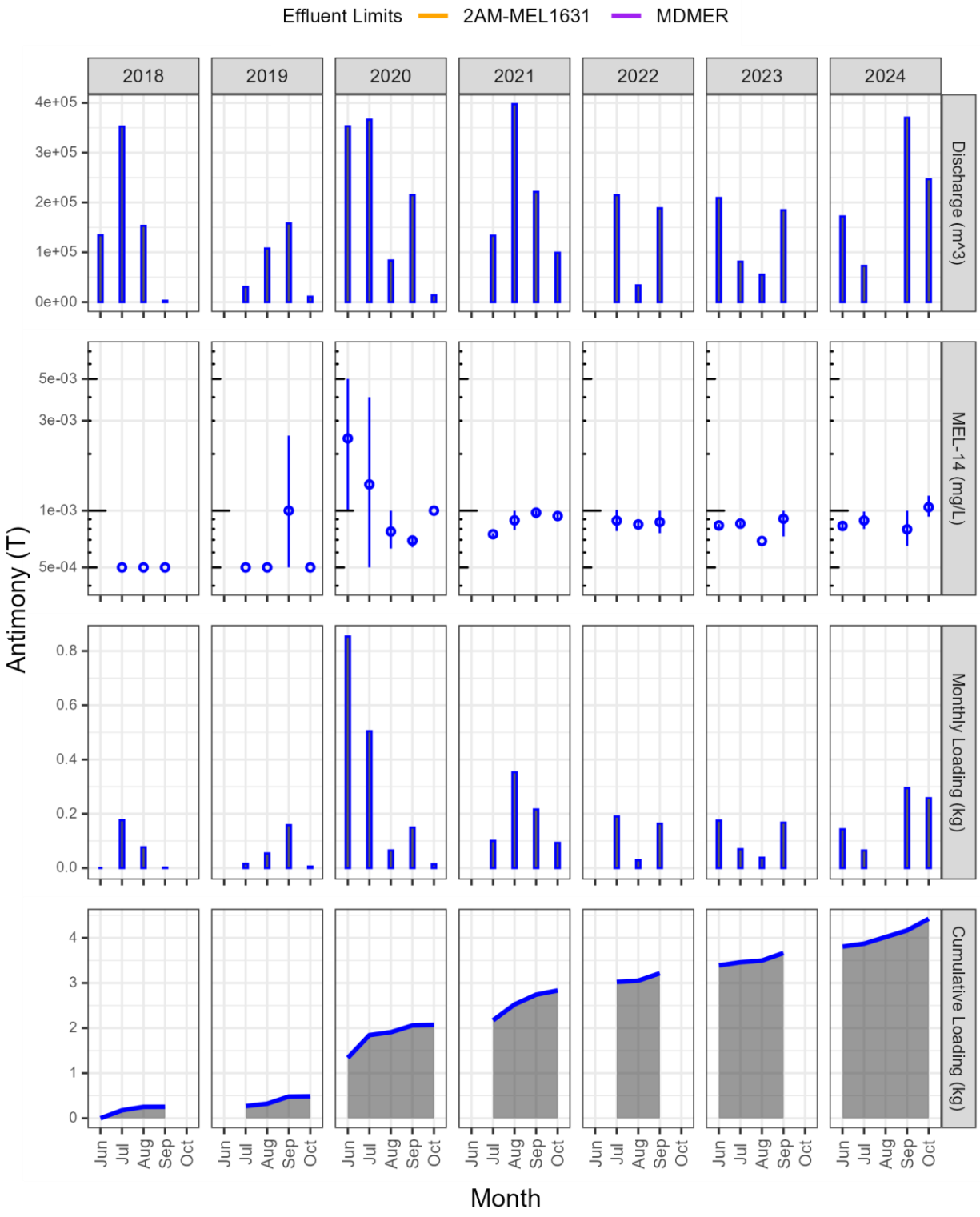


Figure B2-21. Arsenic

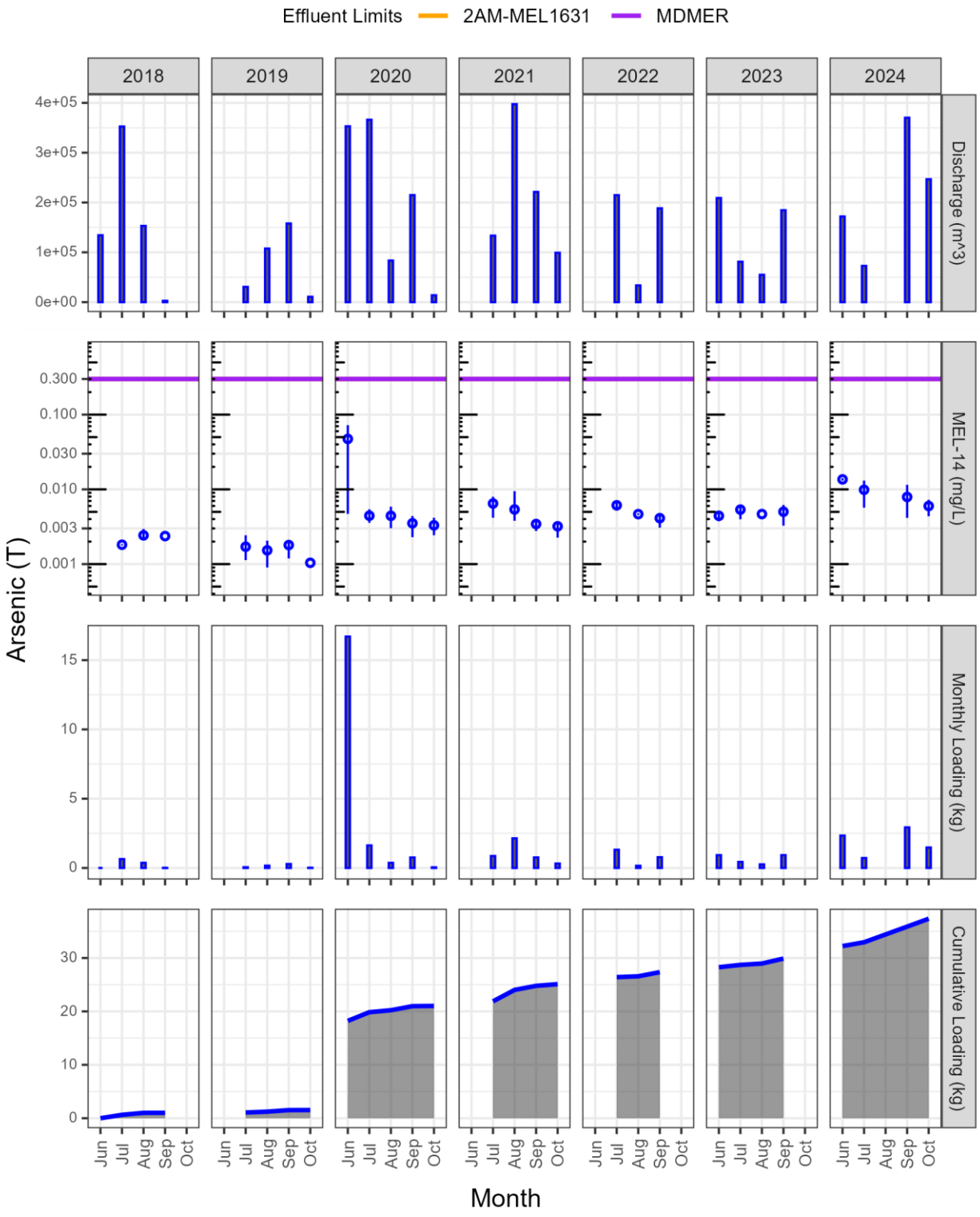


Figure B2-22. Barium

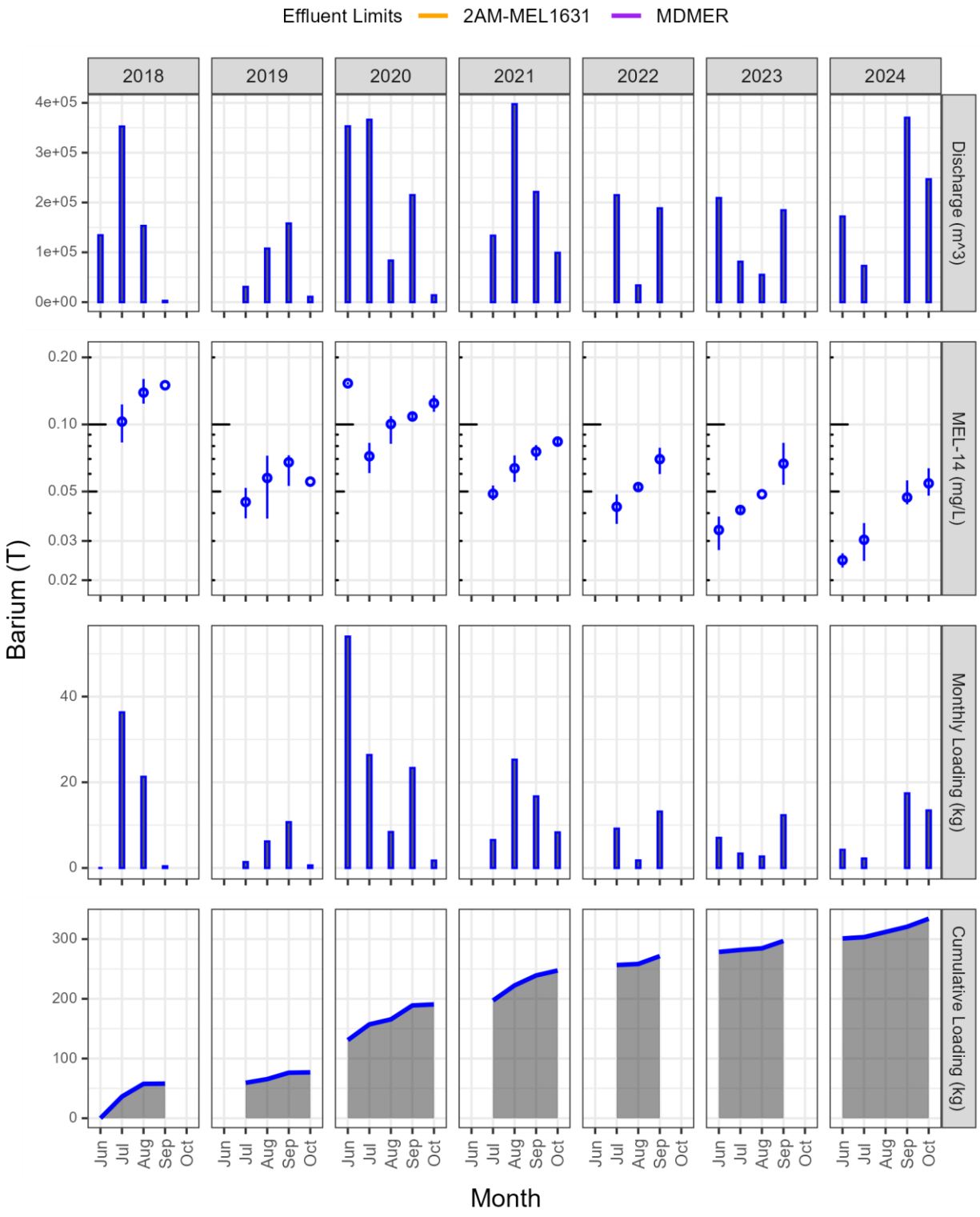


Figure B2-23. Beryllium

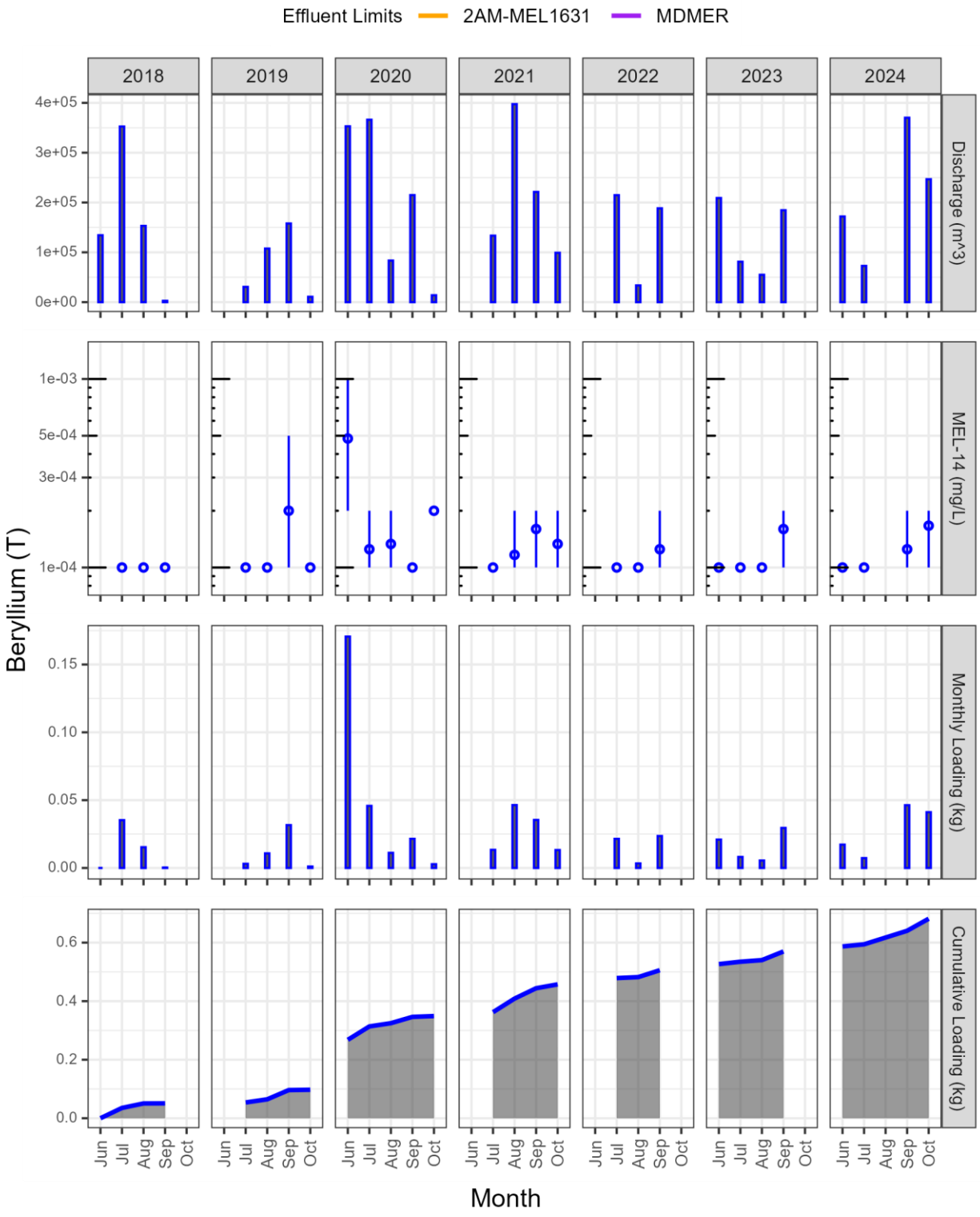


Figure B2-24. Bismuth

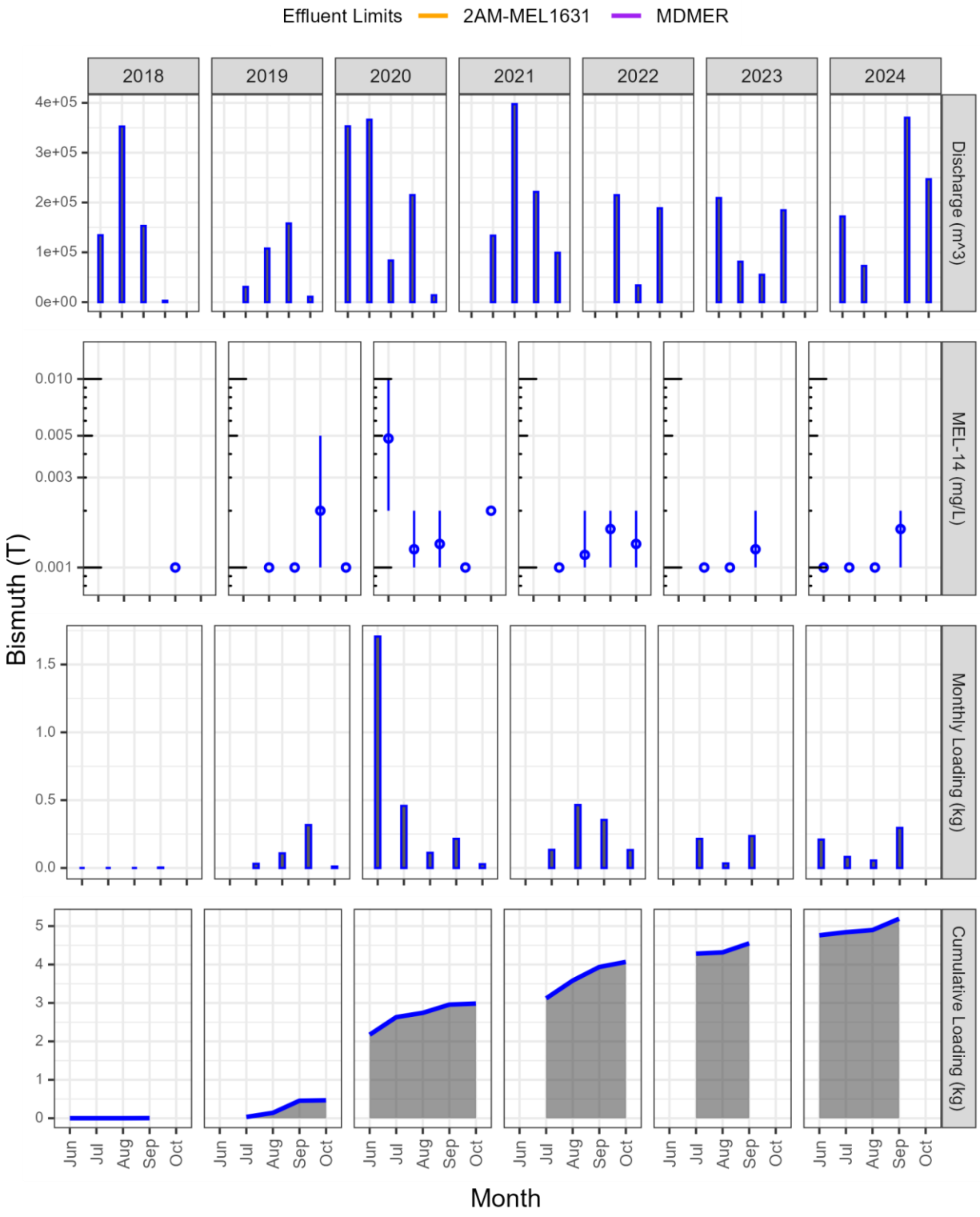


Figure B2-25. Boron

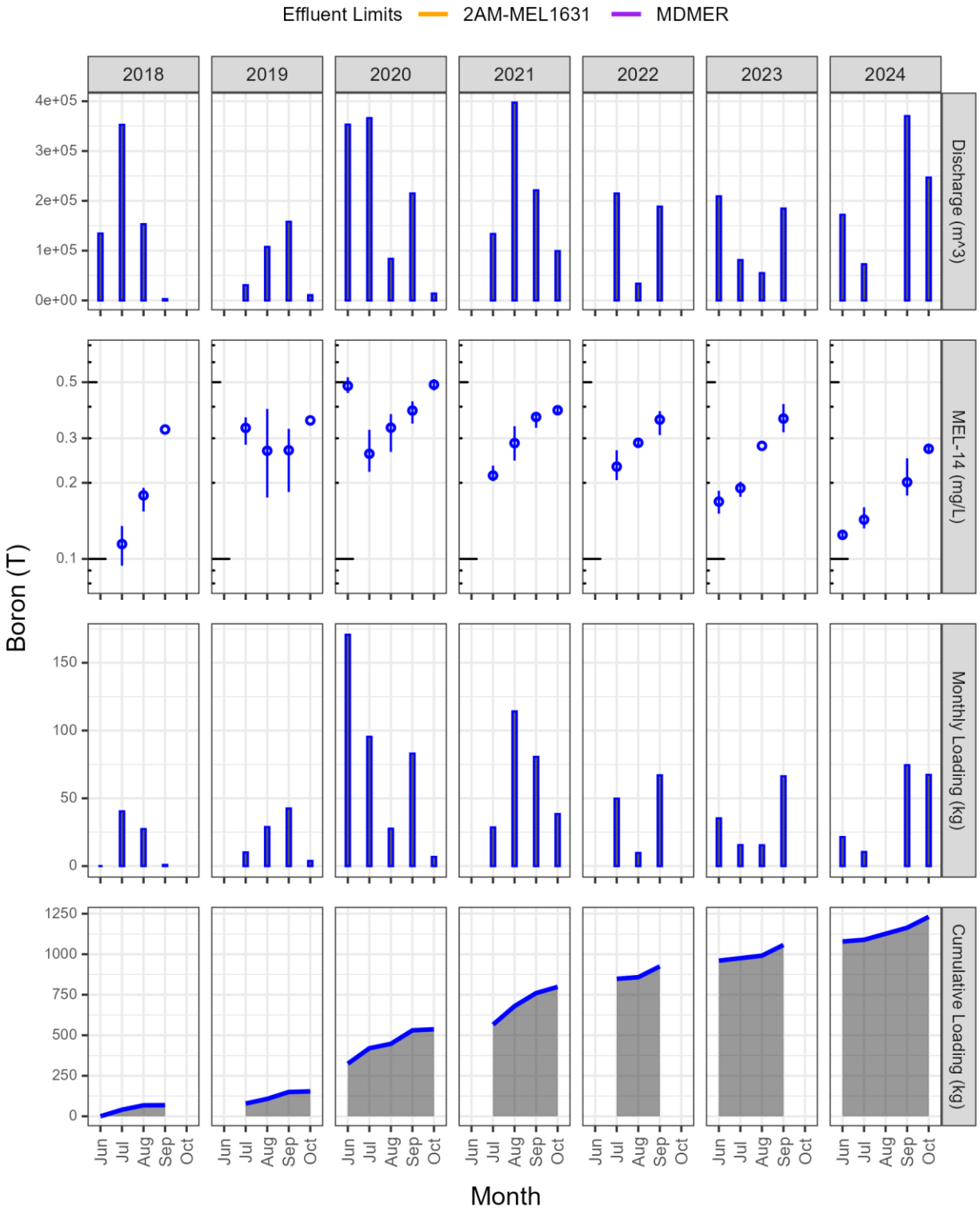


Figure B2-26. Cadmium

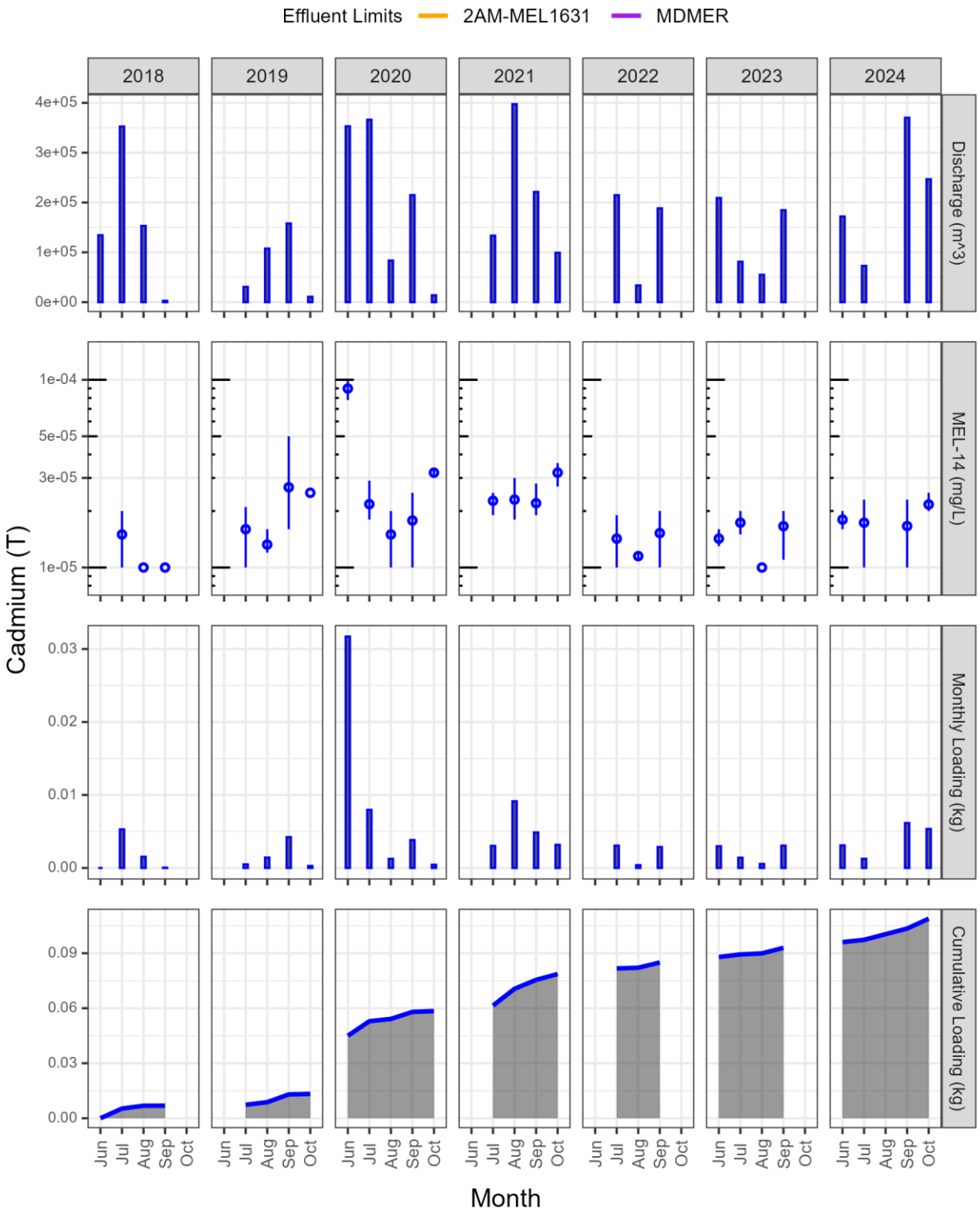


Figure B2-27. Chromium

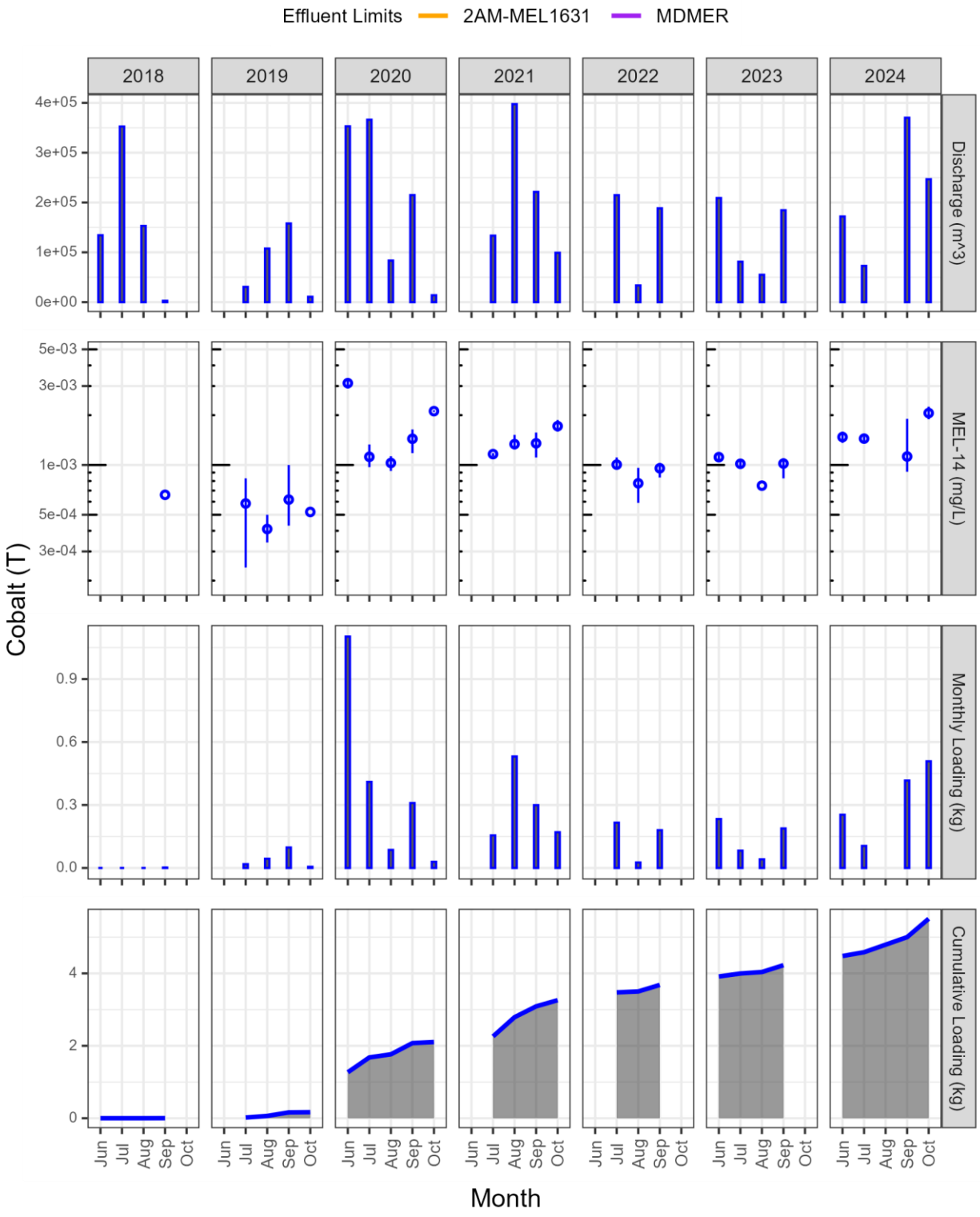


Figure B2-28. Cobalt

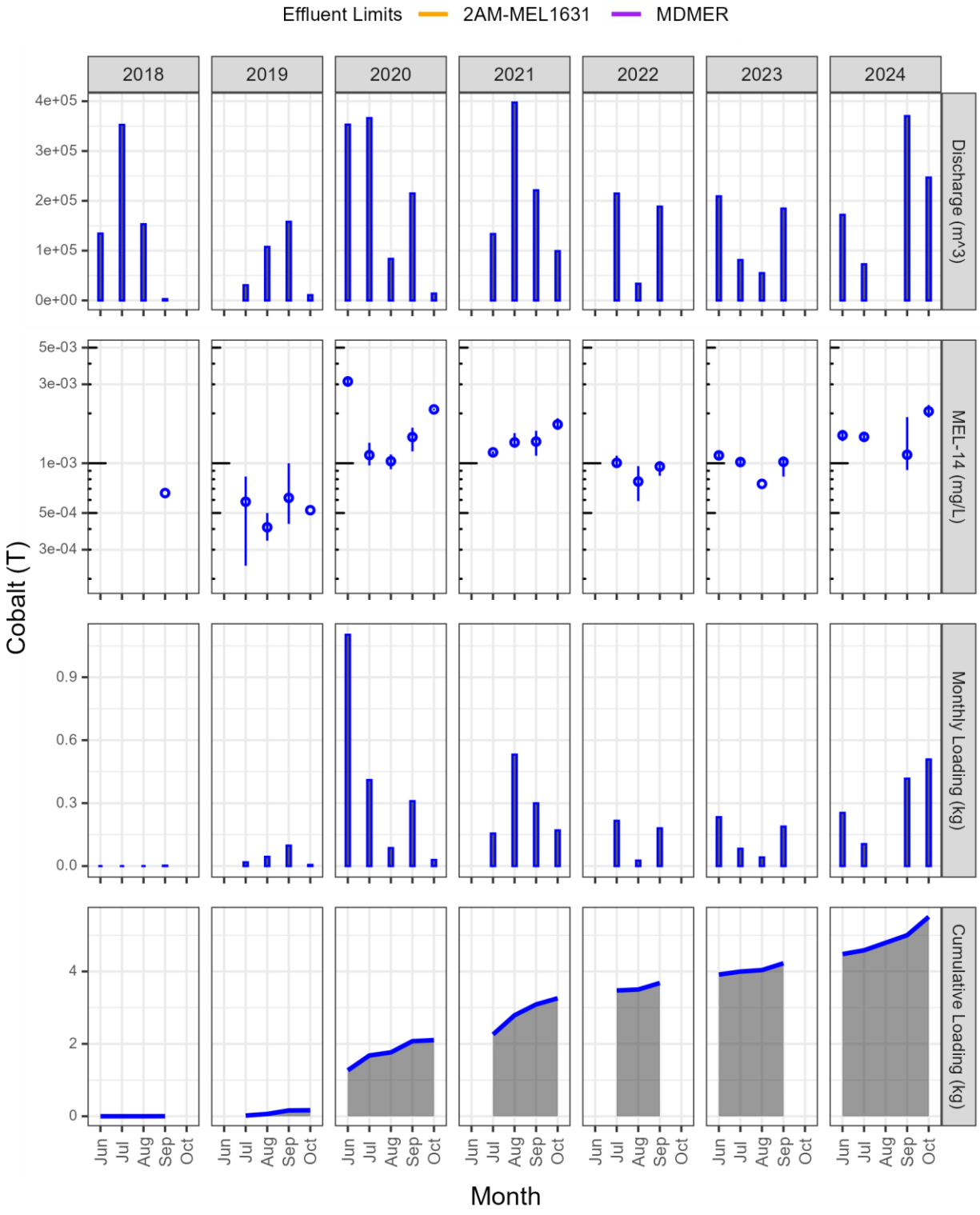


Figure B2-29. Copper

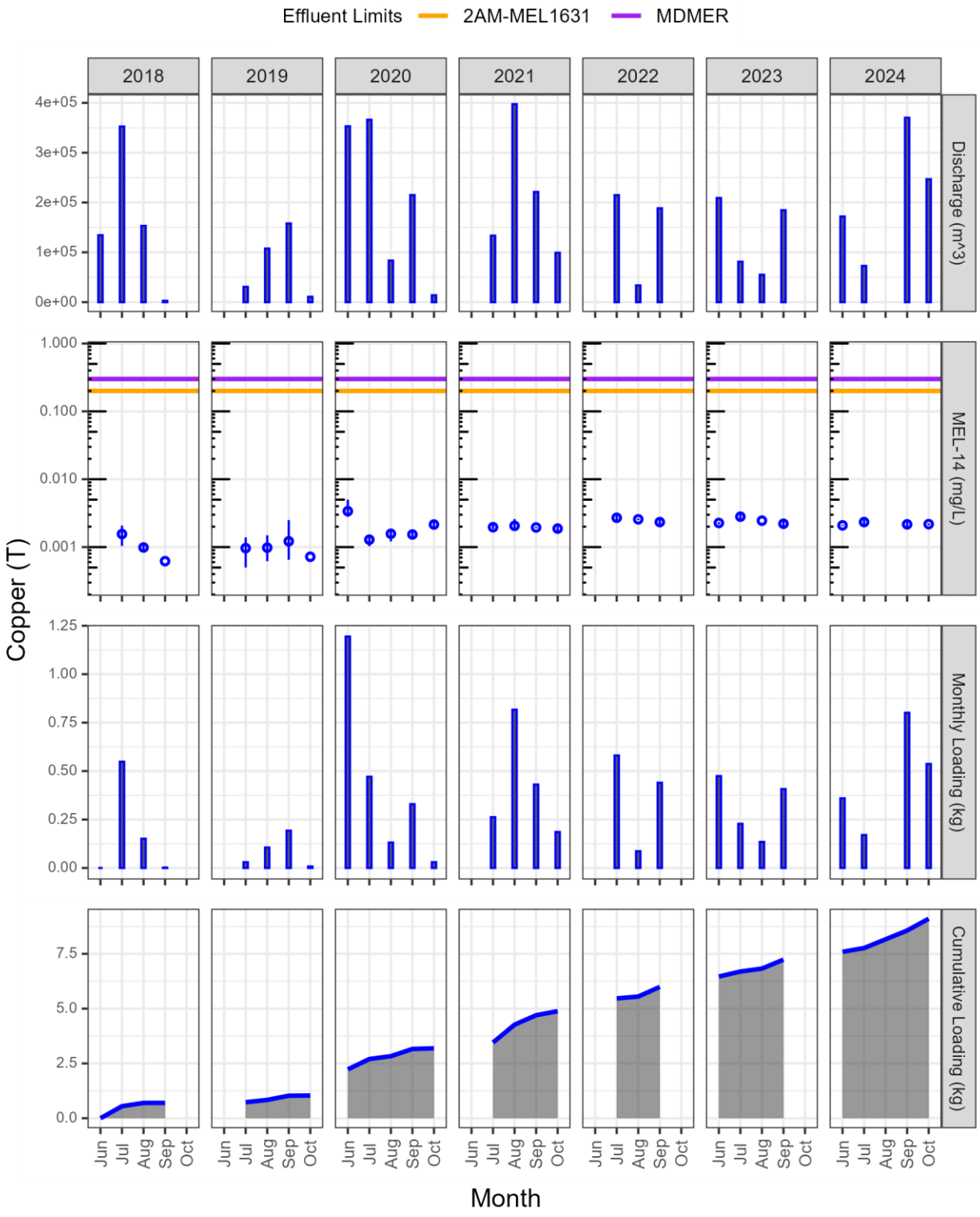


Figure B2-30. Iron

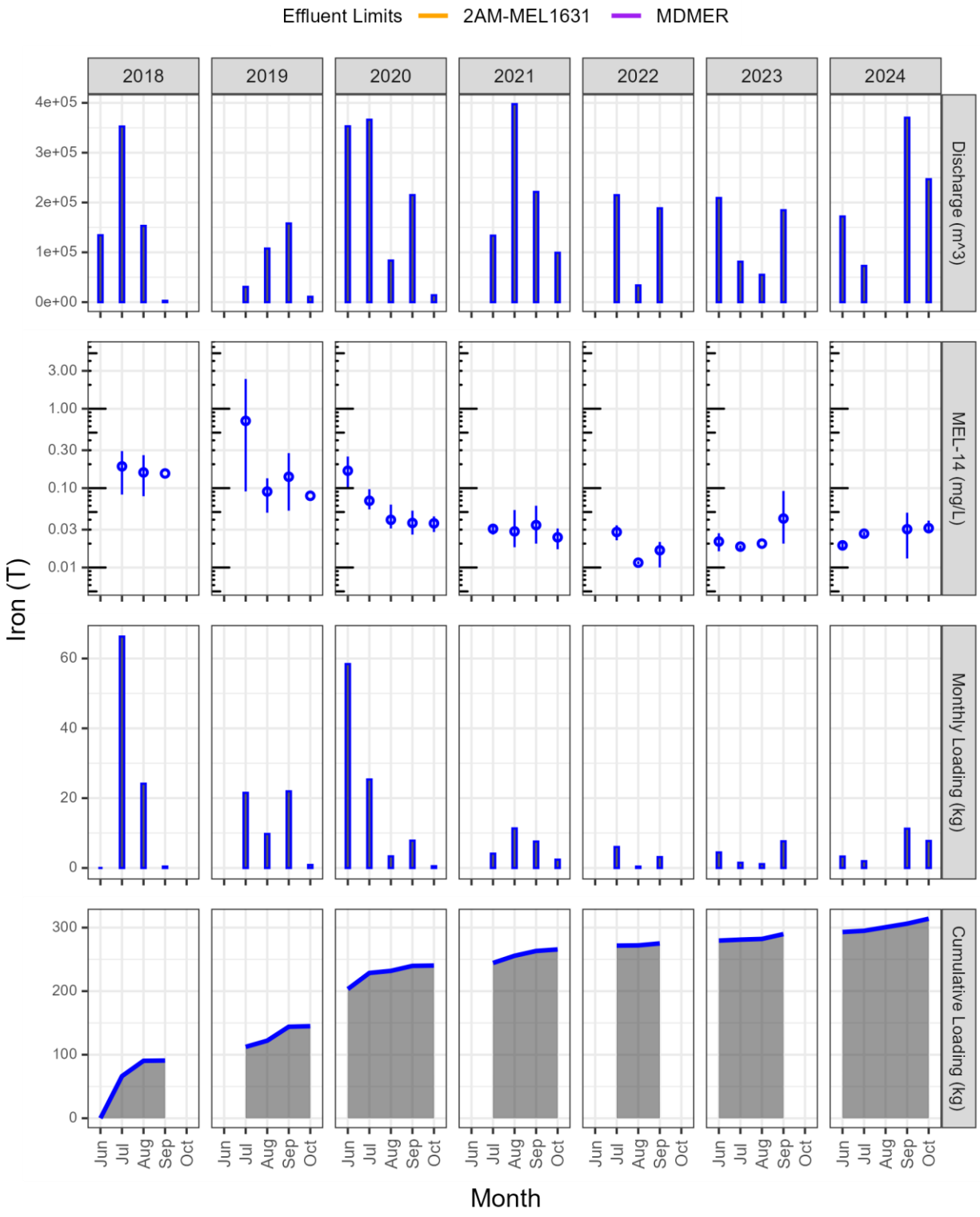


Figure B2-31. Lead

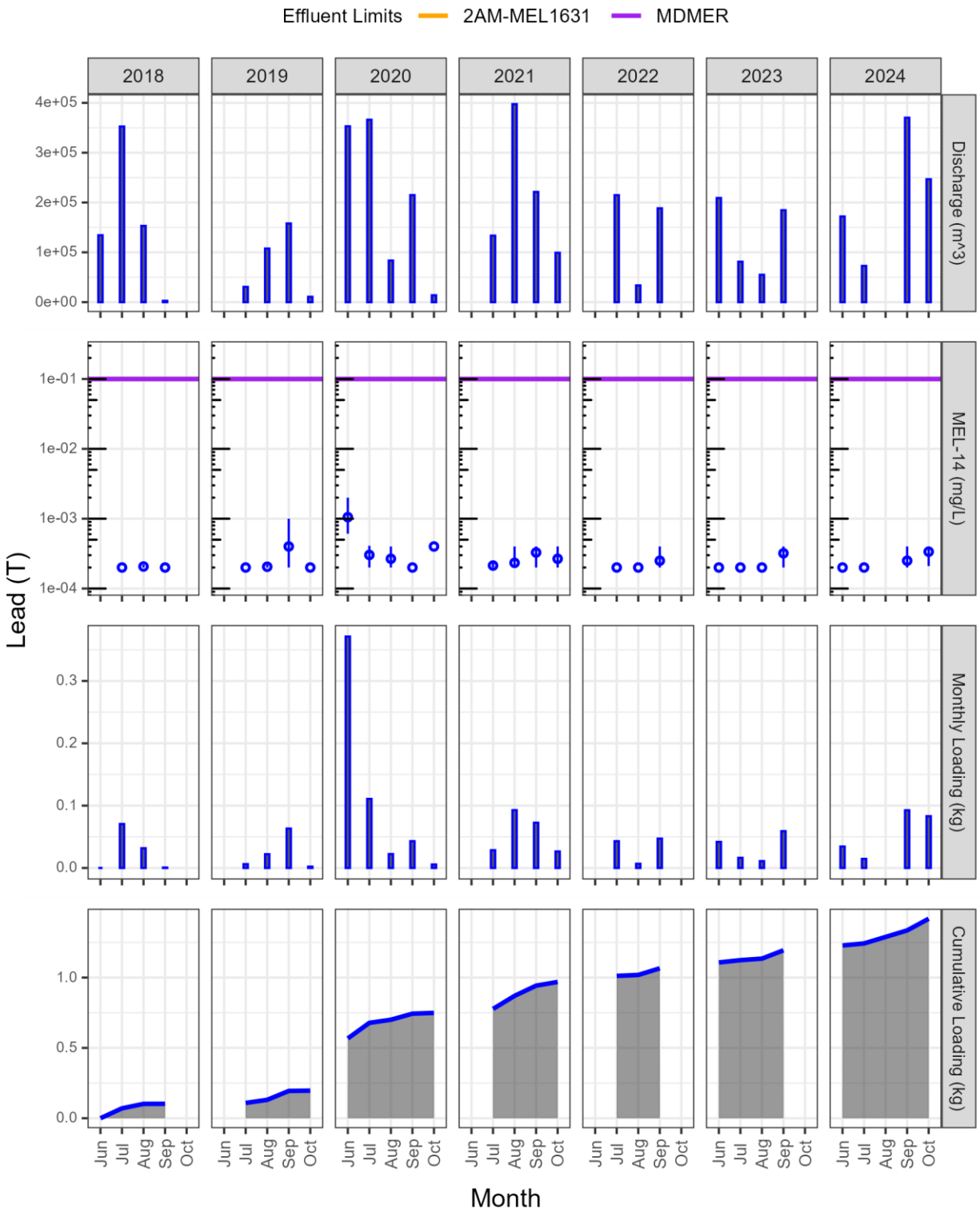


Figure B2-32. Lithium

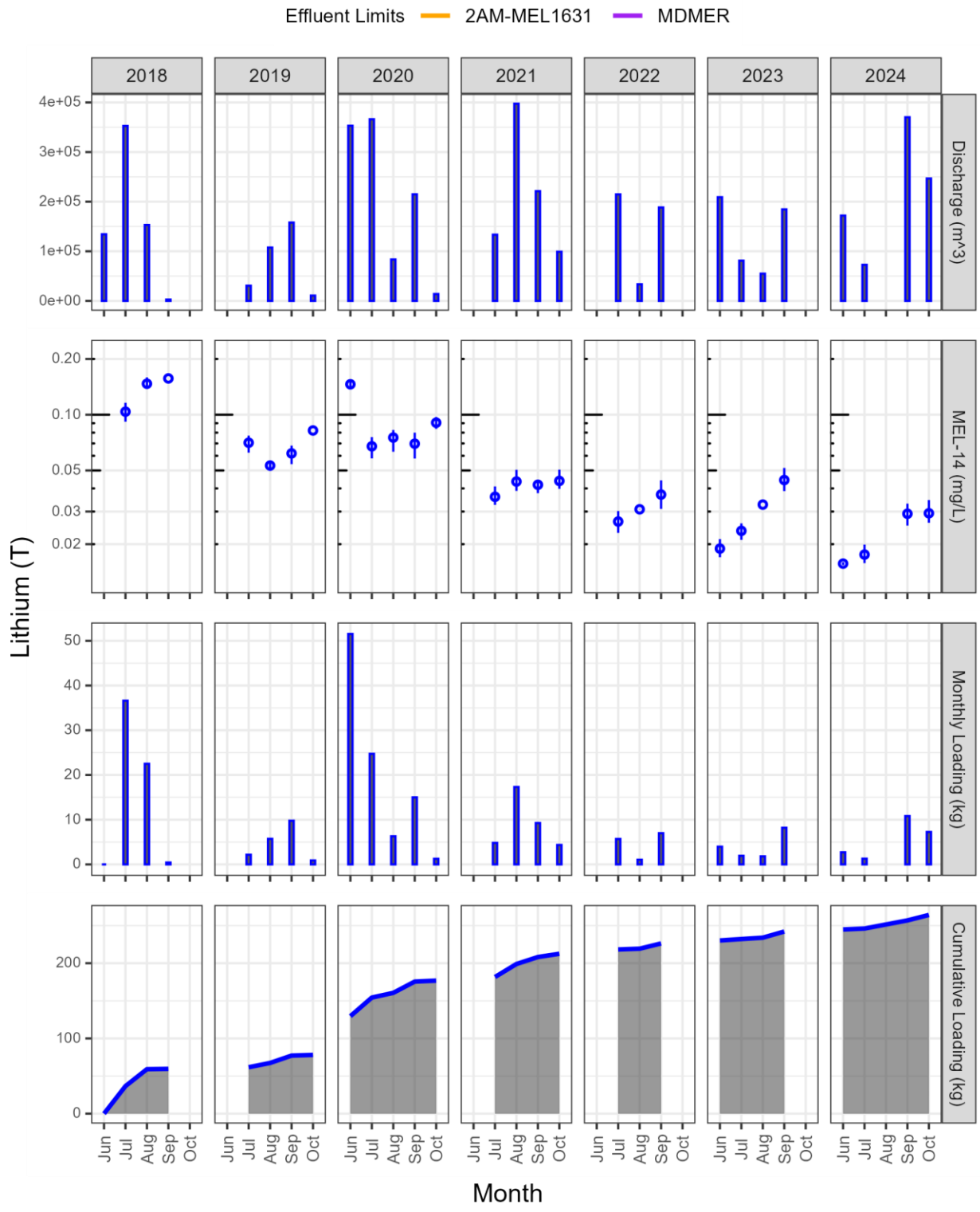


Figure B2-33. Manganese

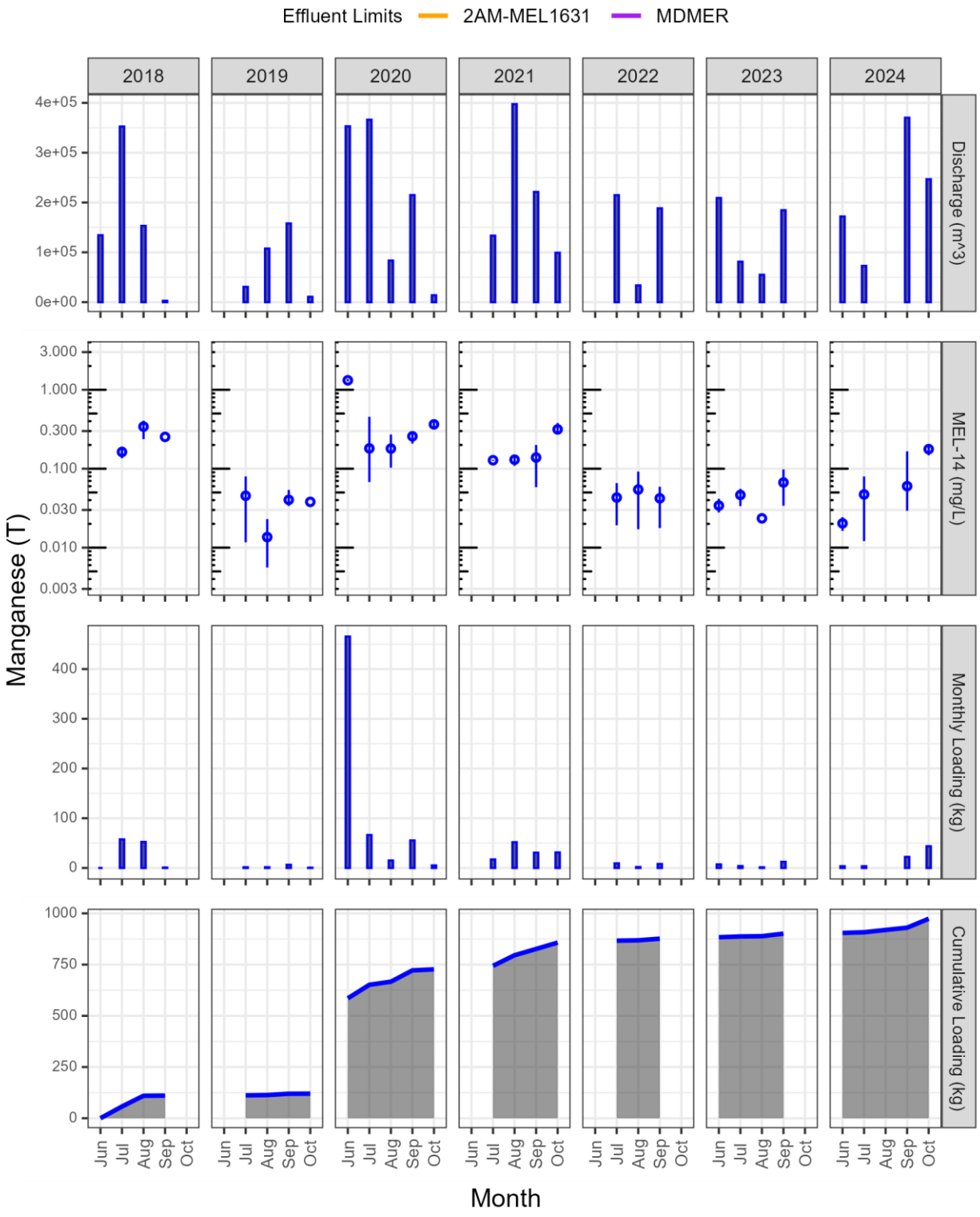


Figure B2-34. Mercury

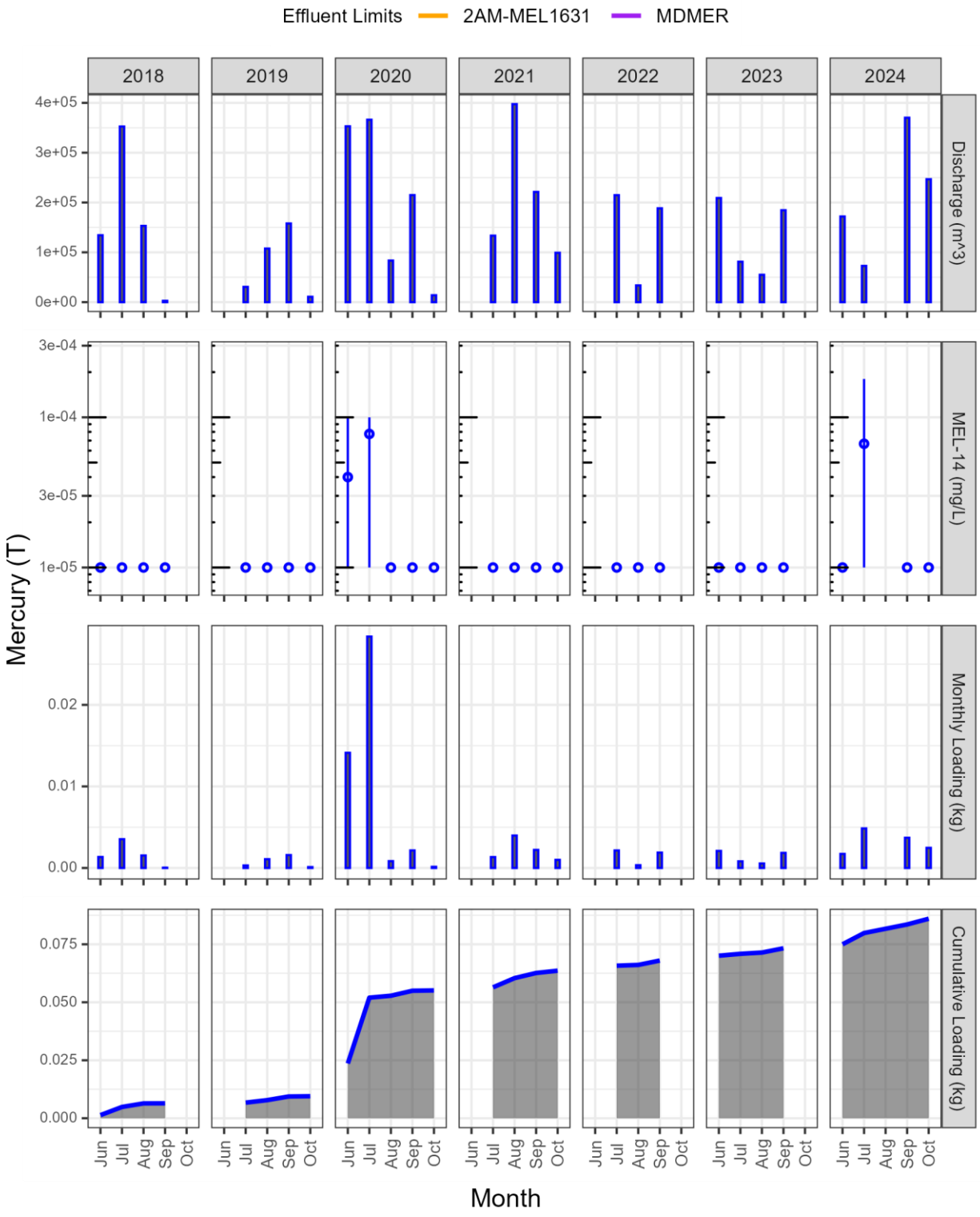


Figure B2-35. Molybdenum

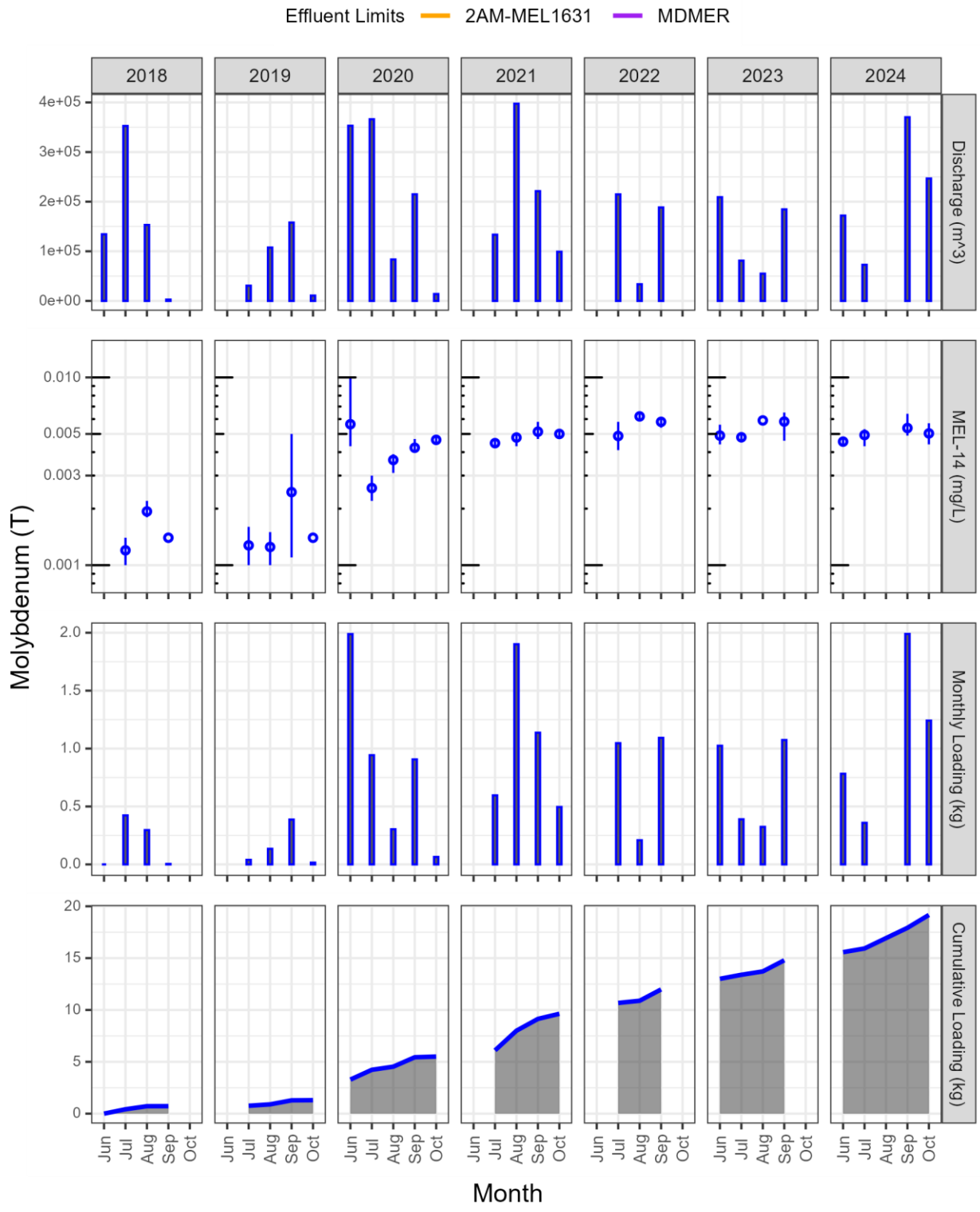


Figure B2-36. Nickel

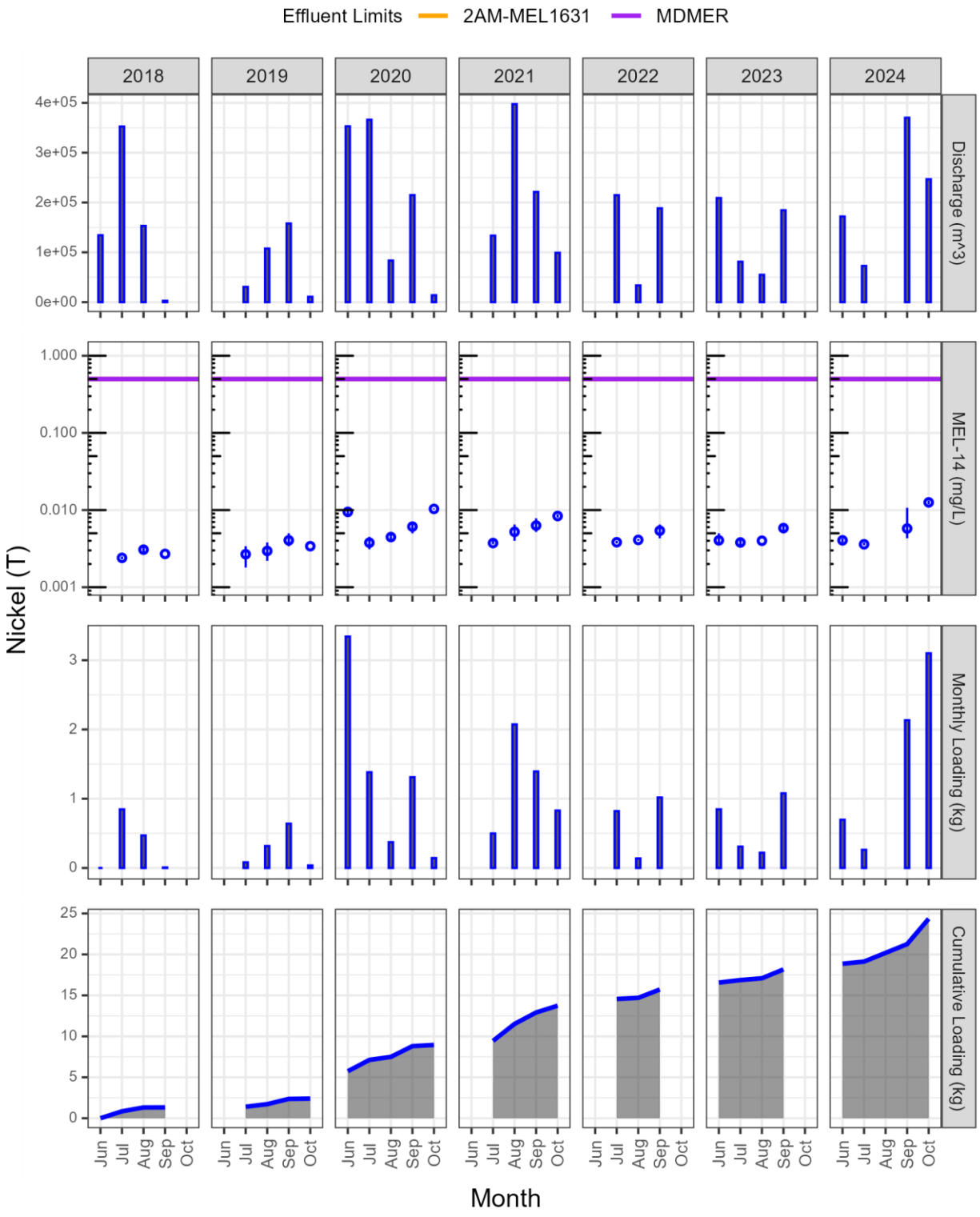


Figure B2-37. Selenium

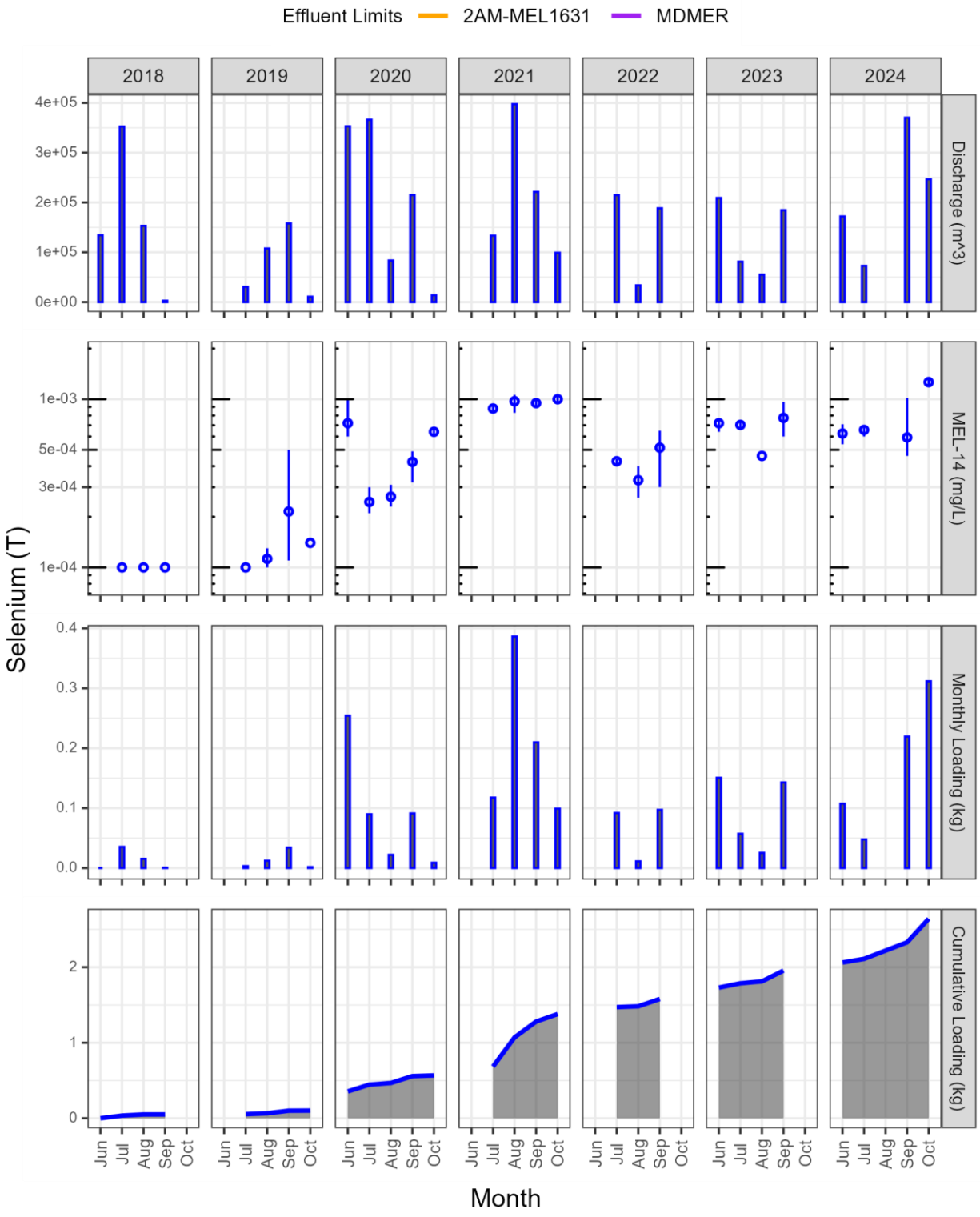


Figure B2-38. Silicon

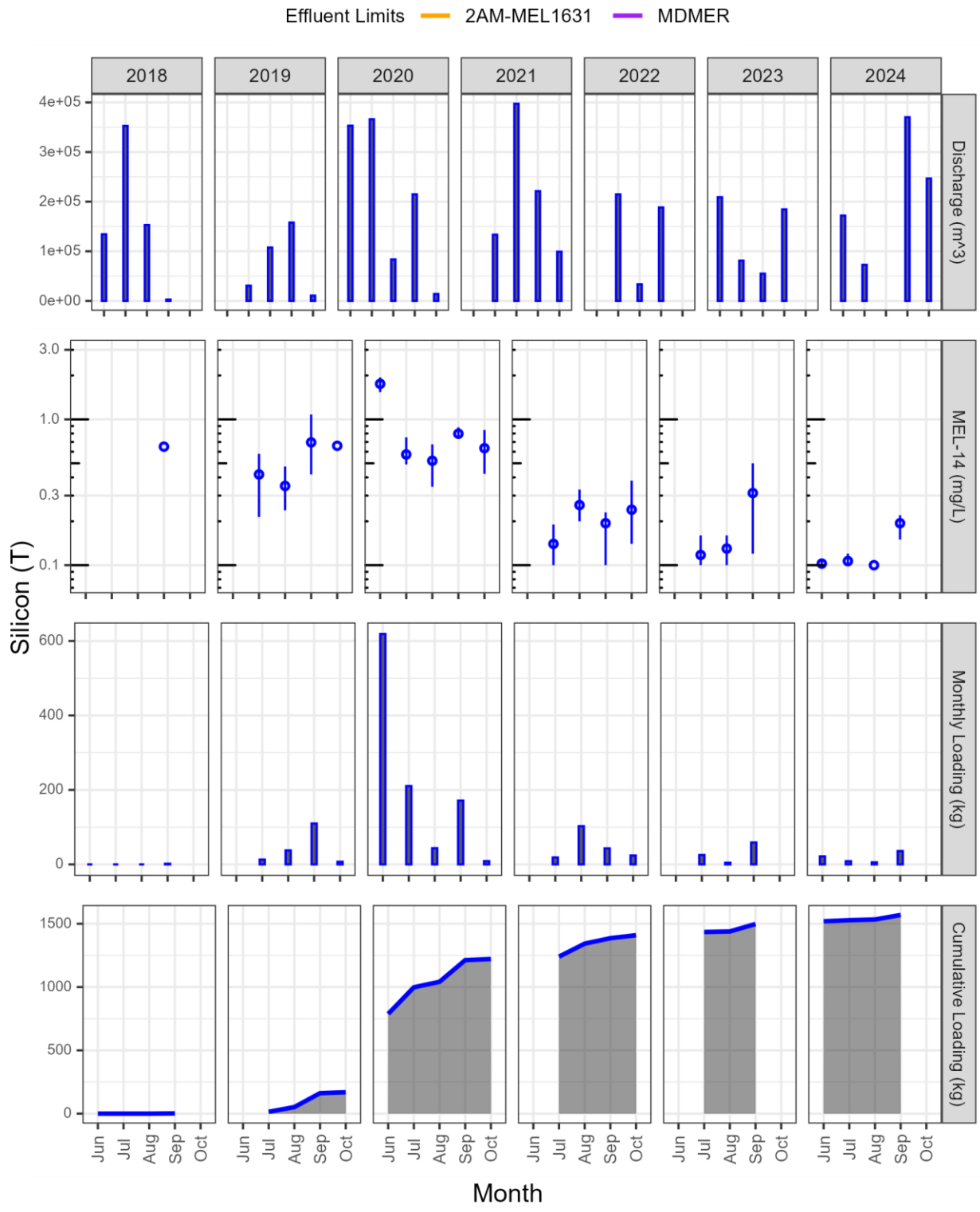


Figure B2-39. Silver

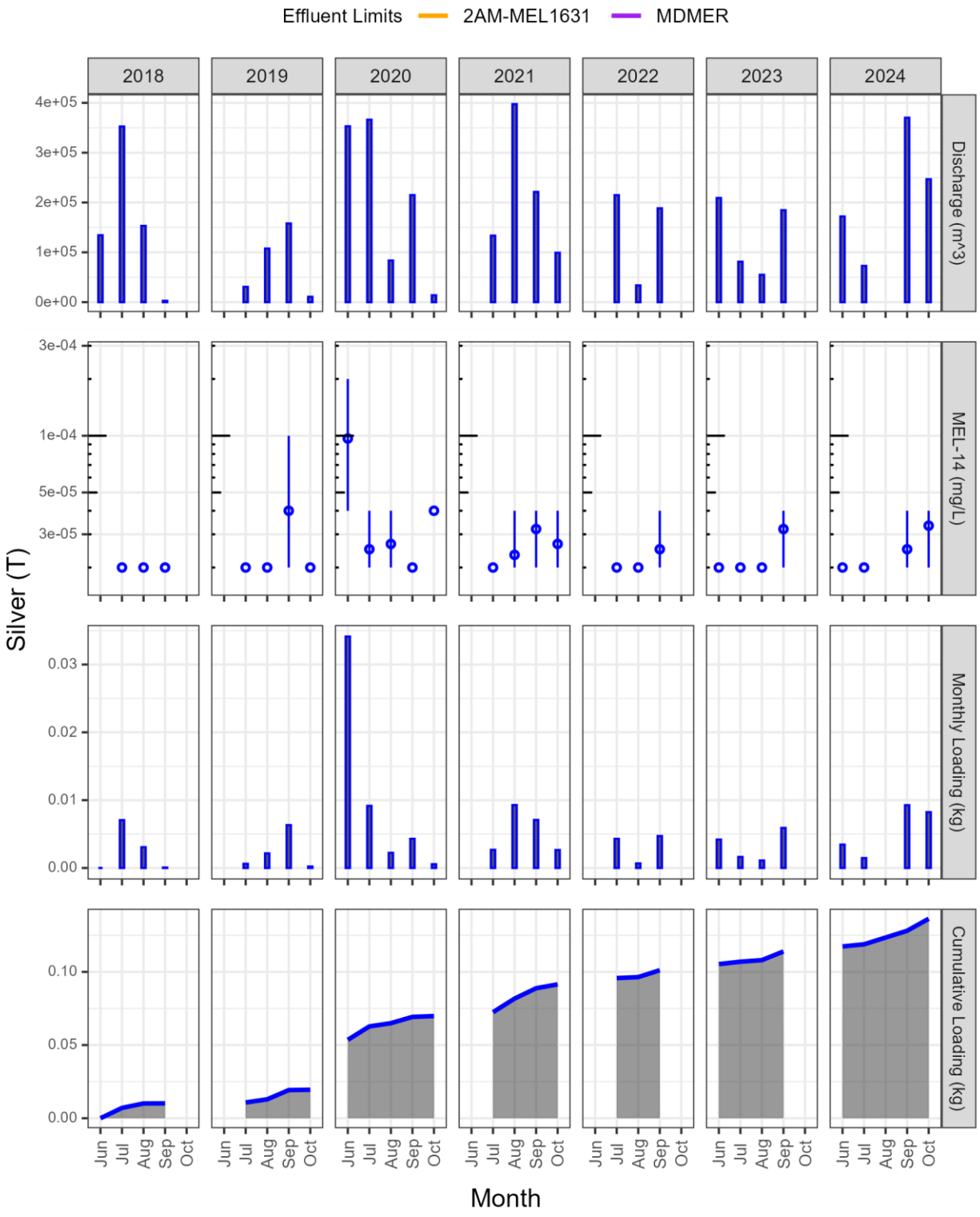


Figure B2-40. Strontium

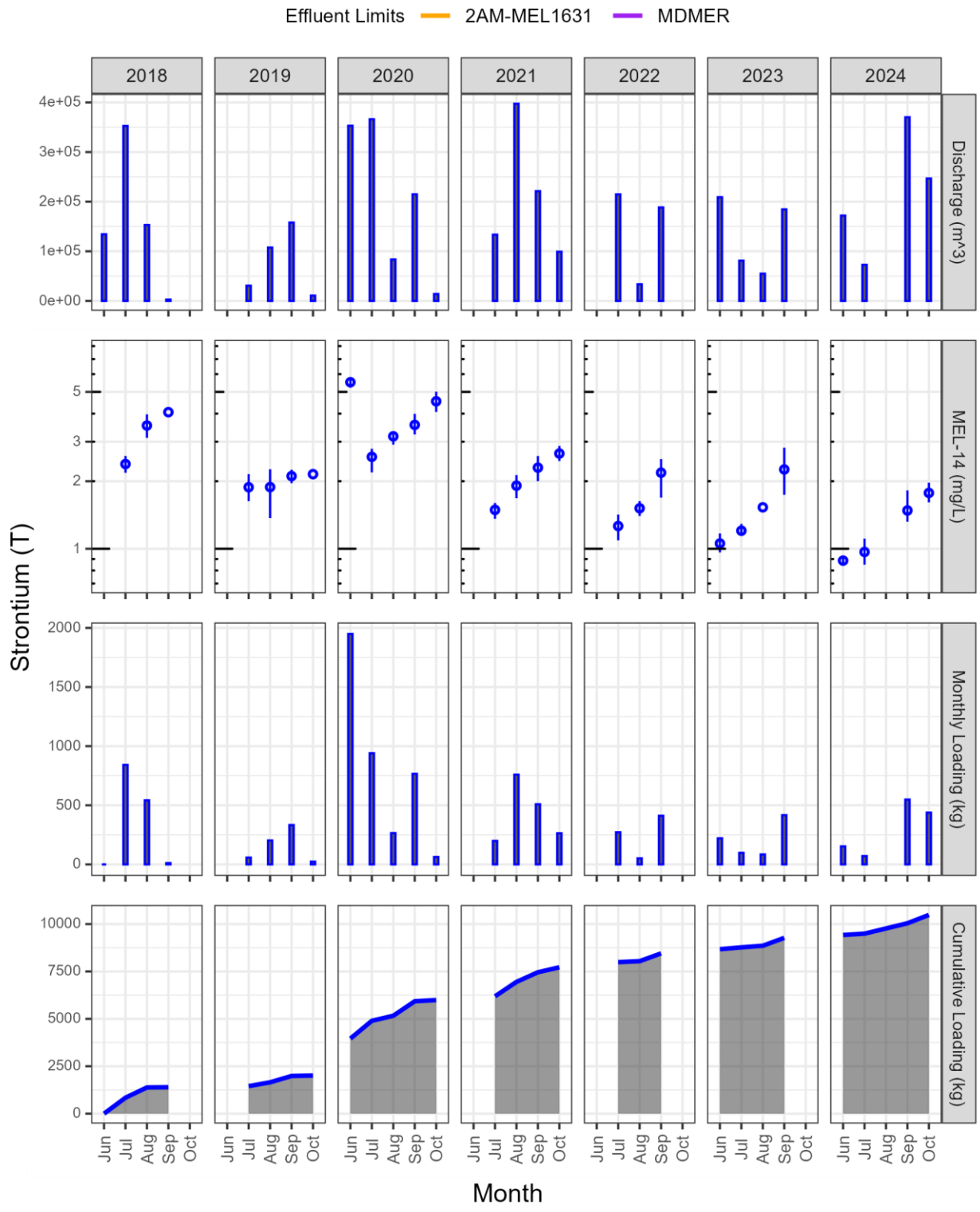


Figure B2-41. Thallium

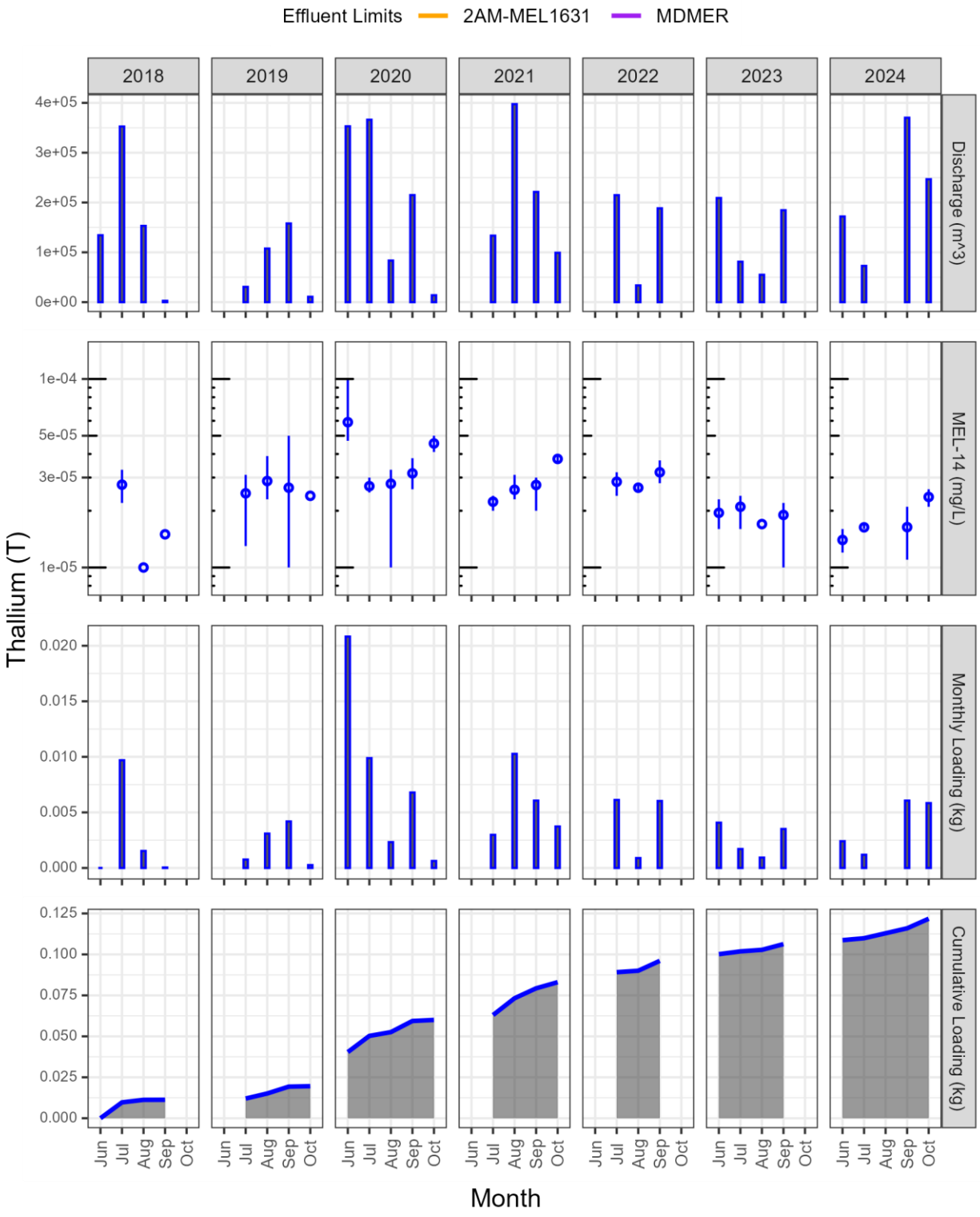


Figure B2-42. Tin

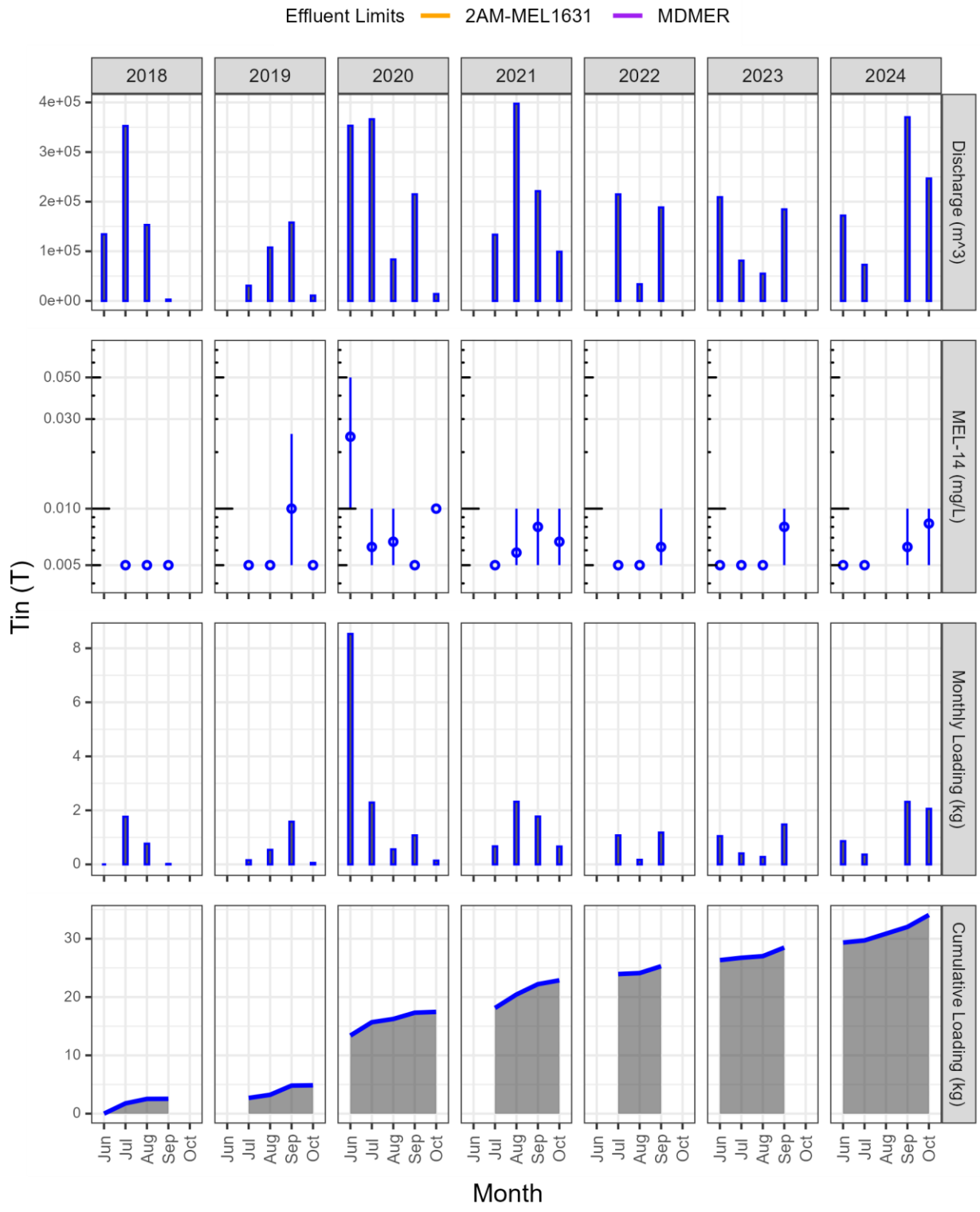


Figure B2-43. Titanium

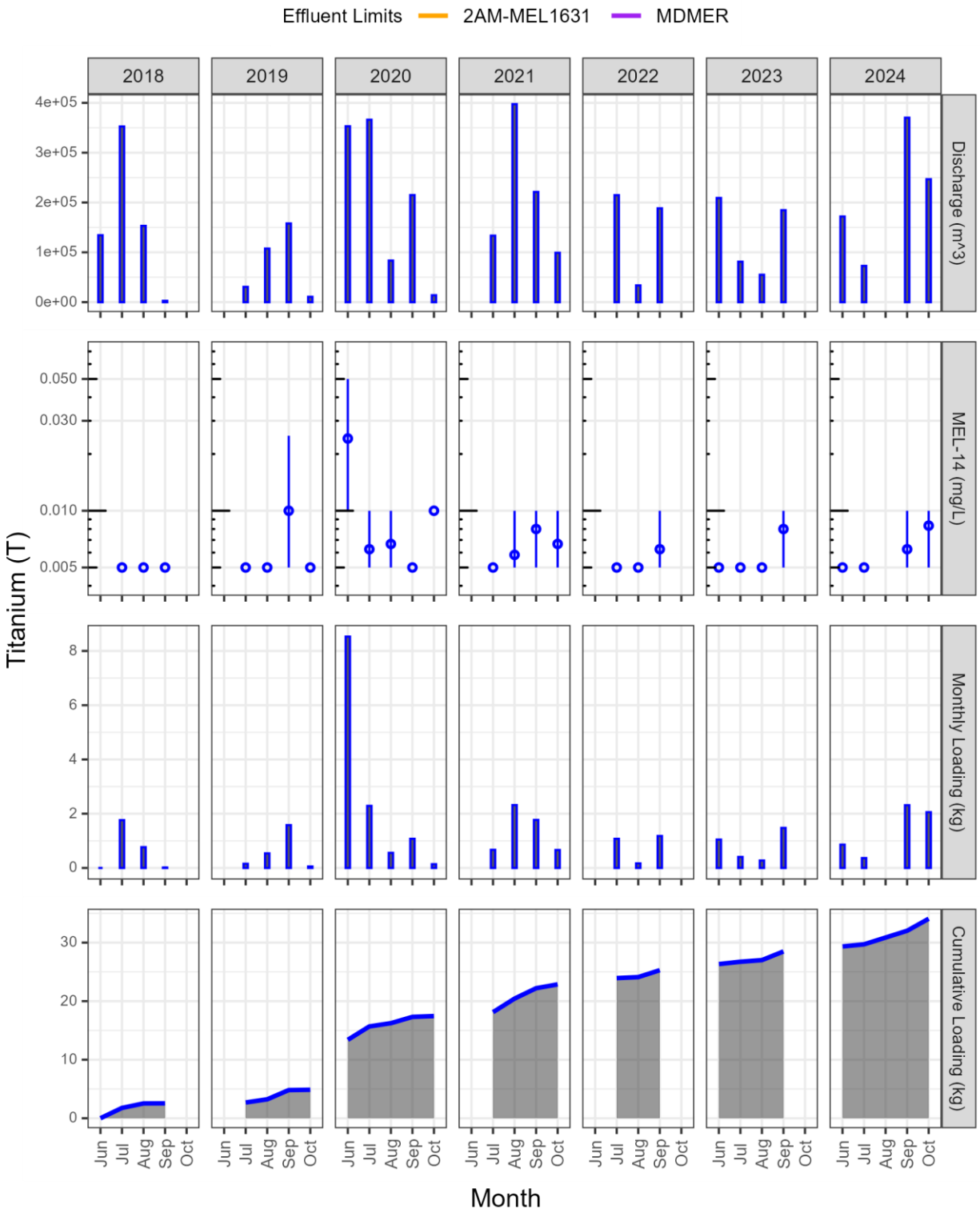


Figure B2-44. Uranium

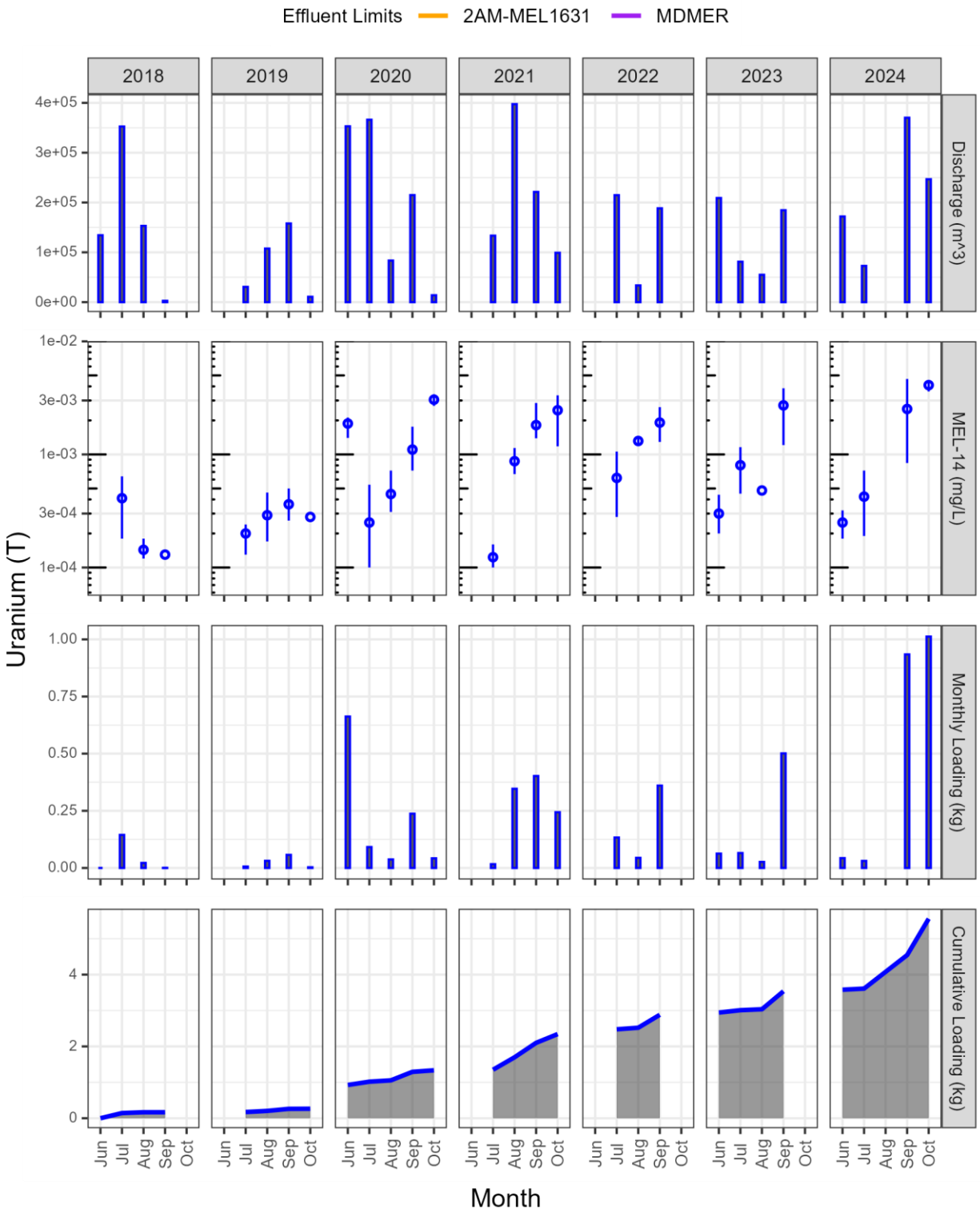


Figure B2-45. Vanadium

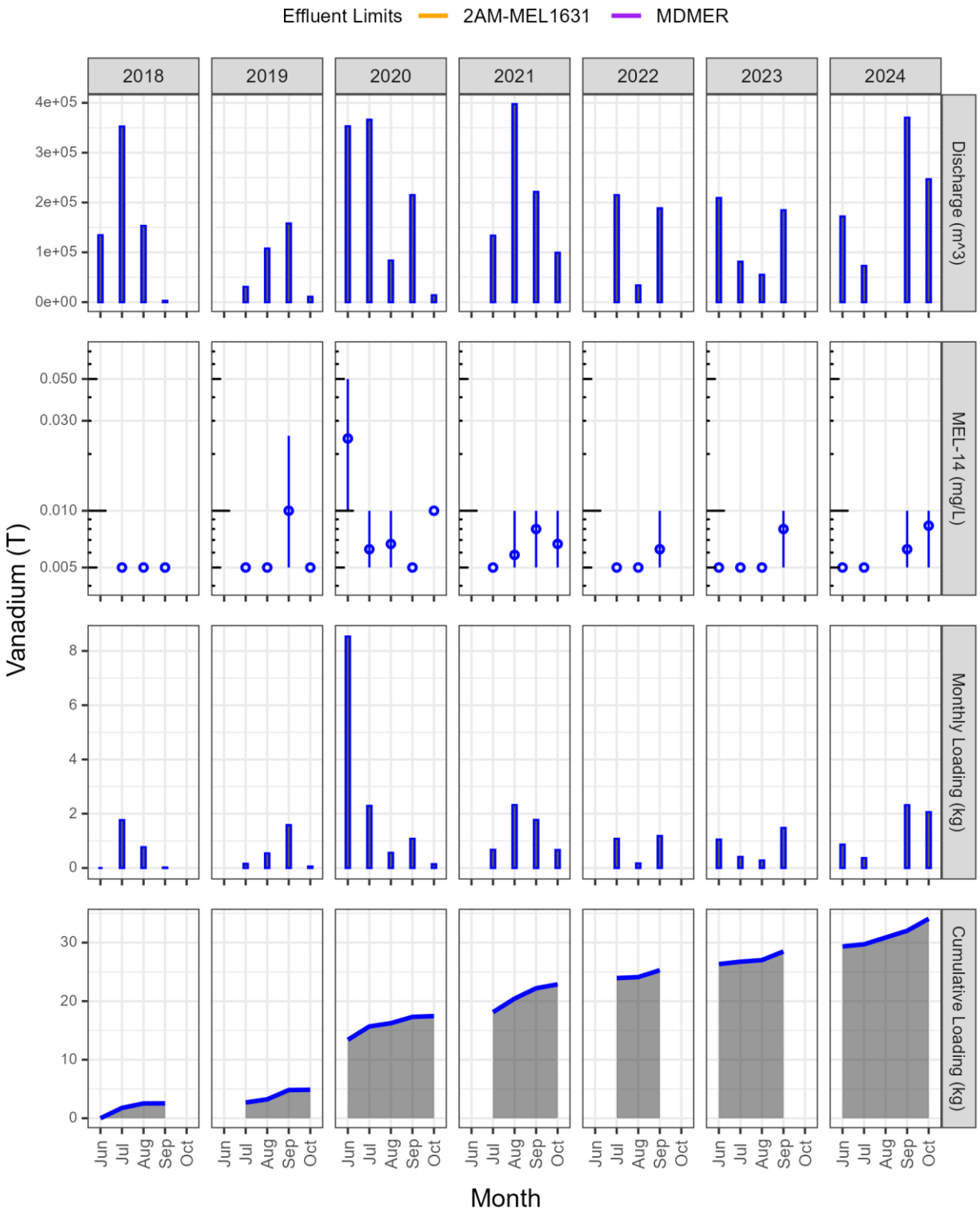


Figure B2-46. Zinc

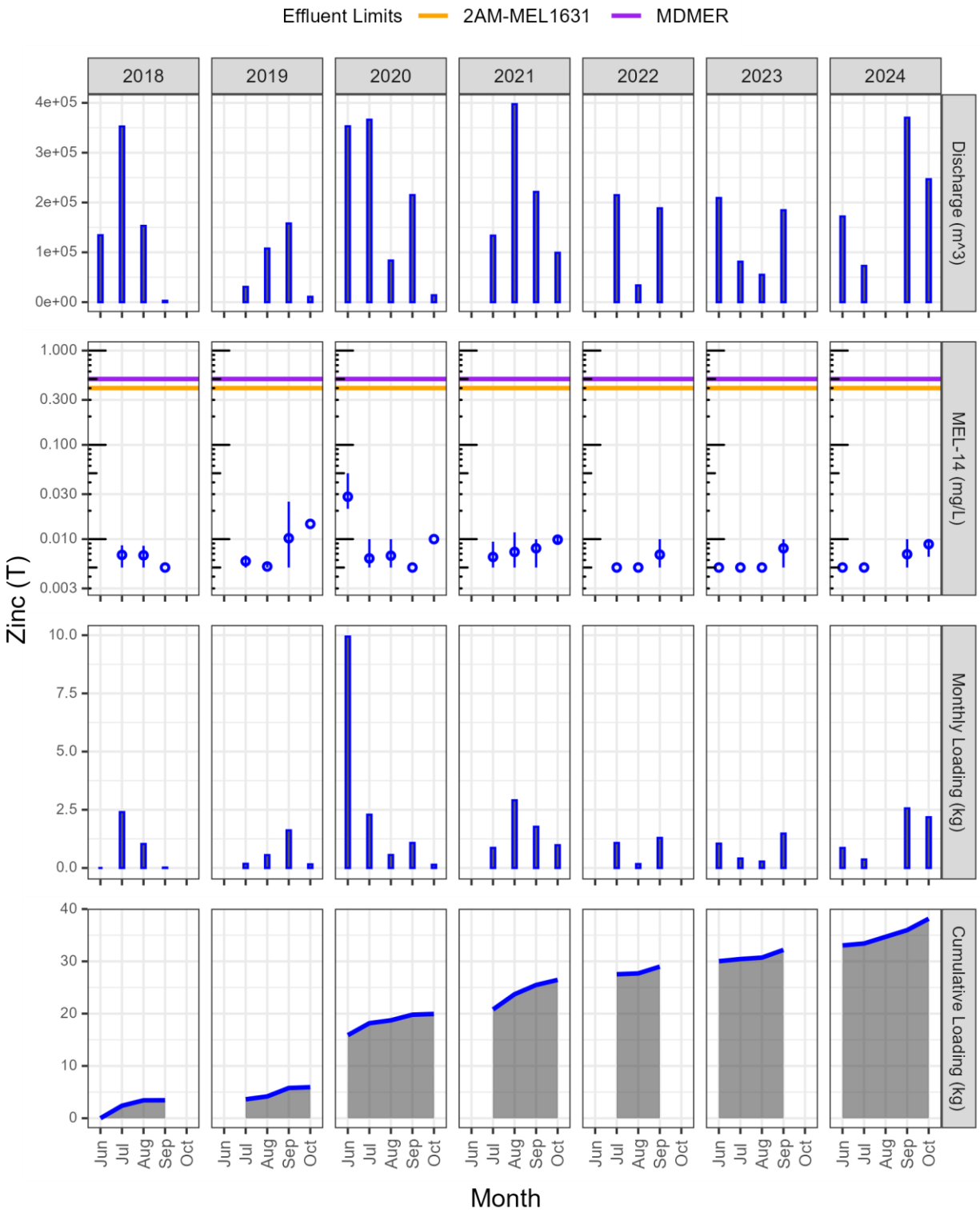


Figure B2-47. Cyanide (Free)

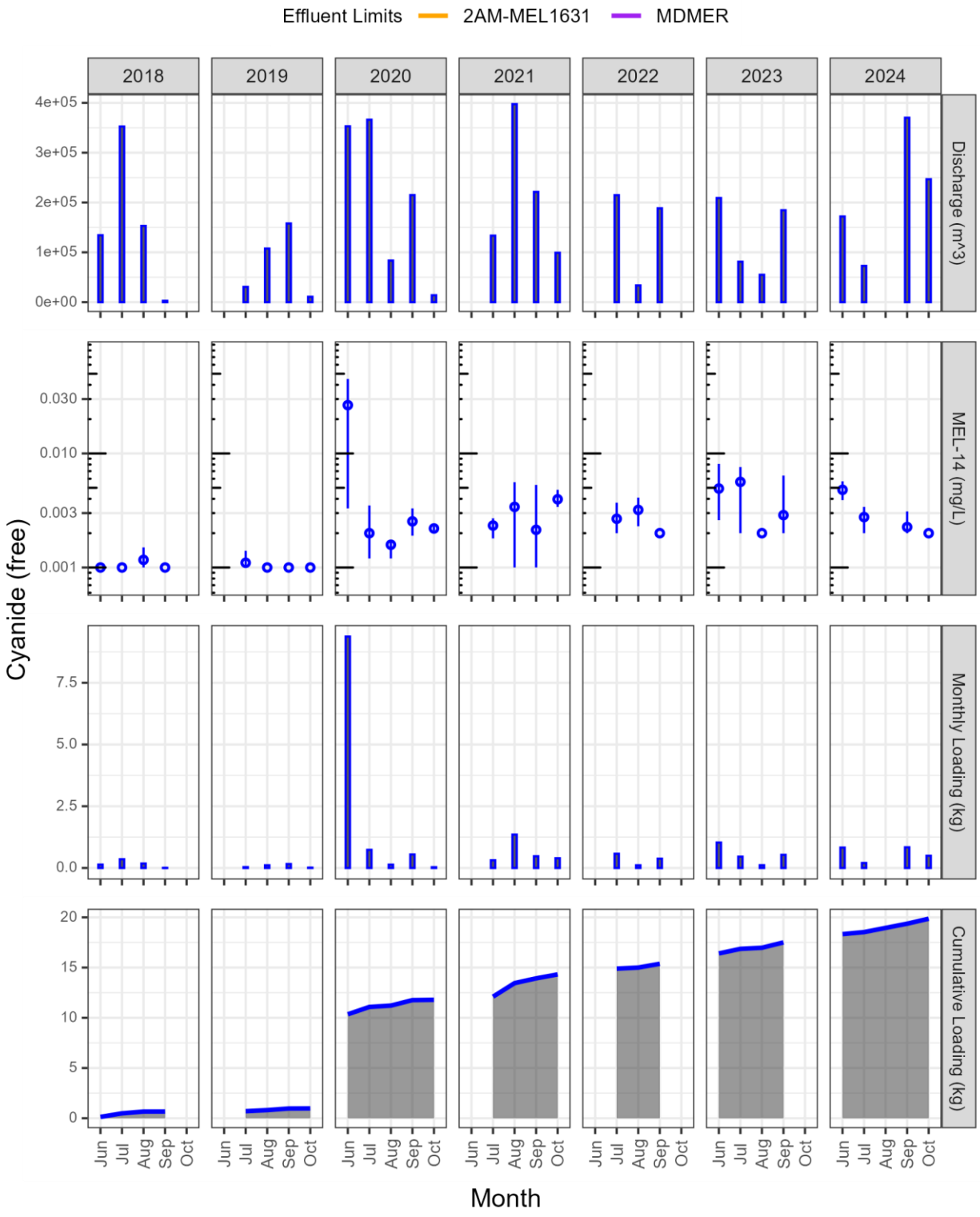


Figure B2-48. Cyanide (Total)

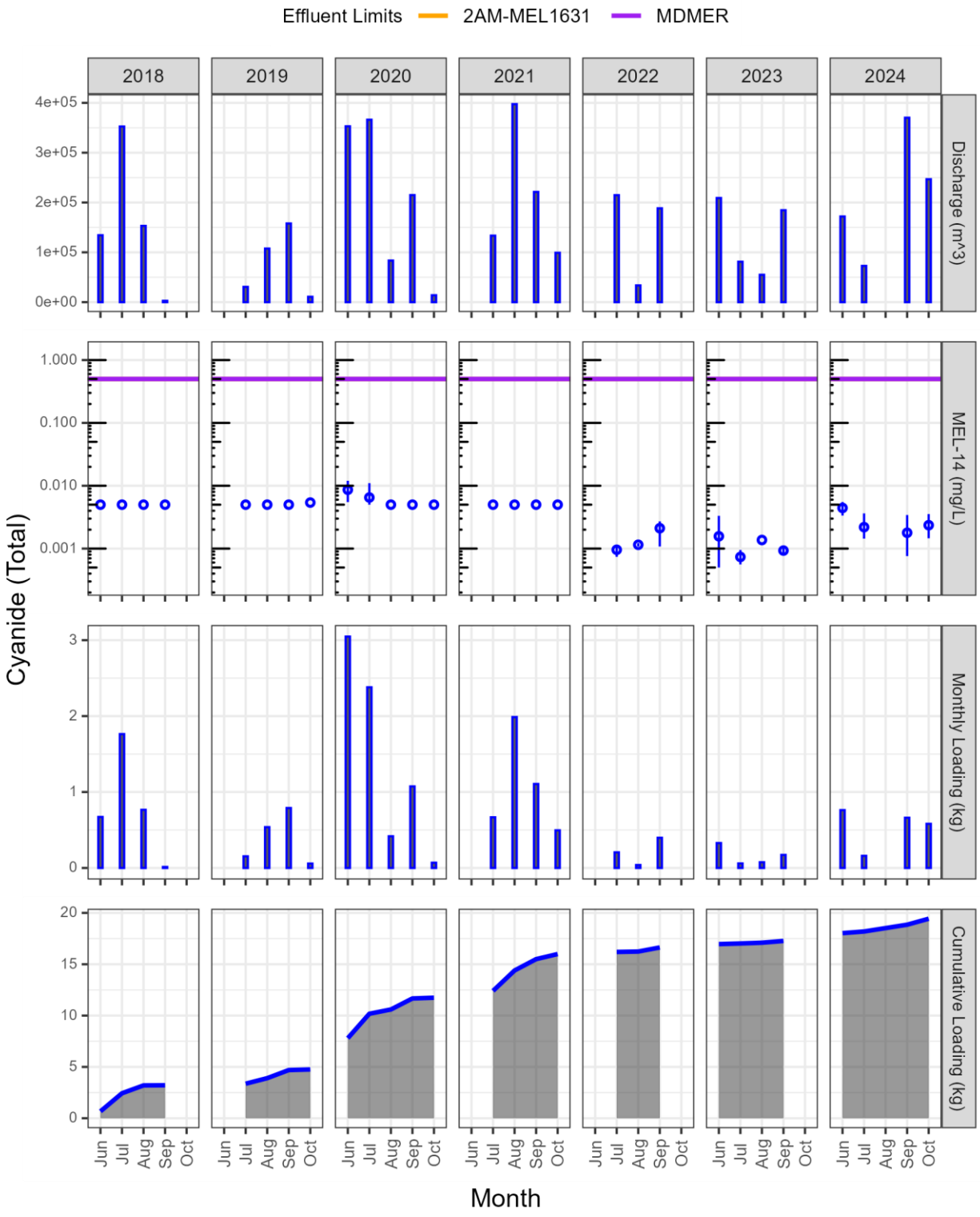
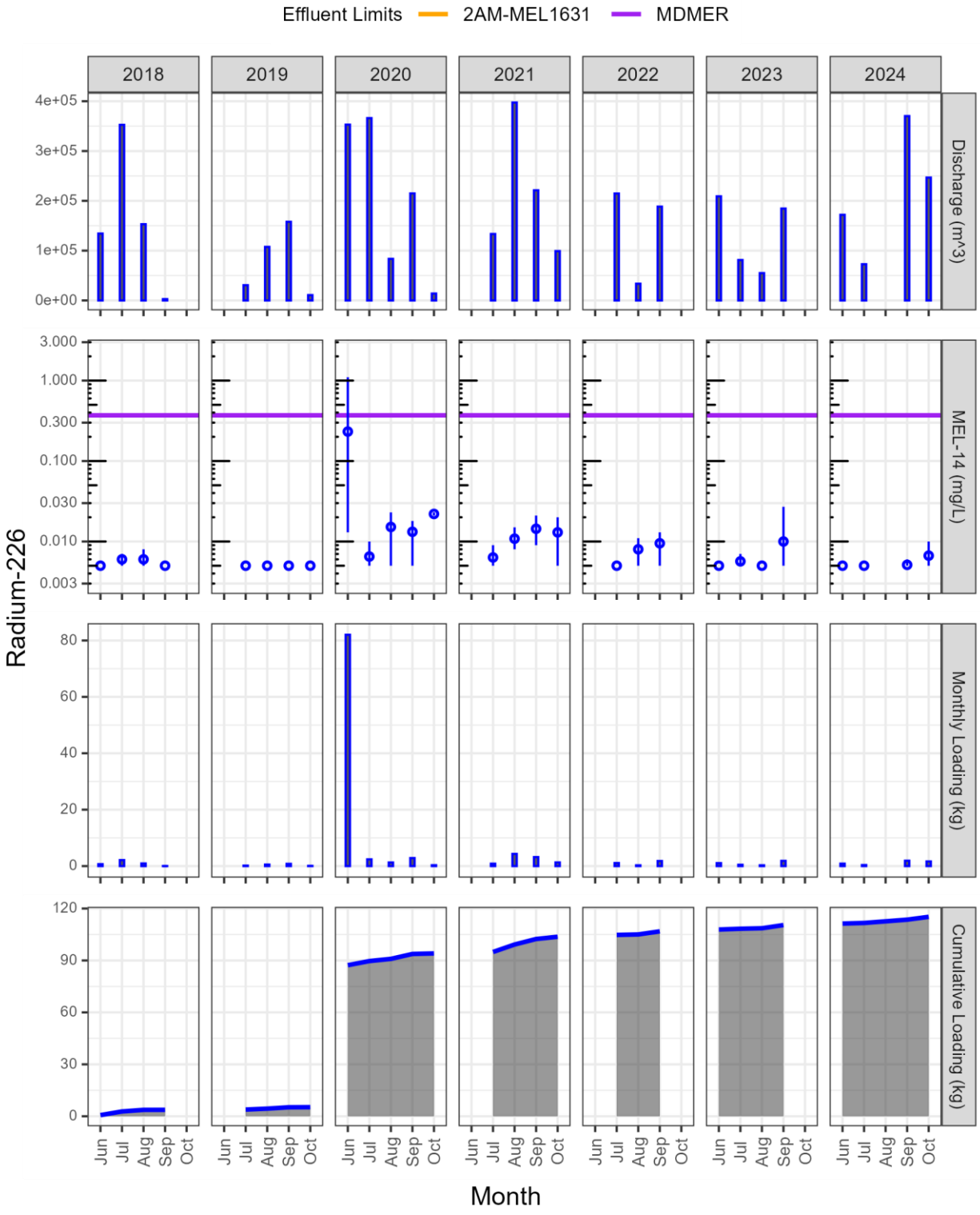


Figure B2-49. Radium-226



APPENDIX C
MELIADINE LAKE WATER QUALITY – SUPPORTING INFORMATION

Appendix C1
Meliadine Lake Water Quality – 2024 Data and Summary Statistics

APPENDIX C1 – TABLES

Table C1-1. Detection limits and screening values for the Meliadine Lake water quality program. 1
Table C1-2. MEL-01 summary statistics for the 2024 winter water sampling event. 3
Table C1-3. MEL-02 summary statistics for the 2024 winter water sampling event. 6
Table C1-4. MEL-01 summary statistics for the 2024 open water sampling events. 9
Table C1-5. MEL-02 summary statistics for the 2024 open water sampling events. 12
Table C1-6. MEL-03 summary statistics for the 2024 open water sampling events. 15
Table C1-7. MEL-04 summary statistics for the August 2024 sampling event. 18
Table C1-8. MEL-05 summary statistics for the August 2024 sampling event. 21
Table C1-9. Surface water chemistry results for the Meliadine Lake study in 2024. 24

Table C1-1. Detection limits and screening values for the Meliadine Lake water quality program.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	FWAL[b] (min | max)	HH DW[c]	SSWQO[d]	Action Level[e] (min | max)	Benchmark[f] (min | max)
Field Measurements									
Temperature	C	-	-	-	-	-	-	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	-	-	-
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0
DO (mg/L)	mg/L	-	-	-	-	-	-	6.5	6.5
DO (%)	%	-	-	-	-	-	-	-	-
Conventional Parameters									
Conductivity (lab)	uS/cm	1	77.5	-	-	-	-	-	-
Hardness	mg/L	0.5	23.37	-	-	-	-	-	-
pH (lab)	pH units	0.1	-	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0
Total Dissolved Solids	mg/L	10	54	68	500	-	1000	375	500
Total Dissolved Solids (Calculated)	mg/L	1	39.61	68	500	-	1000	375	500
Total Suspended Solids	mg/L	1	1	3.1	-	-	-	-	-
Turbidity (lab)	NTU	0.1	-	-	-	-	-	-	-
Major Ions									
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	-	-	-
Alkalinity, Carbonate	mg/L	1	-	-	-	-	-	-	-
Alkalinity, Hydroxide	mg/L	1	-	-	-	-	-	-	-
Alkalinity, Total	mg/L	1	20.5	-	-	-	-	-	-
Bromide	mg/L	0.1	-	-	-	-	-	-	-
Calcium (D)	mg/L	0.01	-	-	-	-	-	-	-
Calcium (T)	mg/L	0.01	7.334	-	-	-	-	-	-
Chloride	mg/L	0.1	9.564	14	120	-	-	90	120
Fluoride	mg/L	0.02	0.028	0.0084	0.12	1.5	2.8	2.1	2.8
Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	-
Magnesium (T)	mg/L	0.004	1.18	-	-	-	-	-	-
Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-
Potassium (T)	mg/L	0.02	0.954	-	-	-	-	-	-
Reactive Silica (SiO2)	mg/L	0.01	0.2684	-	-	-	-	-	-
Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-
Sodium (T)	mg/L	0.02	4.847	5.3	-	-	-	-	-
Sulphate	mg/L	0.3	3.867	38	128 | 218	-	-	96 | 164	128 | 218
Nutrients									
Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.41 | 8.47	-	-	0.308 | 6.35	0.41 | 8.47
Nitrate (as N)	mg/L	0.005	0.0180	0.25	2.9	10	-	2.17	2.9
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	-
Nitrite (as N)	mg/L	0.001	0.001	0.051	0.06	1	-	0.045	0.06
Nitrogen	mg/L	0.05	-	-	-	-	-	-	-
Orthophosphate (PO4-P)	mg/L	0.001	0.001	-	-	-	-	-	-
Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	-	-	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.2497	-	-	-	-	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	-	-	-
Organic/Inorganic Carbon									
Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	-	-	-
Total Organic Carbon	mg/L	0.5	3	-	-	-	-	-	-
Total Metals									
Aluminum	ug/L	1	5.316	9.1	271 | 687	-	-	203 | 515	271 | 687
Antimony	ug/L	0.02	0.02	0.51	-	6	-	4.5	6
Arsenic	ug/L	0.02	0.275	3.8	5	10	25	18.8	25
Barium	ug/L	0.02	8.054	77	-	1000	-	750	1000
Beryllium	ug/L	0.005	0.005	-	-	-	-	-	-
Bismuth	ug/L	0.005	0.005	-	-	-	-	-	-
Boron	ug/L	5	6.52	23	1500	5000	-	1120	1500
Cadmium	ug/L	0.005	0.005	0.05	0.04 | 0.0647	5	-	0.03 | 0.0485	0.04 | 0.0647
Cesium	ug/L	0.005	-	-	-	-	-	-	-
Chromium	ug/L	0.1	0.10	1.1	5	50	-	3.75	5
Cobalt	ug/L	0.005	0.016	-	0.78	-	-	0.585	0.78
Copper	ug/L	0.05	0.86	2	-	2000	-	1500	2000
Gallium	ug/L	0.05	-	-	-	-	-	-	-
Iron	ug/L	1	15.02	42	300	-	1060	795	1060
Lanthanum	ug/L	0.01	-	-	-	-	-	-	-
Lead	ug/L	0.01	0.0222	0.15	-	5	-	3.75	5
Lithium	ug/L	0.5	0.72	-	-	-	-	-	-
Manganese	ug/L	0.05	3.062	5.5	-	120	-	90	120
Mercury	ug/L	0.0005	0.0008	0.02	0.026	1	-	0.0195	0.026
Molybdenum	ug/L	0.05	0.107	5.2	73	-	-	54.8	73
Nickel	ug/L	0.05	0.4412	2.7	25	-	-	18.8	25
Niobium	ug/L	0.1	-	-	-	-	-	-	-
Phosphorus	ug/L	50	-	-	-	-	-	-	-
Rhenium	ug/L	0.005	-	-	-	-	-	-	-
Rubidium	ug/L	0.005	-	-	-	-	-	-	-
Selenium	ug/L	0.04	0.049	0.16	1	50	-	0.75	1
Silicon	ug/L	50	-	-	-	-	-	-	-
Silver	ug/L	0.005	0.005	0.1	0.25	-	-	0.188	0.25
Strontium	ug/L	0.02	36.1	-	2500	7000	-	1880	2500
Sulfur	ug/L	500	-	-	-	-	-	-	-

Table C1-1. Detection limits and screening values for the Meliadine Lake water quality program.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	FWAL[b] (min | max)	HH DW[c]	SSWQO[d]	Action Level[e] (min | max)	Benchmark[f] (min | max)
Tantalum	ug/L	0.1	-	-	-	-	-	-	-
Tellurium	ug/L	0.02	-	-	-	-	-	-	-
Thallium	ug/L	0.005	0.005	0.1	0.8	-	-	0.6	0.8
Thorium	ug/L	0.005	-	-	-	-	-	-	-
Tin	ug/L	0.02	0.0384	-	-	-	-	-	-
Titanium	ug/L	0.05	0.169	-	-	-	-	-	-
Tungsten	ug/L	0.01	-	-	-	-	-	-	-
Uranium	ug/L	0.001	0.0164	1.5	15	20	-	11.2	15
Vanadium	ug/L	0.05	0.05	-	120	-	-	90	120
Yttrium	ug/L	0.01	-	-	-	-	-	-	-
Zinc	ug/L	0.5	1.698	6.7	-	-	-	-	-
Zirconium	ug/L	0.01	-	-	-	-	-	-	-
Dissolved Metals									
Aluminum	ug/L	1	-	-	-	-	-	-	-
Antimony	ug/L	0.02	-	-	-	-	-	-	-
Arsenic	ug/L	0.02	-	-	-	-	-	-	-
Barium	ug/L	0.02	-	-	-	-	-	-	-
Beryllium	ug/L	0.005	-	-	-	-	-	-	-
Bismuth	ug/L	0.005	-	-	-	-	-	-	-
Boron	ug/L	5	-	-	-	-	-	-	-
Cadmium	ug/L	0.005	-	-	-	-	-	-	-
Cesium	ug/L	0.005	-	-	-	-	-	-	-
Chromium	ug/L	0.1	-	-	-	-	-	-	-
Cobalt	ug/L	0.005	-	-	-	-	-	-	-
Copper	ug/L	0.05	0.8614	-	1.61 | 4.92	-	-	1.21 | 3.69	1.61 | 4.92
Gallium	ug/L	0.05	-	-	-	-	-	-	-
Iron	ug/L	1	-	-	-	-	-	-	-
Lanthanum	ug/L	0.01	-	-	-	-	-	-	-
Lead	ug/L	0.01	0.0125	-	4.98 | 7.74	-	-	3.73 | 5.8	4.98 | 7.74
Lithium	ug/L	0.5	-	-	-	-	-	-	-
Manganese	ug/L	0.05	1.196	-	210 | 330	-	-	158 | 248	210 | 330
Mercury	ug/L	0.0005	-	-	-	-	-	-	-
Molybdenum	ug/L	0.05	-	-	-	-	-	-	-
Nickel	ug/L	0.05	-	-	-	-	-	-	-
Niobium	ug/L	0.1	-	-	-	-	-	-	-
Phosphorus	ug/L	50	-	-	-	-	-	-	-
Rhenium	ug/L	0.005	-	-	-	-	-	-	-
Rubidium	ug/L	0.005	-	-	-	-	-	-	-
Selenium	ug/L	0.04	-	-	-	-	-	-	-
Silicon	ug/L	50	-	-	-	-	-	-	-
Silver	ug/L	0.005	-	-	-	-	-	-	-
Strontium	ug/L	0.02	-	-	2500	-	-	1880	2500
Sulfur	ug/L	500	-	-	-	-	-	-	-
Tantalum	ug/L	0.1	-	-	-	-	-	-	-
Tellurium	ug/L	0.02	-	-	-	-	-	-	-
Thallium	ug/L	0.005	-	-	-	-	-	-	-
Thorium	ug/L	0.005	-	-	-	-	-	-	-
Tin	ug/L	0.02	-	-	-	-	-	-	-
Titanium	ug/L	0.05	-	-	-	-	-	-	-
Tungsten	ug/L	0.01	-	-	-	-	-	-	-
Uranium	ug/L	0.001	-	-	-	-	-	-	-
Vanadium	ug/L	0.05	-	-	-	-	-	-	-
Yttrium	ug/L	0.01	-	-	-	-	-	-	-
Zinc	ug/L	0.5	1.902	-	6.87 | 14.2	-	-	5.16 | 10.6	6.87 | 14.2
Zirconium	ug/L	0.01	-	-	-	-	-	-	-
Other									
Cyanide (free)	mg/L	0.001	-	0.00035	-	-	-	-	-
Cyanide (Total)	mg/L	0.001	0.001	0.009	0.005	0.2	-	0.00375	0.005
Cyanide (WAD)	mg/L	0.001	-	-	-	-	-	-	-

Notes

[a] FEIS predictions for the edge of the mixing zone as presented in Agnico Eagle (2014).

[b] The freshwater aquatic life guidelines (FWAL) for cadmium (T), copper (D), lead (D), manganese (D), and zinc (D) are variable depending on modifying factors such as pH, hardness, and DOC. Values shown represent the range of FWAL guidelines calculated for MEL-01 open-water samples in 2024.

[c] Health Canada drinking water guidelines (maximum acceptable concentrations)

[d] Site-specific water quality objectives for fluoride, arsenic, and iron.

[e] The AEMP Action Level is 75% of the AEMP Benchmark.

[f] The AEMP Benchmark is the lowest of the FWAL or HH DW guidelines.

Table C1-2. MEL-01 summary statistics for the 2024 winter water sampling event.

Parameter	Units	DL (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-01 (Near-field Exposure Area) Winter Sampling Event (March)										
						N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	%> FEIS	% > Act Lvl
Field Measurements																
Temperature	C	-	-	-	-	6	0	0	1.6	1.63	0.0753	0.0307	1.48	1.67	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	6	0	0	145	145	2.78	1.13	142	150	-	-
pH (field)	pH units	-	-	6.5 | 9.0	6.5 | 9.0	6	0	0	7.47	7.34	0.425	0.174	7.08	8.22	-	0
DO (mg/L)	mg/L	-	-	6.5	6.5	6	0	0	13.7	13.8	0.226	0.0921	13.3	13.9	-	0
DO (%)	%	-	-	-	-	6	0	0	99.3	100	2.29	0.935	95.3	101	-	-
Conventional Parameters																
Conductivity (lab)	uS/cm	1	-	-	-	6	0	0	158	156	4.04	1.65	155	165	-	-
Hardness	mg/L	0.5	-	-	-	6	0	0	43	42.6	1.18	0.481	41.9	44.7	-	-
pH (lab)	pH units	0.1	-	6.5 | 9.0	6.5 | 9.0	6	0	0	7.23	7.22	0.0248	0.0101	7.2	7.26	-	0
Total Dissolved Solids	mg/L	10	68	375	500	6	0	0	77.2	79.8	10.3	4.22	58.7	87.3	83	0
Total Dissolved Solids (Calculated)	mg/L	1	68	375	500	6	0	0	103	102	2.56	1.05	101	107	100	0
Total Suspended Solids	mg/L	1	3.1	-	-	6	6	100	-	-	-	-	-	1	0	-
Turbidity (lab)	NTU	0.1	-	-	-	6	0	0	0.212	0.19	0.0956	0.039	0.12	0.34	-	-
Major Ions																
Alkalinity, Bicarbonate	mg/L	1	-	-	-	6	0	0	28.4	28.2	0.697	0.285	27.7	29.2	-	-
Alkalinity, Carbonate	mg/L	1	-	-	-	6	6	100	-	-	-	-	-	1	-	-
Alkalinity, Hydroxide	mg/L	1	-	-	-	6	6	100	-	-	-	-	-	1	-	-
Alkalinity, Total	mg/L	1	-	-	-	6	0	0	28.4	28.2	0.697	0.285	27.7	29.2	-	-
Bromide	mg/L	0.1	-	-	-	6	6	100	-	-	-	-	-	0.1	-	-
Calcium (D)	mg/L	0.01	-	-	-	6	0	0	13.1	13.1	0.349	0.142	12.7	13.6	-	-
Calcium (T)	mg/L	0.01	-	-	-	6	0	0	13.3	13	0.468	0.191	12.9	14	-	-
Chloride	mg/L	0.1	14	90	120	6	0	0	22.8	22.5	0.733	0.299	22.1	23.8	100	0
Fluoride	mg/L	0.02	0.0084	2.1	2.8	6	0	0	0.0368	0.0365	0.00147	0.000601	0.035	0.039	100	0
Magnesium (D)	mg/L	0.004	-	-	-	6	0	0	2.48	2.46	0.0922	0.0377	2.37	2.6	-	-
Magnesium (T)	mg/L	0.004	-	-	-	6	0	0	2.52	2.5	0.0897	0.0366	2.4	2.66	-	-
Potassium (D)	mg/L	0.02	-	-	-	6	0	0	1.57	1.56	0.0677	0.0276	1.5	1.69	-	-
Potassium (T)	mg/L	0.02	-	-	-	6	0	0	1.58	1.54	0.082	0.0335	1.52	1.72	-	-
Reactive Silica (SiO2)	mg/L	0.01	-	-	-	6	0	0	0.803	0.799	0.0164	0.00668	0.79	0.834	-	-
Sodium (D)	mg/L	0.02	-	-	-	6	0	0	11.1	11	0.392	0.16	10.7	11.7	-	-
Sodium (T)	mg/L	0.02	5.3	-	-	6	0	0	11.1	11	0.366	0.149	10.7	11.7	100	-
Sulphate	mg/L	0.3	38	96 | 164	128 | 218	6	0	0	9.24	9.22	0.25	0.102	8.95	9.61	0	0
Nutrients																
Ammonia (as N)	mg/L	0.005	0.54	0.308 | 6.35	0.41 | 8.47	6	0	0	0.0386	0.0386	0.0132	0.00539	0.0236	0.0561	0	0
Nitrate (as N)	mg/L	0.005	0.25	2.17	2.9	6	0	0	0.0283	0.0289	0.00339	0.00139	0.023	0.0316	0	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	6	0	0	0.0283	0.0289	0.00339	0.00139	0.023	0.0316	-	-
Nitrite (as N)	mg/L	0.001	0.051	0.045	0.06	6	6	100	-	-	-	-	-	0.001	0	0
Nitrogen	mg/L	0.05	-	-	-	6	0	0	0.341	0.334	0.0212	0.00867	0.321	0.378	-	-
Orthophosphate (PO4-P)	mg/L	0.001	-	-	-	6	6	100	-	-	-	-	-	0.001	-	-
Total Diss Phosphorus	mg/L	0.001	-	-	-	6	0	0	0.00337	0.00295	0.00117	0.000479	0.0025	0.0057	-	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	6	0	0	0.337	0.335	0.00698	0.00285	0.33	0.349	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	-	-	-	6	0	0	0.313	0.307	0.0223	0.0091	0.291	0.35	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	6	0	0	0.309	0.308	0.00792	0.00324	0.302	0.323	-	-
Total Phosphorus	mg/L	0.001	0.0049	-	-	6	0	0	0.00555	0.0054	0.000599	0.000245	0.005	0.0066	100	-

Table C1-2. MEL-01 summary statistics for the 2024 winter water sampling event.

Parameter	Units	DL (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-01 (Near-field Exposure Area) Winter Sampling Event (March)										
						N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	%> FEIS	% > Act Lvl
Organic/Inorganic Carbon																
Dissolved Organic Carbon	mg/L	0.5	-	-	-	6	0	0	4.65	4.7	0.211	0.0862	4.28	4.84	-	-
Total Organic Carbon	mg/L	0.5	-	-	-	6	0	0	5.15	5.15	0.143	0.0585	4.91	5.34	-	-
Total Metals																
Aluminum	ug/L	1	9.1	203 | 515	271 | 687	6	5	83	-	1	-	-	1	2	0	0
Antimony	ug/L	0.02	0.51	4.5	6	6	5	83	-	0.02	-	-	0.02	0.021	0	0
Arsenic	ug/L	0.02	3.8	18.8	25	6	0	0	0.624	0.628	0.0202	0.00825	0.596	0.646	0	0
Barium	ug/L	0.02	77	750	1000	6	0	0	12.5	12.5	0.186	0.076	12.2	12.7	0	0
Beryllium	ug/L	0.005	-	-	-	6	6	100	-	-	-	-	-	0.005	-	-
Boron	ug/L	5	23	1120	1500	6	0	0	10	9.9	0.45	0.184	9.6	10.8	0	0
Cadmium	ug/L	0.005	0.05	0.03 | 0.0485	0.04 | 0.0647	6	6	100	-	-	-	-	-	0.005	0	0
Chromium	ug/L	0.1	1.1	3.75	5	6	3	50	-	0.105	-	-	0.1	0.31	0	0
Cobalt	ug/L	0.005	-	0.585	0.78	6	0	0	0.0314	0.0284	0.00881	0.0036	0.0254	0.0487	-	0
Copper	ug/L	0.05	2	1500	2000	6	0	0	1.85	1.72	0.409	0.167	1.56	2.66	17	0
Iron	ug/L	1	42	795	1060	6	0	0	5.25	5	0.901	0.368	4.3	6.5	0	0
Lead	ug/L	0.01	0.15	3.75	5	6	0	0	0.0183	0.016	0.00622	0.00254	0.015	0.031	0	0
Lithium	ug/L	0.5	-	-	-	6	0	0	1.44	1.44	0.0417	0.017	1.39	1.48	-	-
Manganese	ug/L	0.05	5.5	90	120	6	0	0	1.6	1.58	0.28	0.114	1.19	2.04	0	0
Mercury	ug/L	0.0005	0.02	0.0195	0.026	6	5	83	-	0.0005	-	-	5.00E-04	0.00244	0	0
Molybdenum	ug/L	0.05	5.2	54.8	73	6	0	0	0.173	0.17	0.011	0.00448	0.161	0.19	0	0
Nickel	ug/L	0.05	2.7	18.8	25	6	0	0	1.58	1.35	0.591	0.241	1.22	2.76	17	0
Selenium	ug/L	0.04	0.16	0.75	1	6	0	0	0.0555	0.056	0.00302	0.00123	0.05	0.059	0	0
Silver	ug/L	0.005	0.1	0.188	0.25	6	6	100	-	-	-	-	-	0.005	0	0
Strontium	ug/L	0.02	-	1880	2500	6	0	0	77.1	75.9	2.06	0.84	75.7	80.7	-	0
Thallium	ug/L	0.005	0.1	0.6	0.8	6	6	100	-	-	-	-	-	0.005	0	0
Tin	ug/L	0.02	-	-	-	6	5	83	-	0.02	-	-	0.02	0.039	-	-
Titanium	ug/L	0.05	-	-	-	6	6	100	-	-	-	-	-	0.05	-	-
Uranium	ug/L	0.001	1.5	11.2	15	6	0	0	0.027	0.0271	0.00189	0.00077	0.0248	0.0301	0	0
Vanadium	ug/L	0.05	-	90	120	6	6	100	-	-	-	-	-	0.05	-	0
Zinc	ug/L	0.5	6.7	-	-	6	0	0	1.57	1.6	0.259	0.106	1.2	1.97	0	-
Dissolved Metals																
Aluminum	ug/L	1	-	-	-	6	5	83	-	1	-	-	1	3.7	-	-
Antimony	ug/L	0.02	-	-	-	6	2	33	0.0213	0.021	0.00151	0.000615	0.02	0.023	-	-
Arsenic	ug/L	0.02	-	-	-	6	0	0	0.624	0.619	0.0248	0.0101	0.587	0.659	-	-
Barium	ug/L	0.02	-	-	-	6	0	0	12.5	12.4	0.216	0.0882	12.2	12.8	-	-
Beryllium	ug/L	0.005	-	-	-	6	6	100	-	-	-	-	-	0.005	-	-
Boron	ug/L	5	-	-	-	6	0	0	10.2	10.1	0.437	0.178	9.9	11.1	-	-
Cadmium	ug/L	0.005	-	-	-	6	6	100	-	-	-	-	-	0.005	-	-
Chromium	ug/L	0.1	-	-	-	6	6	100	-	-	-	-	-	0.1	-	-
Cobalt	ug/L	0.005	-	-	-	6	0	0	0.0264	0.0238	0.00526	0.00215	0.0232	0.0366	-	-
Copper	ug/L	0.05	-	1.21 | 3.69	1.61 | 4.92	6	0	0	1.85	1.72	0.368	0.15	1.61	2.59	-	0
Iron	ug/L	1	-	-	-	6	0	0	3.57	3	1.53	0.624	2.4	6.6	-	-
Lead	ug/L	0.01	-	3.73 | 5.8	4.98 | 7.74	6	0	0	0.0148	0.0135	0.00337	0.00138	0.012	0.02	-	0
Lithium	ug/L	0.5	-	-	-	6	0	0	1.47	1.45	0.0366	0.0149	1.44	1.52	-	-
Manganese	ug/L	0.05	-	158 | 248	210 | 330	6	0	0	0.489	0.442	0.157	0.0641	0.365	0.785	-	0

Table C1-2. MEL-01 summary statistics for the 2024 winter water sampling event.

Parameter	Units	DL (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-01 (Near-field Exposure Area) Winter Sampling Event (March)										
						N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	%> FEIS	% > Act Lvl
Mercury	ug/L	0.0005	-	-	-	6	4	67	-	5.00E-04	-	-	5.00E-04	0.00192	-	-
Molybdenum	ug/L	0.05	-	-	-	6	0	0	0.176	0.178	0.00911	0.00372	0.166	0.185	-	-
Nickel	ug/L	0.05	-	-	-	6	0	0	1.41	1.24	0.412	0.168	1.18	2.24	-	-
Selenium	ug/L	0.04	-	-	-	6	0	0	0.0542	0.056	0.00467	0.0019	0.048	0.06	-	-
Silver	ug/L	0.005	-	-	-	6	6	100	-	-	-	-	-	0.005	-	-
Strontium	ug/L	0.02	-	1880	2500	6	0	0	77.5	78	1.88	0.769	75.2	79.4	-	0
Thallium	ug/L	0.005	-	-	-	6	6	100	-	-	-	-	-	0.005	-	-
Tin	ug/L	0.02	-	-	-	6	3	50	-	0.031	-	-	0.02	0.066	-	-
Titanium	ug/L	0.05	-	-	-	6	6	100	-	-	-	-	-	0.05	-	-
Uranium	ug/L	0.001	-	-	-	6	0	0	0.0262	0.0264	0.00124	0.000507	0.0246	0.0278	-	-
Vanadium	ug/L	0.05	-	-	-	6	6	100	-	-	-	-	-	0.05	-	-
Zinc	ug/L	0.5	-	5.16 | 10.6	6.87 | 14.2	6	0	0	2.41	1.82	1.5	0.613	1.24	5.37	-	0
Other																
Cyanide (free)	mg/L	0.001	0.00035	-	-	6	6	100	-	-	-	-	-	0.001	100	-
Cyanide (Total)	mg/L	0.001	0.009	0.00375	0.005	6	6	100	-	-	-	-	-	0.001	0	0
Cyanide (WAD)	mg/L	0.001	-	-	-	6	6	100	-	-	-	-	-	0.001	-	-

Notes

[a] FEIS predictions for the edge of the mixing zone as presented in Agnico Eagle (2014).

[b] The AEMP Action Level is 75% of the AEMP Benchmark.

[c] The AEMP Benchmark is the lowest of the FWAL or HH DW guidelines except for fluoride, arsenic, and iron (AEMP Benchmark = site specific water quality objective).

Table C1-3. MEL-02 summary statistics for the 2024 winter water sampling event.

Parameter	Units	DL (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-02 (Mid-field Exposure Area) Winter Sampling Event (March)										
						N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	%> FEIS	% > Act Lvl
Field Measurements																
Temperature	C	-	-	-	-	5	0	0	1.48	1.54	0.106	0.0476	1.35	1.56	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	5	0	0	108	109	0.859	0.384	107	110	-	-
pH (field)	pH units	-	-	6.5 | 9.0	6.5 | 9.0	5	0	0	7.49	7.51	0.265	0.118	7.24	7.9	-	0
DO (mg/L)	mg/L	-	-	6.5	6.5	5	0	0	13.6	13.3	0.62	0.277	13.1	14.5	-	0
DO (%)	%	-	-	-	-	5	0	0	99.2	97.9	4.22	1.89	95.3	105	-	-
Conventional Parameters																
Conductivity (lab)	uS/cm	1	-	-	-	5	0	0	124	124	1.82	0.812	121	126	-	-
Hardness	mg/L	0.5	-	-	-	5	0	0	34.5	34.5	0.926	0.414	33.2	35.5	-	-
pH (lab)	pH units	0.1	-	6.5 | 9.0	6.5 | 9.0	5	0	0	7.22	7.22	0.082	0.0367	7.09	7.32	-	0
Total Dissolved Solids	mg/L	10	68	375	500	5	0	0	54.7	57.3	9.22	4.12	44.3	65.7	0	0
Total Dissolved Solids (Calculated)	mg/L	1	68	375	500	5	0	0	80.3	80.6	1.19	0.534	78.6	81.9	100	0
Total Suspended Solids	mg/L	1	3.1	-	-	5	5	100	-	-	-	-	-	1	0	-
Turbidity (lab)	NTU	0.1	-	-	-	5	1	20	0.19	0.14	0.113	0.0506	0.1	0.36	-	-
Major Ions																
Alkalinity, Bicarbonate	mg/L	1	-	-	-	5	0	0	25.5	25.1	0.716	0.32	25	26.7	-	-
Alkalinity, Carbonate	mg/L	1	-	-	-	5	5	100	-	-	-	-	-	1	-	-
Alkalinity, Hydroxide	mg/L	1	-	-	-	5	5	100	-	-	-	-	-	1	-	-
Alkalinity, Total	mg/L	1	-	-	-	5	0	0	25.5	25.1	0.716	0.32	25	26.7	-	-
Bromide	mg/L	0.1	-	-	-	5	5	100	-	-	-	-	-	0.1	-	-
Calcium (D)	mg/L	0.01	-	-	-	5	0	0	10.7	10.8	0.297	0.133	10.3	11	-	-
Calcium (T)	mg/L	0.01	-	-	-	5	0	0	11.2	11.2	0.114	0.051	11.1	11.4	-	-
Chloride	mg/L	0.1	14	90	120	5	0	0	16	15.9	0.279	0.125	15.7	16.3	100	0
Fluoride	mg/L	0.02	0.0084	2.1	2.8	5	0	0	0.033	0.033	0.001	0.000447	0.032	0.034	100	0
Magnesium (D)	mg/L	0.004	-	-	-	5	0	0	1.86	1.84	0.0568	0.0254	1.82	1.96	-	-
Magnesium (T)	mg/L	0.004	-	-	-	5	0	0	1.95	1.95	0.0383	0.0171	1.91	2	-	-
Potassium (D)	mg/L	0.02	-	-	-	5	0	0	1.27	1.27	0.0365	0.0163	1.22	1.32	-	-
Potassium (T)	mg/L	0.02	-	-	-	5	0	0	1.34	1.33	0.023	0.0103	1.31	1.36	-	-
Reactive Silica (SiO2)	mg/L	0.01	-	-	-	5	0	0	0.627	0.535	0.197	0.0882	0.524	0.979	-	-
Sodium (D)	mg/L	0.02	-	-	-	5	0	0	7.84	7.84	0.256	0.114	7.52	8.19	-	-
Sodium (T)	mg/L	0.02	5.3	-	-	5	0	0	8.12	8.04	0.138	0.0618	8.02	8.32	100	-
Sulphate	mg/L	0.3	38	96 | 164	128 | 218	5	0	0	6.25	6.24	0.0626	0.028	6.19	6.35	0	0
Nutrients																
Ammonia (as N)	mg/L	0.005	0.54	0.308 | 6.35	0.41 | 8.47	5	0	0	0.045	0.0379	0.014	0.00628	0.0362	0.0696	0	0
Nitrate (as N)	mg/L	0.005	0.25	2.17	2.9	5	0	0	0.0213	0.0118	0.0201	0.00901	0.0083	0.0564	0	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	5	0	0	0.0213	0.0118	0.0201	0.00901	0.0083	0.0564	-	-
Nitrite (as N)	mg/L	0.001	0.051	0.045	0.06	5	5	100	-	-	-	-	-	0.001	0	0
Nitrogen	mg/L	0.05	-	-	-	5	0	0	0.27	0.26	0.0247	0.011	0.249	0.31	-	-
Orthophosphate (PO4-P)	mg/L	0.001	-	-	-	5	5	100	-	-	-	-	-	0.001	-	-
Total Diss Phosphorus	mg/L	0.001	-	-	-	5	0	0	0.00254	0.0024	0.000498	0.000223	0.0021	0.0034	-	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	5	0	0	0.294	0.285	0.0311	0.0139	0.254	0.335	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	-	-	-	5	0	0	0.249	0.252	0.00792	0.00354	0.237	0.256	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	5	0	0	0.273	0.27	0.0269	0.012	0.244	0.315	-	-
Total Phosphorus	mg/L	0.001	0.0049	-	-	5	0	0	0.00438	0.0042	0.00095	0.000425	0.0036	0.006	20	-

Table C1-3. MEL-02 summary statistics for the 2024 winter water sampling event.

Parameter	Units	DL (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-02 (Mid-field Exposure Area) Winter Sampling Event (March)										
						N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	%> FEIS	% > Act Lvl
Organic/Inorganic Carbon																
Dissolved Organic Carbon	mg/L	0.5	-	-	-	5	0	0	3.66	3.61	0.151	0.0677	3.49	3.86	-	-
Total Organic Carbon	mg/L	0.5	-	-	-	5	0	0	3.98	4	0.178	0.0794	3.71	4.2	-	-
Total Metals																
Aluminum	ug/L	1	9.1	203 | 515	271 | 687	5	4	80	-	1	-	-	1	4.7	0	0
Antimony	ug/L	0.02	0.51	4.5	6	5	5	100	-	-	-	-	-	0.02	0	0
Arsenic	ug/L	0.02	3.8	18.8	25	5	0	0	0.634	0.596	0.105	0.047	0.565	0.82	0	0
Barium	ug/L	0.02	77	750	1000	5	0	0	11.5	11.1	0.954	0.427	11	13.2	0	0
Beryllium	ug/L	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-
Boron	ug/L	5	23	1120	1500	5	0	0	7.04	7.1	0.152	0.0678	6.8	7.2	0	0
Cadmium	ug/L	0.005	0.05	0.03 | 0.0485	0.04 | 0.0647	5	5	100	-	-	-	-	-	0.005	0	0
Chromium	ug/L	0.1	1.1	3.75	5	5	5	100	-	-	-	-	-	0.1	0	0
Cobalt	ug/L	0.005	-	0.585	0.78	5	0	0	0.0209	0.0182	0.00795	0.00356	0.0155	0.0349	-	0
Copper	ug/L	0.05	2	1500	2000	5	0	0	1.27	1.26	0.171	0.0764	1.09	1.46	0	0
Iron	ug/L	1	42	795	1060	5	0	0	8.58	3	12.5	5.61	2.7	31	0	0
Lead	ug/L	0.01	0.15	3.75	5	5	2	40	0.0122	0.01	0.00438	0.00196	0.01	0.02	0	0
Lithium	ug/L	0.5	-	-	-	5	0	0	1.13	1.13	0.0192	0.0086	1.1	1.15	-	-
Manganese	ug/L	0.05	5.5	90	120	5	0	0	3.58	1.12	5.54	2.48	1	13.5	20	0
Mercury	ug/L	0.0005	0.02	0.0195	0.026	5	4	80	-	0.0005	-	-	5.00E-04	0.00078	0	0
Molybdenum	ug/L	0.05	5.2	54.8	73	5	0	0	0.115	0.116	0.0153	0.00685	0.089	0.129	0	0
Nickel	ug/L	0.05	2.7	18.8	25	5	0	0	0.935	0.928	0.0828	0.037	0.847	1.05	0	0
Selenium	ug/L	0.04	0.16	0.75	1	5	1	20	0.0434	0.044	0.00241	0.00108	0.04	0.046	0	0
Silver	ug/L	0.005	0.1	0.188	0.25	5	5	100	-	-	-	-	-	0.005	0	0
Strontium	ug/L	0.02	-	1880	2500	5	0	0	59	59.4	1.14	0.509	57.7	60.3	-	0
Thallium	ug/L	0.005	0.1	0.6	0.8	5	5	100	-	-	-	-	-	0.005	0	0
Tin	ug/L	0.02	-	-	-	5	5	100	-	-	-	-	-	0.02	-	-
Titanium	ug/L	0.05	-	-	-	5	4	80	-	0.05	-	-	0.05	0.335	-	-
Uranium	ug/L	0.001	1.5	11.2	15	5	0	0	0.0172	0.0171	0.000559	0.00025	0.0166	0.0181	0	0
Vanadium	ug/L	0.05	-	90	120	5	5	100	-	-	-	-	-	0.05	-	0
Zinc	ug/L	0.5	6.7	-	-	5	0	0	1.24	1.28	0.289	0.129	0.92	1.63	0	-
Dissolved Metals																
Aluminum	ug/L	1	-	-	-	5	5	100	-	-	-	-	-	1	-	-
Antimony	ug/L	0.02	-	-	-	5	5	100	-	-	-	-	-	0.02	-	-
Arsenic	ug/L	0.02	-	-	-	5	0	0	0.61	0.585	0.0716	0.032	0.55	0.734	-	-
Barium	ug/L	0.02	-	-	-	5	0	0	11.5	11.2	0.82	0.367	11.1	13	-	-
Beryllium	ug/L	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-
Boron	ug/L	5	-	-	-	5	0	0	7.14	7.2	0.219	0.098	6.8	7.4	-	-
Cadmium	ug/L	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-
Chromium	ug/L	0.1	-	-	-	5	5	100	-	-	-	-	-	0.1	-	-
Cobalt	ug/L	0.005	-	-	-	5	0	0	0.0155	0.0163	0.00168	0.000753	0.0134	0.0173	-	-
Copper	ug/L	0.05	-	1.21 | 3.69	1.61 | 4.92	5	0	0	1.24	1.26	0.144	0.0642	1.09	1.4	-	0
Iron	ug/L	1	-	-	-	5	0	0	2.74	1.5	2.52	1.12	1.4	7.2	-	-
Lead	ug/L	0.01	-	3.73 | 5.8	4.98 | 7.74	5	5	100	-	-	-	-	-	0.01	-	0
Lithium	ug/L	0.5	-	-	-	5	0	0	1.13	1.12	0.02	0.00894	1.11	1.16	-	-
Manganese	ug/L	0.05	-	158 | 248	210 | 330	5	0	0	0.954	0.314	1.4	0.627	0.271	3.46	-	0

Table C1-3. MEL-02 summary statistics for the 2024 winter water sampling event.

Parameter	Units	DL (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-02 (Mid-field Exposure Area) Winter Sampling Event (March)										
						N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	%> FEIS	% > Act Lvl
Mercury	ug/L	0.0005	-	-	-	5	4	80	-	5.00E-04	-	-	5.00E-04	0.00079	-	-
Molybdenum	ug/L	0.05	-	-	-	5	0	0	0.112	0.114	0.0138	0.00619	0.088	0.123	-	-
Nickel	ug/L	0.05	-	-	-	5	0	0	0.881	0.884	0.0664	0.0297	0.81	0.949	-	-
Selenium	ug/L	0.04	-	-	-	5	0	0	0.0432	0.043	0.00179	0.0008	0.041	0.045	-	-
Silver	ug/L	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-
Strontium	ug/L	0.02	-	1880	2500	5	0	0	57.6	57.2	1.49	0.667	55.7	59.1	-	0
Thallium	ug/L	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-
Tin	ug/L	0.02	-	-	-	5	5	100	-	-	-	-	-	0.02	-	-
Titanium	ug/L	0.05	-	-	-	5	5	100	-	-	-	-	-	0.05	-	-
Uranium	ug/L	0.001	-	-	-	5	0	0	0.0155	0.0157	0.00131	0.000586	0.0136	0.0172	-	-
Vanadium	ug/L	0.05	-	-	-	5	5	100	-	-	-	-	-	0.05	-	-
Zinc	ug/L	0.5	-	5.16 | 10.6	6.87 | 14.2	5	0	0	1.44	1.25	0.621	0.278	0.96	2.53	-	0
Other																
Cyanide (free)	mg/L	0.001	0.00035	-	-	5	5	100	-	-	-	-	-	0.001	100	-
Cyanide (Total)	mg/L	0.001	0.009	0.00375	0.005	5	5	100	-	-	-	-	-	0.001	0	0
Cyanide (WAD)	mg/L	0.001	-	-	-	5	5	100	-	-	-	-	-	0.001	-	-

Notes

[a] FEIS predictions for the edge of the mixing zone as presented in Agnico Eagle (2014).

[b] The AEMP Action Level is 75% of the AEMP Benchmark.

[c] The AEMP Benchmark is the lowest of the FWAL or HH DW guidelines except for fluoride, arsenic, and iron (AEMP Benchmark = site specific water quality objective).

Table C1-4. MEL-01 summary statistics for the 2024 open water sampling events.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-01 (Near-field Exposure Area) Open Water Sampling Events (July, August, September)											
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Field Measurements																		
Temperature	C	-	-	-	-	-	18	0	0	11.7	9.29	3.64	0.859	8.8	16.9	-	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	18	0	0	113	113	1.9	0.448	111	118	-	-	-
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9.0	6.5 | 9.0	18	0	0	7.44	7.5	0.165	0.0388	7.07	7.59	11	-	0
DO (mg/L)	mg/L	-	-	-	6.5	6.5	18	0	0	11.3	11.4	0.899	0.212	10	12.4	-	-	0
DO (%)	%	-	-	-	-	-	18	0	0	106	106	2.54	0.599	102	108	-	-	-
Conventional Parameters																		
Conductivity (lab)	uS/cm	1	77.5	-	-	-	18	0	0	117	118	3.82	0.9	113	125	100	-	-
Hardness	mg/L	0.5	23.37	-	-	-	18	0	0	32.9	33	0.925	0.218	30.6	34	100	-	-
pH (lab)	pH units	0.1	-	-	6.5 | 9.0	6.5 | 9.0	18	0	0	7.39	7.41	0.067	0.0158	7.27	7.47	-	-	0
Total Dissolved Solids	mg/L	10	54	68	375	500	18	0	0	59.9	60.9	5.26	1.24	48.9	67.7	78	0	0
Total Dissolved Solids (Calculated)	mg/L	1	39.61	68	375	500	18	0	0	76.2	76.4	2.5	0.59	73.4	81.2	100	100	0
Total Suspended Solids	mg/L	1	1	3.1	-	-	18	10	56	-	1	-	-	1	1.6	44	0	-
Turbidity (lab)	NTU	0.1	-	-	-	-	18	0	0	0.397	0.385	0.0936	0.0221	0.3	0.59	-	-	-
Major Ions																		
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	18	0	0	20.5	20.4	0.401	0.0946	19.9	21.4	0	-	-
Alkalinity, Carbonate	mg/L	1	-	-	-	-	18	18	100	-	-	-	-	-	1	-	-	-
Alkalinity, Hydroxide	mg/L	1	-	-	-	-	18	18	100	-	-	-	-	-	1	-	-	-
Alkalinity, Total	mg/L	1	20.5	-	-	-	18	0	0	20.5	20.4	0.401	0.0946	19.9	21.4	39	-	-
Bromide	mg/L	0.1	-	-	-	-	18	18	100	-	-	-	-	-	0.1	-	-	-
Calcium (D)	mg/L	0.01	-	-	-	-	18	0	0	10.1	10.1	0.246	0.0579	9.49	10.4	-	-	-
Calcium (T)	mg/L	0.01	7.334	-	-	-	18	0	0	9.82	9.8	0.215	0.0507	9.41	10.2	100	-	-
Chloride	mg/L	0.1	9.564	14	90	120	18	0	0	16.7	16.8	0.714	0.168	15.7	18.2	100	100	0
Fluoride	mg/L	0.02	0.028	0.0084	2.1	2.8	18	0	0	0.0307	0.032	0.00332	0.000783	0.025	0.035	67	100	0
Magnesium (D)	mg/L	0.004	-	-	-	-	18	0	0	1.88	1.89	0.0857	0.0202	1.68	2.01	-	-	-
Magnesium (T)	mg/L	0.004	1.18	-	-	-	18	0	0	1.8	1.78	0.058	0.0137	1.72	1.9	100	-	-
Potassium (D)	mg/L	0.02	-	-	-	-	18	0	0	1.21	1.22	0.04	0.00943	1.16	1.27	-	-	-
Potassium (T)	mg/L	0.02	0.954	-	-	-	18	0	0	1.2	1.2	0.0328	0.00772	1.14	1.28	100	-	-
Reactive Silica (SiO2)	mg/L	0.01	0.2684	-	-	-	18	0	0	0.571	0.556	0.0623	0.0147	0.501	0.655	100	-	-
Sodium (D)	mg/L	0.02	-	-	-	-	18	0	0	8.33	8.41	0.387	0.0912	7.58	9.03	-	-	-
Sodium (T)	mg/L	0.02	4.847	5.3	-	-	18	0	0	8.03	7.94	0.327	0.0772	7.6	8.72	100	100	-
Sulphate	mg/L	0.3	3.867	38	96 | 164	128 | 218	18	0	0	7.15	7.06	0.274	0.0646	6.83	7.87	100	0	0
Nutrients																		
Ammonia (as N)	mg/L	0.005	0.01738	0.54	0.308 | 6.35	0.41 | 8.47	18	10	56	-	0.005	-	-	0.005	0.0191	6	0	0
Nitrate (as N)	mg/L	0.005	0.01798	0.25	2.17	2.9	18	12	67	-	0.005	-	-	0.005	0.0365	17	0	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	18	12	67	-	0.0051	-	-	0.0051	0.0365	-	-	-
Nitrite (as N)	mg/L	0.001	0.001	0.051	0.045	0.06	18	18	100	-	-	-	-	-	0.001	0	0	0
Nitrogen	mg/L	0.05	-	-	-	-	18	0	0	0.307	0.309	0.0432	0.0102	0.225	0.411	-	-	-
Orthophosphate (PO4-P)	mg/L	0.001	0.001	-	-	-	18	18	100	-	-	-	-	-	0.001	0	-	-
Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	18	0	0	0.00309	0.0028	0.00131	0.00031	0.0019	0.008	22	-	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	18	0	0	0.256	0.256	0.0248	0.00583	0.21	0.325	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.2497	-	-	-	18	0	0	0.3	0.302	0.0461	0.0109	0.225	0.411	83	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	18	0	0	0.249	0.247	0.025	0.00588	0.21	0.325	-	-	-
Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	18	0	0	0.00622	0.0063	0.000824	0.000194	0.0039	0.0073	67	94	-

Table C1-4. MEL-01 summary statistics for the 2024 open water sampling events.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-01 (Near-field Exposure Area) Open Water Sampling Events (July, August, September)											
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Organic/Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	18	0	0	4.78	4.86	0.472	0.111	4.04	5.41	100	-	-
Total Organic Carbon	mg/L	0.5	3.00	-	-	-	18	0	0	4.42	4.48	0.364	0.0858	3.79	4.97	100	-	-
Total Metals																		
Aluminum	ug/L	1	5.316	9.1	203 | 515	271 | 687	18	0	0	3.97	3.4	1.05	0.248	2.8	5.9	17	0	0
Antimony	ug/L	0.02	0.02	0.51	4.5	6	18	17	94	-	0.02	-	-	0.02	0.023	6	0	0
Arsenic	ug/L	0.02	0.275	3.8	18.8	25	18	0	0	0.668	0.663	0.0387	0.00912	0.62	0.738	100	0	0
Barium	ug/L	0.02	8.054	77	750	1000	18	0	0	9.22	8.89	0.59	0.139	8.72	10.2	100	0	0
Beryllium	ug/L	0.005	0.005	-	-	-	18	18	100	-	-	-	-	-	0.005	0	-	-
Boron	ug/L	5	6.52	23	1120	1500	18	0	0	7.18	7.2	0.292	0.0687	6.8	7.8	100	0	0
Cadmium	ug/L	0.005	0.005	0.05	0.03 | 0.0485	0.04 | 0.0647	18	18	100	-	-	-	-	-	0.005	0	0	0
Chromium	ug/L	0.1	0.103	1.1	3.75	5	18	18	100	-	-	-	-	-	0.1	0	0	0
Cobalt	ug/L	0.005	0.016	-	0.585	0.78	18	0	0	0.0289	0.0261	0.00612	0.00144	0.022	0.0426	100	-	0
Copper	ug/L	0.05	0.86	2	1500	2000	18	0	0	1.05	1.02	0.167	0.0393	0.881	1.37	100	0	0
Iron	ug/L	1	15.02	42	795	1060	18	0	0	25.4	20.4	10.2	2.4	16.1	46.1	100	6	0
Lead	ug/L	0.01	0.0222	0.15	3.75	5	18	5	28	0.0158	0.015	0.00708	0.00167	0.01	0.039	11	0	0
Lithium	ug/L	0.5	0.72	-	-	-	18	0	0	0.994	0.99	0.0653	0.0154	0.91	1.11	100	-	-
Manganese	ug/L	0.05	3.062	5.5	90	120	18	0	0	7.56	5.82	2.72	0.642	5.1	11.6	100	67	0
Mercury	ug/L	0.0005	0.0008	0.02	0.0195	0.026	18	8	44	0.000583	0.000525	0.000109	2.57E-05	0.0005	0.00082	6	0	0
Molybdenum	ug/L	0.05	0.107	5.2	54.8	73	18	0	0	0.136	0.132	0.016	0.00376	0.12	0.187	100	0	0
Nickel	ug/L	0.05	0.4412	2.7	18.8	25	18	0	0	0.772	0.742	0.0682	0.0161	0.687	0.907	100	0	0
Selenium	ug/L	0.04	0.049	0.16	0.75	1	18	4	22	0.0471	0.0455	0.00611	0.00144	0.04	0.057	39	0	0
Silver	ug/L	0.005	0.005	0.1	0.188	0.25	18	18	100	-	-	-	-	-	0.005	0	0	0
Strontium	ug/L	0.02	36.1	-	1880	2500	18	0	0	57.2	57.4	1.64	0.387	54.3	61.8	100	-	0
Thallium	ug/L	0.005	0.005	0.1	0.6	0.8	18	18	100	-	-	-	-	-	0.005	0	0	0
Tin	ug/L	0.02	0.0383	-	-	-	18	10	56	-	0.02	-	-	0.02	0.068	22	-	-
Titanium	ug/L	0.05	0.169	-	-	-	18	0	0	0.122	0.0935	0.0737	0.0174	0.079	0.381	17	-	-
Uranium	ug/L	0.001	0.0164	1.5	11.2	15	18	0	0	0.0246	0.0244	0.00239	0.000562	0.0217	0.0303	100	0	0
Vanadium	ug/L	0.05	0.05	-	90	120	18	18	100	-	-	-	-	-	0.05	0	-	0
Zinc	ug/L	0.5	1.698	6.7	-	-	18	7	39	0.977	0.585	1.19	0.28	0.5	5.62	6	0	-
Dissolved Metals																		
Aluminum	ug/L	1	-	-	-	-	18	0	0	1.74	1.8	0.357	0.0841	1.1	2.5	-	-	-
Antimony	ug/L	0.02	-	-	-	-	18	17	94	-	0.02	-	-	0.02	0.02	-	-	-
Arsenic	ug/L	0.02	-	-	-	-	18	0	0	0.63	0.644	0.0279	0.00657	0.579	0.666	-	-	-
Barium	ug/L	0.02	-	-	-	-	18	0	0	8.98	8.66	0.512	0.121	8.5	9.82	-	-	-
Beryllium	ug/L	0.005	-	-	-	-	18	18	100	-	-	-	-	-	0.005	-	-	-
Boron	ug/L	5	-	-	-	-	18	0	0	7.38	7.45	0.425	0.1	6.4	8.2	-	-	-
Cadmium	ug/L	0.005	-	-	-	-	18	18	100	-	-	-	-	-	0.005	-	-	-
Chromium	ug/L	0.1	-	-	-	-	18	18	100	-	-	-	-	-	0.1	-	-	-
Cobalt	ug/L	0.005	-	-	-	-	18	0	0	0.0173	0.0174	0.00263	0.00062	0.0132	0.0224	-	-	-
Copper	ug/L	0.05	0.8614	-	1.21 | 3.69	1.61 | 4.92	18	0	0	0.918	0.904	0.0741	0.0175	0.82	1.1	72	-	0
Iron	ug/L	1	-	-	-	-	18	0	0	8.41	8.25	3.21	0.757	4.4	13.1	-	-	-
Lead	ug/L	0.01	0.0125	-	3.73 | 5.8	4.98 | 7.74	18	18	100	-	-	-	-	-	0.01	0	-	0
Lithium	ug/L	0.5	-	-	-	-	18	0	0	0.998	1.03	0.0735	0.0173	0.84	1.13	-	-	-
Manganese	ug/L	0.05	1.196	-	158 | 248	210 | 330	18	0	0	1.34	0.486	1.27	0.298	0.324	3.15	39	-	0

Table C1-4. MEL-01 summary statistics for the 2024 open water sampling events.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-01 (Near-field Exposure Area) Open Water Sampling Events (July, August, September)											
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Mercury	ug/L	0.0005	-	-	-	-	18	11	61	-	5.00E-04	-	-	5.00E-04	0.00079	-	-	-
Molybdenum	ug/L	0.05	-	-	-	-	18	0	0	0.135	0.134	0.0129	0.00304	0.117	0.157	-	-	-
Nickel	ug/L	0.05	-	-	-	-	18	0	0	0.748	0.722	0.0473	0.0112	0.692	0.825	-	-	-
Selenium	ug/L	0.04	-	-	-	-	18	3	17	0.0483	0.048	0.0069	0.00163	0.04	0.068	-	-	-
Silver	ug/L	0.005	-	-	-	-	18	18	100	-	-	-	-	-	0.005	-	-	-
Strontium	ug/L	0.02	-	-	1880	2500	18	0	0	57.1	57.3	1.79	0.422	54.8	60.9	-	-	0
Thallium	ug/L	0.005	-	-	-	-	18	18	100	-	-	-	-	-	0.005	-	-	-
Tin	ug/L	0.02	-	-	-	-	18	15	83	-	0.02	-	-	0.02	0.027	-	-	-
Titanium	ug/L	0.05	-	-	-	-	18	15	83	-	0.05	-	-	0.05	0.177	-	-	-
Uranium	ug/L	0.001	-	-	-	-	18	0	0	0.0228	0.0221	0.0026	0.000612	0.02	0.0289	-	-	-
Vanadium	ug/L	0.05	-	-	-	-	18	18	100	-	-	-	-	-	0.05	-	-	-
Zinc	ug/L	0.5	1.902	-	5.16 | 10.6	6.87 | 14.2	18	10	56	-	0.5	-	-	0.5	2.79	11	-	0
Other																		
Cyanide (free)	mg/L	0.001	-	0.00035	-	-	18	18	100	-	-	-	-	-	0.001	-	100	-
Cyanide (Total)	mg/L	0.001	0.001	0.009	0.00375	0.005	18	18	100	-	-	-	-	-	0.001	0	0	0
Cyanide (WAD)	mg/L	0.001	-	-	-	-	18	18	100	-	-	-	-	-	0.001	-	-	-

Notes

[a] FEIS predictions for the edge of the mixing zone as presented in Agnico Eagle (2014).

[b] The AEMP Action Level is 75% of the AEMP Benchmark.

[c] The AEMP Benchmark is the lowest of the FWAL or HH DW guidelines except for fluoride, arsenic, and iron (AEMP Benchmark = site specific water quality objective).

Orange shaded values indicate parameters where at least 1 sample > Normal Range.

Table C1-5. MEL-02 summary statistics for the 2024 open water sampling events.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-02 (Mid-field Exposure Area) Open Water Sampling Events (July, August, September)											
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Field Measurements																		
Temperature	C	-	-	-	-	-	15	0	0	12.8	11.5	3.36	0.868	9.34	17.6	-	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	15	0	0	97.7	97.6	1.7	0.439	94.1	100	-	-	-
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9.0	6.5 | 9.0	15	0	0	7.56	7.58	0.101	0.0262	7.39	7.69	0	-	0
DO (mg/L)	mg/L	-	-	-	6.5	6.5	15	0	0	10.6	10.6	0.63	0.163	9.76	11.3	-	-	0
DO (%)	%	-	-	-	-	-	15	0	0	101	102	4.23	1.09	90.8	106	-	-	-
Conventional Parameters																		
Conductivity (lab)	uS/cm	1	77.5	-	-	-	15	0	0	100	100	1.52	0.392	98.2	104	100	-	-
Hardness	mg/L	0.5	23.37	-	-	-	15	0	0	29.7	29.4	0.793	0.205	28.6	31.8	100	-	-
pH (lab)	pH units	0.1	-	-	6.5 | 9.0	6.5 | 9.0	15	0	0	7.44	7.44	0.036	0.0093	7.39	7.54	-	-	0
Total Dissolved Solids	mg/L	10	54	68	375	500	15	0	0	51.7	51.8	5.5	1.42	41.4	60.3	40	0	0
Total Dissolved Solids (Calculated)	mg/L	1	39.61	68	375	500	15	0	0	65.2	65	0.985	0.254	63.8	67.6	100	0	0
Total Suspended Solids	mg/L	1	1	3.1	-	-	15	15	100	-	-	-	-	-	1	0	0	-
Turbidity (lab)	NTU	0.1	-	-	-	-	15	0	0	0.321	0.32	0.0557	0.0144	0.24	0.39	-	-	-
Major Ions																		
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	15	0	0	20.1	19.9	0.686	0.177	19.5	22	0	-	-
Alkalinity, Carbonate	mg/L	1	-	-	-	-	15	15	100	-	-	-	-	-	1	-	-	-
Alkalinity, Hydroxide	mg/L	1	-	-	-	-	15	15	100	-	-	-	-	-	1	-	-	-
Alkalinity, Total	mg/L	1	20.5	-	-	-	15	0	0	20.1	19.9	0.686	0.177	19.5	22	13	-	-
Bromide	mg/L	0.1	-	-	-	-	15	15	100	-	-	-	-	-	0.1	-	-	-
Calcium (D)	mg/L	0.01	-	-	-	-	15	0	0	9.25	9.18	0.217	0.056	8.95	9.82	-	-	-
Calcium (T)	mg/L	0.01	7.334	-	-	-	15	0	0	9.15	9.08	0.395	0.102	8.62	9.78	100	-	-
Chloride	mg/L	0.1	9.564	14	90	120	15	0	0	13.1	13	0.159	0.041	12.8	13.3	100	0	0
Fluoride	mg/L	0.02	0.028	0.0084	2.1	2.8	15	0	0	0.0303	0.03	0.00281	0.000727	0.025	0.034	67	100	0
Magnesium (D)	mg/L	0.004	-	-	-	-	15	0	0	1.59	1.59	0.0636	0.0164	1.52	1.76	-	-	-
Magnesium (T)	mg/L	0.004	1.18	-	-	-	15	0	0	1.54	1.51	0.0871	0.0225	1.44	1.7	100	-	-
Potassium (D)	mg/L	0.02	-	-	-	-	15	0	0	1.12	1.12	0.0215	0.00556	1.1	1.18	-	-	-
Potassium (T)	mg/L	0.02	0.954	-	-	-	15	0	0	1.1	1.09	0.0491	0.0127	1.03	1.19	100	-	-
Reactive Silica (SiO2)	mg/L	0.01	0.2684	-	-	-	15	0	0	0.41	0.416	0.0234	0.00605	0.377	0.44	100	-	-
Sodium (D)	mg/L	0.02	-	-	-	-	15	0	0	6.72	6.67	0.216	0.0557	6.49	7.29	-	-	-
Sodium (T)	mg/L	0.02	4.847	5.3	-	-	15	0	0	6.58	6.48	0.366	0.0946	6.08	7.22	100	100	-
Sulphate	mg/L	0.3	3.867	38	96 | 164	128 | 218	15	0	0	5.4	5.42	0.0965	0.0249	5.22	5.55	100	0	0
Nutrients																		
Ammonia (as N)	mg/L	0.005	0.01738	0.54	0.308 | 6.35	0.41 | 8.47	15	3	20	0.0151	0.0088	0.0179	0.00461	0.005	0.0726	20	0	0
Nitrate (as N)	mg/L	0.005	0.01798	0.25	2.17	2.9	15	11	73	-	0.005	-	-	0.005	0.022	7	0	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	15	11	73	-	0.0051	-	-	0.0051	0.022	-	-	-
Nitrite (as N)	mg/L	0.001	0.001	0.051	0.045	0.06	15	15	100	-	-	-	-	-	0.001	0	0	0
Nitrogen	mg/L	0.05	-	-	-	-	15	0	0	0.23	0.218	0.0393	0.0101	0.19	0.35	-	-	-
Orthophosphate (PO4-P)	mg/L	0.001	0.001	-	-	-	15	14	93	-	0.001	-	-	0.001	0.001	0	-	-
Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	15	0	0	0.00238	0.0024	0.000549	0.000142	0.0017	0.004	7	-	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	15	0	0	0.225	0.225	0.0341	0.0088	0.178	0.302	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.2497	-	-	-	15	0	0	0.227	0.217	0.0397	0.0103	0.19	0.35	13	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	15	0	0	0.222	0.225	0.0379	0.00979	0.163	0.302	-	-	-
Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	15	0	0	0.00459	0.0044	0.00053	0.000137	0.0039	0.0056	0	27	-

Table C1-5. MEL-02 summary statistics for the 2024 open water sampling events.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-02 (Mid-field Exposure Area) Open Water Sampling Events (July, August, September)											
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Organic/Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	15	0	0	3.98	3.92	0.384	0.0992	3.52	4.68	100	-	-
Total Organic Carbon	mg/L	0.5	3.00	-	-	-	15	0	0	3.92	4.01	0.355	0.0917	3.39	4.57	100	-	-
Total Metals																		
Aluminum	ug/L	1	5.316	9.1	203 | 515	271 | 687	15	0	0	2.77	2.8	0.863	0.223	1.7	4.2	0	0	0
Antimony	ug/L	0.02	0.02	0.51	4.5	6	15	15	100	-	-	-	-	-	0.02	0	0	0
Arsenic	ug/L	0.02	0.275	3.8	18.8	25	15	0	0	0.844	0.837	0.0294	0.00759	0.798	0.893	100	0	0
Barium	ug/L	0.02	8.054	77	750	1000	15	0	0	9.04	8.83	0.459	0.118	8.51	9.86	100	0	0
Beryllium	ug/L	0.005	0.005	-	-	-	15	15	100	-	-	-	-	-	0.005	0	-	-
Boron	ug/L	5	6.52	23	1120	1500	15	0	0	5.7	5.7	0.165	0.0425	5.4	5.9	0	0	0
Cadmium	ug/L	0.005	0.005	0.05	0.03 | 0.0485	0.04 | 0.0647	15	15	100	-	-	-	-	-	0.005	0	0	0
Chromium	ug/L	0.1	0.103	1.1	3.75	5	15	15	100	-	-	-	-	-	0.1	0	0	0
Cobalt	ug/L	0.005	0.016	-	0.585	0.78	15	0	0	0.0208	0.0196	0.00287	0.00074	0.0167	0.0269	100	-	0
Copper	ug/L	0.05	0.86	2	1500	2000	15	0	0	1	0.884	0.323	0.0833	0.796	2.07	60	7	0
Iron	ug/L	1	15.02	42	795	1060	15	0	0	19.7	16.6	6.13	1.58	12.2	29.2	87	0	0
Lead	ug/L	0.01	0.0222	0.15	3.75	5	15	1	7	0.0161	0.016	0.0054	0.0014	0.01	0.026	7	0	0
Lithium	ug/L	0.5	0.72	-	-	-	15	0	0	0.866	0.87	0.0445	0.0115	0.81	0.96	100	-	-
Manganese	ug/L	0.05	3.062	5.5	90	120	15	0	0	5.68	5.69	0.502	0.13	4.83	6.9	100	53	0
Mercury	ug/L	0.0005	0.0008	0.02	0.0195	0.026	15	13	87	-	0.0005	-	-	0.0005	0.0006	0	0	0
Molybdenum	ug/L	0.05	0.107	5.2	54.8	73	15	0	0	0.105	0.105	0.00327	0.000844	0.101	0.112	27	0	0
Nickel	ug/L	0.05	0.4412	2.7	18.8	25	15	0	0	0.631	0.596	0.076	0.0196	0.539	0.747	100	0	0
Selenium	ug/L	0.04	0.049	0.16	0.75	1	15	3	20	0.0469	0.047	0.00493	0.00127	0.04	0.054	40	0	0
Silver	ug/L	0.005	0.005	0.1	0.188	0.25	15	15	100	-	-	-	-	-	0.005	0	0	0
Strontium	ug/L	0.02	36.1	-	1880	2500	15	0	0	49.3	50.1	2.16	0.556	45.7	51.7	100	-	0
Thallium	ug/L	0.005	0.005	0.1	0.6	0.8	15	15	100	-	-	-	-	-	0.005	0	0	0
Tin	ug/L	0.02	0.0383	-	-	-	15	10	67	-	0.02	-	-	0.02	0.061	7	-	-
Titanium	ug/L	0.05	0.169	-	-	-	15	6	40	0.106	0.094	0.0551	0.0142	0.05	0.196	7	-	-
Uranium	ug/L	0.001	0.0164	1.5	11.2	15	15	0	0	0.0197	0.0194	0.00139	0.000358	0.017	0.0221	100	0	0
Vanadium	ug/L	0.05	0.05	-	90	120	15	15	100	-	-	-	-	-	0.05	0	-	0
Zinc	ug/L	0.5	1.698	6.7	-	-	15	13	87	-	0.5	-	-	0.5	0.68	0	0	-
Dissolved Metals																		
Aluminum	ug/L	1	-	-	-	-	15	6	40	1.15	1	0.409	0.105	1	2.6	-	-	-
Antimony	ug/L	0.02	-	-	-	-	15	15	100	-	-	-	-	-	0.02	-	-	-
Arsenic	ug/L	0.02	-	-	-	-	15	0	0	0.79	0.793	0.0418	0.0108	0.724	0.871	-	-	-
Barium	ug/L	0.02	-	-	-	-	15	0	0	8.84	8.62	0.43	0.111	8.44	9.49	-	-	-
Beryllium	ug/L	0.005	-	-	-	-	15	15	100	-	-	-	-	-	0.005	-	-	-
Boron	ug/L	5	-	-	-	-	15	0	0	5.71	5.7	0.11	0.0284	5.6	5.9	-	-	-
Cadmium	ug/L	0.005	-	-	-	-	15	15	100	-	-	-	-	-	0.005	-	-	-
Chromium	ug/L	0.1	-	-	-	-	15	15	100	-	-	-	-	-	0.1	-	-	-
Cobalt	ug/L	0.005	-	-	-	-	15	0	0	0.0104	0.0103	0.00102	0.000263	0.0092	0.0136	-	-	-
Copper	ug/L	0.05	0.8614	-	1.21 | 3.69	1.61 | 4.92	15	0	0	0.855	0.833	0.0573	0.0148	0.805	1.03	27	-	0
Iron	ug/L	1	-	-	-	-	15	0	0	5.95	7.1	1.94	0.502	2.9	8.1	-	-	-
Lead	ug/L	0.01	0.0125	-	3.73 | 5.8	4.98 | 7.74	15	14	93	-	0.01	-	-	0.01	0.015	7	-	0
Lithium	ug/L	0.5	-	-	-	-	15	0	0	0.853	0.86	0.0339	0.00877	0.8	0.9	-	-	-
Manganese	ug/L	0.05	1.196	-	158 | 248	210 | 330	15	0	0	0.476	0.508	0.163	0.0422	0.25	0.776	0	-	0

Table C1-5. MEL-02 summary statistics for the 2024 open water sampling events.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-02 (Mid-field Exposure Area) Open Water Sampling Events (July, August, September)											
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Mercury	ug/L	0.0005	-	-	-	-	15	13	87	-	5.00E-04	-	-	5.00E-04	0.00059	-	-	-
Molybdenum	ug/L	0.05	-	-	-	-	15	0	0	0.105	0.106	0.00593	0.00153	0.093	0.113	-	-	-
Nickel	ug/L	0.05	-	-	-	-	15	0	0	0.612	0.582	0.0577	0.0149	0.552	0.707	-	-	-
Selenium	ug/L	0.04	-	-	-	-	15	5	33	0.0433	0.041	0.00477	0.00123	0.04	0.056	-	-	-
Silver	ug/L	0.005	-	-	-	-	15	15	100	-	-	-	-	-	0.005	-	-	-
Strontium	ug/L	0.02	-	-	1880	2500	15	0	0	50	50.1	1.37	0.354	47.8	53	-	-	0
Thallium	ug/L	0.005	-	-	-	-	15	15	100	-	-	-	-	-	0.005	-	-	-
Tin	ug/L	0.02	-	-	-	-	15	12	80	-	0.02	-	-	0.02	0.03	-	-	-
Titanium	ug/L	0.05	-	-	-	-	15	13	87	-	0.05	-	-	0.05	0.103	-	-	-
Uranium	ug/L	0.001	-	-	-	-	15	0	0	0.0181	0.0183	0.00149	0.000385	0.0156	0.0219	-	-	-
Vanadium	ug/L	0.05	-	-	-	-	15	15	100	-	-	-	-	-	0.05	-	-	-
Zinc	ug/L	0.5	1.902	-	5.16 | 10.6	6.87 | 14.2	15	12	80	-	0.5	-	-	0.5	1.89	0	-	0
Other																		
Cyanide (free)	mg/L	0.001	-	0.00035	-	-	15	15	100	-	-	-	-	-	0.001	-	100	-
Cyanide (Total)	mg/L	0.001	0.001	0.009	0.00375	0.005	15	15	100	-	-	-	-	-	0.001	0	0	0
Cyanide (WAD)	mg/L	0.001	-	-	-	-	15	15	100	-	-	-	-	-	0.001	-	-	-

Notes

[a] FEIS predictions for the edge of the mixing zone as presented in Agnico Eagle (2014).

[b] The AEMP Action Level is 75% of the AEMP Benchmark.

[c] The AEMP Benchmark is the lowest of the FWAL or HH DW guidelines except for fluoride, arsenic, and iron (AEMP Benchmark = site specific water quality objective).

Orange shaded values indicate parameters where at least 1 sample > Normal Range.

Table C1-6. MEL-03 summary statistics for the 2024 open water sampling events.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-03 (Reference Area 1) Open Water Sampling Events (July, August, September)											
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Field Measurements																		
Temperature	C	-	-	-	-	-	15	0	0	12.2	10.3	3.84	0.993	8.56	18	-	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	15	0	0	87.2	87.4	2.31	0.596	83.7	89.5	-	-	-
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9.0	6.5 | 9.0	15	0	0	7.45	7.52	0.199	0.0514	7.03	7.66	7	-	0
DO (mg/L)	mg/L	-	-	-	6.5	6.5	15	0	0	10.6	10.6	0.422	0.109	9.82	11.4	-	-	0
DO (%)	%	-	-	-	-	-	15	0	0	101	99.1	8.5	2.2	92.8	115	-	-	-
Conventional Parameters																		
Conductivity (lab)	uS/cm	1	77.5	-	-	-	15	0	0	90.3	90.1	2.39	0.617	86.7	95.1	100	-	-
Hardness	mg/L	0.5	23.37	-	-	-	15	0	0	26.4	26.1	1.02	0.262	25	28.1	100	-	-
pH (lab)	pH units	0.1	-	-	6.5 | 9.0	6.5 | 9.0	15	0	0	7.46	7.47	0.0431	0.0111	7.4	7.53	-	-	0
Total Dissolved Solids	mg/L	10	54	68	375	500	15	0	0	44.8	44.3	4.1	1.06	35.4	52.3	0	0	0
Total Dissolved Solids (Calculated)	mg/L	1	39.61	68	375	500	15	0	0	58.7	58.6	1.55	0.399	56.4	61.8	100	0	0
Total Suspended Solids	mg/L	1	1	3.1	-	-	15	13	87	-	1	-	-	1	1.4	7	0	-
Turbidity (lab)	NTU	0.1	-	-	-	-	15	0	0	0.267	0.28	0.0476	0.0123	0.2	0.34	-	-	-
Major Ions																		
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	15	0	0	19.6	19.3	0.718	0.185	18.7	21.1	0	-	-
Alkalinity, Carbonate	mg/L	1	-	-	-	-	15	15	100	-	-	-	-	-	1	-	-	-
Alkalinity, Hydroxide	mg/L	1	-	-	-	-	15	15	100	-	-	-	-	-	1	-	-	-
Alkalinity, Total	mg/L	1	20.5	-	-	-	15	0	0	19.6	19.3	0.718	0.185	18.7	21.1	13	-	-
Bromide	mg/L	0.1	-	-	-	-	15	15	100	-	-	-	-	-	0.1	-	-	-
Calcium (D)	mg/L	0.01	-	-	-	-	15	0	0	8.31	8.21	0.3	0.0774	7.92	8.83	-	-	-
Calcium (T)	mg/L	0.01	7.334	-	-	-	15	0	0	8.37	8.47	0.409	0.106	7.63	8.95	100	-	-
Chloride	mg/L	0.1	9.564	14	90	120	15	0	0	11.5	11.5	0.606	0.156	10.5	12.4	100	0	0
Fluoride	mg/L	0.02	0.028	0.0084	2.1	2.8	15	0	0	0.0297	0.03	0.00349	0.000902	0.024	0.034	67	100	0
Magnesium (D)	mg/L	0.004	-	-	-	-	15	0	0	1.36	1.34	0.066	0.017	1.28	1.47	-	-	-
Magnesium (T)	mg/L	0.004	1.18	-	-	-	15	0	0	1.36	1.36	0.0652	0.0168	1.27	1.49	100	-	-
Potassium (D)	mg/L	0.02	-	-	-	-	15	0	0	1.03	1.02	0.0266	0.00687	0.995	1.08	-	-	-
Potassium (T)	mg/L	0.02	0.954	-	-	-	15	0	0	1.04	1.06	0.0504	0.013	0.944	1.12	93	-	-
Reactive Silica (SiO2)	mg/L	0.01	0.2684	-	-	-	15	0	0	0.347	0.345	0.0198	0.00511	0.297	0.377	100	-	-
Sodium (D)	mg/L	0.02	-	-	-	-	15	0	0	5.74	5.69	0.225	0.058	5.43	6.1	-	-	-
Sodium (T)	mg/L	0.02	4.847	5.3	-	-	15	0	0	5.74	5.79	0.271	0.0699	5.27	6.17	100	87	-
Sulphate	mg/L	0.3	3.867	38	96 | 164	128 | 218	15	0	0	4.44	4.6	0.277	0.0715	3.95	4.7	100	0	0
Nutrients																		
Ammonia (as N)	mg/L	0.005	0.01738	0.54	0.308 | 6.35	0.41 | 8.47	15	1	7	0.0293	0.0186	0.0277	0.00715	0.005	0.111	53	0	0
Nitrate (as N)	mg/L	0.005	0.01798	0.25	2.17	2.9	15	12	80	-	0.005	-	-	0.005	0.0346	13	0	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	15	12	80	-	0.0051	-	-	0.0051	0.0346	-	-	-
Nitrite (as N)	mg/L	0.001	0.001	0.051	0.045	0.06	15	15	100	-	-	-	-	-	0.001	0	0	0
Nitrogen	mg/L	0.05	-	-	-	-	15	0	0	0.23	0.222	0.0262	0.00677	0.197	0.283	-	-	-
Orthophosphate (PO4-P)	mg/L	0.001	0.001	-	-	-	15	14	93	-	0.001	-	-	0.001	0.001	0	-	-
Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	15	0	0	0.00181	0.0019	0.000342	8.83E-05	0.0012	0.0027	0	-	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	15	0	0	0.213	0.212	0.0211	0.00545	0.181	0.255	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.2497	-	-	-	15	0	0	0.225	0.217	0.0263	0.00679	0.197	0.283	20	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	15	0	0	0.209	0.211	0.0214	0.00552	0.172	0.255	-	-	-
Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	15	0	0	0.00415	0.0043	0.000641	0.000166	0.0033	0.0055	0	7	-

Table C1-6. MEL-03 summary statistics for the 2024 open water sampling events.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-03 (Reference Area 1) Open Water Sampling Events (July, August, September)											
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Organic/Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	15	0	0	3.49	3.49	0.245	0.0632	3.19	3.89	100	-	-
Total Organic Carbon	mg/L	0.5	3.00	-	-	-	15	0	0	3.27	3.28	0.314	0.0811	2.82	3.9	73	-	-
Total Metals**																		
Aluminum	ug/L	1	5.316	9.1	203 | 515	271 | 687	15	0	0	2.71	2.7	0.658	0.17	1.8	4.1	0	0	0
Antimony	ug/L	0.02	0.02	0.51	4.5	6	15	15	100	-	-	-	-	-	0.02	0	0	0
Arsenic	ug/L	0.02	0.275	3.8	18.8	25	15	0	0	0.464	0.462	0.0159	0.00411	0.442	0.509	100	0	0
Barium	ug/L	0.02	8.054	77	750	1000	15	0	0	8.63	8.56	0.289	0.0746	8.24	9.17	100	0	0
Beryllium	ug/L	0.005	0.005	-	-	-	15	15	100	-	-	-	-	-	0.005	0	-	-
Boron	ug/L	5	6.52	23	1120	1500	15	6	40	5.05	5	0.0915	0.0236	5	5.3	0	0	0
Cadmium	ug/L	0.005	0.005	0.05	0.03 | 0.0485	0.04 | 0.0647	15	15	100	-	-	-	-	-	0.005	0	0	0
Chromium	ug/L	0.1	0.103	1.1	3.75	5	15	15	100	-	-	-	-	-	0.1	0	0	0
Cobalt	ug/L	0.005	0.016	-	0.585	0.78	15	0	0	0.0161	0.016	0.00121	0.000313	0.014	0.0188	47	-	0
Copper	ug/L	0.05	0.86	2	1500	2000	15	0	0	1.01	0.892	0.355	0.0917	0.701	2.02	60	7	0
Iron	ug/L	1	15.02	42	795	1060	15	0	0	15	13.2	4.53	1.17	9.5	23.6	33	0	0
Lead	ug/L	0.01	0.0222	0.15	3.75	5	15	5	33	0.0146	0.015	0.00419	0.00108	0.01	0.024	7	0	0
Lithium	ug/L	0.5	0.72	-	-	-	15	0	0	0.819	0.81	0.0445	0.0115	0.77	0.9	100	-	-
Manganese	ug/L	0.05	3.062	5.5	90	120	15	0	0	4.06	3.96	0.342	0.0884	3.58	4.59	100	0	0
Mercury	ug/L	0.0005	0.0008	0.02	0.0195	0.026	15	14	93	-	0.0005	-	-	0.0005	0.00059	0	0	0
Molybdenum	ug/L	0.05	0.107	5.2	54.8	73	15	0	0	0.0942	0.093	0.00693	0.00179	0.088	0.118	7	0	0
Nickel	ug/L	0.05	0.4412	2.7	18.8	25	15	0	0	0.474	0.466	0.0387	0.00999	0.411	0.545	80	0	0
Selenium	ug/L	0.04	0.049	0.16	0.75	1	15	8	53	-	0.04	-	-	0.04	0.048	0	0	0
Silver	ug/L	0.005	0.005	0.1	0.188	0.25	15	15	100	-	-	-	-	-	0.005	0	0	0
Strontium	ug/L	0.02	36.1	-	1880	2500	15	0	0	43.2	43.9	2.43	0.626	39.4	45.6	100	-	0
Thallium	ug/L	0.005	0.005	0.1	0.6	0.8	15	15	100	-	-	-	-	-	0.005	0	0	0
Tin	ug/L	0.02	0.0383	-	-	-	15	8	53	-	0.02	-	-	0.02	0.057	13	-	-
Titanium	ug/L	0.05	0.169	-	-	-	15	1	7	0.108	0.112	0.0515	0.0133	0.05	0.226	13	-	-
Uranium	ug/L	0.001	0.0164	1.5	11.2	15	15	0	0	0.0177	0.0181	0.00117	0.000302	0.0156	0.0192	80	0	0
Vanadium	ug/L	0.05	0.05	-	90	120	15	15	100	-	-	-	-	-	0.05	0	-	0
Zinc	ug/L	0.5	1.698	6.7	-	-	15	12	80	-	0.5	-	-	0.5	1.46	0	0	-
Dissolved Metals**																		
Aluminum	ug/L	1	-	-	-	-	15	0	0	1.5	1.3	0.503	0.13	1	2.8	-	-	-
Antimony	ug/L	0.02	-	-	-	-	15	15	100	-	-	-	-	-	0.02	-	-	-
Arsenic	ug/L	0.02	-	-	-	-	15	0	0	0.45	0.45	0.013	0.00335	0.43	0.471	-	-	-
Barium	ug/L	0.02	-	-	-	-	15	0	0	8.53	8.5	0.233	0.0603	8.21	8.94	-	-	-
Beryllium	ug/L	0.005	-	-	-	-	15	15	100	-	-	-	-	-	0.005	-	-	-
Boron	ug/L	5	-	-	-	-	15	10	67	-	5	-	-	5	5.6	-	-	-
Cadmium	ug/L	0.005	-	-	-	-	15	15	100	-	-	-	-	-	0.005	-	-	-
Chromium	ug/L	0.1	-	-	-	-	15	15	100	-	-	-	-	-	0.1	-	-	-
Cobalt	ug/L	0.005	-	-	-	-	15	0	0	0.00801	0.0078	0.00122	0.000314	0.0067	0.0104	-	-	-
Copper	ug/L	0.05	0.8614	-	1.21 | 3.69	1.61 | 4.92	15	0	0	0.852	0.807	0.171	0.0442	0.714	1.44	27	-	0
Iron	ug/L	1	-	-	-	-	15	0	0	5.29	5.1	1.9	0.491	2.2	9.2	-	-	-
Lead	ug/L	0.01	0.0125	-	3.73 | 5.8	4.98 | 7.74	15	11	73	-	0.01	-	-	0.01	0.029	27	-	0
Lithium	ug/L	0.5	-	-	-	-	15	0	0	0.815	0.77	0.0998	0.0258	0.72	0.98	-	-	-
Manganese	ug/L	0.05	1.196	-	158 | 248	210 | 330	15	0	0	0.514	0.442	0.162	0.0419	0.301	0.764	0	-	0

Table C1-6. MEL-03 summary statistics for the 2024 open water sampling events.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-03 (Reference Area 1) Open Water Sampling Events (July, August, September)											
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Mercury	ug/L	0.0005	-	-	-	-	15	15	100	-	-	-	-	-	0.0005	-	-	-
Molybdenum	ug/L	0.05	-	-	-	-	15	0	0	0.0925	0.092	0.00393	0.00101	0.085	0.1	-	-	-
Nickel	ug/L	0.05	-	-	-	-	15	0	0	0.457	0.449	0.0272	0.00703	0.406	0.502	-	-	-
Selenium	ug/L	0.04	-	-	-	-	15	7	47	0.0432	0.041	0.00465	0.0012	0.04	0.056	-	-	-
Silver	ug/L	0.005	-	-	-	-	15	15	100	-	-	-	-	-	0.005	-	-	-
Strontium	ug/L	0.02	-	-	1880	2500	15	0	0	43.3	43.6	1.41	0.365	41.2	45.7	-	-	0
Thallium	ug/L	0.005	-	-	-	-	15	15	100	-	-	-	-	-	0.005	-	-	-
Tin	ug/L	0.02	-	-	-	-	15	8	53	-	0.02	-	-	0.02	0.062	-	-	-
Titanium	ug/L	0.05	-	-	-	-	15	13	87	-	0.05	-	-	0.05	0.105	-	-	-
Uranium	ug/L	0.001	-	-	-	-	15	0	0	0.0165	0.0167	0.00115	0.000298	0.0147	0.0189	-	-	-
Vanadium	ug/L	0.05	-	-	-	-	15	15	100	-	-	-	-	-	0.05	-	-	-
Zinc	ug/L	0.5	1.902	-	5.16 | 10.6	6.87 | 14.2	15	7	47	0.775	0.51	0.405	0.105	0.5	1.66	0	-	0
Other																		
Cyanide (free)	mg/L	0.001	-	0.00035	-	-	15	15	100	-	-	-	-	-	0.001	-	100	-
Cyanide (Total)	mg/L	0.001	0.001	0.009	0.00375	0.005	15	15	100	-	-	-	-	-	0.001	0	0	0
Cyanide (WAD)	mg/L	0.001	-	-	-	-	15	15	100	-	-	-	-	-	0.001	-	-	-

Notes

[a] FEIS predictions for the edge of the mixing zone as presented in Agnico Eagle (2014).

[b] The AEMP Action Level is 75% of the AEMP Benchmark.

[c] The AEMP Benchmark is the lowest of the FWAL or HH DW guidelines except for fluoride, arsenic, and iron (AEMP Benchmark = site specific water quality objective).

Orange shaded values indicate parameters where at least 1 sample > Normal Range.

Table C1-7. MEL-04 summary statistics for the August 2024 sampling event.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-04 Reference Area 2 Open Water Sampling Event (August)											
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Field Measurements																		
Temperature	C	-	-	-	-	-	5	0	0	14.3	14.3	0.113	0.0503	14.2	14.5	-	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	5	0	0	88.8	88.6	0.402	0.18	88.6	89.5	-	-	-
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9.0	6.5 | 9.0	5	0	0	7.46	7.45	0.0277	0.0124	7.42	7.49	0	-	0
DO (mg/L)	mg/L	-	-	-	6.5	6.5	5	0	0	9.57	9.52	0.152	0.0681	9.47	9.84	-	-	0
DO (%)	%	-	-	-	-	-	5	0	0	96.1	95.4	1.74	0.78	95	99.2	-	-	-
Conventional Parameters																		
Conductivity (lab)	uS/cm	1	77.5	-	-	-	5	0	0	91.5	91.5	1.15	0.512	89.6	92.5	100	-	-
Hardness	mg/L	0.5	23.37	-	-	-	5	0	0	24.2	24.4	0.482	0.215	23.4	24.6	100	-	-
pH (lab)	pH units	0.1	-	-	6.5 | 9.0	6.5 | 9.0	5	0	0	7.33	7.34	0.0472	0.0211	7.26	7.39	-	-	0
Total Dissolved Solids	mg/L	10	54	68	375	500	5	0	0	53.9	54.1	0.55	0.246	53.4	54.7	60	0	0
Total Dissolved Solids (Calculated)	mg/L	1	39.61	68	375	500	5	0	0	59.4	59.5	0.757	0.339	58.2	60.1	100	0	0
Total Suspended Solids	mg/L	1	1	3.1	-	-	5	3	60	-	1	-	-	1	2.9	20	0	-
Turbidity (lab)	NTU	0.1	-	-	-	-	5	0	0	0.204	0.21	0.0134	0.006	0.19	0.22	-	-	-
Major Ions																		
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	5	0	0	19.6	19.6	0.573	0.256	18.8	20.4	0	-	-
Alkalinity, Carbonate	mg/L	1	-	-	-	-	5	5	100	-	-	-	-	-	1	-	-	-
Alkalinity, Hydroxide	mg/L	1	-	-	-	-	5	5	100	-	-	-	-	-	1	-	-	-
Alkalinity, Total	mg/L	1	20.5	-	-	-	5	0	0	19.6	19.6	0.573	0.256	18.8	20.4	0	-	-
Bromide	mg/L	0.1	-	-	-	-	5	5	100	-	-	-	-	-	0.1	-	-	-
Calcium (D)	mg/L	0.01	-	-	-	-	5	0	0	7.6	7.67	0.161	0.072	7.32	7.71	-	-	-
Calcium (T)	mg/L	0.01	7.334	-	-	-	5	0	0	7.71	7.72	0.104	0.0466	7.58	7.87	100	-	-
Chloride	mg/L	0.1	9.564	14	90	120	5	0	0	11.3	11.3	0.0837	0.0374	11.2	11.4	100	0	0
Fluoride	mg/L	0.02	0.028	0.0084	2.1	2.8	5	0	0	0.0268	0.027	0.000837	0.000374	0.026	0.028	0	100	0
Magnesium (D)	mg/L	0.004	-	-	-	-	5	0	0	1.27	1.26	0.0217	0.0097	1.25	1.3	-	-	-
Magnesium (T)	mg/L	0.004	1.18	-	-	-	5	0	0	1.29	1.28	0.0179	0.008	1.28	1.32	100	-	-
Potassium (D)	mg/L	0.02	-	-	-	-	5	0	0	0.954	0.952	0.0134	0.00598	0.935	0.969	-	-	-
Potassium (T)	mg/L	0.02	0.954	-	-	-	5	0	0	0.999	0.992	0.0151	0.00677	0.984	1.02	100	-	-
Reactive Silica (SiO2)	mg/L	0.01	0.2684	-	-	-	5	0	0	0.372	0.37	0.00579	0.00259	0.366	0.381	100	-	-
Sodium (D)	mg/L	0.02	-	-	-	-	5	0	0	5.16	5.14	0.0804	0.036	5.09	5.29	-	-	-
Sodium (T)	mg/L	0.02	4.847	5.3	-	-	5	0	0	5.33	5.31	0.0796	0.0356	5.23	5.43	100	60	-
Sulphate	mg/L	0.3	3.867	38	96 | 164	128 | 218	5	0	0	4.3	4.3	0.00548	0.00245	4.3	4.31	100	0	0
Nutrients																		
Ammonia (as N)	mg/L	0.005	0.01738	0.54	0.308 | 6.35	0.41 | 8.47	5	0	0	0.0357	0.0306	0.0248	0.0111	0.0112	0.0747	80	0	0
Nitrate (as N)	mg/L	0.005	0.01798	0.25	2.17	2.9	5	5	100	-	-	-	-	-	0.005	0	0	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	5	5	100	-	-	-	-	-	0.0051	-	-	-
Nitrite (as N)	mg/L	0.001	0.001	0.051	0.045	0.06	5	5	100	-	-	-	-	-	0.001	0	0	0
Nitrogen	mg/L	0.05	-	-	-	-	5	0	0	0.233	0.224	0.0295	0.0132	0.202	0.281	-	-	-
Orthophosphate (PO4-P)	mg/L	0.001	0.001	-	-	-	5	5	100	-	-	-	-	-	0.001	0	-	-
Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	5	0	0	0.00204	0.002	0.00023	0.000103	0.0017	0.0023	0	-	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	5	0	0	0.251	0.208	0.0854	0.0382	0.201	0.402	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.2497	-	-	-	5	0	0	0.233	0.224	0.0295	0.0132	0.202	0.281	20	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	5	0	0	0.251	0.208	0.0854	0.0382	0.201	0.402	-	-	-
Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	5	0	0	0.00478	0.0049	0.00046	0.000206	0.0043	0.0053	0	40	-

Table C1-7. MEL-04 summary statistics for the August 2024 sampling event.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-04 Reference Area 2 Open Water Sampling Event (August)											
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Organic/Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	5	0	0	3.55	3.43	0.267	0.119	3.27	3.94	100	-	-
Total Organic Carbon	mg/L	0.5	3.00	-	-	-	5	0	0	3.1	3.05	0.118	0.0527	2.97	3.27	80	-	-
Total Metals																		
Aluminum	ug/L	1	5.316	9.1	203 | 515	271 | 687	4	0	0	2.7	2.2	1.15	0.574	2	4.4	0	0	0
Antimony	ug/L	0.02	0.02	0.51	4.5	6	5	5	100	-	-	-	-	-	0.02	0	0	0
Arsenic	ug/L	0.02	0.275	3.8	18.8	25	5	0	0	0.456	0.432	0.0592	0.0265	0.424	0.562	100	0	0
Barium	ug/L	0.02	8.054	77	750	1000	5	0	0	8.95	8.83	0.489	0.219	8.59	9.8	100	0	0
Beryllium	ug/L	0.005	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	0	-	-
Boron	ug/L	5	6.52	23	1120	1500	5	2	40	5.04	5	0.0894	0.04	5	5.2	0	0	0
Cadmium	ug/L	0.005	0.005	0.05	0.03 | 0.0485	0.04 | 0.0647	5	5	100	-	-	-	-	-	0.005	0	0	0
Chromium	ug/L	0.1	0.103	1.1	3.75	5	5	3	60	-	0.1	-	-	0.1	0.42	40	0	0
Cobalt	ug/L	0.005	0.016	-	0.585	0.78	4	0	0	0.016	0.0161	0.00133	0.000664	0.0144	0.0172	50	-	0
Copper	ug/L	0.05	0.86	2	1500	2000	4	0	0	0.887	0.783	0.237	0.118	0.74	1.24	25	0	0
Iron	ug/L	1	15.02	42	795	1060	4	0	0	14.8	13.7	4.01	2.01	11.3	20.3	25	0	0
Lead	ug/L	0.01	0.0222	0.15	3.75	5	4	1	25	0.015	0.0115	0.00812	0.00406	0.01	0.027	25	0	0
Lithium	ug/L	0.5	0.72	-	-	-	5	0	0	0.854	0.83	0.0336	0.015	0.83	0.9	100	-	-
Manganese	ug/L	0.05	3.062	5.5	90	120	5	0	0	6.34	4.62	4.01	1.79	4.34	13.5	100	20	0
Mercury	ug/L	0.0005	0.0008	0.02	0.0195	0.026	5	4	80	-	0.0005	-	-	0.0005	0.00098	20	0	0
Molybdenum	ug/L	0.05	0.107	5.2	54.8	73	5	0	0	0.106	0.09	0.0347	0.0155	0.088	0.168	20	0	0
Nickel	ug/L	0.05	0.4412	2.7	18.8	25	5	0	0	0.529	0.476	0.131	0.0586	0.449	0.762	100	0	0
Selenium	ug/L	0.04	0.049	0.16	0.75	1	5	4	80	-	0.04	-	-	0.04	0.04	0	0	0
Silver	ug/L	0.005	0.005	0.1	0.188	0.25	5	5	100	-	-	-	-	-	0.005	0	0	0
Strontium	ug/L	0.02	36.1	-	1880	2500	5	0	0	40.7	40.6	0.415	0.185	40.4	41.4	100	-	0
Thallium	ug/L	0.005	0.005	0.1	0.6	0.8	5	5	100	-	-	-	-	-	0.005	0	0	0
Tin	ug/L	0.02	0.0383	-	-	-	5	0	0	0.0346	0.026	0.0138	0.00617	0.025	0.057	40	-	-
Titanium	ug/L	0.05	0.169	-	-	-	4	0	0	0.118	0.089	0.0878	0.0439	0.051	0.243	25	-	-
Uranium	ug/L	0.001	0.0164	1.5	11.2	15	5	0	0	0.0206	0.0165	0.00935	0.00418	0.0157	0.0373	60	0	0
Vanadium	ug/L	0.05	0.05	-	90	120	5	4	80	-	0.05	-	-	0.05	0.193	20	-	0
Zinc	ug/L	0.5	1.698	6.7	-	-	5	4	80	-	0.5	-	-	0.5	0.54	0	0	-
Dissolved Metals																		
Aluminum	ug/L	1	-	-	-	-	5	5	100	-	-	-	-	-	1	-	-	-
Antimony	ug/L	0.02	-	-	-	-	5	5	100	-	-	-	-	-	0.02	-	-	-
Arsenic	ug/L	0.02	-	-	-	-	5	0	0	0.438	0.442	0.00889	0.00397	0.423	0.445	-	-	-
Barium	ug/L	0.02	-	-	-	-	5	0	0	8.67	8.66	0.0712	0.0318	8.57	8.77	-	-	-
Beryllium	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-
Boron	ug/L	5	-	-	-	-	5	4	80	-	5	-	-	5	5.1	-	-	-
Cadmium	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-
Chromium	ug/L	0.1	-	-	-	-	5	5	100	-	-	-	-	-	0.1	-	-	-
Cobalt	ug/L	0.005	-	-	-	-	5	0	0	0.0071	0.0072	0.000332	1.48E-04	0.0066	0.0075	-	-	-
Copper	ug/L	0.05	0.8614	-	1.21 | 3.69	1.61 | 4.92	5	0	0	0.721	0.727	0.013	0.00583	0.704	0.734	0	-	0
Iron	ug/L	1	-	-	-	-	5	0	0	3.02	3	0.0447	0.02	3	3.1	-	-	-
Lead	ug/L	0.01	0.0125	-	3.73 | 5.8	4.98 | 7.74	5	5	100	-	-	-	-	-	0.01	0	-	0
Lithium	ug/L	0.5	-	-	-	-	5	0	0	0.802	0.78	0.055	0.0246	0.77	0.9	-	-	-
Manganese	ug/L	0.05	1.196	-	158 | 248	210 | 330	5	0	0	0.442	0.414	0.141	0.0633	0.342	0.687	0	-	0

Table C1-7. MEL-04 summary statistics for the August 2024 sampling event.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-04 Reference Area 2 Open Water Sampling Event (August)											
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Mercury	ug/L	0.5	-	-	-	-	5	5	100	-	-	-	-	-	0.0005	-	-	-
Molybdenum	ug/L	0.05	-	-	-	-	5	0	0	0.0812	0.081	0.00228	0.00102	0.079	0.084	-	-	-
Nickel	ug/L	0.05	-	-	-	-	5	0	0	0.437	0.436	0.00581	0.0026	0.43	0.443	-	-	-
Selenium	ug/L	0.04	-	-	-	-	5	5	100	-	-	-	-	-	0.04	-	-	-
Silver	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-
Strontium	ug/L	0.02	-	-	1880	2500	5	0	0	39.6	39.6	0.217	0.097	39.3	39.9	-	-	0
Thallium	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-
Tin	ug/L	0.02	-	-	-	-	5	2	40	0.028	0.02	0.012	0.00538	0.02	0.047	-	-	-
Titanium	ug/L	0.05	-	-	-	-	5	5	100	-	-	-	-	-	0.05	-	-	-
Uranium	ug/L	0.001	-	-	-	-	5	0	0	0.0159	0.0155	0.000931	0.000416	0.0152	0.0175	-	-	-
Vanadium	ug/L	0.05	-	-	-	-	5	5	100	-	-	-	-	-	0.05	-	-	-
Zinc	ug/L	0.5	1.902	-	5.16 | 10.6	6.87 | 14.2	5	5	100	-	-	-	-	-	0.5	0	-	0
Other																		
Cyanide (free)	mg/L	0.001	-	0.00035	-	-	5	5	100	-	-	-	-	-	0.001	-	100	-
Cyanide (Total)	mg/L	0.001	0.001	0.009	0.00375	0.005	5	5	100	-	-	-	-	-	0.001	0	0	0
Cyanide (WAD)	mg/L	0.001	-	-	-	-	5	5	100	-	-	-	-	-	0.001	-	-	-

Notes

[a] FEIS predictions for the edge of the mixing zone as presented in Agnico Eagle (2014).

[b] The AEMP Action Level is 75% of the AEMP Benchmark.

[c] The AEMP Benchmark is the lowest of the FWAL or HH DW guidelines except for fluoride, arsenic, and iron (AEMP Benchmark = site specific water quality objective).

Orange shaded values indicate parameters where at least 1 sample > Normal Range.

Table C1-8. MEL-05 summary statistics for the August 2024 sampling event.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-05 Reference Area 3 Open Water Sampling Event (August)										
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Field Measurements																		
Temperature	C	-	-	-	-	-	5	0	0	16.5	16.6	0.307	0.137	16	16.8	-	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	5	0	0	90	90.1	0.0894	0.04	89.9	90.1	-	-	-
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9.0	6.5 | 9.0	5	0	0	7.53	7.54	0.0422	0.0189	7.47	7.58	0	-	0
DO (mg/L)	mg/L	-	-	-	6.5	6.5	5	0	0	9.78	9.76	0.054	0.0242	9.72	9.86	-	-	0
DO (%)	%	-	-	-	-	-	5	0	0	103	103	0.0837	0.0374	103	103	-	-	-
Conventional Parameters																		
Conductivity (lab)	uS/cm	1	77.5	-	-	-	5	0	0	92.1	91.6	0.968	0.433	91.4	93.7	100	-	-
Hardness	mg/L	0.5	23.37	-	-	-	5	0	0	27.8	27.8	0.406	0.182	27.3	28.4	100	-	-
pH (lab)	pH units	0.1	-	-	6.5 | 9.0	6.5 | 9.0	5	0	0	7.51	7.5	0.0249	0.0111	7.49	7.55	-	-	0
Total Dissolved Solids	mg/L	10	54	68	375	500	5	0	0	52.7	52.3	2.2	0.984	50.3	56.3	20	0	0
Total Dissolved Solids (Calculated)	mg/L	1	39.61	68	375	500	5	0	0	59.9	59.5	0.634	0.284	59.4	60.9	100	0	0
Total Suspended Solids	mg/L	1	1	3.1	-	-	5	5	100	-	-	-	-	-	1	0	0	-
Turbidity (lab)	NTU	0.1	-	-	-	-	5	0	0	0.22	0.22	0.01	0.00447	0.21	0.23	-	-	-
Major Ions																		
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	5	0	0	20.7	20.5	0.611	0.273	20.1	21.6	0	-	-
Alkalinity, Carbonate	mg/L	1	-	-	-	-	5	5	100	-	-	-	-	-	1	-	-	-
Alkalinity, Hydroxide	mg/L	1	-	-	-	-	5	5	100	-	-	-	-	-	1	-	-	-
Alkalinity, Total	mg/L	1	20.5	-	-	-	5	0	0	20.7	20.5	0.611	0.273	20.1	21.6	40	-	-
Bromide	mg/L	0.1	-	-	-	-	5	5	100	-	-	-	-	-	0.1	-	-	-
Calcium (D)	mg/L	0.01	-	-	-	-	5	0	0	8.85	8.85	0.139	0.062	8.66	9.05	-	-	-
Calcium (T)	mg/L	0.01	7.334	-	-	-	5	0	0	8.77	8.85	0.26	0.116	8.39	9.05	100	-	-
Chloride	mg/L	0.1	9.564	14	90	120	5	0	0	11.5	11.5	0.0447	0.02	11.4	11.5	100	0	0
Fluoride	mg/L	0.02	0.028	0.0084	2.1	2.8	5	0	0	0.0326	0.033	0.00114	0.00051	0.031	0.034	100	100	0
Magnesium (D)	mg/L	0.004	-	-	-	-	5	0	0	1.38	1.38	0.0212	0.00949	1.35	1.4	-	-	-
Magnesium (T)	mg/L	0.004	1.18	-	-	-	5	0	0	1.38	1.4	0.0378	0.0169	1.33	1.41	100	-	-
Potassium (D)	mg/L	0.02	-	-	-	-	5	0	0	1.07	1.08	0.0141	0.00632	1.05	1.08	-	-	-
Potassium (T)	mg/L	0.02	0.954	-	-	-	5	0	0	1.05	1.05	0.0114	0.0051	1.04	1.07	100	-	-
Reactive Silica (SiO2)	mg/L	0.01	0.2684	-	-	-	5	0	0	0.359	0.358	0.00402	1.80E-03	0.355	0.363	100	-	-
Sodium (D)	mg/L	0.02	-	-	-	-	5	0	0	5.79	5.8	0.0623	0.0279	5.72	5.88	-	-	-
Sodium (T)	mg/L	0.02	4.847	5.3	-	-	5	0	0	5.78	5.8	0.198	0.0884	5.46	5.97	100	100	-
Sulphate	mg/L	0.3	3.867	38	96 | 164	128 | 218	5	0	0	4.52	4.53	0.0152	0.00678	4.5	4.54	100	0	0
Nutrients																		
Ammonia (as N)	mg/L	0.005	0.01738	0.54	0.308 | 6.35	0.41 | 8.47	5	2	40	0.0275	0.0058	0.0462	0.0207	0.005	0.11	20	0	0
Nitrate (as N)	mg/L	0.005	0.01798	0.25	2.17	2.9	5	5	100	-	-	-	-	-	0.005	0	0	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	5	5	100	-	-	-	-	-	0.0051	-	-	-
Nitrite (as N)	mg/L	0.001	0.001	0.051	0.045	0.06	5	5	100	-	-	-	-	-	0.001	0	0	0
Nitrogen	mg/L	0.05	-	-	-	-	5	0	0	0.266	0.235	0.0711	0.0318	0.219	0.389	-	-	-
Orthophosphate (PO4-P)	mg/L	0.001	0.001	-	-	-	5	2	40	0.0011	0.0011	0.000122	5.48E-05	0.001	0.0013	60	-	-
Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	5	0	0	0.00286	0.0022	0.00148	0.000663	0.002	0.0055	20	-	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	5	0	0	0.274	0.249	0.0647	0.0289	0.23	0.388	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.2497	-	-	-	5	0	0	0.266	0.235	0.0711	0.0318	0.219	0.389	40	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	5	0	0	0.274	0.249	0.0647	0.0289	0.23	0.388	-	-	-
Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	5	0	0	0.004	0.004	0.000122	5.48E-05	0.0038	0.0041	0	0	-

Table C1-8. MEL-05 summary statistics for the August 2024 sampling event.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-05 Reference Area 3 Open Water Sampling Event (August)										
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Organic/Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	5	0	0	3.55	3.69	0.333	0.149	3.08	3.93	100	-	-
Total Organic Carbon	mg/L	0.5	3.00	-	-	-	5	0	0	3.05	3.09	0.135	0.0603	2.9	3.18	60	-	-
Total Metals																		
Aluminum	ug/L	1	5.316	9.1	203 | 515	271 | 687	5	0	0	1.88	1.9	0.277	0.124	1.6	2.2	0	0	0
Antimony	ug/L	0.02	0.02	0.51	4.5	6	5	5	100	-	-	-	-	-	0.02	0	0	0
Arsenic	ug/L	0.02	0.275	3.8	18.8	25	5	0	0	0.475	0.472	0.0108	0.00483	0.463	0.492	100	0	0
Barium	ug/L	0.02	8.054	77	750	1000	5	0	0	8.74	8.78	0.0635	0.0284	8.67	8.8	100	0	0
Beryllium	ug/L	0.005	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	0	-	-
Boron	ug/L	5	6.52	23	1120	1500	5	0	0	5.24	5.2	0.0548	0.0245	5.2	5.3	0	0	0
Cadmium	ug/L	0.005	0.005	0.05	0.03 | 0.0485	0.04 | 0.0647	5	5	100	-	-	-	-	-	0.005	0	0	0
Chromium	ug/L	0.1	0.103	1.1	3.75	5	5	5	100	-	-	-	-	-	0.1	0	0	0
Cobalt	ug/L	0.005	0.016	-	0.585	0.78	5	0	0	0.0169	0.0171	0.000887	3.97E-04	0.0155	0.0178	80	-	0
Copper	ug/L	0.05	0.86	2	1500	2000	5	0	0	0.782	0.778	0.0244	0.0109	0.752	0.817	0	0	0
Iron	ug/L	1	15.02	42	795	1060	5	0	0	12	11.5	1.41	0.632	11.1	14.5	0	0	0
Lead	ug/L	0.01	0.0222	0.15	3.75	5	5	5	100	-	-	-	-	-	0.01	0	0	0
Lithium	ug/L	0.5	0.72	-	-	-	5	0	0	0.844	0.84	0.0207	0.00927	0.82	0.87	100	-	-
Manganese	ug/L	0.05	3.062	5.5	90	120	5	0	0	5.94	5.8	0.442	0.198	5.62	6.71	100	100	0
Mercury	ug/L	0.0005	0.0008	0.02	0.0195	0.026	5	5	100	-	-	-	-	-	0.0005	0	0	0
Molybdenum	ug/L	0.05	0.107	5.2	54.8	73	5	0	0	0.1	0.099	0.00421	0.00188	0.096	0.106	0	0	0
Nickel	ug/L	0.05	0.4412	2.7	18.8	25	5	0	0	0.452	0.454	0.00378	0.00169	0.447	0.456	100	0	0
Selenium	ug/L	0.04	0.049	0.16	0.75	1	5	5	100	-	-	-	-	-	0.04	0	0	0
Silver	ug/L	0.005	0.005	0.1	0.188	0.25	5	5	100	-	-	-	-	-	0.005	0	0	0
Strontium	ug/L	0.02	36.1	-	1880	2500	5	0	0	45.3	45.2	0.915	0.409	44.3	46.6	100	-	0
Thallium	ug/L	0.005	0.005	0.1	0.6	0.8	5	5	100	-	-	-	-	-	0.005	0	0	0
Tin	ug/L	0.02	0.0383	-	-	-	5	2	40	0.0266	0.021	0.0136	0.0061	0.02	0.051	20	-	-
Titanium	ug/L	0.05	0.169	-	-	-	5	4	80	-	0.05	-	-	0.05	0.093	0	-	-
Uranium	ug/L	0.001	0.0164	1.5	11.2	15	5	0	0	0.0168	0.0167	0.000716	0.00032	0.016	0.0178	60	0	0
Vanadium	ug/L	0.05	0.05	-	90	120	5	5	100	-	-	-	-	-	0.05	0	-	0
Zinc	ug/L	0.5	1.698	6.7	-	-	5	5	100	-	-	-	-	-	0.5	0	0	-
Dissolved Metals																		
Aluminum	ug/L	1	-	-	-	-	5	0	0	1.22	1.2	0.0837	0.0374	1.1	1.3	-	-	-
Antimony	ug/L	0.02	-	-	-	-	5	5	100	-	-	-	-	-	0.02	-	-	-
Arsenic	ug/L	0.02	-	-	-	-	5	0	0	0.474	0.474	0.00635	0.00284	0.466	0.483	-	-	-
Barium	ug/L	0.02	-	-	-	-	5	0	0	8.5	8.48	0.0723	0.0323	8.44	8.62	-	-	-
Beryllium	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-
Boron	ug/L	5	-	-	-	-	5	0	0	5.2	5.2	0.0707	0.0316	5.1	5.3	-	-	-
Cadmium	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-
Chromium	ug/L	0.1	-	-	-	-	5	5	100	-	-	-	-	-	0.1	-	-	-
Cobalt	ug/L	0.005	-	-	-	-	5	0	0	0.0075	0.0072	0.000539	0.000241	0.007	0.0083	-	-	-
Copper	ug/L	0.05	0.8614	-	1.21 | 3.69	1.61 | 4.92	5	0	0	0.769	0.77	0.0106	0.00472	0.753	0.782	0	-	0
Iron	ug/L	1	-	-	-	-	5	0	0	4.1	4	0.141	0.0632	4	4.3	-	-	-
Lead	ug/L	0.01	0.0125	-	3.73 | 5.8	4.98 | 7.74	5	5	100	-	-	-	-	-	0.01	0	-	0
Lithium	ug/L	0.5	-	-	-	-	5	0	0	0.796	0.8	0.0114	0.0051	0.78	0.81	-	-	-
Manganese	ug/L	0.05	1.196	-	158 | 248	210 | 330	5	0	0	0.372	0.373	0.0191	0.00854	0.347	0.392	0	-	0

Table C1-8. MEL-05 summary statistics for the August 2024 sampling event.

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	MEL-05 Reference Area 3 Open Water Sampling Event (August)											
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Mercury	ug/L	0.0005	-	-	-	-	5	4	80	-	0.0005	-	-	0.0005	0.00075	-	-	-
Molybdenum	ug/L	0.05	-	-	-	-	5	0	0	0.103	0.104	0.00434	0.00194	0.099	0.11	-	-	-
Nickel	ug/L	0.05	-	-	-	-	5	0	0	0.432	0.431	0.00808	0.00361	0.421	0.442	-	-	-
Selenium	ug/L	0.04	-	-	-	-	5	2	40	0.0422	0.041	0.00268	0.0012	0.04	0.046	-	-	-
Silver	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-
Strontium	ug/L	0.02	-	-	1880	2500	5	0	0	45.3	45.4	0.529	0.237	44.6	46	-	-	0
Thallium	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-
Tin	ug/L	0.02	-	-	-	-	5	0	0	0.0472	0.025	0.0503	0.0225	0.021	0.137	-	-	-
Titanium	ug/L	0.05	-	-	-	-	5	5	100	-	-	-	-	-	0.05	-	-	-
Uranium	ug/L	0.001	-	-	-	-	5	0	0	0.0172	0.0172	0.00037	0.000166	0.0167	0.0177	-	-	-
Vanadium	ug/L	0.05	-	-	-	-	5	5	100	-	-	-	-	-	0.05	-	-	-
Zinc	ug/L	0.5	1.902	-	5.16 | 10.6	6.87 | 14.2	5	4	80	-	0.5	-	-	0.5	0.85	0	-	0
Other																		
Cyanide (free)	mg/L	0.001	-	0.00035	-	-	5	5	100	-	-	-	-	-	0.001	-	100	-
Cyanide (Total)	mg/L	0.001	0.001	0.009	0.00375	0.005	5	5	100	-	-	-	-	-	0.001	0	0	0
Cyanide (WAD)	mg/L	0.001	-	-	-	-	5	5	100	-	-	-	-	-	0.001	-	-	-

Notes

[a] FEIS predictions for the edge of the mixing zone as presented in Agnico Eagle (2014).

[b] The AEMP Action Level is 75% of the AEMP Benchmark.

[c] The AEMP Benchmark is the lowest of the FWAL or HH DW guidelines except for fluoride, arsenic, and iron (AEMP Benchmark = site specific water quality objective).

Orange shaded values indicate parameters where at least 1 sample > Normal Range.

	Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	FWAL[b] (min | max)	HH DW[c]	SSWQO[d]	AEMP Action Level[e] (min | max)	AEMP Benchmark[f] (min | max)	March											July			
											MEL-01						MEL-02						MEL-01			
											MEL-01-01	MEL-01-06	MEL-01-07	MEL-01-08	MEL-01-09	MEL-01-10	MEL-02-02	MEL-02-03	MEL-02-05	MEL-02-06	MEL-02-08		MEL-01-01	MEL-01-06	MEL-01-07	MEL-01-08
											03-29	03-29	03-29	03-29	03-29	03-29	03-30	03-30	03-30	03-30	03-30		07-05	07-05	07-05	07-05
Field Measurements	Temperature	C	-	-	-	-	-	-	-	-	1.63	1.55	1.63	1.48	1.67	1.67	1.37	1.56	1.56	1.35	1.54		8.9	9.1	9.6	9.4
	Sp. Conductivity (field)	uS/cm	-	-	-	-	-	-	-	-	142.4	143.3	145.6	150.1	146.2	143.8	108.9	107.9	109.5	107.3	108.6		114.4	112.7	113.5	112.6
	pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.16	8.22	7.25	7.68	7.08	7.43	7.24	7.52	7.51	7.27	7.9		7.08	7.28	7.33	7.35
	DO (mg/L)	mg/L	-	-	-	-	-	-	6.5	6.5	13.84	13.77	13.43	13.74	13.88	13.34	14	13.09	13.34	14.47	13.06		12.25	12.34	12.22	12.03
	DO (%)	%	-	-	-	-	-	-	-	-	100.7	100.6	98	100	101.4	95.3	101.8	95.3	97.9	105.2	95.8		107.6	106.6	108.5	105.2
	Chlorophyll-a (field)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-
Conventional Parameters	Conductivity (lab)	uS/cm	1	77.5	-	-	-	-	-	-	156	165	156	155	157	162	124	124	121	123	126		118	116	122	117
	Hardness	mg/L	0.5	23.37	-	-	-	-	-	-	42	44.7	41.9	42.2	43	44.1	33.2	35.5	34	34.5	35.2		32.2	32.1	33.7	32.4
	pH (lab)	pH units	0.1	-	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.2	7.26	7.21	7.21	7.25	7.24	7.32	7.22	7.23	7.22	7.09		7.32	7.27	7.32	7.31
	Total Dissolved Solids	mg/L	10	54	68	500	-	1000	375	500	78.7	87.3	84.7	73	81	58.7	57.3	60	44.3	46	65.7		66.6	63.2	62.2	48.9
	Total Dissolved Solids (Calculated)	mg/L	1	39.61	68	500	-	1000	375	500	101	107	101	101	102	105	80.6	80.6	78.6	80	81.9		76.7	75.4	79.3	76
	Total Suspended Solids	mg/L	1	1	3.1	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*		1.2	1.2	1.6	1.1
	Turbidity (lab)	NTU	0.1	-	-	-	-	-	-	-	0.12	0.12	0.34	0.31	0.22	0.16	0.25	*<0.1*	0.1	0.14	0.36		0.43	0.41	0.59	0.4
Major Ions	Acidity, Total	mg/L	2	-	-	-	-	-	-	-	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*		2	2.1	2	2.2
	Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	-	-	-	28	29.2	27.7	27.7	28.5	29.2	26.7	25.1	25.1	25	25.7		20.4	19.9	20.5	20.2
	Alkalinity, Carbonate	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*		*<1*	*<1*	*<1*	*<1*
	Alkalinity, Hydroxide	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*		*<1*	*<1*	*<1*	*<1*
	Alkalinity, Phenolphthalein	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*		*<1*	*<1*	*<1*	*<1*
	Alkalinity, Total	mg/L	1	20.5	-	-	-	-	-	-	28	29.2	27.7	27.7	28.5	29.2	26.7	25.1	25.1	25	25.7		20.4	19.9	20.5	20.2
	Bromide	mg/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*		*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Calcium (D)	mg/L	0.01	-	-	-	-	-	-	-	12.8	13.6	12.7	13	13.2	13.4	10.3	11	10.6	10.8	11		9.89	9.84	10.3	9.95
	Calcium (T)	mg/L	0.01	7.334	-	-	-	-	-	-	13.1	14	12.9	12.9	13	13.7	11.2	11.3	11.2	11.4	11.1		9.75	9.41	10.2	9.87
	Chloride	mg/L	0.1	9.564	14	120	-	-	90	120	22.1	23.8	22.4	22.2	22.6	23.6	15.7	16.2	15.7	15.9	16.3		16.9	16.8	17.7	16.7
	Fluoride	mg/L	0.02	0.028	0.0084	0.12	1.5	2.8	2.1	2.8	0.037	0.039	0.036	0.035	0.036	0.038	0.032	0.034	0.034	0.033	0.032		0.027	0.027	0.026	0.027
	Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	-	2.43	2.6	2.48	2.37	2.44	2.59	1.82	1.96	1.83	1.84	1.87		1.83	1.83	1.94	1.83
	Magnesium (T)	mg/L	0.004	1.18	-	-	-	-	-	-	2.49	2.66	2.48	2.4	2.51	2.58	1.92	2	1.95	1.98	1.91		1.85	1.74	1.9	1.82
	Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-	1.5	1.69	1.52	1.56	1.56	1.6	1.22	1.32	1.27	1.27	1.29		1.17	1.16	1.22	1.17
	Potassium (T)	mg/L	0.02	0.954	-	-	-	-	-	-	1.52	1.72	1.52	1.54	1.54	1.64	1.31	1.36	1.32	1.36	1.33		1.2	1.16	1.28	1.2
	Reactive Silica (SiO2)	mg/L	0.01	0.2684	-	-	-	-	-	-	0.805	0.792	0.79	0.794	0.834	0.804	0.563	0.535	0.524	0.534	0.979		0.655	0.651	0.652	0.65
	Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-	10.9	11.7	11	10.7	10.9	11.5	7.52	8.19	7.84	7.7	7.97		7.97	8.01	8.51	7.86
	Sodium (T)	mg/L	0.02	4.847	5.3	-	-	-	-	-	10.9	11.7	11	10.7	11	11.4	8.02	8.32	8.02	8.22	8.04		8.12	7.72	8.72	8.08
	Sulphate	mg/L	0.3	3.867	38	128 | 218	-	-	96 | 164	128 | 218	8.95	9.61	9.01	9.27	9.16	9.42	6.19	6.35	6.21	6.24	6.27		6.94	6.89	7.3	6.83
Nutrients and Organic Carbon	Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.41 | 8.47	-	-	0.308 | 6.35	0.41 | 8.47	0.0442	0.0489	0.0236	0.0329	0.0561	0.0256	0.0438	0.0376	0.0362	0.0379	0.0696		0.0056	*<0.005*	*<0.005*	*<0.005*
	Nitrate (as N)	mg/L	0.005	0.0180	0.25	2.9	10	-	2.17	2.9	0.0279	0.0258	0.0316	0.0299	0.0314	0.023	0.0203	0.0083	0.0099	0.0118	0.0564		*<0.005*	*<0.005*	0.0117	*<0.005*
	Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	-	0.0279	0.0258	0.0316	0.0299	0.0314	0.023	0.0203	0.0083	0.0099	0.0118	0.0564		*<0.0051*	*<0.0051*	0.0117	*<0.0051*
	Nitrite (as N)	mg/L	0.001	0.001	0.051	0.06	1	-	0.045	0.06	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*		*<0.001*	*<0.001*	*<0.001*	*<0.001*
	Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.378	0.353	0.326	0.321	0.337	0.331	0.276	0.26	0.254	0.249	0.31		0.333	0.296	0.322	0.317
	Orthophosphate (PO4-P)	mg/L	0.001	0.001	-	-	-	-	-	-	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*		*<0.001*	*<0.001*	*<0.001*	*<0.001*
	Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	-	-	-	0.003	0.0033	0.0028	0.0057	0.0025	0.0029	0.0024	0.0021	0.0024	0.0024	0.0034		0.0024	0.0027	0.0026	0.0032
	Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.33	0.349	0.336	0.333	0.342	0.334	0.335	0.285	0.254	0.282	0.313		0.246	0.248	0.262	0.243
	Total Kjeldahl Nitrogen	mg/L	0.05	0.2497	-	-	-	-	-	-	0.35	0.327	0.294	0.291	0.306	0.308	0.256	0.252	0.244	0.237	0.254		0.333	0.296	0.31	0.317
	Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-	0.302	0.323	0.303	0.303	0.311	0.311	0.315	0.277	0.244	0.27	0.257		0.246	0.248	0.25	0.243
	Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	-	-	-	0.0056	0.0058	0.0052	0.0051	0.005	0.0066	0.0042	0.0043	0.0036	0.0038	0.006		0.0072	0.0065	0.0066	0.006
	Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	-	-	-	4.28	4.84	4.55	4.64	4.77	4.81	3.86	3.77	3.57	3.61	3.49		5.41	5.23	4.9	5.19
	Total Organic Carbon	mg/L	0.5	3	-	-	-	-	-	-	4.91	5.34	5.15	5.12	5.15	5.24	3.71	4.04	4	3.95	4.2		4.58	4.25	4.52	4.3
Total Metals	Aluminum	ug/L	1	5.316	9.1	271 | 687	-	-	203 | 515	271 | 687	*<1*	2	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*		4.7	3.7	3.4	5.9	3.4
	Antimony	ug/L	0.02	0.02	0.51	-	6	-	4.5	6	*<0.02*	0.021	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*		*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Arsenic	ug/L	0.02	0.275	3.8	5	10	25	18.8	25	0.596	0.646	0.637	0.619	0.606	0.64	0.596	0.597	0.565	0.59	0.82		0.634	0.62	0.686	0.638
	Barium	ug/L	0.02	8.054	77	-	1000	-	750	1000	12.3	12.5	12.2	12.5	12.6	12.7	11	11.2	11.1	11	13.2		10	9.89	10.1	9.96
	Beryllium	ug/L	0.005	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*		*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Bismuth	ug/L	0.005	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*		*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Boron	ug/L	5	6.52	23	1500	5000	-	1120	1500	9.6	10.8	10	9.7	9.8	10.3	7.1	7.1	7	7.2	6.8		7.2	7	7.2	6.8
	Cadmium	ug/L	0.005	0.005	0.05	0.04 | 0.0647	5	-	0.03 | 0.0485	0.04 | 0.0647	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*		*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.0082	0.0092	0.0083	0.0082	0.0089	0.0089	0.0091	0.0096	0.0094	0.0098	0.0103		0.0096	0.0088	0.0075	0.0071
	Chromium	ug/L	0.1	0.10	1.1	5	50	-	3.75	5	*<0.1*	0.19	*<0.1*	*<0.1*	0.11	0.31	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*		*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Cobalt	ug/L	0.005	0.016	-	0.78	-	-	0.585	0.78	0.0262	0.0487	0.0302	0.0254	0.0265	0.0316	0.0155	0.0182	0.0166	0.0195	0.0349		0.0349	0.0338	0.0426	0.0338
	Copper	ug/L	0.05	0.86	2	-	2000	-	1500	2000	1.6	2.66	1.71	1.83	1.56	1.74	1.09	1.26	1.11	1.42	1.46		0.881	1.05	1.16	0.99
	Gallium	ug/L	0.05	-	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*		*<0.05*	*<0.05*	*<0.05*	*<0.05*
	Iron	ug/L	1	15.02	42	300	-	1060	795	1060	5	5	6.2	4.5	6.5	4.3	3.3	2.9	2.7	3	31		37.3	36	46.1	36.6
	Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.015	0.013	0.014	0.015	0.016	0.014	0.011	0.013	0.011	0.012	0.056		0.03	0.03	0.034	0.029
	Lead	ug/L	0.01	0.0222	0.15	-	5	-	3.75	5	0.015	0.031	0.016	0.016	0.016	0.016	*<0.01*	0.011	*<0.01*	0.01	0.02		0.018	0.018	0.02	0.015
	Lithium	ug/L	0.5	0.72	-	-	-	-	-	-	1.39	1.48	1.39	1.46	1.43	1.48	1.12	1.15	1.13	1.14	1.1		1.03	0.98	1.02	0.96
	Manganese	ug/L	0.05	3.062	5.5	-	120	-	90	120	1.7	1.49	1.63	1.52	2.04	1.19	1.2	1.12	1	1.09	13.5		11.2	10.6	11.5	11.2
	Mercury	ug/L	0.0005	0.0008	0.02	0.026	1	-	0.0195	0.026	*<5e-04*	0.00244	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	0.00078	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*		0.00077	0.00074	0.00056	0.00055
	Molybdenum	ug/L	0.05	0.107	5.2	73	-	-	54.8	73	0.166	0.19	0.169	0.171	0.161	0.183	0.116	0.129	0.116	0.123	0.089		0.12	0.121	0.14	0.123
	Nickel	ug/L	0.05	0.4412	2.7	25	-	-	18.8	25	1.26	2.76	1.43	1.22	1.27	1.54	0.87	0.928	0.847	0.982	1.05		0.821	0.907	0.882	0.851
	Niobium	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*		*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Phosphorus	ug/L	50	-	-	-	-	-	-	-	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*		*<50*	*<50*	*<50*	*<50*
	Rhenium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*		*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Rubidium	ug/L	0.005	-	-	-	-	-	-	-	2.03	2.18	2.02	1.96	2	2.08	1.8	1.86	1.83	1.87	1.84		1.56	1.47	1.64	1.58
	Selenium	ug/L	0.04	0.049	0.16	1	50	-	0.75	1	0.059	0.056	0.057	0.055	0.05	0.056	0.045	0.042	*<0.04*	0.044	0.046		0.055	*<0.04*	0.046	*<0.04*
	Silicon	ug/L	50	-	-	-	-	-	-	-	393	386	410	381	414	391	275	257	256	260	482		347	329	351	334
	Silver	ug/L	0.005	0.005	0.1	0.25	-	-	0.188	0.25	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*		*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Strontium	ug/L	0.02	36.1	-	2500	7000	-	1880	2500	75.9	80.7	75.9	75.7	75.8	78.4	57.7	59.8	58	59.4	60.3		57.9	55.1	61.8	58.4
	Sulfur	ug/L	500	-	-	-	-	-	-	-	3250	3490	3410	3280	3270	3450	2250	2310	2320	2300	2260		2720	2700	2810	2670
	Tantalum	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*		*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Tellurium	ug/L	0.02	-	-	-	-	-	-	-	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*		*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Thallium	ug/L	0.005	0.005	0.1	0.8	-	-	0.6	0.8	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*		*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Thorium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	0.0056	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*		0.01	*<0.005*	*<0.005*	*<0.005*
	Tin	ug/L	0.02	0.038	-	-	-	-	-	-	*<0.02*	0.039	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*		*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Titanium	ug/L	0.05	0.170	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	0.335		0.081	0.092	0.205	0.087
	Tungsten	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*		*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Uranium	ug/L	0.001	0.0164	1.5	15	20	-	11.2	15	0.0248	0.0301	0.0273	0.0276	0.0253	0.0269	0.0171	0.0174	0.0181	0.017	0.0166		0.0241	0.0218	0.0241	0.0226
	Vanadium	ug/L	0.05	0.05	-	120	-	-	90	120	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*		*<0.05*	*<0.05*	*<0.05*	*<0.05*
	Yttrium	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	0.011		*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Zinc	ug/L	0.5	1.698	6.7	-	-	-	-	-	1.57	1.97	1.63	1.41	1.66	1.2	1	1.28	0.92	1.38	1.63		1.2	0.91	0.74	0.57
	Zirconium	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*		*<0.01*	*<0.01*	*<0.01*	*<0.01*
Dissolved Metals	Aluminum	ug/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	3.7	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*		1.7	1.5	2.2	1.8
	Antimony	ug/L	0.02	-	-	-	-	-	-	-	*<0.02*	*<0.02*	0.023	0.023	0.022	0.02	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*		*<0.02*	*<0.02*	0.02	*<0.02*
	Arsenic	ug/L	0.02	-	-	-	-	-	-	-	0.587	0.659	0.618	0.643	0.615	0.62	0.597	0.583	0.55	0.585	0.734		0.592	0.587	0.617	0.579
	Barium	ug/L	0.02	-	-	-	-	-	-	-	12.3	12.5	12.2	12.4	12.8	12.6	11.2	11.3	11.1	11.1	13		9.74	9.5	9.55	9.82
	Beryllium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*		*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Bismuth	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*		*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Boron	ug/L	5	-	-	-	-	-	-	-	9.9	11.1	10.1	10	10.3	10.1	6.8	7.2	7.1	7.2	7.4		7.6	7.4	7.8	7.5
	Cadmium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*		*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.0088	0.0093	0.0088	0.0087	0.0087	0.0089	0.0098	0.0102	0.0098	0.0097	0.0095		0.0135	0.0079	0.0084	0.0081
	Chromium	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*		*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Cobalt	ug/L	0.005	-	-	-	-	-	-	-	0.0232	0.0366	0.0274	0.0243	0.0233	0.0234	0.0134	0.0173	0.014	0.0163	0.0164		0.0181	0.0183	0.0224	0.0187
	Copper	ug/L	0.05	0.8614	-	1.61 | 4.92	-	-	1.21 | 3.69	1.61 | 4.92	1.66	1.78	1.85	5.37	2.47	1.24	0.96	1.25	1.2	1.27	2.53		1.94	0.73	1.31	0.64
	Gallium	ug/L	0.05	-	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*		*<0.05*	*<0.05*	*<0.05*	*<0.05*
	Iron	ug/L	1	-	-	-	-	-	-	-	6.6	2.9	2.9	3.5	3.1	2.4	2.2	1.4	1.4	1.5	7.2		12.5	13.1	11.8	12.8
	Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.012	0.013	0.012	0.014	0.014	0.012	*<0.01*	*<0.01*	*<0.01*	*<0.01*	0.016		0.015	0.016	0.015	0.016
	Lead	ug/L	0.01	0.013	-	4.98 | 7.74	-	-	3.73 | 5.8	4.98 | 7.74	0.012	0.02	0.013	0.018	0.012	0.014	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*		*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Lithium	ug/L	0.5	-	-	-	-	-	-	-	1.44	1.51	1.44	1.45	1.45	1.52	1.11	1.16	1.12	1.12	1.14		1.05	1.03	1.04	1.03
	Manganese	ug/L	0.05	1.196	-	210 | 330	-	-	158 | 248	210 | 330	0.365	0.785	0.458	0.528	0.425	0.372	0.271	0.449	0.274	0.314	3.46		3.15	3.01	3.13	3.1
	Mercury	ug/L	0.0005	-	-	-	-	-	-	-	*<5e-04*	0.00192	*<5e-04*	*<5e-04*	0.00097	*<5e-04*	0.00079	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*		*<5e-04*	*<5e-04*	0.00058	0.00053
	Molybdenum	ug/L	0.05	-	-	-	-	-	-	-	0.184	0.185	0.167	0.171	0.166	0.184	0.113	0.123	0.114	0.12	0.088		0.118	0.117	0.136	0.119
	Nickel	ug/L	0.05	-	-	-	-	-	-	-	1.24	2.24	1.36	1.24	1.18	1.19	0.81	0.884	0.818	0.944	0.949		0.795	0.792	0.825	0.805
	Niobium	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*		*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Phosphorus	ug/L	50	-	-	-	-	-	-	-	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*		*<50*	*<50*	*<50*	*<50*
	Rhenium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*		*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.96	2.1	1.96	1.99	2.01	2.12	1.73	1.85	1.77	1.75	1.78		1.49	1.48	1.55	1.49
	Selenium	ug/L	0.04	-	-	-	-	-	-	-	0.049	0.056	0.048	0.056	0.06	0.056	0.045	0.043	0.042	0.041	0.045		0.052	0.051	0.052	0.046
	Silicon	ug/L	50	-	-	-	-	-	-	-

	Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	FWAL[b] (min | max)	HH DW[c]	SSWQO[d]	AEMP Action Level[e] (min | max)	AEMP Benchmark[f] (min | max)	July												August		
											MEL-01		MEL-02					MEL-03						MEL-01		
											MEL-01-09	MEL-01-10	MEL-02-02	MEL-02-03	MEL-02-05	MEL-02-06	MEL-02-08	MEL-03-01	MEL-03-02	MEL-03-03	MEL-03-04	MEL-03-05	MEL-01-01	MEL-01-06	MEL-01-07
											07-05	07-05	07-13	07-13	07-13	07-13	07-13	07-13	07-13	07-13	07-13	07-13	08-13	08-13	08-13
Field Measurements	Temperature	C	-	-	-	-	-	-	-	-	8.8	9	11.5	11.9	11.5	11.4	11.7	10.2	10.3	10.2	10.5	11.08	16.65	16.92	16.64
	Sp. Conductivity (field)	uS/cm	-	-	-	-	-	-	-	-	114.4	113.3	99.5	99.5	99	99.3	100.1	87.4	87.3	87.4	87.2	83.7	111.6	111.5	111.4
	pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.07	7.33	7.64	7.69	7.65	7.65	7.69	7.56	7.63	7.62	7.52	7.54	7.57	7.59	7.59
	DO (mg/L)	mg/L	-	-	-	-	-	-	6.5	6.5	12.44	12.31	10.58	10.51	11.05	9.9	10.59	10.95	11.09	11.11	10.43	11.37	10.19	10.2	10.26
	DO (%)	%	-	-	-	-	-	-	-	-	107.7	107.5	97.3	97.6	99.7	90.8	97.9	97.9	99.1	99.4	93.8	106.2	107.7	108.3	108.3
	Chlorophyll-a (field)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conventional Parameters	Conductivity (lab)	uS/cm	1	77.5	-	-	-	-	-	-	119	119	100	100	99.4	99.3	101	88.2	87.9	88.4	88.3	86.7	113	113	113
	Hardness	mg/L	0.5	23.37	-	-	-	-	-	-	32.6	32.2	29.5	30.3	30.3	30.6	31.8	27.9	28.1	27.7	27.3	25.8	33.5	30.6	33.5
	pH (lab)	pH units	0.1	-	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.29	7.32	7.44	7.41	7.41	7.39	7.43	7.4	7.42	7.43	7.43	7.4	7.46	7.45	7.45
	Total Dissolved Solids	mg/L	10	54	68	500	-	1000	375	500	56.9	63.6	46.8	50.4	51.8	54.1	41.4	35.4	42.8	43.8	46.8	47.1	52.3	59	65.3
	Total Dissolved Solids (Calculated)	mg/L	1	39.61	68	500	-	1000	375	500	77.4	77.4	65	65	64.6	64.5	65.6	57.3	57.1	57.5	57.4	56.4	73.4	73.4	73.4
	Total Suspended Solids	mg/L	1	1	3.1	-	-	-	-	-	1.3	1.4	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	1.4	*<1*	*<1*	*<1*	*<1*
	Turbidity (lab)	NTU	0.1	-	-	-	-	-	-	-	0.58	0.42	0.39	0.35	0.36	0.39	0.38	0.29	0.34	0.33	0.29	0.31	0.3	0.3	0.3
Major Ions	Acidity, Total	mg/L	2	-	-	-	-	-	-	-	2.4	2.3	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*
	Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	-	-	-	20.2	20.1	19.9	19.7	19.5	19.6	19.9	19.4	19.3	19.5	19.2	18.7	20.4	20	20.2
	Alkalinity, Carbonate	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
	Alkalinity, Hydroxide	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
	Alkalinity, Phenolphthalein	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
	Alkalinity, Total	mg/L	1	20.5	-	-	-	-	-	-	20.2	20.1	19.9	19.7	19.5	19.6	19.9	19.4	19.3	19.5	19.2	18.7	20.4	20	20.2
	Bromide	mg/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Calcium (D)	mg/L	0.01	-	-	-	-	-	-	-	10	9.8	9.21	9.46	9.42	9.52	9.82	8.75	8.83	8.7	8.6	8.14	10.3	9.49	10.2
	Calcium (T)	mg/L	0.01	7.334	-	-	-	-	-	-	9.68	9.54	9.69	9.37	9.64	9.66	9.78	8.9	8.95	8.73	8.67	8.44	9.55	10	9.69
	Chloride	mg/L	0.1	9.564	14	120	-	-	90	120	16.9	17.2	13	13	13	12.9	13.3	10.7	10.7	10.9	10.8	10.5	15.8	15.8	16
	Fluoride	mg/L	0.02	0.028	0.0084	0.12	1.5	2.8	2.1	2.8	0.027	0.025	0.027	0.028	0.028	0.025	0.027	0.024	0.028	0.028	0.024	0.024	0.035	0.034	0.034
	Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	-	1.86	1.88	1.59	1.63	1.65	1.66	1.76	1.46	1.47	1.45	1.41	1.34	1.9	1.68	1.96
	Magnesium (T)	mg/L	0.004	1.18	-	-	-	-	-	-	1.79	1.79	1.61	1.62	1.65	1.67	1.7	1.45	1.49	1.44	1.4	1.36	1.73	1.75	1.76
	Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-	1.16	1.18	1.1	1.14	1.13	1.13	1.18	1.08	1.07	1.06	1.02	1.01	1.26	1.16	1.27
	Potassium (T)	mg/L	0.02	0.954	-	-	-	-	-	-	1.25	1.19	1.15	1.15	1.16	1.16	1.19	1.1	1.12	1.07	1.07	1.05	1.18	1.21	1.2
	Reactive Silica (SiO2)	mg/L	0.01	0.2684	-	-	-	-	-	-	0.654	0.65	0.432	0.434	0.432	0.436	0.44	0.333	0.345	0.355	0.353	0.297	0.504	0.502	0.508
	Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-	8.15	8.15	6.71	6.79	6.97	7.02	7.29	6.08	6.1	5.91	5.76	5.58	8.48	7.58	8.66
	Sodium (T)	mg/L	0.02	4.847	5.3	-	-	-	-	-	8.13	7.96	6.9	6.81	7.01	7.15	7.22	6.07	6.17	5.94	6	5.74	7.6	7.79	7.79
	Sulphate	mg/L	0.3	3.867	38	128 | 218	-	-	96 | 164	128 | 218	7.21	7.11	5.34	5.33	5.27	5.31	5.42	4.08	4.08	4.11	4.11	3.95	6.97	7	7.01
Nutrients and Organic Carbon	Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.41 | 8.47	-	-	0.308 | 6.35	0.41 | 8.47	0.0059	0.0086	*<0.005*	0.0081	0.0092	0.0726	*<0.005*	*<0.005*	0.0065	0.0408	0.0128	0.0583	*<0.005*	0.0116	*<0.005*
	Nitrate (as N)	mg/L	0.005	0.0180	0.25	2.9	10	-	2.17	2.9	*<0.005*	0.0081	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	-	*<0.0051*	0.0081	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*
	Nitrite (as N)	mg/L	0.001	0.001	0.051	0.06	1	-	0.045	0.06	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
	Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.411	0.323	0.216	0.218	0.227	0.35	0.276	0.233	0.217	0.202	0.215	0.222	0.351	0.301	0.29
	Orthophosphate (PO4-P)	mg/L	0.001	0.001	-	-	-	-	-	-	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
	Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	-	-	-	0.0028	0.0019	0.0027	0.0025	0.0025	0.0027	0.0026	0.002	0.0017	0.002	0.0027	0.0019	0.003	0.0021	0.0028
	Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.251	0.266	0.223	0.225	0.227	0.247	0.212	0.212	0.202	0.183	0.23	0.201	0.255	0.257	0.244
	Total Kjeldahl Nitrogen	mg/L	0.05	0.2497	-	-	-	-	-	-	0.411	0.315	0.216	0.218	0.227	0.35	0.276	0.233	0.217	0.202	0.215	0.222	0.351	0.301	0.29
	Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-	0.251	0.258	0.223	0.225	0.227	0.247	0.212	0.212	0.202	0.183	0.23	0.201	0.255	0.257	0.244
	Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	-	-	-	0.0069	0.0062	0.0053	0.0054	0.005	0.0049	0.0056	0.0048	0.0044	0.0045	0.0047	0.0045	0.0055	0.0063	0.0056
	Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	-	-	-	5.34	5.22	4.4	4.46	4.04	4.68	4.48	3.77	3.79	3.49	3.87	3.19	4.04	4.17	4.15
	Total Organic Carbon	mg/L	0.5	3	-	-	-	-	-	-	4.44	4.7	4.04	4.2	4.03	4.2	4.21	3.41	3.29	3.23	3.61	3.9	4.33	4.25	3.96
Total Metals	Aluminum	ug/L	1	5.316	9.1	271 | 687	-	-	203 | 515	271 | 687	5.5	4.8	3.9	2.9	3.2	3.9	3.8	3.8	3	2.7	2.8	4.1	3.5	3.4	3.1
	Antimony	ug/L	0.02	0.02	0.51	-	6	-	4.5	6	0.023	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Arsenic	ug/L	0.02	0.275	3.8	5	10	25	18.8	25	0.696	0.669	0.82	0.887	0.81	0.822	0.827	0.46	0.446	0.455	0.452	0.509	0.644	0.627	0.625
	Barium	ug/L	0.02	8.054	77	-	1000	-	750	1000	10.2	10	9.86	9.59	9.53	9.7	9.53	8.9	9.17	9.06	8.94	8.85	8.9	8.86	8.73
	Beryllium	ug/L	0.005	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Bismuth	ug/L	0.005	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Boron	ug/L	5	6.52	23	1500	5000	-	1120	1500	7.3	7	5.5	5.6	5.4	5.5	5.7	*<5*	*<5*	*<5*	*<5*	*<5*	6.9	6.9	6.9
	Cadmium	ug/L	0.005	0.005	0.05	0.04 | 0.0647	5	-	0.03 | 0.0485	0.04 | 0.0647	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.013	0.0112	0.0081	0.0084	0.0082	0.009	0.0082	0.0091	0.0096	0.0096	0.0093	0.0135	0.0076	0.0081	0.0076
	Chromium	ug/L	0.1	0.10	1.1	5	50	-	3.75	5	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Cobalt	ug/L	0.005	0.016	-	0.78	-	-	0.585	0.78	0.039	0.035	0.0235	0.0214	0.0227	0.0247	0.0269	0.0175	0.0162	0.0175	0.0166	0.0188	0.0229	0.0246	0.024
	Copper	ug/L	0.05	0.86	2	-	2000	-	1500	2000	1.32	1.37	0.997	1.01	0.965	1.29	2.07	0.906	1.06	1.37	0.782	2.02	0.934	0.908	0.893
	Gallium	ug/L	0.05	-	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*
	Iron	ug/L	1	15.02	42	300	-	1060	795	1060	41.1	36.3	29.2	25.8	28.2	27.8	27.8	21	20.6	19.1	20	23.6	20.4	19	18.6
	Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.032	0.03	0.033	0.032	0.03	0.029	0.032	0.026	0.023	0.021	0.023	0.034	0.025	0.022	0.021
	Lead	ug/L	0.01	0.0222	0.15	-	5	-	3.75	5	0.039	0.017	0.022	0.02	0.02	0.021	0.021	0.015	0.015	0.024	0.017	0.02	0.011	*<0.01*	*<0.01*
	Lithium	ug/L	0.5	0.72	-	-	-	-	-	-	1	0.97	0.82	0.81	0.81	0.81	0.84	0.79	0.77	0.77	0.77	0.77	0.92	0.94	0.91
	Manganese	ug/L	0.05	3.062	5.5	-	120	-	90	120	11.6	11	6.03	5.47	5.79	5.92	5.88	4.41	4.59	4.55	4.54	3.96	5.85	5.99	5.72
	Mercury	ug/L	0.0005	0.0008	0.02	0.026	1	-	0.0195	0.026	0.00068	0.0006	*<5e-04*	*<5e-04*	*<5e-04*	0.0006	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*
	Molybdenum	ug/L	0.05	0.107	5.2	73	-	-	54.8	73	0.126	0.131	0.104	0.104	0.102	0.104	0.109	0.092	0.095	0.09	0.091	0.092	0.131	0.134	0.13
	Nickel	ug/L	0.05	0.4412	2.7	25	-	-	18.8	25	0.872	0.828	0.726	0.71	0.722	0.746	0.747	0.545	0.524	0.512	0.513	0.504	0.729	0.732	0.735
	Niobium	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Phosphorus	ug/L	50	-	-	-	-	-	-	-	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*
	Rhenium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.59	1.52	1.62	1.56	1.63	1.61	1.61	1.54	1.56	1.5	1.53	1.46	1.57	1.59	1.59
	Selenium	ug/L	0.04	0.049	0.16	1	50	-	0.75	1	*<0.04*	0.048	0.047	0.04	0.05	0.047	0.053	*<0.04*	*<0.04*	0.042	0.047	0.046	0.044	0.052	0.045
	Silicon	ug/L	50	-	-	-	-	-	-	-	335	326	240	236	222	231	237	177	179	182	184	156	254	258	251
	Silver	ug/L	0.005	0.005	0.1	0.25	-	-	0.188	0.25	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Strontium	ug/L	0.02	36.1	-	2500	7000	-	1880	2500	57.7	57.4	51.1	50.1	51.3	51.2	51.6	44.8	45.2	43.9	43.9	42.2	56.5	57.5	57.4
	Sulfur	ug/L	500	-	-	-	-	-	-	-	2710	2740	2020	2150	2030	2050	2110	1640	1660	1670	1680	1650	2410	2430	2430
	Tantalum	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Tellurium	ug/L	0.02	-	-	-	-	-	-	-	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Thallium	ug/L	0.005	0.005	0.1	0.8	-	-	0.6	0.8	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Thorium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	0.0069	*<0.005*
	Tin	ug/L	0.02	0.038	-	-	-	-	-	-	0.046	0.028	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	0.022	0.022	*<0.02*	0.057	*<0.02*	*<0.02*	*<0.02*
	Titanium	ug/L	0.05	0.170	-	-	-	-	-	-	0.381	0.097	0.149	0.157	0.154	0.169	0.196	0.178	0.133	0.115	0.135	0.226	0.108	0.079	0.09
	Tungsten	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Uranium	ug/L	0.001	0.0164	1.5	15	20	-	11.2	15	0.0217	0.0217	0.0185	0.0206	0.0192	0.0192	0.0182	0.016	0.0187	0.0161	0.0165	0.0156	0.0268	0.0241	0.0267
	Vanadium	ug/L	0.05	0.05	-	120	-	-	90	120	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*
	Yttrium	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Zinc	ug/L	0.5	1.698	6.7	-	-	-	-	-	5.62	1.3	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0.52	*<0.5*	*<0.5*	*<0.5*	1.15	0.6	*<0.5*	*<0.5*
	Zirconium	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
Dissolved Metals	Aluminum	ug/L	1	-	-	-	-	-	-	-	1.9	1.8	*<1*	1.2	*<1*	1.1	1	1.2	1.6	1.3	1.1	2	2.2	1.4	1.8
	Antimony	ug/L	0.02	-	-	-	-	-	-	-	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Arsenic	ug/L	0.02	-	-	-	-	-	-	-	0.601	0.601	0.805	0.793	0.755	0.764	0.754	0.436	0.434	0.43	0.432	0.459	0.644	0.627	0.648
	Barium	ug/L	0.02	-	-	-	-	-	-	-	9.71	9.63	9.49	9.45	9.47	9.3	9.39	8.76	8.84	8.94	8.79	8.69	8.59	8.59	8.65
	Beryllium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Bismuth	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Boron	ug/L	5	-	-	-	-	-	-	-	7.6	7.5	5.6	5.6	5.6	5.7	5.9	*<5*	*<5*	*<5*	*<5*	*<5*	7.3	6.6	7
	Cadmium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.0126	0.0111	0.0074	0.0076	0.008	0.0078	0.0076	0.0089	0.0087	0.0086	0.0093	0.009	0.0079	0.0073	0.0074
	Chromium	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Cobalt	ug/L	0.005	-	-	-	-	-	-	-	0.0204	0.0209	0.0101	0.0105	0.0103	0.0102	0.0105	0.0078	0.0073	0.0069	0.0078	0.0076	0.0154	0.0132	0.0138
	Copper	ug/L	0.05	0.8614	-	1.61 | 4.92	-	-	1.21 | 3.69	1.61 | 4.92	0.872	0.848	0.805	0.831	0.82	0.828	0.86	0.869	0.776	0.714	0.751	0.849	0.993	0.869	0.939
	Gallium	ug/L	0.05	-	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*
	Iron	ug/L	1	-	-	-	-	-	-	-	12.1	11.7	7.5	7.8	7.2	7.7	8.1	6	5.7	5.9	5.3	6.9	8.3	7.2	8.3
	Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.016	0.015	0.011	0.011	0.011	0.011	0.011	*<0.01*	*<0.01*	*<0.01*	*<0.01*	0.012	0.011	0.01	0.011
	Lead	ug/L	0.01	0.013	-	4.98 | 7.74	-	-	3.73 | 5.8	4.98 | 7.74	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Lithium	ug/L	0.5	-	-	-	-	-	-	-	1.04	1.03	0.87	0.8	0.83	0.86	0.88	0.79	0.77	0.77	0.76	0.72	0.96	0.87	0.93
	Manganese	ug/L	0.05	1.196	-	210 | 330	-	-	158 | 248	210 | 330	2.96	3.01	0.48	0.663	0.549	0.515	0.562	0.743	0.74	0.709	0.764	0.656	0.514	0.448	0.403
	Mercury	ug/L	0.0005	-	-	-	-	-	-	-	0.00051	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*
	Molybdenum	ug/L	0.05	-	-	-	-	-	-	-	0.12	0.124	0.093	0.102	0.095	0.104	0.11	0.092	0.09	0.092	0.089	0.088	0.131	0.13	0.134
	Nickel	ug/L	0.05	-	-	-	-	-	-	-	0.816	0.819	0.671	0.707	0.68	0.689	0.698	0.502	0.5	0.485	0.48	0.467	0.724	0.692	0.748
	Niobium	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Phosphorus	ug/L	50	-	-	-	-	-	-	-	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*
	Rhenium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.49	1.48	1.54	1.58	1.56	1.6	1.63	1.55	1.56	1.52	1.5	1.47	1.62	1.55	1.62
	Selenium	ug/L	0.04	-	-	-	-	-	-	-	0.05	0.048	0.05	*<0.04*	0.043	0.048	0.04	0.056	0.05	*<0.04*	*<0.04*	*<0.04*	0.046	*<0.04*	0.047
	Silicon	ug/L	50	-	-	-	-	-	-	-	355	348

	Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	FWAL[b] (min | max)	HH DW[c]	SSWQO[d]	AEMP Action Level[e] (min | max)	AEMP Benchmark[f] (min | max)	August														
											MEL-01			MEL-02						MEL-03					MEL-04	
											MEL-01-08	MEL-01-09	MEL-01-10	MEL-02-02	MEL-02-03	MEL-02-05	MEL-02-06	MEL-02-08	MEL-03-01	MEL-03-02	MEL-03-03	MEL-03-04	MEL-03-05	MEL-04-01	MEL-04-02
											08-13	08-13	08-13	08-12	08-12	08-12	08-12	08-12	08-11	08-11	08-11	08-12	08-12	08-21	08-20
Field Measurements	Temperature	C	-	-	-	-	-	-	-	-	16.57	16.43	16.84	16.84	17.39	17.45	16.58	17.62	16.87	17.08	16.96	17.66	18.03	14.26	14.51
	Sp. Conductivity (field)	uS/cm	-	-	-	-	-	-	-	-	111.5	111.5	111.5	97.3	97.9	97.6	97.1	98.9	83.7	83.7	83.7	88.9	88.9	88.6	89.5
	pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.59	7.54	7.54	7.58	7.57	7.6	7.61	7.58	7.52	7.48	7.66	7.62	7.62	7.45	7.49
	DO (mg/L)	mg/L	-	-	-	-	-	-	6.5	6.5	10.17	10.08	10.02	9.97	9.9	9.84	10.03	9.76	10.66	10.6	10.83	9.85	9.82	9.47	9.84
	DO (%)	%	-	-	-	-	-	-	-	-	107.2	106.1	106.3	105.7	106.1	105.6	105.7	105.2	115.2	113.1	114.9	106.2	106.6	95	99.2
	Chlorophyll-a (field)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conventional Parameters	Conductivity (lab)	uS/cm	1	77.5	-	-	-	-	-	-	113	113	113	98.9	102	99.8	99	100	91	89.6	88.8	90.1	90.5	91.4	91.5
	Hardness	mg/L	0.5	23.37	-	-	-	-	-	-	33.2	33	31.3	29.4	29.3	29.3	29	28.6	26.2	25	25.4	26.4	25.6	24.5	24.4
	pH (lab)	pH units	0.1	-	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.45	7.44	7.46	7.49	7.54	7.46	7.45	7.45	7.5	7.46	7.47	7.47	7.51	7.26	7.33
	Total Dissolved Solids	mg/L	10	54	68	500	-	1000	375	500	67.7	61.7	64.3	55	58	60.3	57	59	51	47	43	47.3	52.3	53.4	54.1
	Total Dissolved Solids (Calculated)	mg/L	1	39.61	68	500	-	1000	375	500	73.4	73.4	73.4	64.3	66.3	64.9	64.4	65	59.2	58.2	57.7	58.6	58.8	59.4	59.5
	Total Suspended Solids	mg/L	1	1	3.1	-	-	-	-	-	*<1*	1.2	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	2.9	*<1*
	Turbidity (lab)	NTU	0.1	-	-	-	-	-	-	-	0.34	0.32	0.31	0.31	0.26	0.29	0.25	0.25	0.22	0.2	0.21	0.25	0.2	0.21	0.21
Major Ions	Acidity, Total	mg/L	2	-	-	-	-	-	-	-	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	4.6	*<2*
	Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	-	-	-	20.8	20.6	20.5	19.7	21.3	19.8	19.7	20	20.5	19.1	19	19.2	19.2	18.8	19.4
	Alkalinity, Carbonate	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
	Alkalinity, Hydroxide	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
	Alkalinity, Phenolphthalein	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
	Alkalinity, Total	mg/L	1	20.5	-	-	-	-	-	-	20.8	20.6	20.5	19.7	21.3	19.8	19.7	20	20.5	19.1	19	19.2	19.2	18.8	19.4
	Bromide	mg/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Calcium (D)	mg/L	0.01	-	-	-	-	-	-	-	10.2	10.1	9.7	9.24	9.15	9.21	9.11	8.95	8.3	7.92	8.07	8.37	8.15	7.67	7.69
	Calcium (T)	mg/L	0.01	7.334	-	-	-	-	-	-	9.8	9.8	9.88	9.11	9.21	8.62	8.74	9.08	8.6	8.37	8.47	8.52	8.54	7.87	7.68
	Chloride	mg/L	0.1	9.564	14	120	-	-	90	120	15.9	16	15.7	13	13.1	13	13	13.3	11.5	11.6	11.8	11.5	11.5	11.2	11.2
	Fluoride	mg/L	0.02	0.028	0.0084	0.12	1.5	2.8	2.1	2.8	0.033	0.034	0.034	0.034	0.034	0.033	0.033	0.033	0.033	0.033	0.034	0.032	0.034	0.028	0.027
	Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	-	1.88	1.88	1.71	1.53	1.56	1.53	1.53	1.52	1.33	1.28	1.28	1.33	1.28	1.29	1.26
	Magnesium (T)	mg/L	0.004	1.18	-	-	-	-	-	-	1.74	1.76	1.72	1.51	1.53	1.46	1.45	1.47	1.36	1.35	1.31	1.36	1.36	1.32	1.28
	Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-	1.24	1.23	1.19	1.11	1.12	1.12	1.14	1.1	1.05	1.01	1.02	1.05	1.02	0.964	0.949
	Potassium (T)	mg/L	0.02	0.954	-	-	-	-	-	-	1.19	1.2	1.2	1.11	1.11	1.07	1.06	1.09	1.06	1.05	1.06	1.06	1.06	1.02	0.99
	Reactive Silica (SiO2)	mg/L	0.01	0.2684	-	-	-	-	-	-	0.501	0.527	0.504	0.382	0.384	0.378	0.382	0.377	0.335	0.342	0.336	0.341	0.336	0.366	0.381
	Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-	8.33	8.31	7.8	6.62	6.67	6.6	6.64	6.61	5.66	5.49	5.5	5.69	5.43	5.17	5.14
	Sodium (T)	mg/L	0.02	4.847	5.3	-	-	-	-	-	7.65	7.9	7.85	6.61	6.66	6.23	6.3	6.4	5.78	5.84	5.72	5.82	5.79	5.43	5.28
	Sulphate	mg/L	0.3	3.867	38	128 | 218	-	-	96 | 164	128 | 218	6.97	6.99	6.94	5.48	5.51	5.47	5.42	5.55	4.6	4.6	4.65	4.61	4.59	4.3	4.31
Nutrients and Organic Carbon	Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.41 | 8.47	-	-	0.308 | 6.35	0.41 | 8.47	*<0.005*	*<0.005*	0.0086	0.0075	0.0088	*<0.005*	0.0105	0.0332	0.0158	0.0217	0.0076	0.0186	0.0171	0.0195	0.0112
	Nitrate (as N)	mg/L	0.005	0.0180	0.25	2.9	10	-	2.17	2.9	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	-	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*
	Nitrite (as N)	mg/L	0.001	0.001	0.051	0.06	1	-	0.045	0.06	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
	Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.336	0.333	0.272	0.217	0.21	0.19	0.199	0.22	0.203	0.204	0.197	0.239	0.283	0.224	0.222
	Orthophosphate (PO4-P)	mg/L	0.001	0.001	-	-	-	-	-	-	*<0.001*	*<0.001*	*<0.001*	0.001	*<0.001*	*<0.001*	*<0.001*	*<0.001*	0.001	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
	Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	-	-	-	0.0031	0.0035	0.0026	0.0017	0.002	0.0022	0.0024	0.0021	0.0017	0.0018	0.0015	0.0019	0.0019	0.002	0.0023
	Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.262	0.325	0.274	0.257	0.236	0.256	0.246	0.302	0.211	0.192	0.194	0.232	0.221	0.208	0.208
	Total Kjeldahl Nitrogen	mg/L	0.05	0.2497	-	-	-	-	-	-	0.336	0.333	0.272	0.217	0.21	0.19	0.199	0.22	0.203	0.204	0.197	0.239	0.283	0.224	0.222
	Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-	0.262	0.325	0.274	0.257	0.236	0.256	0.246	0.302	0.211	0.192	0.194	0.232	0.221	0.208	0.208
	Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	-	-	-	0.0063	0.0069	0.0061	0.004	0.0039	0.0042	0.0041	0.0044	0.0033	0.0036	0.0055	0.0034	0.0046	0.0051	0.0049
	Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	-	-	-	4.58	4.29	4.13	3.52	4	3.79	3.6	3.92	3.28	3.26	3.26	3.52	3.54	3.43	3.42
	Total Organic Carbon	mg/L	0.5	3	-	-	-	-	-	-	3.79	3.94	3.89	3.44	3.79	3.39	3.42	3.54	3.05	2.82	2.88	2.97	2.85	3.04	3.05
Total Metals	Aluminum	ug/L	1	5.316	9.1	271 | 687	-	-	203 | 515	271 | 687	3.3	3.4	2.8	2.3	1.9	1.9	2	2.2	2.1	1.8	2.9	2.4	2.3	46	2
	Antimony	ug/L	0.02	0.02	0.51	-	6	-	4.5	6	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Arsenic	ug/L	0.02	0.275	3.8	5	10	25	18.8	25	0.637	0.656	0.634	0.835	0.868	0.837	0.846	0.893	0.454	0.464	0.463	0.462	0.457	0.562	0.424
	Barium	ug/L	0.02	8.054	77	-	1000	-	750	1000	8.94	8.8	8.78	8.77	8.62	8.68	8.62	8.9	8.33	8.41	8.34	8.56	8.24	9.8	8.67
	Beryllium	ug/L	0.005	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Bismuth	ug/L	0.005	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Boron	ug/L	5	6.52	23	1500	5000	-	1120	1500	6.9	7.2	6.9	5.8	5.9	5.7	5.8	5.9	5.1	5.1	5	5	5	5	*<5*
	Cadmium	ug/L	0.005	0.005	0.05	0.04 | 0.0647	5	-	0.03 | 0.0485	0.04 | 0.0647	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.0082	0.008	0.0075	0.0092	0.0093	0.0088	0.0091	0.0098	0.0141	0.0105	0.0108	0.0104	0.01	0.0255	0.0107
	Chromium	ug/L	0.1	0.10	1.1	5	50	-	3.75	5	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	0.18	0.42
	Cobalt	ug/L	0.005	0.016	-	0.78	-	-	0.585	0.78	0.024	0.0259	0.022	0.0196	0.0195	0.0184	0.0202	0.0231	0.0156	0.016	0.0166	0.0156	0.016	0.0773	0.0169
	Copper	ug/L	0.05	0.86	2	-	2000	-	1500	2000	0.916	0.897	0.912	0.864	0.856	0.809	0.826	0.838	1.47	0.907	0.892	0.827	0.784	1.24	32.4
	Gallium	ug/L	0.05	-	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*
	Iron	ug/L	1	15.02	42	300	-	1060	795	1060	18.6	20.8	17.9	16.1	16.3	15.3	15.4	18.2	11.4	11.2	14.5	11.4	12.9	144	20.3
	Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.024	0.022	0.021	0.019	0.018	0.017	0.018	0.02	0.015	0.014	0.021	0.015	0.015	0.293	0.016
	Lead	ug/L	0.01	0.0222	0.15	-	5	-	3.75	5	0.01	*<0.01*	*<0.01*	0.013	0.01	0.01	0.013	0.01	*<0.01*	*<0.01*	*<0.01*	0.016	*<0.01*	0.113	*<0.01*
	Lithium	ug/L	0.5	0.72	-	-	-	-	-	-	0.91	0.94	0.92	0.87	0.85	0.87	0.88	0.86	0.79	0.81	0.81	0.81	0.82	0.9	0.83
	Manganese	ug/L	0.05	3.062	5.5	-	120	-	90	120	5.8	8.15	5.71	6.02	6.07	5.46	5.69	6.9	4.04	3.94	4.21	3.9	4.18	13.5	4.41
	Mercury	ug/L	0.0005	0.0008	0.02	0.026	1	-	0.0195	0.026	*<5e-04*	0.00058	*<5e-04*	0.00054	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	0.00059	0.00098	*<5e-04*
	Molybdenum	ug/L	0.05	0.107	5.2	73	-	-	54.8	73	0.132	0.126	0.131	0.107	0.102	0.105	0.107	0.109	0.096	0.093	0.094	0.092	0.09	0.094	0.168
	Nickel	ug/L	0.05	0.4412	2.7	25	-	-	18.8	25	0.749	0.75	0.723	0.617	0.622	0.595	0.576	0.596	0.465	0.463	0.466	0.473	0.468	0.762	0.476
	Niobium	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Phosphorus	ug/L	50	-	-	-	-	-	-	-	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*
	Rhenium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Rubidium	ug/L	0.005	0.005	-	-	-	-	1.59	1.59	1.58	1.54	1.55	1.47	1.49	1.51	1.5	1.49	1.49	1.51	1.49	1.58	1.48		
	Selenium	ug/L	0.04	0.049	0.16	1	50	-	0.75	1	0.054	0.044	0.05	*<0.04*	0.046	*<0.04*	0.047	*<0.04*	*<0.04*	0.043	*<0.04*	*<0.04*	*<0.04*	*<0.04*	0.04
	Silicon	ug/L	50	-	-	-	-	-	-	-	256	270	252	184	186	188	185	189	164	163	163	168	159	249	187
	Silver	ug/L	0.005	0.005	0.1	0.25	-	-	0.188	0.25	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Strontium	ug/L	0.02	36.1	-	2500	7000	-	1880	2500	57.5	57.2	56.7	50.6	51.7	48.6	49.1	51	45.6	45.3	45.4	45.6	45.6	41.4	40.4
	Sulfur	ug/L	500	-	-	-	-	-	-	-	2420	2480	2450	1930	1970	1960	1950	1990	1590	1610	1640	1650	1600	1630	1610
	Tantalum	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Tellurium	ug/L	0.02	-	-	-	-	-	-	-	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Thallium	ug/L	0.005	0.005	0.1	0.8	-	-	0.6	0.8	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Thorium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	0.0064	0.0052	*<0.005*	*<0.005*	0.0058	*<0.005*	*<0.005*	*<0.005*	*<0.005*	0.0054	*<0.005*	*<0.005*	0.0052	*<0.005*
	Tin	ug/L	0.02	0.038	-	-	-	-	-	-	*<0.02*	*<0.02*	*<0.02*	0.022	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	0.026	0.057
	Titanium	ug/L	0.05	0.170	-	-	-	-	-	-	0.1	0.086	0.133	0.149	*<0.05*	*<0.05*	*<0.05*	*<0.05*	0.05	*<0.05*	0.135	0.051	0.055	3.72	0.051
	Tungsten	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Uranium	ug/L	0.001	0.0164	1.5	15	20	-	11.2	15	0.0227	0.0248	0.0223	0.0209	0.0206	0.0202	0.021	0.0221	0.0188	0.0183	0.0188	0.0181	0.0176	0.0373	0.0158
	Vanadium	ug/L	0.05	0.05	-	120	-	-	90	120	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	0.193	*<0.05*
	Yttrium	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	0.066	*<0.01*
	Zinc	ug/L	0.5	1.698	6.7	-	-	-	-	-	0.83	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	1.46	*<0.5*	0.54	*<0.5*
	Zirconium	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
Dissolved Metals	Aluminum	ug/L	1	-	-	-	-	-	-	-	2	1.8	1.8	1	1.2	1.2	1	1	1.2	1	1.2	1.3	1.4	*<1*	*<1*
	Antimony	ug/L	0.02	-	-	-	-	-	-	-	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Arsenic	ug/L	0.02	-	-	-	-	-	-	-	0.65	0.645	0.62	0.822	0.871	0.831	0.805	0.839	0.455	0.449	0.447	0.46	0.446	0.442	0.437
	Barium	ug/L	0.02	-	-	-	-	-	-	-	8.62	8.67	9.03	8.45	8.54	8.55	8.49	8.44	8.21	8.24	8.36	8.34	8.26	8.77	8.57
	Beryllium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Bismuth	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Boron	ug/L	5	-	-	-	-	-	-	-	7.2	7.1	6.4	5.7	5.7	5.7	5.6	5.8	*<5*	*<5*	*<5*	*<5*	*<5*	*<5*	*<5*
	Cadmium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.0081	0.008	0.0082	0.0088	0.0096	0.0093	0.009	0.009	0.0125	0.0106	0.0115	0.0099	0.0098	0.0104	0.0103
	Chromium	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Cobalt	ug/L	0.005	-	-	-	-	-	-	-	0.0154	0.0151	0.014	0.0094	0.0095	0.0092	0.0108	0.0097	0.007	0.0068	0.0067	0.008	0.0072	0.0072	0.0075
	Copper	ug/L	0.05	0.8614	-	1.61 | 4.92	-	-	1.21 | 3.69	1.61 | 4.92	0.887	0.912	0.921	0.83	0.841	0.846	0.833	0.816	1.44	0.765	0.904	0.807	0.756	0.71	0.727
	Gallium	ug/L	0.05	-	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*
	Iron	ug/L	1	-	-	-	-	-	-	-	7.7	8.7	8.2	5.7	7.2	6	5.5	7.2	3.8	3.8	4.1	4	4.7	3	3.1
	Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.011	0.01	0.011	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Lead	ug/L	0.01	0.013	-	4.98 | 7.74	-	-	3.73 | 5.8	4.98 | 7.74	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Lithium	ug/L	0.5	-	-	-	-	-	-	-	0.95	0.91	0.84	0.82	0.84	0.83	0.8	0.83	0.74	0.72	0.74	0.74	0.74	0.78	0.77
	Manganese	ug/L	0.05	1.196	-	210 | 330	-	-	158 | 248	210 | 330	0.409	1.23	0.508	0.508	0.577	0.628	0.496	0.776	0.336	0.404	0.425	0.512	0.474	0.687	0.418
	Mercury	ug/L	0.0005	-	-	-	-	-	-	-	*<5e-04*	*<5e-04*	0.00054	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	0.00059	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*
	Molybdenum	ug/L	0.05	-	-	-	-	-	-	-	0.131	0.134	0.133	0.109	0.103	0.108	0.1	0.111	0.096	0.085	0.092	0.1	0.094	0.081	0.084
	Nickel	ug/L	0.05	-	-	-	-	-	-	-	0.72	0.755	0.708	0.572	0.585	0.593	0.574	0.575	0.446	0.431	0.447	0.459	0.429	0.442	0.432
	Niobium	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Phosphorus	ug/L	50	-	-	-	-	-	-	-	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*
	Rhenium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.58	1.59	1.6	1.54	1.56	1.55	1.55	1.51	1.5	1.43	1.46	1.48	1.44	1.38	1.37
	Selenium	ug/L	0.04	-	-	-	-	-	-	-	0.043	0.048	0.041	*<0.04*	0.042	0.04	0.043	*<0.04*	*<0.04*	0.045	0.043	0.041	*<0.04*	*<0.04*	*<0.04*
	Silicon	ug/L	50	-	-	-	-	-	-	-	260	272	242

	Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	FWAL[b] (min | max)	HH DW[c]	SSWQO[d]	AEMP Action Level[e] (min | max)	AEMP Benchmark[f] (min | max)	August								September					
											MEL-04			MEL-05					MEL-01					
											MEL-04-03	MEL-04-04	MEL-04-05	MEL-05-01	MEL-05-02	MEL-05-03	MEL-05-04	MEL-05-05	MEL-01-01	MEL-01-06	MEL-01-07	MEL-01-08	MEL-01-09	MEL-01-10
											08-21	08-21	08-21	08-14	08-14	08-14	08-14	08-14	09-07	09-07	09-07	09-07	09-07	09-07
Field Measurements	Temperature	C	-	-	-	-	-	-	-	-	14.28	14.23	14.28	16.03	16.38	16.71	16.64	16.78	9.21	9.25	9.15	9.31	9.13	9.27
	Sp. Conductivity (field)	uS/cm	-	-	-	-	-	-	-	-	88.6	88.6	88.6	90.1	90.1	89.9	90	90.1	116	118.3	113.4	115	113	115.2
	pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.42	7.45	7.48	7.54	7.56	7.47	7.52	7.58	7.47	7.54	7.48	7.51	7.46	7.56
	DO (mg/L)	mg/L	-	-	-	-	-	-	6.5	6.5	9.5	9.52	9.52	9.86	9.8	9.75	9.76	9.72	11.41	11.44	11.43	11.44	11.47	11.48
	DO (%)	%	-	-	-	-	-	-	-	-	95.4	95.4	95.5	102.8	102.8	103	102.9	102.9	101.9	102.4	102	102.4	102.3	102.8
	Chlorophyll-a (field)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.43	1.57	2.4	2.24	2.3	2.1
Conventional Parameters	Conductivity (lab)	uS/cm	1	77.5	-	-	-	-	-	-	92.3	92.5	89.6	91.4	91.6	91.5	92.4	93.7	122	125	117	119	118	122
	Hardness	mg/L	0.5	23.37	-	-	-	-	-	-	23.4	24.6	24.2	28.4	27.6	27.8	27.9	27.3	32.9	33.7	33	34	33.7	33.8
	pH (lab)	pH units	0.1	-	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.34	7.39	7.35	7.51	7.49	7.49	7.5	7.55	7.47	7.4	7.4	7.41	7.41	7.41
	Total Dissolved Solids	mg/L	10	54	68	500	-	1000	375	500	54.7	53.4	54.1	52	50.3	52.7	52.3	56.3	53.4	60.1	53.4	57.8	59.8	62.1
	Total Dissolved Solids (Calculated)	mg/L	1	39.61	68	500	-	1000	375	500	60	60.1	58.2	59.4	59.5	59.5	60.1	60.9	79.3	81.2	76	77.4	76.7	79.3
	Total Suspended Solids	mg/L	1	1	3.1	-	-	-	-	-	*<1*	1	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	1.6	*<1*	*<1*	*<1*	*<1*	*<1*
	Turbidity (lab)	NTU	0.1	-	-	-	-	-	-	-	0.22	0.19	0.19	0.23	0.21	0.23	0.22	0.21	0.54	0.44	0.42	0.33	0.34	0.37
Major Ions	Acidity, Total	mg/L	2	-	-	-	-	-	-	-	*<2*	6.8	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	3.7	2.1	2.2	2.2	*<2*	*<2*
	Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	-	-	-	19.6	20.4	19.6	20.1	20.5	20.2	20.9	21.6	21.4	21.2	20.7	20.9	20.7	20.3
	Alkalinity, Carbonate	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
	Alkalinity, Hydroxide	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
	Alkalinity, Phenolphthalein	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
	Alkalinity, Total	mg/L	1	20.5	-	-	-	-	-	-	19.6	20.4	19.6	20.1	20.5	20.2	20.9	21.6	21.4	21.2	20.7	20.9	20.7	20.3
	Bromide	mg/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Calcium (D)	mg/L	0.01	-	-	-	-	-	-	-	7.32	7.71	7.61	9.05	8.83	8.85	8.87	8.66	10	10.2	10.1	10.4	10.3	10.3
	Calcium (T)	mg/L	0.01	7.334	-	-	-	-	-	-	7.58	7.72	7.72	8.85	8.39	8.63	8.92	9.05	9.94	10.1	9.76	9.84	9.81	10.2
	Chloride	mg/L	0.1	9.564	14	120	-	-	90	120	11.3	11.4	11.3	11.4	11.5	11.5	11.5	11.5	17.1	18.2	16.5	16.8	16.7	17.5
	Fluoride	mg/L	0.02	0.028	0.0084	0.12	1.5	2.8	2.1	2.8	0.027	0.026	0.026	0.032	0.031	0.034	0.033	0.033	0.033	0.032	0.032	0.032	0.03	0.031
	Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	-	1.25	1.3	1.26	1.4	1.35	1.38	1.4	1.37	1.93	2.01	1.9	1.96	1.94	1.97
	Magnesium (T)	mg/L	0.004	1.18	-	-	-	-	-	-	1.28	1.28	1.3	1.4	1.33	1.34	1.4	1.41	1.85	1.9	1.78	1.8	1.77	1.88
	Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-	0.935	0.969	0.952	1.08	1.06	1.08	1.08	1.05	1.22	1.26	1.21	1.26	1.23	1.26
	Potassium (T)	mg/L	0.02	0.954	-	-	-	-	-	-	0.984	0.992	1.01	1.06	1.04	1.05	1.05	1.07	1.17	1.22	1.16	1.17	1.14	1.2
	Reactive Silica (SiO2)	mg/L	0.01	0.2684	-	-	-	-	-	-	0.374	0.369	0.37	0.363	0.363	0.355	0.358	0.355	0.558	0.544	0.555	0.558	0.556	0.55
	Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-	5.1	5.29	5.09	5.88	5.72	5.8	5.82	5.75	8.65	9.03	8.48	8.62	8.53	8.86
	Sodium (T)	mg/L	0.02	4.847	5.3	-	-	-	-	-	5.23	5.31	5.38	5.91	5.46	5.76	5.8	5.97	8.2	8.72	7.86	8	7.92	8.46
	Sulphate	mg/L	0.3	3.867	38	128 | 218	-	-	96 | 164	128 | 218	4.3	4.31	4.3	4.53	4.5	4.52	4.53	4.54	7.51	7.87	7.14	7.27	7.25	7.58
Nutrients and Organic Carbon	Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.41 | 8.47	-	-	0.308 | 6.35	0.41 | 8.47	0.0306	0.0427	0.0747	0.11	*<0.005*	0.0115	*<0.005*	0.0058	0.0191	*<0.005*	0.01	*<0.005*	0.0125	*<0.005*
	Nitrate (as N)	mg/L	0.005	0.0180	0.25	2.9	10	-	2.17	2.9	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	0.0147	0.0365	0.029	*<0.005*	*<0.005*	0.0257
	Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	-	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*	0.0147	0.0365	0.029	*<0.0051*	*<0.0051*	0.0257
	Nitrite (as N)	mg/L	0.001	0.001	0.051	0.06	1	-	0.045	0.06	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
	Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.235	0.202	0.281	0.389	0.222	0.264	0.219	0.235	0.299	0.288	0.333	0.225	0.24	0.26
	Orthophosphate (PO4-P)	mg/L	0.001	0.001	-	-	-	-	-	-	*<0.001*	*<0.001*	*<0.001*	0.0011	0.0013	*<0.001*	*<0.001*	0.0011	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
	Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	-	-	-	0.002	0.0022	0.0017	0.0024	0.0022	0.002	0.0055	0.0022	0.0027	0.0028	0.008	0.0028	0.0026	0.004
	Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.201	0.238	0.402	0.388	0.261	0.23	0.242	0.249	0.237	0.272	0.266	0.21	0.215	0.268
	Total Kjeldahl Nitrogen	mg/L	0.05	0.2497	-	-	-	-	-	-	0.235	0.202	0.281	0.389	0.222	0.264	0.219	0.235	0.284	0.251	0.304	0.225	0.24	0.234
	Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-	0.201	0.238	0.402	0.388	0.261	0.23	0.242	0.249	0.222	0.236	0.237	0.21	0.215	0.242
	Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	-	-	-	0.0043	0.0053	0.0043	0.004	0.0041	0.004	0.0038	0.0041	0.0073	0.0072	0.0064	0.0056	0.0039	0.0055
	Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	-	-	-	3.94	3.27	3.7	3.69	3.69	3.35	3.08	3.93	5.18	4.81	5.19	4.61	4.55	5.03
	Total Organic Carbon	mg/L	0.5	3	-	-	-	-	-	-	2.97	3.27	3.16	3.18	2.9	3.16	3.09	2.91	4.97	4.65	4.87	4.62	4.97	4.61
Total Metals	Aluminum	ug/L	1	5.316	9.1	271 | 687	-	-	203 | 515	271 | 687	2	2.4	4.4	2.1	1.6	1.9	1.6	2.2	4.8	5.8	3.4	3.2	2.8	5.2
	Antimony	ug/L	0.02	0.02	0.51	-	6	-	4.5	6	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Arsenic	ug/L	0.02	0.275	3.8	5	10	25	18.8	25	0.432	0.43	0.433	0.471	0.472	0.463	0.478	0.492	0.738	0.724	0.686	0.731	0.694	0.693
	Barium	ug/L	0.02	8.054	77	-	1000	-	750	1000	8.59	8.84	8.83	8.67	8.68	8.78	8.79	8.8	8.79	8.95	8.77	8.75	8.72	8.88
	Beryllium	ug/L	0.005	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Bismuth	ug/L	0.005	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Boron	ug/L	5	6.52	23	1500	5000	-	1120	1500	5.2	*<5*	5	5.3	5.2	5.2	5.3	5.2	7.5	7.8	7.3	7.5	7.4	7.6
	Cadmium	ug/L	0.005	0.005	0.05	0.04 | 0.0647	5	-	0.03 | 0.0485	0.04 | 0.0647	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.0109	0.0106	0.0119	0.0096	0.0095	0.0098	0.0097	0.0099	0.0088	0.0097	0.0098	0.0089	0.0094	0.0092
	Chromium	ug/L	0.1	0.10	1.1	5	50	-	3.75	5	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Cobalt	ug/L	0.005	0.016	-	0.78	-	-	0.585	0.78	0.0144	0.0153	0.0172	0.0178	0.0166	0.0155	0.0171	0.0174	0.0263	0.0292	0.0236	0.0247	0.0252	0.028
	Copper	ug/L	0.05	0.86	2	-	2000	-	1500	2000	0.782	0.74	0.784	0.817	0.752	0.778	0.771	0.793	0.892	1.28	1.23	1.18	1.04	1.13
	Gallium	ug/L	0.05	-	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*
	Iron	ug/L	1	15.02	42	300	-	1060	795	1060	11.3	12.4	15	14.5	11.5	11.2	11.1	11.8	17.6	20.7	16.3	20.4	16.1	17
	Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.016	0.018	0.031	0.013	0.012	0.013	0.012	0.011	0.022	0.023	0.019	0.019	0.019	0.019
	Lead	ug/L	0.01	0.0222	0.15	-	5	-	3.75	5	0.013	0.01	0.027	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	0.015	0.023	0.014	0.016	*<0.01*	0.018
	Lithium	ug/L	0.5	0.72	-	-	-	-	-	-	0.88	0.83	0.83	0.87	0.82	0.84	0.86	0.83	1.06	1.11	1.03	1.06	1.02	1.11
	Manganese	ug/L	0.05	3.062	5.5	-	120	-	90	120	4.34	4.62	4.84	6.71	5.8	5.62	5.69	5.87	5.2	5.44	5.35	5.1	5.21	5.42
	Mercury	ug/L	0.0005	0.0008	0.02	0.026	1	-	0.0195	0.026	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	0.0007	*<5e-04*	*<5e-04*	0.00082	*<5e-04*	0.0005
	Molybdenum	ug/L	0.05	0.107	5.2	73	-	-	54.8	73	0.09	0.09	0.088	0.106	0.097	0.096	0.099	0.103	0.144	0.151	0.134	0.157	0.138	0.187
	Nickel	ug/L	0.05	0.4412	2.7	25	-	-	18.8	25	0.449	0.467	0.492	0.456	0.447	0.45	0.455	0.454	0.717	0.72	0.725	0.714	0.687	0.756
	Niobium	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Phosphorus	ug/L	50	-	-	-	-	-	-	-	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*
	Rhenium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Rubidium	ug/L	0.005	0.107	5.2	73	-	-	54.8	73	1.47	1.48	1.5	1.43	1.42	1.43	1.45	1.5	1.58	1.62	1.54	1.59	1.56	1.62
	Selenium	ug/L	0.04	0.049	0.16	1	50	-	0.75	1	*<0.04*	*<0.04*	*<0.04*	*<0.04*	*<0.04*	*<0.04*	*<0.04*	*<0.04*	0.053	0.056	0.042	0.042	*<0.04*	0.057
	Silicon	ug/L	50	-	-	-	-	-	-	-	187	190	187	181	175	182	175	177	278	284	274	279	274	260
	Silver	ug/L	0.005	0.005	0.1	0.25	-	-	0.188	0.25	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Strontium	ug/L	0.02	36.1	-	2500	7000	-	1880	2500	40.6	40.4	40.8	45.2	44.3	44.6	45.7	46.6	57.5	58	54.3	56.2	54.9	58.5
	Sulfur	ug/L	500	-	-	-	-	-	-	-	1640	1630	1600	1600	1560	1600	1600	1610	2570	2760	2460	2540	2510	2520
	Tantalum	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Tellurium	ug/L	0.02	-	-	-	-	-	-	-	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Thallium	ug/L	0.005	0.005	0.1	0.8	-	-	0.6	0.8	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Thorium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Tin	ug/L	0.02	0.038	-	-	-	-	-	-	0.039	0.025	0.026	0.051	*<0.02*	0.021	*<0.02*	0.021	0.048	0.064	0.025	0.038	0.026	0.068
	Titanium	ug/L	0.05	0.170	-	-	-	-	-	-	0.063	0.115	0.243	*<0.05*	*<0.05*	*<0.05*	*<0.05*	0.093	0.124	0.182	0.079	0.09	0.08	0.095
	Tungsten	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	0.061
	Uranium	ug/L	0.001	0.0164	1.5	15	20	-	11.2	15	0.0157	0.0165	0.0179	0.0178	0.0167	0.016	0.0173	0.0164	0.0282	0.0303	0.0263	0.0246	0.0246	0.0255
	Vanadium	ug/L	0.05	0.05	-	120	-	-	90	120	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*
	Yttrium	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Zinc	ug/L	0.5	1.698	6.7	-	-	-	-	-	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0.53	0.7	*<0.5*	*<0.5*	1.08
	Zirconium	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	0.01	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
Dissolved Metals	Aluminum	ug/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	1.1	1.2	1.3	1.2	1.3	1.5	1.8	1.1	1.4	1.2	2.5
	Antimony	ug/L	0.02	-	-	-	-	-	-	-	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Arsenic	ug/L	0.02	-	-	-	-	-	-	-	0.445	0.443	0.423	0.474	0.466	0.475	0.47	0.483	0.66	0.661	0.666	0.653	0.643	0.649
	Barium	ug/L	0.02	-	-	-	-	-	-	-	8.66	8.66	8.68	8.49	8.62	8.45	8.44	8.48	8.56	8.75	8.58	8.5	8.54	8.56
	Beryllium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Bismuth	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Boron	ug/L	5	-	-	-	-	-	-	-	5.1	*<5*	*<5*	5.3	5.2	5.2	5.1	5.2	7.7	8.2	7.6	7.4	7.3	7.7
	Cadmium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.0102	0.0101	0.01	0.0095	0.0093	0.0092	0.0096	0.0097	0.0093	0.0086	0.0091	0.0084	0.008	0.0087
	Chromium	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Cobalt	ug/L	0.005	-	-	-	-	-	-	-	0.0072	0.007	0.0066	0.007	0.0072	0.0083	0.0078	0.0072	0.0156	0.019	0.0166	0.0186	0.0166	0.0195
	Copper	ug/L	0.05	0.8614	-	1.61 | 4.92	-	-	1.21 | 3.69	1.61 | 4.92	0.734	0.704	0.729	0.77	0.767	0.782	0.753	0.773	1.05	0.936	1.1	0.962	0.953	0.895
	Gallium	ug/L	0.05	-	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*
	Iron	ug/L	1	-	-	-	-	-	-	-	3	3	3	4	4	4.3	4	4.2	4.4	4.5	5	4.4	4.6	6
	Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Lead	ug/L	0.01	0.013	-	4.98 | 7.74	-	-	3.73 | 5.8	4.98 | 7.74	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Lithium	ug/L	0.5	-	-	-	-	-	-	-	0.9	0.78	0.78	0.81	0.78	0.8	0.79	0.8	1.05	1.13	1.02	1.04	1	1.05
	Manganese	ug/L	0.05	1.196	-	210 | 330	-	-	158 | 248	210 | 330	0.349	0.342	0.414	0.36	0.373	0.389	0.347	0.392	0.343	0.426	0.353	0.324	0.389	0.464
	Mercury	ug/L	0.0005	-	-	-	-	-	-	-	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	0.00075	*<5e-04*	0.00062	*<5e-04*	*<5e-04*	0.00079	*<5e-04*	0.00056
	Molybdenum	ug/L	0.05	-	-	-	-	-	-	-	0.079	0.079	0.083	0.11	0.104	0.104	0.099	0.1	0.145	0.157	0.149	0.145	0.15	0.156
	Nickel	ug/L	0.05	-	-	-	-	-	-	-	0.43	0.436	0.443	0.442	0.431	0.438	0.43	0.421	0.718	0.708	0.705	0.72	0.702	0.707
	Niobium	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Phosphorus	ug/L	50	-	-	-	-	-	-	-	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*
	Rhenium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.36	1.37	1.37	1.51	1.46	1.49	1.49	1.44	1.63	1.66	1.62	1.64	1.64	1.64
	Selenium	ug/L	0.04	-	-	-	-	-	-	-	*<0.04*	*<0.04*	*<0.04*	*<0.04*	0.041	0.046	0.044	*<0.04*	*<0.04*	0.068	0.051	0.049	0.057	*<0.04*
	Silicon	ug/L	50	-	-	-	-	-	-	-	198	190	188	177	171	176	170	174	279	278	285	285	282	279
	Silver	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Strontium	ug/L	0.02	-	-	2500	-	-	1880	2500	39.3	39.7	39.6	46	45	45.5	45.4	44.6	57.4	60.9	56.8	59.1	58.8	59.5
	Sulfur	ug/L	500	-	-	-	-	-	-	-	1660	1660	1610	1610	1600	1660	1620	1730	2550	2740	2620	2590	2550	2750
	Tantalum	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Tellurium	ug/L	0.02	-	-	-	-	-	-	-	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Thallium	ug/L

	Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	FWAL[b] (min | max)	HH DW[c]	SSWQO[d]	AEMP Action Level[e] (min | max)	AEMP Benchmark[f] (min | max)	September										August			
											MEL-02					MEL-03					Atulik Lake		Peter Lake	
											MEL-02-02	MEL-02-03	MEL-02-05	MEL-02-06	MEL-02-08	MEL-03-01	MEL-03-02	MEL-03-03	MEL-03-04	MEL-03-05	AL-01	AL-02	PL-01	PL-02
											09-08	09-08	09-08	09-08	09-08	09-12	09-12	09-12	09-12	09-12	08-18	08-18	08-17	08-17
Field Measurements	Temperature	C	-	-	-	-	-	-	-	-	9.57	9.45	9.45	9.69	9.34	8.89	8.89	8.91	8.58	8.56	13.6	14.26	14.34	14.38
	Sp. Conductivity (field)	uS/cm	-	-	-	-	-	-	-	-	95.3	96.4	96.7	94.1	97	89.1	88.9	89.2	89.2	89.5	98	98	59.9	60.9
	pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.39	7.43	7.47	7.41	7.48	7.29	7.34	7.17	7.19	7.03	7.4	7.41	7.34	7.61
	DO (mg/L)	mg/L	-	-	-	-	-	-	6.5	6.5	11.26	11.32	11.34	11.2	11.31	10.5	10.51	10.5	10.56	10.55	9.82	9.69	10.01	9.99
	DO (%)	%	-	-	-	-	-	-	-	-	101.5	101.7	101.9	101.2	101.4	93.1	93.1	93.1	93	92.8	97.4	97.1	100.6	100.4
	Chlorophyll-a (field)	ug/L	-	-	-	-	-	-	-	-	1.73	2.04	1.82	1.67	2.2	1.75	0.86	0.56	1.49	1.49	-	-	-	-
Conventional Parameters	Conductivity (lab)	uS/cm	1	77.5	-	-	-	-	-	-	98.2	102	101	99.1	104	91.5	92.8	93.3	95.1	92.8	101	100	61	61.6
	Hardness	mg/L	0.5	23.37	-	-	-	-	-	-	29.4	29.3	29.4	29.1	29.5	27.1	25.2	26	26.1	25.6	25.8	25.3	15.7	16.1
	pH (lab)	pH units	0.1	-	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.43	7.42	7.44	7.44	7.46	7.42	7.49	7.53	7.52	7.47	7.32	7.33	7.06	7.1
	Total Dissolved Solids	mg/L	10	54	68	500	-	1000	375	500	48.1	51.8	48.4	45.1	48.1	45	41.3	43.7	44.3	41.7	51.7	56.4	35.1	37.7
	Total Dissolved Solids (Calculated)	mg/L	1	39.61	68	500	-	1000	375	500	63.8	66.3	65.6	64.4	67.6	59.5	60.3	60.6	61.8	60.3	65.6	65	39.6	40
	Total Suspended Solids	mg/L	1	1	3.1	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	1	*<1*	*<1*	*<1*	1	*<1*	*<1*
	Turbidity (lab)	NTU	0.1	-	-	-	-	-	-	-	0.35	0.39	0.29	0.32	0.24	0.26	0.31	0.22	0.28	0.29	0.26	0.26	0.2	0.16
Major Ions	Acidity, Total	mg/L	2	-	-	-	-	-	-	-	2.8	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	*<2*	2.8	*<2*	*<2*	*<2*	*<2*	*<2*
	Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	-	-	-	19.7	20.3	19.9	20.3	22	19.2	20.5	20.6	21.1	20	21.3	20.9	11.8	11.8
	Alkalinity, Carbonate	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
	Alkalinity, Hydroxide	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
	Alkalinity, Phenolphthalein	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
	Alkalinity, Total	mg/L	1	20.5	-	-	-	-	-	-	19.7	20.3	19.9	20.3	22	19.2	20.5	20.6	21.1	20	21.3	20.9	11.8	11.8
	Bromide	mg/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Calcium (D)	mg/L	0.01	-	-	-	-	-	-	-	9.17	9.11	9.16	9.09	9.18	8.48	7.93	8.14	8.21	8.03	7.85	7.68	4.64	4.75
	Calcium (T)	mg/L	0.01	7.334	-	-	-	-	-	-	8.64	8.94	8.99	8.78	9.02	7.63	8.26	7.78	7.84	7.92	7.44	7.6	4.42	4.7
	Chloride	mg/L	0.1	9.564	14	120	-	-	90	120	12.9	13.2	13.2	12.8	13.3	11.7	12.1	12.1	12.1	12.4	12.8	12.9	7.02	7.22
	Fluoride	mg/L	0.02	0.028	0.0084	0.12	1.5	2.8	2.1	2.8	0.03	0.031	0.031	0.03	0.03	0.031	0.03	0.03	0.03	0.031	0.029	0.029	0.049	0.047
	Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	-	1.59	1.59	1.58	1.56	1.6	1.43	1.32	1.37	1.37	1.34	1.51	1.49	1.01	1.04
	Magnesium (T)	mg/L	0.004	1.18	-	-	-	-	-	-	1.44	1.51	1.51	1.45	1.55	1.27	1.4	1.27	1.3	1.31	1.46	1.46	0.973	1.04
	Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-	1.1	1.1	1.11	1.11	1.12	1.05	0.995	1.01	1.02	1	1.16	1.14	0.833	0.845
	Potassium (T)	mg/L	0.02	0.954	-	-	-	-	-	-	1.03	1.07	1.08	1.04	1.07	0.944	1.05	0.971	0.973	0.982	1.12	1.12	0.788	0.824
	Reactive Silica (SiO2)	mg/L	0.01	0.2684	-	-	-	-	-	-	0.411	0.418	0.416	0.412	0.42	0.377	0.368	0.372	0.36	0.357	0.772	0.759	0.168	0.173
	Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-	6.49	6.59	6.68	6.49	6.7	6.02	5.5	5.84	5.91	5.66	6.43	6.37	3.74	3.83
	Sodium (T)	mg/L	0.02	4.847	5.3	-	-	-	-	-	6.08	6.37	6.41	6.1	6.48	5.27	5.84	5.3	5.44	5.44	6.14	6.22	3.51	3.73
	Sulphate	mg/L	0.3	3.867	38	128 | 218	-	-	96 | 164	128 | 218	5.32	5.44	5.44	5.22	5.49	4.56	4.66	4.62	4.66	4.7	4.37	4.4	4.24	4.26
Nutrients and Organic Carbon	Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.41 | 8.47	-	-	0.308 | 6.35	0.41 | 8.47	0.0058	0.0104	0.0267	0.011	0.007	0.0127	0.0257	0.0361	0.111	0.0495	0.0058	0.0056	*<0.005*	*<0.005*
	Nitrate (as N)	mg/L	0.005	0.0180	0.25	2.9	10	-	2.17	2.9	0.0054	0.0116	0.0096	0.022	*<0.005*	*<0.005*	*<0.005*	0.0086	0.0346	0.0182	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	-	0.0054	0.0116	0.0096	0.022	*<0.0051*	*<0.0051*	*<0.0051*	0.0086	0.0346	0.0182	*<0.0051*	*<0.0051*	*<0.0051*	*<0.0051*
	Nitrite (as N)	mg/L	0.001	0.001	0.051	0.06	1	-	0.045	0.06	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
	Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.212	0.23	0.255	0.225	0.207	0.235	0.259	0.273	0.243	0.219	0.212	0.211	0.205	0.28
	Orthophosphate (PO4-P)	mg/L	0.001	0.001	-	-	-	-	-	-	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	0.0014
	Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	-	-	-	0.0019	0.0018	0.0022	0.004	0.0024	0.0014	0.002	0.0016	0.0019	0.0012	0.0022	0.002	0.0015	0.0017
	Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.186	0.219	0.178	0.185	0.183	0.255	0.213	0.181	0.225	0.238	0.201	0.208	0.145	0.153
	Total Kjeldahl Nitrogen	mg/L	0.05	0.2497	-	-	-	-	-	-	0.207	0.218	0.245	0.203	0.207	0.235	0.259	0.264	0.208	0.201	0.212	0.211	0.205	0.28
	Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-	0.181	0.207	0.168	0.163	0.183	0.255	0.213	0.172	0.19	0.22	0.201	0.208	0.145	0.153
	Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	-	-	-	0.0044	0.0044	0.0042	0.0045	0.0045	0.0034	0.0038	0.0037	0.0037	0.0043	0.004	0.0039	0.0032	0.0029
	Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	-	-	-	3.6	3.65	3.73	3.58	4.19	3.89	3.24	3.29	3.38	3.58	4.13	4.98	3.09	3.84
	Total Organic Carbon	mg/L	0.5	3	-	-	-	-	-	-	3.86	4.01	4.28	3.81	4.57	3.6	3.23	3.28	3.52	3.35	4.26	4.13	3.79	3.3
Total Metals	Aluminum	ug/L	1	5.316	9.1	271 | 687	-	-	203 | 515	271 | 687	1.7	2.8	1.9	4.2	2.9	2	3.3	2	2.7	2.7	1.9	1.9	2.3	2.5
	Antimony	ug/L	0.02	0.02	0.51	-	6	-	4.5	6	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Arsenic	ug/L	0.02	0.275	3.8	5	10	25	18.8	25	0.798	0.854	0.872	0.819	0.876	0.475	0.475	0.442	0.472	0.467	0.39	0.356	0.139	0.14
	Barium	ug/L	0.02	8.054	77	-	1000	-	750	1000	8.78	8.86	8.81	8.51	8.83	8.59	8.51	8.45	8.41	8.64	9.43	9.22	10.2	10.2
	Beryllium	ug/L	0.005	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Bismuth	ug/L	0.005	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Boron	ug/L	5	6.52	23	1500	5000	-	1120	1500	5.7	5.8	5.8	5.5	5.9	*<5*	5	5.1	5.2	5.3	6.1	6.3	*<5*	*<5*
	Cadmium	ug/L	0.005	0.005	0.05	0.04 | 0.0647	5	-	0.03 | 0.0485	0.04 | 0.0647	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.0092	0.0097	0.0094	0.0097	0.0099	0.0123	0.0098	0.0114	0.0115	0.0128	0.0058	0.0058	0.0122	0.012
	Chromium	ug/L	0.1	0.10	1.1	5	50	-	3.75	5	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Cobalt	ug/L	0.005	0.016	-	0.78	-	-	0.585	0.78	0.0167	0.0196	0.0184	0.019	0.0177	0.014	0.0159	0.0146	0.0162	0.0148	0.015	0.015	0.0121	0.0137
	Copper	ug/L	0.05	0.86	2	-	2000	-	1500	2000	0.89	1.06	0.796	0.845	0.884	0.769	0.771	0.701	0.869	0.979	0.786	0.782	0.671	0.694
	Gallium	ug/L	0.05	-	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*
	Iron	ug/L	1	15.02	42	300	-	1060	795	1060	12.2	15.6	13.1	17.8	16.6	10.9	12.6	9.5	13.3	13.2	12.2	11.8	7.1	7.6
	Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.014	0.018	0.016	0.02	0.02	0.018	0.02	0.019	0.025	0.024	0.02	0.018	0.031	0.029
	Lead	ug/L	0.01	0.0222	0.15	-	5	-	3.75	5	*<0.01*	0.016	0.011	0.026	0.018	0.018	0.016	*<0.01*	0.014	0.014	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Lithium	ug/L	0.5	0.72	-	-	-	-	-	-	0.88	0.91	0.92	0.9	0.96	0.86	0.9	0.87	0.86	0.88	0.67	0.66	0.54	0.54
	Manganese	ug/L	0.05	3.062	5.5	-	120	-	90	120	4.83	5.44	5.32	5.02	5.37	3.58	3.91	3.58	3.79	3.71	4.38	4.02	2.3	2.36
	Mercury	ug/L	0.0005	0.0008	0.02	0.026	1	-	0.0195	0.026	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*
	Molybdenum	ug/L	0.05	0.107	5.2	73	-	-	54.8	73	0.101	0.108	0.106	0.101	0.112	0.094	0.118	0.088	0.095	0.093	0.085	0.088	*<0.05*	*<0.05*
	Nickel	ug/L	0.05	0.4412	2.7	25	-	-	18.8	25	0.539	0.583	0.572	0.545	0.574	0.424	0.461	0.411	0.442	0.434	0.422	0.427	0.429	0.433
	Niobium	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Phosphorus	ug/L	50	-	-	-	-	-	-	-	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*
	Rhenium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.46	1.5	1.51	1.47	1.5	1.36	1.46	1.37	1.42	1.38	1.34	1.33	1.47	1.54
	Selenium	ug/L	0.04	0.049	0.16	1	50	-	0.75	1	0.047	0.054	0.052	0.051	0.05	0.043	0.043	*<0.04*	0.048	*<0.04*	*<0.04*	0.043	*<0.04*	*<0.04*
	Silicon	ug/L	50	-	-	-	-	-	-	-	195	202	202	202	208	190	188	179	193	175	400	384	91	94
	Silver	ug/L	0.005	0.005	0.1	0.25	-	-	0.188	0.25	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Strontium	ug/L	0.02	36.1	-	2500	7000	-	1880	2500	45.7	47	47.4	45.7	47.7	39.6	41.3	39.4	40.5	40.2	38.5	38.4	22.8	24.1
	Sulfur	ug/L	500	-	-	-	-	-	-	-	1830	1900	1940	1810	1930	1700	1690	1660	1720	1690	1690	1650	1590	1620
	Tantalum	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Tellurium	ug/L	0.02	-	-	-	-	-	-	-	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Thallium	ug/L	0.005	0.005	0.1	0.8	-	-	0.6	0.8	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Thorium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Tin	ug/L	0.02	0.038	-	-	-	-	-	-	*<0.02*	0.038	0.061	0.023	0.034	0.032	0.033	*<0.02*	0.035	0.048	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Titanium	ug/L	0.05	0.170	-	-	-	-	-	-	*<0.05*	0.072	*<0.05*	0.147	0.094	0.074	0.112	0.072	0.137	0.1	0.088	0.077	*<0.05*	*<0.05*
	Tungsten	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Uranium	ug/L	0.001	0.0164	1.5	15	20	-	11.2	15	0.0181	0.0194	0.0211	0.017	0.0194	0.0192	0.0175	0.0177	0.0183	0.0188	0.0198	0.0208	0.0232	0.0219
	Vanadium	ug/L	0.05	0.05	-	120	-	-	90	120	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*
	Yttrium	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Zinc	ug/L	0.5	1.698	6.7	-	-	-	-	-	*<0.5*	0.68	*<0.5*	0.5	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*
	Zirconium	ug/L	0.01	-	-	-	-	-	-	-	0.014	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
Dissolved Metals	Aluminum	ug/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	2.6	1.4	2.3	2.8	1.6	1.1	1.2	*<1*	1.6	1.6
	Antimony	ug/L	0.02	-	-	-	-	-	-	-	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Arsenic	ug/L	0.02	-	-	-	-	-	-	-	0.728	0.793	0.763	0.724	0.805	0.471	0.45	0.47	0.46	0.453	0.401	0.378	0.139	0.135
	Barium	ug/L	0.02	-	-	-	-	-	-	-	8.62	8.68	8.67	8.61	8.5	8.5	8.39	8.57	8.6	8.49	9.48	9.27	9.82	9.92
	Beryllium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Bismuth	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Boron	ug/L	5	-	-	-	-	-	-	-	5.8	5.9	5.6	5.6	5.8	5.5	5.3	5.6	5.6	5.4	6.4	6.4	*<5*	*<5*
	Cadmium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	0.0066	*<0.005*	*<0.005*
	Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.0092	0.0097	0.0096	0.0093	0.0097	0.0103	0.0101	0.0109	0.0105	0.0102	0.0056	0.0058	0.012	0.0122
	Chromium	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Cobalt	ug/L	0.005	-	-	-	-	-	-	-	0.01	0.0104	0.0106	0.0107	0.0136	0.008	0.0104	0.0103	0.0094	0.009	0.0068	0.0092	0.0055	*<0.005*
	Copper	ug/L	0.05	0.8614	-	1.61 | 4.92	-	-	1.21 | 3.69	1.61 | 4.92	0.868	0.908	0.813	0.905	1.03	0.801	0.835	0.831	0.886	0.792	0.811	0.827	0.661	0.655
	Gallium	ug/L	0.05	-	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*
	Iron	ug/L	1	-	-	-	-	-	-	-	2.9	3.2	3.2	3	7.1	2.2	9.2	8.8	5.1	3.9	3.9	3.7	2.5	2.5
	Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	0.011	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	0.018	0.014
	Lead	ug/L	0.01	0.013	-	4.98 | 7.74	-	-	3.73 | 5.8	4.98 | 7.74	*<0.01*	*<0.01*	*<0.01*	*<0.01*	0.015	*<0.01*	0.017	0.029	0.013	0.016	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Lithium	ug/L	0.5	-	-	-	-	-	-	-	0.88	0.9	0.88	0.88	0.9	0.96	0.91	0.98	0.95	0.94	0.64	0.66	0.52	0.53
	Manganese	ug/L	0.05	1.196	-	210 | 330	-	-	158 | 248	210 | 330	0.25	0.267	0.271	0.288	0.31	0.301	0.442	0.437	0.377	0.39	0.502	0.558	0.263	0.234
	Mercury	ug/L	0.0005	-	-	-	-	-	-	-	0.00052	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	0.001	0.00056
	Molybdenum	ug/L	0.05	-	-	-	-	-	-	-	0.106	0.108	0.11	0.1	0.113	0.093	0.096	0.092	0.098	0.09	0.098	0.704	*<0.05*	0.758
	Nickel	ug/L	0.05	-	-	-	-	-	-	-	0.571	0.566	0.564	0.552	0.582	0.441	0.449	0.439	0.47	0.406	0.43	0.438	0.435	0.43
	Niobium	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Phosphorus	ug/L	50	-	-	-	-	-	-	-	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*
	Rhenium	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.55	1.56	1.56	1.55	1.55	1.47	1.41	1.43	1.42	1.42	1.4	1.38	1.54	1.57
	Selenium	ug/L	0.04	-	-	-	-	-	-	-	*<0.04*	*<0.04*	0.046	0.041	0.056	*<0.04*	0.046	0.042	*<0.04*	0.045	*<0.04*	*<0.04*	*<0.04*	*<0.04*
	Silicon	ug/L	50	-	-	-	-	-	-	-	190	197	197	194	200	196	184	204	184	185	403	407	85	96
	Silver	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
	Strontium	ug/L	0.02	-	-	2500	-	-	1880	2500	48.9	48.5	49.4	47.8	48.8	43.4	41.3	41.5	41.7	41.2	40.3	39.3	24.1	24.5
	Sulfur	ug/L	500	-	-	-	-	-	-	-	1810	1900	1940	1820	1890	1850	1700	1820	1870	1820	1710	1790	1600	1620
	Tantalum	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
	Tellurium	ug/L	0.02	-	-	-	-	-	-	-	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Thallium	ug

Appendix C2
Meliadine Lake Water Quality – Temporal Plots

APPENDIX C2 – FIGURES

Figure C2-1. Specific conductivity (µS/cm) 1
Figure C2-2. Lab-measured conductivity (µS/cm) 2
Figure C2-3. Field pH 3
Figure C2-4. Lab measured pH 4
Figure C2-5. Hardness (mg/L) 5
Figure C2-6. Total dissolved solids (measured; mg/L) 6
Figure C2-7. Total dissolved solids (calculated; mg/L) 7
Figure C2-8. Total suspended solids (mg/L) 8
Figure C2-9. Lab measured turbidity (NTU) 9
Figure C2-10. Bicarbonate alkalinity (mg/L) 10
Figure C2-11. Total alkalinity (mg/L) 11
Figure C2-12. Total calcium (mg/L) 12
Figure C2-13. Total magnesium (mg/L) 13
Figure C2-14. Total potassium (mg/L) 14
Figure C2-15. Total sodium (mg/L) 15
Figure C2-16. Chloride (mg/L) 16
Figure C2-17. Fluoride (mg/L) 17
Figure C2-18. Ammonia (as nitrogen) (mg/L) 18
Figure C2-19. Nitrate (as N) (mg/L) 19
Figure C2-20. Nitrate and nitrite (as N) (mg/L) 20
Figure C2-21. Total Kjeldahl nitrogen (TKN; mg/L) 21
Figure C2-22. Sulphate (mg/L) 22
Figure C2-23. Total phosphorus (mg/L) 23
Figure C2-24. Dissolved organic carbon (mg/L) 24
Figure C2-25. Total organic carbon (mg/L) 25
Figure C2-26. Total aluminum (µg/L) 26
Figure C2-27. Total antimony (µg/L) 27
Figure C2-28. Total arsenic (µg/L) 28
Figure C2-29. Total barium (µg/L) 29

Figure C2-30. Total beryllium (µg/L) 30
Figure C2-31. Total bismuth (µg/L) 31
Figure C2-32. Total boron (µg/L) 32
Figure C2-33. Total cadmium (µg/L) 33
Figure C2-34. Total chromium (µg/L) 34
Figure C2-35. Total cobalt (µg/L) 35
Figure C2-36. Total copper (µg/L) 36
Figure C2-53. Dissolved copper (µg/L) 37
Figure C2-37. Total iron (µg/L) 38
Figure C2-38. Total lead (µg/L) 39
Figure C2-54. Dissolved lead (µg/L) 40
Figure C2-39. Total lithium (µg/L) 41
Figure C2-40. Total manganese (µg/L) 42
Figure C2-55. Dissolved manganese (µg/L) 43
Figure C2-41. Total mercury (µg/L) 44
Figure C2-42. Total molybdenum (µg/L) 45
Figure C2-43. Total nickel (µg/L) 46
Figure C2-44. Total selenium (µg/L) 47
Figure C2-45. Total silver (µg/L) 48
Figure C2-46. Total strontium (µg/L) 49
Figure C2-47. Total thallium (µg/L) 50
Figure C2-48. Total tin (µg/L) 51
Figure C2-49. Total titanium (µg/L) 52
Figure C2-50. Total uranium (µg/L) 53
Figure C2-51. Total vanadium (µg/L) 54
Figure C2-52. Total zinc (µg/L) 55
Figure C2-56. Dissolved zinc (µg/L) 56

Figure C2-1. Specific conductivity (µS/cm)

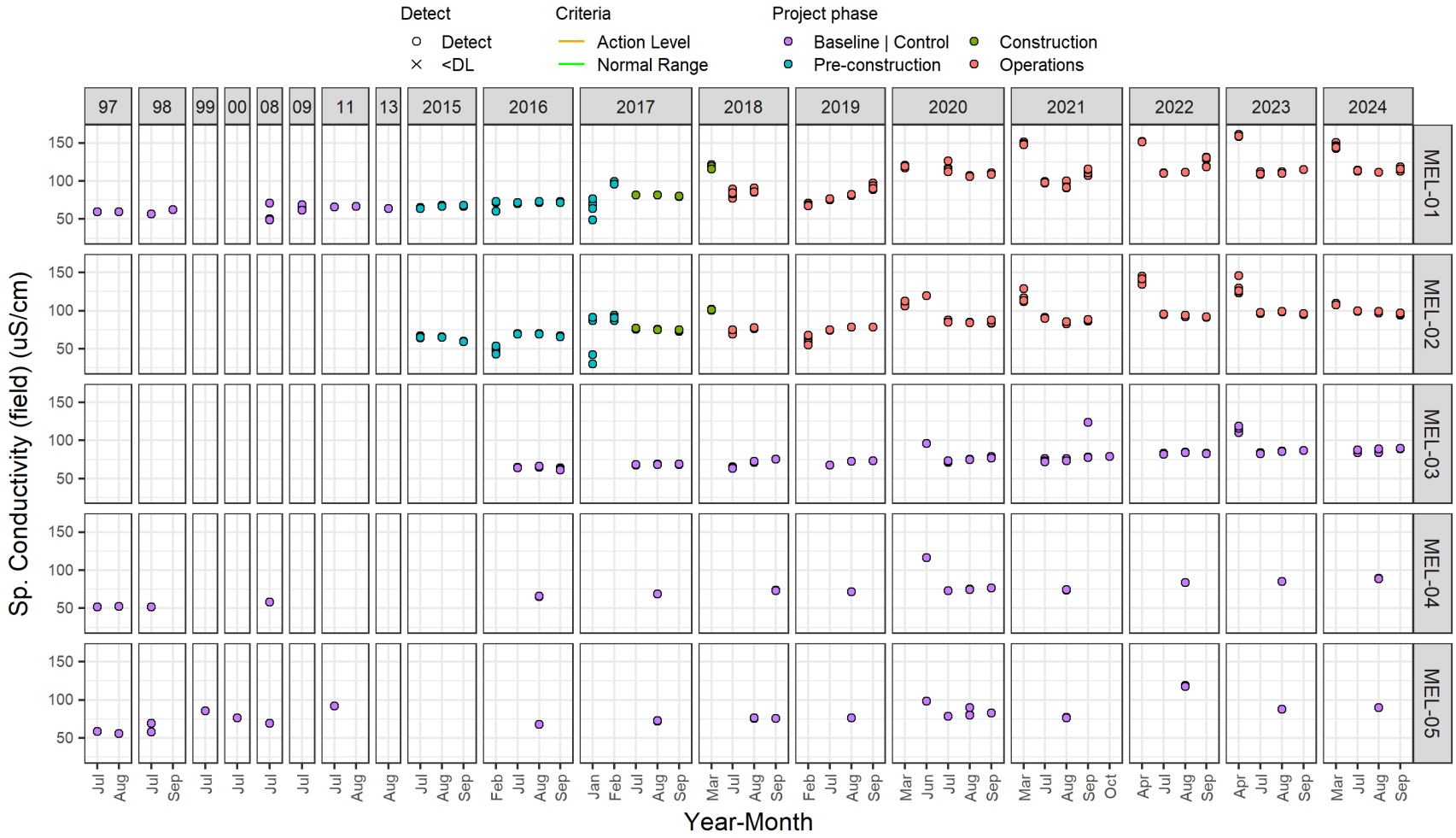


Figure C2-2. Lab-measured conductivity (µS/cm)

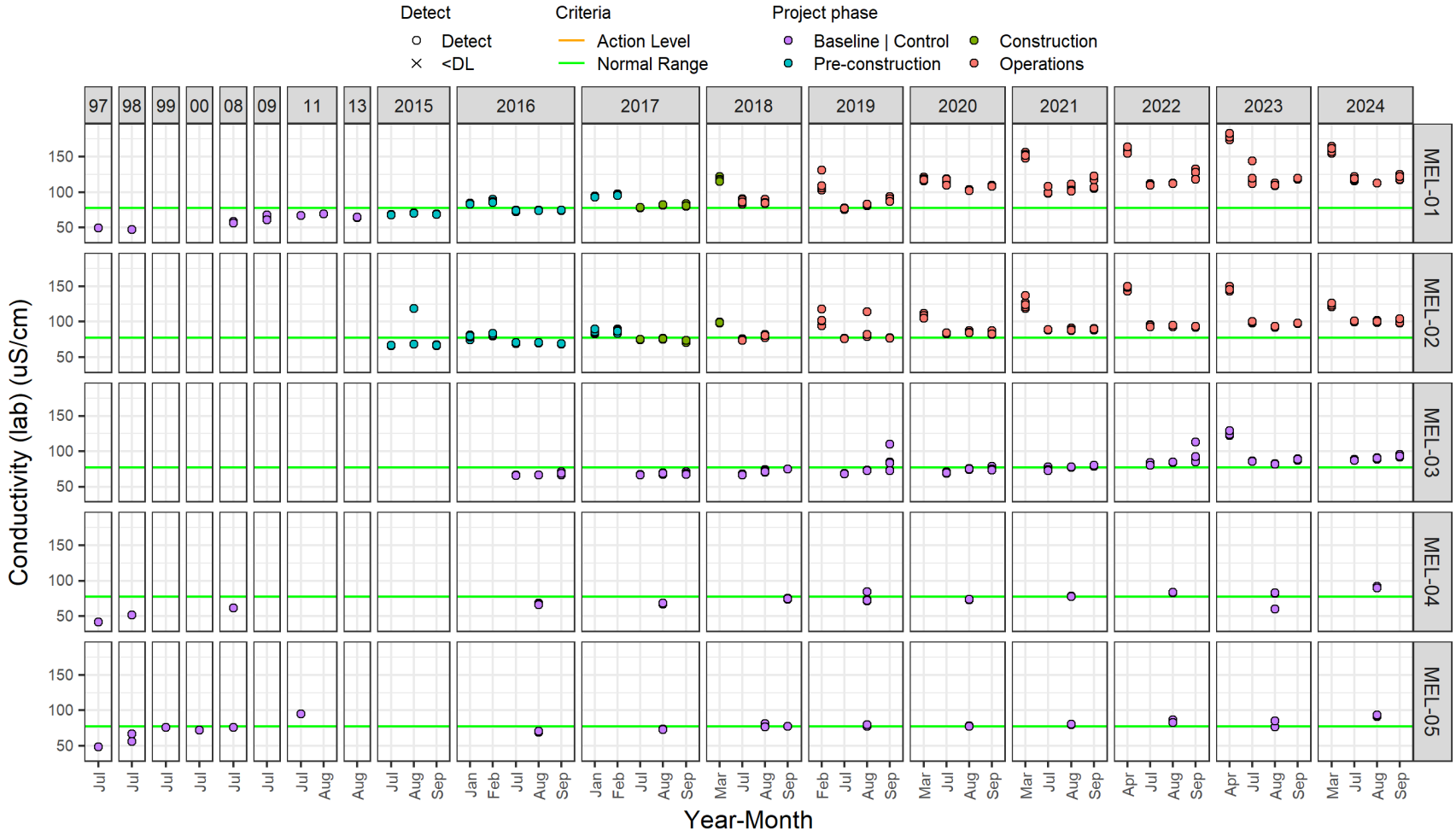


Figure C2-3. Field pH

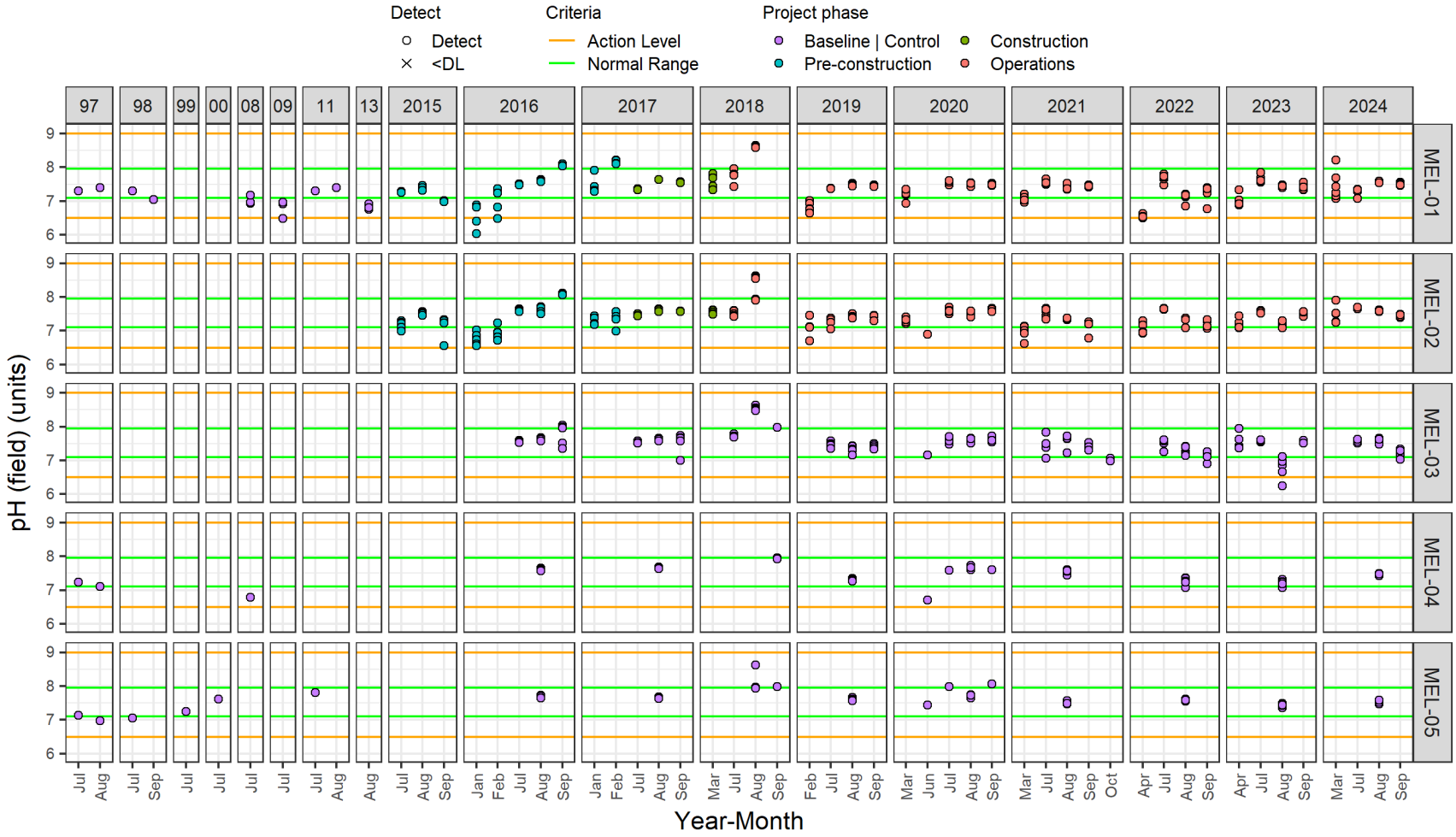


Figure C2-4. Lab measured pH

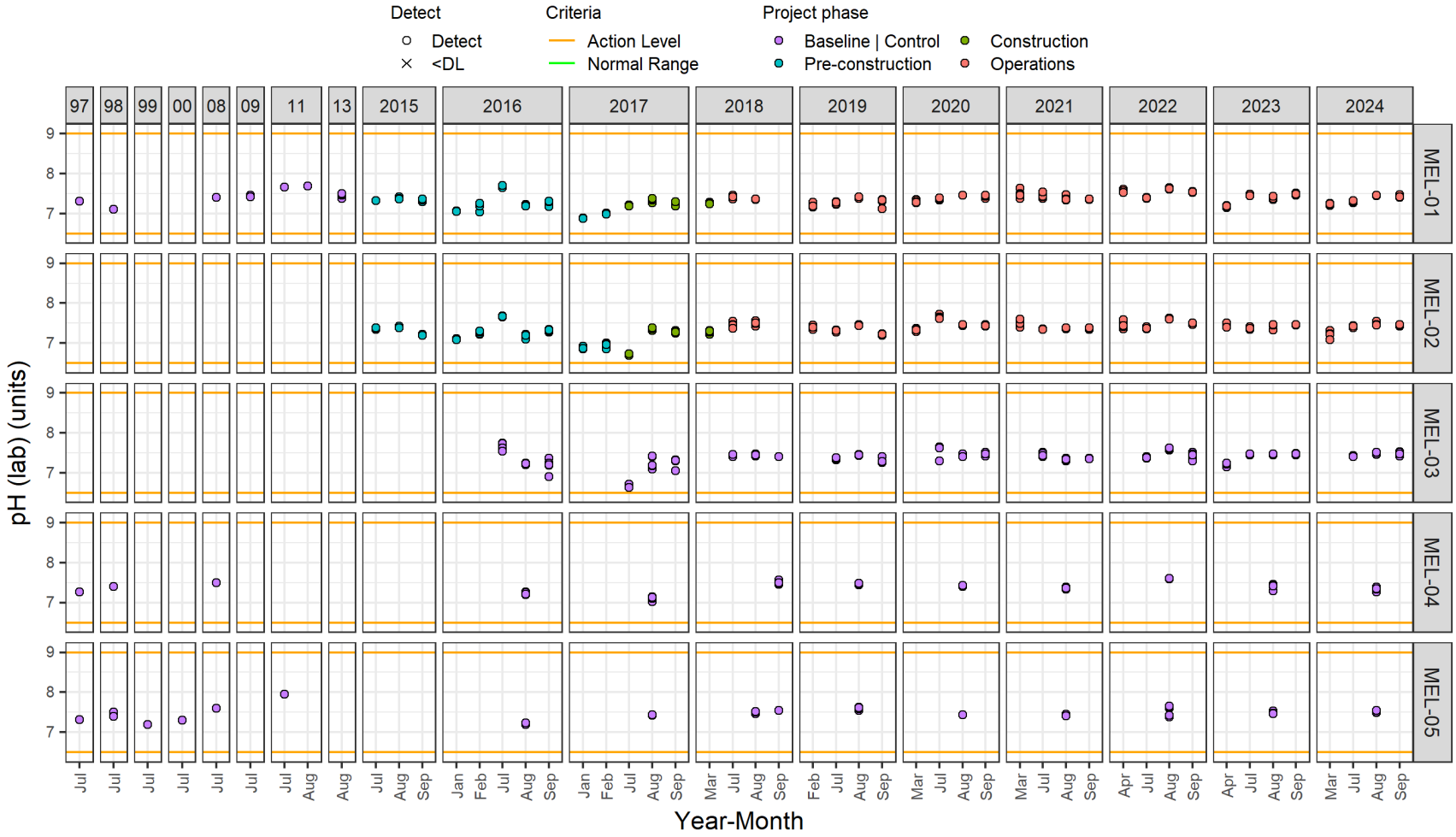


Figure C2-5. Hardness (mg/L)

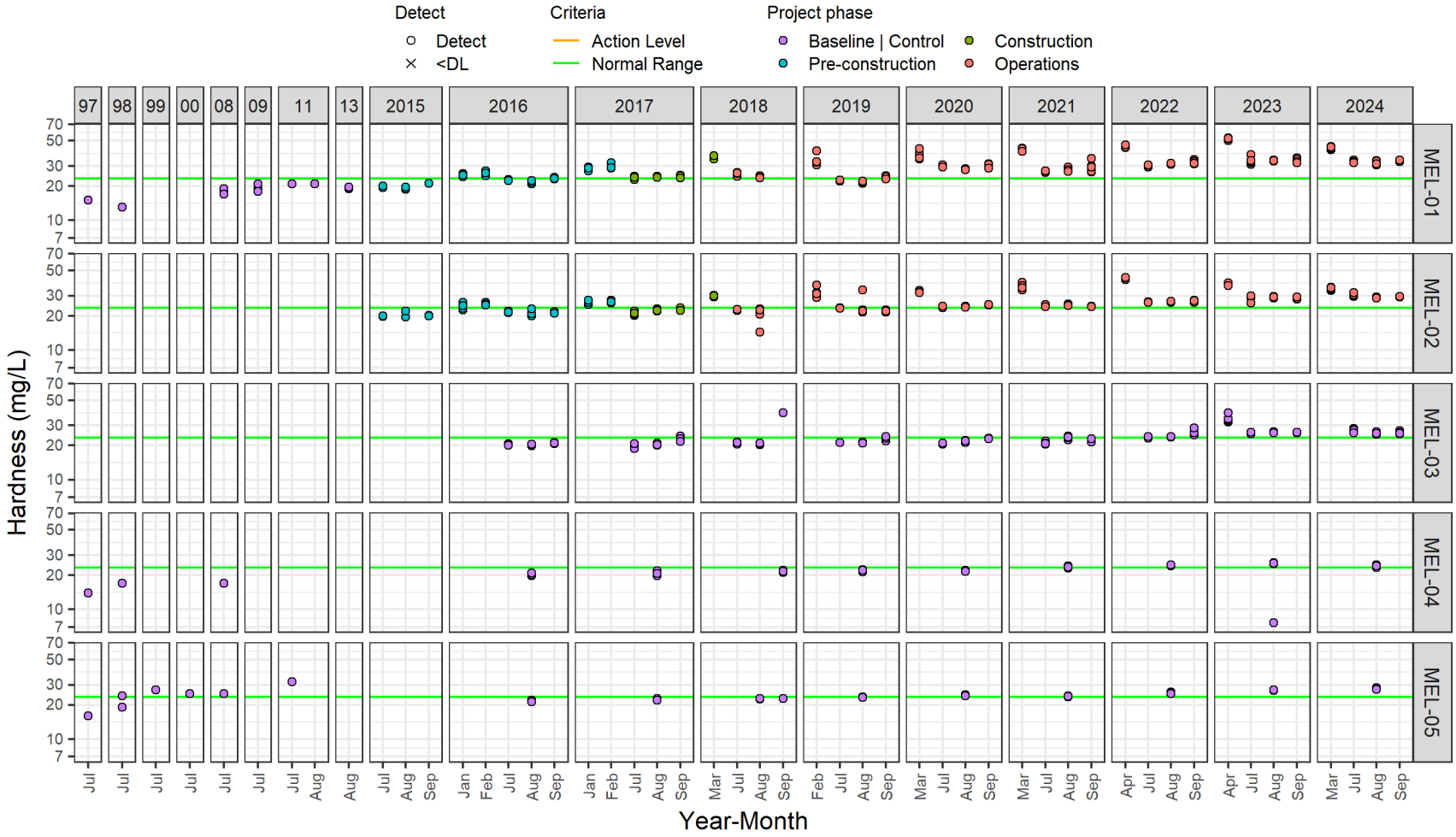


Figure C2-6. Total dissolved solids (measured; mg/L)

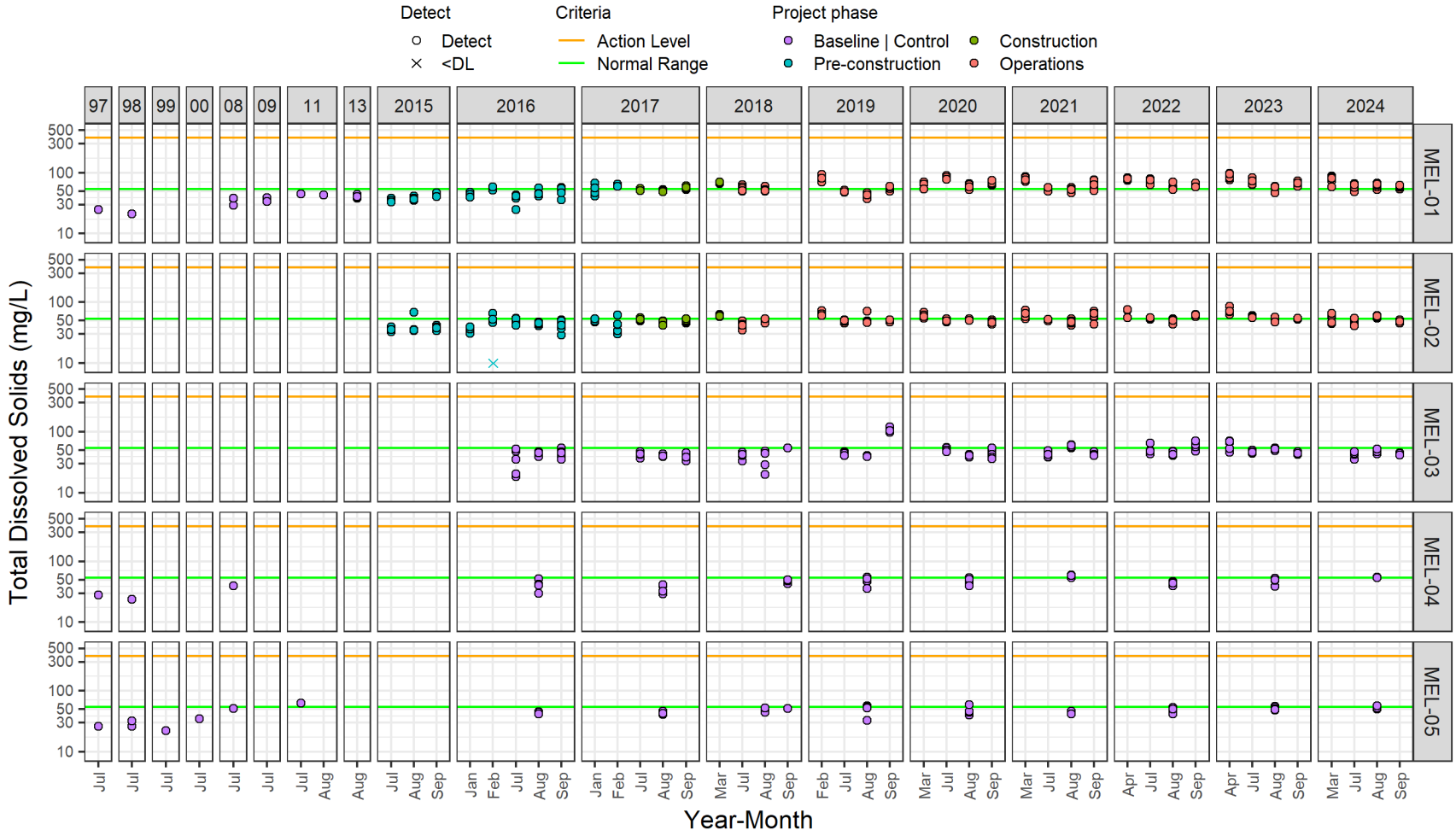


Figure C2-7. Total dissolved solids (calculated; mg/L)

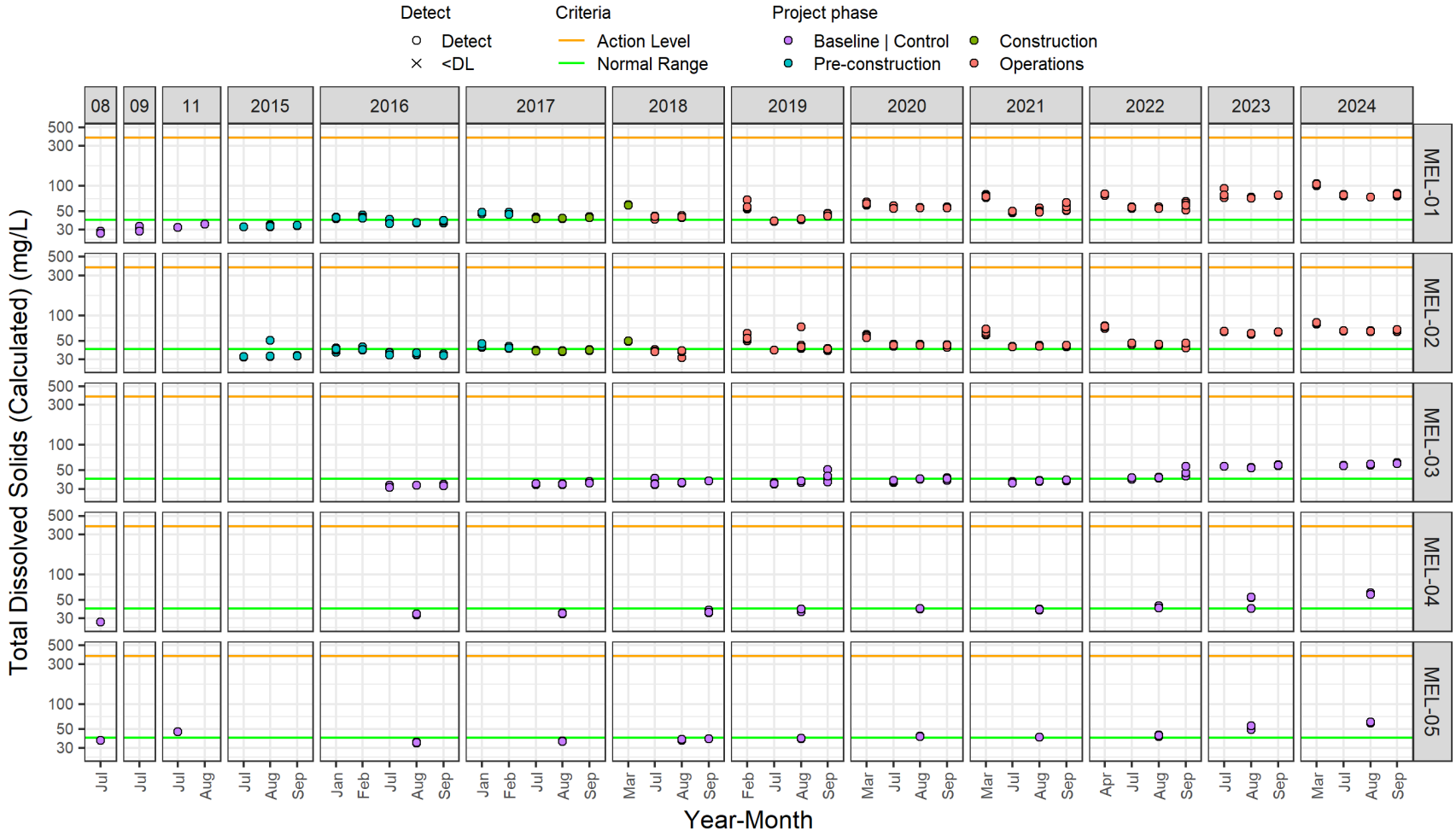


Figure C2-8. Total suspended solids (mg/L)

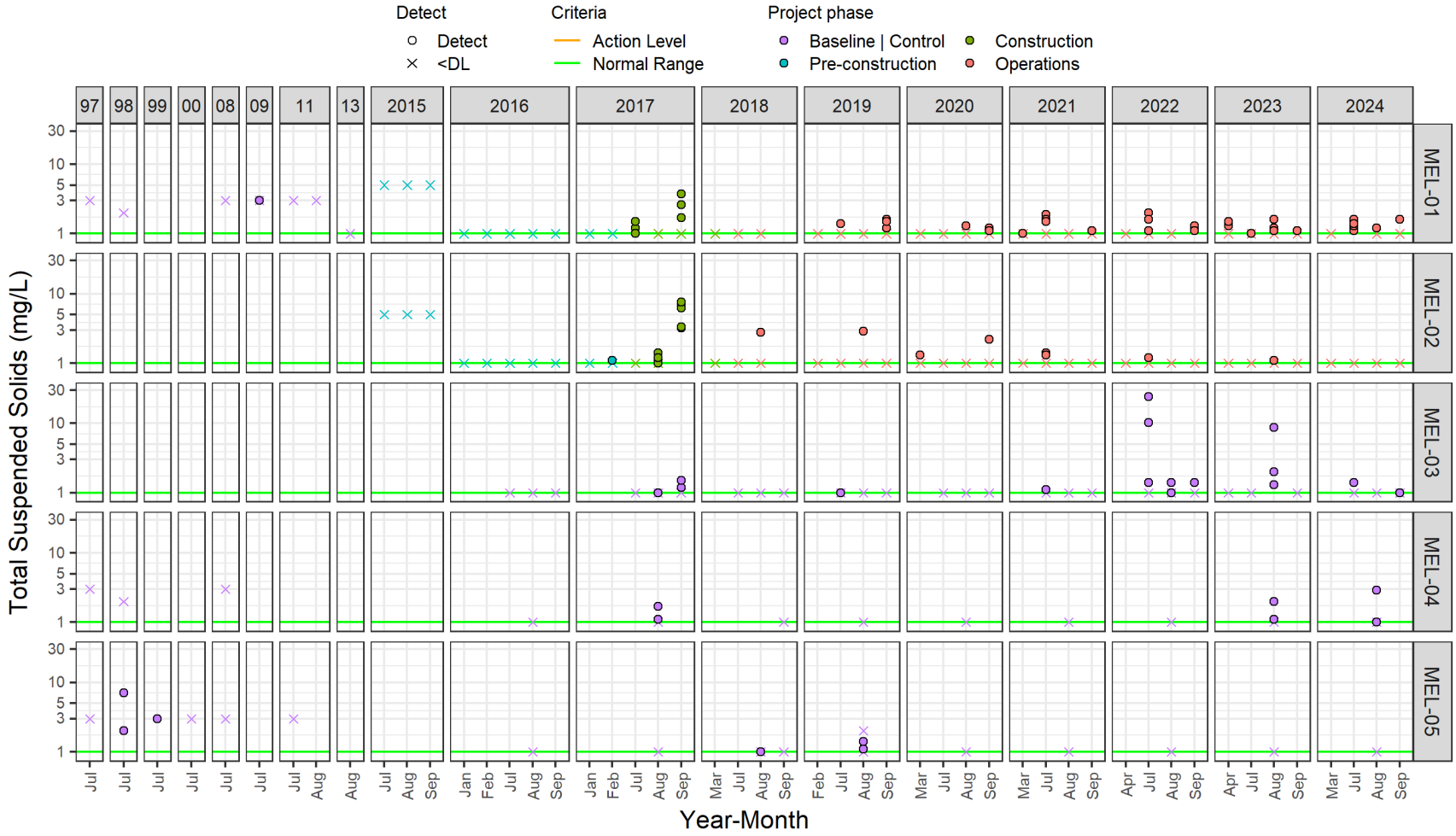


Figure C2-9. Lab measured turbidity (NTU)

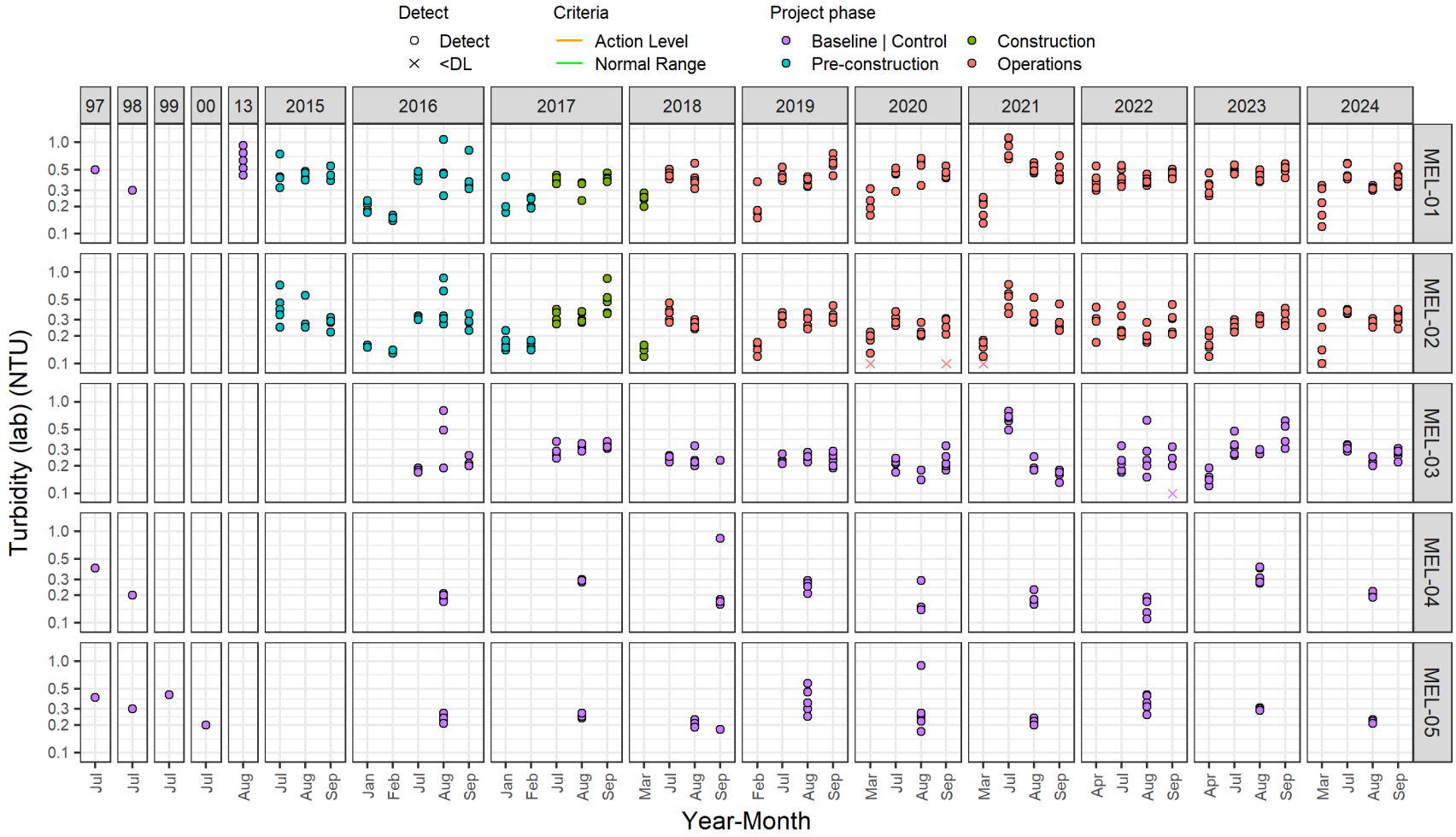


Figure C2-10. Bicarbonate alkalinity (mg/L)

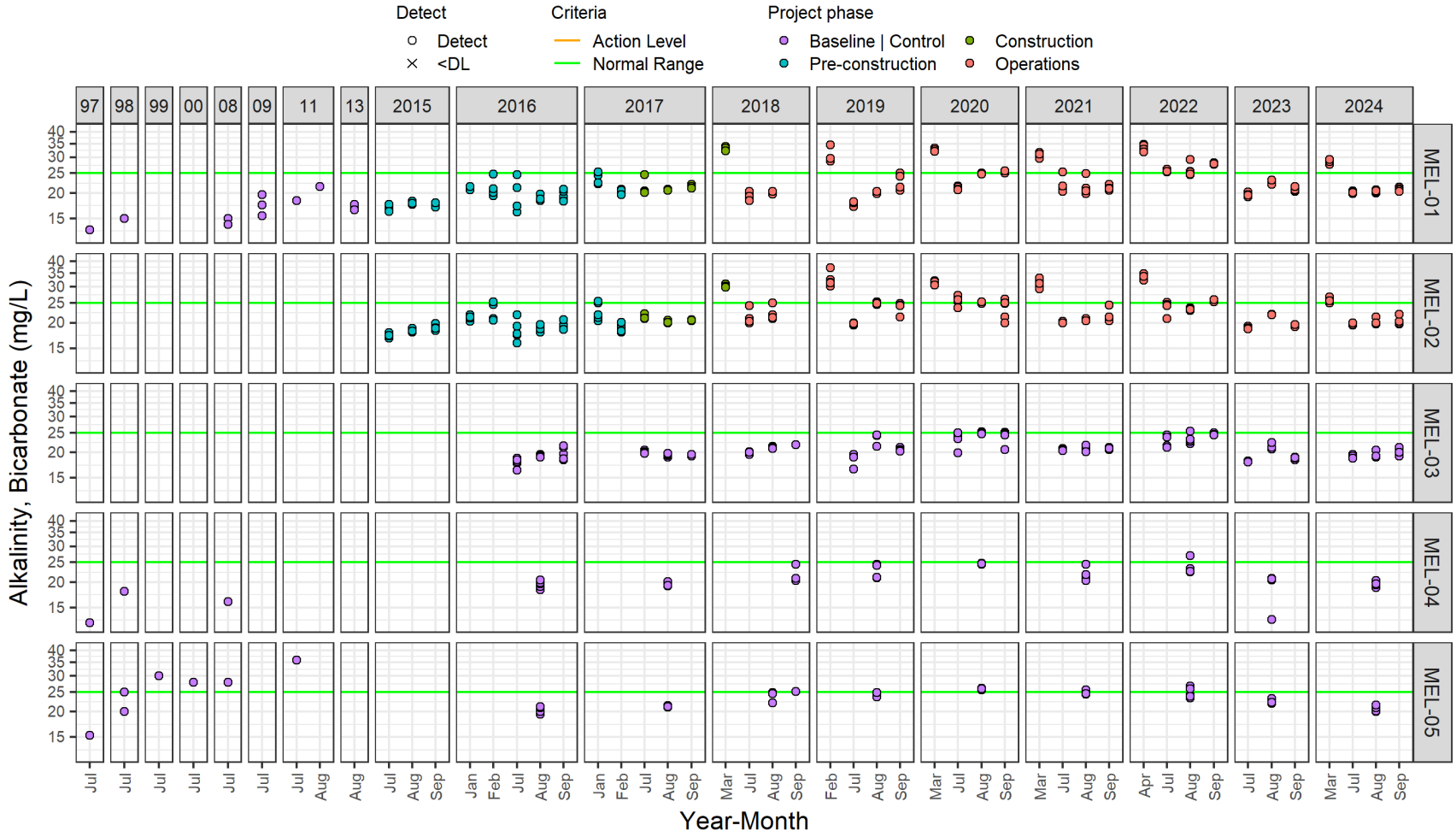


Figure C2-11. Total alkalinity (mg/L)

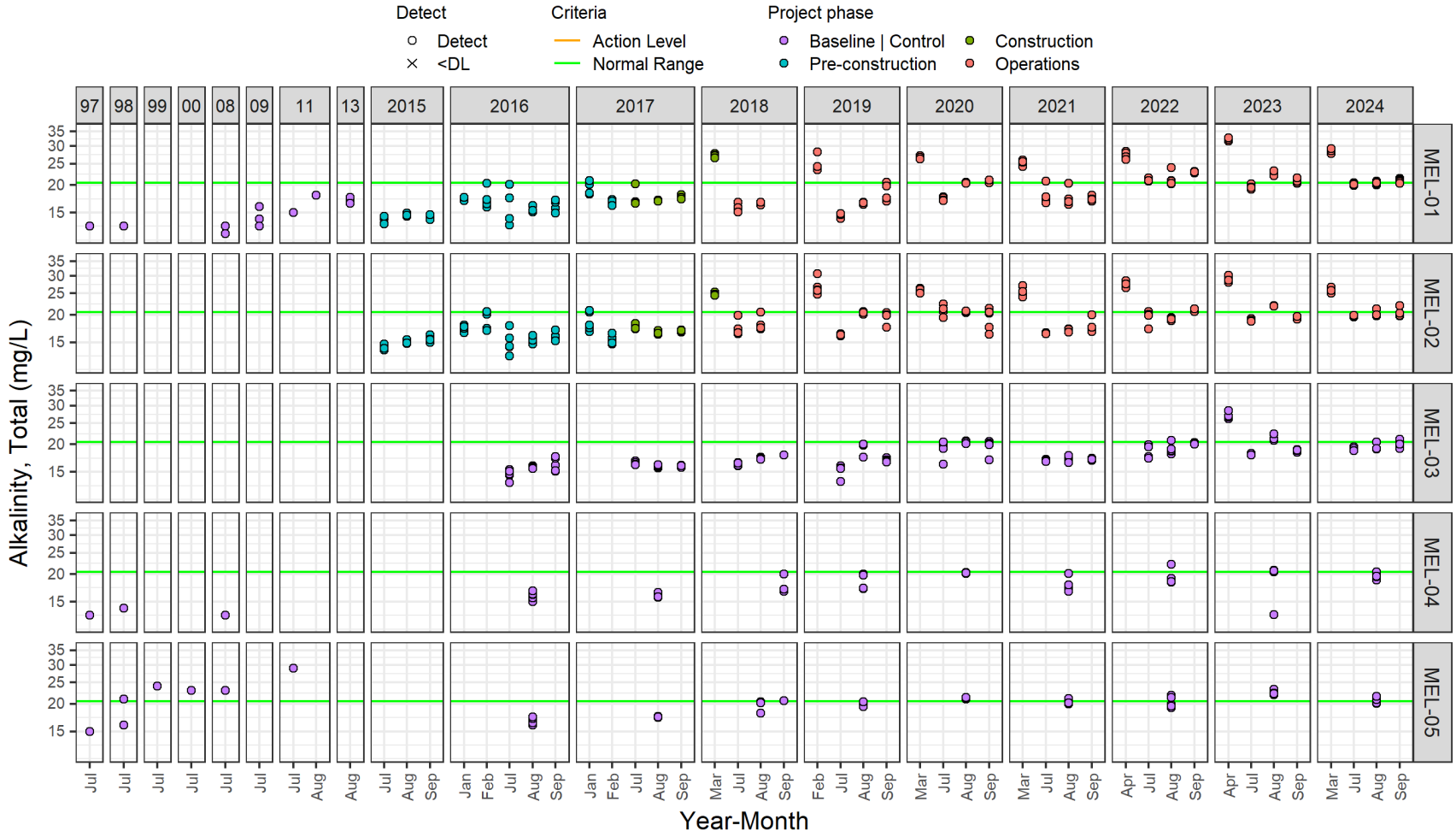


Figure C2-12. Total calcium (mg/L)

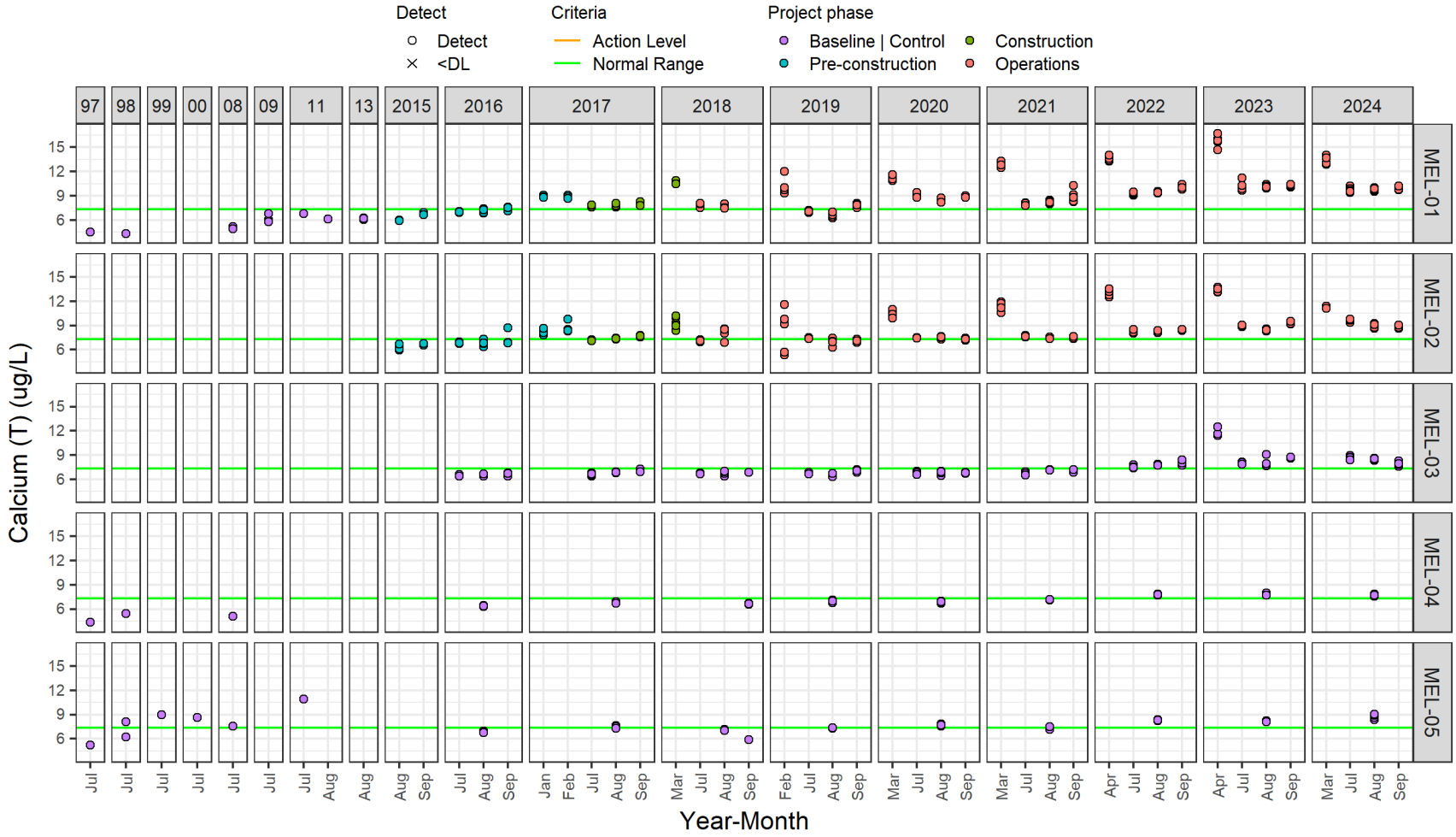


Figure C2-13. Total magnesium (mg/L)

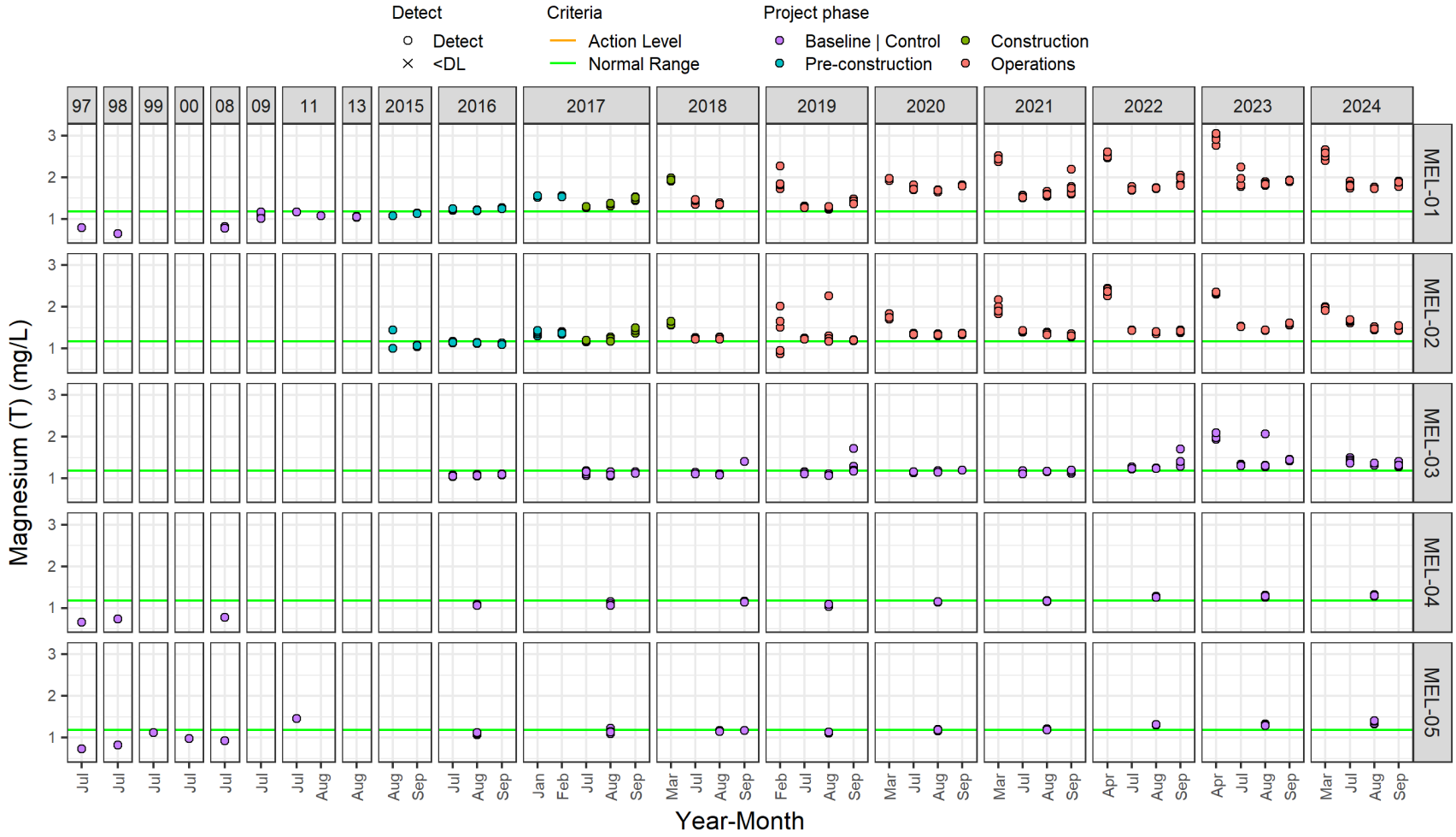


Figure C2-14. Total potassium (mg/L)

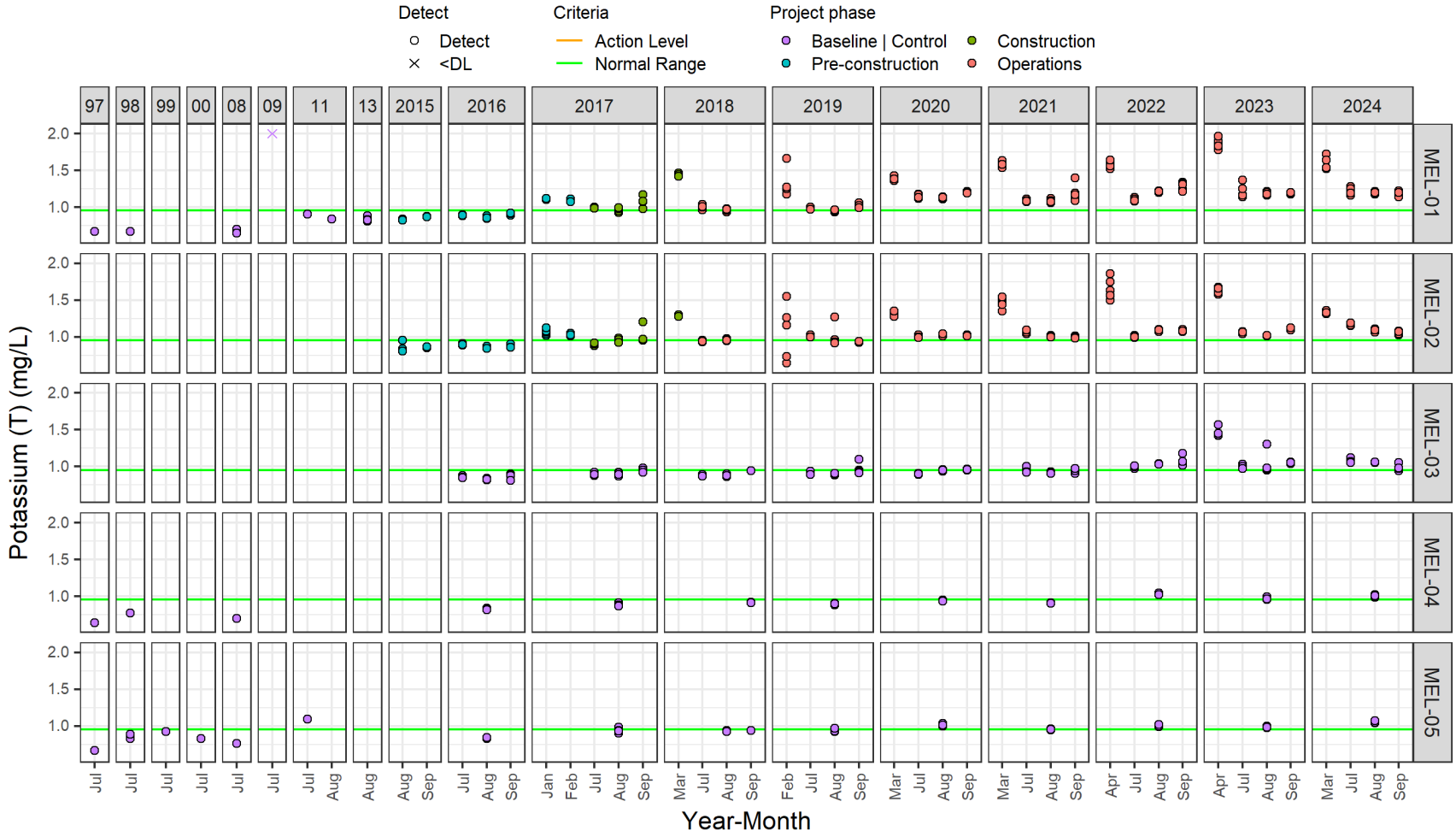


Figure C2-15. Total sodium (mg/L)

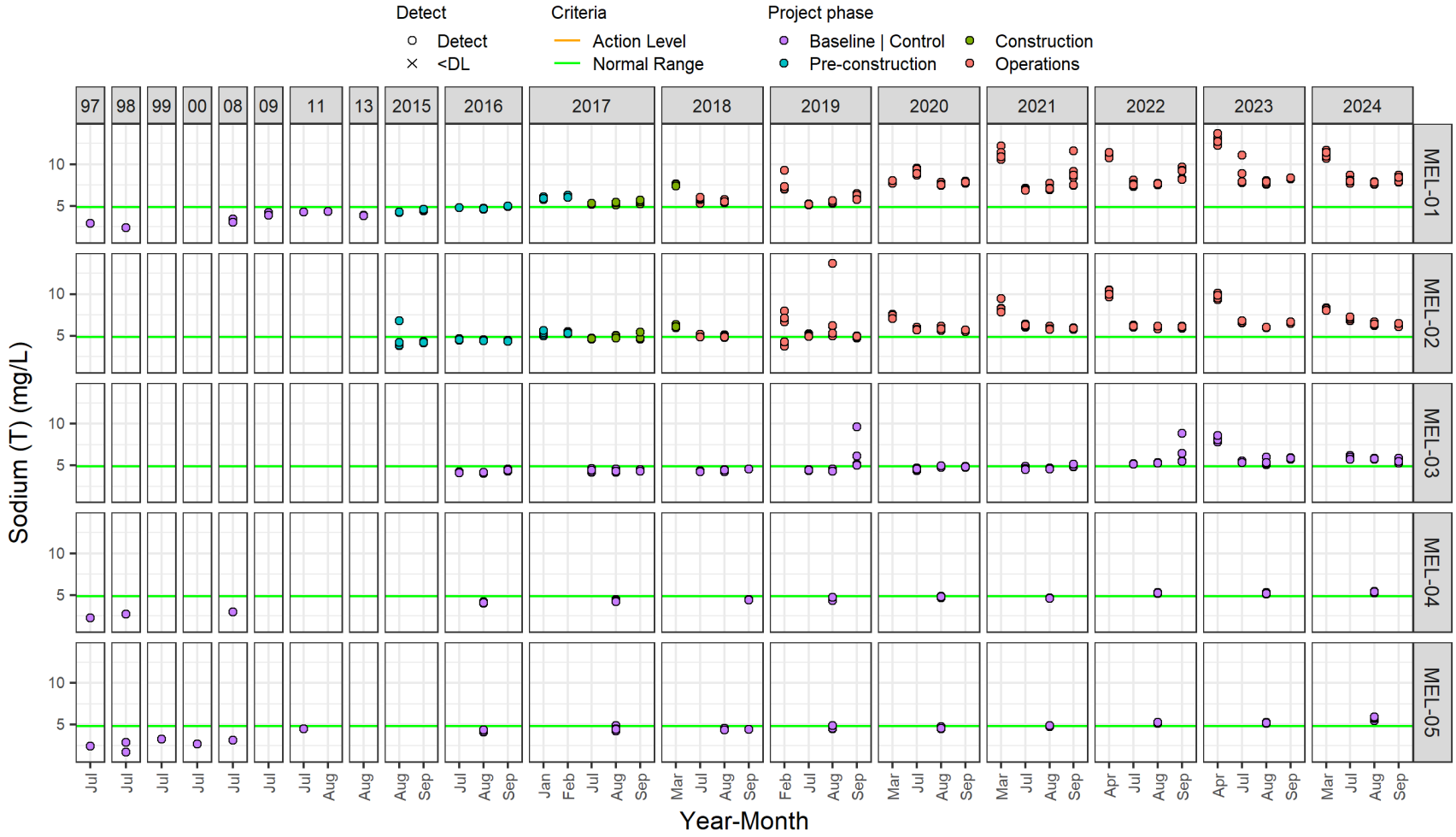


Figure C2-16. Chloride (mg/L)

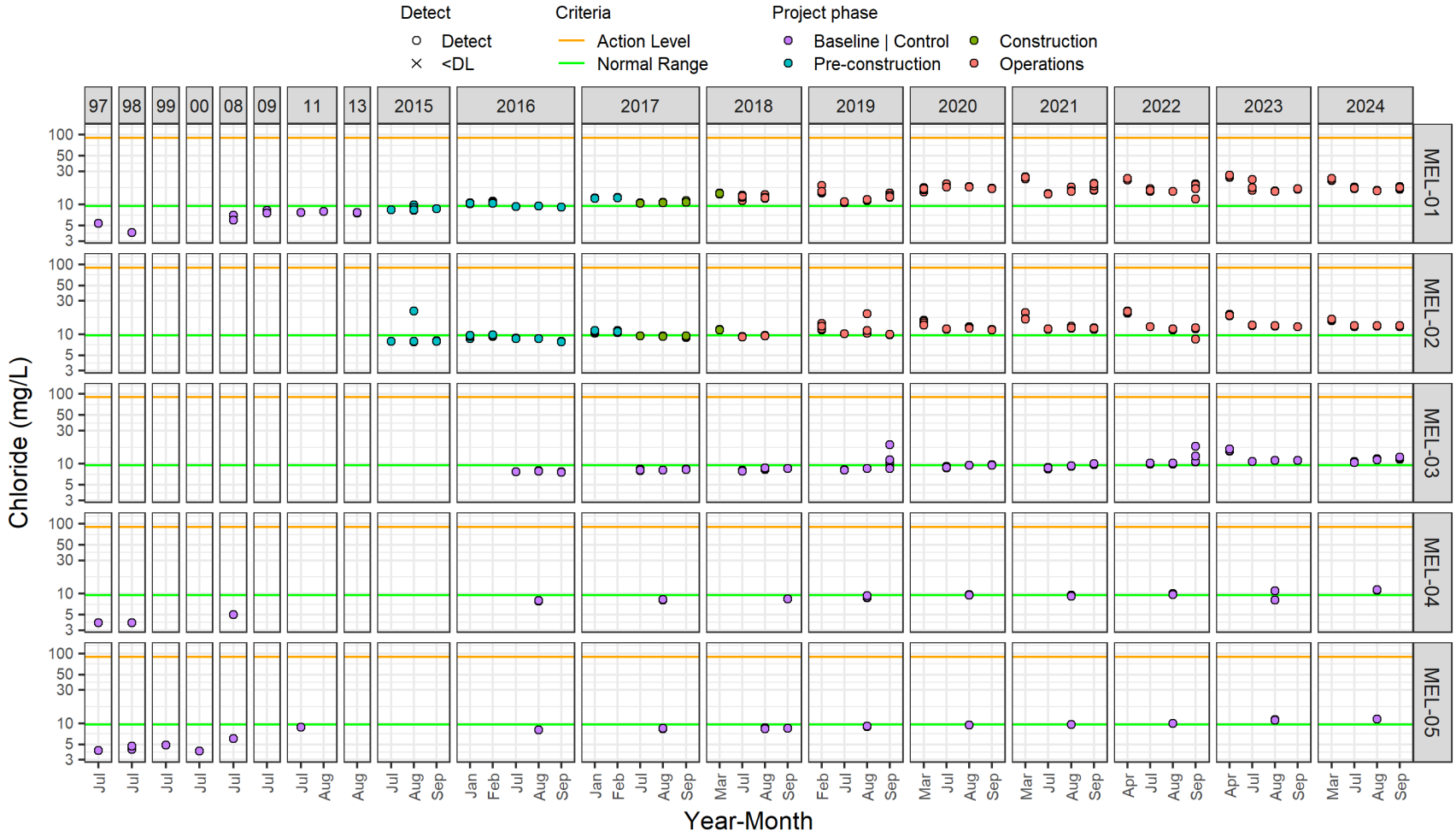


Figure C2-17. Fluoride (mg/L)

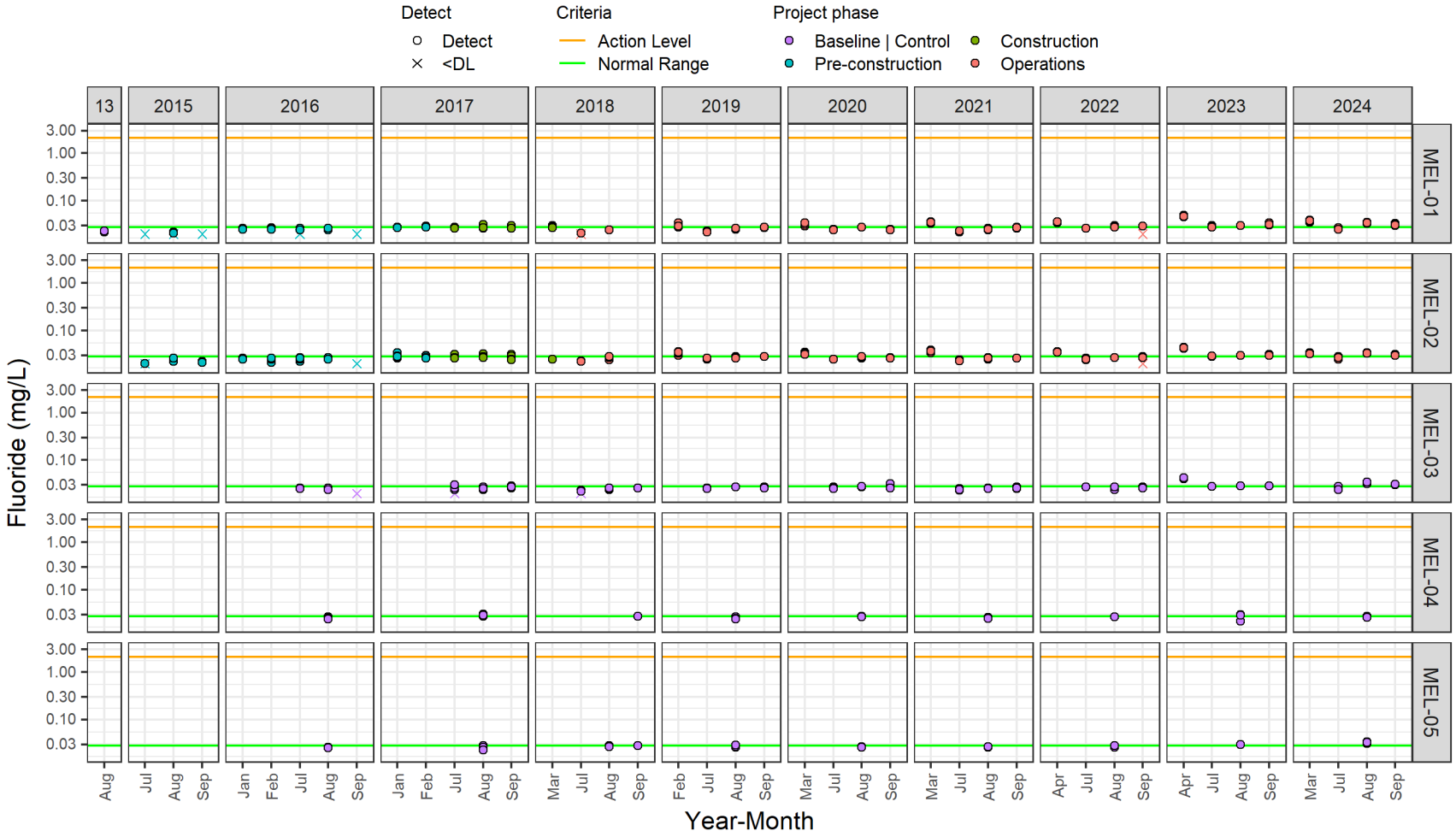


Figure C2-18. Ammonia (as nitrogen) (mg/L)

Notes: Ammonia data from August and September 2021 should be interpreted with caution because of higher detection limits reported by the laboratory.

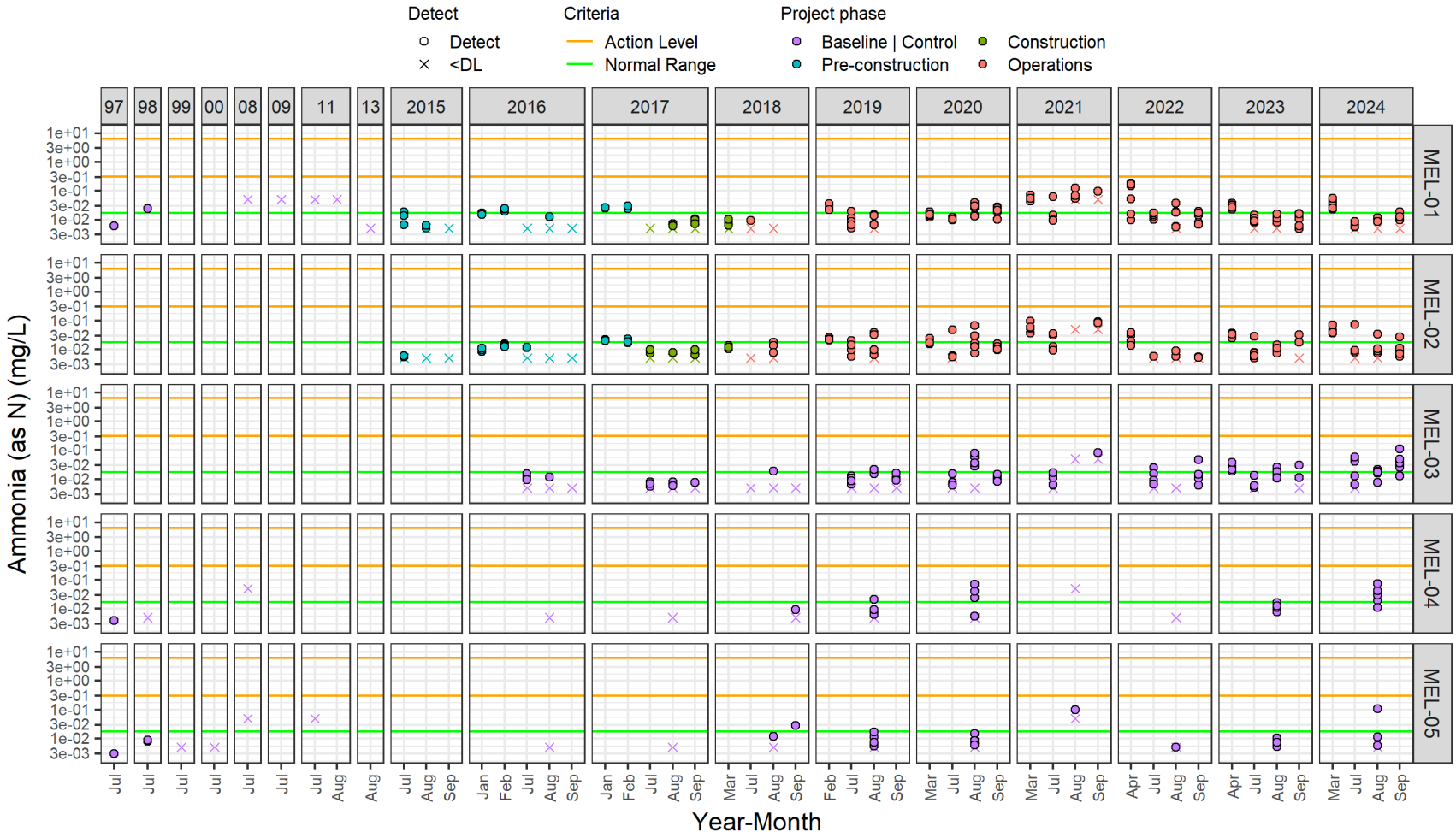


Figure C2-19. Nitrate (as N) (mg/L)

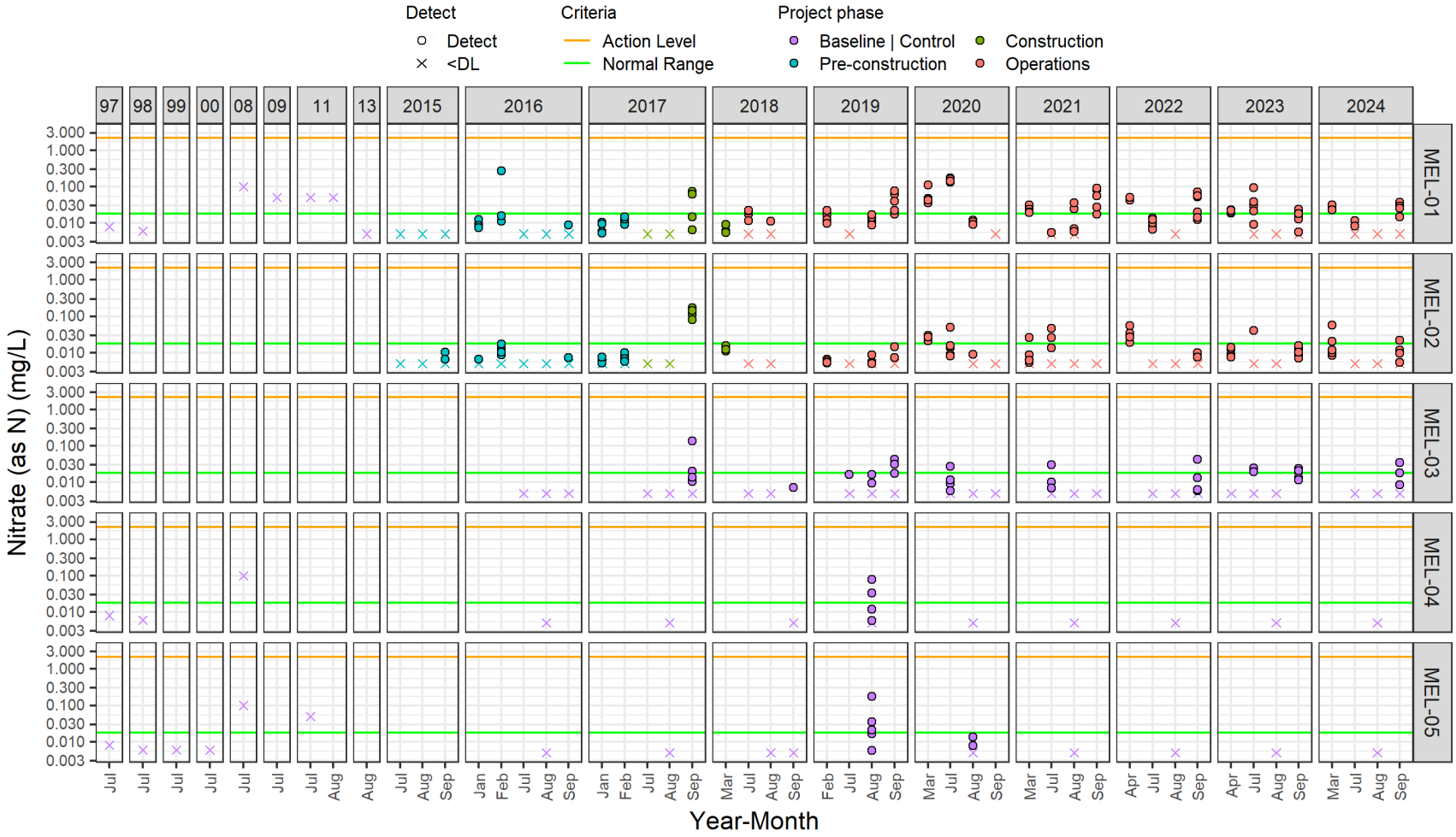


Figure C2-20. Nitrate and nitrite (as N) (mg/L)

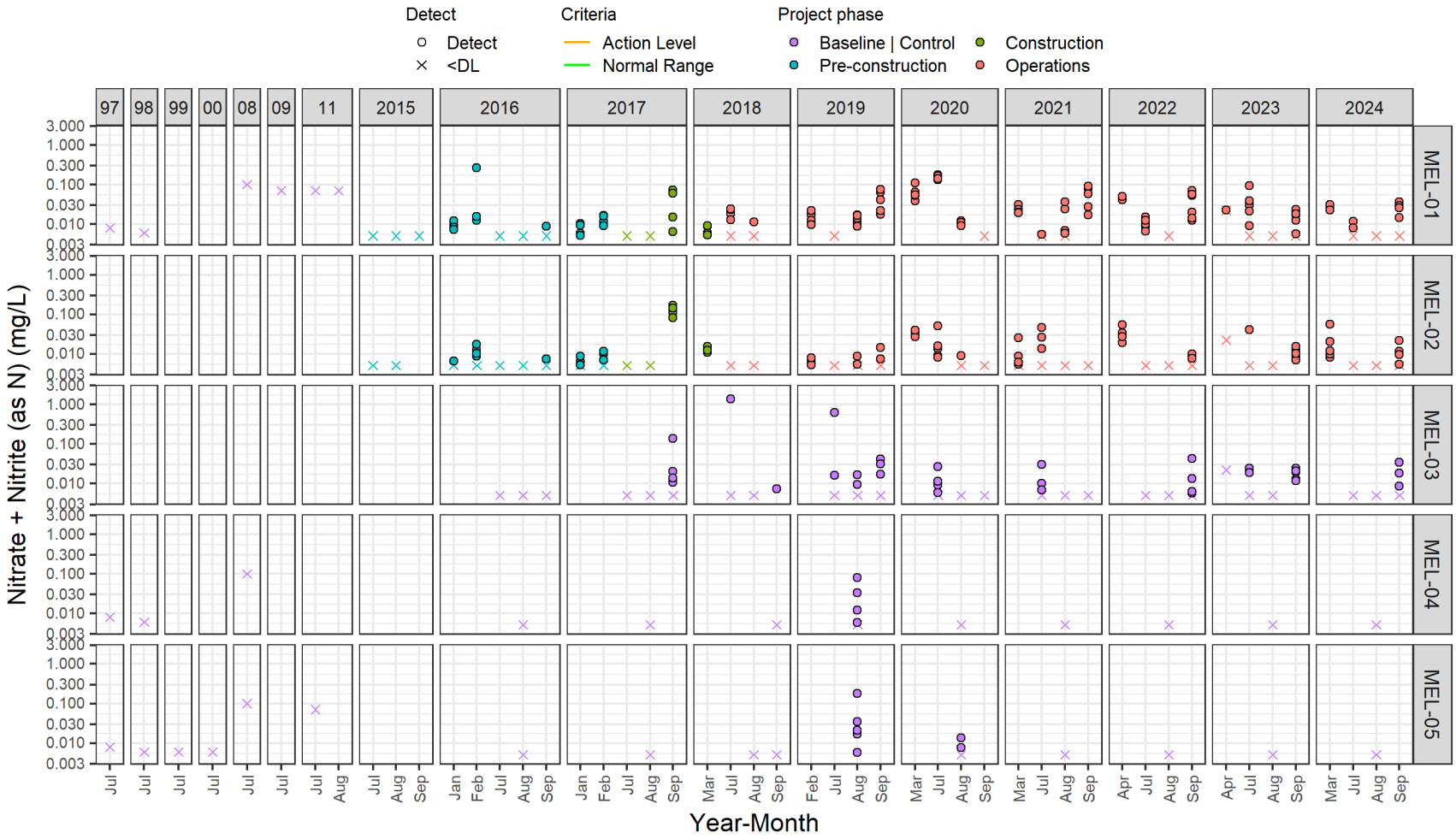


Figure C2-21. Total Kjeldahl nitrogen (TKN; mg/L)

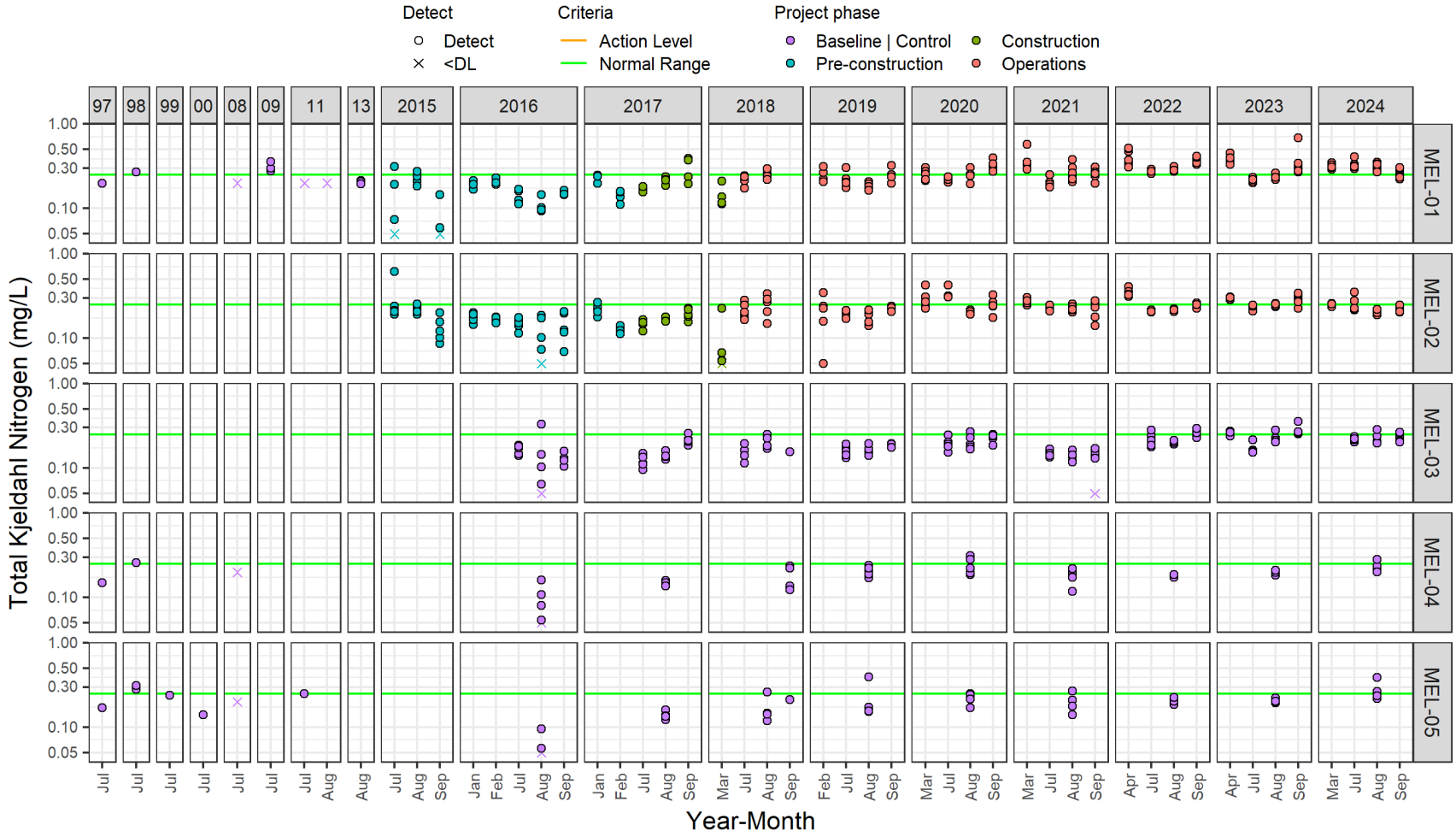


Figure C2-22. Sulphate (mg/L)

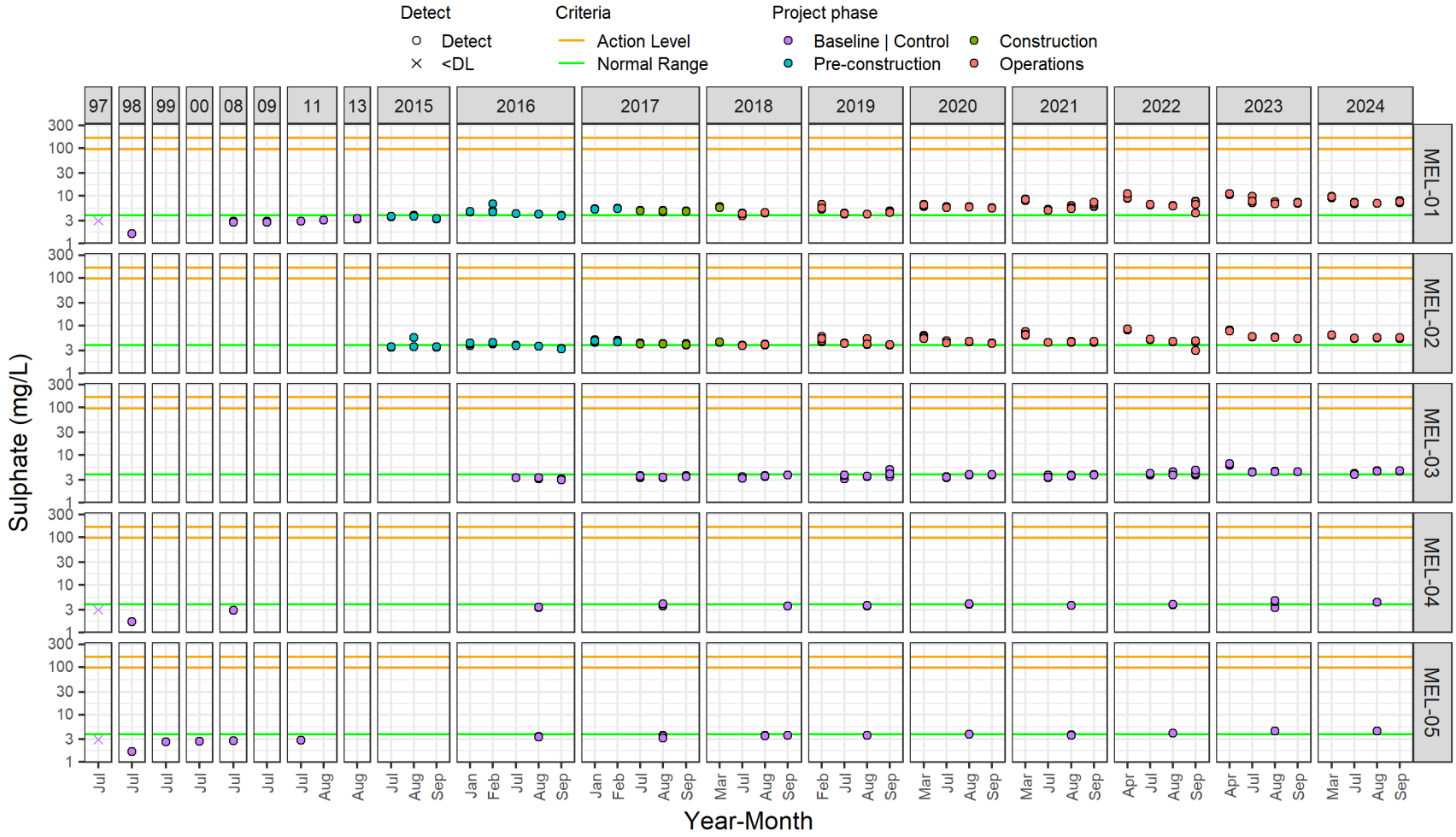


Figure C2-23. Total phosphorus (mg/L)

Notes: The AEMP Benchmark for total phosphorus of 0.01 mg/L is questionable given that baseline concentrations of total phosphorus exceeded this value on occasion. The Action Level (0.0075 mg/L) is not shown.

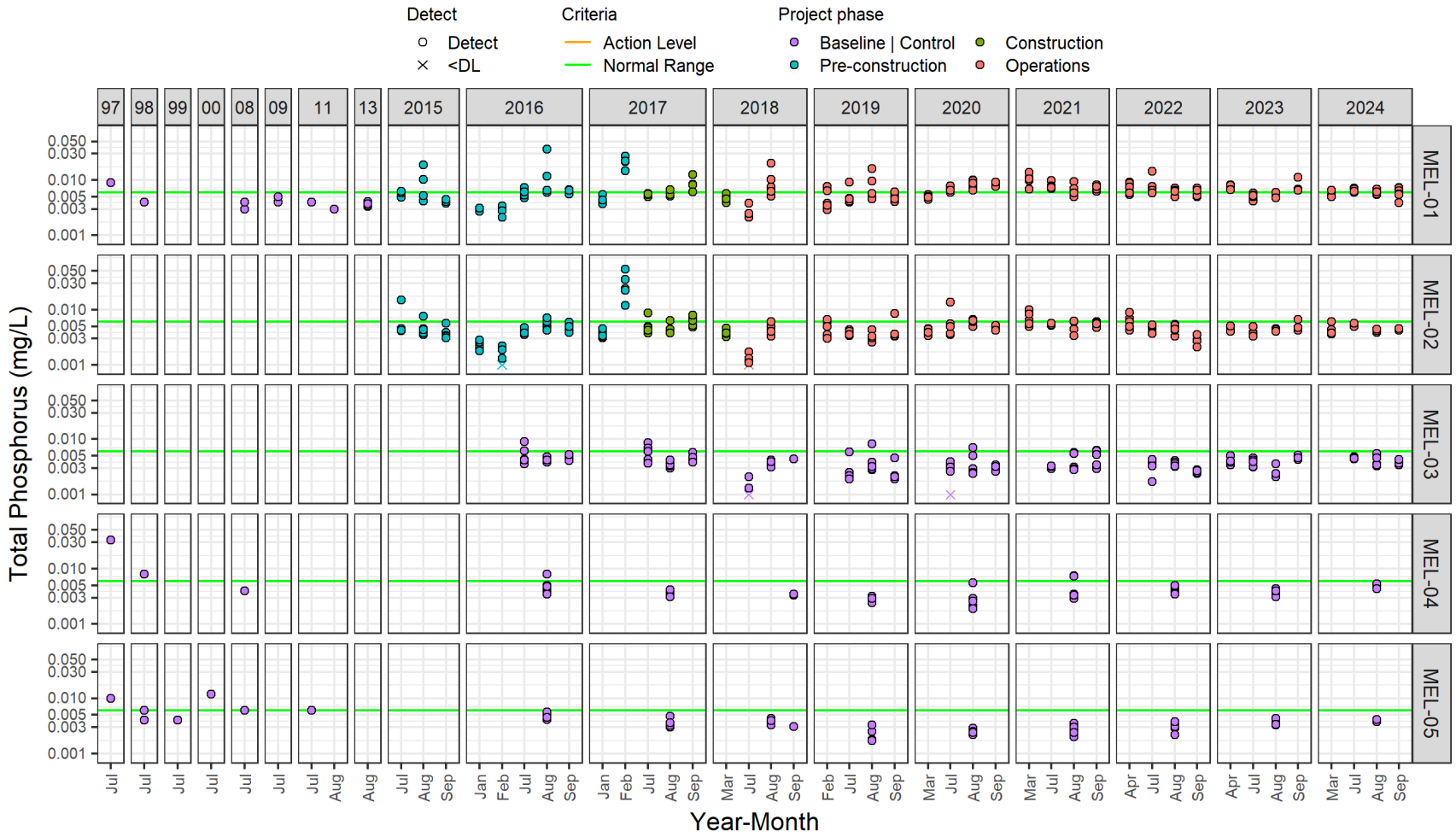


Figure C2-24. Dissolved organic carbon (mg/L)

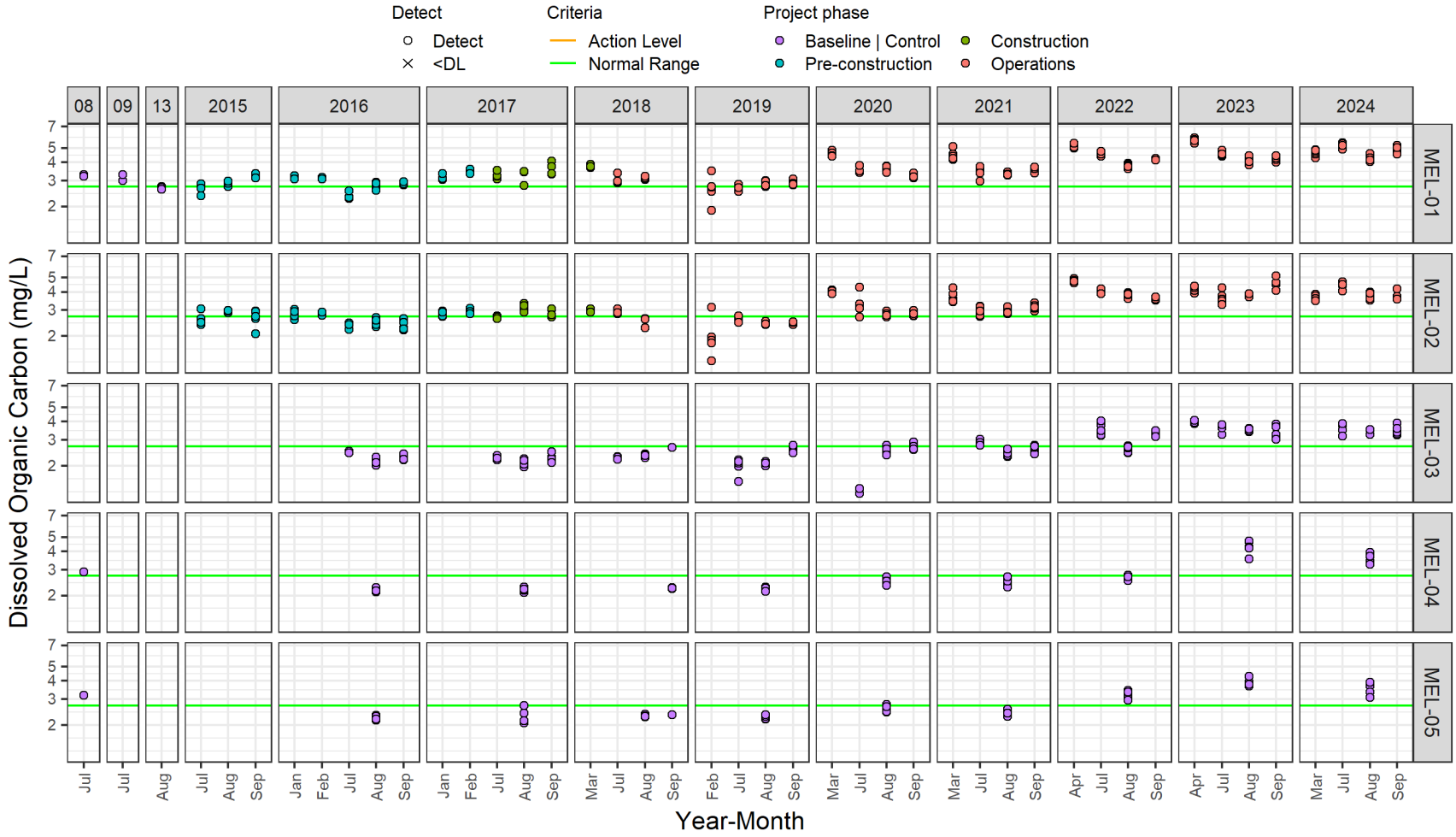


Figure C2-25. Total organic carbon (mg/L)

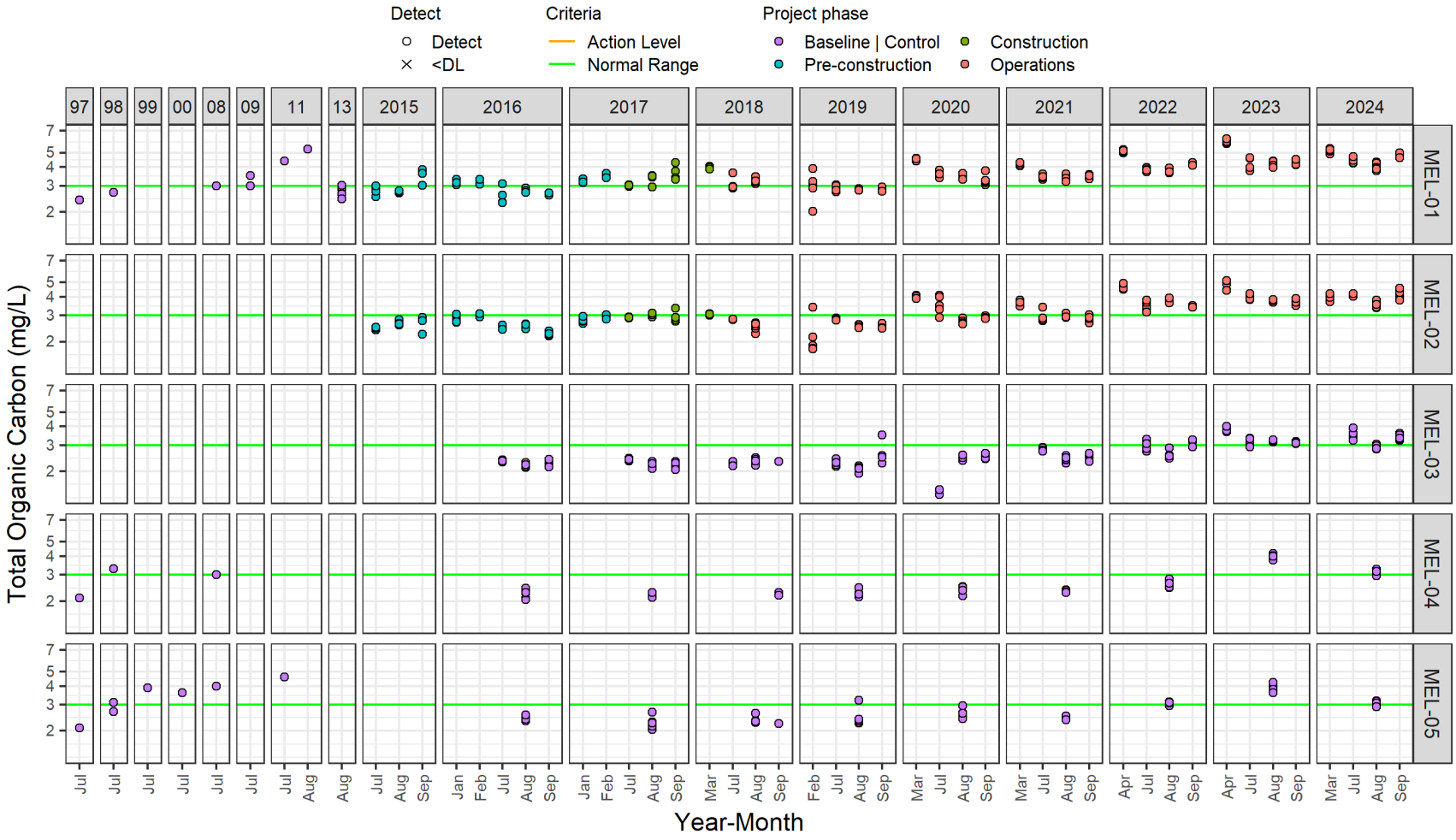


Figure C2-26. Total aluminum (µg/L)

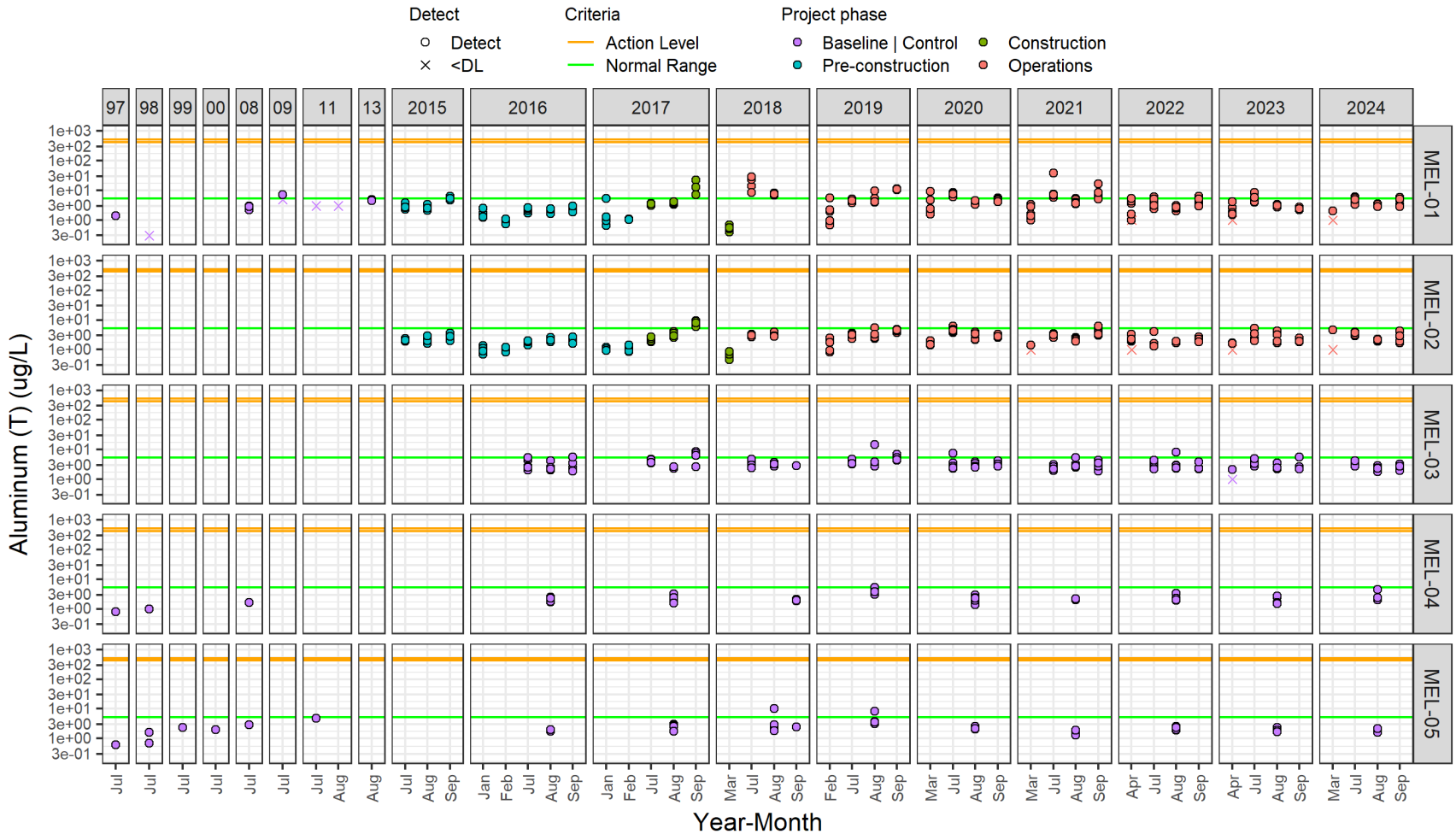


Figure C2-27. Total antimony (µg/L)

Notes: The normal range for antimony is equal to the current detection limit.

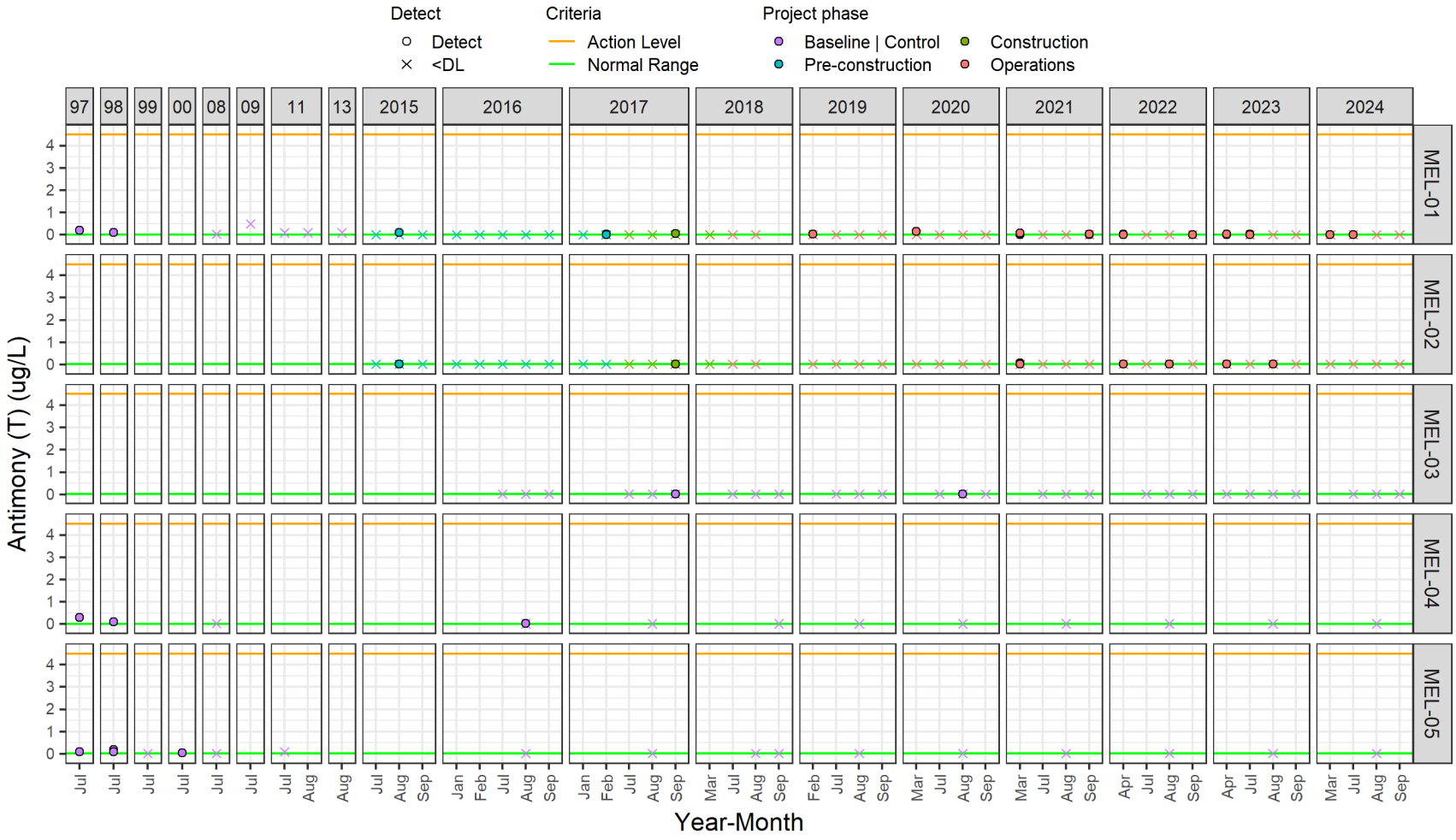


Figure C2-28. Total arsenic (µg/L)

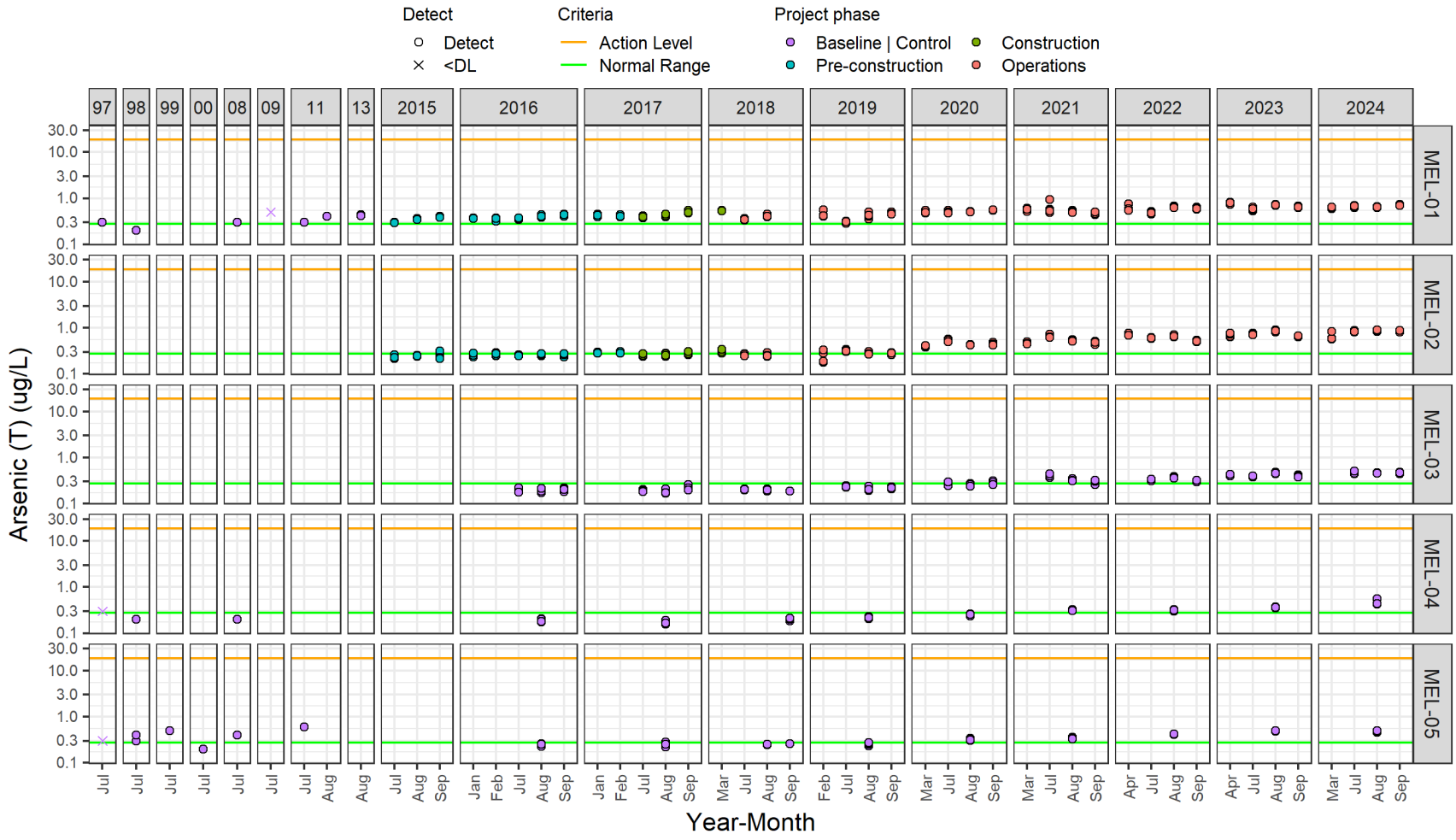


Figure C2-29. Total barium (µg/L)

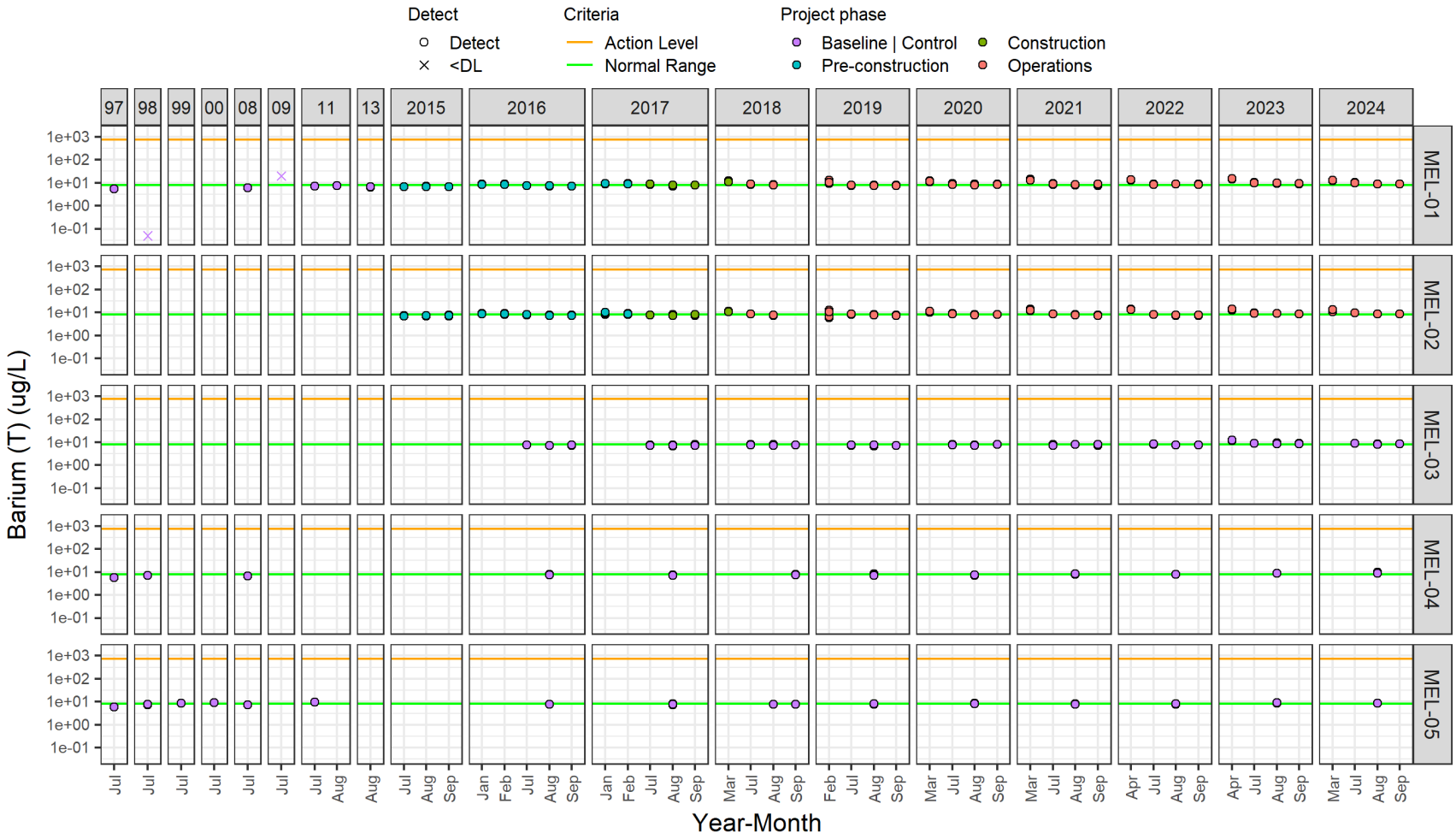


Figure C2-30. Total beryllium (µg/L)

Notes: The normal range for beryllium is equal to the current detection limit.

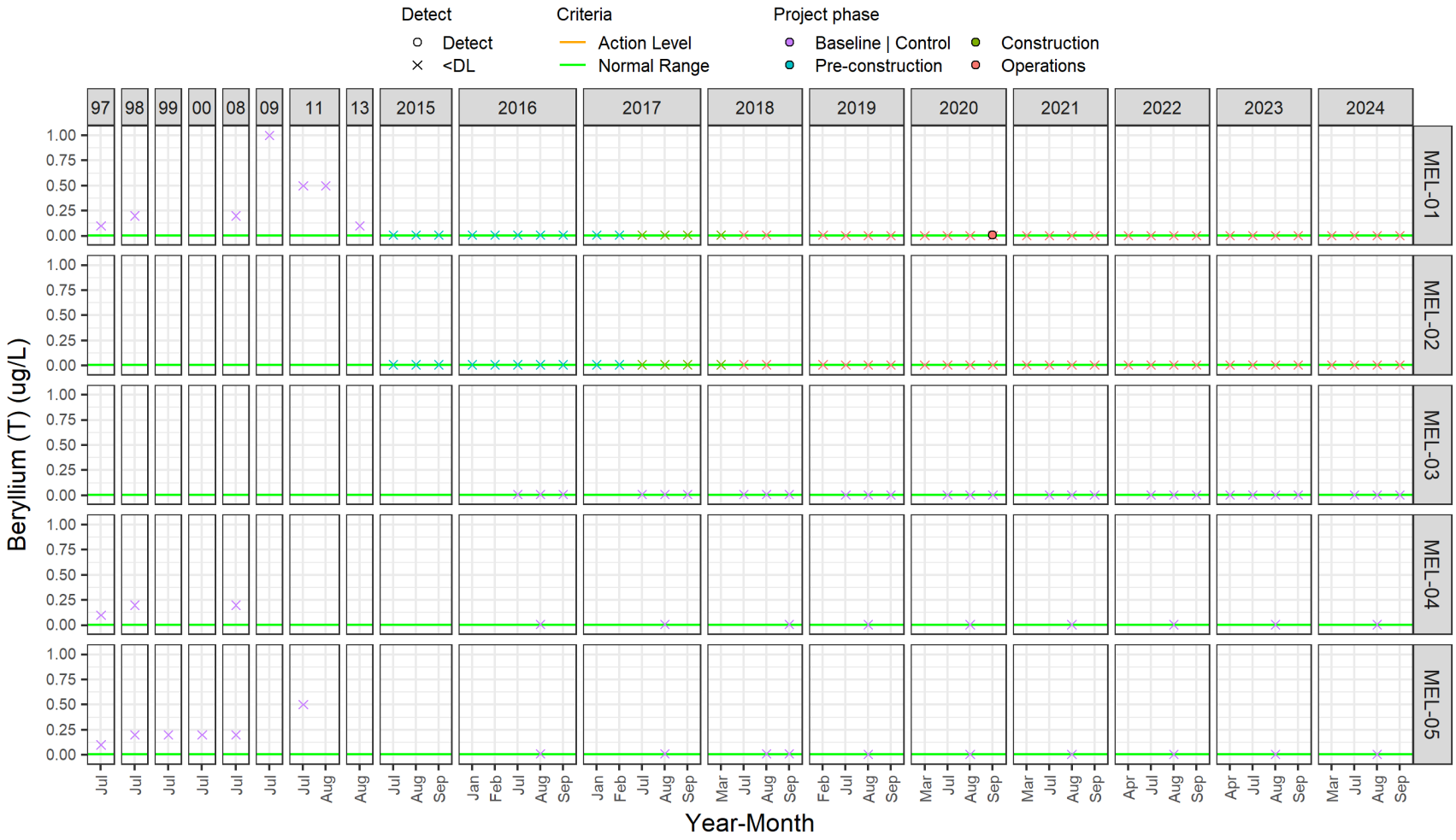


Figure C2-31. Total bismuth (µg/L)

Notes: The normal range for bismuth is equal to the current detection limit.

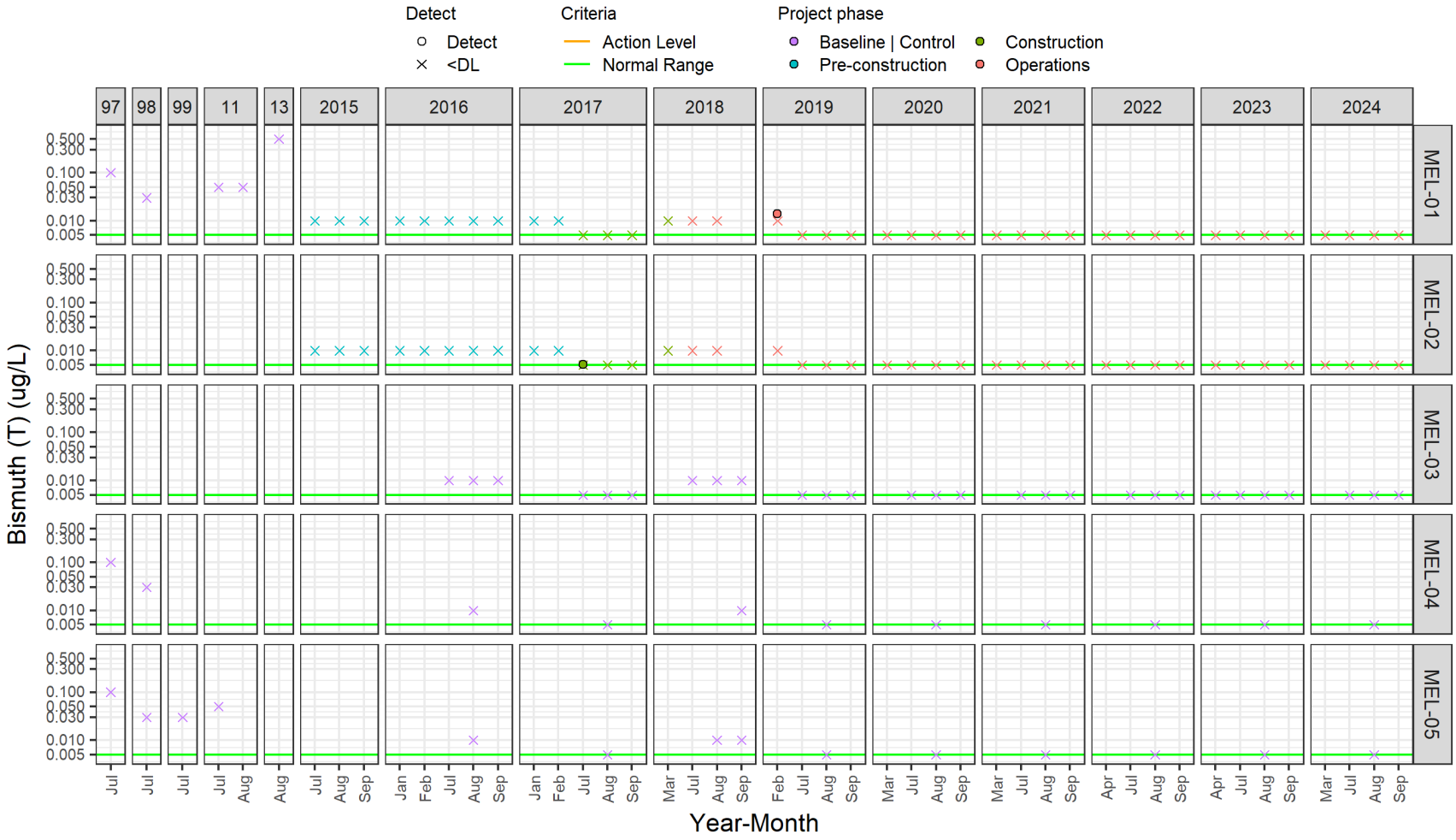


Figure C2-32. Total boron (µg/L)

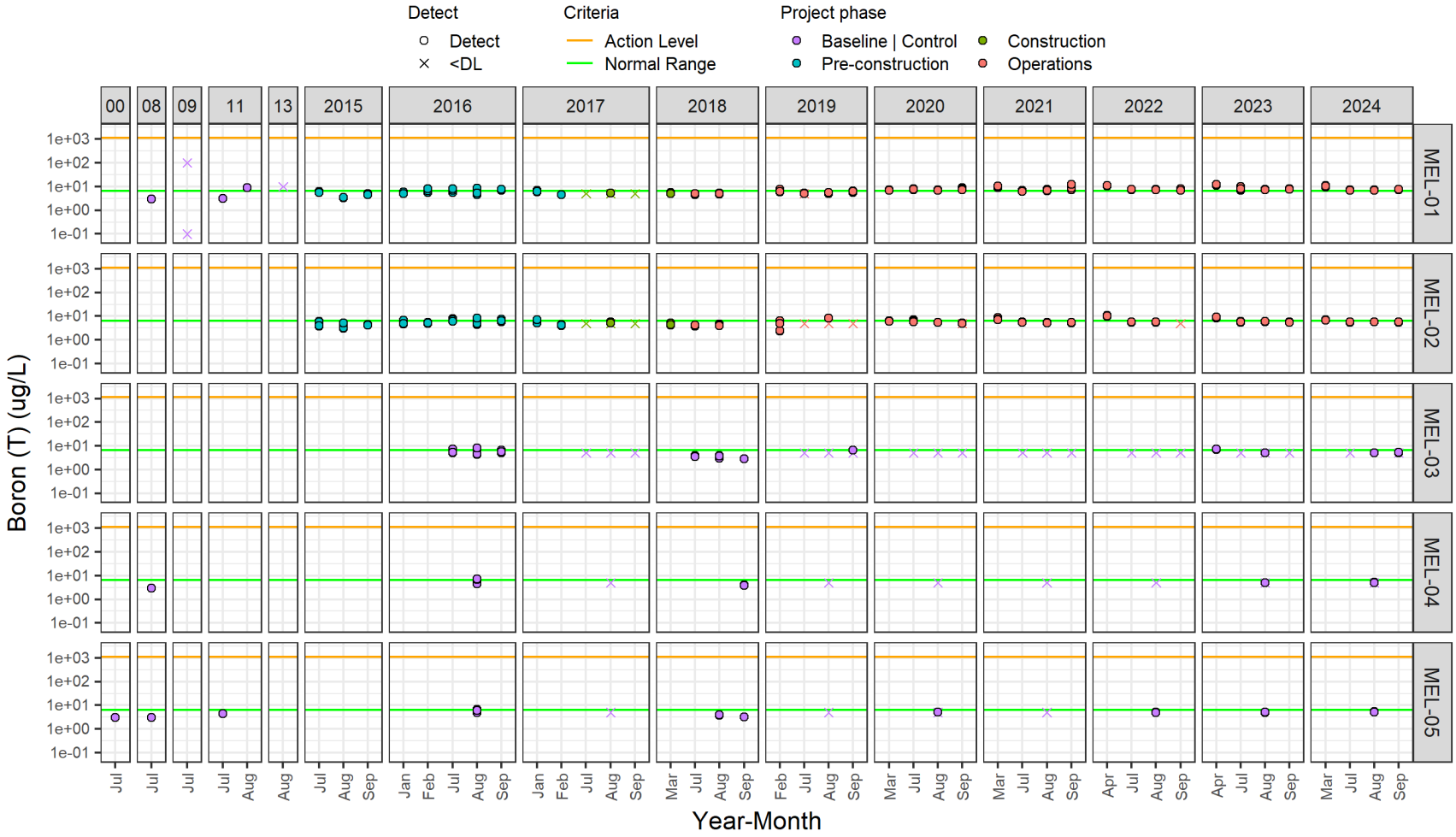


Figure C2-33. Total cadmium (µg/L)

Notes: The normal range for cadmium is equal to the current detection limit. The two lines for the Action Level represent the range in site-specific guidelines for protection of aquatic life for MEL-01 samples in 2024.

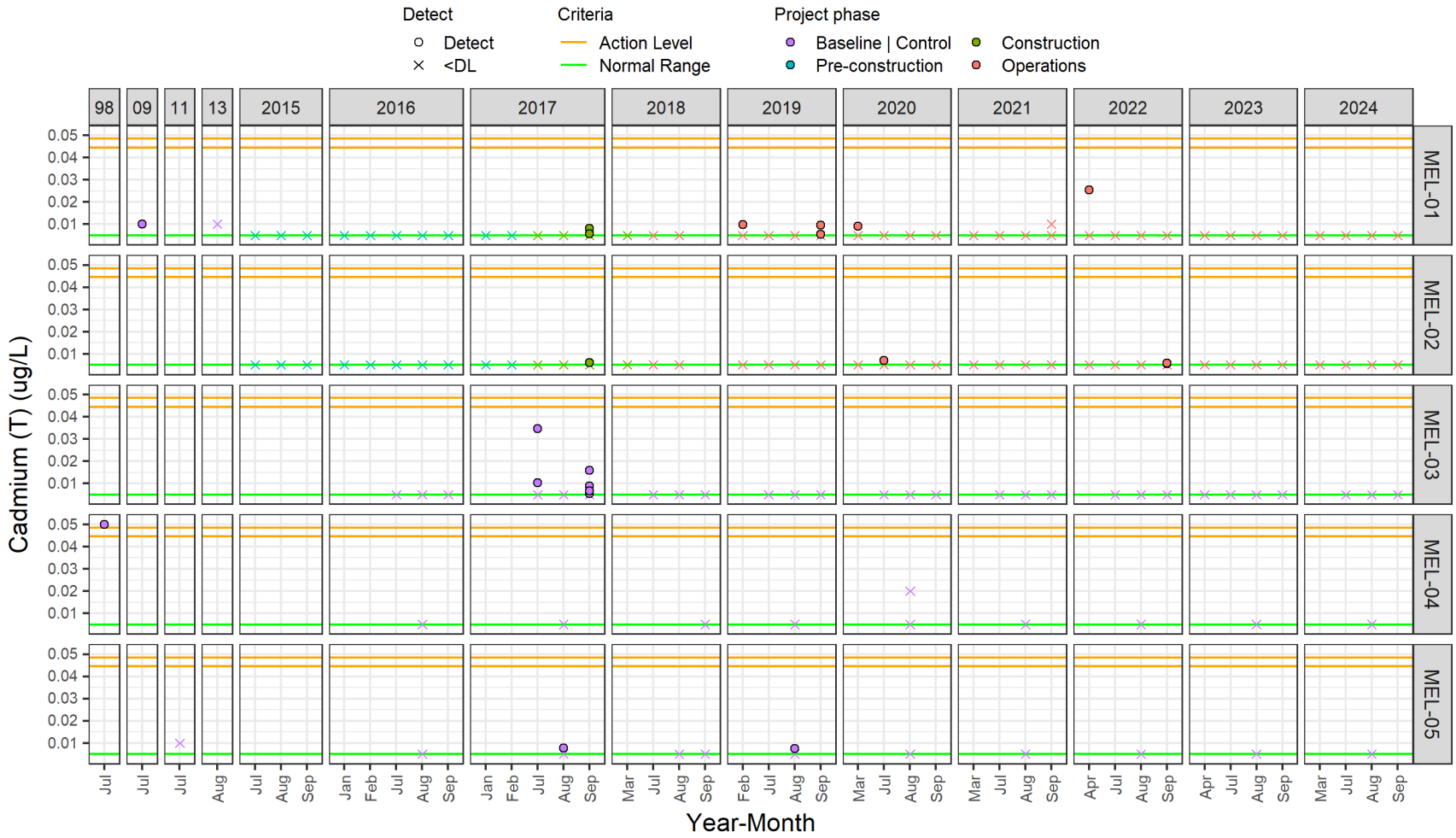


Figure C2-34. Total chromium (µg/L)

Notes: The normal range for chromium is equal to the current detection limit.

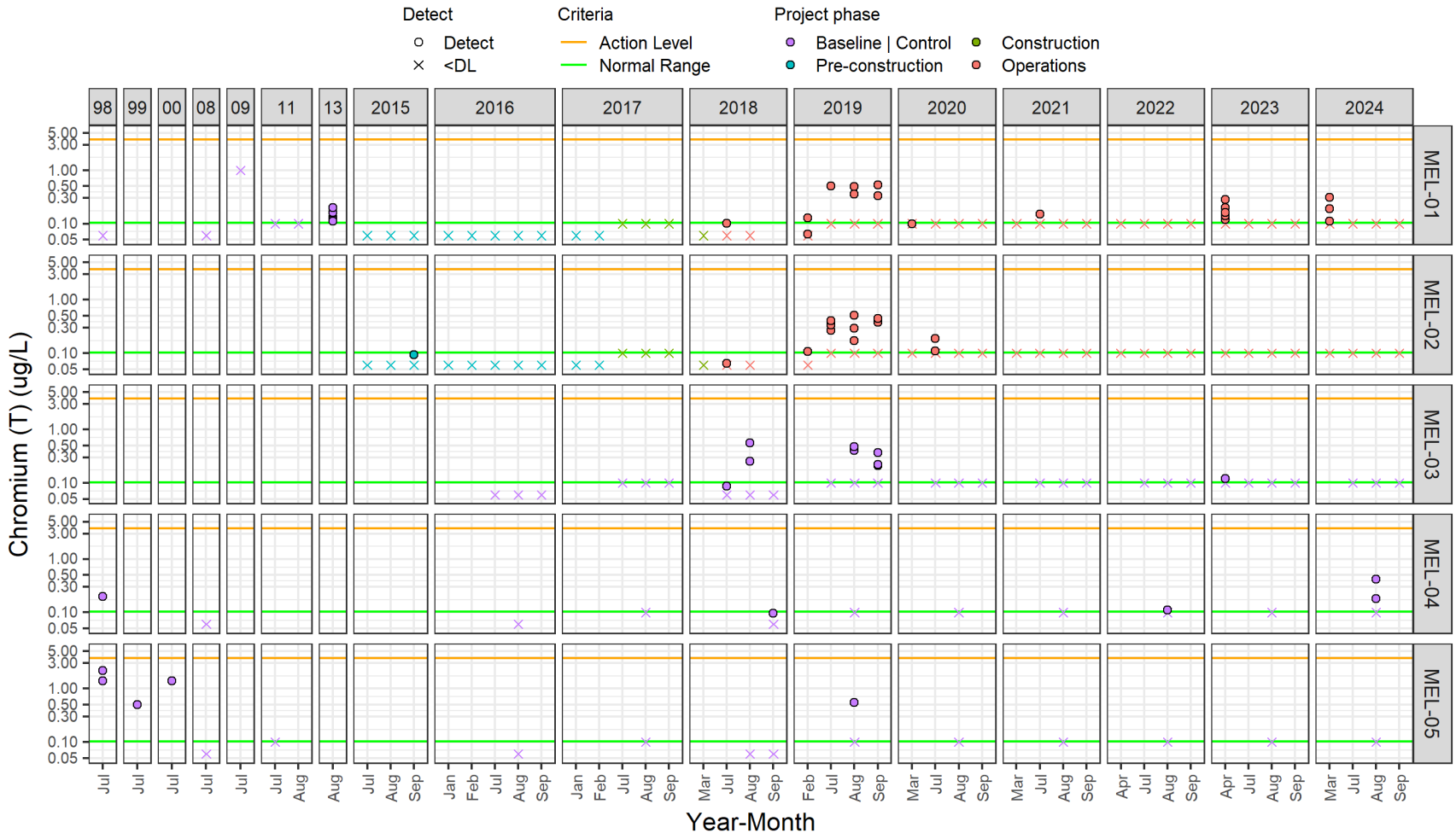


Figure C2-35. Total cobalt (µg/L)

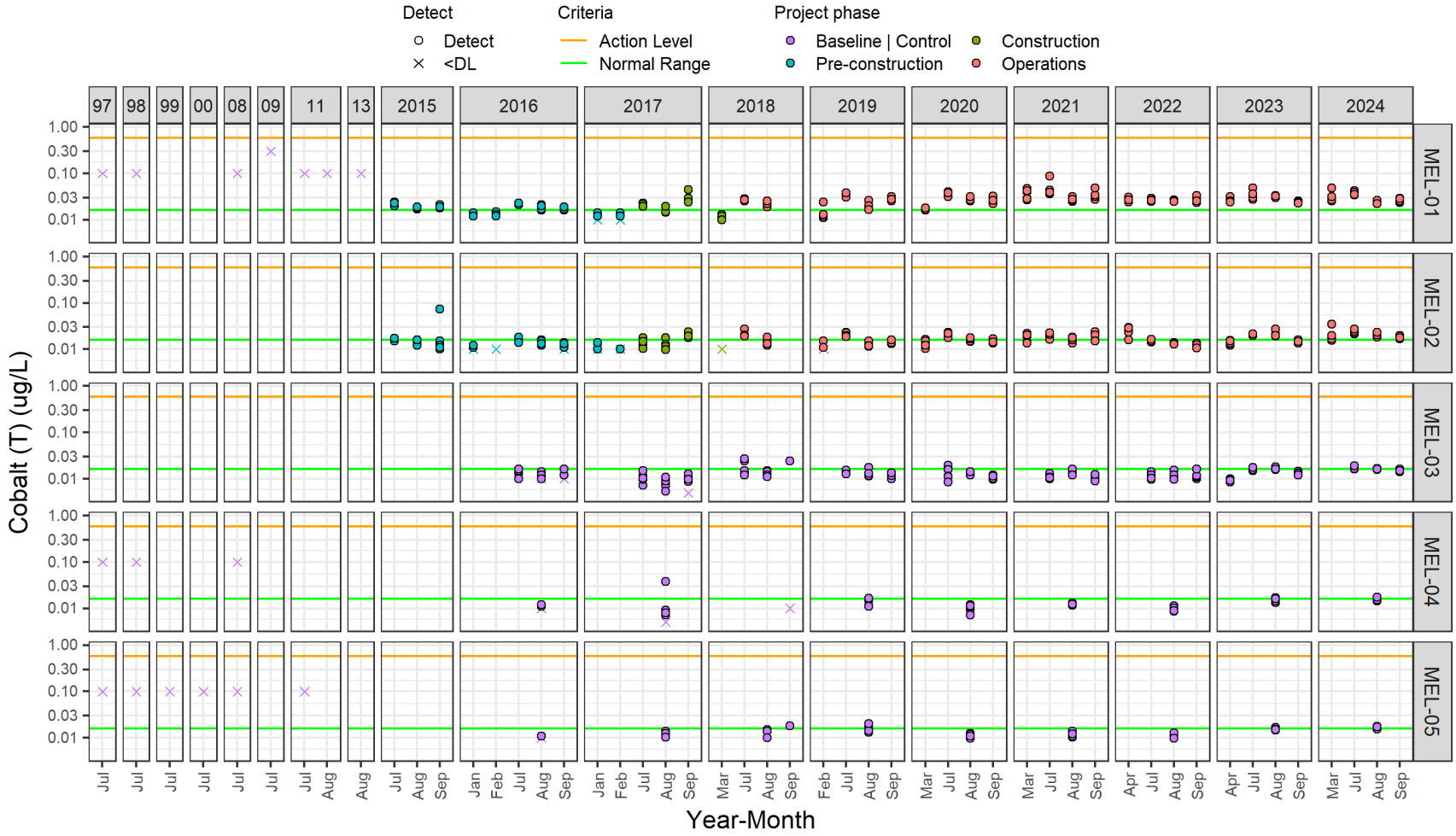


Figure C2-36. Total copper (µg/L)

Notes: The AEMP Benchmark for total copper is equal to 2 µg/L (CCME, 1987). As of 2021, the AEMP Action Level assessment for copper is based on the dissolved concentration. The new FEQG for dissolved copper is based on the biotic ligand model (ECCC, 2021).

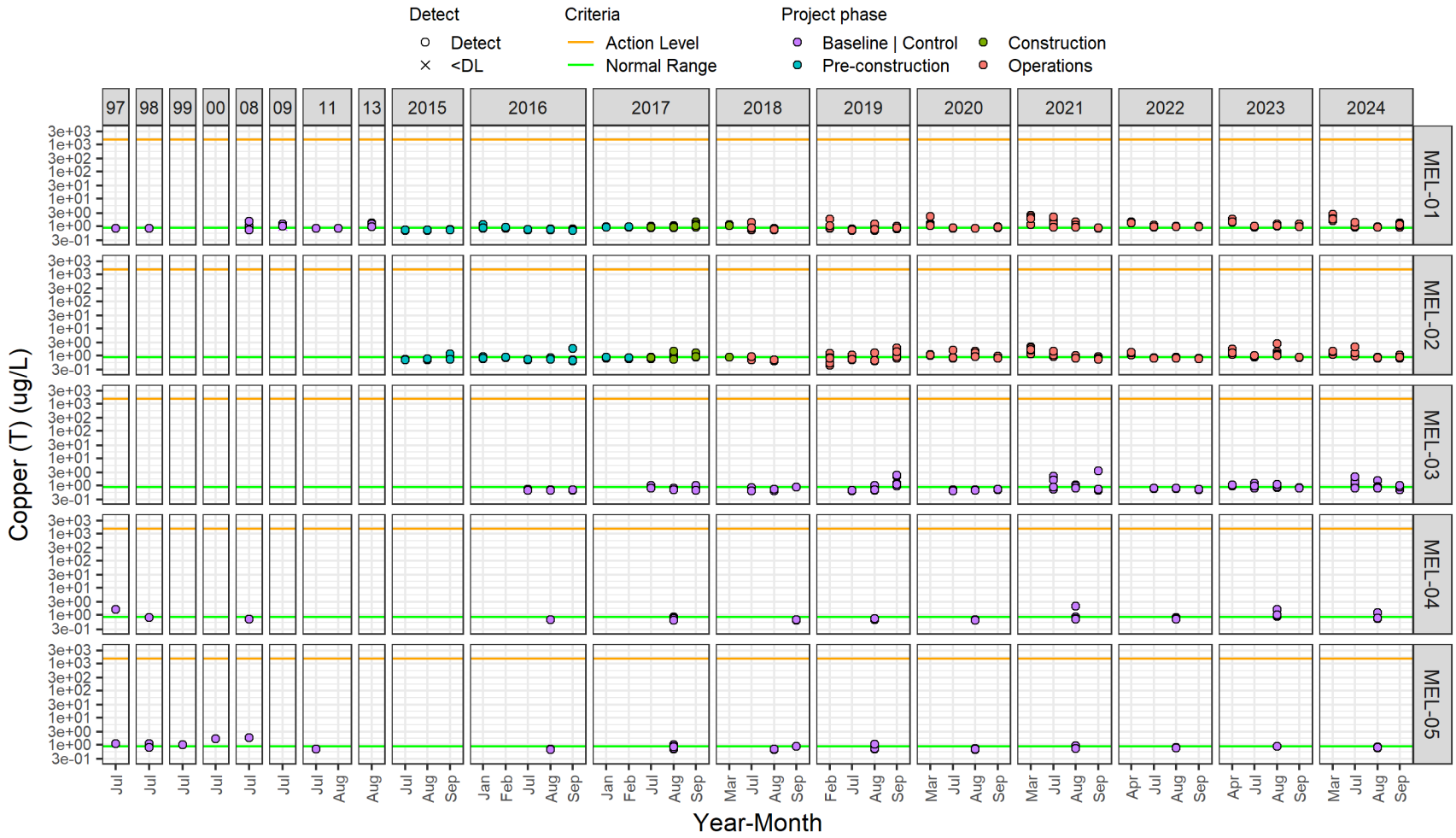


Figure C2-37. Dissolved copper (µg/L)

Notes: The AEMP Benchmark for dissolved copper is based on the copper BLM (ECCC, 2021). The two lines for the Action Level represent the range in site-specific guidelines for protection of aquatic life for open water samples at MEL-01 in 2024.

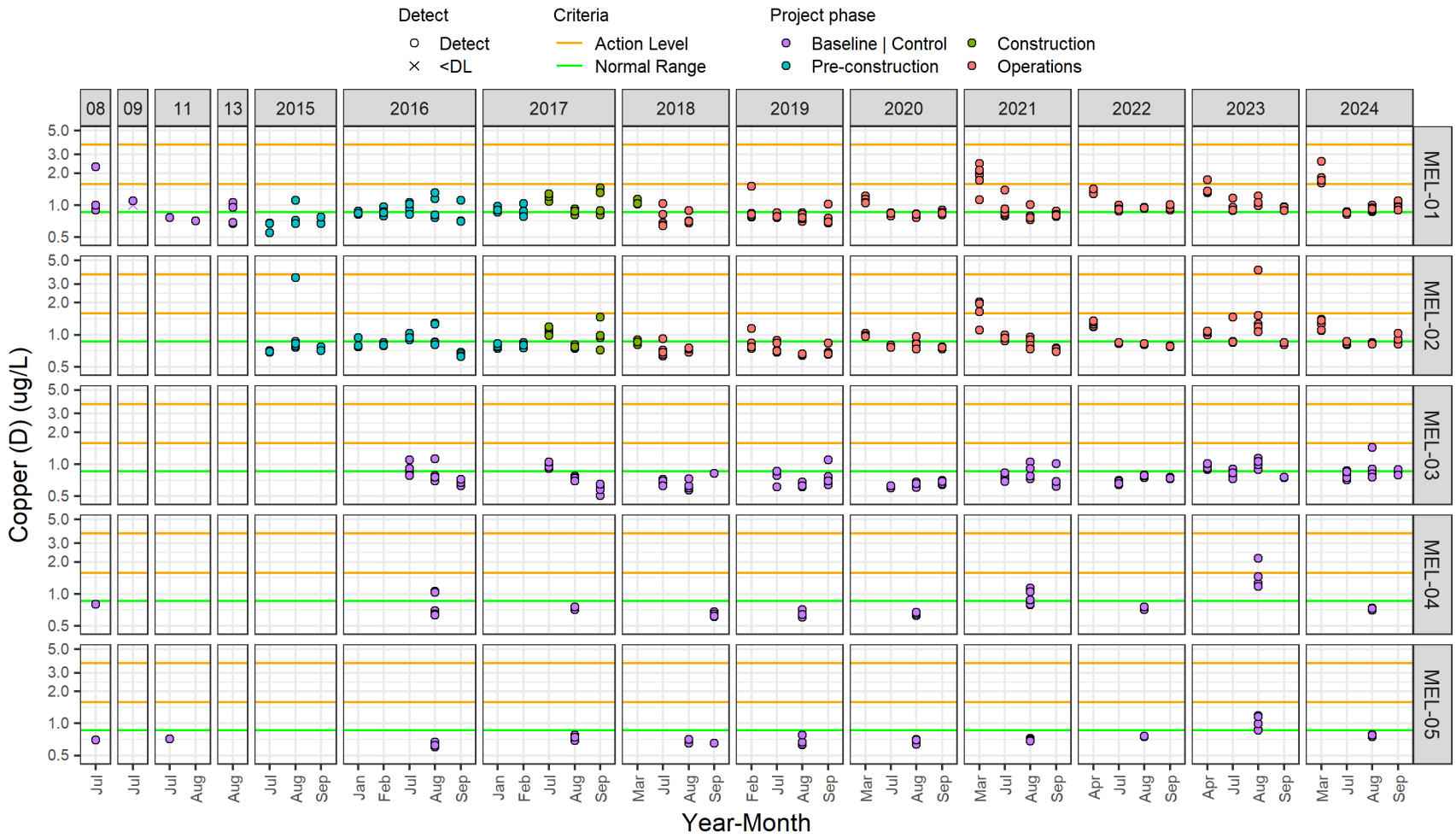


Figure C2-38. Total iron (µg/L)

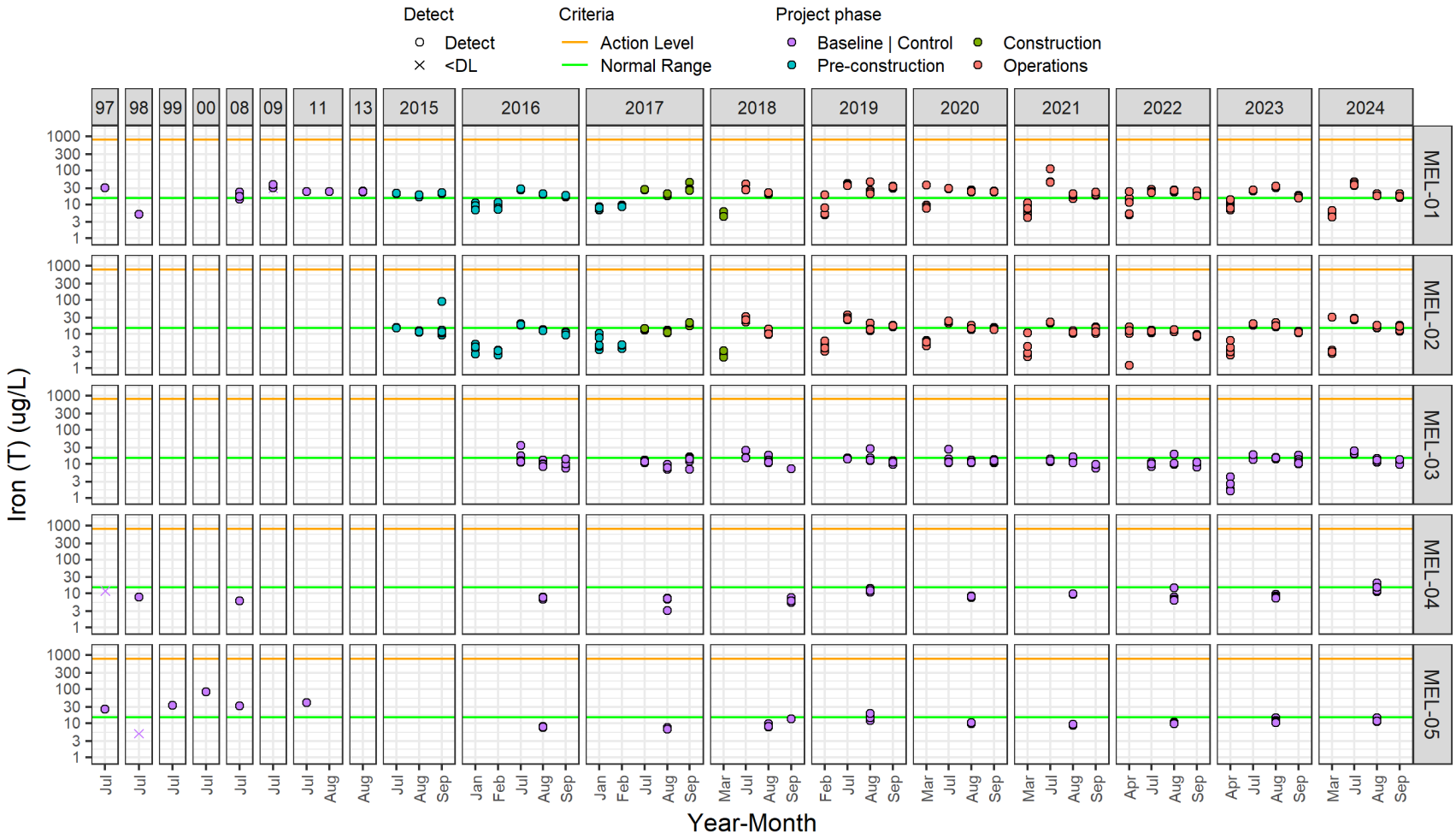


Figure C2-39. Total lead (µg/L)

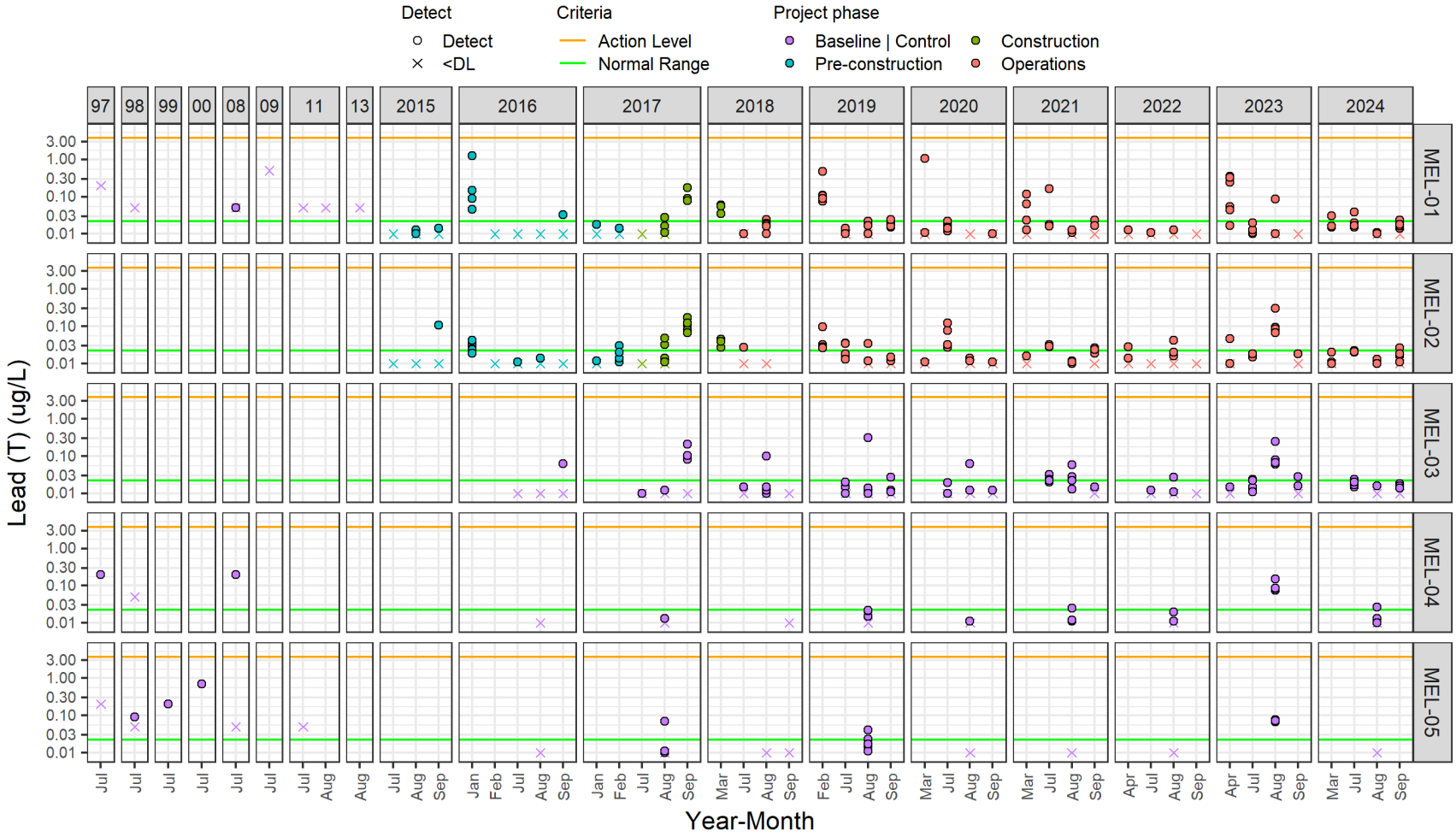


Figure C2-40. Dissolved lead (µg/L)

Notes: The two lines for the Action Level represent the range in site-specific guidelines for protection of aquatic life for open water samples at MEL-01 in 2024.

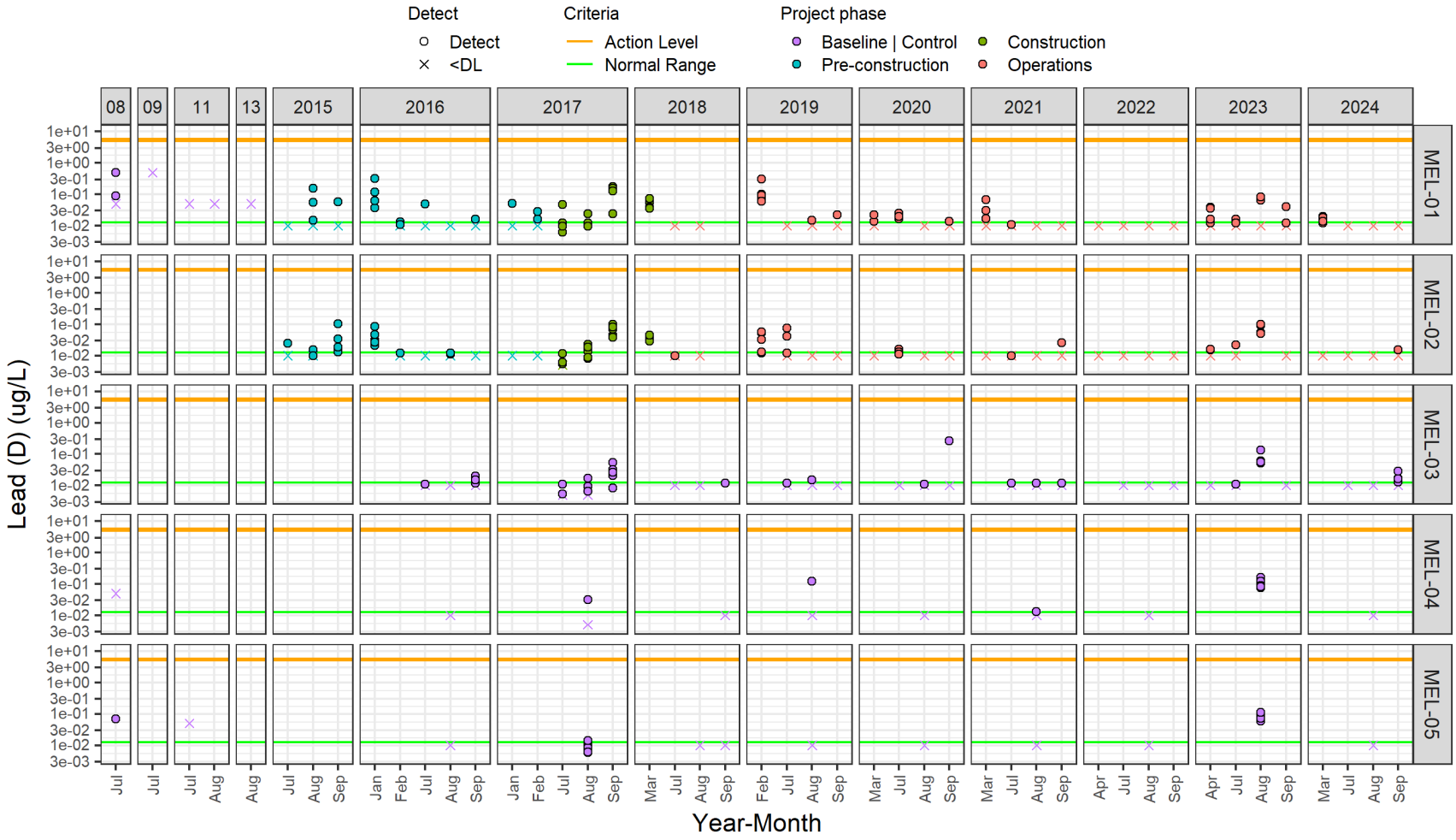


Figure C2-41. Total lithium (µg/L)

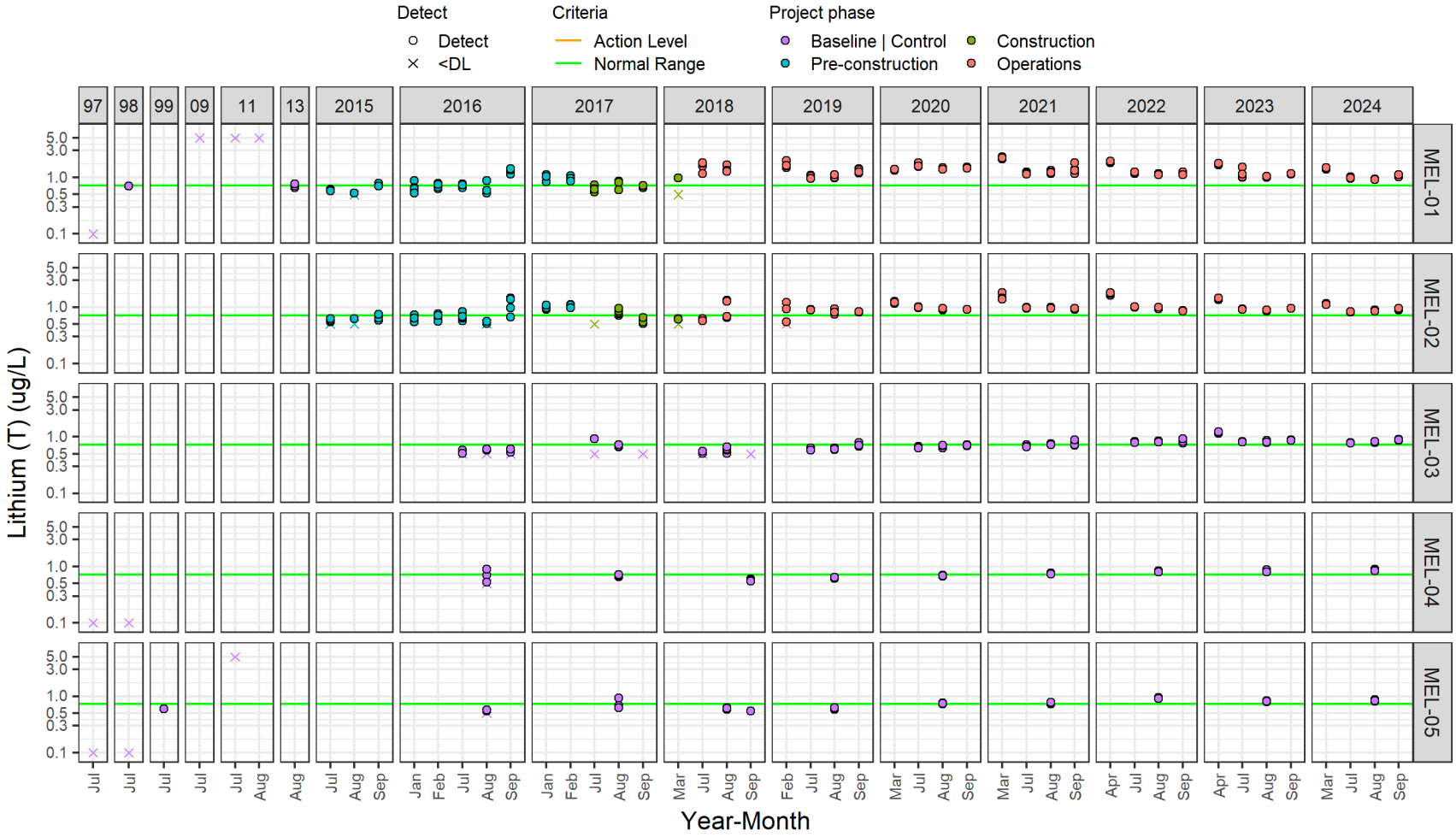


Figure C2-42. Total manganese (µg/L)

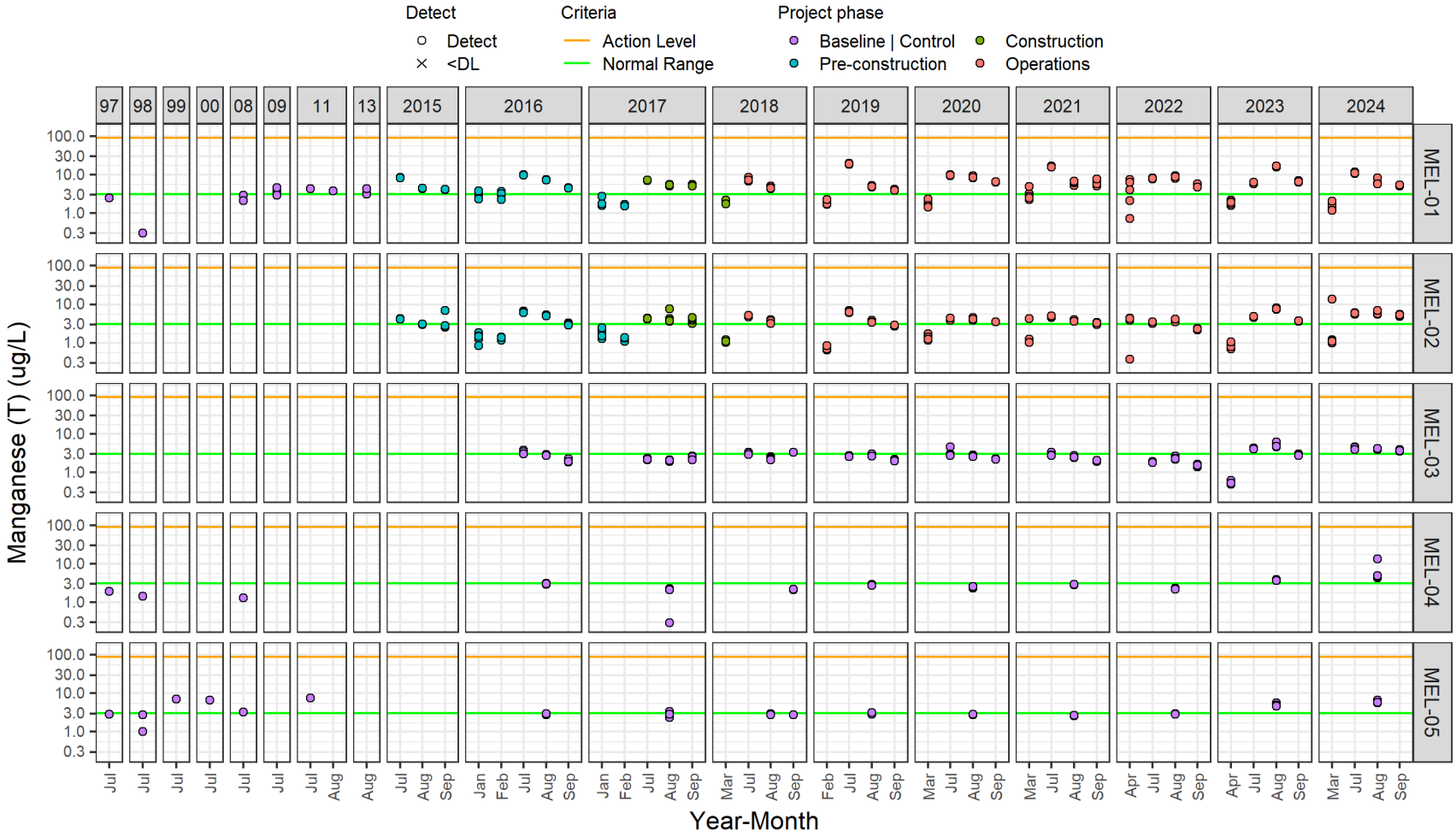


Figure C2-43. Dissolved manganese (µg/L)

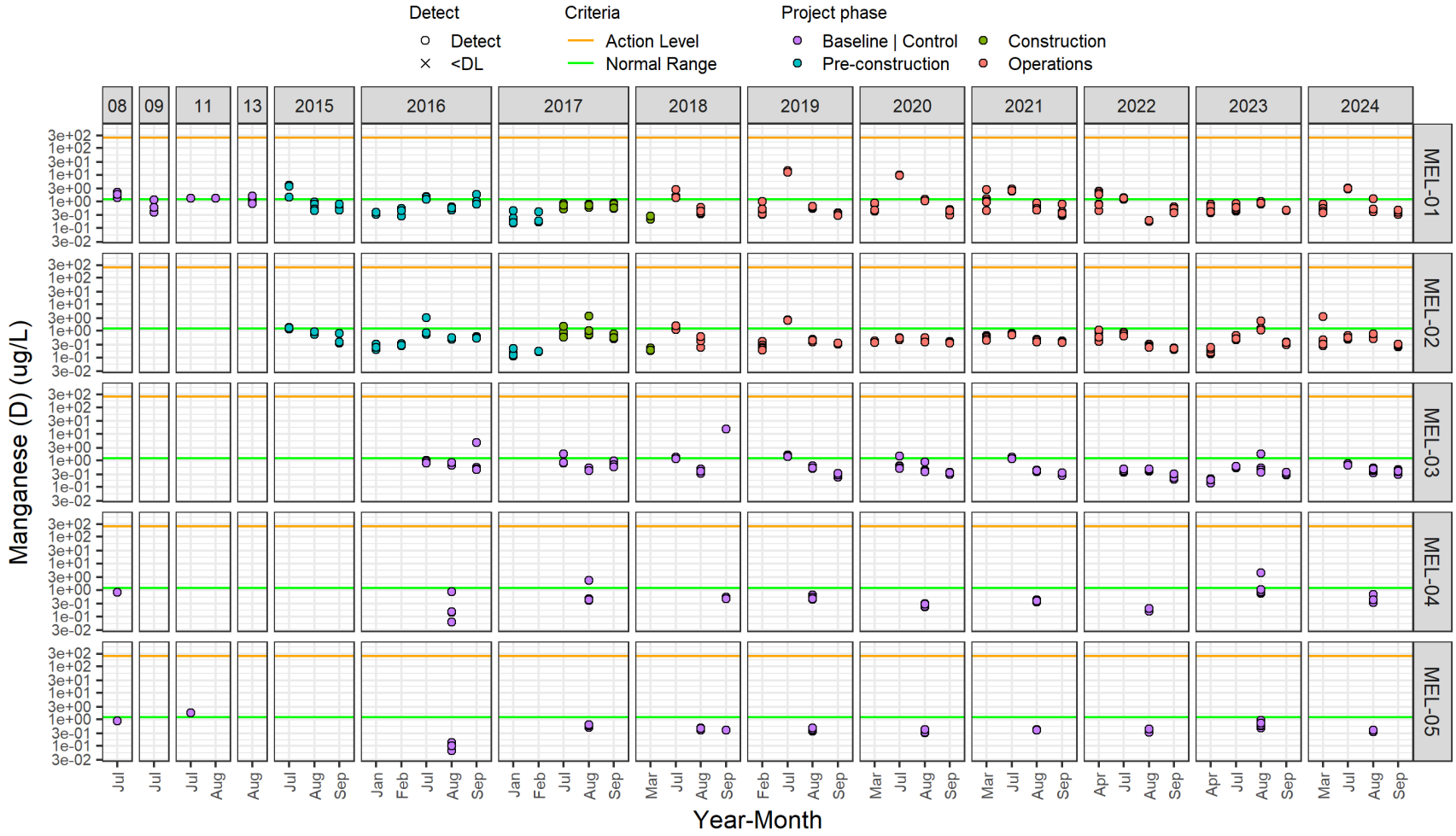


Figure C2-44. Total mercury (µg/L)

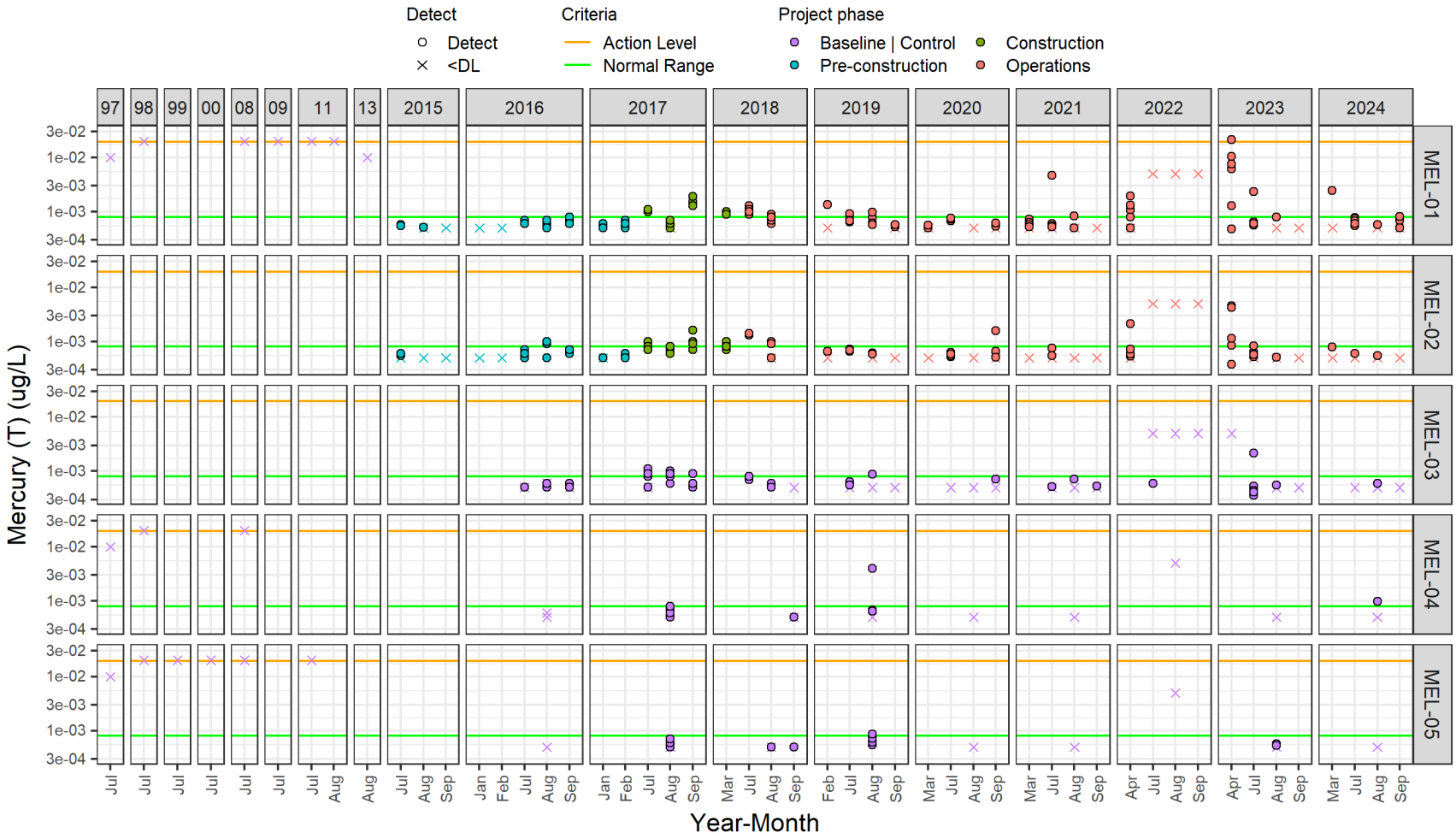


Figure C2-45. Total molybdenum (µg/L)

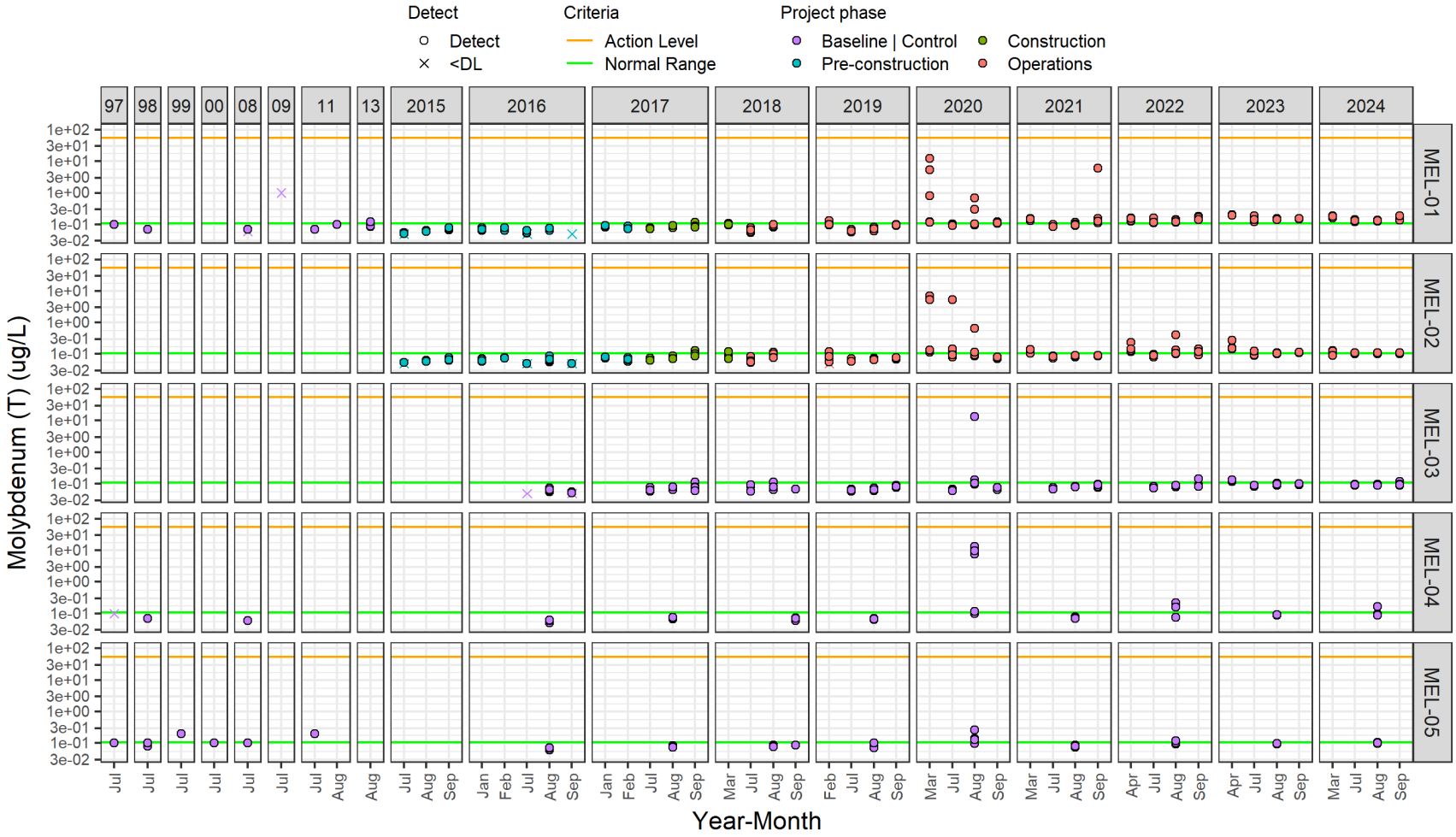


Figure C2-46. Total nickel (µg/L)

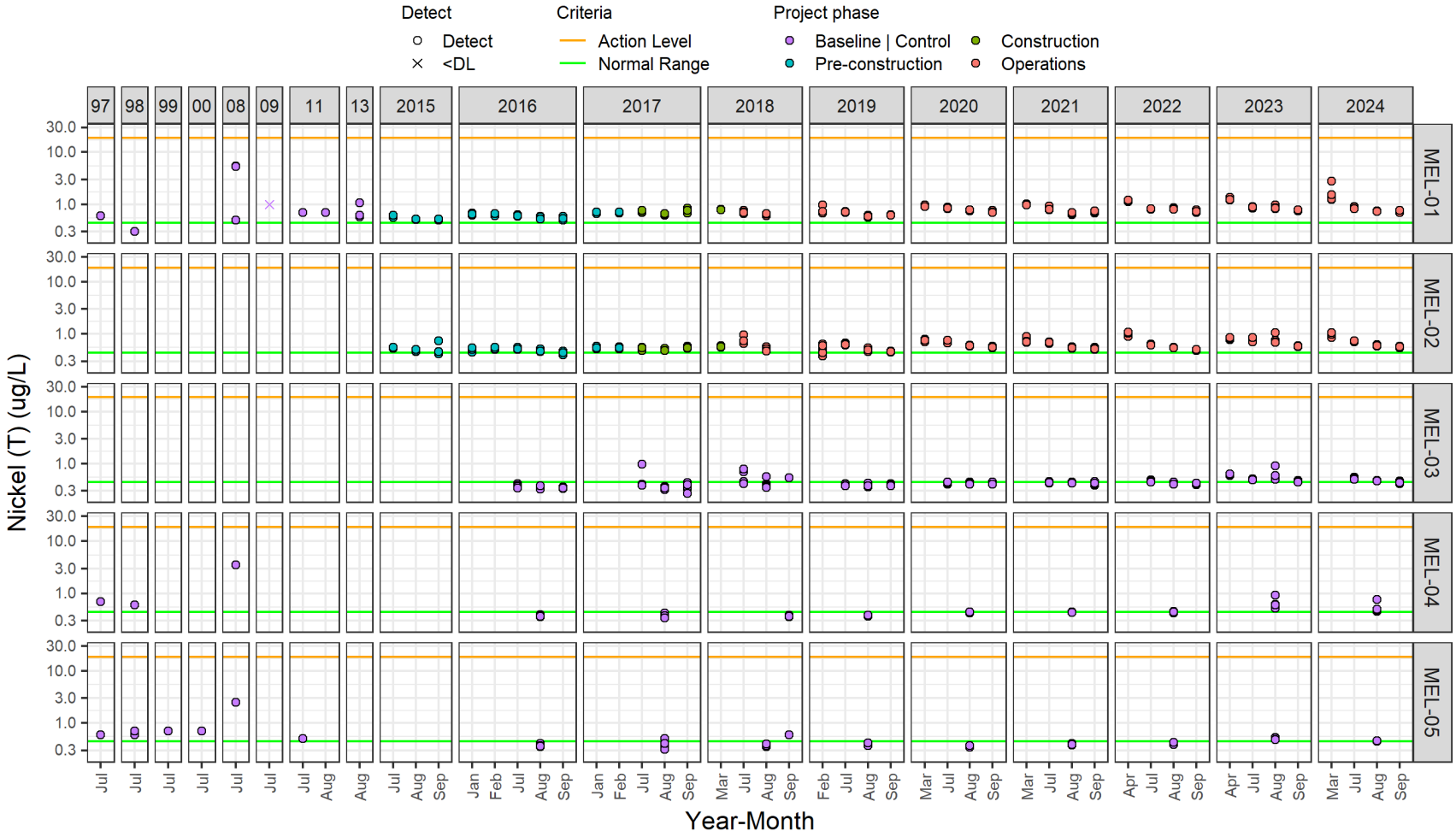


Figure C2-47. Total selenium (µg/L)

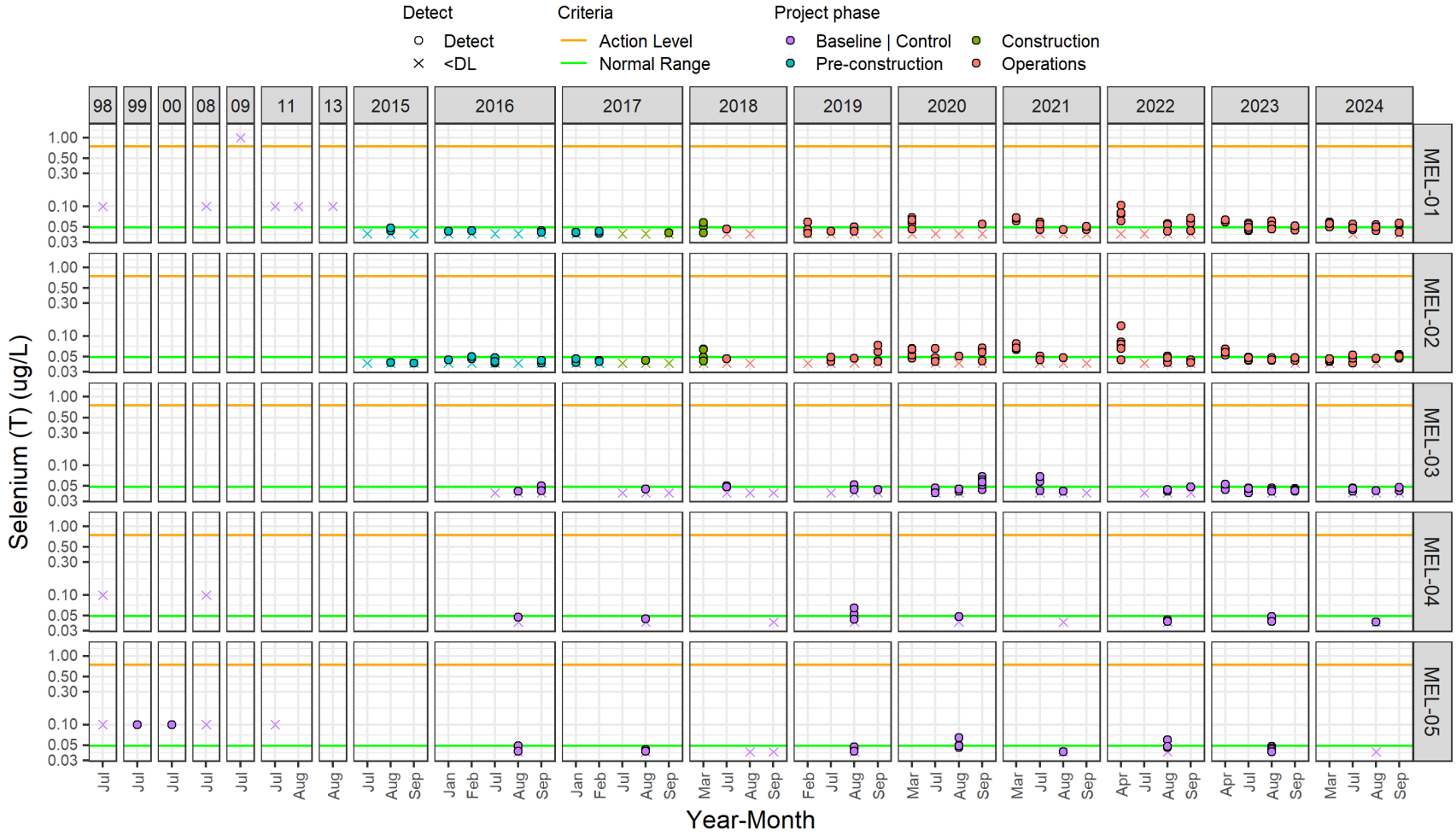


Figure C2-48. Total silver (µg/L)

Notes: The normal range for silver is equal to the current detection limit.

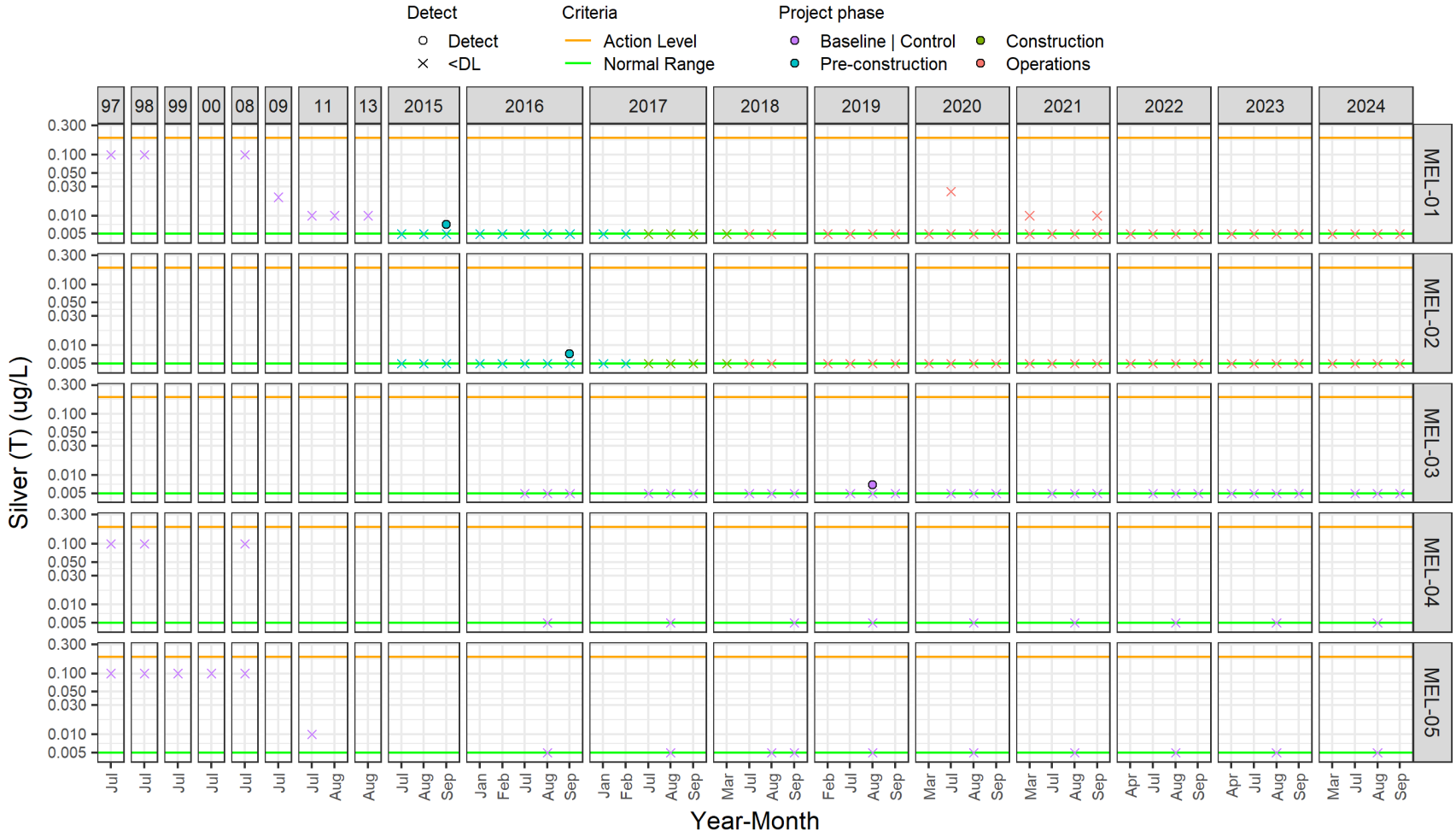


Figure C2-49. Total strontium (µg/L)

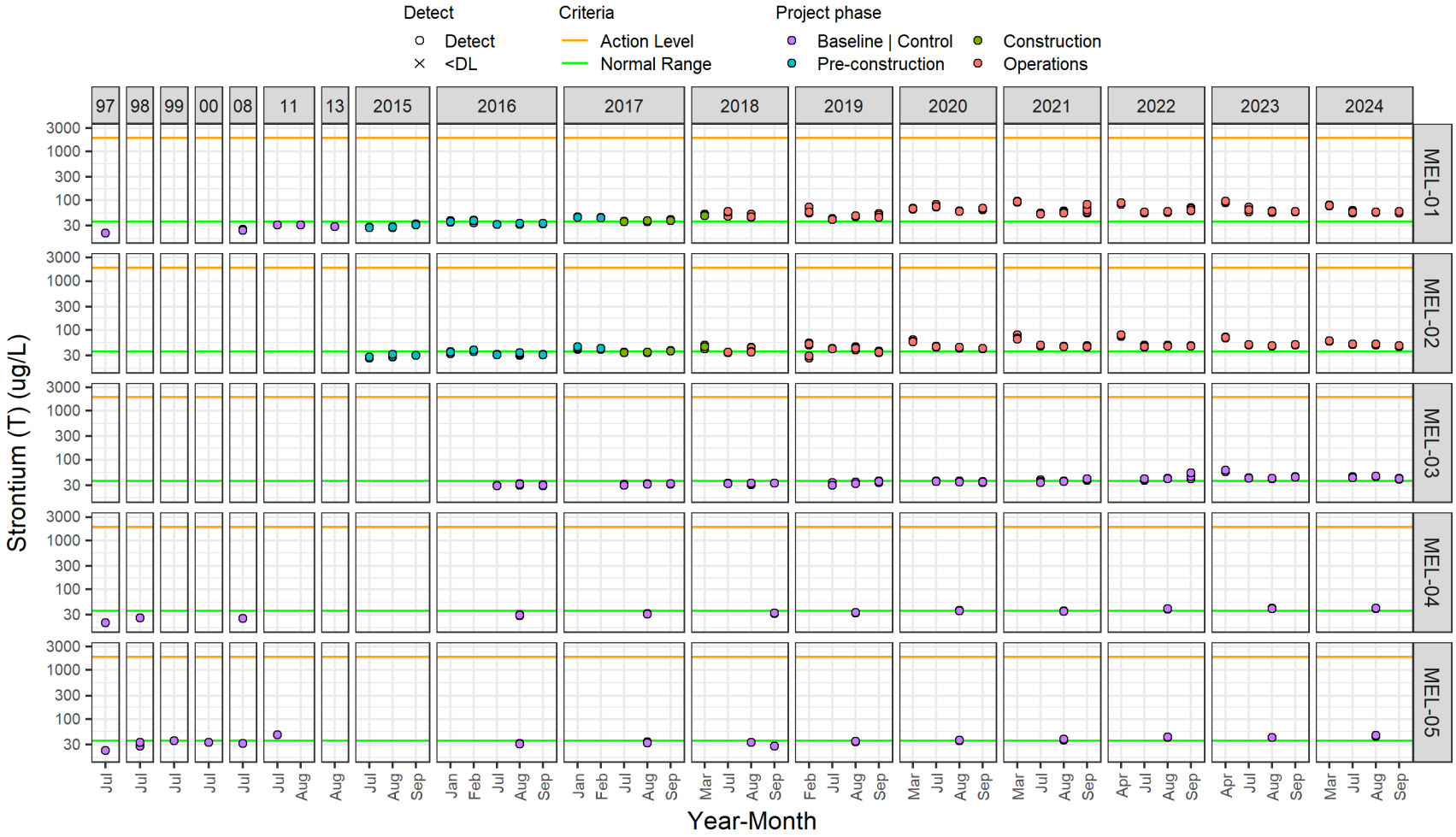


Figure C2-50. Total thallium (µg/L)

Notes: The normal range for thallium is equal to the current detection limit.

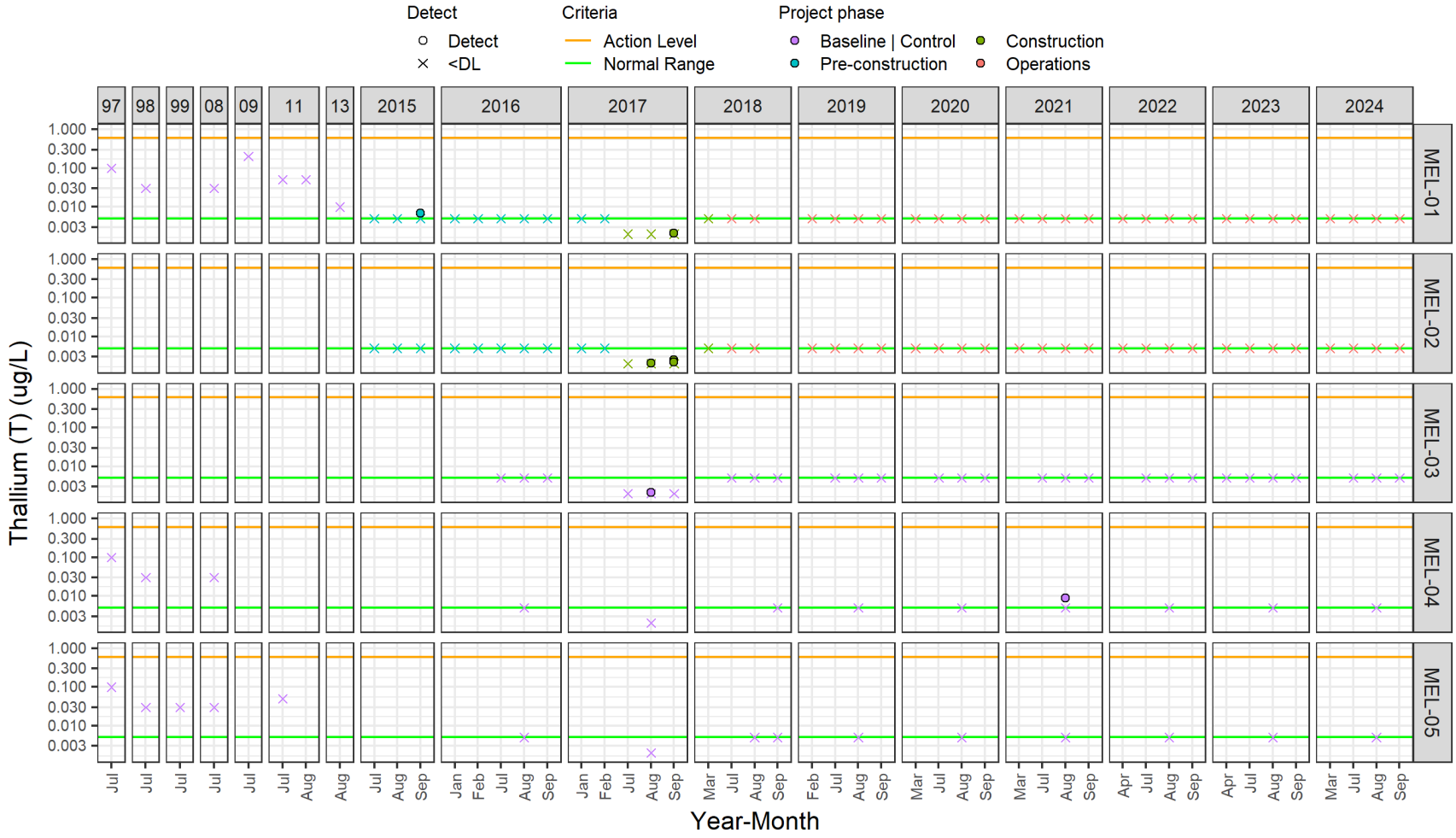


Figure C2-51. Total tin (µg/L)

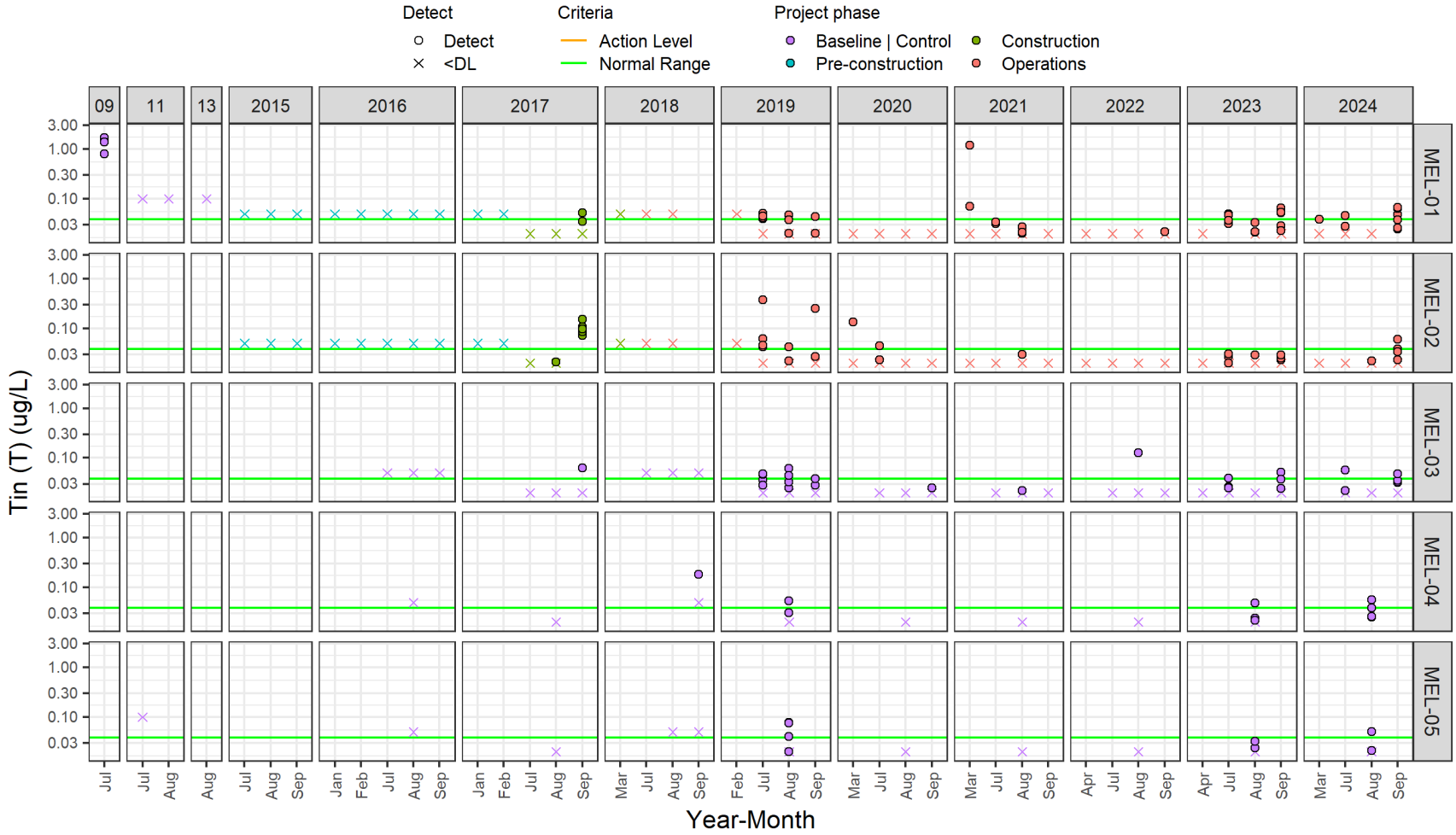


Figure C2-52. Total titanium (µg/L)

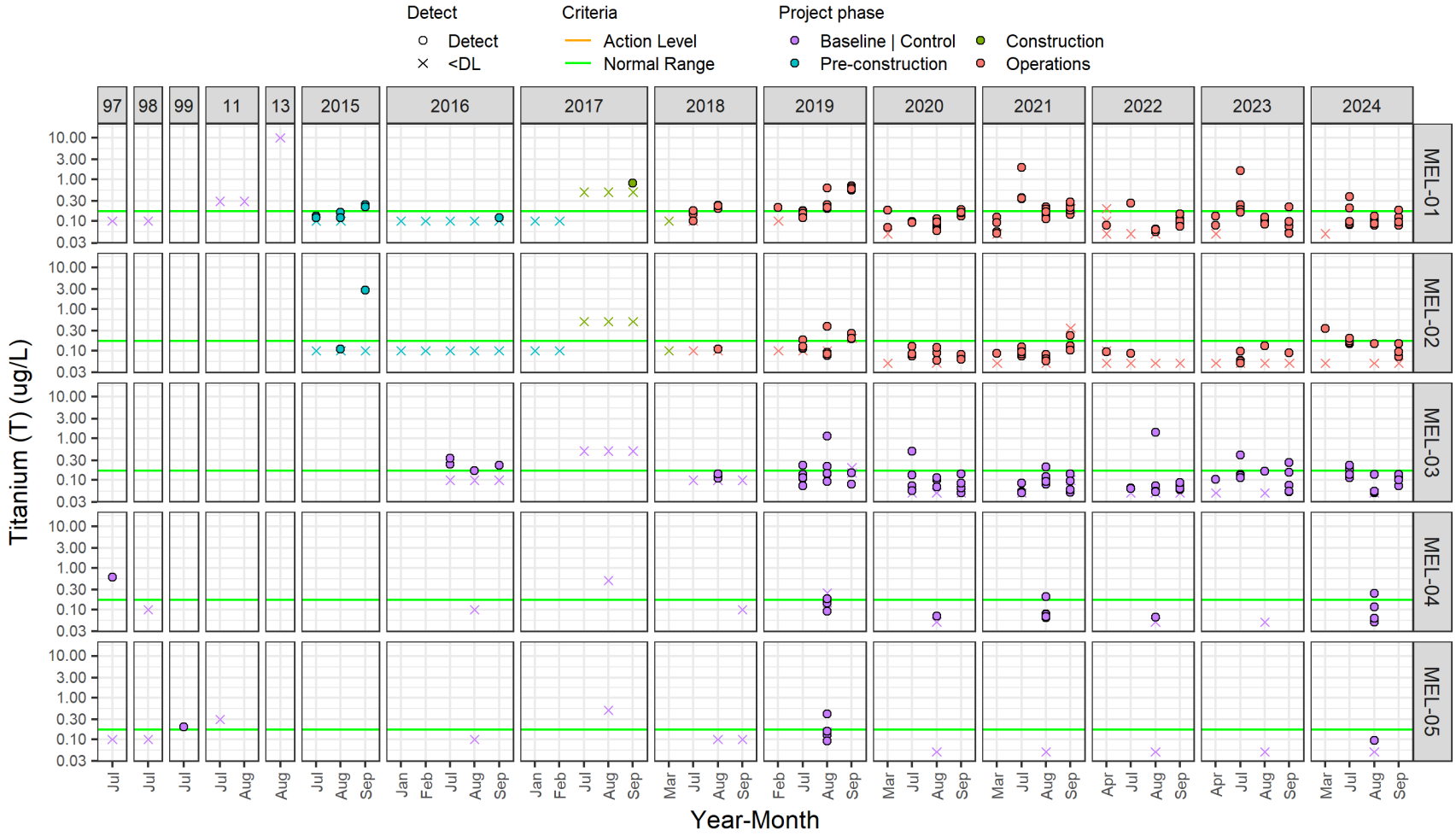


Figure C2-53. Total uranium (µg/L)

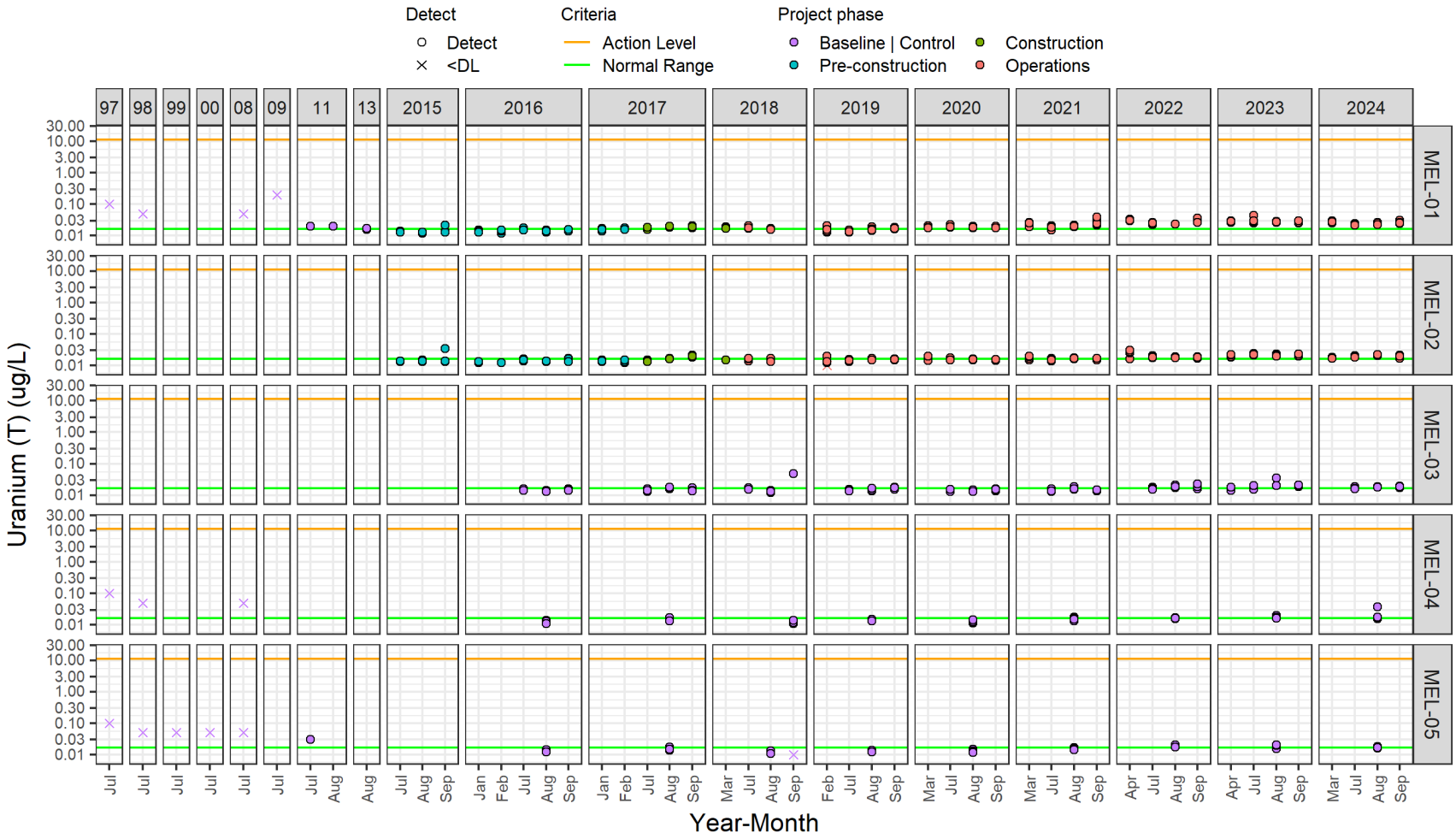


Figure C2-54. Total vanadium (µg/L)

Notes: The normal range for vanadium is equal to the current detection limit.

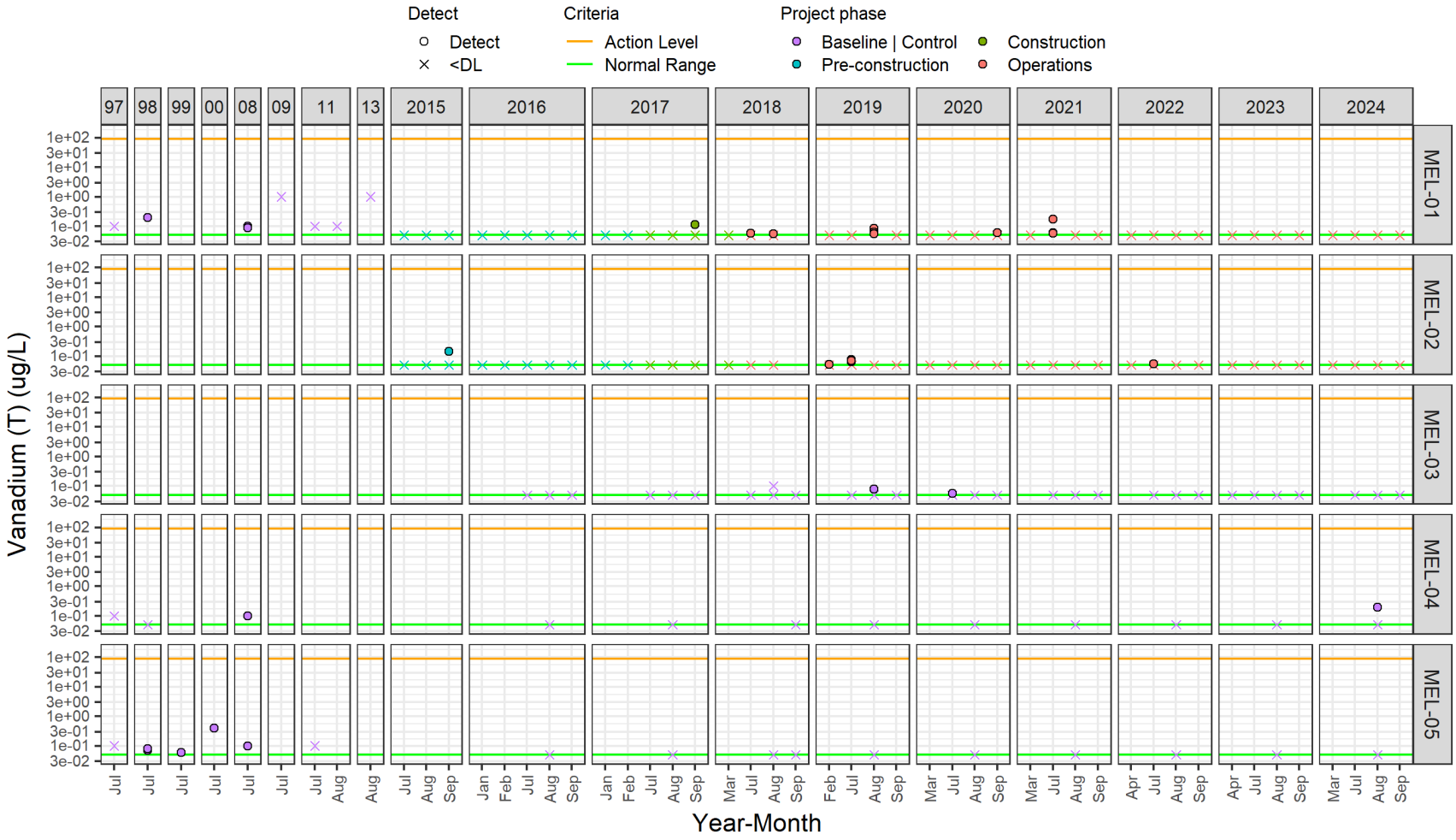


Figure C2-55. Total zinc (µg/L)

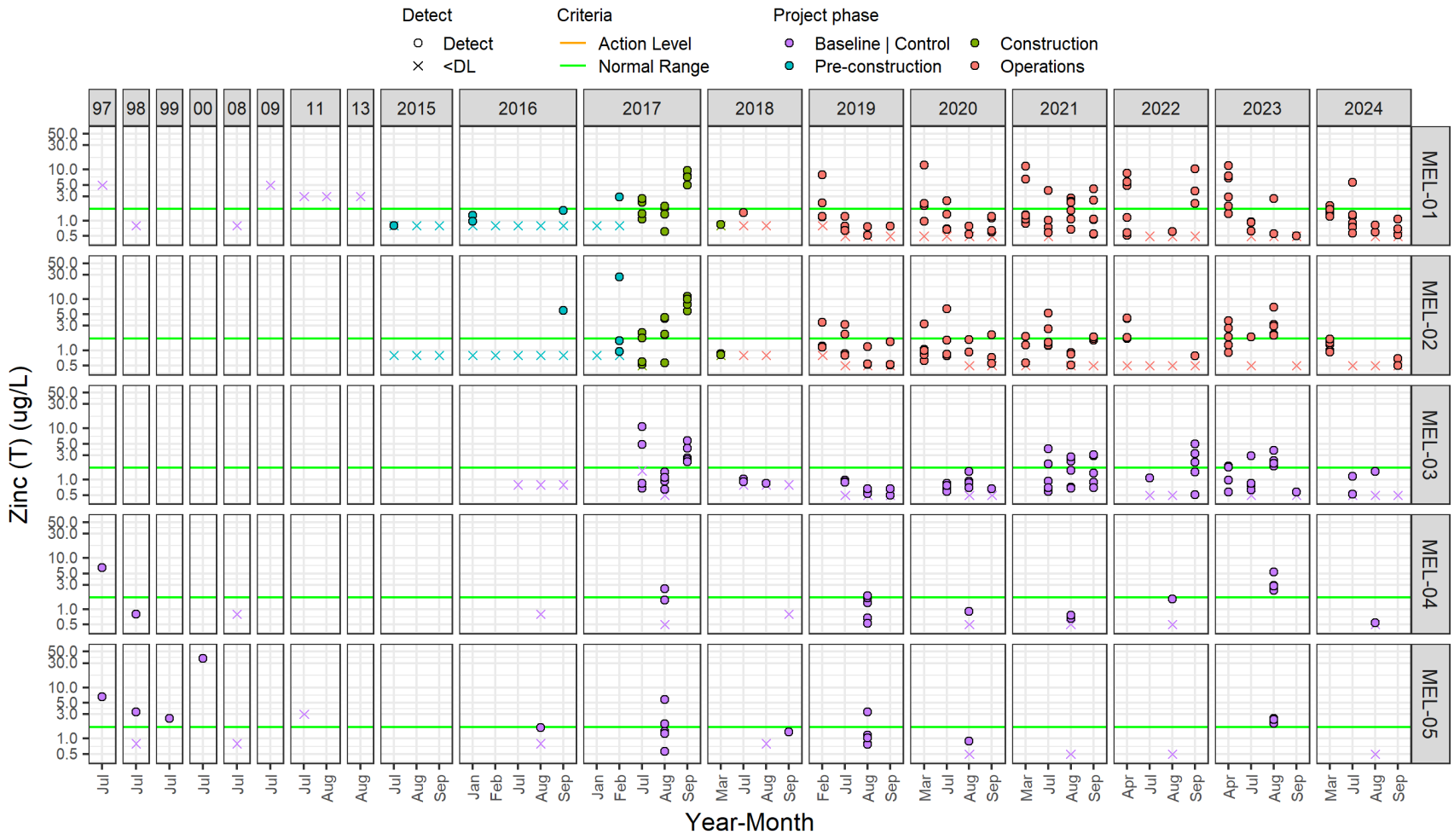
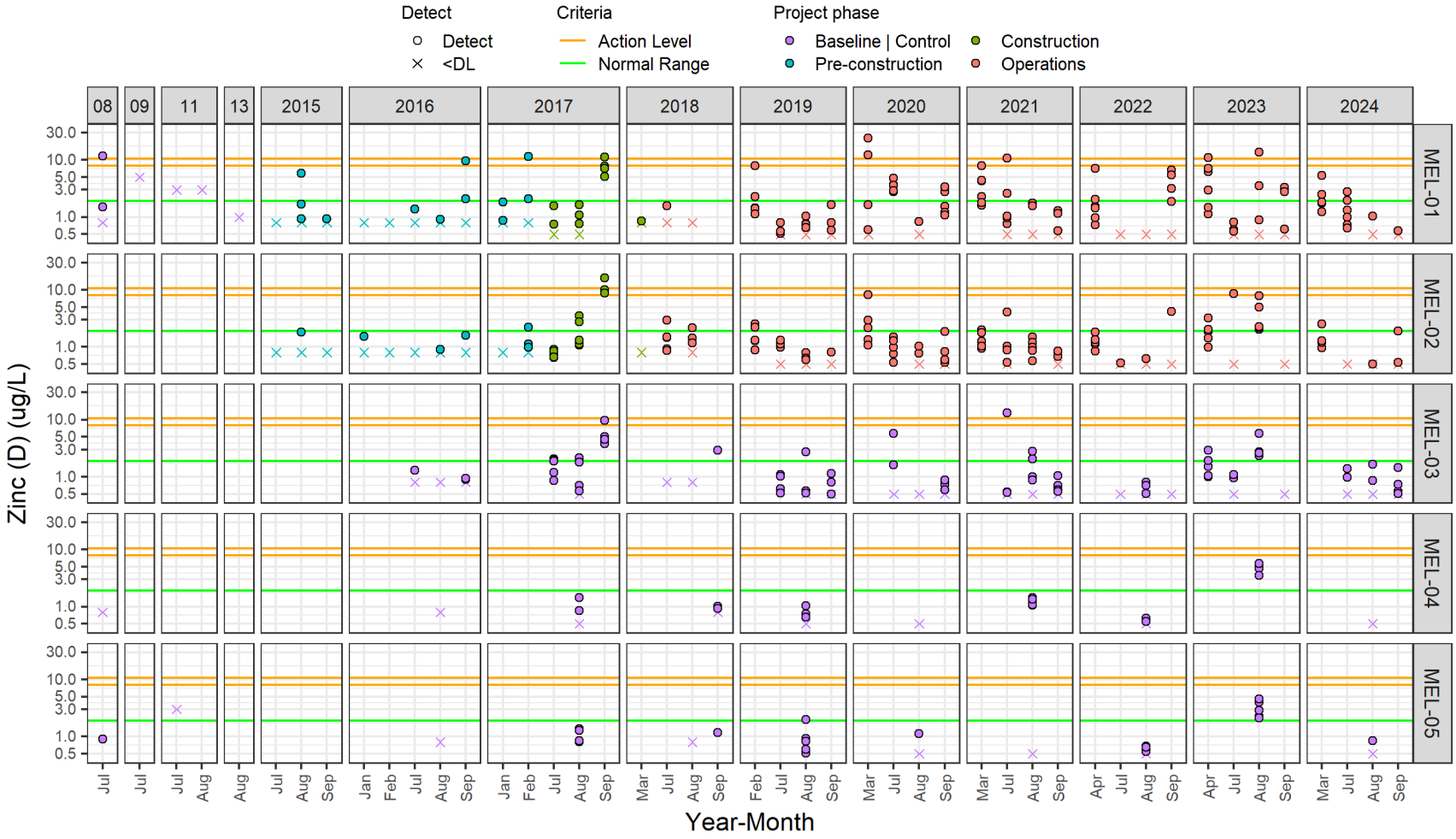


Figure C2-56. Dissolved zinc (µg/L)

Notes: The CCME guideline for dissolved zinc is hardness-dependent. The two lines for the Action Level represent the range in site-specific guidelines for protection of aquatic life for open water samples at MEL-01 in 2024.



Appendix C3
Meliadine Lake Water Quality – Statistical Comparisons

APPENDIX C3 – TABLES

Table C3-1. Results of ANOVA analysis for water chemistry characteristics in Meliadine Lake 1

APPENDIX C3 – FIGURES

Note: ANOVA results (model fits ± 95% confidence intervals) are shown along with pairwise comparisons from Tukey post hoc tests; within each sampling area, years that do not share a similar letter are statistically different (α = 0.05). The percentages indicate year-to-year changes in water quality parameters.

Figure C3-1. Total alkalinity 10
Figure C3-2. Total dissolved solids (measured) 10
Figure C3-3. Hardness 11
Figure C3-4. Lab conductivity 11
Figure C3-5. Chloride 12
Figure C3-6. Fluoride 12
Figure C3-7. Total calcium 13
Figure C3-8. Total magnesium 13
Figure C3-9. Total potassium 14
Figure C3-10. Total sodium 14
Figure C3-11. Reactive silica 15
Figure C3-12. Sulphate 15
Figure C3-13. Total barium 16
Figure C3-14. Total boron 16
Figure C3-15. Total cobalt 17
Figure C3-16. Dissolved copper 17
Figure C3-17. Total copper 18
Figure C3-18. Total iron 18
Figure C3-19. Total Kjeldahl nitrogen 19
Figure C3-20. Total lithium 19
Figure C3-21. Dissolved manganese 20
Figure C3-22. Total manganese 20

Figure C3-23. Total molybdenum 21
Figure C3-24. Total nickel 21
Figure C3-25. Total organic carbon 22
Figure C3-26. Total phosphorus 22
Figure C3-27. Total strontium 23
Figure C3-28. Total uranium 23

Table C3-1. Results of ANOVA analysis for water chemistry characteristics in Meliadine Lake

Parameter	Year	ANOVA Model Estimates | Pairwise Statistical Differences Among Years | % Change Relative to the Previous Year		
		MEL-01	MEL-02	MEL-03
Conductivity (lab) [uS/cm]	2013	64.44 | a | ↓		
	2015	68.943 | ab | +7	70.527 | a | ↓	
	2016	74.067 | b | +7	69.687 | a | -1	66.907 | a | ↓
	2017	80.653 | c | +9	74.607 | ab | +7	68.113 | ab | +2
	2018	86.25 | c | +7	76.82 | ab | +3	70.23 | abc | +3
	2019	82.553 | c | -4	80.24 | bc | +4	75.353 | cd | +7
	2020	108.667 | d | +32	84.1 | cd | +5	73.247 | bcd | -3
	2021	106.911 | d | -2	88.867 | de | +6	77.207 | d | +5
	2022	115.611 | e | +8	93.587 | ef | +5	86.4 | e | +12
	2023	116.278 | e | +0.6	96.447 | fg | +3	85.427 | e | -1
	2024	117.333 | e | +0.9	100.247 | g | +4	90.333 | e | +6
Hardness [mg/L]	2013	19.3 | a | ↓		
	2015	19.95 | a | +3	19.913 | a | ↓	
	2016	22.54 | b | +13	21.313 | ab | +7	20.5 | a | ↓
	2017	24.107 | cd | +7	22.087 | bc | +4	20.987 | a | +2
	2018	24.74 | d | +3	21.456 | abc | -3	22.65 | ab | +8
	2019	22.733 | bc | -8	23.193 | cd | +8	21.667 | a | -4
	2020	29.5 | f | +30	24.313 | d | +5	21.84 | a | +0.8
	2021	28.072 | e | -5	24.507 | d | +0.8	22.293 | a | +2
	2022	31.278 | g | +11	26.5 | e | +8	24.387 | bc | +9
	2023	33.494 | h | +7	28.69 | f | +8	25.927 | c | +6
	2024	32.856 | h | -2	29.653 | f | +3	26.36 | c | +2
Total Dissolved Solids (Cal.) [mg/L]	2015	33.064 | a | ↓	33.847 | a | ↓	
	2016	36.953 | b | +12	34.513 | ab | +2	32.993 | a | ↓
	2017	41.493 | c | +12	38.047 | b | +10	34.707 | ab | +5
	2018	42.42 | c | +2	36.944 | ab | -3	35.63 | abc | +3
	2019	41.04 | c | -3	42.073 | c | +14	37.473 | cd | +5
	2020	55.3 | e | +35	44.093 | c | +5	38.667 | d | +3
	2021	51.778 | d | -6	42.807 | c | -3	37.167 | bcd | -4
	2022	56.406 | e | +9	45.52 | c | +6	42.073 | e | +13
	2023	75.583 | f | +34	62.68 | d | +38	55.52 | f | +32
	2024	76.25 | f | +0.9	65.153 | d | +4	58.713 | g | +6
Total Dissolved Solids [mg/L]	2013	40.26 | ab | ↓		
	2015	37.964 | a | -6	38.653 | a | ↓	
	2016	45.067 | abc | +19	45.533 | ab | +18	40.98 | a | ↓
	2017	53.4 | cde | +18	48.8 | bc | +7	41.067 | a | +0.2
	2018	54.4 | cde | +2	45.8 | ab | -6	38.6 | a | -6
	2019	49.2 | bcd | -10	49.933 | bc | +9	63.667 | b | +65
	2020	70.6 | g | +43	49.133 | bc | -2	45.133 | a | -29

Table C3-1. Results of ANOVA analysis for water chemistry characteristics in Meliadine Lake

Parameter	Year	ANOVA Model Estimates | Pairwise Statistical Differences Among Years | % Change Relative to the Previous Year		
		MEL-01	MEL-02	MEL-03
Total Dissolved Solids [mg/L]	2021	56.944 | def | -19	52.333 | bc | +7	47.867 | a | +6
	2022	64.5 | fg | +13	54.133 | c | +3	51.467 | ab | +8
	2023	64.028 | fg | -0.7	55.187 | c | +2	48.053 | a | -7
	2024	59.906 | ef | -6	51.687 | bc | -6	44.833 | a | -7
Alkalinity, Total [mg/L]	2013	16.92 | bc | ↓		
	2015	14.114 | a | -17	14.887 | a | ↓	
	2016	15.807 | b | +12	15.607 | ab | +5	15.547 | a | ↓
	2017	17.293 | c | +9	16.987 | bc | +9	16.113 | ab | +4
	2018	16.13 | bc | -7	17.72 | cd | +4	16.97 | ab | +5
	2019	16.487 | bc | +2	18.72 | de | +6	17.207 | b | +1
	2020	19.52 | d | +18	20.267 | f | +8	19.767 | c | +15
	2021	17.533 | c | -10	17.02 | bc | -16	17 | b | -14
	2022	21.728 | e | +24	19.887 | ef | +17	19.167 | c | +13
	2023	21.017 | e | -3	20.053 | ef | +0.8	19.353 | c | +1
	2024	20.5 | de | -2	20.087 | ef | +0.2	19.633 | c | +1
Chloride [mg/L]	2013	7.568 | a | ↓		
	2015	8.601 | a | +14	8.821 | a | ↓	
	2016	9.354 | ab | +9	8.395 | a | -5	7.758 | a | ↓
	2017	10.627 | bc | +14	9.376 | ab | +12	8.228 | ab | +6
	2018	12.69 | d | +19	9.372 | ab | -0.1	8.347 | ab | +1
	2019	11.88 | cd | -6	10.885 | bc | +16	9.447 | b | +13
	2020	17.8 | f | +50	11.927 | cd | +10	9.388 | b | -0.6
	2021	16.222 | e | -9	12.167 | cd | +2	9.334 | b | -0.6
	2022	16.211 | e | -0.1	12.021 | cd | -1	10.911 | c | +17
	2023	16.567 | ef | +2	13.12 | d | +9	11.107 | c | +2
	2024	16.678 | ef | +0.7	13.067 | d | -0.4	11.46 | c | +3
Fluoride [mg/L]	2013	0.023 | abc | ↓		
	2015	0.02 | a | -11	0.021 | a | ↓	
	2016	0.023 | bc | +14	0.024 | ab | +11	0.023 | a | ↓
	2017	0.027 | de | +18	0.028 | ef | +17	0.026 | bc | +11
	2018	0.022 | ab | -18	0.024 | bc | -14	0.024 | ab | -8
	2019	0.025 | cde | +13	0.027 | de | +12	0.026 | bc | +9
	2020	0.025 | cde | +0.8	0.026 | cde | -2	0.027 | cde | +5
	2021	0.025 | bcd | -1	0.025 | bcd | -5	0.025 | abc | -8
	2022	0.028 | e | +10	0.026 | cde | +3	0.027 | bcd | +5
	2023	0.03 | f | +10	0.03 | fg | +14	0.029 | de | +8
	2024	0.031 | f | +1	0.03 | g | +2	0.03 | e | +4

Table C3-1. Results of ANOVA analysis for water chemistry characteristics in Meliadine Lake

Parameter	Year	ANOVA Model Estimates | Pairwise Statistical Differences Among Years | % Change Relative to the Previous Year		
		MEL-01	MEL-02	MEL-03
Reactive Silica (SiO2) [mg/L]	2013	0.5 | cd | ↓		
	2015	0.358 | ab | -28	0.263 | ab | ↓	
	2016	0.427 | bc | +19	0.28 | ab | +6	0.204 | a | ↓
	2017	0.546 | d | +28	0.348 | d | +24	0.236 | abc | +16
	2018	0.39 | abc | -29	0.341 | cd | -2	0.245 | bc | +4
	2020	0.333 | a | -15	0.293 | bc | -14	0.23 | abc | -6
	2021	0.357 | ab | +7	0.244 | a | -17	0.211 | ab | -8
	2022	0.399 | abc | +12	0.3 | bc | +23	0.26 | c | +23
	2023	0.544 | d | +36	0.435 | e | +45	0.342 | d | +32
	2024	0.571 | d | +5	0.41 | e | -6	0.347 | d | +2
Sulphate [mg/L]	2013	3.268 | a | ↓		
	2015	3.598 | a | +10	3.665 | a | ↓	
	2016	4.023 | ab | +12	3.579 | a | -2	3.251 | a | ↓
	2017	4.732 | c | +18	4.065 | b | +14	3.517 | b | +8
	2018	4.225 | bc | -11	3.866 | ab | -5	3.528 | ab | +0.3
	2019	4.309 | bc | +2	4.119 | bc | +7	3.742 | b | +6
	2020	5.677 | d | +32	4.425 | cd | +7	3.747 | b | +0.1
	2021	5.802 | d | +2	4.484 | d | +1	3.674 | b | -2
	2022	6.434 | e | +11	4.636 | d | +3	4.021 | c | +9
	2023	7.211 | f | +12	5.548 | e | +20	4.459 | d | +11
	2024	7.154 | f | -0.8	5.401 | e | -3	4.439 | d | -0.4
Total Calcium [mg/L]	2013	6.174 | a | ↓		
	2015	6.356 | a | +3	6.409 | a | ↓	
	2016	7.219 | b | +14	6.945 | b | +8	6.579 | a | ↓
	2017	7.854 | c | +9	7.4 | c | +7	6.851 | ab | +4
	2018	7.767 | c | -1	7.435 | c | +0.5	6.774 | ab | -1
	2019	7.159 | b | -8	7.163 | bc | -4	6.79 | ab | +0.2
	2020	8.793 | d | +23	7.44 | c | +4	6.798 | ab | +0.1
	2021	8.404 | d | -4	7.538 | c | +1	6.983 | b | +3
	2022	9.562 | e | +14	8.282 | d | +10	7.763 | c | +11
	2023	10.154 | f | +6	8.896 | e | +7	8.266 | d | +6
	2024	9.823 | ef | -3	9.151 | e | +3	8.375 | d | +1
Total Magnesium [mg/L]	2013	1.048 | a | ↓		
	2015	1.098 | a | +5	1.082 | a | ↓	
	2016	1.23 | b | +12	1.134 | a | +5	1.073 | a | ↓
	2017	1.365 | c | +11	1.279 | bc | +13	1.121 | a | +4
	2018	1.386 | c | +2	1.241 | ab | -3	1.133 | a | +1
	2019	1.315 | bc | -5	1.29 | bc | +4	1.174 | a | +4
	2020	1.743 | e | +33	1.34 | bc | +4	1.16 | a | -1

Table C3-1. Results of ANOVA analysis for water chemistry characteristics in Meliadine Lake

Parameter	Year	ANOVA Model Estimates | Pairwise Statistical Differences Among Years | % Change Relative to the Previous Year		
		MEL-01	MEL-02	MEL-03
Total Magnesium [mg/L]	2021	1.633 | d | -6	1.359 | bc | +1	1.153 | a | -0.6
	2022	1.786 | ef | +9	1.409 | cd | +4	1.295 | b | +12
	2023	1.881 | f | +5	1.525 | de | +8	1.401 | b | +8
	2024	1.796 | ef | -5	1.542 | e | +1	1.362 | b | -3
Total Potassium [mg/L]	2013	0.83 | a | ↓		
	2015	0.847 | a | +2	0.852 | a | ↓	
	2016	0.886 | a | +5	0.875 | a | +3	0.849 | a | ↓
	2017	1.005 | b | +13	0.953 | b | +9	0.915 | b | +8
	2018	0.979 | b | -3	0.951 | bc | -0.1	0.886 | ab | -3
	2019	0.98 | b | +0.1	0.979 | bcd | +3	0.927 | b | +5
	2020	1.157 | cd | +18	1.012 | cde | +3	0.936 | b | +0.9
	2021	1.116 | c | -4	1.021 | de | +0.9	0.942 | b | +0.6
	2022	1.194 | d | +7	1.057 | ef | +3	1.029 | c | +9
	2023	1.195 | d | +0.1	1.057 | ef | -0.1	1.028 | c | -0.1
	2024	1.196 | d | +0.1	1.103 | f | +4	1.041 | c | +1
Total Sodium [mg/L]	2013	3.848 | a | ↓		
	2015	4.366 | a | +13	4.37 | a | ↓	
	2016	4.805 | ab | +10	4.469 | a | +2	4.242 | a | ↓
	2017	5.325 | bc | +11	4.771 | ab | +7	4.356 | ab | +3
	2018	5.633 | c | +6	4.936 | abc | +3	4.386 | ab | +0.7
	2019	5.585 | c | -0.9	5.71 | bcd | +16	5.007 | bc | +14
	2020	8.167 | d | +46	5.742 | cd | +0.6	4.743 | ab | -5
	2021	7.7 | d | -6	5.959 | cd | +4	4.75 | ab | +0.2
	2022	8.014 | d | +4	6.071 | d | +2	5.596 | cd | +18
	2023	8.244 | d | +3	6.391 | d | +5	5.545 | cd | -0.9
	2024	8.026 | d | -3	6.582 | d | +3	5.744 | d | +4
Total Kjeldahl Nitrogen [mg/L]	2013	0.207 | abcd | ↓		
	2015	0.168 | ab | -19	0.214 | bc | ↓	
	2016	0.138 | a | -18	0.137 | a | -36	0.143 | a | ↓
	2017	0.221 | bc | +61	0.17 | ab | +24	0.158 | a | +10
	2018	0.233 | bcde | +5	0.233 | bc | +37	0.182 | abc | +15
	2019	0.218 | bc | -6	0.2 | abc | -14	0.167 | ab | -8
	2020	0.267 | cde | +22	0.264 | c | +32	0.209 | bc | +25
	2021	0.244 | cd | -9	0.222 | bc | -16	0.138 | a | -34
	2022	0.313 | e | +29	0.221 | bc | -0.6	0.224 | c | +62
	2023	0.273 | cde | -13	0.252 | c | +14	0.225 | c | +0.5
	2024	0.3 | de | +10	0.227 | bc | -10	0.225 | c | +0.2

Table C3-1. Results of ANOVA analysis for water chemistry characteristics in Meliadine Lake

Parameter	Year	ANOVA Model Estimates | Pairwise Statistical Differences Among Years | % Change Relative to the Previous Year		
		MEL-01	MEL-02	MEL-03
Total Phosphorus [mg/L]	2013	0.004 | a | ↓		
	2015	0.006 | a | +74	0.005 | ab | ↓	
	2016	0.008 | a | +32	0.005 | ab | -6	0.005 | c | ↓
	2017	0.007 | a | -23	0.005 | b | +15	0.005 | bc | -2
	2018	0.006 | a | -4	0.003 | a | -44	0.003 | a | -39
	2019	0.006 | a | -1	0.004 | ab | +40	0.003 | ab | +14
	2020	0.008 | a | +27	0.006 | b | +36	0.003 | ab | +0.8
	2021	0.007 | a | -7	0.005 | b | -7	0.004 | abc | +21
	2022	0.007 | a | -7	0.004 | ab | -27	0.003 | a | -20
	2023	0.006 | a | -12	0.004 | ab | +13	0.004 | abc | +22
	2024	0.006 | a | +4	0.005 | ab | +5	0.004 | abc | +7
Dissolved Organic Carbon [mg/L]	2013	2.676 | a | ↓		
	2015	2.881 | a | +8	2.739 | ab | ↓	
	2016	2.69 | a | -7	2.399 | a | -12	2.294 | ab | ↓
	2017	3.319 | bc | +23	2.893 | b | +21	2.217 | a | -3
	2018	3.072 | ab | -7	2.725 | ab | -6	2.346 | ab | +6
	2019	2.799 | a | -9	2.518 | a | -8	2.206 | a | -6
	2020	3.445 | bc | +23	2.985 | b | +19	2.209 | a | +0.1
	2021	3.474 | c | +0.8	3.025 | b | +1	2.633 | b | +19
	2022	4.187 | d | +21	3.819 | c | +26	3.171 | c | +20
	2023	4.285 | d | +2	3.986 | c | +4	3.469 | c | +9
	2024	4.779 | e | +12	3.976 | c | -0.3	3.49 | c | +0.6
Total Organic Carbon [mg/L]	2013	2.77 | ab | ↓		
	2015	2.937 | ab | +6	2.619 | a | ↓	
	2016	2.689 | a | -8	2.415 | a | -8	2.269 | a | ↓
	2017	3.281 | c | +22	2.967 | bc | +23	2.269 | a | +0.1
	2018	3.151 | bc | -4	2.668 | ab | -10	2.309 | ab | +2
	2019	2.851 | ab | -10	2.623 | a | -2	2.345 | ab | +2
	2020	3.436 | c | +21	3.059 | c | +17	2.154 | a | -8
	2021	3.398 | c | -1	2.923 | bc | -4	2.587 | b | +20
	2022	3.923 | d | +15	3.561 | d | +22	2.905 | c | +12
	2023	4.197 | de | +7	3.825 | de | +7	3.167 | cd | +9
	2024	4.424 | e | +5	3.919 | e | +2	3.266 | d | +3
Total Arsenic [ug/L]	2013	0.42 | abc | ↓		
	2015	0.338 | a | -19	0.244 | a | ↓	
	2016	0.4 | ab | +18	0.258 | a | +6	0.198 | a | ↓
	2017	0.434 | b | +8	0.266 | a | +3	0.199 | a | +0.4
	2018	0.385 | ab | -11	0.257 | a | -3	0.196 | a | -1
	2019	0.398 | ab | +3	0.296 | a | +15	0.222 | a | +13

Table C3-1. Results of ANOVA analysis for water chemistry characteristics in Meliadine Lake

Parameter	Year	ANOVA Model Estimates | Pairwise Statistical Differences Among Years | % Change Relative to the Previous Year		
		MEL-01	MEL-02	MEL-03
Total Arsenic [ug/L]	2020	0.523 | cd | +31	0.471 | b | +60	0.271 | b | +22
	2021	0.524 | d | +0.1	0.56 | c | +19	0.341 | c | +26
	2022	0.576 | de | +10	0.592 | c | +6	0.333 | c | -2
	2023	0.642 | ef | +11	0.749 | d | +27	0.406 | d | +22
	2024	0.668 | f | +4	0.844 | e | +13	0.464 | e | +14
Total Barium [ug/L]	2013	6.572 | a | ↓		
	2015	6.821 | a | +4	7.305 | a | ↓	
	2016	7.329 | b | +7	7.662 | ab | +5	7.482 | ab | ↓
	2017	7.949 | cd | +8	7.761 | bc | +1	7.492 | abc | +0.1
	2018	8.328 | de | +5	8.15 | cd | +5	7.579 | abc | +1
	2019	7.676 | bc | -8	8.046 | bcd | -1	7.305 | a | -4
	2020	8.494 | e | +11	8.32 | d | +3	7.766 | bc | +6
	2021	8.436 | e | -0.7	8.151 | cd | -2	7.815 | c | +0.6
	2022	8.62 | e | +2	7.853 | bc | -4	7.789 | bc | -0.3
	2023	9.527 | f | +11	9.141 | e | +16	8.812 | d | +13
	2024	9.223 | f | -3	9.039 | e | -1	8.627 | d | -2
Total Boron [ug/L]	2013	10 | c | ↓		
	2015	4.736 | a | -53	4.207 | a | ↓	
	2016	6.88 | b | +45	6.493 | d | +54	6.247 | c | ↓
	2017	5.027 | a | -27	5.06 | b | -22	5 | b | -20
	2018	4.95 | a | -2	4.11 | a | -19	3.6 | a | -28
	2019	5.493 | a | +11	5.207 | bc | +27	5.113 | b | +42
	2020	7.6 | b | +38	5.567 | bc | +7	5 | b | -2
	2021	7.461 | b | -2	5.48 | bc | -2	5 | b | +0.1
	2022	7.444 | b | -0.2	5.473 | bc | -0.1	5 | b | -0.1
	2023	7.672 | b | +3	5.82 | cd | +6	5.021 | b | +0.4
	2024	7.183 | b | -6	5.7 | bc | -2	5.053 | b | +0.6
Total Cobalt [ug/L]	2013	0.1 | c | ↓		
	2015	0.021 | a | -79	0.018 | ab | ↓	
	2016	0.025 | a | +21	0.014 | ab | -22	0.012 | abc | ↓
	2017	0.023 | a | -10	0.016 | ab | +14	0.01 | a | -22
	2018	0.024 | ab | +8	0.018 | ab | +11	0.016 | d | +73
	2019	0.027 | ab | +13	0.016 | ab | -8	0.013 | bc | -22
	2020	0.03 | ab | +10	0.018 | ab | +9	0.012 | abc | -4
	2021	0.036 | b | +19	0.018 | ab | +4	0.012 | ab | -6
	2022	0.027 | ab | -25	0.014 | a | -26	0.012 | ab | +0.3
	2023	0.029 | ab | +10	0.019 | ab | +38	0.015 | cd | +30
	2024	0.029 | ab | -2	0.021 | b | +11	0.016 | d | +6

Table C3-1. Results of ANOVA analysis for water chemistry characteristics in Meliadine Lake

Parameter	Year	ANOVA Model Estimates | Pairwise Statistical Differences Among Years | % Change Relative to the Previous Year		
		MEL-01	MEL-02	MEL-03
Total Copper [ug/L]	2013	1.148 | d | ↓		
	2015	0.706 | a | -39	0.754 | a | ↓	
	2016	0.77 | ab | +9	0.789 | ab | +5	0.685 | a | ↓
	2017	0.984 | cd | +28	0.934 | ab | +18	0.795 | ab | +16
	2018	0.832 | abc | -15	0.727 | a | -22	0.708 | ab | -11
	2019	0.806 | abc | -3	0.923 | ab | +27	0.98 | ab | +38
	2020	0.848 | abc | +5	0.999 | ab | +8	0.676 | a | -31
	2021	1.067 | d | +26	0.907 | ab | -9	1.129 | b | +67
	2022	0.949 | bcd | -11	0.807 | ab | -11	0.747 | ab | -34
	2023	0.992 | cd | +5	1.086 | b | +35	0.907 | ab | +21
	2024	1.055 | d | +6	1 | ab | -8	1.007 | ab | +11
Total Iron [ug/L]	2013	24 | ab | ↓		
	2015	19.686 | a | -18	18.013 | ab | ↓	
	2016	22.227 | ab | +13	14.02 | ab | -22	12.32 | ab | ↓
	2017	25.367 | ab | +14	15.233 | ab | +9	10.887 | ab | -12
	2018	25.07 | ab | -1	19.28 | ab | +27	14.97 | ab | +38
	2019	32.433 | b | +29	20.82 | b | +8	13.887 | ab | -7
	2020	25.94 | ab | -20	17.633 | ab | -15	12.88 | ab | -7
	2021	31.433 | b | +21	15.667 | ab | -11	11.013 | ab | -14
	2022	23.167 | ab | -26	11.14 | a | -29	10.027 | a | -9
	2023	24.606 | ab | +6	16.08 | ab | +44	13.846 | ab | +38
	2024	25.378 | ab | +3	19.693 | ab | +22	15.013 | b | +8
Total Lithium [ug/L]	2013	0.712 | ab | ↓		
	2015	0.624 | a | -12	0.593 | a | ↓	
	2016	0.928 | bc | +49	0.793 | bc | +34	0.534 | a | ↓
	2017	0.696 | a | -25	0.628 | ab | -21	0.619 | bc | +16
	2018	1.507 | f | +117	0.819 | bc | +30	0.555 | ab | -10
	2019	1.123 | de | -26	0.852 | c | +4	0.653 | c | +18
	2020	1.532 | f | +36	0.942 | c | +11	0.679 | cd | +4
	2021	1.279 | e | -16	0.949 | c | +0.8	0.742 | de | +9
	2022	1.178 | e | -8	0.937 | c | -1	0.817 | ef | +10
	2023	1.108 | cde | -6	0.914 | c | -2	0.839 | f | +3
	2024	0.994 | cd | -10	0.866 | c | -5	0.819 | ef | -2
Total Manganese [ug/L]	2013	3.374 | a | ↓		
	2015	5.634 | ab | +67	3.586 | ab | ↓	
	2016	7.27 | ab | +29	4.785 | bcd | +33	2.762 | b | ↓
	2017	5.846 | ab | -20	4.271 | abc | -11	2.261 | ab | -18
	2018	5.971 | ab | +2	4.218 | abcd | -1	2.8 | b | +24
	2019	9.331 | b | +56	4.247 | abc | +0.7	2.521 | b | -10

Table C3-1. Results of ANOVA analysis for water chemistry characteristics in Meliadine Lake

Parameter	Year	ANOVA Model Estimates | Pairwise Statistical Differences Among Years | % Change Relative to the Previous Year		
		MEL-01	MEL-02	MEL-03
Total Manganese [ug/L]	2020	8.316 | ab | -11	3.941 | ab | -7	2.721 | b | +8
	2021	9.455 | b | +14	3.905 | ab | -0.9	2.512 | ab | -8
	2022	7.301 | ab | -23	3.107 | a | -20	1.9 | a | -24
	2023	9.501 | b | +30	5.334 | cd | +72	3.958 | c | +108
	2024	7.558 | ab | -20	5.681 | d | +6	4.059 | c | +3
Total Molybdenum [ug/L]	2013	0.097 | a | ↓		
	2015	0.062 | a | -36	0.061 | a | ↓	
	2016	0.056 | a | -9	0.056 | a | -8	0.055 | a | ↓
	2017	0.083 | a | +46	0.083 | a | +48	0.073 | a | +32
	2018	0.077 | a | -7	0.08 | a | -4	0.077 | a | +6
	2019	0.077 | a | -0.5	0.07 | a | -12	0.07 | a | -8
	2020	0.155 | a | +103	0.47 | a | +574	0.987 | a | +1304
	2021	0.437 | a | +181	0.085 | a | -82	0.08 | a | -92
	2022	0.138 | a | -68	0.125 | a | +47	0.087 | a | +10
	2023	0.145 | a | +5	0.107 | a | -15	0.093 | a | +6
	2024	0.136 | a | -6	0.105 | a | -1	0.094 | a | +1
Total Nickel [ug/L]	2013	0.692 | cdef | ↓		
	2015	0.534 | a | -23	0.503 | ab | ↓	
	2016	0.566 | ab | +6	0.479 | a | -5	0.361 | a | ↓
	2017	0.699 | cde | +23	0.527 | abc | +10	0.406 | abc | +12
	2018	0.672 | cd | -4	0.63 | cde | +20	0.497 | cd | +22
	2019	0.638 | bc | -5	0.529 | abc | -16	0.388 | ab | -22
	2020	0.781 | fg | +22	0.618 | cde | +17	0.422 | abc | +9
	2021	0.733 | def | -6	0.582 | bcd | -6	0.428 | abc | +1
	2022	0.795 | fg | +8	0.554 | abcd | -5	0.429 | abcd | +0.3
	2023	0.829 | g | +4	0.699 | e | +26	0.525 | d | +22
	2024	0.772 | efg | -7	0.631 | de | -10	0.474 | bcd | -10
Total Strontium [ug/L]	2013	28.98 | a | ↓		
	2015	29.036 | a | +0.2	28.993 | a | ↓	
	2016	32.58 | ab | +12	31.34 | b | +8	30.06 | a | ↓
	2017	37.3 | b | +14	35.473 | c | +13	31.373 | a | +4
	2018	50.72 | c | +36	37.67 | cd | +6	32.29 | ab | +3
	2019	45.353 | c | -11	39.627 | d | +5	33.68 | bc | +4
	2020	67.08 | e | +48	43.54 | e | +10	35.553 | cd | +6
	2021	58.467 | d | -13	46.247 | f | +6	37.087 | d | +4
	2022	59.394 | d | +2	46.673 | f | +0.9	41.387 | e | +12
	2023	59.222 | d | -0.3	48.453 | fg | +4	42.45 | e | +3
	2024	57.25 | d | -3	49.32 | g | +2	43.233 | e | +2

Table C3-1. Results of ANOVA analysis for water chemistry characteristics in Meliadine Lake

Parameter	Year	ANOVA Model Estimates | Pairwise Statistical Differences Among Years | % Change Relative to the Previous Year		
		MEL-01	MEL-02	MEL-03
Total Uranium [ug/L]	2013	0.017 | abc | ↓		
	2015	0.014 | a | -16	0.015 | a | ↓	
	2016	0.015 | a | +6	0.015 | a | -4	0.014 | a | ↓
	2017	0.019 | bc | +25	0.017 | ab | +14	0.015 | a | +6
	2018	0.017 | ab | -6	0.015 | a | -7	0.018 | ab | +17
	2019	0.015 | ab | -11	0.015 | a | -2	0.016 | a | -12
	2020	0.019 | bc | +22	0.016 | a | +4	0.014 | a | -9
	2021	0.022 | cd | +14	0.016 | ab | +1	0.015 | a | +7
	2022	0.026 | ef | +23	0.018 | bc | +15	0.018 | ab | +18
	2023	0.028 | f | +7	0.022 | d | +18	0.02 | b | +15
	2024	0.025 | de | -13	0.02 | cd | -9	0.018 | ab | -13
Dissolved Copper [ug/L]	2013	0.812 | ab | ↓		
	2015	0.846 | ab | +4	0.922 | ab | ↓	
	2016	0.928 | ab | +10	0.869 | ab | -6	0.792 | bc | ↓
	2017	1.077 | b | +16	0.958 | ab | +10	0.767 | abc | -3
	2018	0.751 | a | -30	0.716 | ab | -25	0.67 | ab | -13
	2019	0.785 | a | +4	0.702 | a | -2	0.737 | abc | +10
	2020	0.827 | a | +5	0.789 | ab | +12	0.645 | a | -13
	2021	0.854 | ab | +3	0.83 | ab | +5	0.771 | abc | +19
	2022	0.939 | ab | +10	0.809 | ab | -3	0.731 | abc | -5
	2023	0.972 | ab | +3	1.204 | b | +49	0.845 | c | +16
	2024	0.918 | ab | -6	0.855 | ab | -29	0.852 | c | +0.8
Dissolved Manganese [ug/L]	2013	1.033 | abc | ↓		
	2015	1.768 | abc | +71	0.84 | ab | ↓	
	2016	0.984 | ab | -44	0.783 | ab | -7	0.981 | ab | ↓
	2017	0.693 | a | -30	0.941 | ab | +20	0.721 | ab | -26
	2018	1.205 | ab | +74	0.901 | ab | -4	2.245 | b | +211
	2019	4.721 | c | +292	1.105 | b | +23	0.78 | ab | -65
	2020	3.691 | bc | -22	0.458 | a | -59	0.521 | ab | -33
	2021	1.205 | ab | -67	0.527 | ab | +15	0.63 | ab | +21
	2022	0.648 | a | -46	0.412 | a | -22	0.356 | a | -43
	2023	0.628 | a | -3	0.745 | ab | +81	0.53 | ab | +49
	2024	1.343 | ab | +114	0.476 | ab | -36	0.514 | ab | -3

Figure C3-1. Total alkalinity

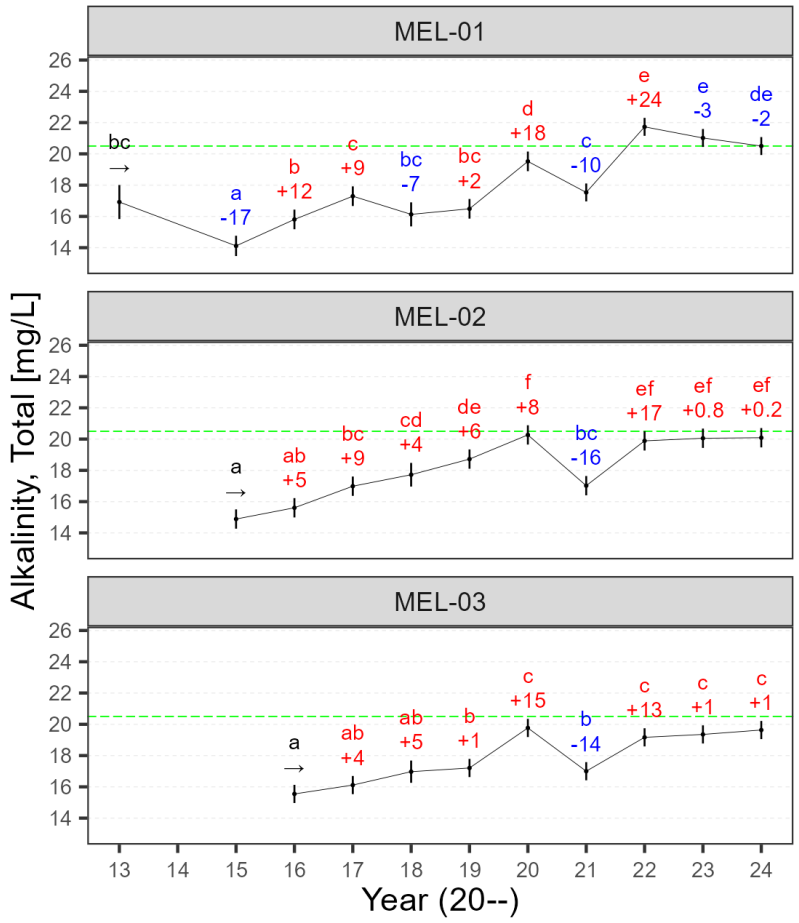


Figure C3-2. Total dissolved solids (measured)

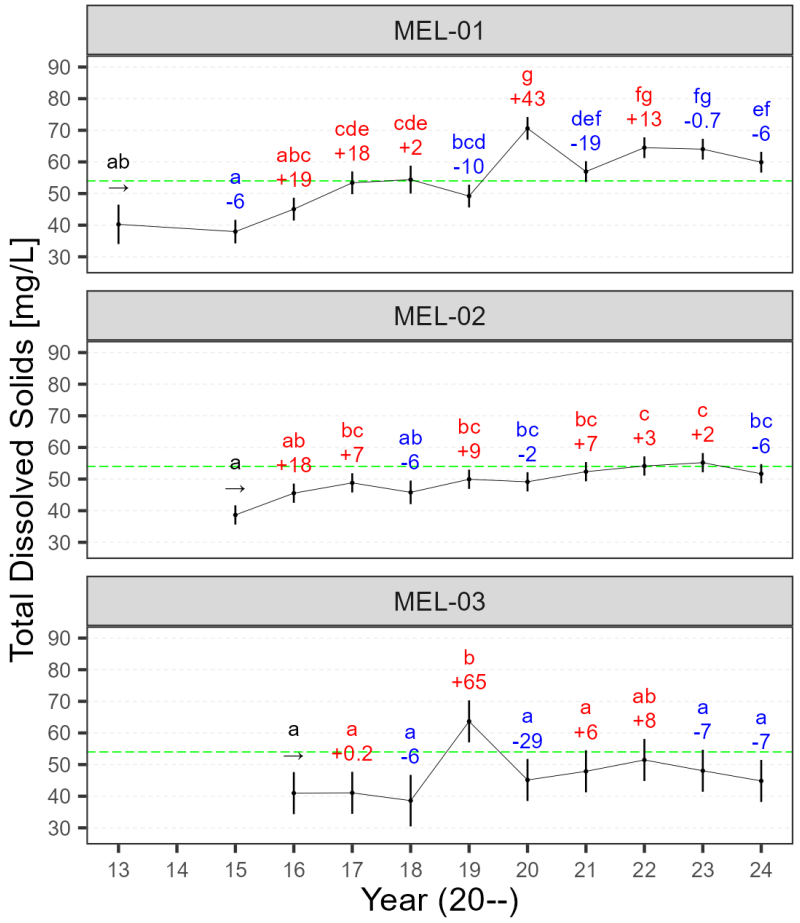


Figure C3-3. Hardness

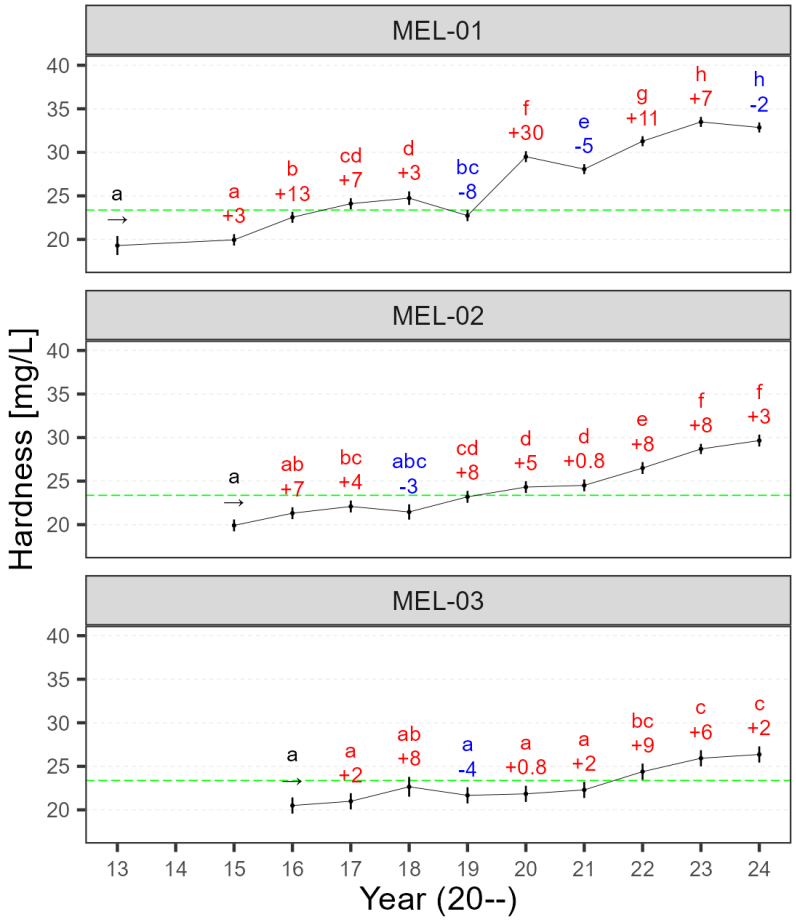


Figure C3-4. Lab conductivity

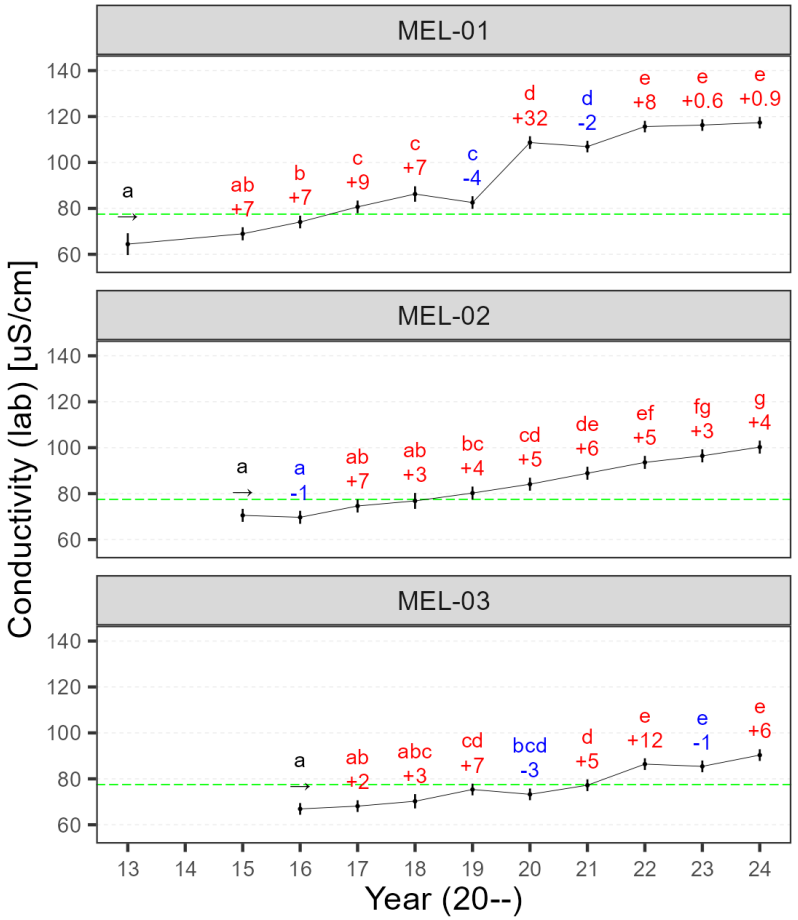


Figure C3-5. Chloride

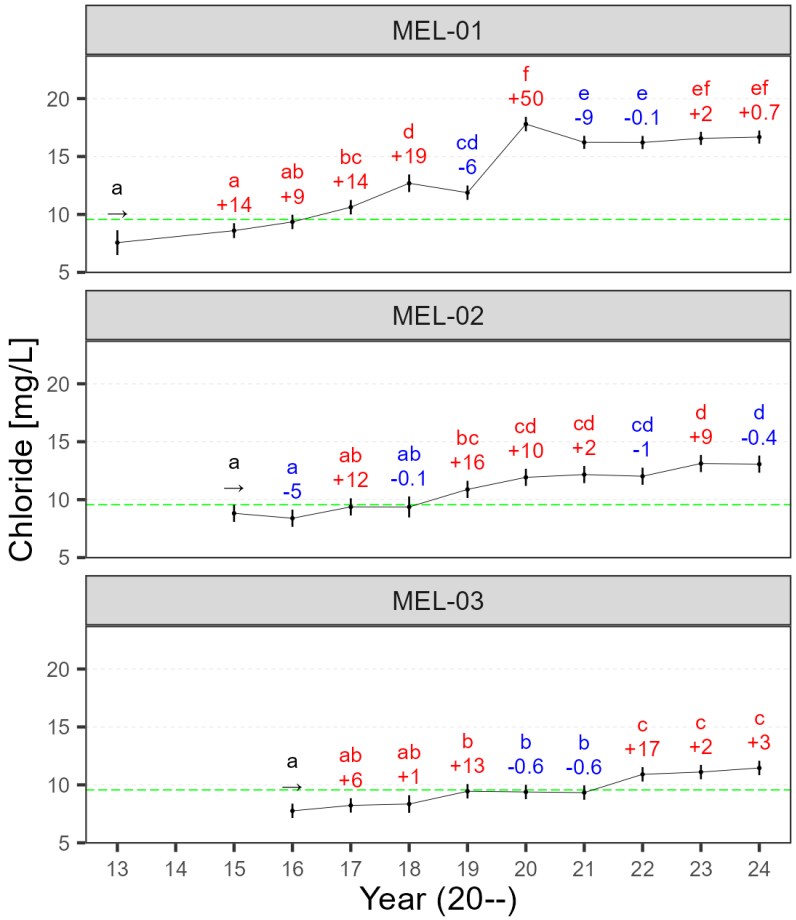


Figure C3-6. Fluoride

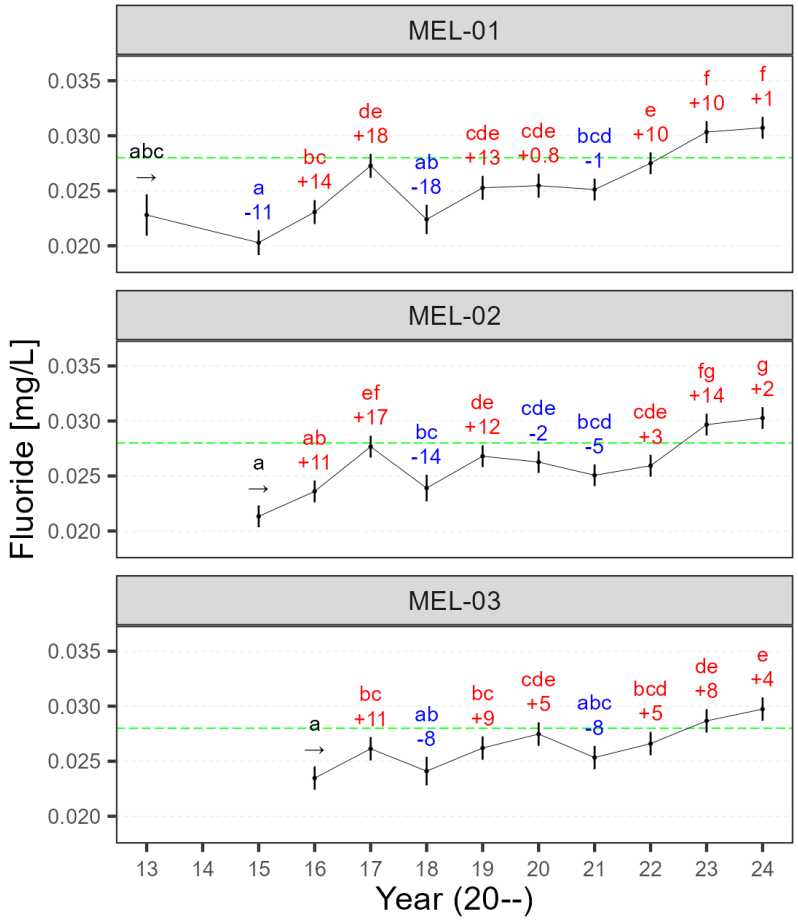


Figure C3-7. Total calcium

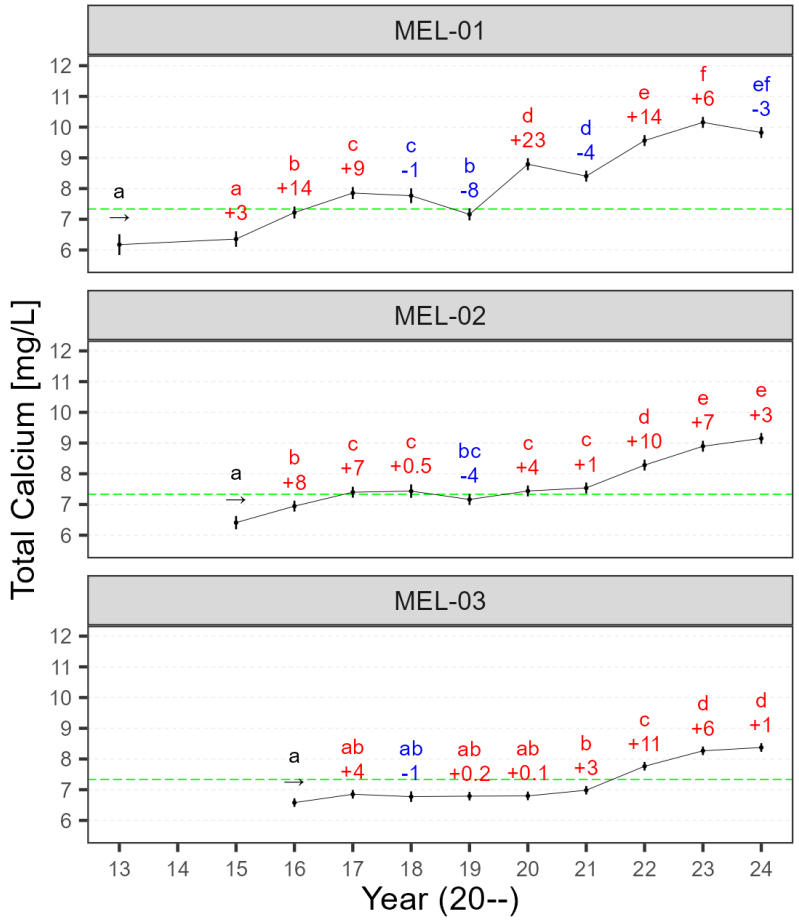


Figure C3-8. Total magnesium

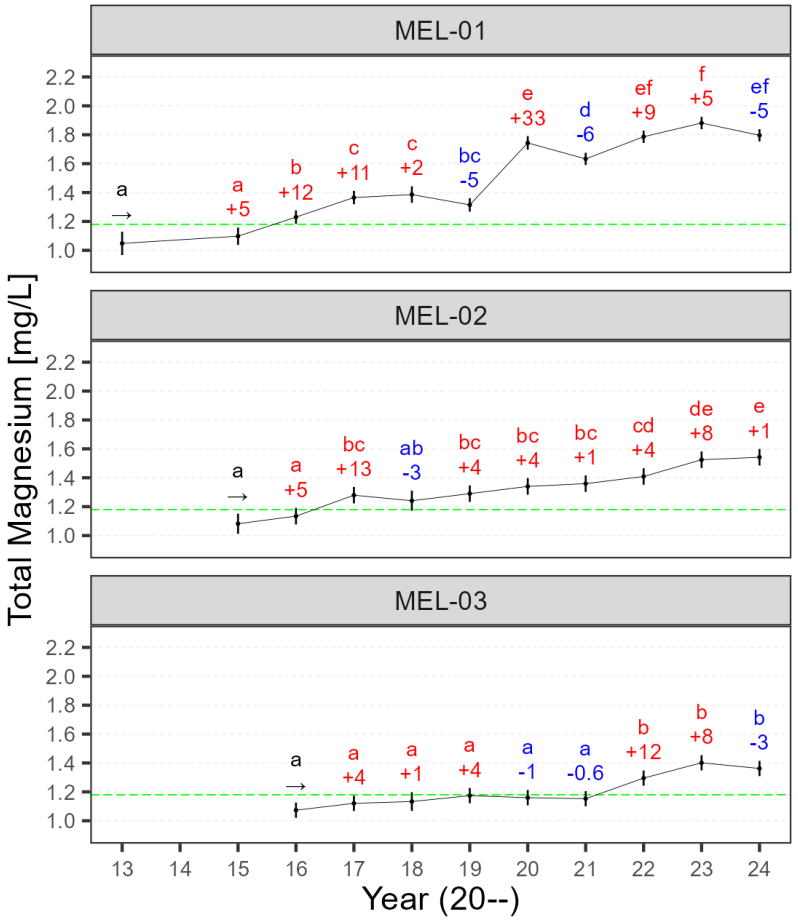


Figure C3-9. Total potassium

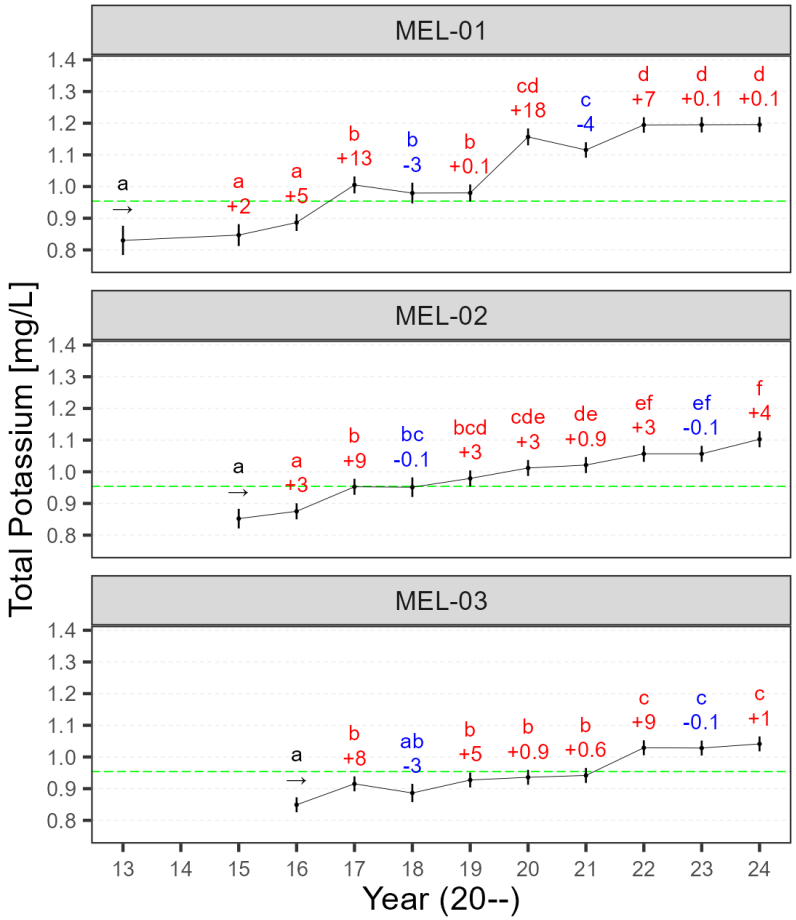


Figure C3-10. Total sodium

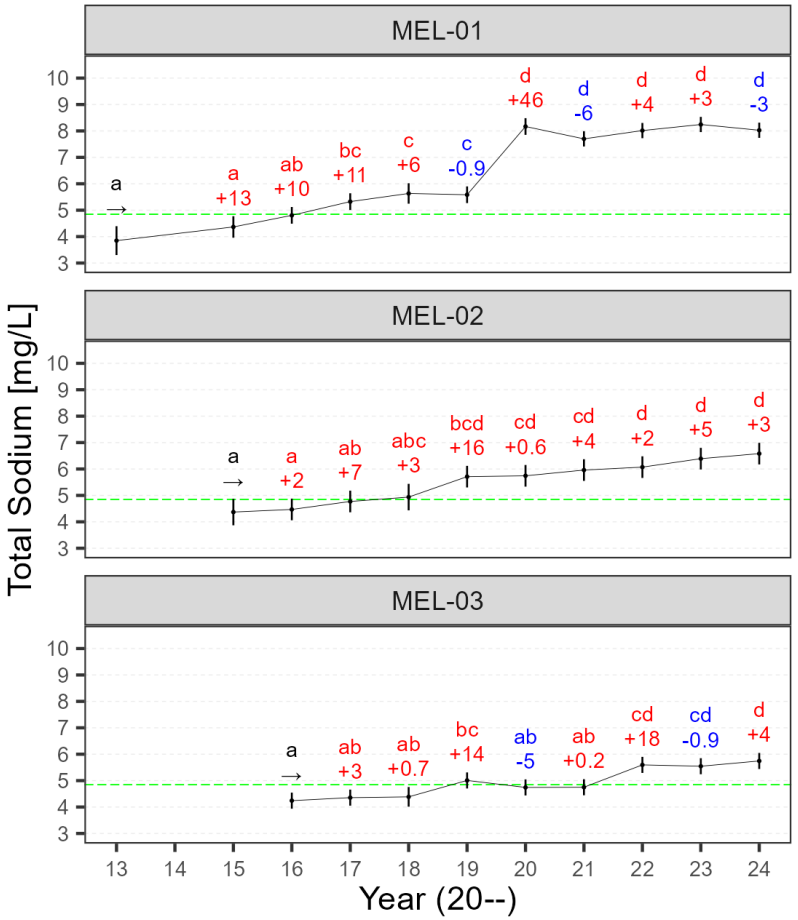


Figure C3-11. Reactive silica

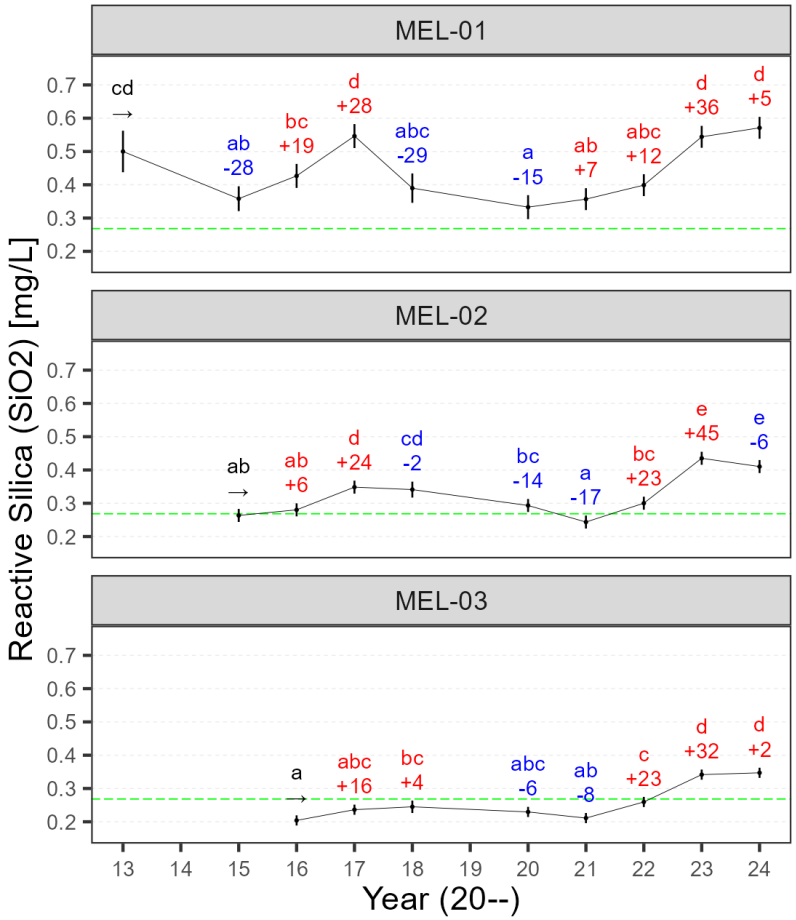


Figure C3-12. Sulphate

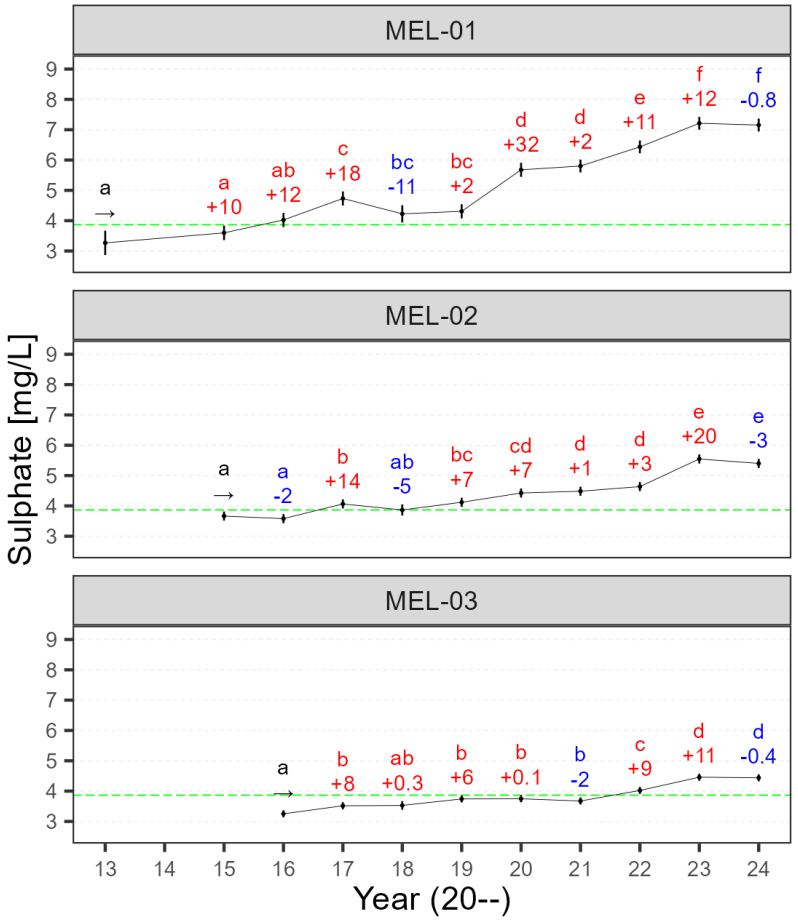


Figure C3-13. Total barium

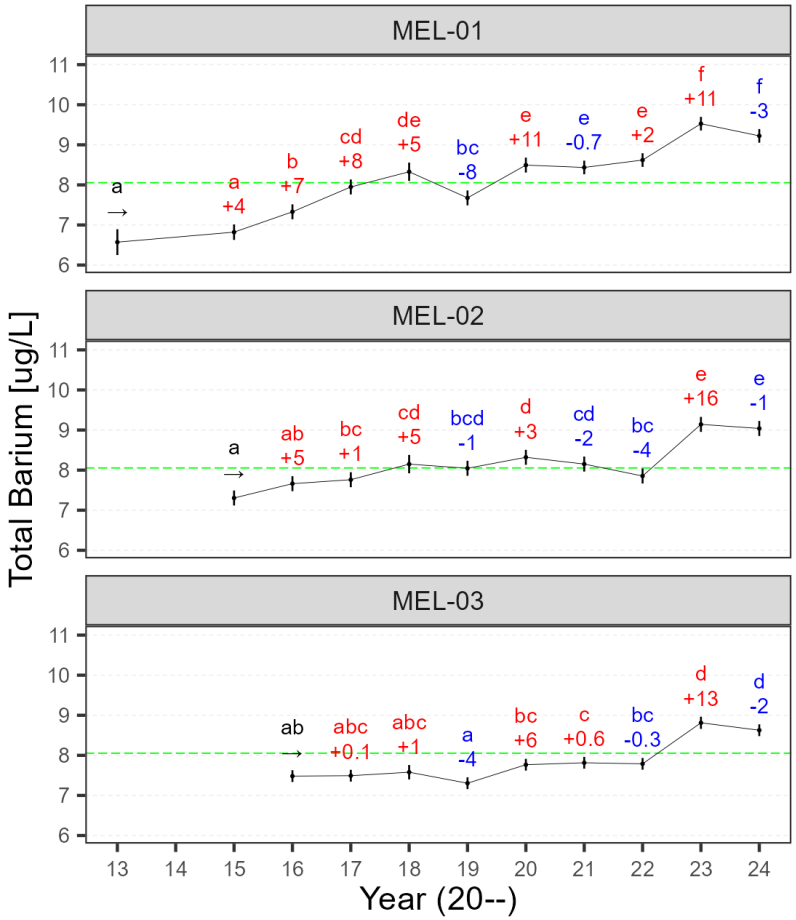


Figure C3-14. Total boron

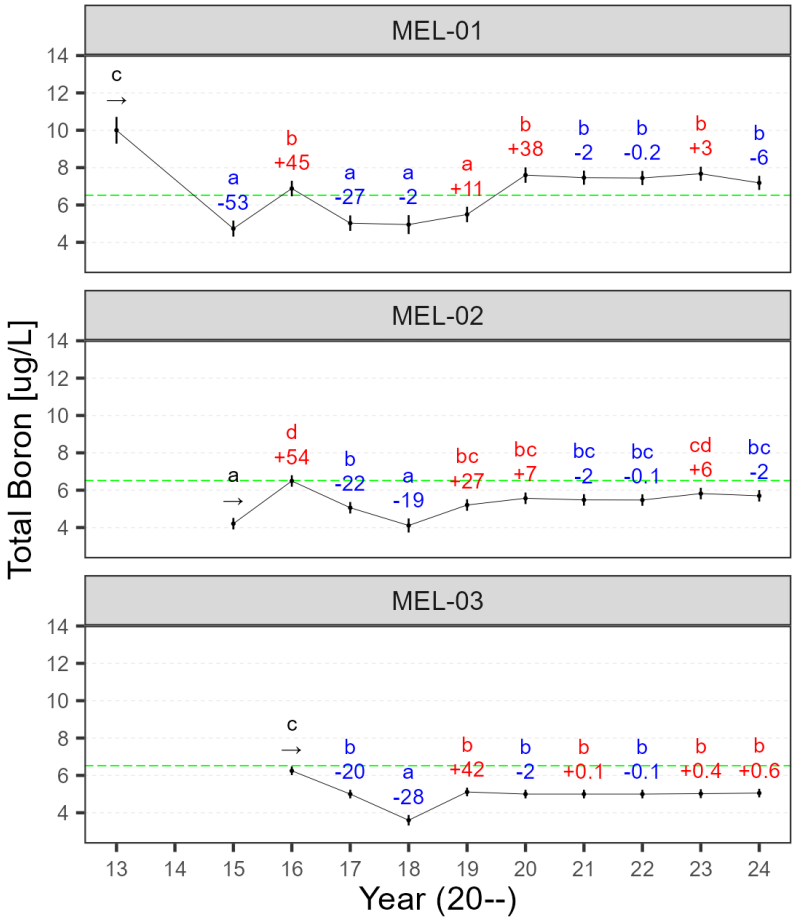


Figure C3-15. Total cobalt

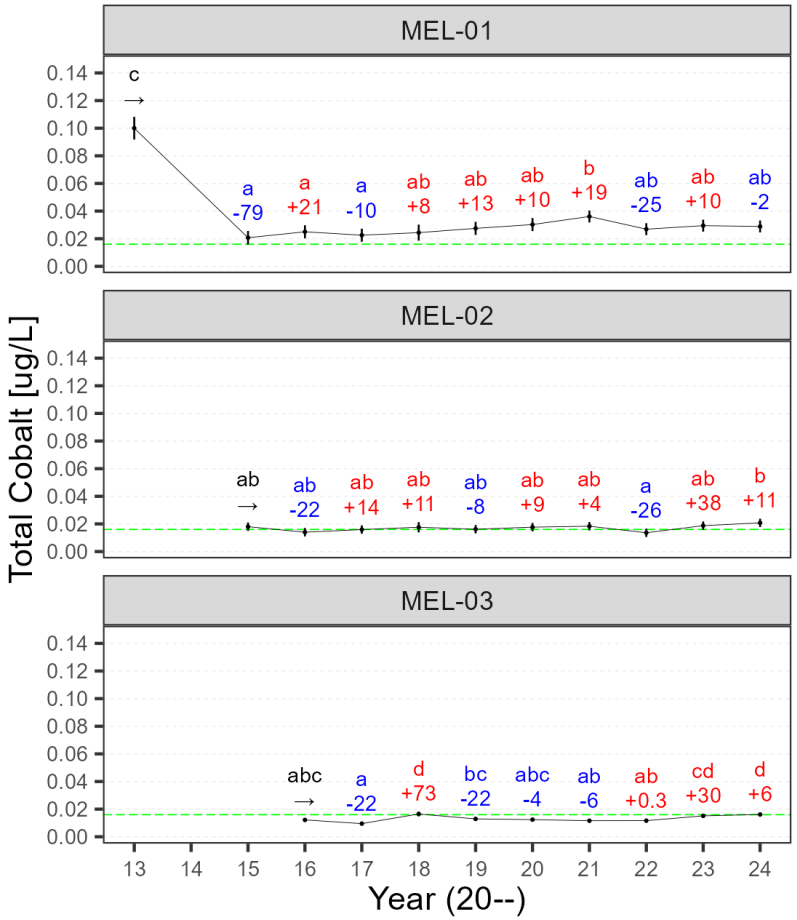


Figure C3-16. Dissolved copper

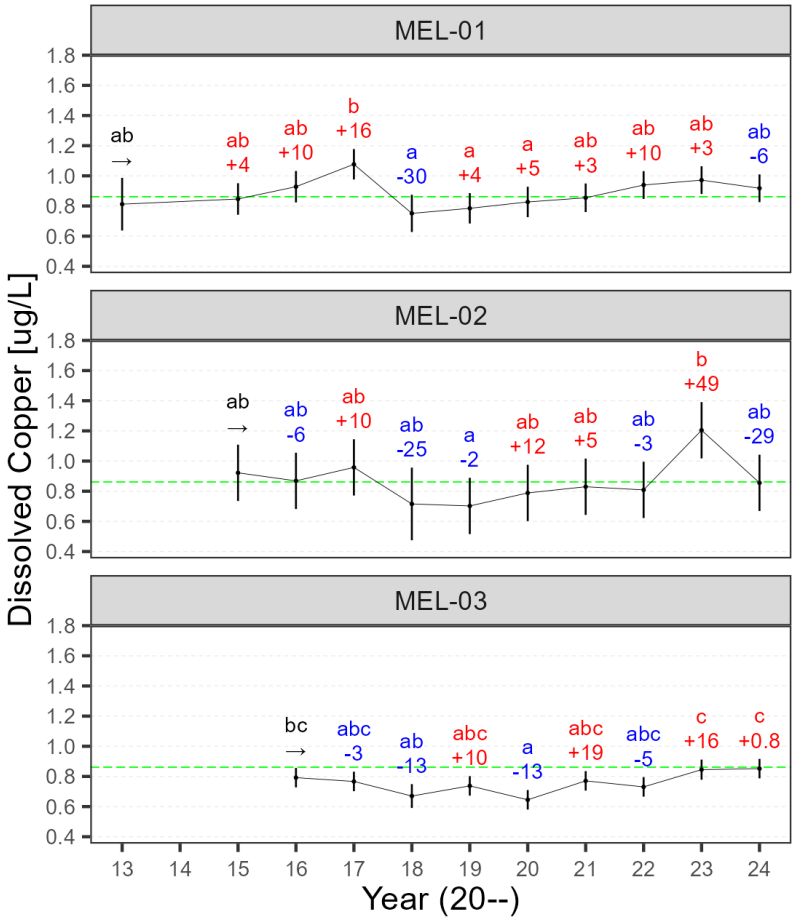


Figure C3-17. Total copper

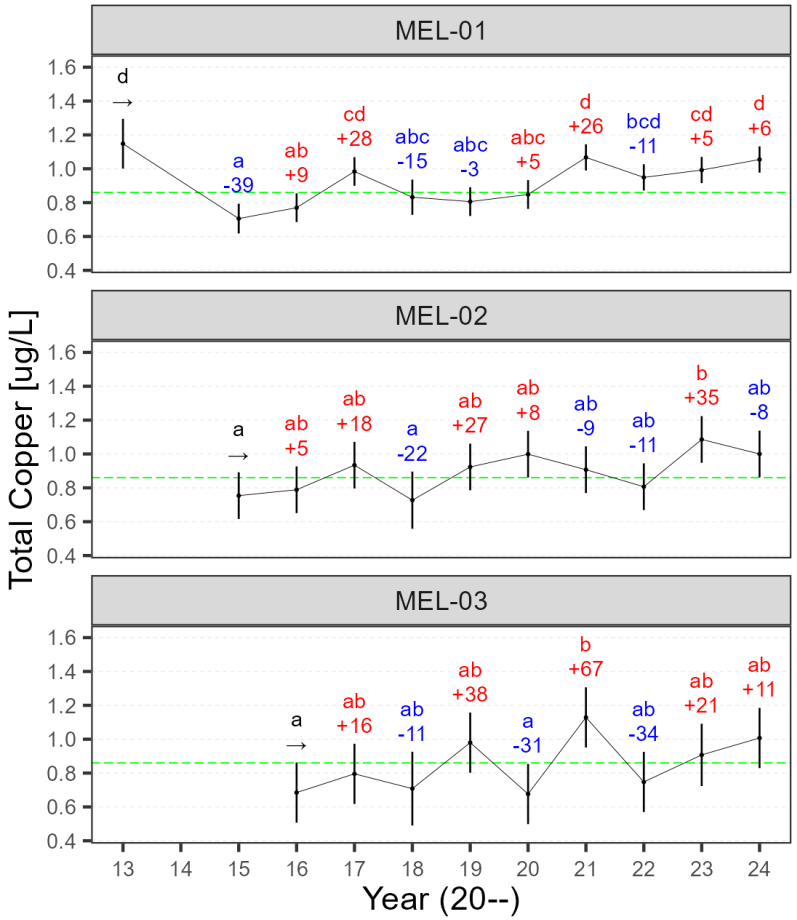


Figure C3-18. Total iron

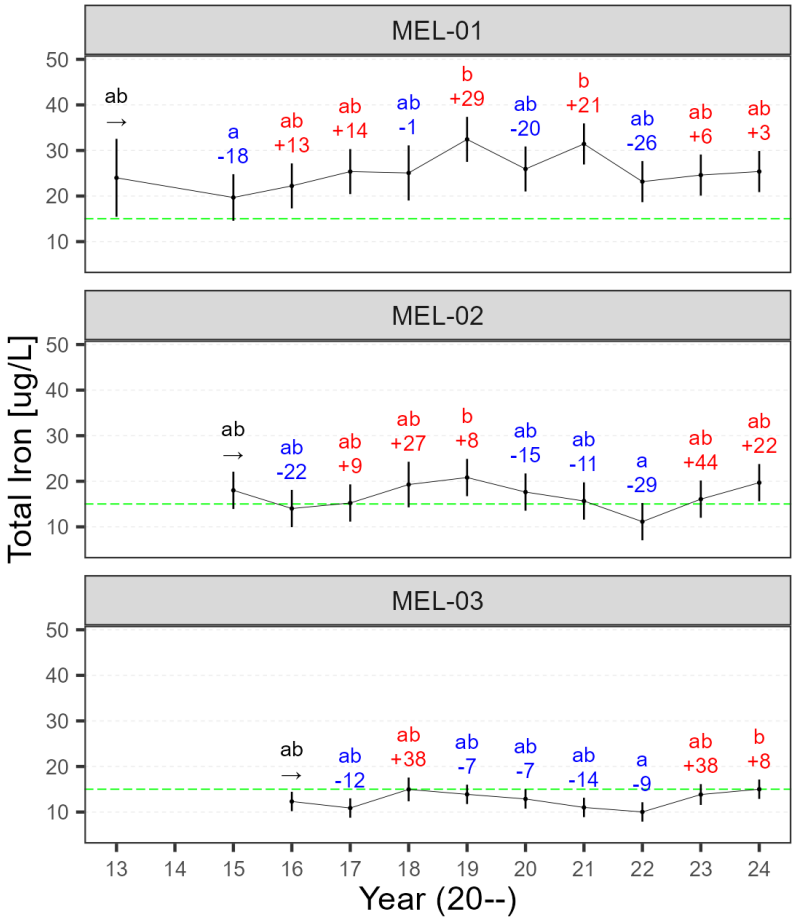


Figure C3-19. Total Kjeldahl nitrogen

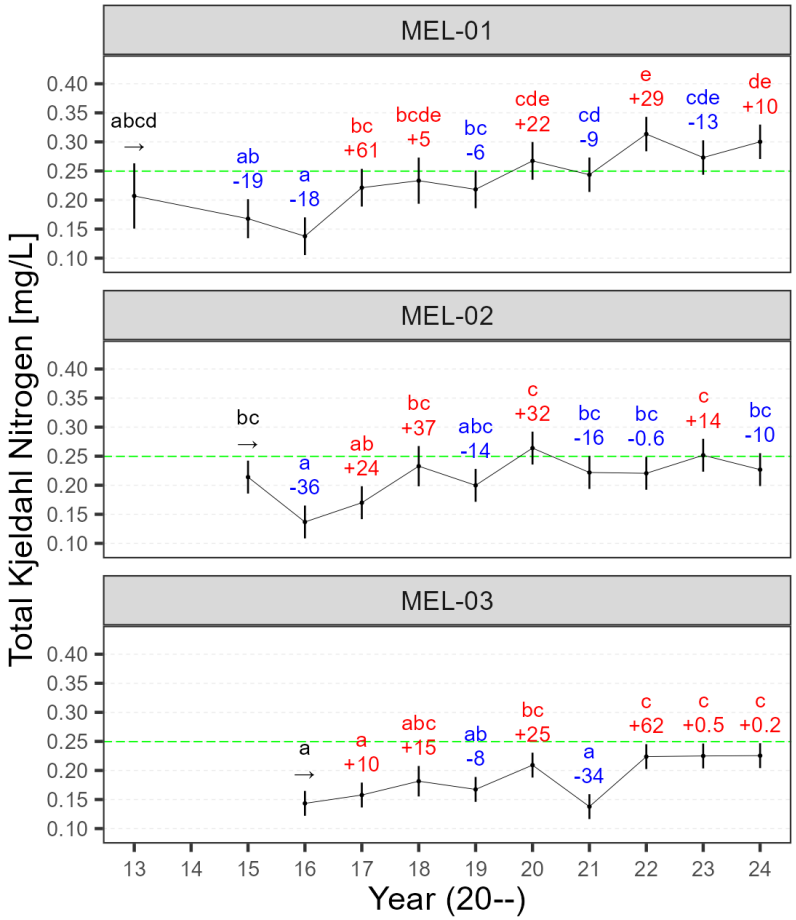


Figure C3-20. Total lithium

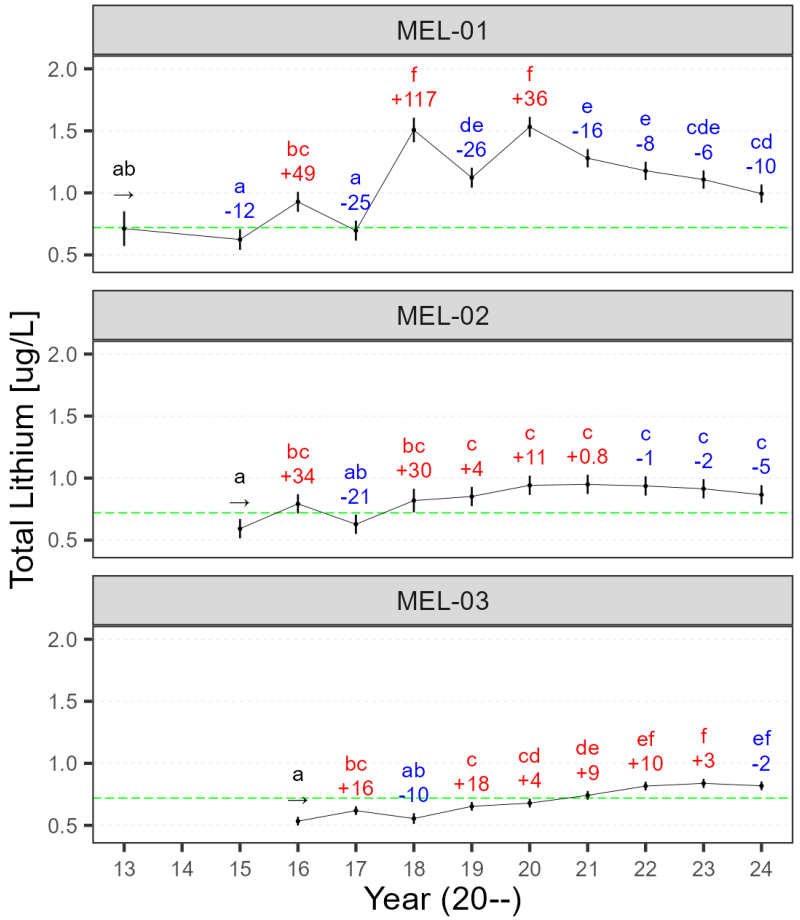


Figure C3-21. Dissolved manganese

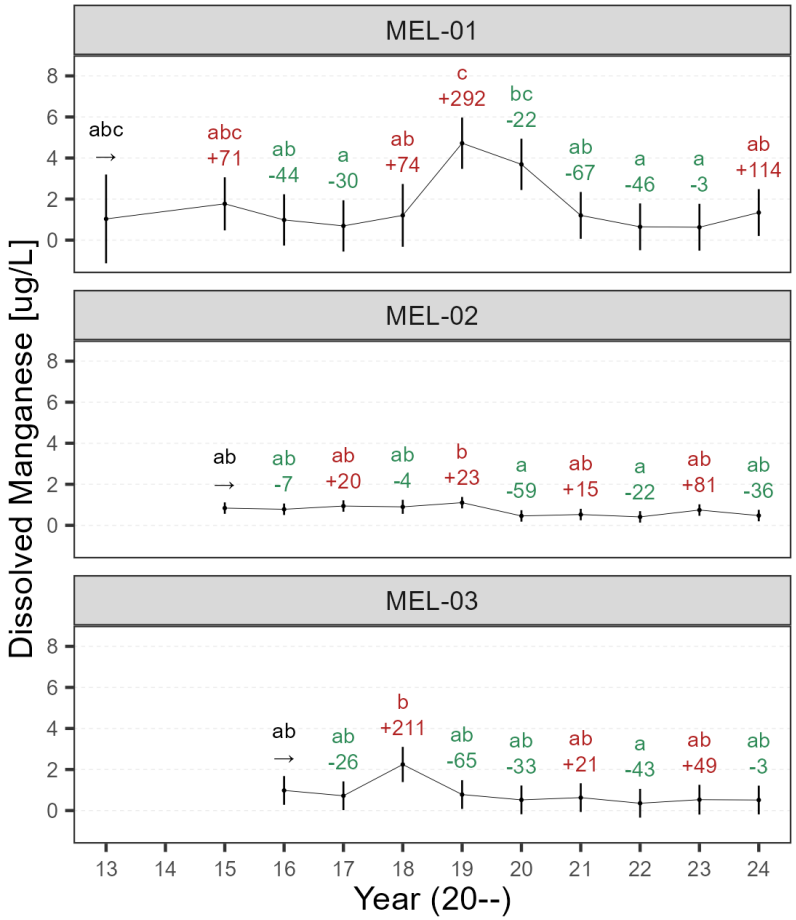


Figure C3-22. Total manganese

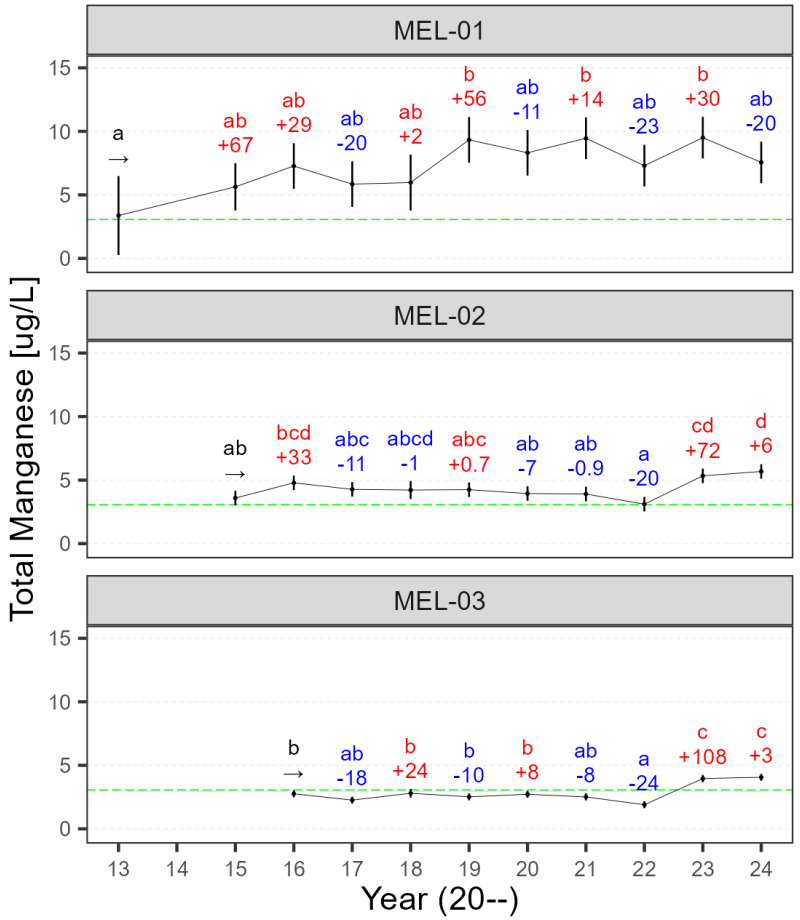


Figure C3-23. Total molybdenum

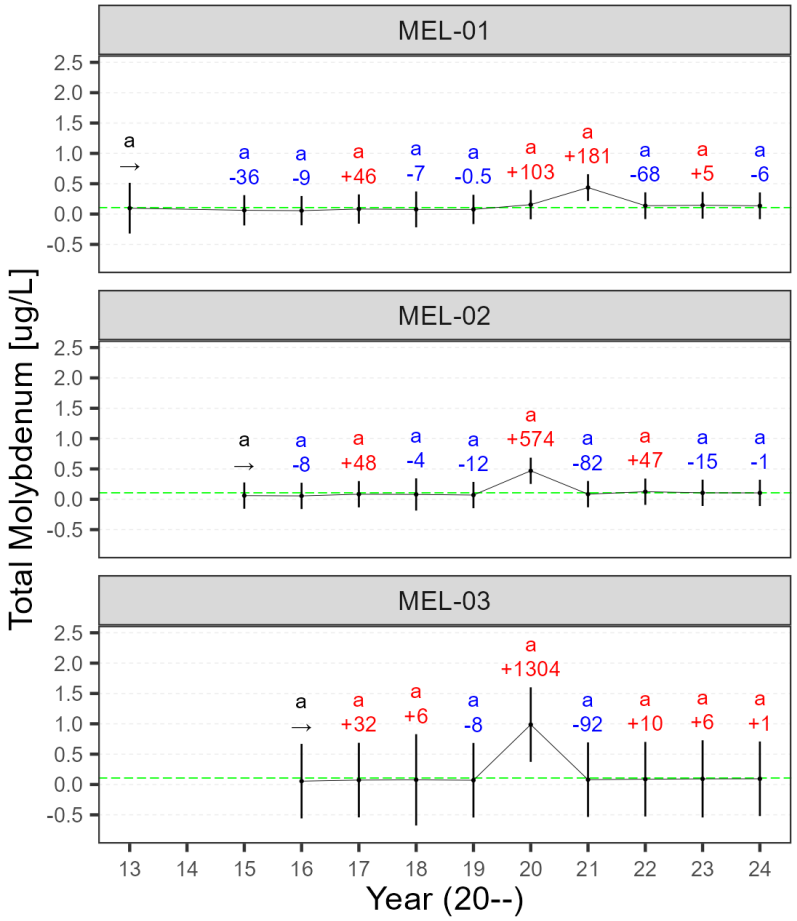


Figure C3-24. Total nickel

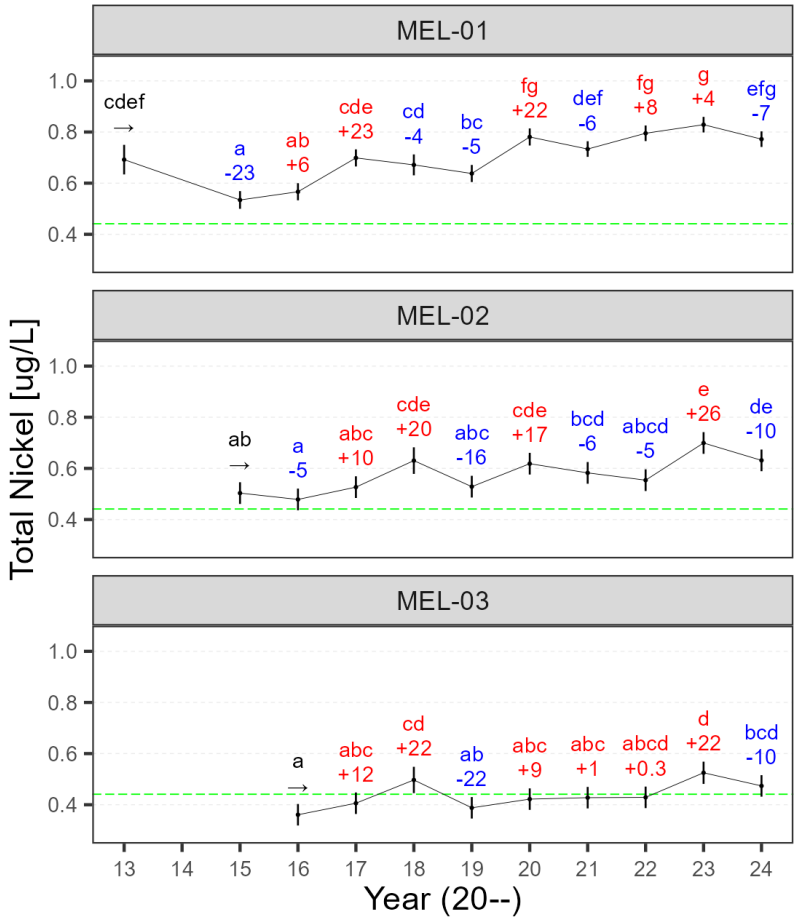


Figure C3-25. Total organic carbon

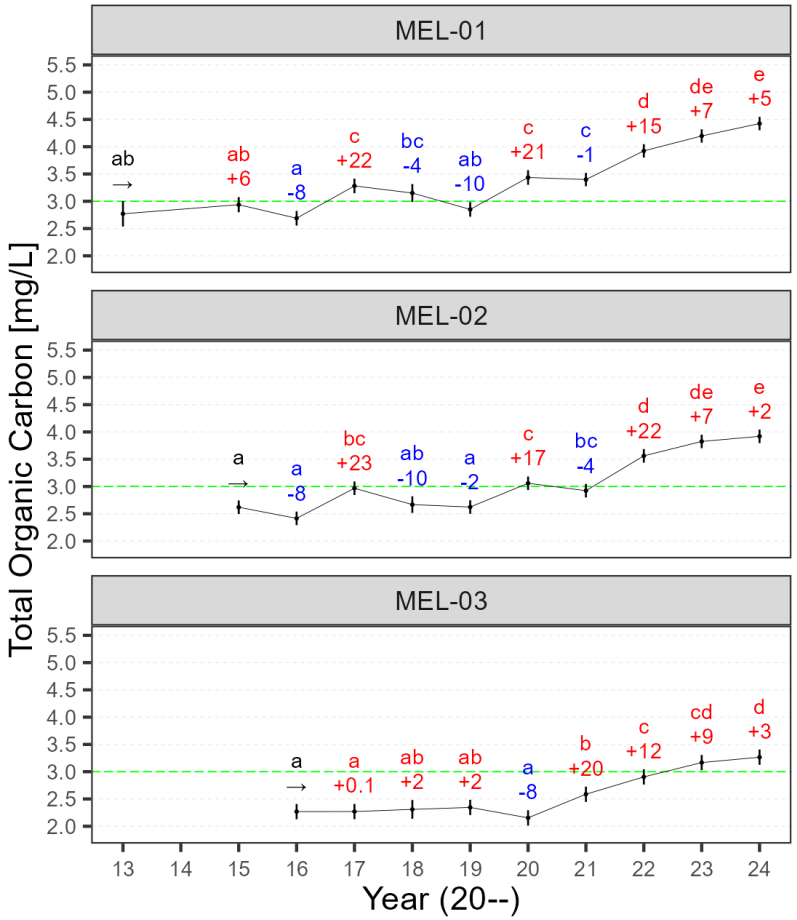


Figure C3-26. Total phosphorus

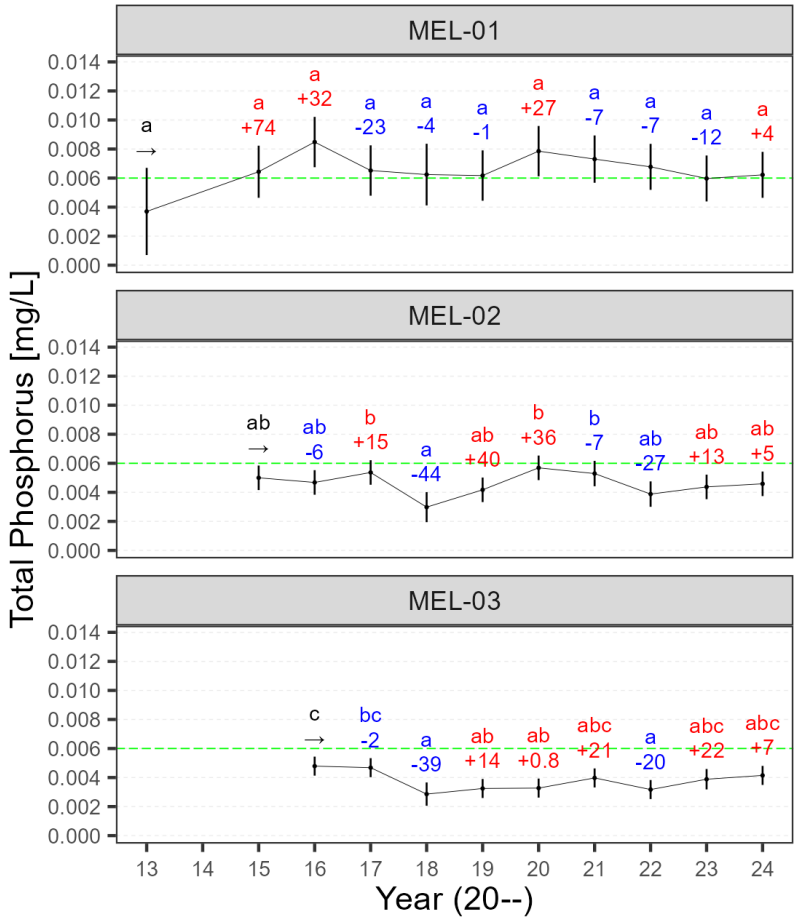


Figure C3-27. Total strontium

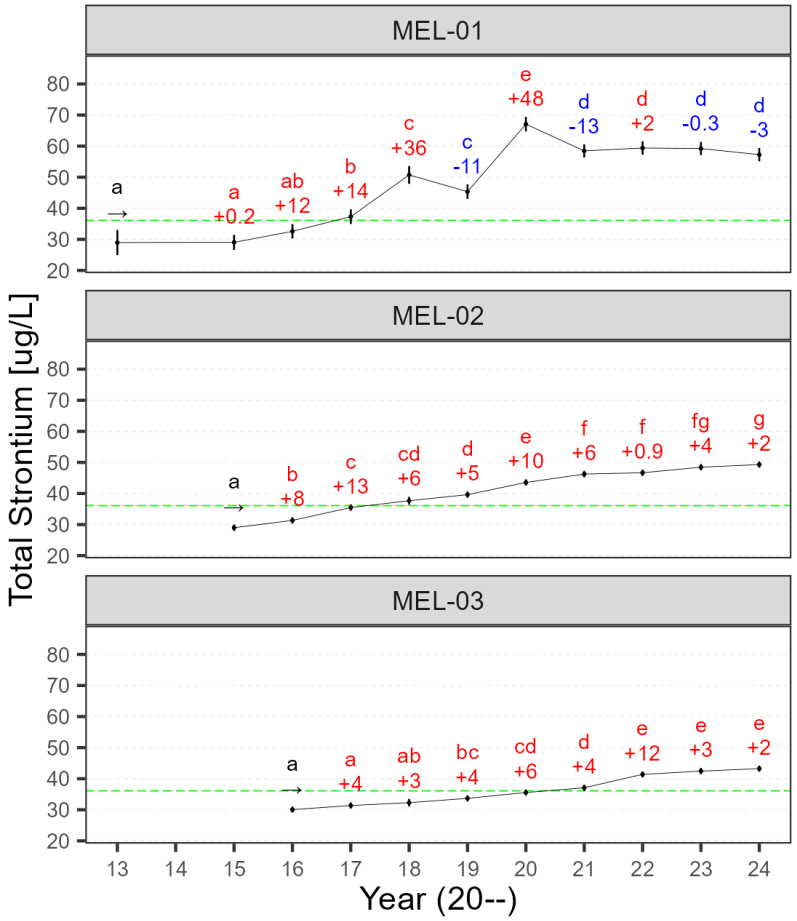
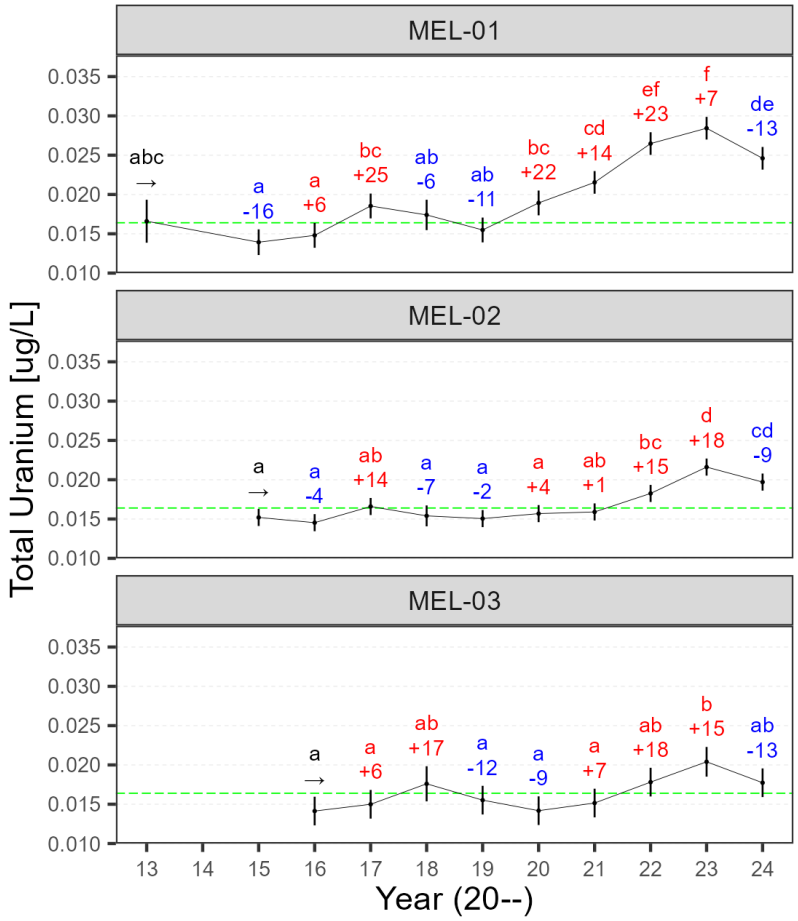


Figure C3-28. Total uranium



APPENDIX D
PENINSULA LAKES WATER QUALITY – SUPPORTING INFORMATION

Appendix D1
Peninsula Lakes Water Quality – 2024 Data and Summary Statistics

APPENDIX D1 – TABLES

Table D1-1. 2018 Normal Range values for the Peninsula Lakes water quality program. 3
Table D1-2. Lake A8 – Summary statistics and screening results for the 2024 sampling events (July and August). 8
Table D1-3. Lake B7 – Summary statistics and screening results for 2024 sampling events (July, August, September, and October). 11
Table D1-4. Lake D7 – Summary statistics and screening results for the 2024 sampling events (July and August). 14
Table D1-5. Water chemistry results from Lake A8, 2024..... 17
Table D1-6. Water chemistry results from Lake B7, 2024..... 20
Table D1-7. Water chemistry results from Lake D7, 2024. 23

Peninsula Lakes Normal Range Derivation

The Normal Ranges for baseline conditions in Lake A8, Lake B7, and Lake D7 were initially defined in the 2018 AEMP (Golder, 2019). Data included in the Normal Range calculations were collected during the baseline period from 1995 to 2011 and during the pre-construction period from 2015 to 2017 (pre-construction). Golder conducted a review of the baseline data as part of the 2018 Normal Range assessment and concluded that conventional parameters, major ions, and selected nutrients from 1995 to 2011 were fit for use in the Normal Range estimation. However, nitrogen and metals data from the baseline were not included in the Normal Range calculations because detection limits in these samples were not comparable with more recent detection limits.

Statistical methods used to estimate the Normal Range of concentrations for the Peninsula Lakes are described in the 2019 AEMP/EEMP report (Golder, 2019). The approach to calculating the normal range in the Peninsula Lakes followed the methods in Barrett et al. (2015). The approach takes into consideration underlying distribution of the baseline/reference data (i.e., are the baseline data normally distributed) when determining which method to use to estimate the limits of the normal range.

Three methods were proposed in the AEMP Design Document (Golder 2016) for calculating the normal range for a given variable (e.g., water quality parameters). A brief description of each method is provided below as per the methods described in the 2018 Interpretive report (Golder 2019):

- **Prediction Interval (PI)** – If the baseline/reference data are normally distributed, the normal range is calculated using the 80% prediction interval. Normality [of the raw data] is assessed using the Shapiro-Wilk test, using $\alpha = 0.05$ to indicate a significant departure from normality.
- **PI Method (Box-Cox Transformation; PI [λ])** – When the baseline/reference data are not normally distributed, but normality could be achieved after Box-Cox transformation (Box and Cox 1964), the normal range is calculated on the Box-Cox transformed data and the upper and lower bound of the normal ranges are back-transformed.
- **Percentile** – If neither the untransformed data nor Box-Cox transformed datasets are normally distributed, the normal range boundaries are defined as the 10th and 90th percentile of the baseline data. In cases where the percentile method is used, a dataset of 1,000 samples is randomly generated from the normal range dataset and the 10th and 90th percentile are calculated from the distribution of 1,000 samples to estimate the normal range.

Normal range estimates were calculated separately for Lake A8, Lake B7, and Lake D7 using samples collected during the open-water sampling events[1]. The baseline period for the Peninsula Lakes ended in 2017; meaning no new data are included in normal range calculations for Lake A8, Lake B7, and Lake D7.

Normal range values derived for each of the three Peninsula Lakes in 2018 are provided in **Table D1-1**. Also included in this table are the revised Normal Ranges that were calculated for a select number of parameters in the 2024 AEMP because the 2018 Normal Ranges were less than two times the 2024 detection limit.

[1] Normal ranges were not derived for the ice-covered sampling events due to insufficient reference and baseline data for the winter months.

Table D1-1. 2018 Normal Range values for the Peninsula Lakes water quality program.

Lake	Parameter Class	Parameter	2018 Normal Range Information			Detection Limit Comparison			Updated Normal Range	
			NR DL	Method	Normal Range (Upper Limit)	2024 DL	DL Comparison	DLx2	Source	Normal Range Value for 2024
A8	Conventional Parameters	TDS Calculated		Percentile	152				2018 Normal Range	152
		Total Suspended Solids	1	Percentile	4	1	2024=2018	2	2018 Normal Range	4
		Turbidity (lab)	0.1	PI(λ)	0.87	0.1	2024=2018	0.2	2018 Normal Range	0.87
	Major Ions	Alkalinity, Bicarbonate	1.2	PI(λ)	91	1	2024 lower	2	2018 Normal Range	91
		Alkalinity, Total	1	PI(λ)	83.6	1	2024=2018	2	2018 Normal Range	83.6
		Calcium (T)	0.02	Percentile	40	0.01	2024 lower	0.02	2018 Normal Range	40
		Chloride	0.1	Percentile	61	0.1	2024=2018	0.2	2018 Normal Range	61
		Fluoride	0.02	PI	0.04	0.02	2024=2018	0.04	2018 Normal Range	0.04
		Magnesium (T)	0.004	Percentile	5.6	0.004	2024=2018	0.008	2018 Normal Range	5.6
		Potassium (T)	0.02	Percentile	2.5	0.02	2024=2018	0.04	2018 Normal Range	2.5
		Reactive Silica (SiO2)	0.01	PI	1.3	0.01	2024=2018	0.02	2018 Normal Range	1.3
		Sodium (T)	0.005	Percentile	8.4	0.02	2024 higher	0.04	2018 Normal Range	8.4
		Sulphate	0.3	PI	9.3	0.3	2024=2018	0.6	2018 Normal Range	9.3
	Nutrients	Ammonia (as N)	0.005	Percentile	0.011	0.005	2024=2018	0.01	2018 Normal Range	0.011
		Nitrate (as N)	0.005	Percentile	0.015	0.005	2024=2018	0.01	2018 Normal Range	0.015
		Nitrite (as N)	0.005	DL	0.005	0.001	2024 lower	0.002	2018 Normal Range	0.005
		Orthophosphate (PO4-P)	0.001	Percentile	0.0023	0.001	2024=2018	0.002	2018 Normal Range	0.0023
		Total Diss Phosphorus	0.001	PI(λ)	0.006	0.001	2024=2018	0.002	2018 Normal Range	0.006
		Total Kjeldahl Nitrogen	0.05	PI(λ)	0.63	0.05	2024=2018	0.1	2018 Normal Range	0.63
		Total Phosphorus	0.001	PI	0.009	0.001	2024=2018	0.002	2018 Normal Range	0.009
	Organic/Inorganic Carbon	Dissolved Organic Carbon	0.5	PI	4.9	0.5	2024=2018	1	2018 Normal Range	4.9
		Total Organic Carbon	0.5	PI	4.7	0.5	2024=2018	1	2018 Normal Range	4.7
	Total Metals	Aluminum (T)	0.3	PI(λ)	3	1	2024 higher	2	2018 Normal Range	3
		Antimony (T)	0.02	Percentile	0.4	0.02	2024=2018	0.04	2018 Normal Range	0.4
		Arsenic (T)	0.02	PI	2.4	0.02	2024=2018	0.04	2018 Normal Range	2.4
		Barium (T)	0.05	PI	32	0.02	2024 lower	0.04	2018 Normal Range	32
		Beryllium (T)	0.01	DL	0.01	0.005	2024 lower	0.01	2018 Normal Range	0.01
		Bismuth (T)	0.01	DL	0.01	0.005	2024 lower	0.01	2018 Normal Range	0.01
		Boron (T)	1	Percentile	5	5	2024 higher	10	DLx2	10
		Cadmium (T)	0.005	DL	0.005	0.005	2024=2018	0.01	DLx2	0.01
		Chromium (T)	0.06	DL	0.06	0.1	2024 higher	0.2	DLx2	0.2
		Cobalt (T)	0.01	PI	0.05	0.005	2024 lower	0.01	2018 Normal Range	0.05
		Copper (T)	0.1	PI	0.89	0.05	2024 lower	0.1	2018 Normal Range	0.89

Table D1-1. 2018 Normal Range values for the Peninsula Lakes water quality program.

Lake	Parameter Class	Parameter	2018 Normal Range Information			Detection Limit Comparison			Updated Normal Range	
			NR DL	Method	Normal Range (Upper Limit)	2024 DL	DL Comparison	DLx2	Source	Normal Range Value for 2024
A8	Total Metals	Iron (T)	1	PI	67	1	2024=2018	2	2018 Normal Range	67
		Lead (T)	0.01	Percentile	0.03	0.01	2024=2018	0.02	2018 Normal Range	0.03
		Lithium (T)	0.5	Percentile	10	0.5	2024=2018	1	2018 Normal Range	10
		Manganese (T)	0.05	PI	13	0.05	2024=2018	0.1	2018 Normal Range	13
		Mercury (T)	5.00E-04	PI	0.0012	5.00E-04	2024=2018	0.001	2018 Normal Range	0.0012
		Molybdenum (T)	0.05	Percentile	0.22	0.05	2024=2018	0.1	2018 Normal Range	0.22
		Nickel (T)	0.06	PI	0.92	0.05	2024 lower	0.1	2018 Normal Range	0.92
		Selenium (T)	0.02	DL	0.02	0.04	2024 higher	0.08	DLx2	0.08
		Silver (T)	0.005	DL	0.005	0.005	2024=2018	0.01	DLx2	0.01
		Strontium (T)	0.05	PI(λ)	273	0.02	2024 lower	0.04	2018 Normal Range	273
		Thallium (T)	0.005	DL	0.005	0.005	2024=2018	0.01	DLx2	0.01
		Tin (T)	0.05	DL	0.05	0.02	2024 lower	0.04	2018 Normal Range	0.05
		Titanium (T)	0.1	Percentile	0.25	0.05	2024 lower	0.1	2018 Normal Range	0.25
		Uranium (T)	0.01	PI(λ)	0.054	0.001	2024 lower	0.002	2018 Normal Range	0.054
		Vanadium (T)	0.01	DL	0.01	0.05	2024 higher	0.1	DLx2	0.1
		Zinc (T)	0.8	Percentile	1.2	0.5	2024 lower	1	2018 Normal Range	1.2
	Dissolved Metals	Zinc (D)	0.8	Percentile	8.5	0.5	2024 lower	1	2018 Normal Range	8.5
	Other	Cyanide (Total)	0.001	DL	0.001	0.001	2024=2018	0.002	DLx2	0.002
B7	Conventional Parameters	TDS Calculated		Percentile	171				2018 Normal Range	171
		Total Suspended Solids	1	PI(λ)	3	1	2024=2018	2	2018 Normal Range	3
		Turbidity (lab)	0.1	PI(λ)	0.69	0.1	2024=2018	0.2	2018 Normal Range	0.69
	Major Ions	Alkalinity, Bicarbonate	1.2	Percentile	135	1	2024 lower	2	2018 Normal Range	135
		Alkalinity, Total	1	Percentile	110	1	2024=2018	2	2018 Normal Range	110
		Calcium (T)	0.02	Percentile	39	0.01	2024 lower	0.02	2018 Normal Range	39
		Chloride	0.1	Percentile	25	0.1	2024=2018	0.2	2018 Normal Range	25
		Fluoride	0.02	PI(λ)	0.04	0.02	2024=2018	0.04	2018 Normal Range	0.04
		Magnesium (T)	0.004	Percentile	5.3	0.004	2024=2018	0.008	2018 Normal Range	5.3
		Potassium (T)	0.02	Percentile	2.8	0.02	2024=2018	0.04	2018 Normal Range	2.8
		Reactive Silica (SiO2)	0.01	Percentile	2.3	0.05	2024 higher	0.1	2018 Normal Range	2.3
		Sodium (T)	0.005	Percentile	7.5	0.02	2024 higher	0.04	2018 Normal Range	7.5
		Sulphate	0.3	Percentile	6	0.3	2024=2018	0.6	2018 Normal Range	6
	Nutrients	Ammonia (as N)	0.005	Percentile	0.025	0.005	2024=2018	0.01	2018 Normal Range	0.025
		Nitrate (as N)	0.005	Percentile	0.005	0.005	2024=2018	0.01	DLx2	0.01

Table D1-1. 2018 Normal Range values for the Peninsula Lakes water quality program.

Lake	Parameter Class	Parameter	2018 Normal Range Information			Detection Limit Comparison			Updated Normal Range	
			NR DL	Method	Normal Range (Upper Limit)	2024 DL	DL Comparison	DLx2	Source	Normal Range Value for 2024
B7	Nutrients	Nitrite (as N)	0.005	DL	0.005	0.001	2024 lower	0.002	2018 Normal Range	0.005
		Orthophosphate (PO4-P)	0.001	DL	0.001	0.001	2024=2018	0.002	DLx2	0.002
		Total Diss Phosphorus	0.001	PI(λ)	0.008	0.001	2024=2018	0.002	2018 Normal Range	0.008
		Total Kjeldahl Nitrogen	0.05	PI(λ)	0.73	0.05	2024=2018	0.1	2018 Normal Range	0.73
		Total Phosphorus	0.001	PI(λ)	0.01	0.001	2024=2018	0.002	2018 Normal Range	0.01
	Organic/Inorganic Carbon	Dissolved Organic Carbon	0.5	PI	5.5	0.5	2024=2018	1	2018 Normal Range	5.5
		Total Organic Carbon	0.5	PI(λ)	7.6	0.5	2024=2018	1	2018 Normal Range	7.6
	Total Metals	Aluminum (T)	0.3	PI(λ)	6.6	1	2024 higher	2	2018 Normal Range	6.6
		Antimony (T)	0.02	DL	0.02	0.02	2024=2018	0.04	DLx2	0.04
		Arsenic (T)	0.02	PI(λ)	1.8	0.02	2024=2018	0.04	2018 Normal Range	1.8
	Total Metals	Barium (T)	0.05	Percentile	20	0.02	2024 lower	0.04	2018 Normal Range	20
		Beryllium (T)	0.01	DL	0.01	0.005	2024 lower	0.01	2018 Normal Range	0.01
		Bismuth (T)	0.01	DL	0.01	0.005	2024 lower	0.01	2018 Normal Range	0.01
		Boron (T)	1	Percentile	8	5	2024 higher	10	DLx2	10
		Cadmium (T)	0.005	Percentile	0.007	0.005	2024=2018	0.01	DLx2	0.01
		Chromium (T)	0.06	DL	0.06	0.1	2024 higher	0.2	DLx2	0.2
		Cobalt (T)	0.01	PI	0.05	0.005	2024 lower	0.01	2018 Normal Range	0.05
		Copper (T)	0.1	Percentile	1.13	0.05	2024 lower	0.1	2018 Normal Range	1.13
		Iron (T)	1	PI	103	1	2024=2018	2	2018 Normal Range	103
		Lead (T)	0.01	Percentile	0.08	0.01	2024=2018	0.02	2018 Normal Range	0.08
		Lithium (T)	0.5	PI(λ)	7.5	0.5	2024=2018	1	2018 Normal Range	7.5
		Manganese (T)	0.05	Percentile	8.6	0.05	2024=2018	0.1	2018 Normal Range	8.6
		Mercury (T)	5.00E-04	PI(λ)	0.004	5.00E-04	2024=2018	0.001	2018 Normal Range	0.004
		Molybdenum (T)	0.05	PI(λ)	0.24	0.05	2024=2018	0.1	2018 Normal Range	0.24
		Nickel (T)	0.06	PI(λ)	1.4	0.05	2024 lower	0.1	2018 Normal Range	1.4
		Selenium (T)	0.02	Percentile	0.04	0.04	2024 higher	0.08	DLx2	0.08
		Silver (T)	0.005	DL	0.005	0.005	2024=2018	0.01	DLx2	0.01
		Strontium (T)	0.05	PI	155	0.02	2024 lower	0.04	2018 Normal Range	155
		Thallium (T)	0.005	Percentile	0.005	0.005	2024=2018	0.01	DLx2	0.01
		Tin (T)	0.05	DL	0.05	0.02	2024 lower	0.04	2018 Normal Range	0.05
		Titanium (T)	0.1	Percentile	0.25	0.05	2024 lower	0.1	2018 Normal Range	0.25
		Uranium (T)	0.01	PI	0.03	0.001	2024 lower	0.002	2018 Normal Range	0.03
		Vanadium (T)	0.01	DL	0.01	0.05	2024 higher	0.1	DLx2	0.1

Table D1-1. 2018 Normal Range values for the Peninsula Lakes water quality program.

Lake	Parameter Class	Parameter	2018 Normal Range Information			Detection Limit Comparison			Updated Normal Range	
			NR DL	Method	Normal Range (Upper Limit)	2024 DL	DL Comparison	DLx2	Source	Normal Range Value for 2024
B7	Total Metals	Zinc (T)	0.8	Percentile	1.9	0.5	2024 lower	1	2018 Normal Range	1.9
	Dissolved Metals	Zinc (D)	0.8	Percentile	2.2	0.5	2024 lower	1	2018 Normal Range	2.2
	Other	Cyanide (Total)	0.001	DL	0.001	0.001	2024=2018	0.002	DLx2	0.002
D7	Conventional Parameters	TDS Calculated		Percentile	81				2018 Normal Range	81
		Total Suspended Solids	1	Percentile	2	1	2024=2018	2	2018 Normal Range	2
		Turbidity (lab)	0.1	PI	1.1	0.1	2024=2018	0.2	2018 Normal Range	1.1
	Major Ions	Alkalinity, Bicarbonate	1.2	Percentile	68	1	2024 lower	2	2018 Normal Range	68
		Alkalinity, Total	1	Percentile	55	1	2024=2018	2	2018 Normal Range	55
		Calcium (T)	0.02	Percentile	17	0.01	2024 lower	0.02	2018 Normal Range	17
		Chloride	0.1	Percentile	25	0.1	2024=2018	0.2	2018 Normal Range	25
		Fluoride	0.02	Percentile	0.05	0.02	2024=2018	0.04	2018 Normal Range	0.05
		Magnesium (T)	0.004	Percentile	3.3	0.004	2024=2018	0.008	2018 Normal Range	3.3
		Potassium (T)	0.02	PI(λ)	1.8	0.02	2024=2018	0.04	2018 Normal Range	1.8
		Reactive Silica (SiO2)	0.01	Percentile	0.28	0.01	2024=2018	0.02	2018 Normal Range	0.28
		Sodium (T)	0.005	Percentile	17	0.02	2024 higher	0.04	2018 Normal Range	17
		Sulphate	0.3	Percentile	10	0.3	2024=2018	0.6	2018 Normal Range	10
	Nutrients	Ammonia (as N)	0.005	PI	0.009	0.005	2024=2018	0.01	DLx2	0.01
		Nitrate (as N)	0.005	DL	0.005	0.005	2024=2018	0.01	DLx2	0.01
		Nitrite (as N)	0.005	DL	0.005	0.001	2024 lower	0.002	2018 Normal Range	0.005
		Orthophosphate (PO4-P)	0.001	Percentile	0.003	0.001	2024=2018	0.002	2018 Normal Range	0.003
		Total Diss Phosphorus	0.001	PI(λ)	0.008	0.001	2024=2018	0.002	2018 Normal Range	0.008
		Total Kjeldahl Nitrogen	0.05	PI(λ)	0.52	0.05	2024=2018	0.1	2018 Normal Range	0.52
		Total Phosphorus	0.001	Percentile	0.02	0.001	2024=2018	0.002	2018 Normal Range	0.02
	Organic/Inorganic Carbon	Dissolved Organic Carbon	0.5	PI(λ)	5.1	0.5	2024=2018	1	2018 Normal Range	5.1
		Total Organic Carbon	0.5	Percentile	14	0.5	2024=2018	1	2018 Normal Range	14
	Total Metals	Aluminum (T)	0.3	PI	6.7	1	2024 higher	2	2018 Normal Range	6.7
		Antimony (T)	0.02	Percentile	0.03	0.02	2024=2018	0.04	DLx2	0.04
		Arsenic (T)	0.02	PI	1.2	0.02	2024=2018	0.04	2018 Normal Range	1.2
		Barium (T)	0.05	PI	17	0.02	2024 lower	0.04	2018 Normal Range	17
		Beryllium (T)	0.01	DL	0.01	0.005	2024 lower	0.01	2018 Normal Range	0.01
		Bismuth (T)	0.01	DL	0.01	0.005	2024 lower	0.01	2018 Normal Range	0.01
		Boron (T)	1	PI	17	5	2024 higher	10	2018 Normal Range	17
		Cadmium (T)	0.005	DL	0.005	0.005	2024=2018	0.01	DLx2	0.01

Table D1-1. 2018 Normal Range values for the Peninsula Lakes water quality program.

Lake	Parameter Class	Parameter	2018 Normal Range Information			Detection Limit Comparison			Updated Normal Range	
			NR DL	Method	Normal Range (Upper Limit)	2024 DL	DL Comparison	DLx2	Source	Normal Range Value for 2024
D7	Total Metals	Chromium (T)	0.06	DL	0.06	0.1	2024 higher	0.2	DLx2	0.2
		Cobalt (T)	0.01	Percentile	0.05	0.005	2024 lower	0.01	2018 Normal Range	0.05
		Copper (T)	0.1	PI	1	0.05	2024 lower	0.1	2018 Normal Range	1
		Iron (T)	1	PI(λ)	112	1	2024=2018	2	2018 Normal Range	112
		Lead (T)	0.01	Percentile	0.02	0.01	2024=2018	0.02	2018 Normal Range	0.02
		Lithium (T)	0.5	PI	1.9	0.5	2024=2018	1	2018 Normal Range	1.9
		Manganese (T)	0.05	PI	13	0.05	2024=2018	0.1	2018 Normal Range	13
		Mercury (T)	5.00E-04	PI	0.001	5.00E-04	2024=2018	0.001	2018 Normal Range	0.001
		Molybdenum (T)	0.05	PI(λ)	0.48	0.05	2024=2018	0.1	2018 Normal Range	0.48
		Nickel (T)	0.06	PI	0.75	0.05	2024 lower	0.1	2018 Normal Range	0.75
		Selenium (T)	0.02	Percentile	0.06	0.04	2024 higher	0.08	DLx2	0.08
		Silver (T)	0.005	DL	0.005	0.005	2024=2018	0.01	DLx2	0.01
		Strontium (T)	0.05	PI(λ)	83	0.02	2024 lower	0.04	2018 Normal Range	83
		Thallium (T)	0.005	DL	0.005	0.005	2024=2018	0.01	DLx2	0.01
		Tin (T)	0.05	DL	0.05	0.02	2024 lower	0.04	2018 Normal Range	0.05
		Titanium (T)	0.1	PI(λ)	0.34	0.05	2024 lower	0.1	2018 Normal Range	0.34
		Uranium (T)	0.01	PI	0.1	0.001	2024 lower	0.002	2018 Normal Range	0.1
		Vanadium (T)	0.01	PI(λ)	0.07	0.05	2024 higher	0.1	DLx2	0.1
		Zinc (T)	0.8	Percentile	2	0.5	2024 lower	1	2018 Normal Range	2
	Dissolved Metals	Zinc (D)	0.8	Percentile	1.4	0.5	2024 lower	1	2018 Normal Range	1.4
	Other	Cyanide (Total)	0.001	DL	0.001	0.001	2024=2018	0.002	DLx2	0.002

Table D1-2. Lake A8 – Summary statistics and screening results for the 2024 sampling events (July and August).

Parameter	Units	DL (min | max)	Normal Range (min | max)	Action Level[a] (min | max)	AEMP Benchmark[b]	Lake A8 - 2024 July and August Sampling Events										
						N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Field Measurements																
Temperature	C	-	-	-	-	6	0	0	11.8	11.8	0.886	0.362	10.8	12.7	-	-
Sp. Conductivity (field)	uS/cm	-	334	-	-	6	0	0	317	322	14.3	5.82	289	326	-	-
pH (field)	pH units	-	7.7 | 8.3	6.5 | 9	6.5 | 9	6	0	0	8.04	8.02	0.0456	0.0186	7.99	8.11	-	0
DO (mg/L)	mg/L	-	-	6.5	6.5	6	0	0	10.4	10.4	0.42	0.171	9.93	11	-	0
DO (%)	%	-	-	-	-	6	0	0	98.5	99.3	2.06	0.84	94.4	99.8	-	-
Conventional Parameters																
Conductivity (lab)	uS/cm	1	-	-	-	6	0	0	322	326	13.9	5.69	295	333	-	-
Hardness	mg/L	0.5	-	-	-	6	0	0	112	114	4.04	1.65	106	116	-	-
pH (lab)	pH units	0.1	-	6.5 | 9	6.5 | 9	6	0	0	7.98	8	0.0509	0.0208	7.88	8.01	-	0
Total Dissolved Solids	mg/L	15	-	375	500	6	0	0	229	234	18.5	7.55	197	247	-	0
TDS (Calculated)	mg/L	1	152	375	500	6	0	0	209	212	8.87	3.62	192	216	6	0
Total Suspended Solids	mg/L	1	4	-	-	6	1	17	1.3	1.35	0.494	0.202	1	2	0	-
Turbidity (lab)	NTU	0.1	0.87	-	-	6	0	0	0.66	0.665	0.046	0.0188	0.6	0.71	0	-
Major Ions																
Alkalinity, Bicarbonate	mg/L	1	91	-	-	6	0	0	66.8	67.2	2.31	0.944	64.1	69	0	-
Alkalinity, Carbonate	mg/L	1	-	-	-	6	6	100	-	1	-	-	1	1	0	-
Alkalinity, Hydroxide	mg/L	1	-	-	-	6	6	100	-	1	-	-	1	1	0	-
Alkalinity, Total	mg/L	1	83.6	-	-	6	0	0	66.8	67.2	2.31	0.944	64.1	69	0	-
Bromide	mg/L	0.1	-	-	-	6	0	0	0.242	0.245	0.0299	0.0122	0.19	0.27	-	-
Calcium (D)	mg/L	0.01	-	-	-	6	0	0	36.8	37.4	1.57	0.642	34.4	38.2	-	-
Calcium (T)	mg/L	0.01	40	-	-	6	0	0	38.9	39	1.54	0.629	36.9	41.4	1	-
Chloride	mg/L	0.1	61	90	120	6	0	0	48.6	49.7	2.93	1.2	42.6	50.1	0	0
Fluoride	mg/L	0.02	0.04	2.1	2.8	6	0	0	0.0422	0.042	0.00542	0.00221	0.037	0.049	3	0
Magnesium (D)	mg/L	0.004	-	-	-	6	0	0	5.02	4.93	0.169	0.069	4.9	5.32	-	-
Magnesium (T)	mg/L	0.004	5.6	-	-	6	0	0	5.36	5.37	0.152	0.0621	5.14	5.56	0	-
Potassium (D)	mg/L	0.02	-	-	-	6	0	0	2.26	2.25	0.107	0.0438	2.12	2.44	-	-
Potassium (T)	mg/L	0.02	2.5	-	-	6	0	0	2.43	2.46	0.119	0.0485	2.22	2.54	2	-
Reactive Silica (SiO2)	mg/L	0.01	1.3	-	-	6	0	0	0.615	0.628	0.288	0.118	0.333	0.885	0	-
Sodium (D)	mg/L	0.02	-	-	-	6	0	0	11	11	0.472	0.193	10.4	11.5	-	-
Sodium (T)	mg/L	0.02	8.4	-	-	6	0	0	11.9	11.9	0.547	0.223	11.2	12.7	6	-
Sulphate	mg/L	0.3	9.3	164	218	6	0	0	11.7	11	1.33	0.544	10.8	13.5	6	0
Nutrients																
Ammonia (as N)	mg/L	0.005	0.011	0.148	0.197	6	1	17	0.0114	0.0091	0.00878	0.00359	0.005	0.0276	2	0
Nitrate (as N)	mg/L	0.005	0.015	2.17	2.9	6	2	33	0.00797	0.00735	0.00541	0.00221	0.005	0.0161	1	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	6	2	33	0.00798	0.00735	0.00539	0.0022	0.0051	0.0161	-	-
Nitrite (as N)	mg/L	0.001	0.005	0.045	0.06	6	6	100	-	0.001	-	-	0.001	0.001	0	0
Nitrogen	mg/L	0.05	-	-	-	6	0	0	0.481	0.51	0.0662	0.027	0.385	0.538	-	-
Orthophosphate (PO4-P)	mg/L	0.001	0.0023	-	-	6	4	67	-	0.001	-	-	0.001	0.0018	0	-
Total Diss Phosphorus	mg/L	0.001	0.006	-	-	6	0	0	0.00407	0.0042	0.000929	0.000379	0.0027	0.0054	0	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	6	0	0	0.416	0.44	0.0697	0.0285	0.331	0.48	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.63	-	-	6	0	0	0.474	0.504	0.0708	0.0289	0.376	0.538	0	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	6	0	0	0.409	0.432	0.0751	0.0307	0.317	0.48	-	-
Total Phosphorus	mg/L	0.001	0.009	-	-	6	0	0	0.0108	0.00865	0.00499	0.00204	0.0079	0.0207	3	-

Table D1-2. Lake A8 – Summary statistics and screening results for the 2024 sampling events (July and August).

Parameter	Units	DL (min | max)	Normal Range (min | max)	Action Level[a] (min | max)	AEMP Benchmark[b]	Lake A8 - 2024 July and August Sampling Events										
						N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Organic/Inorganic Carbon																
Dissolved Organic Carbon	mg/L	0.5	4.9	-	-	6	0	0	6.38	6.7	0.997	0.407	5.1	7.29	6	-
Total Organic Carbon	mg/L	0.5	4.7	-	-	6	0	0	5.95	6.24	1.23	0.502	4.43	7.26	4	-
Total Metals																
Aluminum (T)	ug/L	1	3	75	100	6	0	0	5.08	4.5	3.05	1.24	1.9	9	4	0
Antimony (T)	ug/L	0.02	0.4	4.5	6	6	0	0	0.04	0.034	0.0105	0.00428	0.032	0.054	0	0
Arsenic (T)	ug/L	0.02	2.4	18.8	25	6	0	0	7.32	5.94	2.66	1.09	4.81	11.1	6	0
Barium (T)	ug/L	0.02	32	750	1000	6	0	0	31.3	31.4	1.45	0.592	29.6	32.8	3	0
Beryllium (T)	ug/L	0.005	0.01	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Boron (T)	ug/L	5	10	1120	1500	6	0	0	6.83	6.1	1.56	0.636	5.4	9.1	6	0
Cadmium (T)	ug/L	0.005	0.01	0.124	0.166	6	6	100	-	0.005	-	-	0.005	0.005	0	0
Chromium (T)	ug/L	0.1	0.2	3.75	5	6	6	100	-	0.1	-	-	0.1	0.1	0	0
Cobalt (T)	ug/L	0.005	0.05	0.78	1.04	6	0	0	0.06	0.059	0.0047	0.00192	0.0548	0.0681	6	0
Copper (T)	ug/L	0.05	0.89	1.87	2.49	6	0	0	0.958	0.829	0.283	0.116	0.797	1.52	2	0
Iron (T)	ug/L	1	67	795	1060	6	0	0	90	89.8	11.6	4.73	74.7	108	6	0
Lead (T)	ug/L	0.01	0.03	3.75	5	6	0	0	0.0813	0.048	0.0743	0.0303	0.021	0.186	3	0
Lithium (T)	ug/L	0.5	10	-	-	6	0	0	9.4	9.4	0.855	0.349	7.86	10.2	2	-
Manganese (T)	ug/L	0.05	13	90	120	6	0	0	14.3	16.1	5.64	2.3	6.83	19.6	4	0
Mercury (T)	ug/L	0.0005	0.0012	0.0195	0.026	6	1	17	0.000537	0.00058	0.000146	0.0000595	0.0005	0.00066	0	0
Molybdenum (T)	ug/L	0.05	0.22	54.8	73	6	0	0	0.402	0.412	0.0385	0.0157	0.331	0.444	6	0
Nickel (T)	ug/L	0.05	0.92	74.9	99.9	6	0	0	0.926	0.982	0.0982	0.0401	0.789	0.996	4	0
Selenium (T)	ug/L	0.04	0.08	0.75	1	6	1	17	0.0417	0.045	0.0114	0.00465	0.04	0.05	0	0
Silver (T)	ug/L	0.005	0.01	0.188	0.25	6	6	100	-	0.005	-	-	0.005	0.005	0	0
Strontium (T)	ug/L	0.02	273	1880	2500	6	0	0	254	258	15.7	6.39	229	270	0	0
Thallium (T)	ug/L	0.005	0.01	0.6	0.8	6	5	83	-	0.005	-	-	0.005	0.0051	1	0
Tin (T)	ug/L	0.02	0.05	-	-	6	2	33	0.0298	0.029	0.0183	0.00746	0.02	0.054	1	-
Titanium (T)	ug/L	0.05	0.25	-	-	6	1	17	0.143	0.112	0.116	0.0475	0.05	0.327	1	-
Uranium (T)	ug/L	0.001	0.054	11.2	15	6	0	0	0.0935	0.0909	0.0121	0.00494	0.0792	0.111	6	0
Vanadium (T)	ug/L	0.05	0.1	90	120	6	3	50	-	0.05	-	-	0.05	0.058	0	0
Zinc (T)	ug/L	0.5	1.2	-	-	6	1	17	0.97	0.915	0.629	0.257	0.5	2.02	1	-
Dissolved Metals																
Aluminum (D)	ug/L	1	-	-	-	6	0	0	2.4	1.8	1.62	0.66	1	5.4	-	-
Antimony (D)	ug/L	0.02	-	-	-	6	0	0	0.0412	0.0355	0.0104	0.00424	0.033	0.055	-	-
Arsenic (D)	ug/L	0.02	-	-	-	6	0	0	6.17	5.46	1.88	0.769	3.78	8.46	-	-
Barium (D)	ug/L	0.02	-	-	-	6	0	0	31	30.8	1.94	0.791	29.1	33.8	-	-
Beryllium (D)	ug/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Boron (D)	ug/L	5	-	-	-	6	0	0	6.77	6.2	1.27	0.519	5.4	8.6	-	-
Cadmium (D)	ug/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Chromium (D)	ug/L	0.1	-	-	-	6	6	100	-	0.1	-	-	0.1	0.1	0	-
Cobalt (D)	ug/L	0.005	-	-	-	6	0	0	0.0388	0.0377	0.00576	0.00235	0.0332	0.0479	-	-
Copper (D)	ug/L	0.05	-	-	-	6	0	0	0.712	0.703	0.0445	0.0182	0.666	0.794	-	-
Iron (D)	ug/L	1	-	-	-	6	0	0	37.4	41.9	16.5	6.74	17.2	56.4	-	-
Lead (D)	ug/L	0.01	-	7.41	9.88	6	0	0	0.0245	0.0245	0.0116	0.00475	0.011	0.038	-	0
Lithium (D)	ug/L	0.5	-	-	-	6	0	0	9.17	9.25	0.802	0.328	7.76	10.2	-	-
Manganese (D)	ug/L	0.05	-	278	370	6	0	0	2.14	1.92	1.25	0.512	0.951	4.15	-	0

Table D1-2. Lake A8 – Summary statistics and screening results for the 2024 sampling events (July and August).

Parameter	Units	DL (min | max)	Normal Range (min | max)	Action Level[a] (min | max)	AEMP Benchmark[b]	Lake A8 - 2024 July and August Sampling Events										
						N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Mercury (D)	ug/L	0.0005	-	-	-	6	4	67	-	5.00E-04	-	-	5.00E-04	0.0006	-	-
Molybdenum (D)	ug/L	0.05	-	-	-	6	0	0	0.377	0.384	0.0289	0.0118	0.325	0.41	-	-
Nickel (D)	ug/L	0.05	-	-	-	6	0	0	0.858	0.89	0.0986	0.0403	0.73	0.971	-	-
Selenium (D)	ug/L	0.04	-	-	-	6	5	83	-	0.04	-	-	0.04	0.044	-	-
Silver (D)	ug/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Strontium (D)	ug/L	0.02	-	1880	2500	6	0	0	242	242	16.7	6.81	223	260	-	0
Thallium (D)	ug/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Tin (D)	ug/L	0.02	-	-	-	6	3	50	-	0.0335	-	-	0.02	0.12	-	-
Titanium (D)	ug/L	0.05	-	-	-	6	5	83	-	0.05	-	-	0.05	0.278	-	-
Uranium (D)	ug/L	0.001	-	-	-	6	0	0	0.0911	0.0888	0.00934	0.00381	0.0818	0.105	-	-
Vanadium (D)	ug/L	0.05	-	-	-	6	6	100	-	0.05	-	-	0.05	0.05	0	-
Zinc (D)	ug/L	0.5	8.5	19.3	25.7	6	0	0	2.29	1.44	2.66	1.08	0.55	7.59	0	0
Cyanides																
Cyanide (free)	mg/L	0.001	-	-	-	6	6	100	-	0.001	-	-	0.001	0.001	0	-
Cyanide (Total)	mg/L	0.001	0.002	0.00375	0.005	6	6	100	-	0.001	-	-	0.001	0.001	0	0
Cyanide (WAD)	mg/L	0.001	-	-	-	6	6	100	-	0.001	-	-	0.001	0.001	0	-

Notes

[a] The AEMP Action Level is 75% of the AEMP Benchmark.

[b] The AEMP Benchmark is the lowest of the FWAL or HH DW guidelines, or the SSWQO for fluoride, arsenic, and iron.

N>NR indicates at least one sample exceeded the Normal Range.

Table D1-3. Lake B7 – Summary statistics and screening results for 2024 sampling events (July, August, September, and October).

Parameter	Units	DL (min | max)	Normal Range (min | max)	Action Level[a] (min | max)	AEMP Benchmark[b]	Lake B7 - 2024 July, August, September, and October Sampling Events										
						N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Field Measurements																
Temperature	C	-	-	-	-	13	0	0	7.84	6.93	4.78	1.33	0	13.1	-	-
Sp. Conductivity (field)	uS/cm	-	302	-	-	12	0	0	327	325	31.6	9.12	287	368	-	-
pH (field)	pH units	-	7.7 | 8.3	6.5 | 9	6.5 | 9	12	0	0	7.84	7.93	0.301	0.0869	7.36	8.14	-	0
DO (mg/L)	mg/L	-	-	6.5	6.5	12	0	0	11.9	12	1.36	0.393	10	13.7	-	0
DO (%)	%	-	-	-	-	12	0	0	102	102	4.33	1.25	95.4	107	-	-
Conventional Parameters																
Conductivity (lab)	uS/cm	1	-	-	-	12	0	0	332	334	30.6	8.84	291	373	-	-
Hardness	mg/L	0.5	-	-	-	12	0	0	121	119	18.1	5.24	101	145	-	-
pH (lab)	pH units	0.1	-	6.5 | 9	6.5 | 9	12	0	0	7.89	7.89	0.072	0.0208	7.75	7.97	-	0
Total Dissolved Solids	mg/L	15	-	375	500	12	0	0	236	230	27.9	8.05	200	276	-	0
TDS (Calculated)	mg/L	1	171	375	500	12	0	0	216	217	19.8	5.72	189	242	12	0
Total Suspended Solids	mg/L	1	3	-	-	12	7	58	-	1	-	-	1	1.7	0	-
Turbidity (lab)	NTU	0.1	0.69	-	-	12	0	0	0.472	0.465	0.0513	0.0148	0.4	0.55	0	-
Major Ions																
Alkalinity, Bicarbonate	mg/L	1	135	-	-	12	0	0	61.4	60.6	2.29	0.66	58.2	67.1	0	-
Alkalinity, Carbonate	mg/L	1	-	-	-	12	12	100	-	1	-	-	1	1	0	-
Alkalinity, Hydroxide	mg/L	1	-	-	-	12	12	100	-	1	-	-	1	1	0	-
Alkalinity, Total	mg/L	1	110	-	-	12	0	0	61.4	60.6	2.29	0.66	58.2	67.1	0	-
Bromide	mg/L	0.1	-	-	-	12	0	0	0.198	0.2	0.0147	0.00423	0.18	0.22	-	-
Calcium (D)	mg/L	0.01	-	-	-	12	0	0	41	40.4	5.9	1.7	34	48.4	-	-
Calcium (T)	mg/L	0.01	39	-	-	12	0	0	41.2	41.5	3.03	0.874	37.1	46	9	-
Chloride	mg/L	0.1	25	90	120	12	0	0	49.1	49.5	4.38	1.26	43	55.3	12	0
Fluoride	mg/L	0.02	0.04	2.1	2.8	12	0	0	0.0403	0.0405	0.0029	0.00084	0.036	0.045	6	0
Magnesium (D)	mg/L	0.004	-	-	-	12	0	0	4.64	4.36	0.858	0.248	3.81	5.85	-	-
Magnesium (T)	mg/L	0.004	5.3	-	-	12	0	0	4.66	4.64	0.522	0.151	4.08	5.38	1	-
Potassium (D)	mg/L	0.02	-	-	-	12	0	0	2.41	2.39	0.222	0.064	2.15	2.7	-	-
Potassium (T)	mg/L	0.02	2.8	-	-	12	0	0	2.46	2.47	0.0831	0.024	2.3	2.6	0	-
Reactive Silica (SiO2)	mg/L	0.01 | 0.05	2.3	-	-	12	0	0	1.59	1.9	0.663	0.192	0.486	2.08	0	-
Sodium (D)	mg/L	0.02	-	-	-	12	0	0	11.4	10.9	1.81	0.521	9.72	14	-	-
Sodium (T)	mg/L	0.02	7.5	-	-	12	0	0	11.5	11.6	0.954	0.275	10.5	13.1	12	-
Sulphate	mg/L	0.3	6	164	218	12	0	0	22.7	20.8	10.4	3	12.8	35.9	12	0
Nutrients																
Ammonia (as N)	mg/L	0.005	0.025	0.148	0.197	12	2	17	0.0115	0.0082	0.00972	0.00281	0.005	0.0314	2	0
Nitrate (as N)	mg/L	0.005	0.01	2.17	2.9	12	5	42	0.0328	0.0258	0.0323	0.00933	0.005	0.0807	5	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	12	5	42	0.0331	0.0258	0.0326	0.00941	0.0051	0.0818	-	-
Nitrite (as N)	mg/L	0.001	0.005	0.045	0.06	12	9	75	-	0.001	-	-	0.001	0.0015	0	0
Nitrogen	mg/L	0.05	-	-	-	12	0	0	0.469	0.471	0.0365	0.0105	0.407	0.541	-	-
Orthophosphate (PO4-P)	mg/L	0.001	0.002	-	-	12	8	67	-	0.001	-	-	0.001	0.0016	0	-
Total Diss Phosphorus	mg/L	0.001	0.008	-	-	12	0	0	0.00386	0.00385	0.00028	7.9E-05	0.0034	0.0043	0	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	12	0	0	0.437	0.437	0.0423	0.0122	0.366	0.494	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.73	-	-	12	0	0	0.437	0.43	0.0225	0.0065	0.407	0.481	0	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	12	0	0	0.405	0.394	0.0336	0.0097	0.366	0.487	-	-
Total Phosphorus	mg/L	0.001	0.01	-	-	12	0	0	0.00728	0.0073	0.00164	0.00047	0.004	0.0101	1	-

Table D1-3. Lake B7 – Summary statistics and screening results for 2024 sampling events (July, August, September, and October).

Parameter	Units	DL (min | max)	Normal Range (min | max)	Action Level[a] (min | max)	AEMP Benchmark[b]	Lake B7 - 2024 July, August, September, and October Sampling Events										
						N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Organic/Inorganic Carbon																
Dissolved Organic Carbon	mg/L	0.5	5.5	-	-	12	0	0	6.6	6.85	0.579	0.167	5.4	7.16	11	-
Total Organic Carbon	mg/L	0.5	7.6	-	-	12	0	0	6.4	6.42	0.685	0.198	4.95	7.24	0	-
Total Metals																
Aluminum (T)	ug/L	1	6.6	75	100	12	0	0	3.26	2.9	1.59	0.46	1.6	6.5	0	0
Antimony (T)	ug/L	0.02	0.04	4.5	6	12	0	0	0.053	0.053	0.00165	0.00048	0.05	0.055	12	0
Arsenic (T)	ug/L	0.02	1.8	18.8	25	12	0	0	18.7	16.9	4.41	1.27	14.4	27.5	12	3
Barium (T)	ug/L	0.02	20	750	1000	12	0	0	31.7	31.8	2.13	0.614	28.4	34.6	12	0
Beryllium (T)	ug/L	0.005	0.01	-	-	12	12	100	-	0.005	-	-	0.005	0.005	0	-
Boron (T)	ug/L	5	10	1120	1500	12	0	0	16.8	17	1.25	0.362	14.9	19.1	0	0
Cadmium (T)	ug/L	0.005	0.01	0.12	0.16	12	12	100	-	0.005	-	-	0.005	0.005	0	0
Chromium (T)	ug/L	0.1	0.2	3.75	5	12	12	100	-	0.1	-	-	0.1	0.1	0	0
Cobalt (T)	ug/L	0.005	0.05	0.765	1.02	12	0	0	0.076	0.074	0.0108	0.00311	0.0602	0.0918	12	0
Copper (T)	ug/L	0.05	1.13	1.78	2.38	12	0	0	1.08	0.984	0.269	0.0777	0.77	1.47	5	0
Iron (T)	ug/L	1	103	795	1060	12	0	0	50.7	48.7	11.6	3.35	35.1	67.8	0	0
Lead (T)	ug/L	0.01	0.08	3.75	5	12	0	0	0.1	0.0815	0.0455	0.0131	0.052	0.18	6	0
Lithium (T)	ug/L	0.5	7.5	-	-	12	0	0	16.6	16.4	1.31	0.379	15	18.9	12	-
Manganese (T)	ug/L	0.05	8.6	90	120	12	0	0	4.66	4.6	1.86	0.537	2.36	7.1	0	0
Mercury (T)	ug/L	0.0005	0.004	0.0195	0.026	12	3	25	0.000536	0.00059	0.00018	5.3E-05	0.0005	0.00074	0	0
Molybdenum (T)	ug/L	0.05	0.24	54.8	73	12	0	0	0.407	0.414	0.0301	0.00869	0.354	0.453	12	0
Nickel (T)	ug/L	0.05	0.08	72.2	96.3	12	0	0	0.991	0.998	0.135	0.0389	0.81	1.16	0	0
Selenium (T)	ug/L	0.04	0.08	0.75	1	12	2	17	0.0531	0.048	0.0214	0.00617	0.04	0.092	1	0
Silver (T)	ug/L	0.005	0.01	0.188	0.25	12	12	100	-	0.005	-	-	0.005	0.005	0	0
Strontium (T)	ug/L	0.02	155	1880	2500	12	0	0	331	330	13.8	3.98	315	363	12	0
Thallium (T)	ug/L	0.005	0.01	0.6	0.8	12	6	50	-	0.00505	-	-	0.005	0.0062	6	0
Tin (T)	ug/L	0.02	0.05	-	-	12	8	67	-	0.02	-	-	0.02	0.052	1	-
Titanium (T)	ug/L	0.05	0.25	-	-	12	3	25	0.11	0.11	0.0631	0.0182	0.05	0.183	0	-
Uranium (T)	ug/L	0.001	0.03	11.2	15	12	0	0	0.123	0.109	0.042	0.0121	0.0828	0.188	12	0
Vanadium (T)	ug/L	0.05	0.1	90	120	12	0	0	0.0695	0.0675	0.01	0.0029	0.057	0.088	0	0
Zinc (T)	ug/L	0.5	1.9	-	-	12	7	58	-	0.5	-	-	0.5	0.94	0	-
Dissolved Metals																
Aluminum (D)	ug/L	1	-	-	-	12	1	8	1.17	1.2	0.287	0.0829	1	1.8	-	-
Antimony (D)	ug/L	0.02	-	-	-	12	0	0	0.0522	0.052	0.00111	0.00032	0.05	0.054	-	-
Arsenic (D)	ug/L	0.02	-	-	-	12	0	0	17.8	15.4	4.7	1.36	14	27.1	-	-
Barium (D)	ug/L	0.02	-	-	-	12	0	0	31.3	31.2	2.43	0.7	28.2	34.6	-	-
Beryllium (D)	ug/L	0.005	-	-	-	12	12	100	-	0.005	-	-	0.005	0.005	0	-
Boron (D)	ug/L	5	-	-	-	12	0	0	16.7	16.6	1.32	0.382	14.6	18.7	0	-
Cadmium (D)	ug/L	0.005	-	-	-	12	12	100	-	0.005	-	-	0.005	0.005	0	-
Chromium (D)	ug/L	0.1	-	-	-	12	12	100	-	0.1	-	-	0.1	0.1	0	-
Cobalt (D)	ug/L	0.005	-	-	-	12	0	0	0.0632	0.0616	0.0102	0.00293	0.0505	0.0806	-	-
Copper (D)	ug/L	0.05	-	-	-	12	0	0	1.04	0.917	0.388	0.112	0.698	1.69	-	-
Iron (D)	ug/L	1	-	-	-	12	0	0	21.8	21	4.82	1.39	16.3	35.4	-	-
Lead (D)	ug/L	0.01	-	7.5	10	12	0	0	0.0363	0.033	0.00955	0.00276	0.025	0.061	-	0
Lithium (D)	ug/L	0.5	-	-	-	12	0	0	16.3	16.2	1.03	0.297	14.9	18.2	-	-
Manganese (D)	ug/L	0.05	-	278	370	12	0	0	1.07	1.15	0.424	0.122	0.413	1.95	-	0

Table D1-3. Lake B7 – Summary statistics and screening results for 2024 sampling events (July, August, September, and October).

Parameter	Units	DL (min | max)	Normal Range (min | max)	Action Level[a] (min | max)	AEMP Benchmark[b]	Lake B7 - 2024 July, August, September, and October Sampling Events										
						N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Mercury (D)	ug/L	0.0005	-	-	-	12	7	58	-	5.00E-04	-	-	5.00E-04	0.00105	0	-
Molybdenum (D)	ug/L	0.05	-	-	-	12	0	0	0.398	0.39	0.0553	0.016	0.331	0.478	-	-
Nickel (D)	ug/L	0.05	-	-	-	12	0	0	0.99	0.971	0.216	0.0622	0.742	1.27	-	-
Selenium (D)	ug/L	0.04	-	-	-	12	1	8	0.0484	0.046	0.0139	0.004	0.04	0.077	-	-
Silver (D)	ug/L	0.005	-	-	-	12	12	100	-	0.005	-	-	0.005	0.005	0	-
Strontium (D)	ug/L	0.02	-	1880	2500	12	0	0	328	322	32.9	9.49	292	373	-	0
Thallium (D)	ug/L	0.005	-	-	-	12	10	83	-	0.005	-	-	0.005	0.0056	-	-
Tin (D)	ug/L	0.02	-	-	-	12	7	58	-	0.02	-	-	0.02	0.036	-	-
Titanium (D)	ug/L	0.05	-	-	-	12	10	83	-	0.05	-	-	0.05	0.129	-	-
Uranium (D)	ug/L	0.001	-	-	-	12	0	0	0.122	0.113	0.0399	0.0115	0.0829	0.18	-	-
Vanadium (D)	ug/L	0.05	-	-	-	12	2	17	0.0521	0.0555	0.0134	0.00388	0.05	0.068	-	-
Zinc (D)	ug/L	0.5	2.2	19	25.4	12	7	58	-	0.5	-	-	0.5	1.48	0	0
Cyanides																
Cyanide (free)	mg/L	0.001	-	-	-	12	12	100	-	0.001	-	-	0.001	0.001	0	-
Cyanide (Total)	mg/L	0.001	0.002	0.00375	0.005	12	12	100	-	0.001	-	-	0.001	0.001	0	0
Cyanide (WAD)	mg/L	0.001	-	-	-	12	12	100	-	0.001	-	-	0.001	0.001	0	-

Notes

[a] The AEMP Action Level is 75% of the AEMP Benchmark.

[b] The AEMP Benchmark is the lowest of the FWAL or HH DW guidelines, or the SSWQO for fluoride, arsenic, and iron.

N>NR indicates at least one sample exceeded the Normal Range.

Table D1-4. Lake D7 – Summary statistics and screening results for the 2024 sampling events (July and August).

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	Lake D7 - 2024 July and August Sampling Events										
							N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Field Measurements																	
Temperature	C	-	-	-	-	-	6	0	0	13.4	13.3	0.315	0.128	12.9	13.7	-	-
Sp. Conductivity (field)	uS/cm	-	159	-	-	-	6	0	0	159	159	9.82	4.01	150	169	-	-
pH (field)	pH units	-	7.7 | 8.3	-	6.5 | 9	6.5 | 9	6	0	0	8.09	8.04	0.176	0.0719	7.85	8.31	-	0
DO (mg/L)	mg/L	-	-	-	6.5	6.5	6	0	0	10.4	10.3	0.199	0.0811	10.1	10.6	-	0
DO (%)	%	-	-	-	-	-	6	0	0	100	99.9	1.86	0.759	98.1	102	-	-
Conventional Parameters																	
Conductivity (lab)	uS/cm	1	-	-	-	-	6	0	0	163	163	11.7	4.78	152	175	-	-
Hardness	mg/L	0.5	-	-	-	-	6	0	0	55.4	55.1	1.49	0.609	54	57.8	-	-
pH (lab)	pH units	0.1	-	-	6.5 | 9	6.5 | 9	6	0	0	7.9	7.9	0.0242	0.00989	7.86	7.92	-	0
Total Dissolved Solids	mg/L	10	-	136	375	500	6	0	0	86.3	86.2	10.2	4.14	75.1	97.4	-	0
TDS (Calculated)	mg/L	1	81	-	375	500	6	0	0	106	106	7.52	3.07	98.8	114	6	0
Total Suspended Solids	mg/L	1	2	5.1	-	-	6	0	0	2.18	2.1	0.937	0.382	1.1	3.3	3	-
Turbidity (lab)	NTU	0.1	1.1	-	-	-	6	0	0	0.805	0.775	0.086	0.0351	0.73	0.95	0	-
Major Ions																	
Alkalinity, Bicarbonate	mg/L	1	68	-	-	-	6	0	0	56.7	56.4	3.41	1.39	53.5	60.3	0	-
Alkalinity, Carbonate	mg/L	1	-	-	-	-	6	6	100	-	1	-	-	1	1	0	-
Alkalinity, Hydroxide	mg/L	1	-	-	-	-	6	6	100	-	1	-	-	1	1	0	-
Alkalinity, Total	mg/L	1	55	125	-	-	6	0	0	56.7	56.4	3.41	1.39	53.5	60.3	3	-
Bromide	mg/L	0.1	-	-	-	-	6	6	100	-	0.1	-	-	0.1	0.1	0	-
Calcium (D)	mg/L	0.01	-	-	-	-	6	0	0	17	16.9	0.36	0.147	16.7	17.6	-	-
Calcium (T)	mg/L	0.01	17	55	-	-	6	0	0	17.5	17.4	0.436	0.178	17	18.3	5	-
Chloride	mg/L	0.1	25	20	90	120	6	0	0	11.3	11.3	0.807	0.329	10.4	12	0	0
Fluoride	mg/L	0.02	0.05	0.041	2.1	2.8	6	0	0	0.0507	0.0505	0.00383	0.00156	0.045	0.056	3	0
Magnesium (D)	mg/L	0.004	-	-	-	-	6	0	0	3.15	3.14	0.153	0.0624	3	3.36	-	-
Magnesium (T)	mg/L	0.004	3.3	7.9	-	-	6	0	0	3.21	3.24	0.094	0.0384	3.04	3.3	0	-
Potassium (D)	mg/L	0.02	-	-	-	-	6	0	0	1.49	1.48	0.0887	0.0362	1.4	1.59	-	-
Potassium (T)	mg/L	0.02	1.8	3.3	-	-	6	0	0	1.56	1.58	0.0948	0.0387	1.42	1.65	0	-
Reactive Silica (SiO2)	mg/L	0.01	0.28	-	-	-	6	0	0	0.236	0.226	0.125	0.0512	0.119	0.394	3	-
Sodium (D)	mg/L	0.02	-	-	-	-	6	0	0	8.12	8.12	0.426	0.174	7.65	8.65	-	-
Sodium (T)	mg/L	0.02	17	12.5	-	-	6	0	0	8.41	8.53	0.256	0.105	7.97	8.65	0	-
Sulphate	mg/L	0.3	10	7.2	164	218	6	0	0	5.27	5.14	0.544	0.222	4.81	6.23	0	0
Nutrients																	
Ammonia (as N)	mg/L	0.005	0.01	0.125	0.148	0.20	6	1	17	0.00872	0.00755	0.00549	0.00224	0.005	0.0186	2	0
Nitrate (as N)	mg/L	0.005	0.01	0.5	2.17	2.9	6	4	67	-	0.005	-	-	0.005	0.0184	1	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	6	4	67	-	0.0051	-	-	0.0051	0.0184	-	-
Nitrite (as N)	mg/L	0.001	0.005	-	0.045	0.06	6	6	100	-	0.001	-	-	0.001	0.001	0	0
Nitrogen	mg/L	0.05	-	-	-	-	6	0	0	0.476	0.466	0.101	0.041	0.381	0.6	-	-
Orthophosphate (PO4-P)	mg/L	0.001	0.003	0.00088	-	-	6	6	100	-	0.001	-	-	0.001	0.001	0	-
Total Diss Phosphorus	mg/L	0.001	0.0095	0.0071	-	-	6	0	0	0.00472	0.00475	0.00025	0.0001	0.0044	0.0051	0	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	6	0	0	0.416	0.41	0.067	0.0274	0.353	0.49	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.52	1.29	-	-	6	0	0	0.471	0.463	0.105	0.043	0.373	0.6	3	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	6	0	0	0.412	0.407	0.072	0.0294	0.335	0.49	-	-
Total Phosphorus	mg/L	0.001	0.02	-	-	-	6	0	0	0.0128	0.0126	0.00097	0.0004	0.0118	0.0142	-	-

Table D1-4. Lake D7 – Summary statistics and screening results for the 2024 sampling events (July and August).

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	Lake D7 - 2024 July and August Sampling Events										
							N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Organic/Inorganic Carbon																	
Dissolved Organic Carbon	mg/L	0.5	5.1	-	-	-	6	0	0	6	5.93	0.985	0.402	5.05	7.06	4	-
Total Organic Carbon	mg/L	0.5	14	-	-	-	6	0	0	5.78	5.96	1.05	0.428	4.47	6.93	0	-
Total Metals																	
Aluminum (T)	ug/L	1	6.7	24	75	100	6	0	0	10.5	8.05	4.82	1.97	6.5	17.2	5	0
Antimony (T)	ug/L	0.02	0.04	0.17	4.5	6	6	3	50	-	0.02	-	-	0.02	0.028	0	0
Arsenic (T)	ug/L	0.02	1.2	1.3	18.8	25	6	0	0	1.85	1.84	0.211	0.0862	1.64	2.2	6	0
Barium (T)	ug/L	0.02	17	38	750	1000	6	0	0	18.9	18.8	0.571	0.233	18.3	19.8	6	0
Beryllium (T)	ug/L	0.005	0.01	0.4	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Boron (T)	ug/L	5	17	12	1120	1500	6	0	0	15.1	15.2	1.17	0.479	13.6	16.4	0	0
Cadmium (T)	ug/L	0.005	0.01	0.071	0.0713	0.095	6	4	67	-	0.005	-	-	0.005	0.0104	1	0
Chromium (T)	ug/L	0.1	0.2	2.6	3.75	5	6	6	100	-	0.1	-	-	0.1	0.1	0	0
Cobalt (T)	ug/L	0.005	0.05	0.55	0.592	0.79	6	0	0	0.0679	0.066	0.0121	0.00494	0.0526	0.0884	6	0
Copper (T)	ug/L	0.05	1	2.7	1.5	2	6	0	0	1.17	1.16	0.141	0.0575	0.986	1.37	5	0
Iron (T)	ug/L	1	112	191	795	1060	6	0	0	86	76.2	20.5	8.38	75.1	127	1	0
Lead (T)	ug/L	0.01	0.02	0.21	3.75	5	6	0	0	0.0445	0.0465	0.00622	0.00254	0.032	0.049	6	0
Lithium (T)	ug/L	0.5	1.9	4.9	-	-	6	0	0	1.87	1.88	0.188	0.0769	1.65	2.06	3	-
Manganese (T)	ug/L	0.05	13	111	90	120	6	0	0	13.9	14.8	5.23	2.14	7.76	20	3	0
Mercury (T)	ug/L	0.0005	0.001	0.0112	0.0195	0.026	6	1	17	0.000487	0.00052	0.00012	4.9E-05	0.0005	0.00058	0	0
Molybdenum (T)	ug/L	0.05	0.48	1.0	54.8	73	6	0	0	0.608	0.607	0.105	0.0427	0.499	0.712	6	0
Nickel (T)	ug/L	0.05	0.75	3.5	18.8	25	6	0	0	0.862	0.864	0.0821	0.0335	0.743	0.952	5	0
Selenium (T)	ug/L	0.04	0.08	0.85	0.75	1	6	1	17	0.0478	0.052	0.0146	0.00594	0.04	0.059	0	0
Silver (T)	ug/L	0.005	0.01	0.025	0.188	0.25	6	6	100	-	0.005	-	-	0.005	0.005	0	0
Strontium (T)	ug/L	0.02	83	200	1880	2500	6	0	0	87.6	88.8	3.54	1.45	82.1	92.1	5	0
Thallium (T)	ug/L	0.005	0.01	0.04	0.6	0.8	6	6	100	-	0.005	-	-	0.005	0.005	0	0
Tin (T)	ug/L	0.02	0.05	0.21	-	-	6	1	17	0.0427	0.034	0.0282	0.0115	0.02	0.087	2	-
Titanium (T)	ug/L	0.05	0.34	1.92	-	-	6	0	0	0.456	0.382	0.201	0.082	0.332	0.862	5	-
Uranium (T)	ug/L	0.001	0.1	0.21	11.2	15	6	0	0	0.117	0.117	0.00624	0.00255	0.11	0.125	6	0
Vanadium (T)	ug/L	0.05	0.1	1.13	90	120	6	0	0	0.0972	0.095	0.0128	0.00523	0.084	0.121	6	0
Zinc (T)	ug/L	0.5	2	8.9	-	-	6	1	17	2.95	1.96	3.26	1.33	0.5	8.64	3	-
Dissolved Metals																	
Aluminum (D)	ug/L	1	-	-	-	-	6	0	0	4.5	2.8	4.67	1.91	1.9	14	-	-
Antimony (D)	ug/L	0.02	-	-	-	-	6	3	50	-	0.02	-	-	0.02	0.026	-	-
Arsenic (D)	ug/L	0.02	-	-	-	-	6	0	0	1.48	1.48	0.232	0.0948	1.26	1.71	-	-
Barium (D)	ug/L	0.02	-	-	-	-	6	0	0	18.2	18.2	0.508	0.207	17.7	18.8	-	-
Beryllium (D)	ug/L	0.005	-	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Boron (D)	ug/L	5	-	-	-	-	6	0	0	15.2	15.2	1.42	0.581	13.6	16.6	0	-
Cadmium (D)	ug/L	0.005	-	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Chromium (D)	ug/L	0.1	-	-	-	-	6	6	100	-	0.1	-	-	0.1	0.1	0	-
Cobalt (D)	ug/L	0.005	-	-	-	-	6	0	0	0.0259	0.0265	0.00325	0.00133	0.0221	0.0292	-	-
Copper (D)	ug/L	0.05	-	-	-	-	6	0	0	0.95	0.92	0.083	0.0339	0.878	1.07	-	-
Iron (D)	ug/L	1	-	-	-	-	6	0	0	22.2	21.8	3.36	1.37	19.3	28.6	-	-
Lead (D)	ug/L	0.01	-	-	6.26	8.34	6	1	17	0.0123	0.0135	0.00367	0.0015	0.01	0.015	-	0
Lithium (D)	ug/L	0.5	-	-	-	-	6	0	0	1.8	1.8	0.158	0.0644	1.64	1.95	-	-
Manganese (D)	ug/L	0.05	-	-	240	320	6	0	0	0.638	0.591	0.212	0.0866	0.474	1.05	-	0

Table D1-4. Lake D7 – Summary statistics and screening results for the 2024 sampling events (July and August).

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[c]	Lake D7 - 2024 July and August Sampling Events									
							N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Mercury (D)	ug/L	0.0005	-	-	-	-	6	3	50	-	6.25E-04	-	-	5.00E-04	0.00129	0	-
Molybdenum (D)	ug/L	0.05	-	-	-	-	6	0	0	0.579	0.574	0.0788	0.0322	0.504	0.665	-	-
Nickel (D)	ug/L	0.05	-	-	-	-	6	0	0	0.786	0.774	0.063	0.0257	0.72	0.861	-	-
Selenium (D)	ug/L	0.04	-	-	-	-	6	0	0	0.0525	0.0545	0.00485	0.00198	0.046	0.058	-	-
Silver (D)	ug/L	0.005	-	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Strontium (D)	ug/L	0.02	-	-	1880	2500	6	0	0	85.3	85.6	2.96	1.21	81.8	88.3	-	0
Thallium (D)	ug/L	0.005	-	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Tin (D)	ug/L	0.02	-	-	-	-	6	3	50	-	0.0225	-	-	0.02	0.308	-	-
Titanium (D)	ug/L	0.05	-	-	-	-	6	5	83	-	0.05	-	-	0.05	0.059	-	-
Uranium (D)	ug/L	0.001	-	-	-	-	6	0	0	0.118	0.118	0.00707	0.00289	0.11	0.129	-	-
Vanadium (D)	ug/L	0.05	-	-	-	-	6	4	67	-	0.05	-	-	0.05	0.053	-	-
Zinc (D)	ug/L	0.5	1.4	-	10.3	13.7	6	1	17	2.83	1.88	2.69	1.1	0.5	7.55	4	0
Cyanides																	
Cyanide (free)	mg/L	0.001	-	-	-	-	6	6	100	-	0.001	-	-	0.001	0.001	0	-
Cyanide (Total)	mg/L	0.001	0.001	-	0.00375	0.005	6	6	100	-	0.001	-	-	0.001	0.001	0	0
Cyanide (WAD)	mg/L	0.001	-	-	-	-	6	6	100	-	0.001	-	-	0.001	0.001	0	-

Notes

[a] The FEIS Prediction show here is the median concentration for 'Operations' year 5-8, which correspond to 2022-2025. The FEIS predictions for Lake D7 are provided in Appendix 7.4-A of the 2014 FEIS (Agnico Eagle, 2014).

[b] The AEMP Action Level is 75% of the AEMP Benchmark.

[c] The AEMP Benchmark is the lowest of the FWAL or HH DW guidelines, or the SSWQO for fluoride, arsenic, and iron.

N>NR indicates at least one sample exceeded the Normal Range.

Table D1-5. Water chemistry results from Lake A8, 2024

Parameter	Units	DL (min | max)	Normal Range	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July 2024-07-12			August 2024-08-23		
									A8-01	A8-02	A8-03	A8-01	A8-02	A8-03
Conventional Parameters														
Conductivity (lab)	uS/cm	1	-	-	-	-	-	-	322	324	295	333	331	328
Hardness	mg/L	0.5	-	-	-	-	-	-	116	115	114	109	106	115
pH (lab)	pH units	0.1	-	6.5 | 9.0	-	-	6.5 | 9	6.5 | 9	8	8.01	8	8.01	8	7.88
Total Dissolved Solids	mg/L	15	-	500	-	-	500	375	218	232	197	235	243	247
TDS (Calculated)	mg/L	1	152	500	-	-	500	375	**209**	**211**	**192**	**216**	**215**	**213**
Total Suspended Solids	mg/L	1	4	-	-	-	-	-	1.3	1.5	2	*<1*	1.4	1.1
Turbidity (lab)	NTU	0.1	0.87	-	-	-	-	-	0.7	0.69	0.71	0.6	0.62	0.64
Major Ions														
Alkalinity, Bicarbonate	mg/L	1	91	-	-	-	-	-	64.1	64.4	65.7	69	68.6	68.9
Alkalinity, Carbonate	mg/L	1	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
Alkalinity, Hydroxide	mg/L	1	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
Alkalinity, Total	mg/L	1	83.6	-	-	-	-	-	64.1	64.4	65.7	69	68.6	68.9
Bromide	mg/L	0.1	-	-	-	-	-	-	0.27	0.27	0.19	0.24	0.25	0.23
Calcium (D)	mg/L	0.01	-	-	-	-	-	-	38.2	37.9	37.6	35.2	34.4	37.3
Calcium (T)	mg/L	0.01	40	-	-	-	-	-	**41.4**	39.3	39.4	37.8	36.9	38.8
Chloride	mg/L	0.1	61	120	-	-	120	90	50.1	49.9	42.6	49.7	49.6	49.5
Fluoride	mg/L	0.02	0.04	0.12	1.5	2.8	2.8	2.1	0.037	0.037	0.038	**0.046**	**0.046**	**0.049**
Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	4.9	4.93	4.93	5.13	4.92	5.32
Magnesium (T)	mg/L	0.004	5.6	-	-	-	-	-	5.46	5.14	5.32	5.42	5.25	5.56
Potassium (D)	mg/L	0.02	-	-	-	-	-	-	2.26	2.28	2.12	2.24	2.19	2.44
Potassium (T)	mg/L	0.02	2.5	-	-	-	-	-	2.49	2.38	2.22	**2.52**	2.44	**2.54**
Reactive Silica (SiO2)	mg/L	0.01	1.3	-	-	-	-	-	0.336	0.333	0.389	0.867	0.881	0.885
Sodium (D)	mg/L	0.02	-	-	-	-	-	-	11.3	11.5	10.4	10.7	10.5	11.3
Sodium (T)	mg/L	0.02	8.4	-	-	-	-	-	**12.7**	**12.1**	**11.2**	**11.7**	**11.4**	**12.1**
Sulphate	mg/L	0.3	9.3	218	-	-	218	164	**13.4**	**13.5**	**10.8**	**10.8**	**11**	**10.9**
Nutrients														
Ammonia (as N)	mg/L	0.005	0.011	0.197 | 0.588	-	-	0.197	0.148	0.0061	**0.0137**	*<0.005*	0.0094	0.0088	**0.0276**
Nitrate (as N)	mg/L	0.005	0.015	2.9	10	-	2.9	2.17	**0.0161**	0.0087	0.012	*<0.005*	*<0.005*	0.006
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	0.0161	0.0087	0.012	*<0.0051*	*<0.0051*	0.006
Nitrite (as N)	mg/L	0.001	0.0005	0.06	1	-	0.06	0.045	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Nitrogen	mg/L	0.05	-	-	-	-	-	-	0.41	0.385	0.499	0.538	0.522	0.53
Orthophosphate (PO4-P)	mg/L	0.001	0.0023	-	-	-	-	-	*<0.001*	*<0.001*	0.0018	*<0.001*	*<0.001*	0.0012
Total Diss Phosphorus	mg/L	0.001	0.006	-	-	-	-	-	0.0034	0.0027	0.0054	0.0042	0.0042	0.0045
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	0.333	0.331	0.409	0.48	0.47	0.472
Total Kjeldahl Nitrogen	mg/L	0.05	0.63	-	-	-	-	-	0.394	0.376	0.487	0.538	0.522	0.524
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	0.317	0.322	0.397	0.48	0.47	0.466
Total Phosphorus	mg/L	0.001	0.009	0.01	-	-	-	-	0.008	0.0079	**0.0207**	**0.0109**	0.008	**0.0093**
Organic/Inorganic Carbon														
Dissolved Organic Carbon	mg/L	0.5	4.9	-	-	-	-	-	**5.1**	**5.22**	**6.42**	**7.29**	**7.27**	**6.98**
Total Organic Carbon	mg/L	0.5	4.7	-	-	-	-	-	4.63	4.43	**5.62**	**6.86**	**6.88**	**7.26**

Table D1-5. Water chemistry results from Lake A8, 2024

Parameter	Units	DL (min | max)	Normal Range	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July 2024-07-12			August 2024-08-23		
									A8-01	A8-02	A8-03	A8-01	A8-02	A8-03
Total Metals														
Aluminum (T)	ug/L	1	3	100	-	-	100	75	**9**	**8.2**	**5.8**	1.9	**3.2**	2.4
Antimony (T)	ug/L	0.02	0.4	9	6	-	6	4.5	0.053	0.054	0.032	0.034	0.034	0.033
Arsenic (T)	ug/L	0.02	2.4	5	10	25	25	18.8	**11.1**	**10.3**	**4.81**	**5.86**	**5.87**	**6**
Barium (T)	ug/L	0.02	32	1000	2000	-	1000	750	29.6	30.4	30	**32.5**	**32.5**	**32.8**
Beryllium (T)	ug/L	0.005	0.01	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Boron (T)	ug/L	5	10	1500	5000	-	1500	1120	8.5	9.1	5.4	6	6.2	5.8
Cadmium (T)	ug/L	0.005	0.01	0.166 | 0.179	7	-	0.166	0.124	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Chromium (T)	ug/L	0.1	0.2	5	50	-	5	3.75	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
Cobalt (T)	ug/L	0.005	0.05	1.04 | 1.08	-	-	1.04	0.78	**0.059**	**0.0548**	**0.0681**	**0.0589**	**0.0569**	**0.0624**
Copper (T)	ug/L	0.05	0.89	2.49 | 2.68	2000	-	2.49	1.87	**0.972**	0.801	**1.52**	0.844	0.797	0.814
Iron (T)	ug/L	1	67	300	-	1060	1060	795	**96.3**	**74.7**	**108**	**88.6**	**81.6**	**91.1**
Lead (T)	ug/L	0.01	0.03	-	5	-	5	3.75	**0.186**	**0.161**	**0.072**	0.021	0.024	0.024
Lithium (T)	ug/L	0.5	10	-	-	-	-	-	**10.2**	**10.2**	7.86	9.43	9.35	9.36
Manganese (T)	ug/L	0.05	13	-	120	-	120	90	7.82	6.83	**14.7**	**19.1**	**17.5**	**19.6**
Mercury (T)	ug/L	0.0005	0.0012	0.026	1	-	0.026	0.0195	0.0006	*<5e-04*	0.00055	0.00056	0.00066	0.0006
Molybdenum (T)	ug/L	0.05	0.22	73	-	-	73	54.8	**0.408**	**0.394**	**0.331**	**0.417**	**0.419**	**0.444**
Nickel (T)	ug/L	0.05	0.92	99.9 | 107	-	-	99.9	74.9	0.811	0.789	**0.971**	**0.996**	**0.993**	**0.995**
Selenium (T)	ug/L	0.04	0.08	1	50	-	1	0.75	0.049	0.041	0.049	*<0.04*	0.05	0.041
Silver (T)	ug/L	0.005	0.01	0.25	-	-	0.25	0.188	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Strontium (T)	ug/L	0.02	273	2500	7000	-	2500	1880	270	266	229	253	244	264
Thallium (T)	ug/L	0.005	0.01	0.8	-	-	0.8	0.6	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	0.0051
Tin (T)	ug/L	0.02	0.05	-	-	-	-	-	*<0.02*	*<0.02*	0.03	0.028	**0.054**	0.047
Titanium (T)	ug/L	0.05	0.25	-	-	-	-	-	**0.327**	0.224	0.158	*<0.05*	0.059	0.066
Uranium (T)	ug/L	0.001	0.054	15	20	-	15	11.2	**0.104**	**0.111**	**0.0792**	**0.0943**	**0.0875**	**0.0849**
Vanadium (T)	ug/L	0.05	0.1	120	-	-	120	90	0.058	0.052	0.05	*<0.05*	*<0.05*	*<0.05*
Zinc (T)	ug/L	0.5	1.2	-	-	-	-	-	0.67	0.54	1.16	*<0.5*	1.18	**2.02**
Dissolved Metals														
Aluminum (D)	ug/L	1	-	-	-	-	-	-	1.7	1.9	1.4	1	3	5.4
Antimony (D)	ug/L	0.02	-	-	-	-	-	-	0.054	0.055	0.036	0.033	0.034	0.035
Arsenic (D)	ug/L	0.02	-	-	-	-	-	-	8.45	8.46	3.78	5.44	5.47	5.43
Barium (D)	ug/L	0.02	-	-	-	-	-	-	29.1	29.1	29.8	32.2	31.9	33.8
Beryllium (D)	ug/L	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Boron (D)	ug/L	5	-	-	-	-	-	-	8.6	8.1	5.4	6.1	6.2	6.2
Cadmium (D)	ug/L	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Chromium (D)	ug/L	0.1	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
Cobalt (D)	ug/L	0.005	-	-	-	-	-	-	0.0332	0.0334	0.0428	0.039	0.0363	0.0479
Copper (D)	ug/L	0.05	-	-	-	-	-	-	0.699	0.666	0.707	0.722	0.684	0.794
Iron (D)	ug/L	1	-	-	-	-	-	-	17.2	17.3	41	49.6	42.8	56.4
Lead (D)	ug/L	0.01	-	9.88 | 11.7	-	-	9.88	7.41	0.038	0.037	0.024	0.011	0.012	0.025
Lithium (D)	ug/L	0.5	-	-	-	-	-	-	10.2	9.05	7.76	9.33	9.16	9.53
Manganese (D)	ug/L	0.05	-	370	-	-	370	278	0.951	0.985	2.34	2.93	1.5	4.15
Mercury (D)	ug/L	0.0005	-	-	-	-	-	-	*<5e-04*	*<5e-04*	0.00056	*<5e-04*	0.0006	*<5e-04*

Table D1-5. Water chemistry results from Lake A8, 2024

Parameter	Units	DL (min | max)	Normal Range	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July 2024-07-12			August 2024-08-23		
									A8-01	A8-02	A8-03	A8-01	A8-02	A8-03
Molybdenum (D)	ug/L	0.05	-	-	-	-	-	-	0.388	0.391	0.325	0.38	0.37	0.41
Nickel (D)	ug/L	0.05	-	-	-	-	-	-	0.73	0.744	0.922	0.903	0.877	0.971
Selenium (D)	ug/L	0.04	-	-	-	-	-	-	*<0.04*	*<0.04*	*<0.04*	*<0.04*	*<0.04*	0.044
Silver (D)	ug/L	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Strontium (D)	ug/L	0.02	-	2500	-	-	2500	1880	255	256	228	230	223	260
Thallium (D)	ug/L	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Tin (D)	ug/L	0.02	-	-	-	-	-	-	*<0.02*	0.047	*<0.02*	*<0.02*	0.12	0.092
Titanium (D)	ug/L	0.05	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	0.278
Uranium (D)	ug/L	0.001	-	-	-	-	-	-	0.0995	0.105	0.0818	0.0872	0.0827	0.0904
Vanadium (D)	ug/L	0.05	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*
Zinc (D)	ug/L	0.5	8.5	25.7 | 32.1	-	-	25.7	19.3	0.67	1.38	1.5	0.55	2.05	7.59
Cyanides														
Cyanide (free)	mg/L	0.001	-	0.005	0.2	-	0.005	0.00375	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Cyanide (Total)	mg/L	0.001	0.002	-	-	-	-	-	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Cyanide (WAD)	mg/L	0.001	-	-	-	-	-	-	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*

Notes

DL = Current detection limit

Normal Range = upper limit of baseline concentrations (see **Table D1-1**)

FWAL = freshwater aquatic life guideline (most recent of the CCME or FEQGs; sulphate guideline from BC)

HH DW = Health Canada drinking water quality guideline

SSWQO = site-specific water quality objective

AEMP Benchmark = lowest of the aquatic life or Health Canada guidelines for each parameter, or SSWQO for fluoride, arsenic, and iron

AEMP Action Level = 75 % of the AEMP Benchmark

Table D1-6. Water chemistry results from Lake B7, 2024.

Parameter	Units	DL (min | max)	Normal Range	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July 2024-07-12			August 2024-08-23			September 2024-09-29			October 2024-10-10		
									B7-01	B7-02	B7-03	B7-01	B7-02	B7-03	B7-01	B7-02	B7-03	B7-01	B7-02	B7-03
Conventional Parameters																				
Conductivity (lab)	uS/cm	1	-	-	-	-	-	-	296	292	291	318	316	315	349	351	351	373	367	365
Hardness	mg/L	0.5	-	-	-	-	-	-	108	108	107	101	102	102	139	130	131	145	143	141
pH (lab)	pH units	0.1	-	6.5 | 9.0	-	-	6.5 | 9	6.5 | 9	7.97	7.91	7.94	7.97	7.95	7.96	7.87	7.87	7.75	7.81	7.83	7.84
Total Dissolved Solids	mg/L	15	-	500	-	-	500	375	204	209	200	226	221	234	261	243	215	276	272	270
TDS (Calculated)	mg/L	1	171	500	-	-	500	375	**192**	**190**	**189**	**207**	**205**	**205**	**227**	**228**	**228**	**242**	**238**	**237**
Total Suspended Solids	mg/L	1	3	-	-	-	-	-	*<1*	1.1	*<1*	1.3	1.3	1.7	*<1*	*<1*	*<1*	1.1	*<1*	*<1*
Turbidity (lab)	NTU	0.1	0.69	-	-	-	-	-	0.54	0.45	0.49	0.48	0.54	0.43	0.46	0.55	0.47	0.4	0.4	0.45
Major Ions																				
Alkalinity, Bicarbonate	mg/L	1	135	-	-	-	-	-	61.4	60.5	59.8	63.2	62.6	62.6	60.3	67.1	58.2	60.6	60.1	60.1
Alkalinity, Carbonate	mg/L	1	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
Alkalinity, Hydroxide	mg/L	1	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
Alkalinity, Total	mg/L	1	110	-	-	-	-	-	61.4	60.5	59.8	63.2	62.6	62.6	60.3	67.1	58.2	60.6	60.1	60.1
Bromide	mg/L	0.1	-	-	-	-	-	-	0.19	0.18	0.18	0.2	0.18	0.2	0.22	0.19	0.21	0.21	0.2	0.22
Calcium (D)	mg/L	0.01	-	-	-	-	-	-	36.8	36.8	36.6	34	34.3	34.5	47.1	44	44.4	48.4	47.6	47
Calcium (T)	mg/L	0.01	39	-	-	-	-	-	**40.2**	**39.3**	**39.5**	37.5	37.5	37.1	**46**	**43.8**	**42.8**	**43.4**	**43.8**	**43.5**
Chloride	mg/L	0.1	25	120	-	-	120	90	**43.8**	**43.5**	**43**	**47.2**	**47**	**46.8**	**55.3**	**52.2**	**51.8**	**53.8**	**52.5**	**52.6**
Fluoride	mg/L	0.02	0.04	0.12	1.5	2.8	2.8	2.1	0.037	0.036	0.036	**0.043**	**0.045**	**0.043**	**0.041**	**0.042**	**0.042**	0.04	0.039	0.04
Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	3.87	3.89	3.81	3.93	3.89	3.93	5.23	4.78	4.86	5.85	5.85	5.8
Magnesium (T)	mg/L	0.004	5.3	-	-	-	-	-	4.3	4.2	4.16	4.12	4.18	4.08	**5.38**	4.99	5.02	5.21	5.17	5.14
Potassium (D)	mg/L	0.02	-	-	-	-	-	-	2.18	2.2	2.15	2.22	2.24	2.26	2.64	2.53	2.52	2.7	2.67	2.65
Potassium (T)	mg/L	0.02	2.8	-	-	-	-	-	2.39	2.33	2.3	2.5	2.5	2.47	2.6	2.52	2.47	2.45	2.5	2.44
Reactive Silica (SiO2)	mg/L	0.01 | 0.05	2.3	-	-	-	-	-	0.486	0.515	0.511	1.83	1.79	1.78	2.06	2	2.08	1.97	2.03	2.04
Sodium (D)	mg/L	0.02	-	-	-	-	-	-	9.86	9.93	9.87	9.76	9.78	9.72	13	11.9	11.9	14	13.8	13.7
Sodium (T)	mg/L	0.02	7.5	-	-	-	-	-	**11**	**10.5**	**10.6**	**10.6**	**10.6**	**10.5**	**13.1**	**12.2**	**12.2**	**12.2**	**12.4**	**12.2**
Sulphate	mg/L	0.3	6	218	-	-	218	164	**13.2**	**13**	**13**	**12.8**	**12.9**	**13**	**33.5**	**28.9**	**28.4**	**35.9**	**34**	**34.1**
Nutrients																				
Ammonia (as N)	mg/L	0.005	0.025	0.197 | 2.68	-	-	0.197	0.148	0.0068	0.0135	*<0.005*	**0.0307**	**0.0314**	0.0091	0.011	0.0063	0.0055	0.0112	*<0.005*	0.0073
Nitrate (as N)	mg/L	0.005	0.01	2.9	10	-	2.9	2.17	*<0.005*	*<0.005*	*<0.005*	0.0074	*<0.005*	*<0.005*	**0.0807**	**0.0472**	**0.0442**	**0.074**	**0.0624**	**0.0651**
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	*<0.0051*	*<0.0051*	*<0.0051*	0.0074	*<0.0051*	*<0.0051*	0.0818	0.0487	0.0442	0.074	0.0624	0.0662
Nitrite (as N)	mg/L	0.001	0.005	0.06	1	-	0.06	0.045	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	0.0011	0.0015	*<0.001*	*<0.001*	*<0.001*	0.0011
Nitrogen	mg/L	0.05	-	-	-	-	-	-	0.429	0.407	0.436	0.488	0.455	0.456	0.512	0.474	0.468	0.541	0.478	0.486
Orthophosphate (PO4-P)	mg/L	0.001	0.002	-	-	-	-	-	*<0.001*	*<0.001*	0.0011	0.0016	0.0014	0.0014	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Total Diss Phosphorus	mg/L	0.001	0.008	-	-	-	-	-	0.0037	0.0043	0.0038	0.0039	0.0041	0.0039	0.0036	0.0034	0.0036	0.0037	0.0042	0.0041
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	0.366	0.372	0.392	0.494	0.436	0.434	0.48	0.438	0.428	0.469	0.478	0.459
Total Kjeldahl Nitrogen	mg/L	0.05	0.73	-	-	-	-	-	0.429	0.407	0.436	0.481	0.455	0.456	0.43	0.425	0.424	0.467	0.416	0.42
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	0.366	0.372	0.392	0.487	0.436	0.434	0.398	0.389	0.384	0.395	0.416	0.393
Total Phosphorus	mg/L	0.001	0.01	0.01	-	-	-	-	0.0092	0.0091	**0.0101**	0.0064	0.004	0.0067	0.0074	0.0076	0.0073	0.0061	0.0062	0.0073
Organic/Inorganic Carbon																				
Dissolved Organic Carbon	mg/L	0.5	5.5	-	-	-	-	-	5.4	**5.59**	**6.16**	**6.97**	**7.01**	**6.92**	**7.16**	**6.92**	**7**	**6.72**	**6.52**	**6.78**
Total Organic Carbon	mg/L	0.5	7.6	-	-	-	-	-	4.95	6.12	5.32	6.3	6.9	6.41	6.96	6.85	6.97	6.36	7.24	6.42

Table D1-6. Water chemistry results from Lake B7, 2024.

Parameter	Units	DL (min | max)	Normal Range	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July 2024-07-12			August 2024-08-23			September 2024-09-29			October 2024-10-10		
									B7-01	B7-02	B7-03	B7-01	B7-02	B7-03	B7-01	B7-02	B7-03	B7-01	B7-02	B7-03
Total Metals																				
Aluminum (T)	ug/L	1	6.6	100	-	-	100	75	3.9	6.5	4.7	1.9	1.6	1.8	2.9	5.5	3.3	1.9	2.2	2.9
Antimony (T)	ug/L	0.02	0.04	9	6	-	6	4.5	**0.052**	**0.052**	**0.051**	**0.054**	**0.054**	**0.053**	**0.055**	**0.05**	**0.052**	**0.055**	**0.053**	**0.055**
Arsenic (T)	ug/L	0.02	1.8	5	10	25	25	18.8	**18.7**	**17**	**16.8**	27.5	25.3	24.2	**17.8**	**15.6**	**14.4**	**16.1**	**15.4**	**15.6**
Barium (T)	ug/L	0.02	20	1000	2000	-	1000	750	**28.4**	**29.5**	**29.4**	**30.8**	**30.4**	**30.4**	**34.6**	**33.9**	**33.8**	**32.9**	**33.4**	**33.3**
Beryllium (T)	ug/L	0.005	0.01	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Boron (T)	ug/L	5	10	1500	5000	-	1500	1120	**15.2**	**14.9**	**15.5**	**17.4**	**17**	**17.2**	**19.1**	**17.7**	**18.2**	**16.9**	**16.4**	**16**
Cadmium (T)	ug/L	0.005	0.01	0.16 | 0.216	7	-	0.16	0.12	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Chromium (T)	ug/L	0.1	0.2	5	50	-	5	3.75	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
Cobalt (T)	ug/L	0.005	0.05	1.02 | 1.19	-	-	1.02	0.765	**0.0868**	**0.0891**	**0.0871**	**0.0661**	**0.0613**	**0.0602**	**0.0918**	**0.0749**	**0.078**	**0.0731**	**0.0709**	**0.0726**
Copper (T)	ug/L	0.05	1.13	2.38 | 3.25	2000	-	2.38	1.78	0.922	0.904	1.04	0.809	0.794	0.77	**1.17**	0.929	**1.47**	**1.34**	**1.41**	**1.44**
Iron (T)	ug/L	1	103	300	-	1060	1060	795	58.6	66.9	67.8	65.3	51	43.1	47.2	47.6	49.7	35.1	37.7	38.2
Lead (T)	ug/L	0.01	0.08	-	5	-	5	3.75	**0.18**	**0.177**	**0.156**	0.079	0.058	0.052	**0.112**	**0.084**	**0.087**	0.074	0.071	0.074
Lithium (T)	ug/L	0.5	7.5	-	-	-	-	-	**15.7**	**15**	**15.7**	**17.1**	**17**	**16.9**	**18.9**	**17.8**	**18.4**	**15.8**	**15.4**	**15.1**
Manganese (T)	ug/L	0.05	8.6	-	120	-	120	90	6.46	6.97	7.1	6.42	5.45	5.66	3.75	3.26	3.46	2.36	2.52	2.48
Mercury (T)	ug/L	0.0005	0.004	0.026	1	-	0.026	0.0195	0.0007	*<5e-04*	0.0007	*<5e-04*	*<5e-04*	0.00065	0.00058	0.00052	0.00058	0.0006	0.00061	0.00074
Molybdenum (T)	ug/L	0.05	0.24	73	-	-	73	54.8	**0.37**	**0.354**	**0.366**	**0.401**	**0.403**	**0.406**	**0.453**	**0.423**	**0.428**	**0.423**	**0.421**	**0.435**
Nickel (T)	ug/L	0.05	0.08	96.3 | 127	-	-	96.3	72.2	**0.926**	**0.912**	**0.872**	**0.853**	**0.833**	**0.81**	**1.16**	**1.07**	**1.08**	**1.12**	**1.14**	**1.12**
Selenium (T)	ug/L	0.04	0.08	1	50	-	1	0.75	0.061	0.048	0.048	*<0.04*	*<0.04*	0.046	0.056	0.046	0.048	**0.092**	0.073	0.079
Silver (T)	ug/L	0.005	0.01	0.25	-	-	0.25	0.188	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Strontium (T)	ug/L	0.02	155	2500	7000	-	2500	1880	**321**	**315**	**320**	**322**	**327**	**320**	**363**	**347**	**340**	**332**	**334**	**336**
Thallium (T)	ug/L	0.005	0.01	0.8	-	-	0.8	0.6	0.0054	0.0051	0.0051	0.0055	0.0059	0.0062	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Tin (T)	ug/L	0.02	0.05	-	-	-	-	-	*<0.02*	*<0.02*	*<0.02*	0.028	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	0.022	0.023	**0.052**
Titanium (T)	ug/L	0.05	0.25	-	-	-	-	-	0.154	0.183	0.172	*<0.05*	*<0.05*	*<0.05*	0.121	0.18	0.176	0.084	0.099	0.08
Uranium (T)	ug/L	0.001	0.03	15	20	-	15	11.2	**0.0894**	**0.0856**	**0.0828**	**0.0856**	**0.0859**	**0.0882**	**0.164**	**0.128**	**0.128**	**0.188**	**0.176**	**0.173**
Vanadium (T)	ug/L	0.05	0.1	120	-	-	120	90	0.057	0.073	0.079	0.057	0.066	0.07	0.068	0.088	0.084	0.059	0.067	0.066
Zinc (T)	ug/L	0.5	1.9	-	-	-	-	-	*<0.5*	0.94	0.71	0.93	*<0.5*	*<0.5*	0.54	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0.63
Dissolved Metals																				
Aluminum (D)	ug/L	1	-	-	-	-	-	-	1.3	1.2	1.2	1.1	1.1	1.8	1.2	*<1*	1	1.2	1.2	1.2
Antimony (D)	ug/L	0.02	-	-	-	-	-	-	0.052	0.051	0.051	0.052	0.053	0.053	0.054	0.052	0.05	0.052	0.053	0.053
Arsenic (D)	ug/L	0.02	-	-	-	-	-	-	16.5	14.5	14	27.1	25.2	23.7	17.6	15.2	14.9	15.5	14.6	14.8
Barium (D)	ug/L	0.02	-	-	-	-	-	-	28.2	28.7	28.6	29.7	29.7	29.7	34.6	34.5	33.5	33.1	32.7	32.8
Beryllium (D)	ug/L	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Boron (D)	ug/L	5	-	-	-	-	-	-	15.5	14.6	15.1	18.6	17.8	17.6	18.7	17.4	16.9	16.2	16.1	16.4
Cadmium (D)	ug/L	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Chromium (D)	ug/L	0.1	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
Cobalt (D)	ug/L	0.005	-	-	-	-	-	-	0.0593	0.0574	0.0576	0.0516	0.0513	0.0505	0.0806	0.064	0.0674	0.0761	0.0717	0.0707
Copper (D)	ug/L	0.05	-	-	-	-	-	-	0.87	0.72	0.708	0.717	0.707	0.698	1.19	0.964	1.04	1.54	1.69	1.66
Iron (D)	ug/L	1	-	-	-	-	-	-	21.3	18.3	16.3	35.4	24.7	23.4	21.2	19	19.2	21.7	20.7	20.7
Lead (D)	ug/L	0.01	-	10 | 12.2	-	-	10	7.5	0.061	0.04	0.038	0.04	0.027	0.025	0.044	0.031	0.032	0.034	0.032	0.032
Lithium (D)	ug/L	0.5	-	-	-	-	-	-	15.6	14.9	15.6	17.4	17.1	16.9	18.2	17.2	16.7	15.6	15.4	15.5
Manganese (D)	ug/L	0.05	-	370 | 500	-	-	370	278	1.18	0.784	0.629	1.12	0.413	0.515	1.95	1.14	1.16	1.34	1.3	1.26
Mercury (D)	ug/L	0.0005	-	-	-	-	-	-	0.00079	0.00105	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	0.00053	*<5e-04*	0.00058	0.00059	*<5e-04*

Table D1-6. Water chemistry results from Lake B7, 2024.

Parameter	Units	DL (min | max)	Normal Range	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July			August			September			October		
									2024-07-12			2024-08-23			2024-09-29			2024-10-10		
									B7-01	B7-02	B7-03	B7-01	B7-02	B7-03	B7-01	B7-02	B7-03	B7-01	B7-02	B7-03
Molybdenum (D)	ug/L	0.05	-	-	-	-	-	-	0.347	0.348	0.331	0.348	0.356	0.356	0.455	0.424	0.426	0.478	0.461	0.452
Nickel (D)	ug/L	0.05	-	-	-	-	-	-	0.862	0.802	0.807	0.788	0.742	0.747	1.19	1.12	1.08	1.26	1.27	1.21
Selenium (D)	ug/L	0.04	-	-	-	-	-	-	0.046	0.045	0.047	0.045	0.046	*<0.04*	0.051	0.041	0.042	0.077	0.066	0.055
Silver (D)	ug/L	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Strontium (D)	ug/L	0.02	-	2500	-	-	2500	1880	308	300	303	295	292	292	359	337	339	373	369	367
Thallium (D)	ug/L	0.005	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	0.005	0.0056	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Tin (D)	ug/L	0.02	-	-	-	-	-	-	*<0.02*	*<0.02*	*<0.02*	0.02	0.02	0.028	*<0.02*	*<0.02*	*<0.02*	*<0.02*	0.036	0.036
Titanium (D)	ug/L	0.05	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	0.129	0.063	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*
Uranium (D)	ug/L	0.001	-	-	-	-	-	-	0.0928	0.0829	0.086	0.0848	0.0865	0.0866	0.168	0.133	0.134	0.18	0.172	0.163
Vanadium (D)	ug/L	0.05	-	-	-	-	-	-	*<0.05*	0.055	0.056	*<0.05*	0.051	0.061	0.054	0.068	0.063	0.055	0.056	0.056
Zinc (D)	ug/L	0.5	2.2	25.4 | 41.7	-	-	25.4	19	*<0.5*	*<0.5*	*<0.5*	0.67	*<0.5*	1.48	*<0.5*	*<0.5*	*<0.5*	0.64	0.86	0.78
Cyanides																				
Cyanide (free)	mg/L	0.001	-	0.005	0.2	-	0.005	0.00375	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Cyanide (Total)	mg/L	0.001	0.002	-	-	-	-	-	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Cyanide (WAD)	mg/L	0.001	-	-	-	-	-	-	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*

Notes

DL = Current detection limit

Normal Range = upper limit of baseline concentrations (see **Table D1-1**)

FWAL = freshwater aquatic life guideline (most recent of the CCME or FEQGs; sulphate guideline from BC)

HH DW = Health Canada drinking water quality guideline

SSWQO = site-specific water quality objective

AEMP Benchmark = lowest of the aquatic life or Health Canada guidelines for each parameter, or SSWQO for fluoride, arsenic, and iron

AEMP Action Level = 75 % of the AEMP Benchmark

Table D1-7. Water chemistry results from Lake D7, 2024.

Parameter	Units	DL (min | max)	Normal Range	FEIS	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July 2023-07-17 D7-01	July 2023-07-17 D7-02	July 2023-07-17 D7-03	August 2023-08-21 D7-01	August 2023-08-21 D7-02	August 2023-08-21 D7-03
Conventional Parameters															
Conductivity (lab)	uS/cm	1	-	-	-	-	-	-	-	153	152	152	175	173	173
Hardness	mg/L	0.5	-	-	-	-	-	-	-	54.7	54	54.1	57.8	56.5	55.5
pH (lab)	pH units	0.1	-	-	6.5 | 9.0	-	-	6.5 | 9	6.5 | 9	7.86	7.88	7.89	7.92	7.92	7.91
Total Dissolved Solids	mg/L	10	-	136	500	-	-	500	375	75.8	81.8	75.1	97.4	97.1	90.7
TDS (Calculated)	mg/L	1	81	-	500	-	-	500	375	**99.4**	**98.8**	**98.8**	**114**	**112**	**112**
Total Suspended Solids	mg/L	1	2	5.1	-	-	-	-	-	1.6	1.1	1.4	**3.3**	**2.6**	**3.1**
Turbidity (lab)	NTU	0.1	1.1	-	-	-	-	-	-	0.73	0.8	0.86	0.95	0.75	0.74
Major Ions															
Alkalinity, Bicarbonate	mg/L	1	68	-	-	-	-	-	-	53.7	53.5	53.7	59	60.1	60.3
Alkalinity, Carbonate	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
Alkalinity, Hydroxide	mg/L	1	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
Alkalinity, Total	mg/L	1	55	83	-	-	-	-	-	53.7	53.5	53.7	**59**	**60.1**	**60.3**
Bromide	mg/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
Calcium (D)	mg/L	0.01	-	-	-	-	-	-	-	16.9	16.7	16.7	17.6	17.3	16.9
Calcium (T)	mg/L	0.01	17	36	-	-	-	-	-	**18.3**	**17.4**	17	**17.6**	**17.3**	**17.5**
Chloride	mg/L	0.1	25	15	120	-	-	120	90	10.6	10.4	10.6	12	12	12
Fluoride	mg/L	0.02	0.05	0.036	0.12	1.5	2.8	2.8	2.1	0.045	0.049	0.049	**0.052**	**0.056**	**0.053**
Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	-	3.03	3	3.01	3.36	3.24	3.24
Magnesium (T)	mg/L	0.004	3.3	5.2	-	-	-	-	-	3.3	3.17	3.04	3.27	3.25	3.23
Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-	1.4	1.41	1.41	1.59	1.55	1.56
Potassium (T)	mg/L	0.02	1.8	2.3	-	-	-	-	-	1.53	1.48	1.42	1.64	1.62	1.65
Reactive Silica (SiO2)	mg/L	0.01	0.28	-	-	-	-	-	-	0.129	0.119	0.124	**0.394**	**0.327**	**0.324**
Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-	7.77	7.82	7.65	8.65	8.43	8.43
Sodium (T)	mg/L	0.02	17	8.1	-	-	-	-	-	8.54	8.25	7.97	8.56	8.52	8.65
Sulphate	mg/L	0.3	10	5.5	218	-	-	218	164	4.81	4.88	4.87	6.23	5.41	5.4
Nutrients															
Ammonia (as N)	mg/L	0.005	0.01	0.086	0.197 | 0.588	-	-	0.197	0.148	*<0.005*	0.007	0.0081	**0.0103**	**0.0186**	0.0058
Nitrate (as N)	mg/L	0.005	0.01	1.2	2.9	10	-	2.9	2.17	*<0.005*	**0.0184**	0.0082	*<0.005*	*<0.005*	*<0.005*
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	-	*<0.0051*	0.0184	0.0082	*<0.0051*	*<0.0051*	*<0.0051*
Nitrite (as N)	mg/L	0.001	0.005	-	0.06	1	-	0.06	0.045	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.385	0.391	0.381	0.541	0.556	0.6
Orthophosphate (PO4-P)	mg/L	0.001	0.003	0.00072	-	-	-	-	-	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Total Diss Phosphorus	mg/L	0.001	0.008	0.0071	-	-	-	-	-	0.0044	0.0047	0.0048	0.0048	0.0051	0.0045
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.354	0.353	0.36	0.49	0.48	0.46
Total Kjeldahl Nitrogen	mg/L	0.05	0.52	0.88	-	-	-	-	-	0.385	0.373	0.373	**0.541**	**0.556**	**0.6**
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-	0.354	0.335	0.352	0.49	0.48	0.46
Total Phosphorus	mg/L	0.001	0.02	-	0.01	-	-	-	-	0.0126	0.0126	0.0118	0.0142	0.0118	0.0136
Organic/Inorganic Carbon															
Dissolved Organic Carbon	mg/L	0.5	5.1	-	-	-	-	-	-	**5.22**	5.05	5.05	**6.95**	**7.06**	**6.64**
Total Organic Carbon	mg/L	0.5	14	-	-	-	-	-	-	4.47	4.69	5.52	6.41	6.93	6.67

Table D1-7. Water chemistry results from Lake D7, 2024.

Parameter	Units	DL (min | max)	Normal Range	FEIS	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July 2023-07-17 D7-01	July 2023-07-17 D7-02	July 2023-07-17 D7-03	August 2023-08-21 D7-01	August 2023-08-21 D7-02	August 2023-08-21 D7-03
Total Metals															
Aluminum (T)	ug/L	1	6.7	24	100	-	-	100	75	**8.2**	**7.9**	**7.2**	**17.2**	6.5	**16.2**
Antimony (T)	ug/L	0.02	0.04	0.17	9	6	-	6	4.5	*<0.02*	*<0.02*	*<0.02*	0.022	0.02	0.028
Arsenic (T)	ug/L	0.02	1.2	1.3	5	10	25	25	18.8	**1.76**	**1.65**	**1.64**	**2.2**	**1.92**	**1.91**
Barium (T)	ug/L	0.02	17	38	1000	2000	-	1000	750	**18.8**	**18.3**	**18.3**	**19.8**	**18.9**	**19.2**
Beryllium (T)	ug/L	0.005	0.01	0.4	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Boron (T)	ug/L	5	17	12	1500	5000	-	1500	1120	13.6	14.2	14.4	16.4	15.9	16.1
Cadmium (T)	ug/L	0.005	0.01	0.071	0.095 | 0.101	7	-	0.095	0.0713	*<0.005*	*<0.005*	*<0.005*	0.0061	*<0.005*	**0.0104**
Chromium (T)	ug/L	0.1	0.2	2.6	5	50	-	5	3.75	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
Cobalt (T)	ug/L	0.005	0.05	0.55	0.79 | 0.813	-	-	0.79	0.592	**0.0624**	**0.0627**	**0.0526**	**0.0884**	**0.0694**	**0.072**
Copper (T)	ug/L	0.05	1	2.7	2	2000	-	2	1.5	**1.27**	0.986	**1.37**	**1.12**	**1.06**	**1.2**
Iron (T)	ug/L	1	112	191	300	-	1060	1060	795	86.4	76.4	76	**127**	75.1	75.3
Lead (T)	ug/L	0.01	0.02	0.21	-	5	-	5	3.75	**0.047**	**0.046**	**0.046**	**0.049**	**0.032**	**0.047**
Lithium (T)	ug/L	0.5	1.9	4.9	-	-	-	-	-	1.65	1.69	1.76	**2.01**	**2.06**	**2.04**
Manganese (T)	ug/L	0.05	13	111	-	120	-	120	90	12.2	8.34	7.76	**20**	**17.8**	**17.5**
Mercury (T)	ug/L	0.0005	0.001	0.0112	0.026	1	-	0.026	0.0195	0.00054	0.00051	*<5e-04*	0.00058	0.00051	0.00053
Molybdenum (T)	ug/L	0.05	0.48	1	73	-	-	73	54.8	**0.527**	**0.512**	**0.499**	**0.712**	**0.687**	**0.708**
Nickel (T)	ug/L	0.05	0.75	3.5	25	-	-	25	18.8	**0.821**	**0.812**	0.743	**0.908**	**0.934**	**0.952**
Selenium (T)	ug/L	0.04	0.08	0.85	1	50	-	1	0.75	0.058	0.049	0.059	0.046	0.055	*<0.04*
Silver (T)	ug/L	0.005	0.01	0.025	0.25	-	-	0.25	0.188	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Strontium (T)	ug/L	0.02	83	200	2500	7000	-	2500	1880	**88.4**	**85**	82.1	**92.1**	**89.1**	**89.2**
Thallium (T)	ug/L	0.005	0.01	0.04	0.8	-	-	0.8	0.6	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Tin (T)	ug/L	0.02	0.05	0.21	-	-	-	-	-	0.027	*<0.02*	0.041	**0.087**	0.027	**0.064**
Titanium (T)	ug/L	0.05	0.34	1.92	-	-	-	-	-	**0.394**	**0.37**	**0.366**	**0.862**	0.332	**0.41**
Uranium (T)	ug/L	0.001	0.1	0.21	15	20	-	15	11.2	**0.11**	**0.113**	**0.112**	**0.125**	**0.122**	**0.121**
Vanadium (T)	ug/L	0.05	0.1	1.13	120	-	-	120	90	0.099	0.095	0.095	**0.121**	0.084	0.089
Zinc (T)	ug/L	0.5	2	8.9	-	-	-	-	-	0.53	0.6	*<0.5*	**3.32**	**4.35**	**8.64**
Dissolved Metals															
Aluminum (D)	ug/L	1	-	-	-	-	-	-	-	3	2.8	2.5	14	1.9	2.8
Antimony (D)	ug/L	0.02	-	-	-	-	-	-	-	*<0.02*	0.02	*<0.02*	0.022	*<0.02*	0.026
Arsenic (D)	ug/L	0.02	-	-	-	-	-	-	-	1.29	1.27	1.26	1.71	1.68	1.7
Barium (D)	ug/L	0.02	-	-	-	-	-	-	-	17.9	17.7	17.7	18.8	18.5	18.7
Beryllium (D)	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Boron (D)	ug/L	5	-	-	-	-	-	-	-	14	14.1	13.6	16.6	16.2	16.6
Cadmium (D)	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Chromium (D)	ug/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
Cobalt (D)	ug/L	0.005	-	-	-	-	-	-	-	0.0252	0.0221	0.0222	0.029	0.0278	0.0292
Copper (D)	ug/L	0.05	-	-	-	-	-	-	-	0.878	0.882	0.888	1.03	0.953	1.07
Iron (D)	ug/L	1	-	-	-	-	-	-	-	21.9	19.6	19.3	28.6	21.8	22.1
Lead (D)	ug/L	0.01	-	-	8.34 | 10	-	-	8.34	6.26	0.014	0.015	0.013	0.014	*<0.01*	0.013
Lithium (D)	ug/L	0.5	-	-	-	-	-	-	-	1.67	1.64	1.65	1.95	1.92	1.95
Manganese (D)	ug/L	0.05	-	-	320	-	-	320	240	1.05	0.639	0.583	0.6	0.474	0.484
Mercury (D)	ug/L	0.0005	-	-	-	-	-	-	-	0.0008	*<5e-04*	0.00075	*<5e-04*	*<5e-04*	0.00129

Table D1-7. Water chemistry results from Lake D7, 2024.

Parameter	Units	DL (min | max)	Normal Range	FEIS	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July 2023-07-17			August 2023-08-21		
										D7-01	D7-02	D7-03	D7-01	D7-02	D7-03
Molybdenum (D)	ug/L	0.05	-	-	-	-	-	-	-	0.504	0.505	0.514	0.665	0.651	0.635
Nickel (D)	ug/L	0.05	-	-	-	-	-	-	-	0.738	0.735	0.72	0.861	0.81	0.852
Selenium (D)	ug/L	0.04	-	-	-	-	-	-	-	0.047	0.055	0.046	0.054	0.058	0.055
Silver (D)	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Strontium (D)	ug/L	0.02	-	-	2500	-	-	2500	1880	84	82.2	81.8	88.3	88	87.3
Thallium (D)	ug/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Tin (D)	ug/L	0.02	-	-	-	-	-	-	-	*<0.02*	0.039	*<0.02*	0.308	*<0.02*	0.025
Titanium (D)	ug/L	0.05	-	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	0.059	*<0.05*	*<0.05*
Uranium (D)	ug/L	0.001	-	-	-	-	-	-	-	0.115	0.11	0.112	0.122	0.12	0.129
Vanadium (D)	ug/L	0.05	-	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	0.053	*<0.05*	0.052
Zinc (D)	ug/L	0.5	1.4	-	13.7 | 16.2	-	-	13.7	10.3	*<0.5*	**1.97**	1.08	**7.55**	**1.78**	**4.35**
Cyanides															
Cyanide (free)	mg/L	0.001	-	-	0.005	0.2	-	0.005	0.00375	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Cyanide (Total)	mg/L	0.001	0.001	-	-	-	-	-	-	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Cyanide (WAD)	mg/L	0.001	-	-	-	-	-	-	-	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*

Notes

DL = Current detection limit

Normal Range = upper limit of baseline concentrations (see **Table D1-1**)

FEIS = The FEIS Prediction show here is the median concentration for 'Operations' year 5-8, which correspond to 2022-2025. The FEIS predictions for Lake D7 are provided in Appendix 7.4-A of the 2014 FEIS (Agnico Eagle, 2014).

FWAL = freshwater aquatic life guideline (most recent of the CCME or FEQGs; sulphate guideline from BC)

HH DW = Health Canada drinking water quality guideline

SSWQO = site-specific water quality objective

AEMP Benchmark = lowest of the aquatic life or Health Canada guidelines for each parameter, or SSWQO for fluoride, arsenic, and iron

AEMP Action Level = 75 % of the AEMP Benchmark

APPENDIX E
PHYTOPLANKTON – SUPPORTING INFORMATION

Appendix E1
Phytoplankton Taxonomy – Supporting Metrics

APPENDIX E1 – TABLES

Table E1-1. Phytoplankton biomass (mg/m^3) by major taxa, 2024 1
Table E1-2. Phytoplankton density (cells/L) by major taxa, 2024..... 2
Table E1-3. Phytoplankton richness by major taxa, 2024..... 3
Table E1-4. Phytoplankton community indices – Simpson's Diversity, Simpson's Evenness, and Bray-Curtis Index, 2024 4
Table E1-5. Phytoplankton biomass (mg/m^3) for the top 5 taxa in July, August, and September 2024 .. 5

Table E1-1. Phytoplankton biomass (mg/m^3) by major taxa, 2024

Sampling Event	Area	Station	Date	Biomass (mg/m^3)							
				Total	Diatoms	Cyano	Chloro	Crypto	Chryso	Dino	Eugleno
July	MEL-01	MEL-01-01	05-Jul-24	613.78	58.32	1.99	4.83	42.98	469.54	34.24	1.88
		MEL-01-06	05-Jul-24	891.54	55.73	1.45	6.18	90.72	670.46	67	0
		MEL-01-07	05-Jul-24	627.8	73.13	1.9	4.42	29.54	475.2	43.61	0
		MEL-01-08	05-Jul-24	618.17	61.7	1.56	2.43	64.8	464.72	22.96	0
		MEL-01-09	05-Jul-24	733.46	83.68	2.31	5.29	61.13	331.3	249.75	0
		MEL-01-10	05-Jul-24	605.56	63.84	1.87	2.83	56.03	451.44	29.55	0
	MEL-02	MEL-02-02	13-Jul-24	269.73	58.92	1.85	1.36	12.7	153.83	41.07	0
		MEL-02-03	13-Jul-24	240.7	38.34	1.49	3.01	5.07	168.07	24.72	0
		MEL-02-05	13-Jul-24	212.79	51.27	1.4	1.33	5.86	134.24	18.69	0
		MEL-02-06	13-Jul-24	367.85	38.63	1.8	14.32	8.59	253.58	50.93	0
		MEL-02-08	13-Jul-24	272.35	24.98	1.71	1.98	6.72	153.27	83.69	0
	MEL-03	MEL-03-01	13-Jul-24	187.84	11.06	0.05	4	20.09	121.69	28.18	2.77
		MEL-03-02	13-Jul-24	156.28	17.79	0.1	0.56	7.57	105.5	24.76	0
		MEL-03-03	13-Jul-24	300.33	24.5	0.09	6.92	24.73	164.61	79.48	0
		MEL-03-04	13-Jul-24	221.88	12.03	0.18	3.66	9.59	177.68	18.74	0
		MEL-03-05	13-Jul-24	197.75	7.38	0.04	0.35	19.59	98.9	71.49	0
August	MEL-01	MEL-01-01	13-Aug-24	235.68	86.73	0.3	20.59	43.97	54.12	29.97	0
		MEL-01-06	13-Aug-24	192.1	61.45	0.51	12.74	26.48	49.18	41.74	0
		MEL-01-07	13-Aug-24	189.8	66	0.3	5.23	36.06	34.28	47.93	0
		MEL-01-08	13-Aug-24	265.3	101.21	0.45	15.03	49.75	66.42	32.44	0
		MEL-01-09	13-Aug-24	233.48	84.27	0.3	18.65	50.85	53.69	25.72	0
		MEL-01-10	13-Aug-24	221.21	96.25	1.02	13.9	20.73	60.72	28.59	0
	MEL-02	MEL-02-02	12-Aug-24	277.84	77.3	1	17.51	38.27	98.92	44.84	0
		MEL-02-03	12-Aug-24	302.39	37.09	11.46	14.46	30.79	109.59	99	0
		MEL-02-05	12-Aug-24	209.81	19.3	5.13	20.3	20.03	113.93	31.12	0
		MEL-02-06	12-Aug-24	221.53	26.17	0.1	11.9	23.42	55.14	104.8	0
		MEL-02-08	12-Aug-24	262.44	35.3	0.1	29.96	18.64	92.98	85.46	0
	MEL-03	MEL-03-01	11-Aug-24	149.99	9	0.1	10.75	10.02	89.81	30.31	0
		MEL-03-02	11-Aug-24	168.98	8.11	2.36	10.16	6.54	113.11	28.7	0
		MEL-03-03	11-Aug-24	254.21	18.48	3.02	24.33	14.41	151.15	42.82	0
		MEL-03-04	12-Aug-25	200.05	18.83	0	4.92	8.97	127.39	39.94	0
		MEL-03-05	12-Aug-25	275.47	20.12	0.02	8.79	16.14	136.86	93.54	0
	MEL-04	MEL-04-01	21-Aug-24	142.19	21.93	0	31.81	18.56	60.76	9.13	0
		MEL-04-02	20-Aug-24	175.06	29.38	0	10.12	26.09	80.83	28.64	0
		MEL-04-03	21-Aug-24	217.01	25.85	0	29.33	30.03	113.34	18.46	0
		MEL-04-04	21-Aug-24	119.38	12.12	0.2	8.11	24.47	34.67	39.81	0
		MEL-04-05	21-Aug-24	176.84	22.11	0	17.81	33.99	94.73	8.2	0
	MEL-05	MEL-05-01	14-Aug-24	233.88	46.15	0	15.04	16.89	96.28	59.52	0
		MEL-05-02	14-Aug-24	234.44	14.54	11.47	12.86	8.49	100.46	86.62	0
		MEL-05-03	14-Aug-24	193.79	14.23	0	15.31	8.97	116.47	38.81	0
		MEL-05-04	14-Aug-24	169.93	45.13	0	3.89	3	87.22	30.69	0
		MEL-05-05	14-Aug-24	200.31	13.89	0	20.05	8.62	107.5	50.25	0
September	MEL-01	MEL-01-01	07-Sep-24	340.12	41.77	1.05	15.02	7.42	209.87	64.99	0
		MEL-01-06	07-Sep-24	301.64	33.98	1.35	18.83	10.12	214.32	23.04	0
		MEL-01-07	07-Sep-24	350.56	43.88	1.76	36.01	12.85	194.23	61.83	0
		MEL-01-08	07-Sep-24	397.95	41.66	5.36	13.72	9.79	262.85	64.57	0
		MEL-01-09	07-Sep-24	403.78	57	1.35	23.03	7.03	210.3	105.07	0
		MEL-01-10	07-Sep-24	411.46	45.79	6.71	33	24.54	205.99	95.43	0
	MEL-02	MEL-02-02	07-Sep-24	324.87	37.96	4.07	35.39	10.27	163.55	73.63	0
		MEL-02-03	12-Sep-24	312.42	46.65	0.9	41.25	15.78	184.85	22.99	0
		MEL-02-05	07-Sep-24	240.1	44.81	0.2	17.68	10.46	132.99	33.96	0
		MEL-02-06	07-Sep-24	326.34	42.29	5.12	51.06	3.41	161.09	63.37	0
		MEL-02-08	07-Sep-24	265.71	35.49	7.14	20.1	6.12	160.58	36.28	0
	MEL-03	MEL-03-01	12-Sep-24	259.14	40.45	0	92.62	8.29	81.8	35.98	0
		MEL-03-02	12-Sep-24	212.05	47.55	0.1	13.35	22.73	46.69	81.63	0
		MEL-03-03	12-Sep-24	252.32	49.01	1.19	35.84	2.87	141.22	22.19	0
		MEL-03-04	12-Sep-24	231.38	37.93	2.02	10.96	10.45	93.46	76.56	0
		MEL-03-05	12-Sep-24	369.65	27.62	1.75	9.2	169.18	78.42	83.48	0

Notes:
Chloro = chlorophytes; Chryso = chrysophytes; Crypto = cryptophytes; Dino = dinoflagellates; Cyano = cyanobacteria; Eugleno = Euglenophytes

Table E1-2. Phytoplankton density (cells/L) by major taxa, 2024

Sampling Event	Area	Station	Date	Density (cells/L)						
				Total	Diatoms	Cyano	Chloro	Crypto	Chryso	Dino
July	MEL-01	MEL-01-01	05-Jul-24	4853808	443952	9800	266808	224720	3903328	5000
		MEL-01-06	05-Jul-24	6301072	475936	7800	208336	473792	5126008	9200
		MEL-01-07	05-Jul-24	4778384	594432	10200	143680	176416	3847056	6600
		MEL-01-08	05-Jul-24	5308032	630368	8400	294544	352048	4019872	2800
		MEL-01-09	05-Jul-24	4194992	656304	12400	273192	343864	2868832	40400
		MEL-01-10	05-Jul-24	4690792	518808	9200	122128	273424	3763632	3600
	MEL-02	MEL-02-02	13-Jul-24	2574184	632672	7800	100976	73440	1757296	2000
		MEL-02-03	13-Jul-24	2416120	397184	6600	21552	29536	1958048	3200
		MEL-02-05	13-Jul-24	2362448	515928	6200	57472	9584	1771264	2000
		MEL-02-06	13-Jul-24	2764784	383048	8400	101176	44704	2224856	2600
		MEL-02-08	13-Jul-24	1916056	259904	8200	35920	44104	1563328	4600
	MEL-03	MEL-03-01	13-Jul-24	1519736	86904	200	87608	138096	1203128	3600
		MEL-03-02	13-Jul-24	1439096	190664	200	28936	51288	1165808	2200
		MEL-03-03	13-Jul-24	2091536	254200	400	72640	133112	1626384	4800
		MEL-03-04	13-Jul-24	1880952	134024	1000	50688	65456	1626784	3000
		MEL-03-05	13-Jul-24	969536	65720	200	7384	117744	770488	8000
August	MEL-01	MEL-01-01	13-Aug-24	2537816	239504	400	1337624	265024	690864	4400
		MEL-01-06	13-Aug-24	1960712	137144	1000	805808	155064	856296	5400
		MEL-01-07	13-Aug-24	1530272	119392	400	481928	233888	690664	4000
		MEL-01-08	13-Aug-24	2453408	199000	600	972440	308328	970440	2600
		MEL-01-09	13-Aug-24	2464176	146912	400	1180176	335664	798824	2200
		MEL-01-10	13-Aug-24	2495128	172880	58072	1128688	111760	1020328	3400
	MEL-02	MEL-02-02	12-Aug-24	1813232	125960	15568	167032	275192	1221680	7800
		MEL-02-03	12-Aug-24	2141728	149112	59272	434040	225304	1257400	16600
		MEL-02-05	12-Aug-24	2328864	75656	1400	663728	123928	1459352	4800
		MEL-02-06	12-Aug-24	1801048	120960	200	612240	173416	884432	9800
		MEL-02-08	12-Aug-24	2679696	171048	200	1036696	117344	1345208	9200
	MEL-03	MEL-03-01	11-Aug-24	1804616	57288	200	224704	59072	1458952	4400
		MEL-03-02	11-Aug-24	1472952	99592	400	160048	44104	1163808	5000
		MEL-03-03	11-Aug-24	1790680	49320	800	160848	61472	1509840	8400
		MEL-03-04	12-Aug-25	1659952	133128	0	188784	58472	1272568	7000
		MEL-03-05	12-Aug-25	1906008	98592	200	267808	102576	1423232	13600
	MEL-04	MEL-04-01	21-Aug-24	1552176	92208	0	434040	110960	912768	2200
		MEL-04-02	20-Aug-24	1200960	122144	0	231488	154064	689864	3400
		MEL-04-03	21-Aug-24	1798432	104392	0	382352	210536	1099352	1800
		MEL-04-04	21-Aug-24	1104368	99792	400	461176	174016	366984	2000
		MEL-04-05	21-Aug-24	1661936	52904	0	584104	239472	783456	2000
	MEL-05	MEL-05-01	14-Aug-24	1544592	91608	0	381552	116344	949688	5400
		MEL-05-02	14-Aug-24	1483536	19568	58672	209136	51888	1135472	8800
		MEL-05-03	14-Aug-24	1795832	99592	0	375168	58472	1258800	3800
		MEL-05-04	14-Aug-24	1211348	115576	0	200156	8384	884232	3000
		MEL-05-05	14-Aug-24	1645768	135912	0	310512	58272	1136872	4200
September	MEL-01	MEL-01-01	07-Sep-24	2862488	125120	1400	568736	37520	2122312	7400
		MEL-01-06	07-Sep-24	2610368	119272	1800	439424	72440	1974432	3000
		MEL-01-07	07-Sep-24	2340040	102152	30736	324080	67256	1810016	5800
		MEL-01-08	07-Sep-24	2678872	124888	59672	172816	32136	2282760	6600
		MEL-01-09	07-Sep-24	2954016	55200	1800	361400	50688	2473928	11000
		MEL-01-10	07-Sep-24	3156016	80200	94992	324480	187384	2461560	7400
	MEL-02	MEL-02-02	07-Sep-24	2032216	161744	21952	483728	52488	1306104	6200
		MEL-02-03	12-Sep-24	2610088	108624	400	511864	88208	1897392	3600
		MEL-02-05	07-Sep-24	1687768	89488	400	348032	72640	1173408	3800
		MEL-02-06	07-Sep-24	2178032	31584	114944	238672	8584	1778648	5600
		MEL-02-08	07-Sep-24	2057336	57352	158248	619624	43504	1174608	4000
	MEL-03	MEL-03-01	12-Sep-24	1767728	53920	0	455192	58072	1196744	3800
		MEL-03-02	12-Sep-24	1588360	63520	200	326080	146280	1044880	7400
		MEL-03-03	12-Sep-24	2197384	56336	200	303928	14968	1819352	2600
		MEL-03-04	12-Sep-24	1501336	63904	57672	209736	59272	1102752	8000
		MEL-03-05	12-Sep-24	2710832	38552	400	145280	1303304	1216896	6400

Notes:
Chloro = chlorophytes; Chryso = chrysophytes; Crypto = cryptophytes; Dino = dinoflagellates; Cyano = cyanobacteria; Eugleno = Euglenophytes

Table E1-3. Phytoplankton richness by major taxa, 2024

Sampling Event	Area	Station	Date	Taxa Richness							
				Total	Diatoms	Cyano	Chloro	Crypto	Chryso	Dino	Eugleno
July	MEL-01	MEL-01-01	05-Jul-24	35	8	1	5	4	12	4	1
		MEL-01-06	05-Jul-24	35	8	1	4	4	13	5	0
		MEL-01-07	05-Jul-24	36	10	1	4	4	14	3	0
		MEL-01-08	05-Jul-24	32	8	1	3	4	12	4	0
		MEL-01-09	05-Jul-24	35	11	1	4	4	11	4	0
		MEL-01-10	05-Jul-24	36	10	1	3	4	14	4	0
	MEL-02	MEL-02-02	13-Jul-24	36	9	1	4	3	15	4	0
		MEL-02-03	13-Jul-24	29	7	2	3	2	13	2	0
		MEL-02-05	13-Jul-24	34	10	1	3	3	13	4	0
		MEL-02-06	13-Jul-24	41	10	1	7	3	16	4	0
		MEL-02-08	13-Jul-24	35	8	1	2	4	15	5	0
	MEL-03	MEL-03-01	13-Jul-24	35	8	1	3	2	16	4	1
		MEL-03-02	13-Jul-24	31	6	1	3	3	14	4	0
		MEL-03-03	13-Jul-24	38	8	1	6	3	15	5	0
		MEL-03-04	13-Jul-24	30	7	1	4	2	12	4	0
		MEL-03-05	13-Jul-24	27	5	1	2	2	13	4	0
August	MEL-01	MEL-01-01	13-Aug-24	36	10	1	10	2	9	4	0
		MEL-01-06	13-Aug-24	39	9	2	13	2	10	3	0
		MEL-01-07	13-Aug-24	29	8	1	6	2	8	4	0
		MEL-01-08	13-Aug-24	32	5	1	9	2	12	3	0
		MEL-01-09	13-Aug-24	34	7	1	10	2	11	3	0
		MEL-01-10	13-Aug-24	35	6	2	9	2	12	4	0
	MEL-02	MEL-02-02	12-Aug-24	40	9	3	10	3	11	4	0
		MEL-02-03	12-Aug-24	44	8	3	14	3	12	4	0
		MEL-02-05	12-Aug-24	43	9	2	13	3	13	3	0
		MEL-02-06	12-Aug-24	40	8	1	12	2	13	4	0
		MEL-02-08	12-Aug-24	39	10	1	11	2	13	2	0
	MEL-03	MEL-03-01	11-Aug-24	39	7	1	13	2	12	4	0
		MEL-03-02	11-Aug-24	35	8	2	9	3	10	3	0
		MEL-03-03	11-Aug-24	43	8	3	11	3	15	3	0
		MEL-03-04	12-Aug-25	34	8	0	10	2	11	3	0
		MEL-03-05	12-Aug-25	40	9	1	12	2	13	3	0
	MEL-04	MEL-04-01	21-Aug-24	35	7	0	12	3	11	2	0
		MEL-04-02	20-Aug-24	33	7	0	10	3	11	2	0
		MEL-04-03	21-Aug-24	36	7	0	11	2	14	2	0
		MEL-04-04	21-Aug-24	34	6	1	10	2	12	3	0
		MEL-04-05	21-Aug-24	33	8	0	12	2	9	2	0
	MEL-05	MEL-05-01	14-Aug-24	38	9	0	9	2	15	3	0
		MEL-05-02	14-Aug-24	39	7	3	7	3	15	4	0
		MEL-05-03	14-Aug-24	38	7	0	14	2	11	4	0
		MEL-05-04	14-Aug-24	30	9	0	6	2	11	2	0
		MEL-05-05	14-Aug-24	35	6	0	11	2	14	2	0
September	MEL-01	MEL-01-01	07-Sep-24	45	11	1	12	2	16	3	0
		MEL-01-06	07-Sep-24	41	8	1	11	2	16	3	0
		MEL-01-07	07-Sep-24	45	9	2	11	2	17	4	0
		MEL-01-08	07-Sep-24	45	9	3	8	2	19	4	0
		MEL-01-09	07-Sep-24	41	7	1	7	2	20	4	0
		MEL-01-10	07-Sep-24	45	7	4	10	2	18	4	0
	MEL-02	MEL-02-02	07-Sep-24	46	9	2	12	2	17	4	0
		MEL-02-03	12-Sep-24	42	9	2	11	3	14	3	0
		MEL-02-05	07-Sep-24	40	10	1	9	2	15	3	0
		MEL-02-06	07-Sep-24	43	9	1	10	2	17	4	0
		MEL-02-08	07-Sep-24	40	7	2	11	2	15	3	0
	MEL-03	MEL-03-01	12-Sep-24	41	9	0	11	2	15	4	0
		MEL-03-02	12-Sep-24	40	10	1	11	2	12	4	0
		MEL-03-03	12-Sep-24	39	10	1	9	2	13	4	0
		MEL-03-04	12-Sep-24	45	10	2	11	2	16	4	0
		MEL-03-05	12-Sep-24	36	7	2	7	3	12	5	0

Notes:
Chloro = chlorophytes; Chryso = chrysophytes; Crypto = cryptophytes; Dino = dinoflagellates; Cyano = cyanobacteria; Eugleno = Euglenophytes

Table E1-4. Phytoplankton community indices – Simpson's Diversity, Simpson's Evenness, and Bray-Curtis Index, 2024

Sampling Event	Area	Station	Date	Simpson's Diversity		Simpson's Evenness	Bray-Curtis Index
				1/D	1-D		
July	MEL-01	MEL-01-01	05-Jul-24	4.46	0.776	0.127	0.597
		MEL-01-06	05-Jul-24	4.66	0.785	0.133	0.693
		MEL-01-07	05-Jul-24	4.3	0.767	0.119	0.633
		MEL-01-08	05-Jul-24	3.58	0.72	0.112	0.637
		MEL-01-09	05-Jul-24	6.08	0.835	0.174	0.637
		MEL-01-10	05-Jul-24	3.97	0.748	0.11	0.627
	MEL-02	MEL-02-02	13-Jul-24	10.2	0.902	0.283	0.455
		MEL-02-03	13-Jul-24	7.32	0.863	0.252	0.487
		MEL-02-05	13-Jul-24	8.36	0.88	0.246	0.429
		MEL-02-06	13-Jul-24	12.1	0.917	0.295	0.485
		MEL-02-08	13-Jul-24	9.7	0.897	0.277	0.448
	MEL-03	MEL-03-01	13-Jul-24	12.4	0.919	0.353	0.151
		MEL-03-02	13-Jul-24	10.9	0.908	0.351	0.119
		MEL-03-03	13-Jul-24	12.8	0.922	0.338	0.287
		MEL-03-04	13-Jul-24	5.13	0.805	0.171	0.384
		MEL-03-05	13-Jul-24	10.9	0.909	0.405	0.31
August	MEL-01	MEL-01-01	13-Aug-24	7.49	0.866	0.208	0.619
		MEL-01-06	13-Aug-24	8.69	0.885	0.223	0.608
		MEL-01-07	13-Aug-24	7.37	0.864	0.254	0.614
		MEL-01-08	13-Aug-24	5.69	0.824	0.178	0.639
		MEL-01-09	13-Aug-24	6.62	0.849	0.195	0.611
		MEL-01-10	13-Aug-24	6.15	0.837	0.176	0.578
	MEL-02	MEL-02-02	12-Aug-24	10.8	0.907	0.27	0.408
		MEL-02-03	12-Aug-24	13.7	0.927	0.311	0.41
		MEL-02-05	12-Aug-24	12.7	0.921	0.296	0.27
		MEL-02-06	12-Aug-24	7.75	0.871	0.194	0.469
		MEL-02-08	12-Aug-24	9.39	0.894	0.241	0.386
	MEL-03	MEL-03-01	11-Aug-24	11.1	0.91	0.286	0.244
		MEL-03-02	11-Aug-24	9.01	0.889	0.257	0.213
		MEL-03-03	11-Aug-24	10.6	0.905	0.246	0.28
		MEL-03-04	12-Aug-25	9.88	0.899	0.291	0.258
		MEL-03-05	12-Aug-25	10.8	0.908	0.27	0.453
	MEL-04	MEL-04-01	21-Aug-24	12.5	0.92	0.356	0.423
		MEL-04-02	20-Aug-24	9.37	0.893	0.284	0.328
		MEL-04-03	21-Aug-24	9.81	0.898	0.273	0.281
		MEL-04-04	21-Aug-24	7.66	0.869	0.225	0.516
		MEL-04-05	21-Aug-24	8.56	0.883	0.259	0.286
	MEL-05	MEL-05-01	14-Aug-24	10.2	0.902	0.268	0.298
		MEL-05-02	14-Aug-24	14.5	0.931	0.371	0.383
		MEL-05-03	14-Aug-24	9.32	0.893	0.245	0.229
		MEL-05-04	14-Aug-24	9.8	0.898	0.327	0.246
		MEL-05-05	14-Aug-24	7.78	0.871	0.222	0.279
September	MEL-01	MEL-01-01	07-Sep-24	15.4	0.935	0.343	0.492
		MEL-01-06	07-Sep-24	12.5	0.92	0.305	0.515
		MEL-01-07	07-Sep-24	13.9	0.928	0.308	0.44
		MEL-01-08	07-Sep-24	14	0.929	0.312	0.54
		MEL-01-09	07-Sep-24	12.8	0.922	0.313	0.486
		MEL-01-10	07-Sep-24	13.1	0.924	0.292	0.528
	MEL-02	MEL-02-02	07-Sep-24	12.6	0.921	0.274	0.52
		MEL-02-03	12-Sep-24	11.5	0.913	0.274	0.489
		MEL-02-05	07-Sep-24	13	0.923	0.325	0.414
		MEL-02-06	07-Sep-24	10.5	0.905	0.245	0.503
		MEL-02-08	07-Sep-24	8.48	0.882	0.212	0.455
	MEL-03	MEL-03-01	12-Sep-24	6.79	0.853	0.166	0.327
		MEL-03-02	12-Sep-24	10.3	0.903	0.257	0.269
		MEL-03-03	12-Sep-24	10	0.9	0.257	0.389
		MEL-03-04	12-Sep-24	13.5	0.926	0.301	0.307
		MEL-03-05	12-Sep-24	4.57	0.781	0.127	0.482

Table E1-5. Phytoplankton biomass (mg/m³) for the top 5 taxa in July, August, and September 2024

				Biomass Results			Dominant Taxa No. 1			Dominant Taxa No. 2			Dominant Taxa No. 3			Dominant Taxa No. 4			Dominant Taxa No. 5		
Event	Area	Station	Date	Total (mg/m³)	Top 5 taxa (mg/m³)	% biomass from top 5 taxa	Species	MTG	Biomass	Species	MTG	Biomass	Species	MTG	Biomass	Species	MTG	Biomass	Species	MTG	Biomass
July	MEL-01	MEL-01-01	05-Jul-24	614	457	74%	Uroglena volvox Ehrenberg	CHRYSO	266.5	Dinobryon sociale Ehrenberg	CHRYSO	86.08	Chrysochromulina laurentiana Kling	CHRYSO	49.56	Rhizosolenia eriense H.L. Smith	DIATOMS	30.46	Rhodomonas minuta Skuja	CRYPTO	24.38
		MEL-01-06	05-Jul-24	892	663	74%	Uroglena volvox Ehrenberg	CHRYSO	354.25	Chrysochromulina laurentiana Kling	CHRYSO	191.17	Rhodomonas minuta Skuja	CRYPTO	45.15	Dinobryon sociale Ehrenberg	CHRYSO	37.14	Cryptomonas erosa Ehrenberg	CRYPTO	35.2
		MEL-01-07	05-Jul-24	628	468	75%	Uroglena volvox Ehrenberg	CHRYSO	284.37	Chrysochromulina laurentiana Kling	CHRYSO	56.64	Dinobryon sociale Ehrenberg	CHRYSO	48.71	Rhizosolenia eriense H.L. Smith	DIATOMS	41.42	Dinobryon sertularia Ehrenberg	CHRYSO	36.97
		MEL-01-08	05-Jul-24	618	459	74%	Uroglena volvox Ehrenberg	CHRYSO	314.44	Chrysochromulina laurentiana Kling	CHRYSO	46.02	Rhizosolenia eriense H.L. Smith	DIATOMS	36.55	Rhodomonas minuta Skuja	CRYPTO	35.21	Dinobryon sociale Ehrenberg	CHRYSO	26.91
		MEL-01-09	05-Jul-24	733	531	72%	Gymnodinium sp.	DINOFLG	219.06	Uroglena volvox Ehrenberg	CHRYSO	176.31	Chrysochromulina laurentiana Kling	CHRYSO	60.18	Rhizosolenia eriense H.L. Smith	DIATOMS	43.25	Rhodomonas minuta Skuja	CRYPTO	32.5
		MEL-01-10	05-Jul-24	606	457	76%	Uroglena volvox Ehrenberg	CHRYSO	282.75	Chrysochromulina laurentiana Kling	CHRYSO	92.04	Rhizosolenia eriense H.L. Smith	DIATOMS	31.06	Rhodomonas minuta Skuja	CRYPTO	26.18	Cryptomonas erosa Ehrenberg	CRYPTO	25.3
	MEL-02	MEL-02-02	13-Jul-24	270	167	62%	Rhizosolenia eriense H.L. Smith	DIATOMS	48.73	Chrysococcus sp.	CHRYSO	46.04	Peridinium limbatum (Stokes) Lemmermann	DINOFLG	28.75	Dinobryon sociale Ehrenberg	CHRYSO	26.62	Chrysochromulina laurentiana Kling	CHRYSO	17
		MEL-02-03	13-Jul-24	241	186	77%	Chrysococcus sp.	CHRYSO	53.56	Uroglena volvox Ehrenberg	CHRYSO	47.12	Dinobryon sociale Ehrenberg	CHRYSO	33.12	Rhizosolenia eriense H.L. Smith	DIATOMS	29.24	Gymnodinium sp.	DINOFLG	23.15
		MEL-02-05	13-Jul-24	213	150	71%	Chrysococcus sp.	CHRYSO	44.16	Rhizosolenia eriense H.L. Smith	DIATOMS	37.16	Uroglena volvox Ehrenberg	CHRYSO	29.25	Dinobryon sociale Ehrenberg	CHRYSO	28.25	Large chrysophyceae	CHRYSO	11.61
		MEL-02-06	13-Jul-24	368	202	55%	Uroglena volvox Ehrenberg	CHRYSO	57.68	Chrysococcus sp.	CHRYSO	48.86	Dinobryon sociale Ehrenberg	CHRYSO	36.37	Synura sphagnicola Korschikow	CHRYSO	30.09	Peridinium limbatum (Stokes) Lemmermann	DINOFLG	28.75
		MEL-02-08	13-Jul-24	272	174	64%	Peridinium limbatum (Stokes) Lemmermann	DINOFLG	57.51	Uroglena volvox Ehrenberg	CHRYSO	34.93	Chrysochromulina laurentiana Kling	CHRYSO	34.01	Chrysococcus sp.	CHRYSO	31.94	Dinobryon sociale Ehrenberg	CHRYSO	15.25
	MEL-03	MEL-03-01	13-Jul-24	188	107	57%	Uroglena volvox Ehrenberg	CHRYSO	30.87	Chrysochromulina laurentiana Kling	CHRYSO	22.67	Dinobryon sertularia Ehrenberg	CHRYSO	19.89	Rhodomonas minuta Skuja	CRYPTO	17.15	Chrysococcus sp.	CHRYSO	15.97
		MEL-03-02	13-Jul-24	156	95	61%	Dinobryon sociale Ehrenberg	CHRYSO	21.87	Chrysochromulina laurentiana Kling	CHRYSO	19.84	Dinobryon sertularia Ehrenberg	CHRYSO	19.12	Chrysococcus sp.	CHRYSO	17.38	Uroglena volvox Ehrenberg	CHRYSO	17.06
		MEL-03-03	13-Jul-24	300	160	53%	Chrysochromulina laurentiana Kling	CHRYSO	45.35	Dinobryon sociale Ehrenberg	CHRYSO	37.77	Chrysococcus sp.	CHRYSO	29.12	Peridinium limbatum (Stokes) Lemmermann	DINOFLG	28.75	Uroglena volvox Ehrenberg	CHRYSO	19.5
		MEL-03-04	13-Jul-24	222	166	75%	Rhodomonas minuta Skuja	CRYPTO	8.12	Dinobryon sociale Ehrenberg	CHRYSO	83.45	Chrysococcus sp.	CHRYSO	43.22	Chrysochromulina laurentiana Kling	CHRYSO	17	Uroglena volvox Ehrenberg	CHRYSO	13.81
		MEL-03-05	13-Jul-24	198	116	59%	Peridinium aciculiferum Lemmermann	DINOFLG	14.47	Uroglena volvox Ehrenberg	CHRYSO	31.68	Gymnodinium helveticum Penard	DINOFLG	28.27	Gymnodinium sp.	DINOFLG	21.66	Dinobryon sociale Ehrenberg	CHRYSO	20.25
August	MEL-01	MEL-01-01	13-Aug-24	236	143	61%	Cyclotella pseudostelligera	DIATOMS	72.69	Rhodomonas minuta Skuja	CRYPTO	32.5	Gymnodinium sp.	DINOFLG	14.01	Chrysococcus sp.	CHRYSO	12.68	Cryptomonas erosa Ehrenberg	CRYPTO	11.47
		MEL-01-06	13-Aug-24	192	123	64%	Cyclotella pseudostelligera	DIATOMS	48.46	Gymnodinium sp.	DINOFLG	30.26	Rhodomonas minuta Skuja	CRYPTO	18.96	Stichogloea sp.	CHRYSO	14.09	Uroglena volvox Ehrenberg	CHRYSO	11.37
		MEL-01-07	13-Aug-24	190	133	70%	Cyclotella pseudostelligera	DIATOMS	48.46	Gymnodinium sp.	DINOFLG	34.46	Rhodomonas minuta Skuja	CRYPTO	28.89	Stichogloea sp.	CHRYSO	11.2	Chrysococcus sp.	CHRYSO	10.33
		MEL-01-08	13-Aug-24	265	186	70%	Cyclotella pseudostelligera	DIATOMS	96.93	Rhodomonas minuta Skuja	CRYPTO	37.92	Gymnodinium sp.	DINOFLG	26.23	Stichogloea sp.	CHRYSO	13.37	Cryptomonas erosa Ehrenberg	CRYPTO	11.83
		MEL-01-09	13-Aug-24	233	161	69%	Cyclotella pseudostelligera	DIATOMS	72.69	Rhodomonas minuta Skuja	CRYPTO	41.53	Gymnodinium sp.	DINOFLG	18	Chrysococcus sp.	CHRYSO	16.91	Stichogloea sp.	CHRYSO	12.28
		MEL-01-10	13-Aug-24	221	143	65%	Cyclotella pseudostelligera	DIATOMS	80.77	Gymnodinium sp.	DINOFLG	17.15	Chrysococcus sp.	CHRYSO	16.91	Stichogloea sp.	CHRYSO	14.81	Rhodomonas minuta Skuja	CRYPTO	13.54
	MEL-02	MEL-02-02	12-Aug-24	278	153	55%	Stephanodiscus niagarae Ehrenberg	DIATOMS	58.92	Rhodomonas minuta Skuja	CRYPTO	34.31	Dinobryon sociale Ehrenberg	CHRYSO	22.75	Chrysococcus sp.	CHRYSO	18.79	Uroglena volvox Ehrenberg	CHRYSO	18.68
		MEL-02-03	12-Aug-24	302	154	51%	Gymnodinium sp.	DINOFLG	38.53	Gymnodinium helveticum Penard	DINOFLG	35.91	Chrysochromulina laurentiana Kling	CHRYSO	31.18	Rhodomonas minuta Skuja	CRYPTO	25.28	Peridinium pusillum (Penard) Lemmermann	DINOFLG	22.76
		MEL-02-05	12-Aug-24	210	117	56%	Chrysococcus sp.	CHRYSO	30.06	Chrysochromulina laurentiana Kling	CHRYSO	28.34	Gymnodinium sp.	DINOFLG	21.54	Dinobryon sertularia Ehrenberg	CHRYSO	20.5	Dinobryon sociale Ehrenberg	CHRYSO	16.25
		MEL-02-06	12-Aug-24	222	190	86%	Gymnodinium sp.	DINOFLG	66.44	Gymnodinium sp.	DINOFLG	60.81	Gymnodinium helveticum Penard	DINOFLG	23.56	Rhodomonas minuta Skuja	CRYPTO	21.67	Chrysococcus sp.	CHRYSO	17.85
		MEL-02-08	12-Aug-24	262	153	58%	Gymnodinium sp.	DINOFLG	67.58	Chrysococcus sp.	CHRYSO	29.59	Chrysochromulina laurentiana Kling	CHRYSO	19.84	Dinobryon sociale Ehrenberg	CHRYSO	18.44	Peridinium pusillum (Penard) Lemmermann	DINOFLG	17.88
	MEL-03	MEL-03-01	11-Aug-24	150	89	60%	Dinobryon sociale Ehrenberg	CHRYSO	26	Uroglena volvox Ehrenberg	CHRYSO	21.93	Chrysococcus sp.	CHRYSO	17.38	Gymnodinium sp.	DINOFLG	15.68	Chrysochromulina laurentiana Kling	CHRYSO	8.5
		MEL-03-02	11-Aug-24	169	115	68%	Chrysochromulina laurentiana Kling	CHRYSO	31.18	Chrysococcus sp.	CHRYSO	28.65	Dinobryon sociale Ehrenberg	CHRYSO	26	Peridinium pusillum (Penard) Lemmermann	DINOFLG	16.25	Large chrysophyceae	CHRYSO	12.9
		MEL-03-03	11-Aug-24	254	152	60%	Dinobryon sociale Ehrenberg	CHRYSO	44.12	Chrysochromulina laurentiana Kling	CHRYSO	39.68	Chrysococcus sp.	CHRYSO	27.25	Gymnodinium sp.	DINOFLG	20.7	Peridinium pusillum (Penard) Lemmermann	DINOFLG	20.32
		MEL-03-04	12-Aug-25	200	126	63%	Uroglena volvox Ehrenberg	CHRYSO	39	Chrysochromulina laurentiana Kling	CHRYSO	28.34	Chrysococcus sp.	CHRYSO	22.55	Dinobryon sociale Ehrenberg	CHRYSO	18.12	Peridinium pusillum (Penard) Lemmermann	DINOFLG	17.88
		MEL-03-05	12-Aug-25	275	166	60%	Gymnodinium sp.	DINOFLG	47.88	Chrysochromulina laurentiana Kling	CHRYSO	36.85	Dinobryon bavaricum Imhof	CHRYSO	30.87	Peridinium pusillum (Penard) Lemmermann	DINOFLG	26.82	Chrysococcus sp.	CHRYSO	23.49
	MEL-04	MEL-04-01	21-Aug-24	142	75	53%	Dinobryon sociale Ehrenberg	CHRYSO	22.75	Planctonema lauterbornii Schmidle	CHLORO	20.31	Rhodomonas minuta Skuja	CRYPTO	12.64	Chrysococcus sp.	CHRYSO	9.86	Dinobryon sertularia Ehrenberg	CHRYSO	9.75
		MEL-04-02	20-Aug-24	175	116	66%	Dinobryon sociale Ehrenberg	CHRYSO	39.8	Gymnodinium sp.	DINOFLG	22.14	Rhodomonas minuta Skuja	CRYPTO	18.96	Dinobryon sociale Ehrenberg	CHRYSO	17.87	Chrysochromulina laurentiana Kling	CHRYSO	17
		MEL-04-03	21-Aug-24	217	136	63%	Chrysochromulina laurentiana Kling	CHRYSO	45.35	Dinobryon sociale Ehrenberg	CHRYSO	27.62	Rhodomonas minuta Skuja	CRYPTO	26.18	Chrysococcus sp.	CHRYSO	19.26	Planctonema lauterbornii Schmidle	CHLORO	17.77
		MEL-04-04	21-Aug-24	119	85	71%	Peridinium limbatum (Stokes) Lemmermann	DINOFLG	28.75	Rhodomonas minuta Skuja	CRYPTO	21.67	Dinobryon sociale Ehrenberg	CHRYSO	16.64	Cyclotella stelligera Cleve and Grunow	DIATOMS	10.03	Chrysococcus sp.	CHRYSO	7.98
		MEL-04-05	21-Aug-24	177	119	67%	Chrysochromulina laurentiana Kling	CHRYSO	39.68	Rhodomonas minuta Skuja	CRYPTO	29.79	Dinobryon sociale Ehrenberg	CHRYSO	22.94	Chrysococcus sp.	CHRYSO	15.03	Stephanodiscus niagarae Ehrenberg	DIATOMS	11.78
	MEL-05	MEL-05-01	14-Aug-24	234	150	64%	Gymnodinium sp.	DINOFLG	36.45	Dinobryon sociale Ehrenberg	CHRYSO	34.52	Cyclotella pseudostelligera	DIATOMS	32.31	Chrysochromulina laurentiana Kling	CHRYSO	28.34	Chrysococcus sp.	CHRYSO	18.79
		MEL-05-02	14-Aug-24	234	114	49%	Gymnodinium sp.	DINOFLG	32.2	Peridinium limbatum (Stokes) Lemmermann	DINOFLG	28.75	Chrysococcus sp.	CHRYSO	18.32	Chrysostephanosphaera globulifera Scherffel	CHRYSO	17.94	Chrysochromulina laurentiana Kling	CHRYSO	17
		MEL-05-03	14-Aug-24	194	118	61%	Dinobryon sociale Ehrenberg	CHRYSO	47.5	Gymnodinium sp.	DINOFLG	25.8	Chrysococcus sp.	CHRYSO	21.14	Chrysochromulina laurentiana Kling	CHRYSO	14.17	Uroglena volvox Ehrenberg	CHRYSO	9.75
		MEL-05-04	14-Aug-24	170	114	67%	Chrysochromulina laurentiana Kling	CHRYSO	28.34	Gymnodinium sp.	DINOFLG	26.63	Dinobryon sociale Ehrenberg	CHRYSO	22.75	Cyclotella pseudostelligera	DIATOMS	20.19	Chrysococcus sp.	CHRYSO	16.44
		MEL-05-05	14-Aug-24	200.31	139	70%	Dinobryon sociale Ehrenberg	CHRYSO	45.5	Gymnodinium sp.	DINOFLG	43.75	Chrysococcus sp.	CHRYSO	23.02	Chrysochromulina laurentiana Kling	CHRYSO	17	Planctonema lauterbornii Schmidle	CHLORO	10.15
September	MEL-01	MEL-01-01	07-Sep-24	340	169	50%	Dinobryon sertularia Ehrenberg	CHRYSO	42.5	Gymnodinium sp.	DINOFLG	39.68	Chrysochromulina laurentiana Kling	CHRYSO	34.01	Dinobryon sociale Ehrenberg	CHRYSO	31	Dinobryon bavaricum Imhof	CHRYSO	21.86
		MEL-01-06	07-Sep-24	302	169	56%	Dinobryon bavaricum Imhof	CHRYSO	46.81	Dinobryon sociale Ehrenberg	CHRYSO	38.7	Dinobryon sertularia Ehrenberg	CHRYSO	34	Chrysochromulina laurentiana Kling	CHRYSO	28.34	Chrysochromulina parva Lackey	CHRYSO	21.61
		MEL-01-07	07-Sep-24	351	181	52%	Dinobryon sertularia Ehrenberg	CHRYSO	54.25	Dinobryon bavaricum Imhof	CHRYSO	36.11	Gymnodinium sp.	DINOFLG	32.64	Planctonema lauterbornii Schmidle	CHLORO	30.46	Dinobryon sociale Ehrenberg	CHRYSO	27.98
		MEL-01-08	07-Sep-24	398	205	52%	Dinobryon sertularia Ehrenberg	CHRYSO	52.25	Gymnodinium sp.	DINOFLG	44.77	Uroglena volvox Ehrenberg	CHRYSO	39.81	Dinobryon sociale Ehrenberg	CHRYSO	39.27	Chrysochromulina laurentiana Kling	CHRYSO	29.28
		MEL-01-09	07-Sep-24	404	209	52%	Gymnodinium sp.	DINOFLG	74.87	Dinobryon bavaricum Imhof	CHRYSO	40.31	Dinobryon sertularia Ehrenberg	CHRYSO	36	Chrysococcus sp.	CHRYSO	30.06	Stephanodiscus niagarae Ehrenberg	DIATOMS	27.48
		MEL-01-10	07-Sep-24	411	217	53%	Gymnodinium sp.	DINOFLG	70.5	Dinobryon sertularia Ehrenberg	CHRYSO	55.62	Dinobryon sociale Ehrenberg	CHRYSO	36.21	Dinobryon bavaricum Imhof	CHRYSO	31.32	Rhodomonas minuta Skuja	CRYPTO	23.47
	MEL-02	MEL-02-02	07-Sep-24	325	169	52%	Chrysochromulina laurentiana Kling	CHRYSO	65.2	Dinobryon sociale Ehrenberg	CHRYSO	31.53	Peridinium limbatum (Stokes) Lemmermann	DINOFLG	28.75	Gymnodinium sp.	DINOFLG	23.05	Chrysococcus sp.	CHRYSO	20.67
		MEL-02-03	12-Sep-24	312	185	59%	Chrysochromulina laurentiana Kling	CHRYSO	51.02	Dinobryon bavaricum Imhof	CHRYSO	45.01	Stephanodiscus niagarae Ehrenberg	DIATOMS	31.14	Dinobryon sertularia Ehrenberg	CHRYSO	30.18	Planctonema lauterbornii Schmidle	CHLORO	27.92
		MEL-02-05	07-Sep-24	240	126	53%	Dinobryon sociale Ehrenberg	CHRYSO	37.35	Chrysochromulina laurentiana Kling	CHRYSO	32.21	Gymnodinium sp.	DINOFLG	24.33	Stephanodiscus niagarae Ehrenberg	DIATOMS	18.32	Chrysococcus sp.	CHRYSO	14.09
		MEL-02-06	07-Sep-24	326	195	60%	Chrysochromulina laurentiana Kling	CHRYSO	68.03	Planctonema lauterbornii Schmidle	CHLORO	45.69	Stephanodiscus niagarae Ehrenberg	DIATOMS	29.31	Peridinium limbatum (Stokes) Lemmermann	DINOFLG	28.75	Chrysococcus sp.	CHRYSO	23.02
		MEL-02-08	07-Sep-24	266	172	65%	Chrysochromulina laurentiana Kling	CHRYSO	68.03	Dinobryon sociale Ehrenberg	CHRYSO	42.8	Gymnodinium sp.	DINOFLG	25.6	Stephanodiscus niagarae Ehrenberg	DIATOMS	23.81	Chrysococcus sp.	CHRYSO	12.21
	MEL-03	MEL-03-01	12-Sep-24	259	169	65%	Planctonema lauterbornii Schmidle	CHLORO	86.32	Stephanodiscus niagarae Ehrenberg	DIATOMS	27.48	Dinobryon sociale Ehrenberg	CHRYSO	26.95	Large chrysophyceae	CHRYSO	14.19	Chrysococcus sp.	CHRYSO	14.09
		MEL-03-02	12-Sep-24	212	124	59%	Gymnodinium sp.	DINOFLG	46.71	Stephanodiscus niagarae Ehrenberg	DIATOMS	29.31	Rhodomonas minuta Skuja	CRYPTO	18.06	Peridinium aciculiferum Lemmermann	DINOFLG	16.28	Gymnodinium helveticum Penard	DINOFLG	14.13
		MEL-03-03	12-Sep-24	252	164	65%	Dinobryon sociale Ehrenberg	CHRYSO	42.65	Chrysococcus sp.	CHRYSO	39.46	Stephanodiscus niagarae Ehrenberg	DIATOMS	36.64	Planctonema lauterbornii Schmidle	CHLORO	27.92	Chrysochromulina laurentiana Kling	CHRYSO	17
		MEL-03-04	12-Sep-24	231	120	52%	Chrysochromulina laurentiana Kling	CHRYSO	34.01	Peridinium limbatum (Stokes) Lemmermann	DINOFLG	28.75	Stephanodiscus niagarae Ehrenberg	DIATOMS	23.81	Gymnodinium sp.	DINOFLG	17.23	Peridinium aciculiferum Lemmermann	DINOFLG	16.28
		MEL-03-05	12-Sep-24	370	257	70%	Rhodomonas minuta Skuja	CRYPTO	163.44	Peridinium limbatum (Stokes) Lemmermann	DINOFLG	28.75	Gymnodinium sp.	DINOFLG	25.54	Chrysococcus sp.	CHRYSO	21.14	Stephanodiscus niagarae Ehrenberg	DIATOMS	18.32

Notes

MTG = major taxa group

Appendix E2
2024 Phytoplankton Taxonomy and Chlorophyll-a Lab Reports

UNIVERSITY OF ALBERTA
Biogeochemical Analytical Service Laboratory

Analytical Report

Date Reported On: October 03, 2024

Reported To: AGNICO Ealge

Date Received: August 01, 2024; September 06, 2024 and September 20, 2024

Project Name: AEM Meliadine 2024
Client Name: AGNICO Ealge
Supervisor: Randy Schwandt / Eric Franz (Azimuth Consulting Group)
Billing Address or Speed Code: Rankin Inlet, NU, CAN, X0C 0G0

Other Information:

Comments:

Reviewed by: 

Alvin Kwan, BSc.
Quality Assurance Officer

Approved by: 

Mingsheng Ma, Ph. D
Laboratory Manager

RESULTS RELAY TO SAMPLE AS RECEIVED. THIS TEST REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF THE LABORATORY.

UNIVERSITY OF ALBERTA
Biogeochemical Analytical Service Laboratory

Algae Parameters

UA-BASL Sample ID	Received Date	Site Info	Sampling Date	**Chlorophyll-a (µg/L)**	Analyzed Date
268224	2024-08-01	MEL-01-01-PC	07/05/2024	1.86	2024-09-27
268225	2024-08-01	MEL-01-06-PC	07/05/2024	1.55	2024-09-27
268226	2024-08-01	MEL-01-07-PC	07/05/2024	2.12	2024-09-27
268227	2024-08-01	MEL-01-08-PC	07/05/2024	1.87	2024-09-27
268228	2024-08-01	MEL-01-09-PC	07/05/2024	1.93	2024-09-27
268229	2024-08-01	MEL-01-10-PC	07/05/2024	1.84	2024-09-27
268230	2024-08-01	MEL-02-02-PC	07/13/2024	1.90	2024-09-27
268231	2024-08-01	MEL-02-03-PC	07/13/2024	1.82	2024-09-27
268232	2024-08-01	MEL-02-05-PC	07/13/2024	1.85	2024-09-27
268233	2024-08-01	MEL-02-06-PC	07/13/2024	1.99	2024-09-27
268234	2024-08-01	MEL-02-08-PC	07/13/2024	1.79	2024-09-27
268235	2024-08-01	MEL-03-01-PC	07/13/2024	1.17	2024-09-27
268236	2024-08-01	MEL-03-02-PC	07/13/2024	1.10	2024-09-27
268237	2024-08-01	MEL-03-03-PC	07/13/2024	1.00	2024-09-27
268238	2024-08-01	MEL-03-04-PC	07/13/2024	1.07	2024-09-27
268239	2024-08-01	MEL-03-05-PC	07/13/2024	1.08	2024-09-27
268240	2024-08-01	DUP-MEL-JUL-01-PC	07/13/2024	1.15	2024-09-27
268241	2024-08-01	DUP-MEL-JUL-02-PC	07/05/2024	1.88	2024-09-27
268242	2024-08-01	MEL-BLANK-01	07/15/2024	0.51	2024-09-27
268405	2024-09-06	MEL-01-01-PC	08/13/2024	1.88	2024-09-27
268406	2024-09-06	MEL-01-06-PC	08/13/2024	1.92	2024-09-27
268407	2024-09-06	MEL-01-07-PC	08/13/2024	2.11	2024-09-27
268408	2024-09-06	MEL-01-08-PC	08/13/2024	2.01	2024-09-27
268409	2024-09-06	MEL-01-09-PC	08/13/2024	2.05	2024-09-27
268410	2024-09-06	MEL-01-10-PC	08/13/2024	1.91	2024-09-27
268411	2024-09-06	MEL-02-02-PC	08/12/2024	1.47	2024-09-27
268412	2024-09-06	MEL-02-03-PC	08/12/2024	1.40	2024-09-27
268413	2024-09-06	MEL-02-05-PC	08/12/2024	1.40	2024-09-27
268414	2024-09-06	MEL-02-06-PC	08/12/2024	1.52	2024-09-27
268415	2024-09-06	MEL-02-08-PC	08/12/2024	1.36	2024-09-27
268416	2024-09-06	MEL-03-01-PC	08/11/2024	1.09	2024-09-27
268417	2024-09-06	MEL-03-02-PC	08/11/2024	1.02	2024-09-27
268418	2024-09-06	MEL-03-03-PC	08/11/2024	1.42	2024-09-27
268419	2024-09-06	MEL-03-04-PC	08/12/2024	1.07	2024-09-27
		Reportable Detection Limit (µg/L)		0.04	

UNIVERSITY OF ALBERTA
Biogeochemical Analytical Service Laboratory

Algae Parameters

UA-BASL Sample ID	Received Date	Site Info	Sampling Date	**Chlorophyll-a (µg/L)**	Analyzed Date
268420	2024-09-06	MEL-03-05-PC	08/12/2024	1.25	2024-09-27
268421	2024-09-06	MEL-04-01-PC	08/21/2024	1.19	2024-09-27
268422	2024-09-06	MEL-04-02-PC	08/20/2024	1.18	2024-09-27
268423	2024-09-06	MEL-04-03-PC	08/21/2024	1.14	2024-09-27
268424	2024-09-06	MEL-04-04-PC	08/21/2024	1.15	2024-09-27
268425	2024-09-06	MEL-04-05-PC	08/21/2024	1.21	2024-09-27
268426	2024-09-06	MEL-05-01-PC	08/14/2024	1.75	2024-09-27
268427	2024-09-06	MEL-05-02-PC	08/14/2024	1.56	2024-09-27
268428	2024-09-06	MEL-05-03-PC	08/14/2024	1.41	2024-09-27
268429	2024-09-06	MEL-05-04-PC	08/14/2024	1.52	2024-09-27
268430	2024-09-06	MEL-05-05-PC	08/14/2024	1.40	2024-09-27
268431	2024-09-06	PL-01-PC	08/17/2024	1.07	2024-09-27
268432	2024-09-06	PL-02-PC	08/17/2024	1.00	2024-09-27
268433	2024-09-06	AL-01-PC	08/18/2024	0.66	2024-09-27
268434	2024-09-06	AL-02-PC	08/18/2024	0.88	2024-09-27
268435	2024-09-06	DUP-MEL-AUG-01-PC	08/12/2024	1.09	2024-09-27
268436	2024-09-06	DUP-MEL-AUG-02-PC	08/13/2024	1.82	2024-09-27
268437	2024-09-06	DUP-MEL-AUG-03-PC	08/20/2024	1.14	2024-09-27
268438	2024-09-06	DUP-MEL-AUG-05-PC	08/18/2024	0.86	2024-09-27
268439	2024-09-20	MEL-01-01-PC	09/07/2024	2.14	2024-09-27
268440	2024-09-20	MEL-01-06-PC	09/07/2024	2.08	2024-09-27
270157	2024-09-20	MEL-01-07-PC	09/07/2024	1.92	2024-09-27
270158	2024-09-20	MEL-01-08-PC	09/07/2024	1.92	2024-09-27
270159	2024-09-20	MEL-01-09-PC	09/07/2024	2.11	2024-09-27
270160	2024-09-20	MEL-01-10-PC	09/07/2024	1.95	2024-09-27
270161	2024-09-20	MEL-02-02-PC	09/08/2024	1.85	2024-09-27
270162	2024-09-20	MEL-02-03-PC	09/08/2024	2.25	2024-09-27
270163	2024-09-20	MEL-02-05-PC	09/08/2024	2.04	2024-09-27
270164	2024-09-20	MEL-02-06-PC	09/08/2024	1.90	2024-09-27
270165	2024-09-20	MEL-02-08-PC	09/08/2024	2.16	2024-09-27
270166	2024-09-20	MEL-03-01-PC	09/12/2024	1.54	2024-09-27
270167	2024-09-20	MEL-03-02-PC	09/12/2024	1.41	2024-09-27
270168	2024-09-20	MEL-03-03-PC	09/12/2024	1.76	2024-09-27
270169	2024-09-20	MEL-03-04-PC	09/12/2024	1.86	2024-09-27
		Reportable Detection Limit (µg/L)		0.04	

UNIVERSITY OF ALBERTA
Biogeochemical Analytical Service Laboratory

Algae Parameters

UA-BASL Sample ID	Received Date	Site Info	Sampling Date	**Chlorophyll-a (µg/L)**	Analyzed Date
270170	2024-09-20	MEL-03-05-PC	09/12/2024	1.67	2024-09-27
270171	2024-09-20	DUP-MEL-SEPT-01-PC	09/07/2024	2.06	2024-09-27
270172	2024-09-20	DUP-MEL-SEPT-02-PC	09/08/2024	1.87	2024-09-27
270173	2024-09-20	MEL-02-03-PC	09/12/2024	2.16	2024-09-27
270174	2024-09-20	MEL-01-01-S	09/07/2024	2.35	2024-09-27
270175	2024-09-20	MEL-01-01-M	09/07/2024	2.16	2024-09-27
270176	2024-09-20	MEL-01-01-D	09/07/2024	2.72	2024-09-27
270177	2024-09-20	MEL-02-02-S	09/08/2024	1.87	2024-09-27
270178	2024-09-20	MEL-02-02-M	09/08/2024	1.93	2024-09-27
270179	2024-09-20	MEL-02-02-D	09/08/2024	1.86	2024-09-27
270180	2024-09-20	MEL-03-03-S	09/12/2024	1.66	2024-09-27
270181	2024-09-20	MEL-03-03-M	09/12/2024	1.53	2024-09-27
270182	2024-09-20	MEL-03-03-D	09/12/2024	1.76	2024-09-27
		Reportable Detection Limit (µg/L)		0.04	

Method of Analysis

Laboratory Method	Reference	Method	Instrument
Determination of Chlorophyll a in Water by Fluorometry	*Welschmeyer, N.A. 1994. Fluorometric Analysis of chlorophyll a in the presence of chlorophyll b and pheopigments. Limnol. Oceanogr., 39(8), 1994, 1985-1992. (Modified)		Agilent Eclipse fluorescence spectrophotometer

* REFERENCE METHOD MODIFIED.

Phytoplankton species data for Meliadine 2024 (Azimuth Consulting Group)

** 1st number in **species code** = group 1=cyanophyte 2=chlorophyte 3= Euglenophyte 4=chrysophyte 5=diatoms 6=Cryptophyte 7=Dinoflagellates

***RECOUNT = QA\QC sample

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^3
MEL - 0101	5-Jul-24	4401	Uroglena volvox Ehrenberg	2356352	266.50	6.00	6.00	113.10
MEL - 0101	5-Jul-24	4390	Dinobryon sociale Ehrenberg	352016	79.63	12.00	6.00	226.20
MEL - 0101	5-Jul-24	4413	Chrysochromulina laurentiana Kling	100576	49.56	9.80	9.80	492.80
MEL - 0101	5-Jul-24	5511	Rhizosolenia eriense H.L. Smith	359200	30.46	12.00	3.00	84.80
MEL - 0101	5-Jul-24	6554	Rhodomonas minuta Skuja	193968	24.38	10.00	6.00	125.70
MEL - 0101	5-Jul-24	4355	Chrysochromulina parva Lackey	344832	22.55	5.00	5.00	65.40
MEL - 0101	5-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	8400	17.42	220.00	6.00	2073.50
MEL - 0101	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	71840	16.25	12.00	6.00	226.20
MEL - 0101	5-Jul-24	4357	Chrysococcus sp.	244256	15.97	5.00	5.00	65.40
MEL - 0101	5-Jul-24	6558	Cryptomonas erosa Ehrenberg	8600	15.77	26.80	14.00	1833.60
MEL - 0101	5-Jul-24	7632	Gymnodinium sp.	2400	13.38	22.00	22.00	5575.30
MEL - 0101	5-Jul-24	7631	Gymnodinium helveticum Penard	400	9.42	50.00	30.00	23561.90
MEL - 0101	5-Jul-24	4390	Dinobryon sociale Ehrenberg	6800	6.46	0.00	0.00	950.00
MEL - 0101	5-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	1600	6.02	19.30	19.30	3764.20
MEL - 0101	5-Jul-24	7641	Peridinium aciculiferum Lemmermann	600	5.43	30.00	24.00	9047.80
MEL - 0101	5-Jul-24	4352	Large chrysophyceae	28736	5.16	7.00	7.00	179.60
MEL - 0101	5-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	1600	2.91	10.50	21.00	1818.40
MEL - 0101	5-Jul-24	5524	Asterionella formosa Hassall	26000	2.72	100.00	2.00	104.70
MEL - 0101	5-Jul-24	5908	Diatoma tenuis Agardh	11200	2.30	49.00	4.00	205.30
MEL - 0101	5-Jul-24	2235	Ankistrodesmus spiralis Lemmermann	35920	2.14	38.00	2.00	59.70
MEL - 0101	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	2200	2.09	0.00	0.00	950.00
MEL - 0101	5-Jul-24	1054	Planktolyngbya limnetica	9800	2.00	180.00	1.20	203.60
MEL - 0101	5-Jul-24	6565	Cryptomonas rostratiformis Skuja	600	1.98	37.00	16.00	3306.40
MEL - 0101	5-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	71840	1.96	5.80	3.00	27.30
MEL - 0101	5-Jul-24	3301	Euglena acus Ehrenberg	200	1.88	125.00	12.00	9424.80
MEL - 0101	5-Jul-24	4351	Small chrysophyceae	229888	1.66	2.40	2.40	7.20
MEL - 0101	5-Jul-24	5518	Synedra acus Kutzing	14200	1.64	110.00	2.00	115.20
MEL - 0101	5-Jul-24	2206	Botryococcus braunii Kutzing	1000	1.44	14.00	14.00	1436.80
MEL - 0101	5-Jul-24	4362	Kephyrion sp.	93392	1.20	2.90	2.90	12.80
MEL - 0101	5-Jul-24	6568	Katablepharis ovalis Skuja	21552	0.87	7.60	4.00	40.30
MEL - 0101	5-Jul-24	2215	Tetraedron caudatum (Corda) Hansgrig	114944	0.54	3.00	3.00	4.70
MEL - 0101	5-Jul-24	5551	Cyclotella michiganiana Skvortzow	21552	0.53	2.50	5.00	24.50
MEL - 0101	5-Jul-24	2137	Dictyosphaerium simplex Sukja	107760	0.45	2.00	2.00	4.20
MEL - 0101	5-Jul-24	5916	Fragilaria capucina Grunow	1800	0.39	52.00	4.00	217.80
MEL - 0101	5-Jul-24	4383	Dinobryon bavaricum Imhof	400	0.38	0.00	0.00	950.00
MEL - 0101	5-Jul-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - 0101	5-Jul-24	4368	Mallomonas crassisquama (Asmund) Fott	200	0.21	19.60	10.00	1026.30
MEL - 0101R	5-Jul-24	4401	Uroglena volvox Ehrenberg	2413824	273.00	6.00	6.00	113.10
MEL - 0101R	5-Jul-24	4357	Chrysococcus sp.	1645136	107.59	5.00	5.00	65.40
MEL - 0101R	5-Jul-24	4390	Dinobryon sociale Ehrenberg	301728	68.25	12.00	6.00	226.20
MEL - 0101R	5-Jul-24	4413	Chrysochromulina laurentiana Kling	79024	38.94	9.80	9.80	492.80
MEL - 0101R	5-Jul-24	5511	Rhizosolenia eriense H.L. Smith	359200	30.46	12.00	3.00	84.80
MEL - 0101R	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	107760	24.38	12.00	6.00	226.20
MEL - 0101R	5-Jul-24	4355	Chrysochromulina parva Lackey	294544	19.26	5.00	5.00	65.40
MEL - 0101R	5-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	9200	19.08	220.00	6.00	2073.50
MEL - 0101R	5-Jul-24	6554	Rhodomonas minuta Skuja	150864	18.96	10.00	6.00	125.70
MEL - 0101R	5-Jul-24	6558	Cryptomonas erosa Ehrenberg	9600	17.60	26.80	14.00	1833.60
MEL - 0101R	5-Jul-24	7635	Peridinium willei Huitfeldt-Kaas	600	13.47	35.00	35.00	22449.30
MEL - 0101R	5-Jul-24	7632	Gymnodinium sp.	1800	10.04	22.00	22.00	5575.30
MEL - 0101R	5-Jul-24	7641	Peridinium aciculiferum Lemmermann	1000	9.05	30.00	24.00	9047.80
MEL - 0101R	5-Jul-24	4352	Large chrysophyceae	43104	7.74	7.00	7.00	179.60
MEL - 0101R	5-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	1800	6.78	19.30	19.30	3764.20
MEL - 0101R	5-Jul-24	4390	Dinobryon sociale Ehrenberg	6400	6.08	0.00	0.00	950.00
MEL - 0101R	5-Jul-24	2235	Ankistrodesmus spiralis Lemmermann	71840	4.29	38.00	2.00	59.70
MEL - 0101R	5-Jul-24	5524	Asterionella formosa Hassall	28200	2.95	100.00	2.00	104.70
MEL - 0101R	5-Jul-24	5908	Diatoma tenuis Agardh	14200	2.92	49.00	4.00	205.30
MEL - 0101R	5-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	1400	2.55	10.50	21.00	1818.40
MEL - 0101R	5-Jul-24	1054	Planktolyngbya limnetica	12200	2.48	180.00	1.20	203.60
MEL - 0101R	5-Jul-24	4351	Small chrysophyceae	316096	2.28	2.40	2.40	7.20
MEL - 0101R	5-Jul-24	4358	Chrysostephanosphaera globulifera Scherffel	7184	2.00	8.10	8.10	278.30
MEL - 0101R	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	2000	1.90	0.00	0.00	950.00
MEL - 0101R	5-Jul-24	4362	Kephyrion sp.	143680	1.84	2.90	2.90	12.80
MEL - 0101R	5-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	57472	1.57	5.80	3.00	27.30
MEL - 0101R	5-Jul-24	5518	Synedra acus Kutzing	10400	1.20	110.00	2.00	115.20
MEL - 0101R	5-Jul-24	6568	Katablepharis ovalis Skuja	28736	1.16	7.60	4.00	40.30
MEL - 0101R	5-Jul-24	6565	Cryptomonas rostratiformis Skuja	200	0.66	37.00	16.00	3306.40
MEL - 0101R	5-Jul-24	4368	Mallomonas crassisquama (Asmund) Fott	600	0.62	19.60	10.00	1026.30
MEL - 0101R	5-Jul-24	2206	Botryococcus braunii Kutzing	400	0.57	14.00	14.00	1436.80
MEL - 0101R	5-Jul-24	4383	Dinobryon bavaricum Imhof	600	0.57	0.00	0.00	950.00
MEL - 0101R	5-Jul-24	5916	Fragilaria capucina Grunow	2400	0.51	51.00	4.00	213.60
MEL - 0101R	5-Jul-24	2137	Dictyosphaerium simplex Sukja	86208	0.36	2.00	2.00	4.20
MEL - 0101R	5-Jul-24	4411	Bitrichia chodatii (Reverdin) Chodat	7184	0.36	6.00	4.00	50.30
MEL - 0101R	5-Jul-24	5551	Cyclotella michiganiana Skvortzow	14368	0.35	2.50	5.00	24.50
MEL - 0101R	5-Jul-24	2215	Tetraedron caudatum (Corda) Hansgrig	71840	0.34	3.00	3.00	4.70
MEL - 0106	5-Jul-24	1054	Planktolyngbya limnetica	7800	1.46	165.00	1.20	186.60
MEL - 0106	5-Jul-24	2137	Dictyosphaerium simplex Sukja	107760	0.45	2.00	2.00	4.20
MEL - 0106	5-Jul-24	2169	Planctonema lauterbornii Schmidle	7184	2.54	18.00	5.00	353.40
MEL - 0106	5-Jul-24	2215	Tetraedron caudatum (Corda) Hansgrig	43104	0.20	3.00	3.00	4.70
MEL - 0106	5-Jul-24	2235	Ankistrodesmus spiralis Lemmermann	50288	3.00	38.00	2.00	59.70
MEL - 0106	5-Jul-24	4351	Small chrysophyceae	373568	2.69	2.40	2.40	7.20
MEL - 0106	5-Jul-24	4352	Large chrysophyceae	57472	10.32	7.00	7.00	179.60
MEL - 0106	5-Jul-24	4355	Chrysochromulina parva Lackey	359200	23.49	5.00	5.00	65.40
MEL - 0106	5-Jul-24	4357	Chrysococcus sp.	244256	15.97	5.00	5.00	65.40
MEL - 0106	5-Jul-24	4362	Kephyrion sp.	136496	1.75	2.90	2.90	12.80
MEL - 0106	5-Jul-24	4383	Dinobryon bavaricum Imhof	1400	1.33	0.00	0.00	950.00
MEL - 0106	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	107760	24.38	12.00	6.00	226.20

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0106	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	3000	2.85	0.00	0.00	950.00
MEL - 0106	5-Jul-24	4390	Dinobryon sociale Ehrenberg	136496	30.88	12.00	6.00	226.20
MEL - 0106	5-Jul-24	4390	Dinobryon sociale Ehrenberg	6600	6.27	0.00	0.00	950.00
MEL - 0106	5-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	136496	3.73	5.80	3.00	27.30
MEL - 0106	5-Jul-24	4400	Ochromonas sp.	7184	0.46	7.60	4.00	63.70
MEL - 0106	5-Jul-24	4401	Uroglena volvox Ehrenberg	3132224	354.25	6.00	6.00	113.10
MEL - 0106	5-Jul-24	4413	Chrysochromulina laurentiana Kling	387936	191.17	9.80	9.80	492.80
MEL - 0106	5-Jul-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	35920	0.98	5.80	3.00	27.30
MEL - 0106	5-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	1600	2.91	10.50	21.00	1818.40
MEL - 0106	5-Jul-24	5511	Rhizosolenia eriense H.L. Smith	337648	28.63	12.00	3.00	84.80
MEL - 0106	5-Jul-24	5518	Synedra acus Kutzing	16200	1.87	110.00	2.00	115.20
MEL - 0106	5-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	5800	12.03	220.00	6.00	2073.50
MEL - 0106	5-Jul-24	5524	Asterionella formosa Hassall	41200	4.31	100.00	2.00	104.70
MEL - 0106	5-Jul-24	5551	Cyclotella michiganiana Skvortzow	50288	1.23	2.50	5.00	24.50
MEL - 0106	5-Jul-24	5908	Diatoma tenuis Agardh	21000	4.31	49.00	4.00	205.30
MEL - 0106	5-Jul-24	5916	Fragilaria capucina Grunow	2200	0.48	52.00	4.00	217.80
MEL - 0106	5-Jul-24	6554	Rhodomonas minuta Skuja	359200	45.15	10.00	6.00	125.70
MEL - 0106	5-Jul-24	6558	Cryptomonas erosa Ehrenberg	19200	35.21	26.80	14.00	1833.60
MEL - 0106	5-Jul-24	6565	Cryptomonas rostratiformis Skuja	2000	6.61	37.00	16.00	3306.40
MEL - 0106	5-Jul-24	6568	Katablepharis ovalis Skuja	93392	3.76	7.60	4.00	40.30
MEL - 0106	5-Jul-24	7631	Gymnodinium helveticum Penard	400	9.42	50.00	30.00	23561.90
MEL - 0106	5-Jul-24	7632	Gymnodinium sp.	2000	11.15	22.00	22.00	5575.30
MEL - 0106	5-Jul-24	7635	Peridinium willei Huitfeldt-Kaas	200	5.75	38.00	38.00	28730.90
MEL - 0106	5-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	3600	13.55	19.30	19.30	3764.20
MEL - 0106	5-Jul-24	7641	Peridinium aciculiferum Lemmermann	3000	27.14	30.00	24.00	9047.80
MEL - 0107	5-Jul-24	1054	Planktolyngbya limnetica	10200	1.90	165.00	1.20	186.60
MEL - 0107	5-Jul-24	2121	Oocystis lacustris Chodat	28736	0.81	6.00	3.00	28.30
MEL - 0107	5-Jul-24	2137	Dictyosphaerium simplex Sukja	57472	0.24	2.00	2.00	4.20
MEL - 0107	5-Jul-24	2215	Tetraedron caudatum (Corda) Hansgrig	21552	0.10	3.00	3.00	4.70
MEL - 0107	5-Jul-24	2235	Ankistrodesmus spiralis Lemmermann	35920	3.27	58.00	2.00	91.10
MEL - 0107	5-Jul-24	4351	Small chrysophyceae	114944	0.83	2.40	2.40	7.20
MEL - 0107	5-Jul-24	4352	Large chrysophyceae	64656	11.61	7.00	7.00	179.60
MEL - 0107	5-Jul-24	4355	Chrysochromulina parva Lackey	258624	16.91	5.00	5.00	65.40
MEL - 0107	5-Jul-24	4357	Chrysococcus sp.	114944	7.52	5.00	5.00	65.40
MEL - 0107	5-Jul-24	4362	Kephyrion sp.	107760	1.38	2.90	2.90	12.80
MEL - 0107	5-Jul-24	4375	Synura sphagnicola Korschikow	7184	3.76	10.00	10.00	523.60
MEL - 0107	5-Jul-24	4378	Dinobryon borgei Lemmermann	7184	0.31	9.10	3.00	42.90
MEL - 0107	5-Jul-24	4383	Dinobryon bavaricum Imhof	1000	0.95	0.00	0.00	950.00
MEL - 0107	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	150864	34.13	12.00	6.00	226.20
MEL - 0107	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	3000	2.85	0.00	0.00	950.00
MEL - 0107	5-Jul-24	4390	Dinobryon sociale Ehrenberg	186784	42.25	12.00	6.00	226.20
MEL - 0107	5-Jul-24	4390	Dinobryon sociale Ehrenberg	6800	6.46	0.00	0.00	950.00
MEL - 0107	5-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	172416	4.71	5.80	3.00	27.30
MEL - 0107	5-Jul-24	4401	Uroglena volvox Ehrenberg	2514400	284.38	6.00	6.00	113.10
MEL - 0107	5-Jul-24	4413	Chrysochromulina laurentiana Kling	114944	56.64	9.80	9.80	492.80
MEL - 0107	5-Jul-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	21552	0.59	5.80	3.00	27.30
MEL - 0107	5-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	800	1.45	10.50	21.00	1818.40
MEL - 0107	5-Jul-24	5511	Rhizosolenia eriense H.L. Smith	488512	41.43	12.00	3.00	84.80
MEL - 0107	5-Jul-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	1600	1.24	82.00	6.00	772.80
MEL - 0107	5-Jul-24	5514	Tabellaria flocculosa (Roth) Kutzing	4000	5.34	26.00	14.00	1334.10
MEL - 0107	5-Jul-24	5518	Synedra acus Kutzing	13400	1.54	110.00	2.00	115.20
MEL - 0107	5-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	7600	15.76	220.00	6.00	2073.50
MEL - 0107	5-Jul-24	5524	Asterionella formosa Hassall	31800	3.33	100.00	2.00	104.70
MEL - 0107	5-Jul-24	5551	Cyclotella michiganiana Skvortzow	35920	0.88	2.50	5.00	24.50
MEL - 0107	5-Jul-24	5908	Diatoma tenuis Agardh	10600	2.18	49.00	4.00	205.30
MEL - 0107	5-Jul-24	5916	Fragilaria capucina Grunow	200	0.04	52.00	4.00	217.80
MEL - 0107	5-Jul-24	6554	Rhodomonas minuta Skuja	165232	20.77	10.00	6.00	125.70
MEL - 0107	5-Jul-24	6558	Cryptomonas erosa Ehrenberg	3200	5.87	26.80	14.00	1833.60
MEL - 0107	5-Jul-24	6565	Cryptomonas rostratiformis Skuja	800	2.65	37.00	16.00	3306.40
MEL - 0107	5-Jul-24	6568	Katablepharis ovalis Skuja	7184	0.29	7.60	4.00	40.30
MEL - 0107	5-Jul-24	7632	Gymnodinium sp.	2200	12.27	22.00	22.00	5575.30
MEL - 0107	5-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	1600	6.02	19.30	19.30	3764.20
MEL - 0107	5-Jul-24	7641	Peridinium aciculiferum Lemmermann	2800	25.33	30.00	24.00	9047.80
MEL - 0108	5-Jul-24	1054	Planktolyngbya limnetica	8400	1.57	165.00	1.20	186.60
MEL - 0108	5-Jul-24	2137	Dictyosphaerium simplex Sukja	237072	1.00	2.00	2.00	4.20
MEL - 0108	5-Jul-24	2215	Tetraedron caudatum (Corda) Hansgrig	35920	0.17	3.00	3.00	4.70
MEL - 0108	5-Jul-24	2235	Ankistrodesmus spiralis Lemmermann	21552	1.29	38.00	2.00	59.70
MEL - 0108	5-Jul-24	4351	Small chrysophyceae	201152	1.45	2.40	2.40	7.20
MEL - 0108	5-Jul-24	4352	Large chrysophyceae	50288	9.03	7.00	7.00	179.60
MEL - 0108	5-Jul-24	4355	Chrysochromulina parva Lackey	402304	26.31	5.00	5.00	65.40
MEL - 0108	5-Jul-24	4357	Chrysococcus sp.	114944	7.52	5.00	5.00	65.40
MEL - 0108	5-Jul-24	4362	Kephyrion sp.	50288	0.64	2.90	2.90	12.80
MEL - 0108	5-Jul-24	4363	Spiniferomonas serrata	14368	1.88	6.30	6.30	130.90
MEL - 0108	5-Jul-24	4383	Dinobryon bavaricum Imhof	7184	1.63	12.00	6.00	226.20
MEL - 0108	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	100576	22.75	12.00	6.00	226.20
MEL - 0108	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	2400	2.28	0.00	0.00	950.00
MEL - 0108	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	1000	0.95	0.00	0.00	950.00
MEL - 0108	5-Jul-24	4390	Dinobryon sociale Ehrenberg	86208	19.50	12.00	6.00	226.20
MEL - 0108	5-Jul-24	4390	Dinobryon sociale Ehrenberg	7800	7.41	0.00	0.00	950.00
MEL - 0108	5-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	107760	2.94	5.80	3.00	27.30
MEL - 0108	5-Jul-24	4401	Uroglena volvox Ehrenberg	2780208	314.44	6.00	6.00	113.10
MEL - 0108	5-Jul-24	4413	Chrysochromulina laurentiana Kling	93392	46.02	9.80	9.80	492.80
MEL - 0108	5-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	600	1.09	10.50	21.00	1818.40
MEL - 0108	5-Jul-24	5511	Rhizosolenia eriense H.L. Smith	431040	36.55	12.00	3.00	84.80
MEL - 0108	5-Jul-24	5518	Synedra acus Kutzing	12200	1.41	110.00	2.00	115.20
MEL - 0108	5-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	5800	12.03	220.00	6.00	2073.50
MEL - 0108	5-Jul-24	5524	Asterionella formosa Hassall	43400	4.54	100.00	2.00	104.70
MEL - 0108	5-Jul-24	5551	Cyclotella michiganiana Skvortzow	122128	2.99	2.50	5.00	24.50
MEL - 0108	5-Jul-24	5908	Diatoma tenuis Agardh	14800	3.04	49.00	4.00	205.30
MEL - 0108	5-Jul-24	5916	Fragilaria capucina Grunow	400	0.09	52.00	4.00	217.80
MEL - 0108	5-Jul-24	6554	Rhodomonas minuta Skuja	280176	35.22	10.00	6.00	125.70
MEL - 0108	5-Jul-24	6558	Cryptomonas erosa Ehrenberg	13800	25.30	26.80	14.00	1833.60
MEL - 0108	5-Jul-24	6565	Cryptomonas rostratiformis Skuja	600	1.98	37.00	16.00	3306.40
MEL - 0108	5-Jul-24	6568	Katablepharis ovalis Skuja	57472	2.32	7.60	4.00	40.30
MEL - 0108	5-Jul-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0108	5-Jul-24	7632	Gymnodinium sp.	600	3.35	22.00	22.00	5575.30
MEL - 0108	5-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	600	2.26	19.30	19.30	3764.20

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0108	5-Jul-24	7641	Peridinium aciculiferum Lemmermann	1400	12.67	30.00	24.00	9047.80
MEL - 0109	5-Jul-24	1054	Planktolyngbya limnetica	12400	2.31	165.00	1.20	186.60
MEL - 0109	5-Jul-24	2137	Dictyosphaerium simplex Sukja	186784	0.78	2.00	2.00	4.20
MEL - 0109	5-Jul-24	2193	Staurodesmus paradoxum Meyen	200	0.57	26.00	24.00	2831.60
MEL - 0109	5-Jul-24	2215	Tetraedron caudatum (Corda) Hansgrig	21552	0.10	3.00	3.00	4.70
MEL - 0109	5-Jul-24	2235	Ankistrodesmus spiralis Lemmermann	64656	3.86	38.00	2.00	59.70
MEL - 0109	5-Jul-24	4351	Small chrysophyceae	294544	2.12	2.40	2.40	7.20
MEL - 0109	5-Jul-24	4352	Large chrysophyceae	79024	14.19	7.00	7.00	179.60
MEL - 0109	5-Jul-24	4355	Chrysochromulina parva Lackey	237072	15.50	5.00	5.00	65.40
MEL - 0109	5-Jul-24	4357	Chrysococcus sp.	215520	14.10	5.00	5.00	65.40
MEL - 0109	5-Jul-24	4362	Kephyrion sp.	86208	1.10	2.90	2.90	12.80
MEL - 0109	5-Jul-24	4383	Dinobryon bavaricum Imhof	2200	2.09	0.00	0.00	950.00
MEL - 0109	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	86208	19.50	12.00	6.00	226.20
MEL - 0109	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	2800	2.66	0.00	0.00	950.00
MEL - 0109	5-Jul-24	4390	Dinobryon sociale Ehrenberg	71840	16.25	12.00	6.00	226.20
MEL - 0109	5-Jul-24	4390	Dinobryon sociale Ehrenberg	4600	4.37	0.00	0.00	950.00
MEL - 0109	5-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	107760	2.94	5.80	3.00	27.30
MEL - 0109	5-Jul-24	4401	Uroglena volvox Ehrenberg	1558928	176.31	6.00	6.00	113.10
MEL - 0109	5-Jul-24	4413	Chrysochromulina laurentiana Kling	122128	60.18	9.80	9.80	492.80
MEL - 0109	5-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	1800	3.27	10.50	21.00	1818.40
MEL - 0109	5-Jul-24	5511	Rhizosolenia eriense H.L. Smith	510064	43.25	12.00	3.00	84.80
MEL - 0109	5-Jul-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	800	0.60	80.00	6.00	754.00
MEL - 0109	5-Jul-24	5514	Tabellaria flocculosa (Roth) Kutzing	800	1.07	26.00	14.00	1334.10
MEL - 0109	5-Jul-24	5518	Synedra acus Kutzing	20200	2.33	110.00	2.00	115.20
MEL - 0109	5-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	8800	18.25	220.00	6.00	2073.50
MEL - 0109	5-Jul-24	5524	Asterionella formosa Hassall	24600	2.58	100.00	2.00	104.70
MEL - 0109	5-Jul-24	5551	Cyclotella michiganiana Skvortzow	71840	1.76	2.50	5.00	24.50
MEL - 0109	5-Jul-24	5776	Rhopalodia gibba (Ehrenberg) O. Muller	200	7.08	200.00	26.00	35395.30
MEL - 0109	5-Jul-24	5908	Diatoma tenuis Agardh	16000	3.28	49.00	4.00	205.30
MEL - 0109	5-Jul-24	5916	Fragilaria capucina Grunow	1200	0.26	52.00	4.00	217.80
MEL - 0109	5-Jul-24	6554	Rhodomonas minuta Skuja	258624	32.51	10.00	6.00	125.70
MEL - 0109	5-Jul-24	6558	Cryptomonas erosa Ehrenberg	12600	23.10	26.80	14.00	1833.60
MEL - 0109	5-Jul-24	6565	Cryptomonas rostratiformis Skuja	800	2.65	37.00	16.00	3306.40
MEL - 0109	5-Jul-24	6568	Katablepharis ovalis Skuja	71840	2.90	7.60	4.00	40.30
MEL - 0109	5-Jul-24	7631	Gymnodinium helveticum Penard	600	14.14	50.00	30.00	23561.90
MEL - 0109	5-Jul-24	7632	Gymnodinium sp.	36200	201.83	22.00	22.00	5575.30
MEL - 0109	5-Jul-24	7632	Gymnodinium sp.	600	17.24	38.00	38.00	28730.90
MEL - 0109	5-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	2000	7.53	19.30	19.30	3764.20
MEL - 0109	5-Jul-24	7641	Peridinium aciculiferum Lemmermann	1000	9.05	30.00	24.00	9047.80
MEL - 0110	5-Jul-24	1054	Planktolyngbya limnetica	9200	1.87	180.00	1.20	203.60
MEL - 0110	5-Jul-24	2137	Dictyosphaerium simplex Sukja	57472	0.24	2.00	2.00	4.20
MEL - 0110	5-Jul-24	2167	Elakatothrix gelatinosa Willen	28736	0.45	10.00	2.00	15.70
MEL - 0110	5-Jul-24	2235	Ankistrodesmus spiralis Lemmermann	35920	2.14	38.00	2.00	59.70
MEL - 0110	5-Jul-24	4351	Small chrysophyceae	258624	1.86	2.40	2.40	7.20
MEL - 0110	5-Jul-24	4352	Large chrysophyceae	64656	11.61	7.00	7.00	179.60
MEL - 0110	5-Jul-24	4355	Chrysochromulina parva Lackey	64656	4.23	5.00	5.00	65.40
MEL - 0110	5-Jul-24	4357	Chrysococcus sp.	258624	16.91	5.00	5.00	65.40
MEL - 0110	5-Jul-24	4362	Kephyrion sp.	186784	2.39	2.90	2.90	12.80
MEL - 0110	5-Jul-24	4363	Spiniferomonas serrata	14368	1.71	6.10	6.10	118.80
MEL - 0110	5-Jul-24	4378	Dinobryon borgei Lemmermann	7184	0.30	9.00	3.00	42.40
MEL - 0110	5-Jul-24	4383	Dinobryon bavaricum Imhof	600	0.57	0.00	0.00	950.00
MEL - 0110	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	64656	14.63	12.00	6.00	226.20
MEL - 0110	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	2400	2.28	0.00	0.00	950.00
MEL - 0110	5-Jul-24	4390	Dinobryon sociale Ehrenberg	64656	14.63	12.00	6.00	226.20
MEL - 0110	5-Jul-24	4390	Dinobryon sociale Ehrenberg	3400	3.23	0.00	0.00	950.00
MEL - 0110	5-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	57472	1.57	5.80	3.00	27.30
MEL - 0110	5-Jul-24	4401	Uroglena volvox Ehrenberg	2500032	282.75	6.00	6.00	113.10
MEL - 0110	5-Jul-24	4413	Chrysochromulina laurentiana Kling	186784	92.05	9.80	9.80	492.80
MEL - 0110	5-Jul-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	28736	0.78	5.80	3.00	27.30
MEL - 0110	5-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	600	1.43	11.50	23.00	2389.00
MEL - 0110	5-Jul-24	5509	Cyclotella ocellata Pant.	7184	0.90	4.30	8.60	124.90
MEL - 0110	5-Jul-24	5511	Rhizosolenia eriense H.L. Smith	366384	31.07	12.00	3.00	84.80
MEL - 0110	5-Jul-24	5514	Tabellaria flocculosa (Roth) Kutzing	800	1.07	26.00	14.00	1334.10
MEL - 0110	5-Jul-24	5518	Synedra acus Kutzing	10200	1.18	110.00	2.00	115.20
MEL - 0110	5-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	9400	19.49	220.00	6.00	2073.50
MEL - 0110	5-Jul-24	5524	Asterionella formosa Hassall	37600	3.94	100.00	2.00	104.70
MEL - 0110	5-Jul-24	5551	Cyclotella michiganiana Skvortzow	71840	1.76	2.50	5.00	24.50
MEL - 0110	5-Jul-24	5908	Diatoma tenuis Agardh	13000	2.67	49.00	4.00	205.30
MEL - 0110	5-Jul-24	5916	Fragilaria capucina Grunow	1800	0.39	52.00	4.00	217.80
MEL - 0110	5-Jul-24	6554	Rhodomonas minuta Skuja	208336	26.19	10.00	6.00	125.70
MEL - 0110	5-Jul-24	6558	Cryptomonas erosa Ehrenberg	13800	25.30	26.80	14.00	1833.60
MEL - 0110	5-Jul-24	6565	Cryptomonas rostratiformis Skuja	1000	2.53	37.00	14.00	2531.40
MEL - 0110	5-Jul-24	6568	Katablepharis ovalis Skuja	50288	2.03	7.60	4.00	40.30
MEL - 0110	5-Jul-24	7632	Gymnodinium sp.	1000	5.58	22.00	22.00	5575.30
MEL - 0110	5-Jul-24	7635	Peridinium willei Huitfeldt-Kaas	400	11.49	38.00	38.00	28730.90
MEL - 0110	5-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	1400	5.27	19.30	19.30	3764.20
MEL - 0110	5-Jul-24	7641	Peridinium aciculiferum Lemmermann	800	7.24	30.00	24.00	9047.80
MEL - DUP2	5-Jul-24	1054	Planktolyngbya limnetica	6400	1.30	180.00	1.20	203.60
MEL - DUP2	5-Jul-24	2137	Dictyosphaerium simplex Sukja	107760	0.45	2.00	2.00	4.20
MEL - DUP2	5-Jul-24	2167	Elakatothrix gelatinosa Willen	7184	0.11	10.00	2.00	15.70
MEL - DUP2	5-Jul-24	2235	Ankistrodesmus spiralis Lemmermann	21552	1.29	38.00	2.00	59.70
MEL - DUP2	5-Jul-24	3301	Euglena acus Ehrenberg	200	1.88	125.00	12.00	9424.80
MEL - DUP2	5-Jul-24	4351	Small chrysophyceae	158048	1.14	2.40	2.40	7.20
MEL - DUP2	5-Jul-24	4352	Large chrysophyceae	122128	21.93	7.00	7.00	179.60
MEL - DUP2	5-Jul-24	4355	Chrysochromulina parva Lackey	114944	7.52	5.00	5.00	65.40
MEL - DUP2	5-Jul-24	4357	Chrysococcus sp.	272992	17.85	5.00	5.00	65.40
MEL - DUP2	5-Jul-24	4362	Kephyrion sp.	114944	1.47	2.90	2.90	12.80
MEL - DUP2	5-Jul-24	4368	Mallomonas crassisquama (Asmund) Fott	200	0.21	19.60	10.00	1026.30
MEL - DUP2	5-Jul-24	4383	Dinobryon bavaricum Imhof	2000	1.90	0.00	0.00	950.00
MEL - DUP2	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	28736	6.50	12.00	6.00	226.20
MEL - DUP2	5-Jul-24	4388	Dinobryon sertularia Ehrenberg	1400	1.33	0.00	0.00	950.00
MEL - DUP2	5-Jul-24	4390	Dinobryon sociale Ehrenberg	122128	27.63	12.00	6.00	226.20
MEL - DUP2	5-Jul-24	4390	Dinobryon sociale Ehrenberg	4200	3.99	0.00	0.00	950.00
MEL - DUP2	5-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	35920	0.98	5.80	3.00	27.30
MEL - DUP2	5-Jul-24	4401	Uroglena volvox Ehrenberg	3160960	357.50	6.00	6.00	113.10
MEL - DUP2	5-Jul-24	4413	Chrysochromulina laurentiana Kling	229888	113.29	9.80	9.80	492.80
MEL - DUP2	5-Jul-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	21552	0.59	5.80	3.00	27.30

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - DUP2	5-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	1000	1.82	10.50	21.00	1818.40
MEL - DUP2	5-Jul-24	5511	Rhizosolenia eriense H.L. Smith	265808	22.54	12.00	3.00	84.80
MEL - DUP2	5-Jul-24	5518	Synedra acus Kutzing	11400	1.31	110.00	2.00	115.20
MEL - DUP2	5-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	7800	16.17	220.00	6.00	2073.50
MEL - DUP2	5-Jul-24	5524	Asterionella formosa Hassall	35000	3.66	100.00	2.00	104.70
MEL - DUP2	5-Jul-24	5551	Cyclotella michiganiana Skvortzow	122128	2.99	2.50	5.00	24.50
MEL - DUP2	5-Jul-24	5908	Diatoma tenuis Agardh	11600	2.38	49.00	4.00	205.30
MEL - DUP2	5-Jul-24	5916	Fragilaria capucina Grunow	2800	0.61	52.00	4.00	217.80
MEL - DUP2	5-Jul-24	6554	Rhodomonas minuta Skuja	208336	26.19	10.00	6.00	125.70
MEL - DUP2	5-Jul-24	6558	Cryptomonas erosa Ehrenberg	10600	17.26	23.80	14.00	1628.30
MEL - DUP2	5-Jul-24	6565	Cryptomonas rostratiformis Skuja	200	0.66	37.00	16.00	3306.40
MEL - DUP2	5-Jul-24	6568	Katablepharis ovalis Skuja	64656	2.61	7.60	4.00	40.30
MEL - DUP2	5-Jul-24	7631	Gymnodinium helveticum Penard	400	9.42	50.00	30.00	23561.90
MEL - DUP2	5-Jul-24	7632	Gymnodinium sp.	1200	6.69	22.00	22.00	5575.30
MEL - DUP2	5-Jul-24	7635	Peridinium willei Huitfeldt-Kaas	400	11.49	38.00	38.00	28730.90
MEL - DUP2	5-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	1600	6.02	19.30	19.30	3764.20
MEL - DUP2	5-Jul-24	7641	Peridinium aciculiferum Lemmermann	1600	14.48	30.00	24.00	9047.80
MEL - 0202	13-Jul-24	1054	Planktolyngbya limnetica	7800	1.85	210.00	1.20	237.50
MEL - 0202	13-Jul-24	2121	Oocystis lacustris Chodat	7184	0.19	5.50	3.00	25.90
MEL - 0202	13-Jul-24	2137	Dictyosphaerium simplex Sukja	86208	0.36	2.00	2.00	4.20
MEL - 0202	13-Jul-24	2178	Cosmarium sp.	400	0.56	20.00	20.00	1396.30
MEL - 0202	13-Jul-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - 0202	13-Jul-24	4351	Small chrysophyceae	308912	1.98	2.30	2.30	6.40
MEL - 0202	13-Jul-24	4352	Large chrysophyceae	64656	11.61	7.00	7.00	179.60
MEL - 0202	13-Jul-24	4355	Chrysochromulina parva Lackey	21552	1.41	5.00	5.00	65.40
MEL - 0202	13-Jul-24	4357	Chrysococcus sp.	704032	46.04	5.00	5.00	65.40
MEL - 0202	13-Jul-24	4362	Kephyrion sp.	43104	0.50	2.80	2.80	11.50
MEL - 0202	13-Jul-24	4378	Dinobryon borgei Lemmermann	7184	0.29	8.60	3.00	40.50
MEL - 0202	13-Jul-24	4383	Dinobryon bavaricum Imhof	43104	9.75	12.00	6.00	226.20
MEL - 0202	13-Jul-24	4383	Dinobryon bavaricum Imhof	2400	3.00	0.00	0.00	1250.00
MEL - 0202	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	28736	6.50	12.00	6.00	226.20
MEL - 0202	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	200	0.19	0.00	0.00	950.00
MEL - 0202	13-Jul-24	4390	Dinobryon sociale Ehrenberg	107760	24.38	12.00	6.00	226.20
MEL - 0202	13-Jul-24	4390	Dinobryon sociale Ehrenberg	1800	2.25	0.00	0.00	1250.00
MEL - 0202	13-Jul-24	4394	Epiphyxis sp.	136496	10.40	9.10	4.00	76.20
MEL - 0202	13-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	21552	0.59	5.80	3.00	27.30
MEL - 0202	13-Jul-24	4401	Uroglena volvox Ehrenberg	122128	13.81	6.00	6.00	113.10
MEL - 0202	13-Jul-24	4413	Chrysochromulina laurentiana Kling	43104	17.01	9.10	9.10	394.60
MEL - 0202	13-Jul-24	4414	Stichogloea spp.	64656	3.25	6.00	4.00	50.30
MEL - 0202	13-Jul-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	35920	0.93	5.50	3.00	25.90
MEL - 0202	13-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	1000	1.57	10.00	20.00	1570.80
MEL - 0202	13-Jul-24	5511	Rhizosolenia eriense H.L. Smith	574720	48.74	12.00	3.00	84.80
MEL - 0202	13-Jul-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	400	0.31	81.00	6.00	763.40
MEL - 0202	13-Jul-24	5515	Fragilaria crotonensis Kitton	800	0.24	71.00	4.00	297.40
MEL - 0202	13-Jul-24	5518	Synedra acus Kutzing	10400	1.09	100.00	2.00	104.70
MEL - 0202	13-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	2000	4.15	220.00	6.00	2073.50
MEL - 0202	13-Jul-24	5524	Asterionella formosa Hassall	20200	2.11	100.00	2.00	104.70
MEL - 0202	13-Jul-24	5551	Cyclotella michiganiana Skvortzow	21552	0.47	2.40	4.80	21.70
MEL - 0202	13-Jul-24	5908	Diatoma tenuis Agardh	1600	0.31	46.00	4.00	192.70
MEL - 0202	13-Jul-24	6554	Rhodomonas minuta Skuja	71840	9.03	10.00	6.00	125.70
MEL - 0202	13-Jul-24	6558	Cryptomonas erosa Ehrenberg	1400	2.57	26.80	14.00	1833.60
MEL - 0202	13-Jul-24	6559	Cryptomonas ovata Ehrenberg	200	1.12	40.00	20.00	5585.10
MEL - 0202	13-Jul-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0202	13-Jul-24	7632	Gymnodinium sp.	800	4.46	22.00	22.00	5575.30
MEL - 0202	13-Jul-24	7637	Peridinium limbatum (Stokes) Lemmermann	200	28.76	65.00	65.00	143793.30
MEL - 0202	13-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	800	3.15	19.60	19.60	3942.50
MEL - 0203	13-Jul-24	1054	Planktolyngbya limnetica	6400	1.40	193.00	1.20	218.30
MEL - 0203	13-Jul-24	1073	Snowella sp	200	0.10	0.00	0.00	500.00
MEL - 0203	13-Jul-24	2169	Planctonema lauterbornii Schmidle	7184	2.54	18.00	5.00	353.40
MEL - 0203	13-Jul-24	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.03	3.00	3.00	4.70
MEL - 0203	13-Jul-24	2235	Ankistrodesmus spiralis Lemmermann	7184	0.45	40.00	2.00	62.80
MEL - 0203	13-Jul-24	4351	Small chrysophyceae	294544	1.89	2.30	2.30	6.40
MEL - 0203	13-Jul-24	4352	Large chrysophyceae	50288	9.03	7.00	7.00	179.60
MEL - 0203	13-Jul-24	4357	Chrysococcus sp.	818976	53.56	5.00	5.00	65.40
MEL - 0203	13-Jul-24	4362	Kephyrion sp.	57472	0.66	2.80	2.80	11.50
MEL - 0203	13-Jul-24	4378	Dinobryon borgei Lemmermann	35920	1.45	8.60	3.00	40.50
MEL - 0203	13-Jul-24	4383	Dinobryon bavaricum Imhof	7184	1.63	12.00	6.00	226.20
MEL - 0203	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	50288	11.38	12.00	6.00	226.20
MEL - 0203	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	800	0.76	0.00	0.00	950.00
MEL - 0203	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	1400	1.75	0.00	0.00	1250.00
MEL - 0203	13-Jul-24	4390	Dinobryon sociale Ehrenberg	136496	30.88	12.00	6.00	226.20
MEL - 0203	13-Jul-24	4390	Dinobryon sociale Ehrenberg	1800	2.25	0.00	0.00	1250.00
MEL - 0203	13-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.20	5.80	3.00	27.30
MEL - 0203	13-Jul-24	4401	Uroglena volvox Ehrenberg	416672	47.13	6.00	6.00	113.10
MEL - 0203	13-Jul-24	4413	Chrysochromulina laurentiana Kling	7184	2.83	9.10	9.10	394.60
MEL - 0203	13-Jul-24	4414	Stichogloea spp.	35920	1.81	6.00	4.00	50.30
MEL - 0203	13-Jul-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	35920	0.93	5.50	3.00	25.90
MEL - 0203	13-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	1400	3.34	11.50	23.00	2389.00
MEL - 0203	13-Jul-24	5511	Rhizosolenia eriense H.L. Smith	344832	29.24	12.00	3.00	84.80
MEL - 0203	13-Jul-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	1600	1.22	81.00	6.00	763.40
MEL - 0203	13-Jul-24	5518	Synedra acus Kutzing	5200	0.54	100.00	2.00	104.70
MEL - 0203	13-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	600	1.24	220.00	6.00	2073.50
MEL - 0203	13-Jul-24	5524	Asterionella formosa Hassall	22000	2.30	100.00	2.00	104.70
MEL - 0203	13-Jul-24	5551	Cyclotella michiganiana Skvortzow	21552	0.47	2.40	4.80	21.70
MEL - 0203	13-Jul-24	6554	Rhodomonas minuta Skuja	28736	3.61	10.00	6.00	125.70
MEL - 0203	13-Jul-24	6558	Cryptomonas erosa Ehrenberg	800	1.47	26.80	14.00	1833.60
MEL - 0203	13-Jul-24	7632	Gymnodinium sp.	2400	13.38	22.00	22.00	5575.30
MEL - 0203	13-Jul-24	7632	Gymnodinium sp.	400	9.77	36.00	36.00	24429.00
MEL - 0203	13-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	400	1.58	19.60	19.60	3942.50
MEL - 0205	13-Jul-24	1054	Planktolyngbya limnetica	6200	1.40	200.00	1.20	226.20
MEL - 0205	13-Jul-24	2112	Sphaerocystis schroeteri Chodat	28736	0.33	2.80	2.80	11.50
MEL - 0205	13-Jul-24	2121	Oocystis lacustris Chodat	21552	0.56	5.50	3.00	25.90
MEL - 0205	13-Jul-24	2235	Ankistrodesmus spiralis Lemmermann	7184	0.45	40.00	2.00	62.80
MEL - 0205	13-Jul-24	4351	Small chrysophyceae	359200	2.30	2.30	2.30	6.40
MEL - 0205	13-Jul-24	4352	Large chrysophyceae	64656	11.61	7.00	7.00	179.60
MEL - 0205	13-Jul-24	4355	Chrysochromulina parva Lackey	7184	0.47	5.00	5.00	65.40
MEL - 0205	13-Jul-24	4357	Chrysococcus sp.	675296	44.16	5.00	5.00	65.40

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0205	13-Jul-24	4362	Kephyrion sp.	143680	1.65	2.80	2.80	11.50
MEL - 0205	13-Jul-24	4383	Dinobryon bavaricum Imhof	1600	2.00	0.00	0.00	1250.00
MEL - 0205	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	35920	8.13	12.00	6.00	226.20
MEL - 0205	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	600	0.57	0.00	0.00	950.00
MEL - 0205	13-Jul-24	4390	Dinobryon sociale Ehrenberg	114944	26.00	12.00	6.00	226.20
MEL - 0205	13-Jul-24	4390	Dinobryon sociale Ehrenberg	1800	2.25	0.00	0.00	1250.00
MEL - 0205	13-Jul-24	4394	Epiphyxis sp.	7184	0.55	9.10	4.00	76.20
MEL - 0205	13-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	71840	1.96	5.80	3.00	27.30
MEL - 0205	13-Jul-24	4401	Uroglena volvox Ehrenberg	258624	29.25	6.00	6.00	113.10
MEL - 0205	13-Jul-24	4413	Chrysochromulina laurentiana Kling	7184	2.83	9.10	9.10	394.60
MEL - 0205	13-Jul-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	21552	0.56	5.50	3.00	25.90
MEL - 0205	13-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	600	1.43	11.50	23.00	2389.00
MEL - 0205	13-Jul-24	5509	Cyclotella ocellata Pant.	7184	0.90	4.30	8.60	124.90
MEL - 0205	13-Jul-24	5511	Rhizosolenia eriense H.L. Smith	438224	37.16	12.00	3.00	84.80
MEL - 0205	13-Jul-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	6400	4.89	81.00	6.00	763.40
MEL - 0205	13-Jul-24	5515	Fragilaria crotonensis Kitton	1800	0.54	71.00	4.00	297.40
MEL - 0205	13-Jul-24	5518	Synedra acus Kutzing	4200	0.44	100.00	2.00	104.70
MEL - 0205	13-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	1400	2.90	220.00	6.00	2073.50
MEL - 0205	13-Jul-24	5524	Asterionella formosa Hassall	18200	1.91	100.00	2.00	104.70
MEL - 0205	13-Jul-24	5551	Cyclotella michiganiana Skvortzow	35920	0.78	2.40	4.80	21.70
MEL - 0205	13-Jul-24	5908	Diatoma tenuis Agardh	2000	0.39	46.00	4.00	192.70
MEL - 0205	13-Jul-24	6554	Rhodomonas minuta Skuja	7184	0.90	10.00	6.00	125.70
MEL - 0205	13-Jul-24	6558	Cryptomonas erosa Ehrenberg	2000	3.68	26.90	14.00	1840.40
MEL - 0205	13-Jul-24	6565	Cryptomonas rostratiformis Skuja	400	1.29	36.00	16.00	3217.00
MEL - 0205	13-Jul-24	7631	Gymnodinium helveticum Penard	400	9.42	50.00	30.00	23561.90
MEL - 0205	13-Jul-24	7632	Gymnodinium sp.	1200	6.69	22.00	22.00	5575.30
MEL - 0205	13-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	200	0.79	19.60	19.60	3942.50
MEL - 0205	13-Jul-24	7641	Peridinium aciculiferum Lemmermann	200	1.81	30.00	24.00	9047.80
MEL - 0206	13-Jul-24	1054	Planktolyngbya limnetica	8400	1.81	190.00	1.20	214.90
MEL - 0206	13-Jul-24	2112	Sphaerocystis schroeteri Chodat	7184	0.08	2.80	2.80	11.50
MEL - 0206	13-Jul-24	2167	Elakatothrix gelatinosa Willen	28736	0.54	12.00	2.00	18.80
MEL - 0206	13-Jul-24	2169	Planctonema lauterbornii Schmidle	35920	12.69	18.00	5.00	353.40
MEL - 0206	13-Jul-24	2187	Staurodesmus extensus (Andersson) Teiling	200	0.08	13.60	12.00	387.40
MEL - 0206	13-Jul-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - 0206	13-Jul-24	2206	Botryococcus braunii Kutzing	400	0.57	14.00	14.00	1436.80
MEL - 0206	13-Jul-24	2215	Tetraedron caudatum (Corda) Hansgrig	21552	0.10	3.00	3.00	4.70
MEL - 0206	13-Jul-24	4351	Small chrysophyceae	244256	1.56	2.30	2.30	6.40
MEL - 0206	13-Jul-24	4352	Large chrysophyceae	136496	24.51	7.00	7.00	179.60
MEL - 0206	13-Jul-24	4355	Chrysochromulina parva Lackey	86208	5.64	5.00	5.00	65.40
MEL - 0206	13-Jul-24	4357	Chrysococcus sp.	747136	48.86	5.00	5.00	65.40
MEL - 0206	13-Jul-24	4358	Chrysostephanosphaera globulifera Scherffel	14368	4.00	8.10	8.10	278.30
MEL - 0206	13-Jul-24	4362	Kephyrion sp.	35920	0.41	2.80	2.80	11.50
MEL - 0206	13-Jul-24	4375	Synura sphagnicola Korschikow	57472	30.09	10.00	10.00	523.60
MEL - 0206	13-Jul-24	4378	Dinobryon borgei Lemmermann	35920	1.45	8.60	3.00	40.50
MEL - 0206	13-Jul-24	4383	Dinobryon bavaricum Imhof	43104	9.75	12.00	6.00	226.20
MEL - 0206	13-Jul-24	4383	Dinobryon bavaricum Imhof	2600	3.25	0.00	0.00	1250.00
MEL - 0206	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	71840	16.25	12.00	6.00	226.20
MEL - 0206	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	600	0.57	0.00	0.00	950.00
MEL - 0206	13-Jul-24	4390	Dinobryon sociale Ehrenberg	150864	34.13	12.00	6.00	226.20
MEL - 0206	13-Jul-24	4390	Dinobryon sociale Ehrenberg	1800	2.25	0.00	0.00	1250.00
MEL - 0206	13-Jul-24	4394	Epiphyxis sp.	7184	0.55	9.10	4.00	76.20
MEL - 0206	13-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	28736	0.78	5.80	3.00	27.30
MEL - 0206	13-Jul-24	4401	Uroglena volvox Ehrenberg	510064	57.69	6.00	6.00	113.10
MEL - 0206	13-Jul-24	4413	Chrysochromulina laurentiana Kling	28736	11.34	9.10	9.10	394.60
MEL - 0206	13-Jul-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	21552	0.57	5.60	3.00	26.40
MEL - 0206	13-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	200	0.48	11.50	23.00	2389.00
MEL - 0206	13-Jul-24	5511	Rhizosolenia eriense H.L. Smith	316096	26.80	12.00	3.00	84.80
MEL - 0206	13-Jul-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	1800	1.39	82.00	6.00	772.80
MEL - 0206	13-Jul-24	5514	Tabellaria flocculosa (Roth) Kutzing	800	1.07	26.00	14.00	1334.10
MEL - 0206	13-Jul-24	5515	Fragilaria crotonensis Kitton	2000	0.59	71.00	4.00	297.40
MEL - 0206	13-Jul-24	5518	Synedra acus Kutzing	7200	0.75	100.00	2.00	104.70
MEL - 0206	13-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	1600	3.32	220.00	6.00	2073.50
MEL - 0206	13-Jul-24	5524	Asterionella formosa Hassall	26400	2.76	100.00	2.00	104.70
MEL - 0206	13-Jul-24	5551	Cyclotella michiganiana Skvortzow	21552	0.47	2.40	4.80	21.70
MEL - 0206	13-Jul-24	5908	Diatoma tenuis Agardh	5400	1.04	46.00	4.00	192.70
MEL - 0206	13-Jul-24	6554	Rhodomonas minuta Skuja	43104	5.42	10.00	6.00	125.70
MEL - 0206	13-Jul-24	6558	Cryptomonas erosa Ehrenberg	1200	2.21	26.90	14.00	1840.40
MEL - 0206	13-Jul-24	6565	Cryptomonas rostratiformis Skuja	400	0.99	36.00	14.00	2463.00
MEL - 0206	13-Jul-24	7631	Gymnodinium helveticum Penard	600	14.14	50.00	30.00	23561.90
MEL - 0206	13-Jul-24	7632	Gymnodinium sp.	400	2.55	23.00	23.00	6370.60
MEL - 0206	13-Jul-24	7637	Peridinium limbatum (Stokes) Lemmermann	200	28.76	65.00	65.00	143793.30
MEL - 0206	13-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	1400	5.52	19.60	19.60	3942.50
MEL - 0208	13-Jul-24	1054	Planktolyngbya limnetica	8200	1.72	185.00	1.20	209.20
MEL - 0208	13-Jul-24	2167	Elakatothrix gelatinosa Willen	7184	0.14	12.00	2.00	18.80
MEL - 0208	13-Jul-24	2235	Ankistrodesmus spiralis Lemmermann	28736	1.85	41.00	2.00	64.40
MEL - 0208	13-Jul-24	4351	Small chrysophyceae	272992	1.75	2.30	2.30	6.40
MEL - 0208	13-Jul-24	4352	Large chrysophyceae	79024	14.19	7.00	7.00	179.60
MEL - 0208	13-Jul-24	4355	Chrysochromulina parva Lackey	57472	3.76	5.00	5.00	65.40
MEL - 0208	13-Jul-24	4357	Chrysococcus sp.	488512	31.95	5.00	5.00	65.40
MEL - 0208	13-Jul-24	4358	Chrysostephanosphaera globulifera Scherffel	35920	10.00	8.10	8.10	278.30
MEL - 0208	13-Jul-24	4362	Kephyrion sp.	100576	1.16	2.80	2.80	11.50
MEL - 0208	13-Jul-24	4368	Mallomonas crassisquama (Asmund) Fott	200	0.21	20.00	10.00	1047.20
MEL - 0208	13-Jul-24	4378	Dinobryon borgei Lemmermann	7184	0.29	8.60	3.00	40.50
MEL - 0208	13-Jul-24	4383	Dinobryon bavaricum Imhof	1400	1.75	0.00	0.00	1250.00
MEL - 0208	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	7184	1.63	12.00	6.00	226.20
MEL - 0208	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	1000	0.95	0.00	0.00	950.00
MEL - 0208	13-Jul-24	4390	Dinobryon sociale Ehrenberg	57472	13.00	12.00	6.00	226.20
MEL - 0208	13-Jul-24	4390	Dinobryon sociale Ehrenberg	1800	2.25	0.00	0.00	1250.00
MEL - 0208	13-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	21552	0.59	5.80	3.00	27.30
MEL - 0208	13-Jul-24	4401	Uroglena volvox Ehrenberg	308912	34.94	6.00	6.00	113.10
MEL - 0208	13-Jul-24	4413	Chrysochromulina laurentiana Kling	86208	34.02	9.10	9.10	394.60
MEL - 0208	13-Jul-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	35920	0.93	5.50	3.00	25.90
MEL - 0208	13-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	1600	3.82	11.50	23.00	2389.00
MEL - 0208	13-Jul-24	5511	Rhizosolenia eriense H.L. Smith	136496	11.57	12.00	3.00	84.80
MEL - 0208	13-Jul-24	5515	Fragilaria crotonensis Kitton	2600	0.77	71.00	4.00	297.40
MEL - 0208	13-Jul-24	5518	Synedra acus Kutzing	7800	0.82	100.00	2.00	104.70
MEL - 0208	13-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	1600	3.32	220.00	6.00	2073.50

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0208	13-Jul-24	5524	Asterionella formosa Hassall	19400	2.03	100.00	2.00	104.70
MEL - 0208	13-Jul-24	5551	Cyclotella michiganiana Skvortzow	86208	1.87	2.40	4.80	21.70
MEL - 0208	13-Jul-24	5908	Diatoma tenuis Agardh	4200	0.81	46.00	4.00	192.70
MEL - 0208	13-Jul-24	6554	Rhodomonas minuta Skuja	35920	4.52	10.00	6.00	125.70
MEL - 0208	13-Jul-24	6558	Cryptomonas erosa Ehrenberg	800	1.47	26.90	14.00	1840.40
MEL - 0208	13-Jul-24	6565	Cryptomonas rostratiformis Skuja	200	0.47	34.00	14.00	2326.20
MEL - 0208	13-Jul-24	6568	Katablepharis ovalis Skuja	7184	0.29	7.60	4.00	40.30
MEL - 0208	13-Jul-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0208	13-Jul-24	7632	Gymnodinium sp.	1000	5.58	22.00	22.00	5575.30
MEL - 0208	13-Jul-24	7637	Peridinium limbatum (Stokes) Lemmermann	400	57.52	65.00	65.00	143793.30
MEL - 0208	13-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	2200	8.67	19.60	19.60	3942.50
MEL - 0208	13-Jul-24	7641	Peridinium aciculiferum Lemmermann	800	7.24	30.00	24.00	9047.80
MEL - 0301	13-Jul-24	1054	Planktolyngbya limnetica	200	0.05	225.00	1.20	254.50
MEL - 0301	13-Jul-24	2112	Sphaerocystis schroeteri Chodat	86208	0.99	2.80	2.80	11.50
MEL - 0301	13-Jul-24	2195	Staurodesmus bullardii G.M. Smith	200	1.29	34.00	32.00	6456.30
MEL - 0301	13-Jul-24	2206	Botryococcus braunii Kutzing	1200	1.72	14.00	14.00	1436.80
MEL - 0301	13-Jul-24	3301	Euglena acus Ehrenberg	200	2.77	135.00	14.00	13854.40
MEL - 0301	13-Jul-24	4351	Small chrysophyceae	258624	1.66	2.30	2.30	6.40
MEL - 0301	13-Jul-24	4352	Large chrysophyceae	21552	3.87	7.00	7.00	179.60
MEL - 0301	13-Jul-24	4357	Chrysococcus sp.	244256	15.97	5.00	5.00	65.40
MEL - 0301	13-Jul-24	4358	Chrysostephanosphaera globulifera Scherffel	7184	2.15	8.30	8.30	299.40
MEL - 0301	13-Jul-24	4362	Kephyrion sp.	100576	1.16	2.80	2.80	11.50
MEL - 0301	13-Jul-24	4363	Spiniferomonas serrata	7184	0.85	6.10	6.10	118.80
MEL - 0301	13-Jul-24	4368	Mallomonas crassisquama (Asmund) Fott	400	0.42	20.00	10.00	1047.20
MEL - 0301	13-Jul-24	4375	Synura sphagnicola Korschikow	400	6.28	0.00	0.00	15700.00
MEL - 0301	13-Jul-24	4378	Dinobryon borgei Lemmermann	35920	1.45	8.60	3.00	40.50
MEL - 0301	13-Jul-24	4383	Dinobryon bavaricum Imhof	7184	1.63	12.00	6.00	226.20
MEL - 0301	13-Jul-24	4383	Dinobryon bavaricum Imhof	1000	1.25	0.00	0.00	1250.00
MEL - 0301	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	86208	19.50	12.00	6.00	226.20
MEL - 0301	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	200	0.40	0.00	0.00	1991.00
MEL - 0301	13-Jul-24	4390	Dinobryon sociale Ehrenberg	35920	8.13	12.00	6.00	226.20
MEL - 0301	13-Jul-24	4390	Dinobryon sociale Ehrenberg	1400	1.75	0.00	0.00	1250.00
MEL - 0301	13-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	57472	1.57	5.80	3.00	27.30
MEL - 0301	13-Jul-24	4401	Uroglena volvox Ehrenberg	272992	30.88	6.00	6.00	113.10
MEL - 0301	13-Jul-24	4413	Chrysochromulina laurentiana Kling	57472	22.68	9.10	9.10	394.60
MEL - 0301	13-Jul-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	7184	0.19	5.50	3.00	25.90
MEL - 0301	13-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	1200	2.87	11.50	23.00	2389.00
MEL - 0301	13-Jul-24	5511	Rhizosolenia eriense H.L. Smith	35920	3.05	12.00	3.00	84.80
MEL - 0301	13-Jul-24	5515	Fragilaria crotonensis Kitton	800	0.24	71.00	4.00	297.40
MEL - 0301	13-Jul-24	5518	Synedra acus Kutzing	12600	1.32	100.00	2.00	104.70
MEL - 0301	13-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	200	0.41	220.00	6.00	2073.50
MEL - 0301	13-Jul-24	5524	Asterionella formosa Hassall	28600	2.99	100.00	2.00	104.70
MEL - 0301	13-Jul-24	5551	Cyclotella michiganiana Skvortzow	7184	0.16	2.40	4.80	21.70
MEL - 0301	13-Jul-24	5908	Diatoma tenuis Agardh	400	0.08	47.00	4.00	196.90
MEL - 0301	13-Jul-24	6554	Rhodomonas minuta Skuja	136496	17.16	10.00	6.00	125.70
MEL - 0301	13-Jul-24	6558	Cryptomonas erosa Ehrenberg	1600	2.94	26.90	14.00	1840.40
MEL - 0301	13-Jul-24	7631	Gymnodinium helveticum Penard	400	9.42	50.00	30.00	23561.90
MEL - 0301	13-Jul-24	7632	Gymnodinium sp.	800	4.46	22.00	22.00	5575.30
MEL - 0301	13-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	1400	5.27	19.30	19.30	3764.20
MEL - 0301	13-Jul-24	7641	Peridinium aciculiferum Lemmermann	1000	9.05	30.00	24.00	9047.80
MEL - 0302	13-Jul-24	1073	Snowella sp	200	0.10	0.00	0.00	500.00
MEL - 0302	13-Jul-24	2112	Sphaerocystis schroeteri Chodat	21552	0.25	2.80	2.80	11.50
MEL - 0302	13-Jul-24	2187	Staurodesmus extensus (Andersson) Teiling	200	0.05	12.00	10.00	251.30
MEL - 0302	13-Jul-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - 0302	13-Jul-24	4351	Small chrysophyceae	344832	2.21	2.30	2.30	6.40
MEL - 0302	13-Jul-24	4352	Large chrysophyceae	7184	1.29	7.00	7.00	179.60
MEL - 0302	13-Jul-24	4357	Chrysococcus sp.	265808	17.38	5.00	5.00	65.40
MEL - 0302	13-Jul-24	4362	Kephyrion sp.	57472	0.66	2.80	2.80	11.50
MEL - 0302	13-Jul-24	4368	Mallomonas crassisquama (Asmund) Fott	400	0.42	20.00	10.00	1047.20
MEL - 0302	13-Jul-24	4378	Dinobryon borgei Lemmermann	7184	0.20	5.80	3.00	27.30
MEL - 0302	13-Jul-24	4383	Dinobryon bavaricum Imhof	7184	1.63	12.00	6.00	226.20
MEL - 0302	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	79024	17.88	12.00	6.00	226.20
MEL - 0302	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	1000	1.25	0.00	0.00	1250.00
MEL - 0302	13-Jul-24	4390	Dinobryon sociale Ehrenberg	93392	21.13	12.00	6.00	226.20
MEL - 0302	13-Jul-24	4390	Dinobryon sociale Ehrenberg	600	0.75	0.00	0.00	1250.00
MEL - 0302	13-Jul-24	4394	Epiphyxis sp.	21552	1.64	9.10	4.00	76.20
MEL - 0302	13-Jul-24	4401	Uroglena volvox Ehrenberg	150864	17.06	6.00	6.00	113.10
MEL - 0302	13-Jul-24	4413	Chrysochromulina laurentiana Kling	50288	19.84	9.10	9.10	394.60
MEL - 0302	13-Jul-24	4414	Stichogloea spp.	7184	0.36	6.00	4.00	50.30
MEL - 0302	13-Jul-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	71840	1.86	5.50	3.00	25.90
MEL - 0302	13-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	1200	2.87	11.50	23.00	2389.00
MEL - 0302	13-Jul-24	5511	Rhizosolenia eriense H.L. Smith	114944	9.75	12.00	3.00	84.80
MEL - 0302	13-Jul-24	5518	Synedra acus Kutzing	10600	1.11	100.00	2.00	104.70
MEL - 0302	13-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	200	0.41	220.00	6.00	2073.50
MEL - 0302	13-Jul-24	5524	Asterionella formosa Hassall	27800	2.91	100.00	2.00	104.70
MEL - 0302	13-Jul-24	5551	Cyclotella michiganiana Skvortzow	35920	0.78	2.40	4.80	21.70
MEL - 0302	13-Jul-24	6554	Rhodomonas minuta Skuja	43104	5.42	10.00	6.00	125.70
MEL - 0302	13-Jul-24	6558	Cryptomonas erosa Ehrenberg	1000	1.84	26.90	14.00	1840.40
MEL - 0302	13-Jul-24	6568	Katablepharis ovalis Skuja	7184	0.32	8.00	4.00	44.70
MEL - 0302	13-Jul-24	7631	Gymnodinium helveticum Penard	600	14.14	50.00	30.00	23561.90
MEL - 0302	13-Jul-24	7632	Gymnodinium sp.	800	4.46	22.00	22.00	5575.30
MEL - 0302	13-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	200	0.75	19.30	19.30	3764.20
MEL - 0302	13-Jul-24	7641	Peridinium aciculiferum Lemmermann	600	5.43	30.00	24.00	9047.80
MEL - 0303	13-Jul-24	4357	Chrysococcus sp.	402304	26.31	5.00	5.00	65.40
MEL - 0303	13-Jul-24	2112	Sphaerocystis schroeteri Chodat	28736	0.33	2.80	2.80	11.50
MEL - 0303	13-Jul-24	7631	Gymnodinium helveticum Penard	800	18.85	50.00	30.00	23561.90
MEL - 0303	13-Jul-24	2169	Planctonema lauterbornii Schmidle	7184	2.54	18.00	5.00	353.40
MEL - 0303	13-Jul-24	2178	Cosmarium sp.	400	3.26	36.00	36.00	8143.00
MEL - 0303	13-Jul-24	2191	Staurodesmus cuspidatus (Brebisson and Ralfs) Teiling	200	0.39	23.00	21.00	1938.90
MEL - 0303	13-Jul-24	6554	Rhodomonas minuta Skuja	129312	16.25	10.00	6.00	125.70
MEL - 0303	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	64656	14.63	12.00	6.00	226.20
MEL - 0303	13-Jul-24	7641	Peridinium aciculiferum Lemmermann	1200	10.86	30.00	24.00	9047.80
MEL - 0303	13-Jul-24	7632	Gymnodinium sp.	400	8.98	35.00	35.00	22449.30
MEL - 0303	13-Jul-24	7632	Gymnodinium sp.	1400	8.92	23.00	23.00	6370.60
MEL - 0303	13-Jul-24	4352	Large chrysophyceae	35920	6.45	7.00	7.00	179.60
MEL - 0303	13-Jul-24	4378	Dinobryon borgei Lemmermann	21552	0.87	8.60	3.00	40.50
MEL - 0303	13-Jul-24	6558	Cryptomonas erosa Ehrenberg	3400	6.26	26.90	14.00	1840.40

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0303	13-Jul-24	5524	Asterionella formosa Hassall	48600	5.09	100.00	2.00	104.70
MEL - 0303	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	2000	3.98	0.00	0.00	1991.00
MEL - 0303	13-Jul-24	4390	Dinobryon sociale Ehrenberg	165232	37.38	12.00	6.00	226.20
MEL - 0303	13-Jul-24	4390	Dinobryon sociale Ehrenberg	200	0.40	0.00	0.00	1991.00
MEL - 0303	13-Jul-24	4394	Epiphyxis sp.	14368	1.09	9.10	4.00	76.20
MEL - 0303	13-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	1600	3.82	11.50	23.00	2389.00
MEL - 0303	13-Jul-24	4401	Uroglena volvox Ehrenberg	172416	19.50	6.00	6.00	113.10
MEL - 0303	13-Jul-24	4413	Chrysochromulina laurentiana Kling	114944	45.36	9.10	9.10	394.60
MEL - 0303	13-Jul-24	4414	Stichogloea spp.	21552	1.08	6.00	4.00	50.30
MEL - 0303	13-Jul-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	21552	0.56	5.50	3.00	25.90
MEL - 0303	13-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	800	3.15	19.60	19.60	3942.50
MEL - 0303	13-Jul-24	5511	Rhizosolenia eriense H.L. Smith	93392	7.92	12.00	3.00	84.80
MEL - 0303	13-Jul-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	2800	2.16	82.00	6.00	772.80
MEL - 0303	13-Jul-24	5515	Fragilaria crotonensis Kitton	1200	0.36	71.00	4.00	297.40
MEL - 0303	13-Jul-24	4362	Kephyrion sp.	215520	2.48	2.80	2.80	11.50
MEL - 0303	13-Jul-24	6565	Cryptomonas rostratiformis Skuja	400	2.23	40.00	20.00	5585.10
MEL - 0303	13-Jul-24	5518	Synedra acus Kutzing	19800	2.07	100.00	2.00	104.70
MEL - 0303	13-Jul-24	4351	Small chrysophyceae	316096	2.02	2.30	2.30	6.40
MEL - 0303	13-Jul-24	5551	Cyclotella michiganiana Skvortzow	86208	1.87	2.40	4.80	21.70
MEL - 0303	13-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	57472	1.57	5.80	3.00	27.30
MEL - 0303	13-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	600	1.24	220.00	6.00	2073.50
MEL - 0303	13-Jul-24	4383	Dinobryon bavaricum Imhof	400	0.80	0.00	0.00	1991.00
MEL - 0303	13-Jul-24	2206	Botryococcus braunii Kutzing	200	0.29	14.00	14.00	1436.80
MEL - 0303	13-Jul-24	4368	Mallomonas crassisquama (Asmund) Fott	200	0.21	20.00	10.00	1047.20
MEL - 0303	13-Jul-24	7637	Peridinium limbatum (Stokes) Lemmermann	200	28.76	65.00	65.00	143793.30
MEL - 0303	13-Jul-24	2137	Dictyosphaerium simplex Sukja	35920	0.15	2.00	2.00	4.20
MEL - 0303	13-Jul-24	1054	Planktolyngbya limnetica	400	0.09	200.00	1.20	226.20
MEL - 0303R	13-Jul-24	5524	Asterionella formosa Hassall	45800	4.80	100.00	2.00	104.70
MEL - 0303R	13-Jul-24	2112	Sphaerocystis schroeteri Chodat	14368	0.17	2.80	2.80	11.50
MEL - 0303R	13-Jul-24	2206	Botryococcus braunii Kutzing	400	0.57	14.00	14.00	1436.80
MEL - 0303R	13-Jul-24	2167	Elakatothrix gelatinosa Willen	28736	0.63	14.00	2.00	22.00
MEL - 0303R	13-Jul-24	4357	Chrysococcus sp.	445408	29.13	5.00	5.00	65.40
MEL - 0303R	13-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	64656	1.77	5.80	3.00	27.30
MEL - 0303R	13-Jul-24	6558	Cryptomonas erosa Ehrenberg	4200	7.73	26.90	14.00	1840.40
MEL - 0303R	13-Jul-24	5551	Cyclotella michiganiana Skvortzow	64656	1.40	2.40	4.80	21.70
MEL - 0303R	13-Jul-24	4358	Chrysostephanosphaera globulifera Scherffel	7184	2.15	8.30	8.30	299.40
MEL - 0303R	13-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	1800	4.30	11.50	23.00	2389.00
MEL - 0303R	13-Jul-24	5908	Diatoma tenuis Agardh	1600	0.31	46.00	4.00	192.70
MEL - 0303R	13-Jul-24	4378	Dinobryon borgei Lemmermann	28736	1.16	8.60	3.00	40.50
MEL - 0303R	13-Jul-24	2137	Dictyosphaerium simplex Sukja	71840	0.30	2.00	2.00	4.20
MEL - 0303R	13-Jul-24	4383	Dinobryon bavaricum Imhof	200	0.25	0.00	0.00	1250.00
MEL - 0303R	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	86208	19.50	12.00	6.00	226.20
MEL - 0303R	13-Jul-24	4390	Dinobryon sociale Ehrenberg	122128	27.63	12.00	6.00	226.20
MEL - 0303R	13-Jul-24	4390	Dinobryon sociale Ehrenberg	200	0.25	0.00	0.00	1250.00
MEL - 0303R	13-Jul-24	4394	Epiphyxis sp.	7184	0.55	9.10	4.00	76.20
MEL - 0303R	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	1200	2.39	0.00	0.00	1991.00
MEL - 0303R	13-Jul-24	4401	Uroglena volvox Ehrenberg	215520	24.38	6.00	6.00	113.10
MEL - 0303R	13-Jul-24	4411	Bitrichia chodatii (Reverdin) Chodat	7184	0.36	6.00	4.00	50.30
MEL - 0303R	13-Jul-24	4413	Chrysochromulina laurentiana Kling	150864	59.53	9.10	9.10	394.60
MEL - 0303R	13-Jul-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	35920	0.93	5.50	3.00	25.90
MEL - 0303R	13-Jul-24	7631	Gymnodinium helveticum Penard	600	14.14	50.00	30.00	23561.90
MEL - 0303R	13-Jul-24	5511	Rhizosolenia eriense H.L. Smith	64656	5.48	12.00	3.00	84.80
MEL - 0303R	13-Jul-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	800	0.62	82.00	6.00	772.80
MEL - 0303R	13-Jul-24	5515	Fragilaria crotonensis Kitton	400	0.12	71.00	4.00	297.40
MEL - 0303R	13-Jul-24	7632	Gymnodinium sp.	2000	12.74	23.00	23.00	6370.60
MEL - 0303R	13-Jul-24	7632	Gymnodinium sp.	400	9.77	36.00	36.00	24429.00
MEL - 0303R	13-Jul-24	4362	Kephyrion sp.	165232	1.90	2.80	2.80	11.50
MEL - 0303R	13-Jul-24	4352	Large chrysophyceae	21552	3.87	7.00	7.00	179.60
MEL - 0303R	13-Jul-24	4368	Mallomonas crassisquama (Asmund) Fott	400	0.42	20.00	10.00	1047.20
MEL - 0303R	13-Jul-24	7641	Peridinium aciculiferum Lemmermann	1200	10.86	30.00	24.00	9047.80
MEL - 0303R	13-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	600	2.37	19.60	19.60	3942.50
MEL - 0303R	13-Jul-24	6559	Cryptomonas ovata Ehrenberg	1200	6.70	40.00	20.00	5585.10
MEL - 0303R	13-Jul-24	1054	Planktolyngbya limnetica	400	0.10	210.00	1.20	237.50
MEL - 0303R	13-Jul-24	6554	Rhodomonas minuta Skuja	165232	20.77	10.00	6.00	125.70
MEL - 0303R	13-Jul-24	4351	Small chrysophyceae	244256	1.56	2.30	2.30	6.40
MEL - 0303R	13-Jul-24	7637	Peridinium limbatum (Stokes) Lemmermann	200	28.76	65.00	65.00	143793.30
MEL - 0303R	13-Jul-24	5518	Synedra acus Kutzing	22000	2.30	100.00	2.00	104.70
MEL - 0303R	13-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	200	0.41	220.00	6.00	2073.50
MEL - 0304	13-Jul-24	1054	Planktolyngbya limnetica	1000	0.18	160.00	1.20	181.00
MEL - 0304	13-Jul-24	2137	Dictyosphaerium simplex Sukja	35920	0.15	2.00	2.00	4.20
MEL - 0304	13-Jul-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.42	9.20	4.00	57.80
MEL - 0304	13-Jul-24	2169	Planctonema lauterbornii Schmidle	7184	2.54	18.00	5.00	353.40
MEL - 0304	13-Jul-24	2206	Botryococcus braunii Kutzing	400	0.57	14.00	14.00	1436.80
MEL - 0304	13-Jul-24	4351	Small chrysophyceae	258624	1.66	2.30	2.30	6.40
MEL - 0304	13-Jul-24	4355	Chrysochromulina parva Lackey	43104	2.82	5.00	5.00	65.40
MEL - 0304	13-Jul-24	4357	Chrysococcus sp.	660928	43.22	5.00	5.00	65.40
MEL - 0304	13-Jul-24	4362	Kephyrion sp.	215520	2.48	2.80	2.80	11.50
MEL - 0304	13-Jul-24	4375	Synura sphagnicola Korschikow	200	3.54	0.00	0.00	17700.00
MEL - 0304	13-Jul-24	4383	Dinobryon bavaricum Imhof	7184	1.63	12.00	6.00	226.20
MEL - 0304	13-Jul-24	4383	Dinobryon bavaricum Imhof	200	0.25	0.00	0.00	1250.00
MEL - 0304	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	7184	1.63	12.00	6.00	226.20
MEL - 0304	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	2000	3.98	0.00	0.00	1991.00
MEL - 0304	13-Jul-24	4390	Dinobryon sociale Ehrenberg	208336	82.46	21.00	6.00	395.80
MEL - 0304	13-Jul-24	4390	Dinobryon sociale Ehrenberg	800	1.00	0.00	0.00	1250.00
MEL - 0304	13-Jul-24	4394	Epiphyxis sp.	14368	1.09	9.10	4.00	76.20
MEL - 0304	13-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	43104	1.18	5.80	3.00	27.30
MEL - 0304	13-Jul-24	4401	Uroglena volvox Ehrenberg	122128	13.81	6.00	6.00	113.10
MEL - 0304	13-Jul-24	4413	Chrysochromulina laurentiana Kling	43104	17.01	9.10	9.10	394.60
MEL - 0304	13-Jul-24	5511	Rhizosolenia eriense H.L. Smith	57472	4.87	12.00	3.00	84.80
MEL - 0304	13-Jul-24	5515	Fragilaria crotonensis Kitton	800	0.24	71.00	4.00	297.40
MEL - 0304	13-Jul-24	5518	Synedra acus Kutzing	16000	1.68	100.00	2.00	104.70
MEL - 0304	13-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	400	0.83	220.00	6.00	2073.50
MEL - 0304	13-Jul-24	5524	Asterionella formosa Hassall	37400	3.92	100.00	2.00	104.70
MEL - 0304	13-Jul-24	5551	Cyclotella michiganiana Skvortzow	21552	0.47	2.40	4.80	21.70
MEL - 0304	13-Jul-24	5908	Diatoma tenuis Agardh	400	0.08	46.00	4.00	192.70
MEL - 0304	13-Jul-24	6554	Rhodomonas minuta Skuja	64656	8.13	10.00	6.00	125.70
MEL - 0304	13-Jul-24	6558	Cryptomonas erosa Ehrenberg	800	1.47	26.90	14.00	1840.40

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0304	13-Jul-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0304	13-Jul-24	7632	Gymnodinium sp.	400	2.55	23.00	23.00	6370.60
MEL - 0304	13-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	2000	7.89	19.60	19.60	3942.50
MEL - 0304	13-Jul-24	7641	Peridinium aciculiferum Lemmermann	400	3.62	30.00	24.00	9047.80
MEL - 0305	13-Jul-24	1054	Planktolyngbya limnetica	200	0.05	210.00	1.20	237.50
MEL - 0305	13-Jul-24	2187	Staurodesmus extensus (Andersson) Teiling	200	0.08	14.00	12.00	410.50
MEL - 0305	13-Jul-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - 0305	13-Jul-24	4351	Small chrysophyceae	114944	0.74	2.30	2.30	6.40
MEL - 0305	13-Jul-24	4352	Large chrysophyceae	50288	9.03	7.00	7.00	179.60
MEL - 0305	13-Jul-24	4357	Chrysococcus sp.	165232	10.81	5.00	5.00	65.40
MEL - 0305	13-Jul-24	4369	Mallomonas pseudocoronata Prescott	7184	7.52	20.00	10.00	1047.20
MEL - 0305	13-Jul-24	4375	Synura sphagnicola Korschikow	400	6.28	0.00	0.00	15700.00
MEL - 0305	13-Jul-24	4378	Dinobryon borgei Lemmermann	7184	0.29	8.60	3.00	40.50
MEL - 0305	13-Jul-24	4383	Dinobryon bavaricum Imhof	200	0.25	0.00	0.00	1250.00
MEL - 0305	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	35920	8.13	12.00	6.00	226.20
MEL - 0305	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	600	0.75	0.00	0.00	1250.00
MEL - 0305	13-Jul-24	4390	Dinobryon sociale Ehrenberg	86208	19.50	12.00	6.00	226.20
MEL - 0305	13-Jul-24	4390	Dinobryon sociale Ehrenberg	600	0.75	0.00	0.00	1250.00
MEL - 0305	13-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.20	5.80	3.00	27.30
MEL - 0305	13-Jul-24	4401	Uroglena volvox Ehrenberg	280176	31.69	6.00	6.00	113.10
MEL - 0305	13-Jul-24	4413	Chrysochromulina laurentiana Kling	7184	2.83	9.10	9.10	394.60
MEL - 0305	13-Jul-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	7184	0.19	5.60	3.00	26.40
MEL - 0305	13-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	200	0.48	11.50	23.00	2389.00
MEL - 0305	13-Jul-24	5511	Rhizosolenia eriense H.L. Smith	35920	3.05	12.00	3.00	84.80
MEL - 0305	13-Jul-24	5518	Synedra acus Kutzing	6800	0.71	100.00	2.00	104.70
MEL - 0305	13-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	400	0.83	220.00	6.00	2073.50
MEL - 0305	13-Jul-24	5524	Asterionella formosa Hassall	22400	2.35	100.00	2.00	104.70
MEL - 0305	13-Jul-24	6554	Rhodomonas minuta Skuja	114944	14.45	10.00	6.00	125.70
MEL - 0305	13-Jul-24	6558	Cryptomonas erosa Ehrenberg	2800	5.15	26.90	14.00	1840.40
MEL - 0305	13-Jul-24	7631	Gymnodinium helveticum Penard	1200	28.27	50.00	30.00	23561.90
MEL - 0305	13-Jul-24	7632	Gymnodinium sp.	3400	21.66	23.00	23.00	6370.60
MEL - 0305	13-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	1800	7.10	19.60	19.60	3942.50
MEL - 0305	13-Jul-24	7641	Peridinium aciculiferum Lemmermann	1600	14.48	30.00	24.00	9047.80
MEL - DUP1	13-Jul-24	1054	Planktolyngbya limnetica	200	0.05	210.00	1.20	237.50
MEL - DUP1	13-Jul-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.43	9.60	4.00	60.30
MEL - DUP1	13-Jul-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - DUP1	13-Jul-24	2187	Staurodesmus extensus (Andersson) Teiling	200	0.08	13.60	12.00	387.40
MEL - DUP1	13-Jul-24	2215	Tetraedron caudatum (Corda) Hansgrig	50288	0.24	3.00	3.00	4.70
MEL - DUP1	13-Jul-24	4351	Small chrysophyceae	215520	1.38	2.30	2.30	6.40
MEL - DUP1	13-Jul-24	4352	Large chrysophyceae	21552	3.87	7.00	7.00	179.60
MEL - DUP1	13-Jul-24	4355	Chrysochromulina parva Lackey	43104	2.82	5.00	5.00	65.40
MEL - DUP1	13-Jul-24	4357	Chrysococcus sp.	466960	30.54	5.00	5.00	65.40
MEL - DUP1	13-Jul-24	4362	Kephyrion sp.	122128	1.40	2.80	2.80	11.50
MEL - DUP1	13-Jul-24	4378	Dinobryon borgei Lemmermann	43104	1.75	8.60	3.00	40.50
MEL - DUP1	13-Jul-24	4383	Dinobryon bavaricum Imhof	7184	1.63	12.00	6.00	226.20
MEL - DUP1	13-Jul-24	4383	Dinobryon bavaricum Imhof	200	0.25	0.00	0.00	1250.00
MEL - DUP1	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	35920	8.13	12.00	6.00	226.20
MEL - DUP1	13-Jul-24	4388	Dinobryon sertularia Ehrenberg	600	0.57	0.00	0.00	950.00
MEL - DUP1	13-Jul-24	4390	Dinobryon sociale Ehrenberg	143680	32.50	12.00	6.00	226.20
MEL - DUP1	13-Jul-24	4390	Dinobryon sociale Ehrenberg	2800	3.50	0.00	0.00	1250.00
MEL - DUP1	13-Jul-24	4396	Chrysolykos skuja (Nauwerck) Willen	21552	0.59	5.80	3.00	27.30
MEL - DUP1	13-Jul-24	4401	Uroglena volvox Ehrenberg	201152	22.75	6.00	6.00	113.10
MEL - DUP1	13-Jul-24	4413	Chrysochromulina laurentiana Kling	28736	11.34	9.10	9.10	394.60
MEL - DUP1	13-Jul-24	4414	Stichogloea spp.	7184	0.36	6.00	4.00	50.30
MEL - DUP1	13-Jul-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	7184	0.19	5.50	3.00	25.90
MEL - DUP1	13-Jul-24	5507	Cyclotella stelligera Cleve and Grunow	1000	2.39	11.50	23.00	2389.00
MEL - DUP1	13-Jul-24	5511	Rhizosolenia eriense H.L. Smith	129312	10.97	12.00	3.00	84.80
MEL - DUP1	13-Jul-24	5515	Fragilaria crotonensis Kitton	1200	0.36	71.00	4.00	297.40
MEL - DUP1	13-Jul-24	5518	Synedra acus Kutzing	11600	1.21	100.00	2.00	104.70
MEL - DUP1	13-Jul-24	5523	Synedra ulna (Nitzsch) Ehrenberg	600	1.24	220.00	6.00	2073.50
MEL - DUP1	13-Jul-24	5524	Asterionella formosa Hassall	23000	2.41	100.00	2.00	104.70
MEL - DUP1	13-Jul-24	5551	Cyclotella michiganiana Skvortzow	7184	0.16	2.40	4.80	21.70
MEL - DUP1	13-Jul-24	6554	Rhodomonas minuta Skuja	93392	11.74	10.00	6.00	125.70
MEL - DUP1	13-Jul-24	6558	Cryptomonas erosa Ehrenberg	600	1.10	26.80	14.00	1833.60
MEL - DUP1	13-Jul-24	6568	Katablepharis ovalis Skuja	21552	0.96	8.00	4.00	44.70
MEL - DUP1	13-Jul-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - DUP1	13-Jul-24	7632	Gymnodinium sp.	2400	13.38	22.00	22.00	5575.30
MEL - DUP1	13-Jul-24	7635	Peridinium willei Huitfeldt-Kaas	200	4.49	35.00	35.00	22449.30
MEL - DUP1	13-Jul-24	7639	Peridinium pusillum (Penard) Lemmermann	1600	6.31	19.60	19.60	3942.50
MEL - 0101	13-Aug-24	1073	Snowella sp	400	0.30	0.00	0.00	750.00
MEL - 0101	13-Aug-24	2112	Sphaerocystis schroeteri Chodat	790240	9.09	2.80	2.80	11.50
MEL - 0101	13-Aug-24	2121	Oocystis lacustris Chodat	208336	5.90	6.00	3.00	28.30
MEL - 0101	13-Aug-24	2137	Dictyosphaerium simplex Sukja	237072	1.00	2.00	2.00	4.20
MEL - 0101	13-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	14368	0.87	9.60	4.00	60.30
MEL - 0101	13-Aug-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0101	13-Aug-24	2167	Elakatothrix gelatinosa Willen	57472	0.90	10.00	2.00	15.70
MEL - 0101	13-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	200	0.08	14.00	12.00	410.50
MEL - 0101	13-Aug-24	2191	Staurodesmus cuspidatus (Brebisson and Ralfs) Teiling	600	1.63	26.00	23.00	2713.60
MEL - 0101	13-Aug-24	2193	Staurodesmus paradoxum Meyen	200	0.57	26.00	24.00	2831.60
MEL - 0101	13-Aug-24	2206	Botryococcus braunii Kutzing	400	0.57	14.00	14.00	1436.80
MEL - 0101	13-Aug-24	4351	Small chrysophyceae	136496	0.87	2.30	2.30	6.40
MEL - 0101	13-Aug-24	4357	Chrysococcus sp.	193968	12.69	5.00	5.00	65.40
MEL - 0101	13-Aug-24	4362	Kephyrion sp.	86208	0.99	2.80	2.80	11.50
MEL - 0101	13-Aug-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - 0101	13-Aug-24	4383	Dinobryon bavaricum Imhof	50288	11.38	12.00	6.00	226.20
MEL - 0101	13-Aug-24	4388	Dinobryon sertularia Ehrenberg	7184	1.63	12.00	6.00	226.20
MEL - 0101	13-Aug-24	4388	Dinobryon sertularia Ehrenberg	800	2.71	0.00	0.00	3390.00
MEL - 0101	13-Aug-24	4390	Dinobryon sociale Ehrenberg	35920	8.13	12.00	6.00	226.20
MEL - 0101	13-Aug-24	4390	Dinobryon sociale Ehrenberg	200	0.25	0.00	0.00	1250.00
MEL - 0101	13-Aug-24	4401	Uroglena volvox Ehrenberg	86208	9.75	6.00	6.00	113.10
MEL - 0101	13-Aug-24	4414	Stichogloea spp.	93392	4.70	6.00	4.00	50.30
MEL - 0101	13-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	2000	4.18	11.00	22.00	2090.70
MEL - 0101	13-Aug-24	5508	Cyclotella pseudostelligera	129312	72.70	7.10	14.20	562.20
MEL - 0101	13-Aug-24	5511	Rhizosolenia eriense H.L. Smith	7184	0.61	12.00	3.00	84.80
MEL - 0101	13-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	6200	4.15	71.00	6.00	669.20
MEL - 0101	13-Aug-24	5518	Synedra acus Kutzing	2600	0.27	100.00	2.00	104.70
MEL - 0101	13-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	200	0.41	220.00	6.00	2073.50

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0101	13-Aug-24	5524	Asterionella formosa Hassall	4800	0.50	100.00	2.00	104.70
MEL - 0101	13-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	200	1.68	17.50	35.00	8418.50
MEL - 0101	13-Aug-24	5551	Cyclotella michiganiana Skvortzow	86208	2.11	2.50	5.00	24.50
MEL - 0101	13-Aug-24	5908	Diatoma tenuis Agardh	800	0.15	46.00	4.00	192.70
MEL - 0101	13-Aug-24	6554	Rhodomonas minuta Skuja	258624	32.51	10.00	6.00	125.70
MEL - 0101	13-Aug-24	6558	Cryptomonas erosa Ehrenberg	6400	11.47	26.20	14.00	1792.50
MEL - 0101	13-Aug-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0101	13-Aug-24	7632	Gymnodinium sp.	2200	14.02	23.00	23.00	6370.60
MEL - 0101	13-Aug-24	7635	Peridinium willei Huitfeldt-Kaas	200	4.49	35.00	35.00	22449.30
MEL - 0101	13-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	1800	6.78	19.30	19.30	3764.20
MEL - 0106	13-Aug-24	1054	Planktolyngbya limnetica	400	0.07	150.00	1.20	169.60
MEL - 0106	13-Aug-24	1073	Snowella sp	600	0.45	0.00	0.00	750.00
MEL - 0106	13-Aug-24	2112	Sphaerocystis schroeteri Chodat	373568	4.30	2.80	2.80	11.50
MEL - 0106	13-Aug-24	2113	Pediastrum duplex Meyen	200	0.42	0.00	0.00	2100.00
MEL - 0106	13-Aug-24	2121	Oocystis lacustris Chodat	50288	1.42	6.00	3.00	28.30
MEL - 0106	13-Aug-24	2137	Dictyosphaerium simplex Sukja	258624	1.09	2.00	2.00	4.20
MEL - 0106	13-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	21552	1.30	9.60	4.00	60.30
MEL - 0106	13-Aug-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0106	13-Aug-24	2167	Elakatothrix gelatinosa Willen	7184	0.11	10.00	2.00	15.70
MEL - 0106	13-Aug-24	2178	Cosmarium sp.	200	0.28	20.00	20.00	1396.30
MEL - 0106	13-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	200	0.08	14.00	12.00	410.50
MEL - 0106	13-Aug-24	2193	Staurodesmus paradoxum Meyen	200	0.57	26.00	24.00	2831.60
MEL - 0106	13-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	57472	2.17	6.00	6.00	37.70
MEL - 0106	13-Aug-24	2206	Botryococcus braunii Kutzing	400	0.57	14.00	14.00	1436.80
MEL - 0106	13-Aug-24	2235	Ankistrodesmus spiralis Lemmermann	7184	0.45	40.00	2.00	62.80
MEL - 0106	13-Aug-24	4351	Small chrysophyceae	244256	1.56	2.30	2.30	6.40
MEL - 0106	13-Aug-24	4352	Large chrysophyceae	7184	1.29	7.00	7.00	179.60
MEL - 0106	13-Aug-24	4357	Chrysococcus sp.	107760	7.05	5.00	5.00	65.40
MEL - 0106	13-Aug-24	4362	Kephyrion sp.	86208	0.99	2.80	2.80	11.50
MEL - 0106	13-Aug-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - 0106	13-Aug-24	4383	Dinobryon bavaricum Imhof	21552	4.88	12.00	6.00	226.20
MEL - 0106	13-Aug-24	4388	Dinobryon sertularia Ehrenberg	1200	4.07	0.00	0.00	3390.00
MEL - 0106	13-Aug-24	4390	Dinobryon sociale Ehrenberg	7184	2.84	21.00	6.00	395.80
MEL - 0106	13-Aug-24	4401	Uroglena volvox Ehrenberg	100576	11.38	6.00	6.00	113.10
MEL - 0106	13-Aug-24	4414	Stichogloea spp.	280176	14.09	6.00	4.00	50.30
MEL - 0106	13-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	1000	2.09	11.00	22.00	2090.70
MEL - 0106	13-Aug-24	5508	Cyclotella pseudostelligera	86208	48.47	7.10	14.20	562.20
MEL - 0106	13-Aug-24	5511	Rhizosolenia eriense H.L. Smith	21552	1.83	12.00	3.00	84.80
MEL - 0106	13-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	6200	4.15	71.00	6.00	669.20
MEL - 0106	13-Aug-24	5518	Synedra acus Kutzing	1400	0.15	100.00	2.00	104.70
MEL - 0106	13-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	1600	3.32	220.00	6.00	2073.50
MEL - 0106	13-Aug-24	5524	Asterionella formosa Hassall	11200	1.17	100.00	2.00	104.70
MEL - 0106	13-Aug-24	5551	Cyclotella michiganiana Skvortzow	7184	0.18	2.50	5.00	24.50
MEL - 0106	13-Aug-24	5908	Diatoma tenuis Agardh	800	0.15	46.00	4.00	192.70
MEL - 0106	13-Aug-24	6554	Rhodomonas minuta Skuja	150864	18.96	10.00	6.00	125.70
MEL - 0106	13-Aug-24	6558	Cryptomonas erosa Ehrenberg	4200	7.53	26.20	14.00	1792.50
MEL - 0106	13-Aug-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0106	13-Aug-24	7632	Gymnodinium sp.	2800	15.61	22.00	22.00	5575.30
MEL - 0106	13-Aug-24	7632	Gymnodinium sp.	600	14.66	36.00	36.00	24429.00
MEL - 0106	13-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	1800	6.78	19.30	19.30	3764.20
MEL - 0107	13-Aug-24	1073	Snowella sp	400	0.30	0.00	0.00	750.00
MEL - 0107	13-Aug-24	2121	Oocystis lacustris Chodat	79024	2.24	6.00	3.00	28.30
MEL - 0107	13-Aug-24	2137	Dictyosphaerium simplex Sukja	172416	0.72	2.00	2.00	4.20
MEL - 0107	13-Aug-24	2145	Crucigenia quadrata Morr.	229888	1.08	3.00	3.00	4.70
MEL - 0107	13-Aug-24	2178	Cosmarium sp.	200	0.28	20.00	20.00	1396.30
MEL - 0107	13-Aug-24	2182	Euastrum spp.	200	0.37	22.00	22.00	1858.40
MEL - 0107	13-Aug-24	2193	Staurodesmus paradoxum Meyen	200	0.57	26.00	24.00	2831.60
MEL - 0107	13-Aug-24	4351	Small chrysophyceae	165232	1.06	2.30	2.30	6.40
MEL - 0107	13-Aug-24	4352	Large chrysophyceae	21552	3.87	7.00	7.00	179.60
MEL - 0107	13-Aug-24	4355	Chrysochromulina parva Lackey	7184	0.47	5.00	5.00	65.40
MEL - 0107	13-Aug-24	4357	Chrysococcus sp.	158048	10.34	5.00	5.00	65.40
MEL - 0107	13-Aug-24	4362	Kephyrion sp.	71840	0.83	2.80	2.80	11.50
MEL - 0107	13-Aug-24	4378	Dinobryon borgei Lemmermann	35920	1.54	9.10	3.00	42.90
MEL - 0107	13-Aug-24	4388	Dinobryon sertularia Ehrenberg	7184	1.63	12.00	6.00	226.20
MEL - 0107	13-Aug-24	4388	Dinobryon sertularia Ehrenberg	1000	3.39	0.00	0.00	3390.00
MEL - 0107	13-Aug-24	4414	Stichogloea spp.	222704	11.20	6.00	4.00	50.30
MEL - 0107	13-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	2000	4.18	11.00	22.00	2090.70
MEL - 0107	13-Aug-24	5508	Cyclotella pseudostelligera	86208	48.47	7.10	14.20	562.20
MEL - 0107	13-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	9400	6.29	71.00	6.00	669.20
MEL - 0107	13-Aug-24	5518	Synedra acus Kutzing	400	0.04	100.00	2.00	104.70
MEL - 0107	13-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	200	0.41	220.00	6.00	2073.50
MEL - 0107	13-Aug-24	5524	Asterionella formosa Hassall	13400	1.40	100.00	2.00	104.70
MEL - 0107	13-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	600	5.05	17.50	35.00	8418.50
MEL - 0107	13-Aug-24	5551	Cyclotella michiganiana Skvortzow	7184	0.18	2.50	5.00	24.50
MEL - 0107	13-Aug-24	6554	Rhodomonas minuta Skuja	229888	28.90	10.00	6.00	125.70
MEL - 0107	13-Aug-24	6558	Cryptomonas erosa Ehrenberg	4000	7.17	26.20	14.00	1792.50
MEL - 0107	13-Aug-24	7631	Gymnodinium helveticum Penard	400	9.42	50.00	30.00	23561.90
MEL - 0107	13-Aug-24	7632	Gymnodinium sp.	1800	10.04	22.00	22.00	5575.30
MEL - 0107	13-Aug-24	7632	Gymnodinium sp.	1000	24.43	36.00	36.00	24429.00
MEL - 0107	13-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	600	2.26	19.30	19.30	3764.20
MEL - 0107	13-Aug-24	7641	Peridinium aciculiferum Lemmermann	200	1.81	30.00	24.00	9047.80
MEL - 0108	13-Aug-24	1073	Snowella sp	600	0.45	0.00	0.00	750.00
MEL - 0108	13-Aug-24	2112	Sphaerocystis schroeteri Chodat	402304	4.63	2.80	2.80	11.50
MEL - 0108	13-Aug-24	2121	Oocystis lacustris Chodat	179600	5.08	6.00	3.00	28.30
MEL - 0108	13-Aug-24	2137	Dictyosphaerium simplex Sukja	373568	1.57	2.00	2.00	4.20
MEL - 0108	13-Aug-24	2182	Euastrum spp.	400	0.74	22.00	22.00	1858.40
MEL - 0108	13-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	600	0.25	14.00	12.00	410.50
MEL - 0108	13-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - 0108	13-Aug-24	2206	Botryococcus braunii Kutzing	1400	2.01	14.00	14.00	1436.80
MEL - 0108	13-Aug-24	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.03	3.00	3.00	4.70
MEL - 0108	13-Aug-24	2247	Oocystis gigas Archer	200	0.48	18.00	16.00	2412.70
MEL - 0108	13-Aug-24	4351	Small chrysophyceae	237072	1.52	2.30	2.30	6.40
MEL - 0108	13-Aug-24	4352	Large chrysophyceae	64656	11.61	7.00	7.00	179.60
MEL - 0108	13-Aug-24	4355	Chrysochromulina parva Lackey	35920	2.35	5.00	5.00	65.40
MEL - 0108	13-Aug-24	4357	Chrysococcus sp.	150864	9.87	5.00	5.00	65.40
MEL - 0108	13-Aug-24	4362	Kephyrion sp.	71840	0.83	2.80	2.80	11.50
MEL - 0108	13-Aug-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0108	13-Aug-24	4378	Dinobryon borgei Lemmermann	7184	0.31	9.10	3.00	42.90
MEL - 0108	13-Aug-24	4388	Dinobryon sertularia Ehrenberg	7184	1.63	12.00	6.00	226.20
MEL - 0108	13-Aug-24	4388	Dinobryon sertularia Ehrenberg	400	0.80	0.00	0.00	1991.00
MEL - 0108	13-Aug-24	4390	Dinobryon sociale Ehrenberg	21552	4.88	12.00	6.00	226.20
MEL - 0108	13-Aug-24	4401	Uroglena volvox Ehrenberg	86208	9.75	6.00	6.00	113.10
MEL - 0108	13-Aug-24	4413	Chrysochromulina laurentiana Kling	21552	8.50	9.10	9.10	394.60
MEL - 0108	13-Aug-24	4414	Stichogloea spp.	265808	13.37	6.00	4.00	50.30
MEL - 0108	13-Aug-24	5508	Cyclotella pseudostelligera	172416	96.93	7.10	14.20	562.20
MEL - 0108	13-Aug-24	5511	Rhizosolenia eriense H.L. Smith	7184	0.61	12.00	3.00	84.80
MEL - 0108	13-Aug-24	5518	Synedra acus Kutzing	400	0.04	100.00	2.00	104.70
MEL - 0108	13-Aug-24	5524	Asterionella formosa Hassall	18800	1.97	100.00	2.00	104.70
MEL - 0108	13-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	200	1.68	17.50	35.00	8418.50
MEL - 0108	13-Aug-24	6554	Rhodomonas minuta Skuja	301728	37.93	10.00	6.00	125.70
MEL - 0108	13-Aug-24	6558	Cryptomonas erosa Ehrenberg	6600	11.83	26.20	14.00	1792.50
MEL - 0108	13-Aug-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0108	13-Aug-24	7632	Gymnodinium sp.	1200	6.69	22.00	22.00	5575.30
MEL - 0108	13-Aug-24	7632	Gymnodinium sp.	800	19.54	36.00	36.00	24429.00
MEL - 0108	13-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	400	1.51	19.30	19.30	3764.20
MEL - 0109	13-Aug-24	1073	Snowella sp	400	0.30	0.00	0.00	750.00
MEL - 0109	13-Aug-24	2112	Sphaerocystis schroeteri Chodat	840528	9.67	2.80	2.80	11.50
MEL - 0109	13-Aug-24	2113	Pediastrum duplex Meyen	200	0.42	0.00	0.00	2100.00
MEL - 0109	13-Aug-24	2121	Oocystis lacustris Chodat	93392	2.64	6.00	3.00	28.30
MEL - 0109	13-Aug-24	2137	Dictyosphaerium simplex Sukja	136496	0.57	2.00	2.00	4.20
MEL - 0109	13-Aug-24	2167	Elakatothrix gelatinosa Willen	35920	0.56	10.00	2.00	15.70
MEL - 0109	13-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	800	0.33	14.00	12.00	410.50
MEL - 0109	13-Aug-24	2191	Staurodesmus cuspidatus (Brebisson and Ralfs) Teiling	200	0.44	24.00	22.00	2211.70
MEL - 0109	13-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	71840	2.71	6.00	6.00	37.70
MEL - 0109	13-Aug-24	2206	Botryococcus braunii Kutzing	600	0.86	14.00	14.00	1436.80
MEL - 0109	13-Aug-24	2247	Oocystis gigas Archer	200	0.48	18.00	16.00	2412.70
MEL - 0109	13-Aug-24	4351	Small chrysophyceae	100576	0.64	2.30	2.30	6.40
MEL - 0109	13-Aug-24	4357	Chrysococcus sp.	258624	16.91	5.00	5.00	65.40
MEL - 0109	13-Aug-24	4361	Kephyrion boreale Skuja	7184	0.85	6.10	6.10	118.80
MEL - 0109	13-Aug-24	4362	Kephyrion sp.	71840	0.83	2.80	2.80	11.50
MEL - 0109	13-Aug-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - 0109	13-Aug-24	4378	Dinobryon borgei Lemmermann	7184	0.30	9.00	3.00	42.40
MEL - 0109	13-Aug-24	4388	Dinobryon sertularia Ehrenberg	43104	9.75	12.00	6.00	226.20
MEL - 0109	13-Aug-24	4388	Dinobryon sertularia Ehrenberg	1200	2.39	0.00	0.00	1991.00
MEL - 0109	13-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.19	5.50	3.00	25.90
MEL - 0109	13-Aug-24	4401	Uroglena volvox Ehrenberg	50288	5.69	6.00	6.00	113.10
MEL - 0109	13-Aug-24	4413	Chrysochromulina laurentiana Kling	7184	2.83	9.10	9.10	394.60
MEL - 0109	13-Aug-24	4414	Stichogloea spp.	244256	12.29	6.00	4.00	50.30
MEL - 0109	13-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	2800	5.85	11.00	22.00	2090.70
MEL - 0109	13-Aug-24	5508	Cyclotella pseudostelligera	129312	72.70	7.10	14.20	562.20
MEL - 0109	13-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	2400	1.61	71.00	6.00	669.20
MEL - 0109	13-Aug-24	5518	Synedra acus Kutzing	200	0.02	100.00	2.00	104.70
MEL - 0109	13-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	600	1.24	220.00	6.00	2073.50
MEL - 0109	13-Aug-24	5524	Asterionella formosa Hassall	11400	1.19	100.00	2.00	104.70
MEL - 0109	13-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	200	1.68	17.50	35.00	8418.50
MEL - 0109	13-Aug-24	6554	Rhodomonas minuta Skuja	330464	41.54	10.00	6.00	125.70
MEL - 0109	13-Aug-24	6558	Cryptomonas erosa Ehrenberg	5200	9.32	26.20	14.00	1792.50
MEL - 0109	13-Aug-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0109	13-Aug-24	7632	Gymnodinium sp.	600	3.35	22.00	22.00	5575.30
MEL - 0109	13-Aug-24	7632	Gymnodinium sp.	600	14.66	36.00	36.00	24429.00
MEL - 0109	13-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	800	3.01	19.30	19.30	3764.20
MEL - 0110	13-Aug-24	1026	Merismopedia tenuissima Lemmermann	57472	0.57	0.00	0.00	10.00
MEL - 0110	13-Aug-24	1073	Snowella sp	600	0.45	0.00	0.00	750.00
MEL - 0110	13-Aug-24	2112	Sphaerocystis schroeteri Chodat	718400	8.26	2.80	2.80	11.50
MEL - 0110	13-Aug-24	2121	Oocystis lacustris Chodat	86208	2.23	5.50	3.00	25.90
MEL - 0110	13-Aug-24	2137	Dictyosphaerium simplex Sukja	251440	1.06	2.00	2.00	4.20
MEL - 0110	13-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	14368	0.87	9.60	4.00	60.30
MEL - 0110	13-Aug-24	2167	Elakatothrix gelatinosa Willen	35920	0.56	10.00	2.00	15.70
MEL - 0110	13-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	400	0.16	14.00	12.00	410.50
MEL - 0110	13-Aug-24	2191	Staurodesmus cuspidatus (Brebisson and Ralfs) Teiling	200	0.41	23.00	22.00	2031.20
MEL - 0110	13-Aug-24	2206	Botryococcus braunii Kutzing	200	0.29	14.00	14.00	1436.80
MEL - 0110	13-Aug-24	2215	Tetraedron caudatum (Corda) Hansgrig	21552	0.10	3.00	3.00	4.70
MEL - 0110	13-Aug-24	4351	Small chrysophyceae	244256	1.56	2.30	2.30	6.40
MEL - 0110	13-Aug-24	4355	Chrysochromulina parva Lackey	50288	3.29	5.00	5.00	65.40
MEL - 0110	13-Aug-24	4357	Chrysococcus sp.	258624	16.91	5.00	5.00	65.40
MEL - 0110	13-Aug-24	4358	Chrysostephanosphaera globulifera Scherffel	7184	2.56	8.80	8.80	356.80
MEL - 0110	13-Aug-24	4362	Kephyrion sp.	7184	0.08	2.80	2.80	11.50
MEL - 0110	13-Aug-24	4378	Dinobryon borgei Lemmermann	7184	0.30	9.00	3.00	42.40
MEL - 0110	13-Aug-24	4388	Dinobryon sertularia Ehrenberg	200	0.40	0.00	0.00	1991.00
MEL - 0110	13-Aug-24	4390	Dinobryon sociale Ehrenberg	43104	9.75	12.00	6.00	226.20
MEL - 0110	13-Aug-24	4401	Uroglena volvox Ehrenberg	64656	7.31	6.00	6.00	113.10
MEL - 0110	13-Aug-24	4413	Chrysochromulina laurentiana Kling	7184	2.83	9.10	9.10	394.60
MEL - 0110	13-Aug-24	4414	Stichogloea spp.	294544	14.82	6.00	4.00	50.30
MEL - 0110	13-Aug-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	35920	0.95	5.60	3.00	26.40
MEL - 0110	13-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	4200	8.78	11.00	22.00	2090.70
MEL - 0110	13-Aug-24	5508	Cyclotella pseudostelligera	143680	80.78	7.10	14.20	562.20
MEL - 0110	13-Aug-24	5518	Synedra acus Kutzing	800	0.08	100.00	2.00	104.70
MEL - 0110	13-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	400	0.83	220.00	6.00	2073.50
MEL - 0110	13-Aug-24	5524	Asterionella formosa Hassall	23400	2.45	100.00	2.00	104.70
MEL - 0110	13-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	400	3.37	17.50	35.00	8418.50
MEL - 0110	13-Aug-24	6554	Rhodomonas minuta Skuja	107760	13.55	10.00	6.00	125.70
MEL - 0110	13-Aug-24	6558	Cryptomonas erosa Ehrenberg	4000	7.20	26.30	14.00	1799.40
MEL - 0110	13-Aug-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0110	13-Aug-24	7632	Gymnodinium sp.	2200	12.27	22.00	22.00	5575.30
MEL - 0110	13-Aug-24	7632	Gymnodinium sp.	200	4.89	36.00	36.00	24429.00
MEL - 0110	13-Aug-24	7635	Peridinium willei Huitfeldt-Kaas	200	4.49	35.00	35.00	22449.30
MEL - 0110	13-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	600	2.26	19.30	19.30	3764.20
MEL - 0202	12-Aug-24	1014	Chroococcus limneticus Lemmermann	14368	0.56	4.20	4.20	38.80
MEL - 0202	12-Aug-24	1054	Planktolyngbya limnetica	400	0.06	130.00	1.20	147.00
MEL - 0202	12-Aug-24	1073	Snowella sp	800	0.40	0.00	0.00	500.00
MEL - 0202	12-Aug-24	2112	Sphaerocystis schroeteri Chodat	57472	0.66	2.80	2.80	11.50
MEL - 0202	12-Aug-24	2121	Oocystis lacustris Chodat	7184	0.19	5.50	3.00	25.90
MEL - 0202	12-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	21552	1.30	9.60	4.00	60.30
MEL - 0202	12-Aug-24	2167	Elakatothrix gelatinosa Willen	14368	0.23	10.00	2.00	15.70

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0202	12-Aug-24	2169	Planctonema lauterbornii Schmidle	28736	10.16	18.00	5.00	353.40
MEL - 0202	12-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	800	0.33	14.00	12.00	410.50
MEL - 0202	12-Aug-24	2195	Staurodesmus bullardii G.M. Smith	200	1.81	38.00	36.00	9072.90
MEL - 0202	12-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	35920	1.35	6.00	6.00	37.70
MEL - 0202	12-Aug-24	2206	Botryococcus braunii Kutzing	400	0.57	14.00	14.00	1436.80
MEL - 0202	12-Aug-24	2247	Oocystis gigas Archer	400	0.97	18.00	16.00	2412.70
MEL - 0202	12-Aug-24	4351	Small chrysophyceae	387936	2.17	2.20	2.20	5.60
MEL - 0202	12-Aug-24	4352	Large chrysophyceae	7184	1.29	7.00	7.00	179.60
MEL - 0202	12-Aug-24	4355	Chrysochromulina parva Lackey	114944	7.52	5.00	5.00	65.40
MEL - 0202	12-Aug-24	4357	Chrysococcus sp.	287360	18.79	5.00	5.00	65.40
MEL - 0202	12-Aug-24	4362	Kephyrion sp.	50288	0.58	2.80	2.80	11.50
MEL - 0202	12-Aug-24	4368	Mallomonas crassisquama (Asmund) Fott	200	0.21	20.00	10.00	1047.20
MEL - 0202	12-Aug-24	4388	Dinobryon sertularia Ehrenberg	35920	8.13	12.00	6.00	226.20
MEL - 0202	12-Aug-24	4388	Dinobryon sertularia Ehrenberg	200	0.40	0.00	0.00	1991.00
MEL - 0202	12-Aug-24	4390	Dinobryon sociale Ehrenberg	100576	22.75	12.00	6.00	226.20
MEL - 0202	12-Aug-24	4401	Uroglena volvox Ehrenberg	165232	18.69	6.00	6.00	113.10
MEL - 0202	12-Aug-24	4413	Chrysochromulina laurentiana Kling	43104	17.01	9.10	9.10	394.60
MEL - 0202	12-Aug-24	4414	Stichogloea spp.	28736	1.45	6.00	4.00	50.30
MEL - 0202	12-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	3800	7.94	11.00	22.00	2090.70
MEL - 0202	12-Aug-24	5509	Cyclotella ocellata Pant.	64656	7.00	4.10	8.20	108.30
MEL - 0202	12-Aug-24	5511	Rhizosolenia eriense H.L. Smith	7184	0.61	12.00	3.00	84.80
MEL - 0202	12-Aug-24	5518	Synedra acus Kutzing	1400	0.15	100.00	2.00	104.70
MEL - 0202	12-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	600	1.24	220.00	6.00	2073.50
MEL - 0202	12-Aug-24	5524	Asterionella formosa Hassall	5200	0.54	100.00	2.00	104.70
MEL - 0202	12-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	7000	58.93	17.50	35.00	8418.50
MEL - 0202	12-Aug-24	5551	Cyclotella michiganiana Skvortzow	35920	0.88	2.50	5.00	24.50
MEL - 0202	12-Aug-24	5908	Diatoma tenuis Agardh	200	0.04	48.00	4.00	201.10
MEL - 0202	12-Aug-24	6554	Rhodomonas minuta Skuja	272992	34.32	10.00	6.00	125.70
MEL - 0202	12-Aug-24	6558	Cryptomonas erosa Ehrenberg	2000	3.50	25.60	14.00	1751.50
MEL - 0202	12-Aug-24	6565	Cryptomonas rostratiformis Skuja	200	0.47	34.00	14.00	2326.20
MEL - 0202	12-Aug-24	7631	Gymnodinium helveticum Penard	600	14.14	50.00	30.00	23561.90
MEL - 0202	12-Aug-24	7632	Gymnodinium sp.	3800	15.92	20.00	20.00	4188.80
MEL - 0202	12-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	3200	13.01	19.80	19.80	4064.40
MEL - 0202	12-Aug-24	7641	Peridinium aciculiferum Lemmermann	200	1.81	30.00	24.00	9047.80
MEL - 0203	12-Aug-24	1014	Chroococcus limneticus Lemmermann	57472	2.23	4.20	4.20	38.80
MEL - 0203	12-Aug-24	1073	Snowella sp	200	0.10	0.00	0.00	500.00
MEL - 0203	12-Aug-24	1133	Anabaena flos-aquae (Lyngb.) Breb. & Bornet	1600	9.14	275.00	6.30	5714.90
MEL - 0203	12-Aug-24	2112	Sphaerocystis schroeteri Chodat	21552	0.25	2.80	2.80	11.50
MEL - 0203	12-Aug-24	2113	Pediastrum duplex Meyen	200	0.42	0.00	0.00	2100.00
MEL - 0203	12-Aug-24	2121	Oocystis lacustris Chodat	86208	2.23	5.50	3.00	25.90
MEL - 0203	12-Aug-24	2132	Scenedesmus denticulatus Lagerhiem	28736	1.38	8.60	4.00	48.00
MEL - 0203	12-Aug-24	2137	Dictyosphaerium simplex Sukja	150864	0.63	2.00	2.00	4.20
MEL - 0203	12-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	21552	1.30	9.60	4.00	60.30
MEL - 0203	12-Aug-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0203	12-Aug-24	2164	Quadrigula closterioides (Bohl.) Printz	28736	0.63	14.00	2.00	22.00
MEL - 0203	12-Aug-24	2169	Planctonema lauterbornii Schmidle	7184	2.54	18.00	5.00	353.40
MEL - 0203	12-Aug-24	2178	Cosmarium sp.	400	0.56	20.00	20.00	1396.30
MEL - 0203	12-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	1600	0.66	14.00	12.00	410.50
MEL - 0203	12-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	57472	2.17	6.00	6.00	37.70
MEL - 0203	12-Aug-24	2206	Botryococcus braunii Kutzing	200	0.29	14.00	14.00	1436.80
MEL - 0203	12-Aug-24	2247	Oocystis gigas Archer	600	1.45	18.00	16.00	2412.70
MEL - 0203	12-Aug-24	4351	Small chrysophyceae	402304	2.25	2.20	2.20	5.60
MEL - 0203	12-Aug-24	4357	Chrysococcus sp.	316096	20.67	5.00	5.00	65.40
MEL - 0203	12-Aug-24	4362	Kephyrion sp.	86208	0.99	2.80	2.80	11.50
MEL - 0203	12-Aug-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - 0203	12-Aug-24	4383	Dinobryon bavaricum Imhof	14368	3.25	12.00	6.00	226.20
MEL - 0203	12-Aug-24	4388	Dinobryon sertularia Ehrenberg	64656	14.63	12.00	6.00	226.20
MEL - 0203	12-Aug-24	4390	Dinobryon sociale Ehrenberg	71840	16.25	12.00	6.00	226.20
MEL - 0203	12-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	35920	0.98	5.80	3.00	27.30
MEL - 0203	12-Aug-24	4401	Uroglena volvox Ehrenberg	150864	17.06	6.00	6.00	113.10
MEL - 0203	12-Aug-24	4413	Chrysochromulina laurentiana Kling	79024	31.18	9.10	9.10	394.60
MEL - 0203	12-Aug-24	4414	Stichogloea spp.	14368	0.72	6.00	4.00	50.30
MEL - 0203	12-Aug-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	21552	0.56	5.50	3.00	25.90
MEL - 0203	12-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	8000	16.73	11.00	22.00	2090.70
MEL - 0203	12-Aug-24	5509	Cyclotella ocellata Pant.	57472	6.22	4.10	8.20	108.30
MEL - 0203	12-Aug-24	5515	Fragilaria crotonensis Kitton	4200	1.25	71.00	4.00	297.40
MEL - 0203	12-Aug-24	5518	Synedra acus Kutzing	2200	0.23	100.00	2.00	104.70
MEL - 0203	12-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	200	0.41	220.00	6.00	2073.50
MEL - 0203	12-Aug-24	5524	Asterionella formosa Hassall	4000	0.42	100.00	2.00	104.70
MEL - 0203	12-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	1200	10.10	17.50	35.00	8418.50
MEL - 0203	12-Aug-24	5551	Cyclotella michiganiana Skvortzow	71840	1.76	2.50	5.00	24.50
MEL - 0203	12-Aug-24	6554	Rhodomonas minuta Skuja	201152	25.28	10.00	6.00	125.70
MEL - 0203	12-Aug-24	6558	Cryptomonas erosa Ehrenberg	2600	4.55	25.60	14.00	1751.50
MEL - 0203	12-Aug-24	6568	Katablepharis ovalis Skuja	21552	0.96	8.00	4.00	44.70
MEL - 0203	12-Aug-24	7631	Gymnodinium helveticum Penard	1600	35.92	35.00	35.00	22449.30
MEL - 0203	12-Aug-24	7632	Gymnodinium sp.	9200	38.54	20.00	20.00	4188.80
MEL - 0203	12-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	5600	22.76	19.80	19.80	4064.40
MEL - 0203	12-Aug-24	7641	Peridinium aciculiferum Lemmermann	200	1.81	30.00	24.00	9047.80
MEL - 0205	12-Aug-24	1073	Snowella sp	400	0.20	0.00	0.00	500.00
MEL - 0205	12-Aug-24	1133	Anabaena flos-aquae (Lyngb.) Breb. & Bornet	1000	4.93	245.00	6.20	4931.10
MEL - 0205	12-Aug-24	2112	Sphaerocystis schroeteri Chodat	93392	1.07	2.80	2.80	11.50
MEL - 0205	12-Aug-24	2121	Oocystis lacustris Chodat	344832	8.93	5.50	3.00	25.90
MEL - 0205	12-Aug-24	2137	Dictyosphaerium simplex Sukja	93392	0.39	2.00	2.00	4.20
MEL - 0205	12-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.43	9.60	4.00	60.30
MEL - 0205	12-Aug-24	2167	Elakatothrix gelatinosa Willen	21552	0.34	10.00	2.00	15.70
MEL - 0205	12-Aug-24	2169	Planctonema lauterbornii Schmidle	7184	2.54	18.00	5.00	353.40
MEL - 0205	12-Aug-24	2182	Euastrum spp.	1000	1.86	22.00	22.00	1858.40
MEL - 0205	12-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	1200	0.49	14.00	12.00	410.50
MEL - 0205	12-Aug-24	2193	Staurodesmus paradoxum Meyen	200	0.57	26.00	24.00	2831.60
MEL - 0205	12-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	71840	2.71	6.00	6.00	37.70
MEL - 0205	12-Aug-24	2206	Botryococcus braunii Kutzing	400	0.57	14.00	14.00	1436.80
MEL - 0205	12-Aug-24	2215	Tetraedron caudatum (Corda) Hansgrig	14368	0.07	3.00	3.00	4.70
MEL - 0205	12-Aug-24	2235	Ankistrodesmus spiralis Lemmermann	7184	0.40	35.00	2.00	55.00
MEL - 0205	12-Aug-24	4351	Small chrysophyceae	459776	2.57	2.20	2.20	5.60
MEL - 0205	12-Aug-24	4355	Chrysochromulina parva Lackey	50288	3.29	5.00	5.00	65.40
MEL - 0205	12-Aug-24	4357	Chrysococcus sp.	459776	30.07	5.00	5.00	65.40
MEL - 0205	12-Aug-24	4362	Kephyrion sp.	86208	0.99	2.80	2.80	11.50

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0205	12-Aug-24	4363	Spiniferomonas serrata	14368	1.71	6.10	6.10	118.80
MEL - 0205	12-Aug-24	4369	Mallomonas pseudocoronata Prescott	200	0.35	23.00	12.00	1734.20
MEL - 0205	12-Aug-24	4383	Dinobryon bavaricum Imhof	7184	1.63	12.00	6.00	226.20
MEL - 0205	12-Aug-24	4388	Dinobryon sertularia Ehrenberg	86208	19.50	12.00	6.00	226.20
MEL - 0205	12-Aug-24	4388	Dinobryon sertularia Ehrenberg	800	1.00	0.00	0.00	1250.00
MEL - 0205	12-Aug-24	4390	Dinobryon sociale Ehrenberg	71840	16.25	12.00	6.00	226.20
MEL - 0205	12-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.20	5.80	3.00	27.30
MEL - 0205	12-Aug-24	4401	Uroglena volvox Ehrenberg	50288	5.69	6.00	6.00	113.10
MEL - 0205	12-Aug-24	4413	Chrysochromulina laurentiana Kling	71840	28.35	9.10	9.10	394.60
MEL - 0205	12-Aug-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	93392	2.42	5.50	3.00	25.90
MEL - 0205	12-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	4600	9.62	11.00	22.00	2090.70
MEL - 0205	12-Aug-24	5509	Cyclotella ocellata Pant.	7184	0.75	4.05	8.10	104.30
MEL - 0205	12-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	1600	1.22	81.00	6.00	763.40
MEL - 0205	12-Aug-24	5515	Fragilaria crotonensis Kitton	400	0.12	69.00	4.00	289.00
MEL - 0205	12-Aug-24	5518	Synedra acus Kutzing	800	0.08	100.00	2.00	104.70
MEL - 0205	12-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	400	0.83	220.00	6.00	2073.50
MEL - 0205	12-Aug-24	5524	Asterionella formosa Hassall	2600	0.27	100.00	2.00	104.70
MEL - 0205	12-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	600	5.05	17.50	35.00	8418.50
MEL - 0205	12-Aug-24	5551	Cyclotella michiganiana Skvortzow	57472	1.41	2.50	5.00	24.50
MEL - 0205	12-Aug-24	6554	Rhodomonas minuta Skuja	122128	15.35	10.00	6.00	125.70
MEL - 0205	12-Aug-24	6558	Cryptomonas erosa Ehrenberg	1400	2.45	25.60	14.00	1751.50
MEL - 0205	12-Aug-24	6559	Cryptomonas ovata Ehrenberg	400	2.23	40.00	20.00	5585.10
MEL - 0205	12-Aug-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0205	12-Aug-24	7632	Gymnodinium sp.	3000	12.57	20.00	20.00	4188.80
MEL - 0205	12-Aug-24	7632	Gymnodinium sp.	400	8.98	35.00	35.00	22449.30
MEL - 0205	12-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	1200	4.88	19.80	19.80	4064.40
MEL - 0206	12-Aug-24	1073	Snowella sp	200	0.10	0.00	0.00	500.00
MEL - 0206	12-Aug-24	2112	Sphaerocystis schroeteri Chodat	43104	0.50	2.80	2.80	11.50
MEL - 0206	12-Aug-24	2121	Oocystis lacustris Chodat	21552	0.56	5.50	3.00	25.90
MEL - 0206	12-Aug-24	2137	Dictyosphaerium simplex Sukja	179600	0.75	2.00	2.00	4.20
MEL - 0206	12-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	21552	1.30	9.60	4.00	60.30
MEL - 0206	12-Aug-24	2145	Crucigenia quadrata Morr.	165232	0.23	2.00	2.00	1.40
MEL - 0206	12-Aug-24	2167	Elakatothrix gelatinosa Willen	28736	0.45	10.00	2.00	15.70
MEL - 0206	12-Aug-24	2169	Planctonema lauterbornii Schmidle	7184	2.54	18.00	5.00	353.40
MEL - 0206	12-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	1400	0.57	14.00	12.00	410.50
MEL - 0206	12-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	114944	4.33	6.00	6.00	37.70
MEL - 0206	12-Aug-24	2215	Tetraedron caudatum (Corda) Hansgrig	21552	0.10	3.00	3.00	4.70
MEL - 0206	12-Aug-24	2247	Oocystis gigas Archer	200	0.48	18.00	16.00	2412.70
MEL - 0206	12-Aug-24	2260	Monomastix minuta Skuja	7184	0.14	6.10	3.00	19.20
MEL - 0206	12-Aug-24	4351	Small chrysophyceae	294544	1.65	2.20	2.20	5.60
MEL - 0206	12-Aug-24	4352	Large chrysophyceae	7184	1.29	7.00	7.00	179.60
MEL - 0206	12-Aug-24	4355	Chrysochromulina parva Lackey	43104	2.82	5.00	5.00	65.40
MEL - 0206	12-Aug-24	4357	Chrysococcus sp.	237072	15.50	5.00	5.00	65.40
MEL - 0206	12-Aug-24	4362	Kephyrion sp.	129312	1.49	2.80	2.80	11.50
MEL - 0206	12-Aug-24	4363	Spiniferomonas serrata	7184	0.85	6.10	6.10	118.80
MEL - 0206	12-Aug-24	4383	Dinobryon bavaricum Imhof	200	0.40	0.00	0.00	1991.00
MEL - 0206	12-Aug-24	4388	Dinobryon sertularia Ehrenberg	43104	9.75	12.00	6.00	226.20
MEL - 0206	12-Aug-24	4388	Dinobryon sertularia Ehrenberg	600	0.75	0.00	0.00	1250.00
MEL - 0206	12-Aug-24	4390	Dinobryon sociale Ehrenberg	43104	9.75	12.00	6.00	226.20
MEL - 0206	12-Aug-24	4401	Uroglena volvox Ehrenberg	50288	5.69	6.00	6.00	113.10
MEL - 0206	12-Aug-24	4413	Chrysochromulina laurentiana Kling	7184	2.83	9.10	9.10	394.60
MEL - 0206	12-Aug-24	4414	Stichogloea spp.	14368	0.72	6.00	4.00	50.30
MEL - 0206	12-Aug-24	4437	Pteridomonas sp.	7184	1.71	8.80	8.80	237.90
MEL - 0206	12-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	3800	7.94	11.00	22.00	2090.70
MEL - 0206	12-Aug-24	5509	Cyclotella ocellata Pant.	35920	3.89	4.10	8.20	108.30
MEL - 0206	12-Aug-24	5515	Fragilaria crotonensis Kitton	400	0.12	69.00	4.00	289.00
MEL - 0206	12-Aug-24	5518	Synedra acus Kutzing	1200	0.13	100.00	2.00	104.70
MEL - 0206	12-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	800	1.66	220.00	6.00	2073.50
MEL - 0206	12-Aug-24	5524	Asterionella formosa Hassall	5800	0.61	100.00	2.00	104.70
MEL - 0206	12-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	1200	10.10	17.50	35.00	8418.50
MEL - 0206	12-Aug-24	5551	Cyclotella michiganiana Skvortzow	71840	1.76	2.50	5.00	24.50
MEL - 0206	12-Aug-24	6554	Rhodomonas minuta Skuja	172416	21.67	10.00	6.00	125.70
MEL - 0206	12-Aug-24	6558	Cryptomonas erosa Ehrenberg	1000	1.75	25.60	14.00	1751.50
MEL - 0206	12-Aug-24	7631	Gymnodinium helveticum Penard	1000	23.56	50.00	30.00	23561.90
MEL - 0206	12-Aug-24	7632	Gymnodinium sp.	3000	12.57	20.00	20.00	4188.80
MEL - 0206	12-Aug-24	7632	Gymnodinium sp.	2400	53.88	35.00	35.00	22449.30
MEL - 0206	12-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	3200	13.01	19.80	19.80	4064.40
MEL - 0206	12-Aug-24	7641	Peridinium aciculiferum Lemmermann	200	1.81	30.00	24.00	9047.80
MEL - 0206R	12-Aug-24	1073	Snowella sp	200	0.10	0.00	0.00	500.00
MEL - 0206R	12-Aug-24	2112	Sphaerocystis schroeteri Chodat	86208	0.99	2.80	2.80	11.50
MEL - 0206R	12-Aug-24	2121	Oocystis lacustris Chodat	43104	1.12	5.50	3.00	25.90
MEL - 0206R	12-Aug-24	2137	Dictyosphaerium simplex Sukja	136496	0.57	2.00	2.00	4.20
MEL - 0206R	12-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	14368	0.87	9.60	4.00	60.30
MEL - 0206R	12-Aug-24	2145	Crucigenia quadrata Morr.	57472	0.08	2.00	2.00	1.40
MEL - 0206R	12-Aug-24	2167	Elakatothrix gelatinosa Willen	28736	0.45	10.00	2.00	15.70
MEL - 0206R	12-Aug-24	2169	Planctonema lauterbornii Schmidle	14368	5.08	18.00	5.00	353.40
MEL - 0206R	12-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	1600	0.66	14.00	12.00	410.50
MEL - 0206R	12-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	64656	2.44	6.00	6.00	37.70
MEL - 0206R	12-Aug-24	2215	Tetraedron caudatum (Corda) Hansgrig	14368	0.07	3.00	3.00	4.70
MEL - 0206R	12-Aug-24	4351	Small chrysophyceae	251440	1.41	2.20	2.20	5.60
MEL - 0206R	12-Aug-24	4355	Chrysochromulina parva Lackey	64656	4.23	5.00	5.00	65.40
MEL - 0206R	12-Aug-24	4357	Chrysococcus sp.	272992	17.85	5.00	5.00	65.40
MEL - 0206R	12-Aug-24	4358	Chrysostephanosphaera globulifera Scherffel	7184	2.00	8.10	8.10	278.30
MEL - 0206R	12-Aug-24	4362	Kephyrion sp.	79024	0.91	2.80	2.80	11.50
MEL - 0206R	12-Aug-24	4363	Spiniferomonas serrata	7184	0.85	6.10	6.10	118.80
MEL - 0206R	12-Aug-24	4368	Mallomonas crassisquama (Asmund) Fott	400	0.42	20.00	10.00	1047.20
MEL - 0206R	12-Aug-24	4388	Dinobryon sertularia Ehrenberg	35920	8.13	12.00	6.00	226.20
MEL - 0206R	12-Aug-24	4388	Dinobryon sertularia Ehrenberg	400	0.50	0.00	0.00	1250.00
MEL - 0206R	12-Aug-24	4390	Dinobryon sociale Ehrenberg	64656	14.63	12.00	6.00	226.20
MEL - 0206R	12-Aug-24	4401	Uroglena volvox Ehrenberg	28736	3.25	6.00	6.00	113.10
MEL - 0206R	12-Aug-24	4411	Bitrichia chodatii (Reverdin) Chodat	7184	0.36	6.00	4.00	50.30
MEL - 0206R	12-Aug-24	4413	Chrysochromulina laurentiana Kling	14368	5.67	9.10	9.10	394.60
MEL - 0206R	12-Aug-24	4414	Stichogloea spp.	43104	2.17	6.00	4.00	50.30
MEL - 0206R	12-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	3200	6.69	11.00	22.00	2090.70
MEL - 0206R	12-Aug-24	5509	Cyclotella ocellata Pant.	57472	6.22	4.10	8.20	108.30
MEL - 0206R	12-Aug-24	5511	Rhizosolenia eriense H.L. Smith	14368	1.22	12.00	3.00	84.80
MEL - 0206R	12-Aug-24	5515	Fragilaria crotonensis Kitton	2800	0.81	69.00	4.00	289.00

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0206R	12-Aug-24	5518	Synedra acus Kutzing	1000	0.10	100.00	2.00	104.70
MEL - 0206R	12-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	1800	3.73	220.00	6.00	2073.50
MEL - 0206R	12-Aug-24	5524	Asterionella formosa Hassall	5200	0.54	100.00	2.00	104.70
MEL - 0206R	12-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	1600	13.47	17.50	35.00	8418.50
MEL - 0206R	12-Aug-24	5551	Cyclotella michiganiana Skvortzow	57472	1.41	2.50	5.00	24.50
MEL - 0206R	12-Aug-24	6554	Rhodomonas minuta Skuja	114944	14.45	10.00	6.00	125.70
MEL - 0206R	12-Aug-24	6558	Cryptomonas erosa Ehrenberg	400	0.70	25.60	14.00	1751.50
MEL - 0206R	12-Aug-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0206R	12-Aug-24	7632	Gymnodinium sp.	3800	15.92	20.00	20.00	4188.80
MEL - 0206R	12-Aug-24	7632	Gymnodinium sp.	2000	44.90	35.00	35.00	22449.30
MEL - 0206R	12-Aug-24	7635	Peridinium willei Huitfeldt-Kaas	200	4.49	35.00	35.00	22449.30
MEL - 0206R	12-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	2400	9.75	19.80	19.80	4064.40
MEL - 0206R	12-Aug-24	7641	Peridinium aciculiferum Lemmermann	800	7.24	30.00	24.00	9047.80
MEL - 0208	12-Aug-24	1073	Snowella sp	200	0.10	0.00	0.00	500.00
MEL - 0208	12-Aug-24	2105	Chlamydomonas spp.	7184	0.36	6.00	4.00	50.30
MEL - 0208	12-Aug-24	2112	Sphaerocystis schroeteri Chodat	603456	6.94	2.80	2.80	11.50
MEL - 0208	12-Aug-24	2121	Oocystis lacustris Chodat	272992	7.07	5.50	3.00	25.90
MEL - 0208	12-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	21552	1.30	9.60	4.00	60.30
MEL - 0208	12-Aug-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0208	12-Aug-24	2167	Elakatothrix gelatinosa Willen	21552	0.34	10.00	2.00	15.70
MEL - 0208	12-Aug-24	2169	Planctonema lauterbornii Schmidle	28736	10.16	18.00	5.00	353.40
MEL - 0208	12-Aug-24	2178	Cosmarium sp.	400	0.56	20.00	20.00	1396.30
MEL - 0208	12-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	1200	0.49	14.00	12.00	410.50
MEL - 0208	12-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	50288	1.90	6.00	6.00	37.70
MEL - 0208	12-Aug-24	2206	Botryococcus braunii Kutzing	600	0.86	14.00	14.00	1436.80
MEL - 0208	12-Aug-24	4351	Small chrysophyceae	416672	2.33	2.20	2.20	5.60
MEL - 0208	12-Aug-24	4355	Chrysochromulina parva Lackey	86208	5.64	5.00	5.00	65.40
MEL - 0208	12-Aug-24	4357	Chrysococcus sp.	452592	29.60	5.00	5.00	65.40
MEL - 0208	12-Aug-24	4361	Kephyrion boreale Skuja	7184	0.85	6.10	6.10	118.80
MEL - 0208	12-Aug-24	4362	Kephyrion sp.	122128	1.40	2.80	2.80	11.50
MEL - 0208	12-Aug-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - 0208	12-Aug-24	4378	Dinobryon borgei Lemmermann	7184	0.29	8.60	3.00	40.50
MEL - 0208	12-Aug-24	4383	Dinobryon bavaricum Imhof	7184	1.63	12.00	6.00	226.20
MEL - 0208	12-Aug-24	4388	Dinobryon sertularia Ehrenberg	7184	1.63	12.00	6.00	226.20
MEL - 0208	12-Aug-24	4388	Dinobryon sertularia Ehrenberg	1000	1.25	0.00	0.00	1250.00
MEL - 0208	12-Aug-24	4390	Dinobryon sociale Ehrenberg	79024	17.88	12.00	6.00	226.20
MEL - 0208	12-Aug-24	4390	Dinobryon sociale Ehrenberg	600	0.57	0.00	0.00	950.00
MEL - 0208	12-Aug-24	4401	Uroglena volvox Ehrenberg	71840	8.13	6.00	6.00	113.10
MEL - 0208	12-Aug-24	4413	Chrysochromulina laurentiana Kling	50288	19.84	9.10	9.10	394.60
MEL - 0208	12-Aug-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	35920	0.93	5.50	3.00	25.90
MEL - 0208	12-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	4400	9.20	11.00	22.00	2090.70
MEL - 0208	12-Aug-24	5509	Cyclotella ocellata Pant.	100576	10.49	4.05	8.10	104.30
MEL - 0208	12-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	4800	3.66	81.00	6.00	763.40
MEL - 0208	12-Aug-24	5514	Tabellaria flocculosa (Roth) Kutzing	800	1.07	26.00	14.00	1334.10
MEL - 0208	12-Aug-24	5515	Fragilaria crotonensis Kitton	600	0.18	70.00	4.00	293.20
MEL - 0208	12-Aug-24	5518	Synedra acus Kutzing	800	0.08	100.00	2.00	104.70
MEL - 0208	12-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	400	0.83	220.00	6.00	2073.50
MEL - 0208	12-Aug-24	5524	Asterionella formosa Hassall	200	0.02	100.00	2.00	104.70
MEL - 0208	12-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	1000	8.42	17.50	35.00	8418.50
MEL - 0208	12-Aug-24	5551	Cyclotella michiganiana Skvortzow	57472	1.41	2.50	5.00	24.50
MEL - 0208	12-Aug-24	6554	Rhodomonas minuta Skuja	114944	14.45	10.00	6.00	125.70
MEL - 0208	12-Aug-24	6558	Cryptomonas erosa Ehrenberg	2400	4.20	25.60	14.00	1751.50
MEL - 0208	12-Aug-24	7632	Gymnodinium sp.	2200	9.22	20.00	20.00	4188.80
MEL - 0208	12-Aug-24	7632	Gymnodinium sp.	2600	58.37	35.00	35.00	22449.30
MEL - 0208	12-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	4400	17.88	19.80	19.80	4064.40
MEL - 0301	11-Aug-24	1073	Snowella sp	200	0.10	0.00	0.00	500.00
MEL - 0301	11-Aug-24	2100	Pyramidomonas tetrarhynchus Schmarda	200	0.11	14.00	12.00	527.80
MEL - 0301	11-Aug-24	2112	Sphaerocystis schroeteri Chodat	21552	0.25	2.80	2.80	11.50
MEL - 0301	11-Aug-24	2121	Oocystis lacustris Chodat	57472	1.49	5.50	3.00	25.90
MEL - 0301	11-Aug-24	2137	Dictyosphaerium simplex Sukja	21552	0.09	2.00	2.00	4.20
MEL - 0301	11-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	35920	2.21	9.80	4.00	61.60
MEL - 0301	11-Aug-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0301	11-Aug-24	2169	Planctonema lauterbornii Schmidle	7184	2.54	18.00	5.00	353.40
MEL - 0301	11-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	1000	0.41	14.00	12.00	410.50
MEL - 0301	11-Aug-24	2191	Staurodesmus cuspidatus (Brebisson and Ralfs) Teiling	400	0.88	24.00	22.00	2211.70
MEL - 0301	11-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	43104	1.63	6.00	6.00	37.70
MEL - 0301	11-Aug-24	2206	Botryococcus braunii Kutzing	200	0.29	14.00	14.00	1436.80
MEL - 0301	11-Aug-24	2235	Ankistrodesmus spiralis Lemmermann	7184	0.40	35.00	2.00	55.00
MEL - 0301	11-Aug-24	2247	Oocystis gigas Archer	200	0.48	18.00	16.00	2412.70
MEL - 0301	11-Aug-24	4351	Small chrysophyceae	517248	2.90	2.20	2.20	5.60
MEL - 0301	11-Aug-24	4352	Large chrysophyceae	7184	1.29	7.00	7.00	179.60
MEL - 0301	11-Aug-24	4355	Chrysochromulina parva Lackey	28736	1.88	5.00	5.00	65.40
MEL - 0301	11-Aug-24	4357	Chrysococcus sp.	265808	17.38	5.00	5.00	65.40
MEL - 0301	11-Aug-24	4362	Kephyrion sp.	244256	2.81	2.80	2.80	11.50
MEL - 0301	11-Aug-24	4378	Dinobryon borgei Lemmermann	28736	1.16	8.60	3.00	40.50
MEL - 0301	11-Aug-24	4388	Dinobryon sertularia Ehrenberg	21552	4.88	12.00	6.00	226.20
MEL - 0301	11-Aug-24	4388	Dinobryon sertularia Ehrenberg	600	0.75	0.00	0.00	1250.00
MEL - 0301	11-Aug-24	4390	Dinobryon sociale Ehrenberg	114944	26.00	12.00	6.00	226.20
MEL - 0301	11-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.20	5.80	3.00	27.30
MEL - 0301	11-Aug-24	4401	Uroglena volvox Ehrenberg	193968	21.94	6.00	6.00	113.10
MEL - 0301	11-Aug-24	4413	Chrysochromulina laurentiana Kling	21552	8.50	9.10	9.10	394.60
MEL - 0301	11-Aug-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	7184	0.19	5.50	3.00	25.90
MEL - 0301	11-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	800	1.67	11.00	22.00	2090.70
MEL - 0301	11-Aug-24	5509	Cyclotella ocellata Pant.	7184	0.75	4.05	8.10	104.30
MEL - 0301	11-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	2400	1.83	81.00	6.00	763.40
MEL - 0301	11-Aug-24	5518	Synedra acus Kutzing	2600	0.27	100.00	2.00	104.70
MEL - 0301	11-Aug-24	5524	Asterionella formosa Hassall	800	0.08	100.00	2.00	104.70
MEL - 0301	11-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	400	3.37	17.50	35.00	8418.50
MEL - 0301	11-Aug-24	5551	Cyclotella michiganiana Skvortzow	43104	1.06	2.50	5.00	24.50
MEL - 0301	11-Aug-24	6554	Rhodomonas minuta Skuja	57472	7.22	10.00	6.00	125.70
MEL - 0301	11-Aug-24	6558	Cryptomonas erosa Ehrenberg	1600	2.80	25.60	14.00	1751.50
MEL - 0301	11-Aug-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0301	11-Aug-24	7632	Gymnodinium sp.	1600	6.70	20.00	20.00	4188.80
MEL - 0301	11-Aug-24	7632	Gymnodinium sp.	400	8.98	35.00	35.00	22449.30
MEL - 0301	11-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	2000	8.13	19.80	19.80	4064.40
MEL - 0301	11-Aug-24	7641	Peridinium aciculiferum Lemmermann	200	1.81	30.00	24.00	9047.80
MEL - 0302	11-Aug-24	1044	Anabaena planctonica Brunnthaler	200	2.26	405.00	7.30	11300.50

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0302	11-Aug-24	1073	Snowella sp	200	0.10	0.00	0.00	500.00
MEL - 0302	11-Aug-24	2112	Sphaerocystis schroeteri Chodat	35920	0.41	2.80	2.80	11.50
MEL - 0302	11-Aug-24	2137	Dictyosphaerium simplex Sukja	57472	0.24	2.00	2.00	4.20
MEL - 0302	11-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.43	9.60	4.00	60.30
MEL - 0302	11-Aug-24	2169	Planctonema lauterbornii Schmidle	14368	5.08	18.00	5.00	353.40
MEL - 0302	11-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	800	0.33	14.00	12.00	410.50
MEL - 0302	11-Aug-24	2193	Staurodesmus paradoxum Meyen	200	0.57	26.00	24.00	2831.60
MEL - 0302	11-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	43104	1.63	6.00	6.00	37.70
MEL - 0302	11-Aug-24	2205	Mougeotia sp.	200	0.38	24.00	10.00	1885.00
MEL - 0302	11-Aug-24	2206	Botryococcus braunii Kutzing	800	1.15	14.00	14.00	1436.80
MEL - 0302	11-Aug-24	4351	Small chrysophyceae	215520	1.21	2.20	2.20	5.60
MEL - 0302	11-Aug-24	4352	Large chrysophyceae	71840	12.90	7.00	7.00	179.60
MEL - 0302	11-Aug-24	4355	Chrysochromulina parva Lackey	7184	0.47	5.00	5.00	65.40
MEL - 0302	11-Aug-24	4357	Chrysococcus sp.	438224	28.66	5.00	5.00	65.40
MEL - 0302	11-Aug-24	4362	Kephyrion sp.	172416	1.98	2.80	2.80	11.50
MEL - 0302	11-Aug-24	4388	Dinobryon sertularia Ehrenberg	35920	8.13	12.00	6.00	226.20
MEL - 0302	11-Aug-24	4390	Dinobryon sociale Ehrenberg	114944	26.00	12.00	6.00	226.20
MEL - 0302	11-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.20	5.80	3.00	27.30
MEL - 0302	11-Aug-24	4401	Uroglena volvox Ehrenberg	21552	2.44	6.00	6.00	113.10
MEL - 0302	11-Aug-24	4413	Chrysochromulina laurentiana Kling	79024	31.18	9.10	9.10	394.60
MEL - 0302	11-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	1400	2.93	11.00	22.00	2090.70
MEL - 0302	11-Aug-24	5509	Cyclotella ocellata Pant.	7184	0.75	4.05	8.10	104.30
MEL - 0302	11-Aug-24	5515	Fragilaria crotonensis Kitton	800	0.23	69.00	4.00	289.00
MEL - 0302	11-Aug-24	5518	Synedra acus Kutzing	1200	0.13	100.00	2.00	104.70
MEL - 0302	11-Aug-24	5524	Asterionella formosa Hassall	2200	0.23	100.00	2.00	104.70
MEL - 0302	11-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	200	1.68	17.50	35.00	8418.50
MEL - 0302	11-Aug-24	5551	Cyclotella michiganiana Skvortzow	86208	2.11	2.50	5.00	24.50
MEL - 0302	11-Aug-24	5908	Diatoma tenuis Agardh	400	0.08	48.00	4.00	201.10
MEL - 0302	11-Aug-24	6554	Rhodomonas minuta Skuja	35920	4.52	10.00	6.00	125.70
MEL - 0302	11-Aug-24	6558	Cryptomonas erosa Ehrenberg	1000	1.75	25.60	14.00	1751.50
MEL - 0302	11-Aug-24	6568	Katablepharis ovalis Skuja	7184	0.29	7.60	4.00	40.30
MEL - 0302	11-Aug-24	7632	Gymnodinium sp.	400	1.68	20.00	20.00	4188.80
MEL - 0302	11-Aug-24	7632	Gymnodinium sp.	400	8.98	35.00	35.00	22449.30
MEL - 0302	11-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	4000	16.26	19.80	19.80	4064.40
MEL - 0302	11-Aug-24	7641	Peridinium aciculiferum Lemmermann	200	1.81	30.00	24.00	9047.80
MEL - 0303	11-Aug-24	1044	Anabaena planctonica Brunnthaler	400	2.90	275.00	7.10	7258.50
MEL - 0303	11-Aug-24	1054	Planktolyngbya limnetica	200	0.03	130.00	1.20	147.00
MEL - 0303	11-Aug-24	1073	Snowella sp	200	0.10	0.00	0.00	500.00
MEL - 0303	11-Aug-24	2112	Sphaerocystis schroeteri Chodat	21552	0.25	2.80	2.80	11.50
MEL - 0303	11-Aug-24	2121	Oocystis lacustris Chodat	35920	0.93	5.50	3.00	25.90
MEL - 0303	11-Aug-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0303	11-Aug-24	2167	Elakatothrix gelatinosa Willen	7184	0.11	10.00	2.00	15.70
MEL - 0303	11-Aug-24	2169	Planctonema lauterbornii Schmidle	57472	20.31	18.00	5.00	353.40
MEL - 0303	11-Aug-24	2178	Cosmarium sp.	200	0.28	20.00	20.00	1396.30
MEL - 0303	11-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	1800	0.74	14.00	12.00	410.50
MEL - 0303	11-Aug-24	2191	Staurodesmus cuspidatus (Brebisson and Ralfs) Teiling	200	0.39	23.00	21.00	1938.90
MEL - 0303	11-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - 0303	11-Aug-24	2206	Botryococcus braunii Kutzing	400	0.57	14.00	14.00	1436.80
MEL - 0303	11-Aug-24	2247	Oocystis gigas Archer	200	0.48	18.00	16.00	2412.70
MEL - 0303	11-Aug-24	4351	Small chrysophyceae	402304	2.25	2.20	2.20	5.60
MEL - 0303	11-Aug-24	4352	Large chrysophyceae	7184	1.29	7.00	7.00	179.60
MEL - 0303	11-Aug-24	4355	Chrysochromulina parva Lackey	114944	7.52	5.00	5.00	65.40
MEL - 0303	11-Aug-24	4357	Chrysococcus sp.	416672	27.25	5.00	5.00	65.40
MEL - 0303	11-Aug-24	4358	Chrysostephanosphaera globulifera Scherffel	7184	2.56	8.80	8.80	356.80
MEL - 0303	11-Aug-24	4362	Kephyrion sp.	122128	1.40	2.80	2.80	11.50
MEL - 0303	11-Aug-24	4363	Spiniferomonas serrata	7184	0.85	6.10	6.10	118.80
MEL - 0303	11-Aug-24	4368	Mallomonas crassisquama (Asmund) Fott	400	0.42	20.00	10.00	1047.20
MEL - 0303	11-Aug-24	4378	Dinobryon borgei Lemmermann	7184	0.29	8.60	3.00	40.50
MEL - 0303	11-Aug-24	4388	Dinobryon sertularia Ehrenberg	21552	4.88	12.00	6.00	226.20
MEL - 0303	11-Aug-24	4388	Dinobryon sertularia Ehrenberg	400	0.50	0.00	0.00	1250.00
MEL - 0303	11-Aug-24	4390	Dinobryon sociale Ehrenberg	193968	43.88	12.00	6.00	226.20
MEL - 0303	11-Aug-24	4390	Dinobryon sociale Ehrenberg	200	0.25	0.00	0.00	1250.00
MEL - 0303	11-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.20	5.80	3.00	27.30
MEL - 0303	11-Aug-24	4401	Uroglena volvox Ehrenberg	93392	10.56	6.00	6.00	113.10
MEL - 0303	11-Aug-24	4401	Uroglena volvox Ehrenberg	200	7.06	0.00	0.00	35300.00
MEL - 0303	11-Aug-24	4413	Chrysochromulina laurentiana Kling	100576	39.69	9.10	9.10	394.60
MEL - 0303	11-Aug-24	4414	Stichogloea spp.	7184	0.36	6.00	4.00	50.30
MEL - 0303	11-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	2400	5.02	11.00	22.00	2090.70
MEL - 0303	11-Aug-24	5509	Cyclotella ocellata Pant.	28736	3.11	4.10	8.20	108.30
MEL - 0303	11-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	5600	4.22	80.00	6.00	754.00
MEL - 0303	11-Aug-24	5515	Fragilaria crotonensis Kitton	2400	0.68	68.00	4.00	284.80
MEL - 0303	11-Aug-24	5518	Synedra acus Kutzing	1800	0.19	100.00	2.00	104.70
MEL - 0303	11-Aug-24	5524	Asterionella formosa Hassall	600	0.06	100.00	2.00	104.70
MEL - 0303	11-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	600	5.05	17.50	35.00	8418.50
MEL - 0303	11-Aug-24	5551	Cyclotella michiganiana Skvortzow	7184	0.18	2.50	5.00	24.50
MEL - 0303	11-Aug-24	6554	Rhodomonas minuta Skuja	57472	7.22	10.00	6.00	125.70
MEL - 0303	11-Aug-24	6558	Cryptomonas erosa Ehrenberg	3800	6.73	25.90	14.00	1772.00
MEL - 0303	11-Aug-24	6565	Cryptomonas rostratiformis Skuja	200	0.47	34.00	14.00	2326.20
MEL - 0303	11-Aug-24	7632	Gymnodinium sp.	2800	11.73	20.00	20.00	4188.80
MEL - 0303	11-Aug-24	7632	Gymnodinium sp.	400	8.98	35.00	35.00	22449.30
MEL - 0303	11-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	5000	20.32	19.80	19.80	4064.40
MEL - 0303	11-Aug-24	7641	Peridinium aciculiferum Lemmermann	200	1.81	30.00	24.00	9047.80
MEL - 0304	11-Aug-24	2112	Sphaerocystis schroeteri Chodat	43104	0.50	2.80	2.80	11.50
MEL - 0304	11-Aug-24	2121	Oocystis lacustris Chodat	21552	0.56	5.50	3.00	25.90
MEL - 0304	11-Aug-24	2137	Dictyosphaerium simplex Sukja	86208	0.36	2.00	2.00	4.20
MEL - 0304	11-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.43	9.60	4.00	60.30
MEL - 0304	11-Aug-24	2178	Cosmarium sp.	200	0.28	20.00	20.00	1396.30
MEL - 0304	11-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	1000	0.41	14.00	12.00	410.50
MEL - 0304	11-Aug-24	2193	Staurodesmus paradoxum Meyen	200	0.71	28.00	26.00	3557.70
MEL - 0304	11-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	21552	0.81	6.00	6.00	37.70
MEL - 0304	11-Aug-24	2206	Botryococcus braunii Kutzing	600	0.86	14.00	14.00	1436.80
MEL - 0304	11-Aug-24	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.03	3.00	3.00	4.70
MEL - 0304	11-Aug-24	4351	Small chrysophyceae	158048	0.89	2.20	2.20	5.60
MEL - 0304	11-Aug-24	4352	Large chrysophyceae	21552	3.87	7.00	7.00	179.60
MEL - 0304	11-Aug-24	4355	Chrysochromulina parva Lackey	35920	2.35	5.00	5.00	65.40
MEL - 0304	11-Aug-24	4357	Chrysococcus sp.	344832	22.55	5.00	5.00	65.40
MEL - 0304	11-Aug-24	4362	Kephyrion sp.	143680	1.65	2.80	2.80	11.50

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0304	11-Aug-24	4378	Dinobryon borgei Lemmermann	28736	1.16	8.60	3.00	40.50
MEL - 0304	11-Aug-24	4388	Dinobryon sertularia Ehrenberg	35920	8.13	12.00	6.00	226.20
MEL - 0304	11-Aug-24	4388	Dinobryon sertularia Ehrenberg	800	1.00	0.00	0.00	1250.00
MEL - 0304	11-Aug-24	4390	Dinobryon sociale Ehrenberg	79024	17.88	12.00	6.00	226.20
MEL - 0304	11-Aug-24	4390	Dinobryon sociale Ehrenberg	200	0.25	0.00	0.00	1250.00
MEL - 0304	11-Aug-24	4401	Uroglena volvox Ehrenberg	344832	39.00	6.00	6.00	113.10
MEL - 0304	11-Aug-24	4413	Chrysochromulina laurentiana Kling	71840	28.35	9.10	9.10	394.60
MEL - 0304	11-Aug-24	4414	Stichogloea spp.	7184	0.36	6.00	4.00	50.30
MEL - 0304	11-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	1800	3.76	11.00	22.00	2090.70
MEL - 0304	11-Aug-24	5509	Cyclotella ocellata Pant.	35920	3.75	4.05	8.10	104.30
MEL - 0304	11-Aug-24	5514	Tabellaria flocculosa (Roth) Kutzing	1000	1.33	26.00	14.00	1334.10
MEL - 0304	11-Aug-24	5518	Synedra acus Kutzing	2600	0.27	100.00	2.00	104.70
MEL - 0304	11-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	200	0.41	220.00	6.00	2073.50
MEL - 0304	11-Aug-24	5524	Asterionella formosa Hassall	4600	0.48	100.00	2.00	104.70
MEL - 0304	11-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	800	6.73	17.50	35.00	8418.50
MEL - 0304	11-Aug-24	5551	Cyclotella michiganiana Skvortzow	86208	2.11	2.50	5.00	24.50
MEL - 0304	11-Aug-24	6554	Rhodomonas minuta Skuja	57472	7.22	10.00	6.00	125.70
MEL - 0304	11-Aug-24	6558	Cryptomonas erosa Ehrenberg	1000	1.75	25.60	14.00	1751.50
MEL - 0304	11-Aug-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0304	11-Aug-24	7632	Gymnodinium sp.	2000	8.38	20.00	20.00	4188.80
MEL - 0304	11-Aug-24	7632	Gymnodinium sp.	400	8.98	35.00	35.00	22449.30
MEL - 0304	11-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	4400	17.88	19.80	19.80	4064.40
MEL - 0305	12-Aug-24	1054	Planktolyngbya limnetica	200	0.03	130.00	1.20	147.00
MEL - 0305	12-Aug-24	2112	Sphaerocystis schroeteri Chodat	7184	0.08	2.80	2.80	11.50
MEL - 0305	12-Aug-24	2121	Oocystis lacustris Chodat	7184	0.19	5.50	3.00	25.90
MEL - 0305	12-Aug-24	2132	Scenedesmus denticulatus Lagerhiem	28736	1.32	8.20	4.00	45.80
MEL - 0305	12-Aug-24	2137	Dictyosphaerium simplex Sukja	150864	0.63	2.00	2.00	4.20
MEL - 0305	12-Aug-24	2167	Elakatothrix gelatinosa Willen	28736	0.45	10.00	2.00	15.70
MEL - 0305	12-Aug-24	2169	Planctonema lauterbornii Schmidle	7184	2.54	18.00	5.00	353.40
MEL - 0305	12-Aug-24	2182	Euastrum spp.	200	0.37	22.00	22.00	1858.40
MEL - 0305	12-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	1000	0.41	14.00	12.00	410.50
MEL - 0305	12-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	28736	1.08	6.00	6.00	37.70
MEL - 0305	12-Aug-24	2206	Botryococcus braunii Kutzing	200	0.29	14.00	14.00	1436.80
MEL - 0305	12-Aug-24	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.03	3.00	3.00	4.70
MEL - 0305	12-Aug-24	2247	Oocystis gigas Archer	600	1.45	18.00	16.00	2412.70
MEL - 0305	12-Aug-24	4351	Small chrysophyceae	294544	1.65	2.20	2.20	5.60
MEL - 0305	12-Aug-24	4352	Large chrysophyceae	43104	7.74	7.00	7.00	179.60
MEL - 0305	12-Aug-24	4355	Chrysochromulina parva Lackey	100576	6.58	5.00	5.00	65.40
MEL - 0305	12-Aug-24	4357	Chrysococcus sp.	359200	23.49	5.00	5.00	65.40
MEL - 0305	12-Aug-24	4362	Kephyrion sp.	122128	1.40	2.80	2.80	11.50
MEL - 0305	12-Aug-24	4383	Dinobryon bavaricum Imhof	136496	30.88	12.00	6.00	226.20
MEL - 0305	12-Aug-24	4388	Dinobryon sertularia Ehrenberg	28736	6.50	12.00	6.00	226.20
MEL - 0305	12-Aug-24	4388	Dinobryon sertularia Ehrenberg	400	0.50	0.00	0.00	1250.00
MEL - 0305	12-Aug-24	4390	Dinobryon sociale Ehrenberg	400	0.38	0.00	0.00	950.00
MEL - 0305	12-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	21552	0.59	5.80	3.00	27.30
MEL - 0305	12-Aug-24	4401	Uroglena volvox Ehrenberg	165232	18.69	6.00	6.00	113.10
MEL - 0305	12-Aug-24	4411	Bitrichia chodatii (Reverdin) Chodat	7184	0.36	6.00	4.00	50.30
MEL - 0305	12-Aug-24	4413	Chrysochromulina laurentiana Kling	93392	36.85	9.10	9.10	394.60
MEL - 0305	12-Aug-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	50288	1.30	5.50	3.00	25.90
MEL - 0305	12-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	1200	2.51	11.00	22.00	2090.70
MEL - 0305	12-Aug-24	5508	Cyclotella pseudostelligera	14368	8.08	7.10	14.20	562.20
MEL - 0305	12-Aug-24	5509	Cyclotella ocellata Pant.	28736	3.00	4.05	8.10	104.30
MEL - 0305	12-Aug-24	5511	Rhizosolenia eriense H.L. Smith	7184	0.61	12.00	3.00	84.80
MEL - 0305	12-Aug-24	5518	Synedra acus Kutzing	2800	0.29	100.00	2.00	104.70
MEL - 0305	12-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	600	1.24	220.00	6.00	2073.50
MEL - 0305	12-Aug-24	5524	Asterionella formosa Hassall	200	0.02	100.00	2.00	104.70
MEL - 0305	12-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	400	3.37	17.50	35.00	8418.50
MEL - 0305	12-Aug-24	5551	Cyclotella michiganiana Skvortzow	43104	1.06	2.50	5.00	24.50
MEL - 0305	12-Aug-24	6554	Rhodomonas minuta Skuja	100576	12.64	10.00	6.00	125.70
MEL - 0305	12-Aug-24	6558	Cryptomonas erosa Ehrenberg	2000	3.50	25.60	14.00	1751.50
MEL - 0305	12-Aug-24	7631	Gymnodinium helveticum Penard	800	18.85	50.00	30.00	23561.90
MEL - 0305	12-Aug-24	7632	Gymnodinium sp.	5000	20.94	20.00	20.00	4188.80
MEL - 0305	12-Aug-24	7632	Gymnodinium sp.	1200	26.94	35.00	35.00	22449.30
MEL - 0305	12-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	6600	26.83	19.80	19.80	4064.40
MEL - 0401	21-Aug-24	2112	Sphaerocystis schroeteri Chodat	50288	0.58	2.80	2.80	11.50
MEL - 0401	21-Aug-24	2121	Oocystis lacustris Chodat	28736	0.74	5.50	3.00	25.90
MEL - 0401	21-Aug-24	2137	Dictyosphaerium simplex Sukja	122128	0.51	2.00	2.00	4.20
MEL - 0401	21-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	35920	2.17	9.60	4.00	60.30
MEL - 0401	21-Aug-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0401	21-Aug-24	2167	Elakatothrix gelatinosa Willen	35920	0.56	10.00	2.00	15.70
MEL - 0401	21-Aug-24	2169	Planctonema lauterbornii Schmidle	57472	20.31	18.00	5.00	353.40
MEL - 0401	21-Aug-24	2178	Cosmarium sp.	200	0.28	20.00	20.00	1396.30
MEL - 0401	21-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	1200	0.49	14.00	12.00	410.50
MEL - 0401	21-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	71840	2.71	6.00	6.00	37.70
MEL - 0401	21-Aug-24	2206	Botryococcus braunii Kutzing	400	0.57	14.00	14.00	1436.80
MEL - 0401	21-Aug-24	2247	Oocystis gigas Archer	1200	2.90	18.00	16.00	2412.70
MEL - 0401	21-Aug-24	4351	Small chrysophyceae	344832	1.93	2.20	2.20	5.60
MEL - 0401	21-Aug-24	4352	Large chrysophyceae	7184	1.29	7.00	7.00	179.60
MEL - 0401	21-Aug-24	4357	Chrysococcus sp.	150864	9.87	5.00	5.00	65.40
MEL - 0401	21-Aug-24	4362	Kephyrion sp.	57472	0.66	2.80	2.80	11.50
MEL - 0401	21-Aug-24	4368	Mallomonas crassisquama (Asmund) Fott	400	0.42	20.00	10.00	1047.20
MEL - 0401	21-Aug-24	4388	Dinobryon sertularia Ehrenberg	43104	9.75	12.00	6.00	226.20
MEL - 0401	21-Aug-24	4390	Dinobryon sociale Ehrenberg	100576	22.75	12.00	6.00	226.20
MEL - 0401	21-Aug-24	4401	Uroglena volvox Ehrenberg	21552	2.44	6.00	6.00	113.10
MEL - 0401	21-Aug-24	4413	Chrysochromulina laurentiana Kling	7184	2.83	9.10	9.10	394.60
MEL - 0401	21-Aug-24	4414	Stichogloea spp.	172416	8.67	6.00	4.00	50.30
MEL - 0401	21-Aug-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	7184	0.19	5.50	3.00	25.90
MEL - 0401	21-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	3800	7.94	11.00	22.00	2090.70
MEL - 0401	21-Aug-24	5508	Cyclotella pseudostelligera	14368	8.08	7.10	14.20	562.20
MEL - 0401	21-Aug-24	5509	Cyclotella ocellata Pant.	28736	3.00	4.05	8.10	104.30
MEL - 0401	21-Aug-24	5518	Synedra acus Kutzing	1400	0.15	100.00	2.00	104.70
MEL - 0401	21-Aug-24	5524	Asterionella formosa Hassall	600	0.06	100.00	2.00	104.70
MEL - 0401	21-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	200	1.68	17.50	35.00	8418.50
MEL - 0401	21-Aug-24	5551	Cyclotella michiganiana Skvortzow	43104	1.06	2.50	5.00	24.50
MEL - 0401	21-Aug-24	6554	Rhodomonas minuta Skuja	100576	12.64	10.00	6.00	125.70
MEL - 0401	21-Aug-24	6558	Cryptomonas erosa Ehrenberg	3200	5.60	25.60	14.00	1751.50
MEL - 0401	21-Aug-24	6568	Katablepharis ovalis Skuja	7184	0.32	8.00	4.00	44.70

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0401	21-Aug-24	7632	Gymnodinium sp.	1600	6.70	20.00	20.00	4188.80
MEL - 0401	21-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	600	2.44	19.80	19.80	4064.40
MEL - 0402	20-Aug-24	2105	Chlamydomonas spp.	7184	0.21	6.10	3.00	28.70
MEL - 0402	20-Aug-24	2121	Oocystis lacustris Chodat	21552	0.56	5.50	3.00	25.90
MEL - 0402	20-Aug-24	2137	Dictyosphaerium simplex Sukja	57472	0.24	2.00	2.00	4.20
MEL - 0402	20-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	100576	6.06	9.60	4.00	60.30
MEL - 0402	20-Aug-24	2167	Elakatothrix gelatinosa Willen	7184	0.11	10.00	2.00	15.70
MEL - 0402	20-Aug-24	2178	Cosmarium sp.	200	0.28	20.00	20.00	1396.30
MEL - 0402	20-Aug-24	2182	Euastrum spp.	200	0.37	22.00	22.00	1858.40
MEL - 0402	20-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	1000	0.41	14.00	12.00	410.50
MEL - 0402	20-Aug-24	2193	Staurodesmus paradoxum Meyen	200	0.57	26.00	24.00	2831.60
MEL - 0402	20-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	28736	1.08	6.00	6.00	37.70
MEL - 0402	20-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - 0402	20-Aug-24	4351	Small chrysophyceae	294544	1.65	2.20	2.20	5.60
MEL - 0402	20-Aug-24	4352	Large chrysophyceae	7184	1.29	7.00	7.00	179.60
MEL - 0402	20-Aug-24	4357	Chrysococcus sp.	93392	6.11	5.00	5.00	65.40
MEL - 0402	20-Aug-24	4361	Kephyrion boreale Skuja	7184	0.85	6.10	6.10	118.80
MEL - 0402	20-Aug-24	4362	Kephyrion sp.	7184	0.08	2.80	2.80	11.50
MEL - 0402	20-Aug-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - 0402	20-Aug-24	4390	Dinobryon sociale Ehrenberg	100576	39.81	21.00	6.00	395.80
MEL - 0402	20-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.20	5.80	3.00	27.30
MEL - 0402	20-Aug-24	4401	Uroglena volvox Ehrenberg	100576	11.38	6.00	6.00	113.10
MEL - 0402	20-Aug-24	4413	Chrysochromulina laurentiana Kling	43104	17.01	9.10	9.10	394.60
MEL - 0402	20-Aug-24	4414	Stichogloea spp.	28736	1.45	6.00	4.00	50.30
MEL - 0402	20-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	4400	9.20	11.00	22.00	2090.70
MEL - 0402	20-Aug-24	5508	Cyclotella pseudostelligera	21552	12.12	7.10	14.20	562.20
MEL - 0402	20-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	800	0.61	81.00	6.00	763.40
MEL - 0402	20-Aug-24	5518	Synedra acus Kutzing	1000	0.10	100.00	2.00	104.70
MEL - 0402	20-Aug-24	5524	Asterionella formosa Hassall	400	0.04	100.00	2.00	104.70
MEL - 0402	20-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	600	5.05	17.50	35.00	8418.50
MEL - 0402	20-Aug-24	5551	Cyclotella michiganiana Skvortzow	93392	2.29	2.50	5.00	24.50
MEL - 0402	20-Aug-24	6554	Rhodomonas minuta Skuja	150864	18.96	10.00	6.00	125.70
MEL - 0402	20-Aug-24	6558	Cryptomonas erosa Ehrenberg	2800	4.90	25.60	14.00	1751.50
MEL - 0402	20-Aug-24	6559	Cryptomonas ovata Ehrenberg	400	2.23	40.00	20.00	5585.10
MEL - 0402	20-Aug-24	7632	Gymnodinium sp.	1000	4.19	20.00	20.00	4188.80
MEL - 0402	20-Aug-24	7632	Gymnodinium sp.	800	17.96	35.00	35.00	22449.30
MEL - 0402	20-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	1600	6.50	19.80	19.80	4064.40
MEL - 0402R	20-Aug-24	1054	Planktolyngbya limnetica	400	0.06	130.00	1.20	147.00
MEL - 0402R	20-Aug-24	2105	Chlamydomonas spp.	7184	0.22	6.40	3.00	30.20
MEL - 0402R	20-Aug-24	2121	Oocystis lacustris Chodat	43104	1.12	5.50	3.00	25.90
MEL - 0402R	20-Aug-24	2137	Dictyosphaerium simplex Sukja	43104	0.18	2.00	2.00	4.20
MEL - 0402R	20-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	64656	3.90	9.60	4.00	60.30
MEL - 0402R	20-Aug-24	2167	Elakatothrix gelatinosa Willen	64656	1.02	10.00	2.00	15.70
MEL - 0402R	20-Aug-24	2169	Planctonema lauterbornii Schmidle	28736	10.16	18.00	5.00	353.40
MEL - 0402R	20-Aug-24	2182	Euastrum spp.	600	1.12	22.00	22.00	1858.40
MEL - 0402R	20-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	1600	0.66	14.00	12.00	410.50
MEL - 0402R	20-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - 0402R	20-Aug-24	2247	Oocystis gigas Archer	600	1.45	18.00	16.00	2412.70
MEL - 0402R	20-Aug-24	4351	Small chrysophyceae	395120	2.21	2.20	2.20	5.60
MEL - 0402R	20-Aug-24	4357	Chrysococcus sp.	136496	8.93	5.00	5.00	65.40
MEL - 0402R	20-Aug-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - 0402R	20-Aug-24	4388	Dinobryon sertularia Ehrenberg	28736	6.50	12.00	6.00	226.20
MEL - 0402R	20-Aug-24	4388	Dinobryon sertularia Ehrenberg	200	0.25	0.00	0.00	1250.00
MEL - 0402R	20-Aug-24	4390	Dinobryon sociale Ehrenberg	79024	17.88	12.00	6.00	226.20
MEL - 0402R	20-Aug-24	4401	Uroglena volvox Ehrenberg	64656	7.31	6.00	6.00	113.10
MEL - 0402R	20-Aug-24	4411	Bitrichia chodatii (Reverdin) Chodat	7184	0.36	6.00	4.00	50.30
MEL - 0402R	20-Aug-24	4413	Chrysochromulina laurentiana Kling	35920	14.17	9.10	9.10	394.60
MEL - 0402R	20-Aug-24	4414	Stichogloea spp.	28736	1.45	6.00	4.00	50.30
MEL - 0402R	20-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	3200	6.69	11.00	22.00	2090.70
MEL - 0402R	20-Aug-24	5508	Cyclotella pseudostelligera	14368	8.08	7.10	14.20	562.20
MEL - 0402R	20-Aug-24	5509	Cyclotella ocellata Pant.	14368	1.50	4.05	8.10	104.30
MEL - 0402R	20-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	400	0.31	81.00	6.00	763.40
MEL - 0402R	20-Aug-24	5518	Synedra acus Kutzing	400	0.04	100.00	2.00	104.70
MEL - 0402R	20-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	1200	10.10	17.50	35.00	8418.50
MEL - 0402R	20-Aug-24	5551	Cyclotella michiganiana Skvortzow	122128	2.99	2.50	5.00	24.50
MEL - 0402R	20-Aug-24	6554	Rhodomonas minuta Skuja	100576	12.64	10.00	6.00	125.70
MEL - 0402R	20-Aug-24	6558	Cryptomonas erosa Ehrenberg	4200	7.36	25.60	14.00	1751.50
MEL - 0402R	20-Aug-24	6565	Cryptomonas rostratiformis Skuja	600	3.35	40.00	20.00	5585.10
MEL - 0402R	20-Aug-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0402R	20-Aug-24	7632	Gymnodinium sp.	1200	5.03	20.00	20.00	4188.80
MEL - 0402R	20-Aug-24	7632	Gymnodinium sp.	400	8.98	35.00	35.00	22449.30
MEL - 0402R	20-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	1200	4.88	19.80	19.80	4064.40
MEL - 0403	21-Aug-24	2105	Chlamydomonas spp.	7184	0.20	6.00	3.00	28.30
MEL - 0403	21-Aug-24	2121	Oocystis lacustris Chodat	129312	3.35	5.50	3.00	25.90
MEL - 0403	21-Aug-24	2137	Dictyosphaerium simplex Sukja	79024	0.33	2.00	2.00	4.20
MEL - 0403	21-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	64656	3.90	9.60	4.00	60.30
MEL - 0403	21-Aug-24	2167	Elakatothrix gelatinosa Willen	28736	0.45	10.00	2.00	15.70
MEL - 0403	21-Aug-24	2169	Planctonema lauterbornii Schmidle	50288	17.77	18.00	5.00	353.40
MEL - 0403	21-Aug-24	2182	Euastrum spp.	200	0.37	22.00	22.00	1858.40
MEL - 0403	21-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	400	0.16	14.00	12.00	410.50
MEL - 0403	21-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	21552	0.81	6.00	6.00	37.70
MEL - 0403	21-Aug-24	2206	Botryococcus braunii Kutzing	400	0.57	14.00	14.00	1436.80
MEL - 0403	21-Aug-24	2247	Oocystis gigas Archer	600	1.45	18.00	16.00	2412.70
MEL - 0403	21-Aug-24	4351	Small chrysophyceae	344832	1.93	2.20	2.20	5.60
MEL - 0403	21-Aug-24	4352	Large chrysophyceae	35920	6.45	7.00	7.00	179.60
MEL - 0403	21-Aug-24	4355	Chrysochromulina parva Lackey	35920	2.35	5.00	5.00	65.40
MEL - 0403	21-Aug-24	4357	Chrysococcus sp.	294544	19.26	5.00	5.00	65.40
MEL - 0403	21-Aug-24	4362	Kephyrion sp.	86208	0.99	2.80	2.80	11.50
MEL - 0403	21-Aug-24	4368	Mallomonas crassisquama (Asmund) Fott	200	0.21	20.00	10.00	1047.20
MEL - 0403	21-Aug-24	4378	Dinobryon borgei Lemmermann	7184	0.29	8.60	3.00	40.50
MEL - 0403	21-Aug-24	4388	Dinobryon sertularia Ehrenberg	7184	1.63	12.00	6.00	226.20
MEL - 0403	21-Aug-24	4390	Dinobryon sociale Ehrenberg	122128	27.63	12.00	6.00	226.20
MEL - 0403	21-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.20	5.80	3.00	27.30
MEL - 0403	21-Aug-24	4401	Uroglena volvox Ehrenberg	14368	1.63	6.00	6.00	113.10
MEL - 0403	21-Aug-24	4413	Chrysochromulina laurentiana Kling	114944	45.36	9.10	9.10	394.60
MEL - 0403	21-Aug-24	4414	Stichogloea spp.	7184	0.36	6.00	4.00	50.30
MEL - 0403	21-Aug-24	4437	Pteridomonas sp.	21552	5.13	8.80	8.80	237.90

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0403	21-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	4600	9.62	11.00	22.00	2090.70
MEL - 0403	21-Aug-24	5508	Cyclotella pseudostelligera	7184	4.04	7.10	14.20	562.20
MEL - 0403	21-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	4200	3.17	80.00	6.00	754.00
MEL - 0403	21-Aug-24	5515	Fragilaria crotonensis Kitton	400	0.11	68.00	4.00	284.80
MEL - 0403	21-Aug-24	5518	Synedra acus Kutzing	1000	0.10	100.00	2.00	104.70
MEL - 0403	21-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	800	6.73	17.50	35.00	8418.50
MEL - 0403	21-Aug-24	5551	Cyclotella michiganiana Skvortzow	86208	2.11	2.50	5.00	24.50
MEL - 0403	21-Aug-24	6554	Rhodomonas minuta Skuja	208336	26.19	10.00	6.00	125.70
MEL - 0403	21-Aug-24	6558	Cryptomonas erosa Ehrenberg	2200	3.85	25.60	14.00	1751.50
MEL - 0403	21-Aug-24	7632	Gymnodinium sp.	1000	4.19	20.00	20.00	4188.80
MEL - 0403	21-Aug-24	7632	Gymnodinium sp.	600	13.47	35.00	35.00	22449.30
MEL - 0403	21-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	200	0.81	19.80	19.80	4064.40
MEL - 0404	21-Aug-24	1073	Snowella sp	400	0.20	0.00	0.00	500.00
MEL - 0404	21-Aug-24	2112	Sphaerocystis schroeteri Chodat	57472	0.66	2.80	2.80	11.50
MEL - 0404	21-Aug-24	2121	Oocystis lacustris Chodat	201152	5.21	5.50	3.00	25.90
MEL - 0404	21-Aug-24	2137	Dictyosphaerium simplex Sukja	150864	0.63	2.00	2.00	4.20
MEL - 0404	21-Aug-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0404	21-Aug-24	2167	Elakatothrix gelatinosa Willen	7184	0.11	10.00	2.00	15.70
MEL - 0404	21-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	1000	0.41	14.00	12.00	410.50
MEL - 0404	21-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - 0404	21-Aug-24	2206	Botryococcus braunii Kutzing	200	0.29	14.00	14.00	1436.80
MEL - 0404	21-Aug-24	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.03	3.00	3.00	4.70
MEL - 0404	21-Aug-24	2247	Oocystis gigas Archer	200	0.48	18.00	16.00	2412.70
MEL - 0404	21-Aug-24	4351	Small chrysophyceae	100576	0.56	2.20	2.20	5.60
MEL - 0404	21-Aug-24	4352	Large chrysophyceae	7184	1.29	7.00	7.00	179.60
MEL - 0404	21-Aug-24	4355	Chrysochromulina parva Lackey	7184	0.47	5.00	5.00	65.40
MEL - 0404	21-Aug-24	4357	Chrysococcus sp.	122128	7.99	5.00	5.00	65.40
MEL - 0404	21-Aug-24	4362	Kephyrion sp.	7184	0.08	2.80	2.80	11.50
MEL - 0404	21-Aug-24	4368	Mallomonas crassisquama (Asmund) Fott	400	0.42	20.00	10.00	1047.20
MEL - 0404	21-Aug-24	4388	Dinobryon sertularia Ehrenberg	7184	1.63	12.00	6.00	226.20
MEL - 0404	21-Aug-24	4390	Dinobryon sociale Ehrenberg	71840	16.25	12.00	6.00	226.20
MEL - 0404	21-Aug-24	4390	Dinobryon sociale Ehrenberg	200	0.40	0.00	0.00	1991.00
MEL - 0404	21-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.20	5.80	3.00	27.30
MEL - 0404	21-Aug-24	4401	Uroglena volvox Ehrenberg	21552	2.44	6.00	6.00	113.10
MEL - 0404	21-Aug-24	4413	Chrysochromulina laurentiana Kling	7184	2.83	9.10	9.10	394.60
MEL - 0404	21-Aug-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	7184	0.19	5.50	3.00	25.90
MEL - 0404	21-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	4800	10.04	11.00	22.00	2090.70
MEL - 0404	21-Aug-24	5509	Cyclotella ocellata Pant.	7184	0.75	4.05	8.10	104.30
MEL - 0404	21-Aug-24	5515	Fragilaria crotonensis Kitton	600	0.17	68.00	4.00	284.80
MEL - 0404	21-Aug-24	5518	Synedra acus Kutzing	600	0.06	100.00	2.00	104.70
MEL - 0404	21-Aug-24	5524	Asterionella formosa Hassall	400	0.04	100.00	2.00	104.70
MEL - 0404	21-Aug-24	5551	Cyclotella michiganiana Skvortzow	86208	1.09	2.00	4.00	12.60
MEL - 0404	21-Aug-24	6554	Rhodomonas minuta Skuja	172416	21.67	10.00	6.00	125.70
MEL - 0404	21-Aug-24	6558	Cryptomonas erosa Ehrenberg	1600	2.80	25.60	14.00	1751.50
MEL - 0404	21-Aug-24	7632	Gymnodinium sp.	600	2.51	20.00	20.00	4188.80
MEL - 0404	21-Aug-24	7632	Gymnodinium sp.	200	4.49	35.00	35.00	22449.30
MEL - 0404	21-Aug-24	7637	Peridinium limbatum (Stokes) Lemmermann	200	28.76	65.00	65.00	143793.30
MEL - 0404	21-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	1000	4.06	19.80	19.80	4064.40
MEL - 0405	21-Aug-24	2100	Pyramidomonas tetrarhynchus Schmarda	200	0.11	14.50	12.00	546.60
MEL - 0405	21-Aug-24	2112	Sphaerocystis schroeteri Chodat	244256	2.81	2.80	2.80	11.50
MEL - 0405	21-Aug-24	2121	Oocystis lacustris Chodat	50288	1.30	5.50	3.00	25.90
MEL - 0405	21-Aug-24	2137	Dictyosphaerium simplex Sukja	186784	0.78	2.00	2.00	4.20
MEL - 0405	21-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.43	9.60	4.00	60.30
MEL - 0405	21-Aug-24	2167	Elakatothrix gelatinosa Willen	7184	0.11	10.00	2.00	15.70
MEL - 0405	21-Aug-24	2169	Planctonema lauterbornii Schmidle	21552	7.62	18.00	5.00	353.40
MEL - 0405	21-Aug-24	2178	Cosmarium sp.	200	0.28	20.00	20.00	1396.30
MEL - 0405	21-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	1200	0.46	13.60	12.00	387.40
MEL - 0405	21-Aug-24	2193	Staurodesmus paradoxum Meyen	200	0.57	26.00	24.00	2831.60
MEL - 0405	21-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	64656	2.44	6.00	6.00	37.70
MEL - 0405	21-Aug-24	2247	Oocystis gigas Archer	400	0.97	18.00	16.00	2412.70
MEL - 0405	21-Aug-24	4351	Small chrysophyceae	229888	1.29	2.20	2.20	5.60
MEL - 0405	21-Aug-24	4352	Large chrysophyceae	21552	3.87	7.00	7.00	179.60
MEL - 0405	21-Aug-24	4357	Chrysococcus sp.	229888	15.03	5.00	5.00	65.40
MEL - 0405	21-Aug-24	4368	Mallomonas crassisquama (Asmund) Fott	200	0.21	20.00	10.00	1047.20
MEL - 0405	21-Aug-24	4383	Dinobryon bavaricum Imhof	7184	1.63	12.00	6.00	226.20
MEL - 0405	21-Aug-24	4390	Dinobryon sociale Ehrenberg	100576	22.75	12.00	6.00	226.20
MEL - 0405	21-Aug-24	4390	Dinobryon sociale Ehrenberg	200	0.19	0.00	0.00	950.00
MEL - 0405	21-Aug-24	4401	Uroglena volvox Ehrenberg	86208	9.75	6.00	6.00	113.10
MEL - 0405	21-Aug-24	4413	Chrysochromulina laurentiana Kling	100576	39.69	9.10	9.10	394.60
MEL - 0405	21-Aug-24	4414	Stichogloea spp.	7184	0.36	6.00	4.00	50.30
MEL - 0405	21-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	3400	7.11	11.00	22.00	2090.70
MEL - 0405	21-Aug-24	5509	Cyclotella ocellata Pant.	7184	0.75	4.05	8.10	104.30
MEL - 0405	21-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	1600	1.21	80.00	6.00	754.00
MEL - 0405	21-Aug-24	5515	Fragilaria crotonensis Kitton	400	0.11	68.00	4.00	284.80
MEL - 0405	21-Aug-24	5518	Synedra acus Kutzing	1600	0.17	100.00	2.00	104.70
MEL - 0405	21-Aug-24	5524	Asterionella formosa Hassall	1400	0.15	100.00	2.00	104.70
MEL - 0405	21-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	1400	11.79	17.50	35.00	8418.50
MEL - 0405	21-Aug-24	5551	Cyclotella michiganiana Skvortzow	35920	0.88	2.50	5.00	24.50
MEL - 0405	21-Aug-24	6554	Rhodomonas minuta Skuja	237072	29.80	10.00	6.00	125.70
MEL - 0405	21-Aug-24	6558	Cryptomonas erosa Ehrenberg	2400	4.20	25.60	14.00	1751.50
MEL - 0405	21-Aug-24	7632	Gymnodinium sp.	600	2.51	20.00	20.00	4188.80
MEL - 0405	21-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	1400	5.69	19.80	19.80	4064.40
MEL - 0501	14-Aug-24	2112	Sphaerocystis schroeteri Chodat	64656	0.74	2.80	2.80	11.50
MEL - 0501	14-Aug-24	2121	Oocystis lacustris Chodat	172416	4.47	5.50	3.00	25.90
MEL - 0501	14-Aug-24	2130	Scenedesmus quadricauda (Turp.) Brebisson	28736	1.54	9.60	4.00	53.60
MEL - 0501	14-Aug-24	2167	Elakatothrix gelatinosa Willen	35920	0.56	10.00	2.00	15.70
MEL - 0501	14-Aug-24	2169	Planctonema lauterbornii Schmidle	14368	5.08	18.00	5.00	353.40
MEL - 0501	14-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	600	0.25	14.00	12.00	410.50
MEL - 0501	14-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	50288	1.90	6.00	6.00	37.70
MEL - 0501	14-Aug-24	2215	Tetraedron caudatum (Corda) Hansgrig	14368	0.07	3.00	3.00	4.70
MEL - 0501	14-Aug-24	2247	Oocystis gigas Archer	200	0.48	18.00	16.00	2412.70
MEL - 0501	14-Aug-24	4351	Small chrysophyceae	186784	1.05	2.20	2.20	5.60
MEL - 0501	14-Aug-24	4357	Chrysococcus sp.	287360	18.79	5.00	5.00	65.40
MEL - 0501	14-Aug-24	4358	Chrysostephanosphaera globulifera Scherffel	7184	2.00	8.10	8.10	278.30
MEL - 0501	14-Aug-24	4362	Kephyrion sp.	129312	1.49	2.80	2.80	11.50
MEL - 0501	14-Aug-24	4364	Mallomonas caudata Ivanov	400	2.14	40.00	16.00	5361.70
MEL - 0501	14-Aug-24	4368	Mallomonas crassisquama (Asmund) Fott	400	0.42	20.00	10.00	1047.20

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0501	14-Aug-24	4378	Dinobryon borgei Lemmermann	7184	0.31	9.10	3.00	42.90
MEL - 0501	14-Aug-24	4388	Dinobryon sertularia Ehrenberg	7184	1.63	12.00	6.00	226.20
MEL - 0501	14-Aug-24	4388	Dinobryon sertularia Ehrenberg	400	0.50	0.00	0.00	1250.00
MEL - 0501	14-Aug-24	4390	Dinobryon sociale Ehrenberg	150864	34.13	12.00	6.00	226.20
MEL - 0501	14-Aug-24	4390	Dinobryon sociale Ehrenberg	200	0.40	0.00	0.00	1991.00
MEL - 0501	14-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.20	5.80	3.00	27.30
MEL - 0501	14-Aug-24	4401	Uroglena volvox Ehrenberg	7184	0.81	6.00	6.00	113.10
MEL - 0501	14-Aug-24	4411	Bitrichia chodatii (Reverdin) Chodat	7184	0.36	6.00	4.00	50.30
MEL - 0501	14-Aug-24	4413	Chrysochromulina laurentiana Kling	71840	28.35	9.10	9.10	394.60
MEL - 0501	14-Aug-24	4414	Stichogloea spp.	71840	3.61	6.00	4.00	50.30
MEL - 0501	14-Aug-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	7184	0.19	5.50	3.00	25.90
MEL - 0501	14-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	2600	5.44	11.00	22.00	2090.70
MEL - 0501	14-Aug-24	5508	Cyclotella pseudostelligera	57472	32.31	7.10	14.20	562.20
MEL - 0501	14-Aug-24	5511	Rhizosolenia eriense H.L. Smith	7184	0.61	12.00	3.00	84.80
MEL - 0501	14-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	200	0.15	80.00	6.00	754.00
MEL - 0501	14-Aug-24	5515	Fragilaria crotonensis Kitton	1200	0.36	71.00	4.00	297.40
MEL - 0501	14-Aug-24	5518	Synedra acus Kutzing	200	0.02	100.00	2.00	104.70
MEL - 0501	14-Aug-24	5524	Asterionella formosa Hassall	400	0.04	100.00	2.00	104.70
MEL - 0501	14-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	800	6.73	17.50	35.00	8418.50
MEL - 0501	14-Aug-24	5551	Cyclotella michiganiana Skvortzow	21552	0.53	2.50	5.00	24.50
MEL - 0501	14-Aug-24	6554	Rhodomonas minuta Skuja	114944	14.45	10.00	6.00	125.70
MEL - 0501	14-Aug-24	6558	Cryptomonas erosa Ehrenberg	1400	2.45	25.60	14.00	1751.50
MEL - 0501	14-Aug-24	7631	Gymnodinium helveticum Penard	600	14.14	50.00	30.00	23561.90
MEL - 0501	14-Aug-24	7632	Gymnodinium sp.	1200	5.03	20.00	20.00	4188.80
MEL - 0501	14-Aug-24	7632	Gymnodinium sp.	1400	31.43	35.00	35.00	22449.30
MEL - 0501	14-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	2200	8.94	19.80	19.80	4064.40
MEL - 0502	14-Aug-24	1014	Chroococcus limneticus Lemmermann	57472	4.48	5.30	5.30	78.00
MEL - 0502	14-Aug-24	1073	Snowella sp	200	0.15	0.00	0.00	750.00
MEL - 0502	14-Aug-24	1133	Anabaena flos-aquae (Lyngb.) Breb. & Bornet	1000	6.84	340.00	6.20	6843.20
MEL - 0502	14-Aug-24	2112	Sphaerocystis schroeteri Chodat	71840	0.83	2.80	2.80	11.50
MEL - 0502	14-Aug-24	2137	Dictyosphaerium simplex Sukja	93392	0.39	2.00	2.00	4.20
MEL - 0502	14-Aug-24	2167	Elakatothrix gelatinosa Willen	7184	0.11	10.00	2.00	15.70
MEL - 0502	14-Aug-24	2169	Planctonema lauterbornii Schmidle	28736	10.16	18.00	5.00	353.40
MEL - 0502	14-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	400	0.16	14.00	12.00	410.50
MEL - 0502	14-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - 0502	14-Aug-24	2247	Oocystis gigas Archer	400	0.97	18.00	16.00	2412.70
MEL - 0502	14-Aug-24	4351	Small chrysophyceae	330464	1.85	2.20	2.20	5.60
MEL - 0502	14-Aug-24	4352	Large chrysophyceae	21552	3.87	7.00	7.00	179.60
MEL - 0502	14-Aug-24	4355	Chrysochromulina parva Lackey	21552	1.41	5.00	5.00	65.40
MEL - 0502	14-Aug-24	4357	Chrysococcus sp.	280176	18.32	5.00	5.00	65.40
MEL - 0502	14-Aug-24	4358	Chrysostephanosphaera globulifera Scherffel	50288	17.94	8.80	8.80	356.80
MEL - 0502	14-Aug-24	4361	Kephyrion boreale Skuja	7184	0.85	6.10	6.10	118.80
MEL - 0502	14-Aug-24	4362	Kephyrion sp.	93392	1.07	2.80	2.80	11.50
MEL - 0502	14-Aug-24	4388	Dinobryon sertularia Ehrenberg	43104	9.75	12.00	6.00	226.20
MEL - 0502	14-Aug-24	4388	Dinobryon sertularia Ehrenberg	200	0.25	0.00	0.00	1250.00
MEL - 0502	14-Aug-24	4390	Dinobryon sociale Ehrenberg	57472	13.00	12.00	6.00	226.20
MEL - 0502	14-Aug-24	4390	Dinobryon sociale Ehrenberg	200	0.25	0.00	0.00	1250.00
MEL - 0502	14-Aug-24	4401	Uroglena volvox Ehrenberg	50288	5.69	6.00	6.00	113.10
MEL - 0502	14-Aug-24	4411	Bitrichia chodatii (Reverdin) Chodat	7184	0.36	6.00	4.00	50.30
MEL - 0502	14-Aug-24	4413	Chrysochromulina laurentiana Kling	43104	17.01	9.10	9.10	394.60
MEL - 0502	14-Aug-24	4414	Stichogloea spp.	86208	4.34	6.00	4.00	50.30
MEL - 0502	14-Aug-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	21552	0.56	5.50	3.00	25.90
MEL - 0502	14-Aug-24	4437	Pteridomonas sp.	21552	4.00	8.10	8.10	185.50
MEL - 0502	14-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	2000	4.18	11.00	22.00	2090.70
MEL - 0502	14-Aug-24	5508	Cyclotella pseudostelligera	7184	4.04	7.10	14.20	562.20
MEL - 0502	14-Aug-24	5515	Fragilaria crotonensis Kitton	400	0.12	69.00	4.00	289.00
MEL - 0502	14-Aug-24	5518	Synedra acus Kutzing	1800	0.19	100.00	2.00	104.70
MEL - 0502	14-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	400	0.83	220.00	6.00	2073.50
MEL - 0502	14-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	600	5.05	17.50	35.00	8418.50
MEL - 0502	14-Aug-24	5551	Cyclotella michiganiana Skvortzow	7184	0.18	2.50	5.00	24.50
MEL - 0502	14-Aug-24	6554	Rhodomonas minuta Skuja	43104	5.42	10.00	6.00	125.70
MEL - 0502	14-Aug-24	6558	Cryptomonas erosa Ehrenberg	1600	2.80	25.60	14.00	1751.50
MEL - 0502	14-Aug-24	6568	Katablepharis ovalis Skuja	7184	0.29	7.60	4.00	40.30
MEL - 0502	14-Aug-24	7631	Gymnodinium helveticum Penard	400	9.42	50.00	30.00	23561.90
MEL - 0502	14-Aug-24	7632	Gymnodinium sp.	3400	14.24	20.00	20.00	4188.80
MEL - 0502	14-Aug-24	7632	Gymnodinium sp.	800	17.96	35.00	35.00	22449.30
MEL - 0502	14-Aug-24	7637	Peridinium limbatum (Stokes) Lemmermann	200	28.76	65.00	65.00	143793.30
MEL - 0502	14-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	4000	16.26	19.80	19.80	4064.40
MEL - 0503	14-Aug-24	2112	Sphaerocystis schroeteri Chodat	64656	0.74	2.80	2.80	11.50
MEL - 0503	14-Aug-24	2121	Oocystis lacustris Chodat	172416	4.47	5.50	3.00	25.90
MEL - 0503	14-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.43	9.60	4.00	60.30
MEL - 0503	14-Aug-24	2164	Quadrigula closterioides (Bohl.) Printz	21552	0.66	16.00	2.20	30.40
MEL - 0503	14-Aug-24	2167	Elakatothrix gelatinosa Willen	50288	0.79	10.00	2.00	15.70
MEL - 0503	14-Aug-24	2169	Planctonema lauterbornii Schmidle	14368	5.08	18.00	5.00	353.40
MEL - 0503	14-Aug-24	2182	Euastrum spp.	200	0.37	22.00	22.00	1858.40
MEL - 0503	14-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	600	0.25	14.00	12.00	410.50
MEL - 0503	14-Aug-24	2193	Staurodesmus paradoxum Meyen	200	0.57	26.00	24.00	2831.60
MEL - 0503	14-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - 0503	14-Aug-24	2205	Mougeotia sp.	200	0.25	64.00	5.00	1256.60
MEL - 0503	14-Aug-24	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.03	3.00	3.00	4.70
MEL - 0503	14-Aug-24	2247	Oocystis gigas Archer	400	0.97	18.00	16.00	2412.70
MEL - 0503	14-Aug-24	2252	Scenedesmus acutus Chodat	28736	0.51	5.60	3.00	17.60
MEL - 0503	14-Aug-24	4351	Small chrysophyceae	237072	1.33	2.20	2.20	5.60
MEL - 0503	14-Aug-24	4352	Large chrysophyceae	21552	3.87	7.00	7.00	179.60
MEL - 0503	14-Aug-24	4357	Chrysococcus sp.	323280	21.14	5.00	5.00	65.40
MEL - 0503	14-Aug-24	4362	Kephyrion sp.	172416	1.98	2.80	2.80	11.50
MEL - 0503	14-Aug-24	4383	Dinobryon bavaricum Imhof	7184	1.63	12.00	6.00	226.20
MEL - 0503	14-Aug-24	4388	Dinobryon sertularia Ehrenberg	35920	8.13	12.00	6.00	226.20
MEL - 0503	14-Aug-24	4388	Dinobryon sertularia Ehrenberg	1200	1.50	0.00	0.00	1250.00
MEL - 0503	14-Aug-24	4390	Dinobryon sociale Ehrenberg	208336	47.13	12.00	6.00	226.20
MEL - 0503	14-Aug-24	4390	Dinobryon sociale Ehrenberg	400	0.38	0.00	0.00	950.00
MEL - 0503	14-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	43104	1.18	5.80	3.00	27.30
MEL - 0503	14-Aug-24	4401	Uroglena volvox Ehrenberg	86208	9.75	6.00	6.00	113.10
MEL - 0503	14-Aug-24	4413	Chrysochromulina laurentiana Kling	35920	14.17	9.10	9.10	394.60
MEL - 0503	14-Aug-24	4414	Stichogloea spp.	86208	4.34	6.00	4.00	50.30
MEL - 0503	14-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	2400	5.02	11.00	22.00	2090.70
MEL - 0503	14-Aug-24	5511	Rhizosolenia eriense H.L. Smith	21552	1.83	12.00	3.00	84.80

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0503	14-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	400	0.30	80.00	6.00	754.00
MEL - 0503	14-Aug-24	5518	Synedra acus Kutzing	2200	0.23	100.00	2.00	104.70
MEL - 0503	14-Aug-24	5524	Asterionella formosa Hassall	600	0.06	100.00	2.00	104.70
MEL - 0503	14-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	600	5.05	17.50	35.00	8418.50
MEL - 0503	14-Aug-24	5551	Cyclotella michiganiana Skvortzow	71840	1.76	2.50	5.00	24.50
MEL - 0503	14-Aug-24	6554	Rhodomonas minuta Skuja	57472	7.22	10.00	6.00	125.70
MEL - 0503	14-Aug-24	6558	Cryptomonas erosa Ehrenberg	1000	1.75	25.60	14.00	1751.50
MEL - 0503	14-Aug-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0503	14-Aug-24	7632	Gymnodinium sp.	800	3.35	20.00	20.00	4188.80
MEL - 0503	14-Aug-24	7632	Gymnodinium sp.	1000	22.45	35.00	35.00	22449.30
MEL - 0503	14-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	1600	6.50	19.80	19.80	4064.40
MEL - 0503	14-Aug-24	7641	Peridinium aciculiferum Lemmermann	200	1.81	30.00	24.00	9047.80
MEL - 0504	14-Aug-24	2121	Oocystis lacustris Chodat	70044	0.99	3.00	3.00	14.10
MEL - 0504	14-Aug-24	2137	Dictyosphaerium simplex Sukja	71840	0.30	2.00	2.00	4.20
MEL - 0504	14-Aug-24	2167	Elakatothrix gelatinosa Willen	7184	0.11	10.00	2.00	15.70
MEL - 0504	14-Aug-24	2182	Euastrum spp.	200	0.37	22.00	22.00	1858.40
MEL - 0504	14-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	600	0.25	14.00	12.00	410.50
MEL - 0504	14-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	50288	1.90	6.00	6.00	37.70
MEL - 0504	14-Aug-24	4351	Small chrysophyceae	158048	0.89	2.20	2.20	5.60
MEL - 0504	14-Aug-24	4352	Large chrysophyceae	7184	1.29	7.00	7.00	179.60
MEL - 0504	14-Aug-24	4355	Chrysochromulina parva Lackey	35920	2.35	5.00	5.00	65.40
MEL - 0504	14-Aug-24	4357	Chrysococcus sp.	251440	16.44	5.00	5.00	65.40
MEL - 0504	14-Aug-24	4362	Kephyrion sp.	193968	2.23	2.80	2.80	11.50
MEL - 0504	14-Aug-24	4368	Mallomonas crassisquama (Asmund) Fott	200	0.21	20.00	10.00	1047.20
MEL - 0504	14-Aug-24	4388	Dinobryon sertularia Ehrenberg	35920	8.13	12.00	6.00	226.20
MEL - 0504	14-Aug-24	4388	Dinobryon sertularia Ehrenberg	400	0.50	0.00	0.00	1250.00
MEL - 0504	14-Aug-24	4390	Dinobryon sociale Ehrenberg	100576	22.75	12.00	6.00	226.20
MEL - 0504	14-Aug-24	4401	Uroglena volvox Ehrenberg	21552	2.44	6.00	6.00	113.10
MEL - 0504	14-Aug-24	4413	Chrysochromulina laurentiana Kling	71840	28.35	9.10	9.10	394.60
MEL - 0504	14-Aug-24	4437	Pteridomonas sp.	7184	1.71	8.80	8.80	237.90
MEL - 0504	14-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	2000	4.18	11.00	22.00	2090.70
MEL - 0504	14-Aug-24	5508	Cyclotella pseudostelligera	35920	20.19	7.10	14.20	562.20
MEL - 0504	14-Aug-24	5509	Cyclotella ocellata Pant.	28736	3.00	4.05	8.10	104.30
MEL - 0504	14-Aug-24	5511	Rhizosolenia eriense H.L. Smith	7184	0.61	12.00	3.00	84.80
MEL - 0504	14-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	6800	5.19	81.00	6.00	763.40
MEL - 0504	14-Aug-24	5514	Tabellaria flocculosa (Roth) Kutzing	4600	6.14	26.00	14.00	1334.10
MEL - 0504	14-Aug-24	5518	Synedra acus Kutzing	1000	0.10	100.00	2.00	104.70
MEL - 0504	14-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	600	5.05	17.50	35.00	8418.50
MEL - 0504	14-Aug-24	5551	Cyclotella michiganiana Skvortzow	28736	0.70	2.50	5.00	24.50
MEL - 0504	14-Aug-24	6554	Rhodomonas minuta Skuja	7184	0.90	10.00	6.00	125.70
MEL - 0504	14-Aug-24	6558	Cryptomonas erosa Ehrenberg	1200	2.10	25.60	14.00	1751.50
MEL - 0504	14-Aug-24	7632	Gymnodinium sp.	1000	4.19	20.00	20.00	4188.80
MEL - 0504	14-Aug-24	7632	Gymnodinium sp.	1000	22.45	35.00	35.00	22449.30
MEL - 0504	14-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	1000	4.06	19.80	19.80	4064.40
MEL - 0505	14-Aug-24	2112	Sphaerocystis schroeteri Chodat	21552	0.25	2.80	2.80	11.50
MEL - 0505	14-Aug-24	2121	Oocystis lacustris Chodat	172416	4.47	5.50	3.00	25.90
MEL - 0505	14-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	50288	3.03	9.60	4.00	60.30
MEL - 0505	14-Aug-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0505	14-Aug-24	2167	Elakatothrix gelatinosa Willen	7184	0.11	10.00	2.00	15.70
MEL - 0505	14-Aug-24	2169	Planctonema lauterbornii Schmidle	28736	10.16	18.00	5.00	353.40
MEL - 0505	14-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	800	0.33	14.00	12.00	410.50
MEL - 0505	14-Aug-24	2191	Staurodesmus cuspidatus (Brebisson and Ralfs) Teiling	200	0.39	23.00	21.00	1938.90
MEL - 0505	14-Aug-24	2193	Staurodesmus paradoxum Meyen	200	0.57	26.00	24.00	2831.60
MEL - 0505	14-Aug-24	2206	Botryococcus braunii Kutzing	200	0.29	14.00	14.00	1436.80
MEL - 0505	14-Aug-24	2247	Oocystis gigas Archer	200	0.48	18.00	16.00	2412.70
MEL - 0505	14-Aug-24	4351	Small chrysophyceae	287360	1.61	2.20	2.20	5.60
MEL - 0505	14-Aug-24	4352	Large chrysophyceae	21552	3.87	7.00	7.00	179.60
MEL - 0505	14-Aug-24	4357	Chrysococcus sp.	352016	23.02	5.00	5.00	65.40
MEL - 0505	14-Aug-24	4358	Chrysostephanosphaera globulifera Scherffel	14368	5.13	8.80	8.80	356.80
MEL - 0505	14-Aug-24	4362	Kephyrion sp.	71840	0.83	2.80	2.80	11.50
MEL - 0505	14-Aug-24	4368	Mallomonas crassisquama (Asmund) Fott	600	0.63	20.00	10.00	1047.20
MEL - 0505	14-Aug-24	4369	Mallomonas pseudocoronata Prescott	200	0.36	24.00	12.00	1809.60
MEL - 0505	14-Aug-24	4388	Dinobryon sertularia Ehrenberg	7184	1.63	12.00	6.00	226.20
MEL - 0505	14-Aug-24	4388	Dinobryon sertularia Ehrenberg	1000	0.95	0.00	0.00	950.00
MEL - 0505	14-Aug-24	4390	Dinobryon sociale Ehrenberg	201152	45.50	12.00	6.00	226.20
MEL - 0505	14-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	71840	1.96	5.80	3.00	27.30
MEL - 0505	14-Aug-24	4401	Uroglena volvox Ehrenberg	21552	2.44	6.00	6.00	113.10
MEL - 0505	14-Aug-24	4413	Chrysochromulina laurentiana Kling	43104	17.01	9.10	9.10	394.60
MEL - 0505	14-Aug-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	35920	0.93	5.50	3.00	25.90
MEL - 0505	14-Aug-24	4437	Pteridomonas sp.	7184	1.71	8.80	8.80	237.90
MEL - 0505	14-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	3000	6.27	11.00	22.00	2090.70
MEL - 0505	14-Aug-24	5518	Synedra acus Kutzing	1200	0.13	100.00	2.00	104.70
MEL - 0505	14-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	400	0.83	220.00	6.00	2073.50
MEL - 0505	14-Aug-24	5524	Asterionella formosa Hassall	1600	0.17	100.00	2.00	104.70
MEL - 0505	14-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	400	3.37	17.50	35.00	8418.50
MEL - 0505	14-Aug-24	5551	Cyclotella michiganiana Skvortzow	129312	3.17	2.50	5.00	24.50
MEL - 0505	14-Aug-24	6554	Rhodomonas minuta Skuja	57472	7.22	10.00	6.00	125.70
MEL - 0505	14-Aug-24	6558	Cryptomonas erosa Ehrenberg	800	1.40	25.60	14.00	1751.50
MEL - 0505	14-Aug-24	7632	Gymnodinium sp.	800	3.35	20.00	20.00	4188.80
MEL - 0505	14-Aug-24	7632	Gymnodinium sp.	1800	40.41	35.00	35.00	22449.30
MEL - 0505	14-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	1600	6.50	19.80	19.80	4064.40
MEL - DUP1	12-Aug-24	1073	Snowella sp	400	0.20	0.00	0.00	500.00
MEL - DUP1	12-Aug-24	2112	Sphaerocystis schroeteri Chodat	7184	0.08	2.80	2.80	11.50
MEL - DUP1	12-Aug-24	2137	Dictyosphaerium simplex Sukja	165232	0.69	2.00	2.00	4.20
MEL - DUP1	12-Aug-24	2145	Crucigenia quadrata Morr.	64656	0.09	2.00	2.00	1.40
MEL - DUP1	12-Aug-24	2167	Elakatothrix gelatinosa Willen	7184	0.11	10.00	2.00	15.70
MEL - DUP1	12-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	400	0.16	14.00	12.00	410.50
MEL - DUP1	12-Aug-24	2193	Staurodesmus paradoxum Meyen	200	0.57	26.00	24.00	2831.60
MEL - DUP1	12-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	71840	2.71	6.00	6.00	37.70
MEL - DUP1	12-Aug-24	2205	Mougeotia sp.	600	2.03	43.00	10.00	3377.20
MEL - DUP1	12-Aug-24	2206	Botryococcus braunii Kutzing	600	0.86	14.00	14.00	1436.80
MEL - DUP1	12-Aug-24	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.03	3.00	3.00	4.70
MEL - DUP1	12-Aug-24	4351	Small chrysophyceae	373568	2.09	2.20	2.20	5.60
MEL - DUP1	12-Aug-24	4355	Chrysochromulina parva Lackey	71840	4.70	5.00	5.00	65.40
MEL - DUP1	12-Aug-24	4357	Chrysococcus sp.	409488	26.78	5.00	5.00	65.40
MEL - DUP1	12-Aug-24	4358	Chrysostephanosphaera globulifera Scherffel	7184	2.00	8.10	8.10	278.30
MEL - DUP1	12-Aug-24	4362	Kephyrion sp.	165232	1.90	2.80	2.80	11.50

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - DUP1	12-Aug-24	4368	Mallomonas crassisquama (Asmund) Fott	200	0.21	20.00	10.00	1047.20
MEL - DUP1	12-Aug-24	4388	Dinobryon sertularia Ehrenberg	35920	8.13	12.00	6.00	226.20
MEL - DUP1	12-Aug-24	4388	Dinobryon sertularia Ehrenberg	400	0.80	0.00	0.00	1991.00
MEL - DUP1	12-Aug-24	4390	Dinobryon sociale Ehrenberg	86208	19.50	12.00	6.00	226.20
MEL - DUP1	12-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.20	5.80	3.00	27.30
MEL - DUP1	12-Aug-24	4401	Uroglena volvox Ehrenberg	21552	2.44	6.00	6.00	113.10
MEL - DUP1	12-Aug-24	4411	Bitrichia chodatii (Reverdin) Chodat	7184	0.36	6.00	4.00	50.30
MEL - DUP1	12-Aug-24	4413	Chrysochromulina laurentiana Kling	93392	36.85	9.10	9.10	394.60
MEL - DUP1	12-Aug-24	4415	Bicosoeca lacustris Clark	7184	0.37	4.60	4.60	51.00
MEL - DUP1	12-Aug-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	7184	0.19	5.50	3.00	25.90
MEL - DUP1	12-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	2600	5.44	11.00	22.00	2090.70
MEL - DUP1	12-Aug-24	5509	Cyclotella ocellata Pant.	21552	2.33	4.10	8.20	108.30
MEL - DUP1	12-Aug-24	5515	Fragilaria crotonensis Kitton	600	0.17	68.00	4.00	284.80
MEL - DUP1	12-Aug-24	5518	Synedra acus Kutzing	3000	0.31	100.00	2.00	104.70
MEL - DUP1	12-Aug-24	5551	Cyclotella michiganiana Skvortzow	57472	1.41	2.50	5.00	24.50
MEL - DUP1	12-Aug-24	6554	Rhodomonas minuta Skuja	86208	10.84	10.00	6.00	125.70
MEL - DUP1	12-Aug-24	6558	Cryptomonas erosa Ehrenberg	1600	2.80	25.60	14.00	1751.50
MEL - DUP1	12-Aug-24	6568	Katablepharis ovalis Skuja	43104	1.93	8.00	4.00	44.70
MEL - DUP1	12-Aug-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - DUP1	12-Aug-24	7632	Gymnodinium sp.	4800	20.11	20.00	20.00	4188.80
MEL - DUP1	12-Aug-24	7632	Gymnodinium sp.	200	4.49	35.00	35.00	22449.30
MEL - DUP1	12-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	6400	26.01	19.80	19.80	4064.40
MEL - DUP2	13-Aug-24	1040	Phormidium sp	200	0.40	250.00	3.20	2010.60
MEL - DUP2	13-Aug-24	1073	Snowella sp	800	0.60	0.00	0.00	750.00
MEL - DUP2	13-Aug-24	2112	Sphaerocystis schroeteri Chodat	574720	6.61	2.80	2.80	11.50
MEL - DUP2	13-Aug-24	2113	Pediastrum duplex Meyen	200	0.42	0.00	0.00	2100.00
MEL - DUP2	13-Aug-24	2121	Oocystis lacustris Chodat	7184	0.20	6.00	3.00	28.30
MEL - DUP2	13-Aug-24	2127	Tetraedron minimum (Brunow) Hansgrig	7184	1.25	10.00	10.00	174.50
MEL - DUP2	13-Aug-24	2137	Dictyosphaerium simplex Sukja	438224	1.84	2.00	2.00	4.20
MEL - DUP2	13-Aug-24	2193	Staurodesmus paradoxum Meyen	200	0.57	26.00	24.00	2831.60
MEL - DUP2	13-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	43104	1.63	6.00	6.00	37.70
MEL - DUP2	13-Aug-24	2206	Botryococcus braunii Kutzing	21552	30.97	14.00	14.00	1436.80
MEL - DUP2	13-Aug-24	4351	Small chrysophyceae	186784	1.20	2.30	2.30	6.40
MEL - DUP2	13-Aug-24	4352	Large chrysophyceae	7184	1.29	7.00	7.00	179.60
MEL - DUP2	13-Aug-24	4357	Chrysococcus sp.	122128	7.99	5.00	5.00	65.40
MEL - DUP2	13-Aug-24	4362	Kephyrion sp.	114944	1.32	2.80	2.80	11.50
MEL - DUP2	13-Aug-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - DUP2	13-Aug-24	4383	Dinobryon bavaricum Imhof	200	0.25	0.00	0.00	1250.00
MEL - DUP2	13-Aug-24	4388	Dinobryon sertularia Ehrenberg	57472	13.00	12.00	6.00	226.20
MEL - DUP2	13-Aug-24	4388	Dinobryon sertularia Ehrenberg	1400	4.75	0.00	0.00	3390.00
MEL - DUP2	13-Aug-24	4390	Dinobryon sociale Ehrenberg	86208	19.50	12.00	6.00	226.20
MEL - DUP2	13-Aug-24	4401	Uroglena volvox Ehrenberg	21552	2.44	6.00	6.00	113.10
MEL - DUP2	13-Aug-24	4414	Stichogloea spp.	258624	13.01	6.00	4.00	50.30
MEL - DUP2	13-Aug-24	4415	Bicosoeca lacustris Clark	21552	0.78	4.10	4.10	36.10
MEL - DUP2	13-Aug-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	35920	0.93	5.50	3.00	25.90
MEL - DUP2	13-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	1800	3.76	11.00	22.00	2090.70
MEL - DUP2	13-Aug-24	5508	Cyclotella pseudostelligera	100576	56.54	7.10	14.20	562.20
MEL - DUP2	13-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	9000	6.02	71.00	6.00	669.20
MEL - DUP2	13-Aug-24	5514	Tabellaria flocculosa (Roth) Kutzing	200	0.27	26.00	14.00	1334.10
MEL - DUP2	13-Aug-24	5518	Synedra acus Kutzing	1200	0.13	100.00	2.00	104.70
MEL - DUP2	13-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	400	0.83	220.00	6.00	2073.50
MEL - DUP2	13-Aug-24	5524	Asterionella formosa Hassall	13200	1.38	100.00	2.00	104.70
MEL - DUP2	13-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	200	1.68	17.50	35.00	8418.50
MEL - DUP2	13-Aug-24	6554	Rhodomonas minuta Skuja	172416	21.67	10.00	6.00	125.70
MEL - DUP2	13-Aug-24	6558	Cryptomonas erosa Ehrenberg	3800	6.81	26.20	14.00	1792.50
MEL - DUP2	13-Aug-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - DUP2	13-Aug-24	7632	Gymnodinium sp.	2400	15.29	23.00	23.00	6370.60
MEL - DUP2	13-Aug-24	7635	Peridinium willei Huitfeldt-Kaas	400	8.98	35.00	35.00	22449.30
MEL - DUP2	13-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	1200	4.52	19.30	19.30	3764.20
MEL - DUP2	13-Aug-24	7641	Peridinium aciculiferum Lemmermann	200	1.81	30.00	24.00	9047.80
MEL - DUP3	20-Aug-24	2105	Chlamydomonas spp.	7184	0.21	6.10	3.00	28.70
MEL - DUP3	20-Aug-24	2137	Dictyosphaerium simplex Sukja	86208	0.36	2.00	2.00	4.20
MEL - DUP3	20-Aug-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	114944	6.93	9.60	4.00	60.30
MEL - DUP3	20-Aug-24	2167	Elakatothrix gelatinosa Willen	57472	0.90	10.00	2.00	15.70
MEL - DUP3	20-Aug-24	2169	Planctonema lauterbornii Schmidle	35920	12.69	18.00	5.00	353.40
MEL - DUP3	20-Aug-24	2178	Cosmarium sp.	400	0.56	20.00	20.00	1396.30
MEL - DUP3	20-Aug-24	2182	Euastrum spp.	200	0.37	22.00	22.00	1858.40
MEL - DUP3	20-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	1000	0.41	14.00	12.00	410.50
MEL - DUP3	20-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	43104	1.63	6.00	6.00	37.70
MEL - DUP3	20-Aug-24	4351	Small chrysophyceae	71840	0.40	2.20	2.20	5.60
MEL - DUP3	20-Aug-24	4352	Large chrysophyceae	7184	1.29	7.00	7.00	179.60
MEL - DUP3	20-Aug-24	4355	Chrysochromulina parva Lackey	21552	1.41	5.00	5.00	65.40
MEL - DUP3	20-Aug-24	4357	Chrysococcus sp.	186784	12.22	5.00	5.00	65.40
MEL - DUP3	20-Aug-24	4362	Kephyrion sp.	7184	0.08	2.80	2.80	11.50
MEL - DUP3	20-Aug-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - DUP3	20-Aug-24	4388	Dinobryon sertularia Ehrenberg	28736	6.50	12.00	6.00	226.20
MEL - DUP3	20-Aug-24	4390	Dinobryon sociale Ehrenberg	79024	17.88	12.00	6.00	226.20
MEL - DUP3	20-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.20	5.80	3.00	27.30
MEL - DUP3	20-Aug-24	4401	Uroglena volvox Ehrenberg	64656	7.31	6.00	6.00	113.10
MEL - DUP3	20-Aug-24	4411	Bitrichia chodatii (Reverdin) Chodat	14368	0.72	6.00	4.00	50.30
MEL - DUP3	20-Aug-24	4413	Chrysochromulina laurentiana Kling	64656	25.51	9.10	9.10	394.60
MEL - DUP3	20-Aug-24	4414	Stichogloea spp.	14368	0.72	6.00	4.00	50.30
MEL - DUP3	20-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	4600	9.62	11.00	22.00	2090.70
MEL - DUP3	20-Aug-24	5508	Cyclotella pseudostelligera	35920	20.19	7.10	14.20	562.20
MEL - DUP3	20-Aug-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	200	0.15	80.00	6.00	754.00
MEL - DUP3	20-Aug-24	5518	Synedra acus Kutzing	800	0.08	100.00	2.00	104.70
MEL - DUP3	20-Aug-24	5523	Synedra ulna (Nitzsch) Ehrenberg	400	0.83	220.00	6.00	2073.50
MEL - DUP3	20-Aug-24	5530	Stephanodiscus niagarae Ehrenberg	1000	8.42	17.50	35.00	8418.50
MEL - DUP3	20-Aug-24	5551	Cyclotella michiganiana Skvortzow	57472	1.41	2.50	5.00	24.50
MEL - DUP3	20-Aug-24	6554	Rhodomonas minuta Skuja	86208	10.84	10.00	6.00	125.70
MEL - DUP3	20-Aug-24	6558	Cryptomonas erosa Ehrenberg	3600	6.31	25.60	14.00	1751.50
MEL - DUP3	20-Aug-24	6559	Cryptomonas ovata Ehrenberg	1200	6.70	40.00	20.00	5585.10
MEL - DUP3	20-Aug-24	7632	Gymnodinium sp.	1200	5.03	20.00	20.00	4188.80
MEL - DUP3	20-Aug-24	7632	Gymnodinium sp.	400	8.98	35.00	35.00	22449.30
MEL - DUP3	20-Aug-24	7639	Peridinium pusillum (Penard) Lemmermann	200	0.81	19.80	19.80	4064.40
MEL - DUP5	18-Aug-24	2113	Pediastrum duplex Meyen	200	0.42	0.00	0.00	2100.00
MEL - DUP5	18-Aug-24	2121	Oocystis lacustris Chodat	21552	0.56	5.50	3.00	25.90

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - DUP5	18-Aug-24	2137	Dictyosphaerium simplex Sukja	57472	0.24	2.00	2.00	4.20
MEL - DUP5	18-Aug-24	2164	Quadrigula closterioides (Bohl.) Printz	7184	0.16	14.00	2.00	22.00
MEL - DUP5	18-Aug-24	2167	Elakatothrix gelatinosa Willen	86208	1.35	10.00	2.00	15.70
MEL - DUP5	18-Aug-24	2187	Staurodesmus extensus (Andersson) Teiling	200	0.08	14.00	12.00	410.50
MEL - DUP5	18-Aug-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - DUP5	18-Aug-24	4351	Small chrysophyceae	272992	1.75	2.30	2.30	6.40
MEL - DUP5	18-Aug-24	4357	Chrysococcus sp.	215520	14.10	5.00	5.00	65.40
MEL - DUP5	18-Aug-24	4383	Dinobryon bavaricum Imhof	244256	55.25	12.00	6.00	226.20
MEL - DUP5	18-Aug-24	4383	Dinobryon bavaricum Imhof	143680	32.50	12.00	6.00	226.20
MEL - DUP5	18-Aug-24	4383	Dinobryon bavaricum Imhof	1600	2.00	0.00	0.00	1250.00
MEL - DUP5	18-Aug-24	4388	Dinobryon sertularia Ehrenberg	2000	2.50	0.00	0.00	1250.00
MEL - DUP5	18-Aug-24	4390	Dinobryon sociale Ehrenberg	79024	17.88	12.00	6.00	226.20
MEL - DUP5	18-Aug-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.20	5.80	3.00	27.30
MEL - DUP5	18-Aug-24	4401	Uroglena volvox Ehrenberg	7184	0.81	6.00	6.00	113.10
MEL - DUP5	18-Aug-24	4413	Chrysochromulina laurentiana Kling	7184	2.83	9.10	9.10	394.60
MEL - DUP5	18-Aug-24	5507	Cyclotella stelligera Cleve and Grunow	1200	2.87	11.50	23.00	2389.00
MEL - DUP5	18-Aug-24	5509	Cyclotella ocellata Pant.	21552	2.42	4.15	8.30	112.30
MEL - DUP5	18-Aug-24	5524	Asterionella formosa Hassall	8600	0.90	100.00	2.00	104.70
MEL - DUP5	18-Aug-24	5551	Cyclotella michiganiana Skvortzow	7184	0.18	2.50	5.00	24.50
MEL - DUP5	18-Aug-24	6554	Rhodomonas minuta Skuja	7184	0.90	10.00	6.00	125.70
MEL - DUP5	18-Aug-24	6558	Cryptomonas erosa Ehrenberg	400	0.74	26.90	14.00	1840.40
MEL - DUP5	18-Aug-24	7632	Gymnodinium sp.	800	5.10	23.00	23.00	6370.60
MEL - DUP5	18-Aug-24	7637	Peridinium limbatum (Stokes) Lemmermann	200	28.76	65.00	65.00	143793.30
MEL - 0101	7-Sep-24	1073	Snowella sp	1400	1.05	0.00	0.00	750.00
MEL - 0101	7-Sep-24	2100	Pyramidomonas tetrarhynchus Schmarda	200	0.11	14.00	12.00	527.80
MEL - 0101	7-Sep-24	2112	Sphaerocystis schroeteri Chodat	387936	4.46	2.80	2.80	11.50
MEL - 0101	7-Sep-24	2121	Oocystis lacustris Chodat	7184	0.19	5.50	3.00	25.90
MEL - 0101	7-Sep-24	2132	Scenedesmus denticulatus Lagerhiem	28736	1.33	8.30	4.00	46.40
MEL - 0101	7-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	28736	1.73	9.60	4.00	60.30
MEL - 0101	7-Sep-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0101	7-Sep-24	2169	Planctonema lauterbornii Schmidle	7184	2.54	18.00	5.00	353.40
MEL - 0101	7-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	200	0.07	13.30	12.00	370.50
MEL - 0101	7-Sep-24	2193	Staurodesmus paradoxum Meyen	200	0.25	20.00	18.00	1256.60
MEL - 0101	7-Sep-24	2199	Spondylosium planum (Wolle) W. and G.S. West	50288	1.90	6.00	6.00	37.70
MEL - 0101	7-Sep-24	2206	Botryococcus braunii Kutzing	600	0.86	14.00	14.00	1436.80
MEL - 0101	7-Sep-24	2235	Ankistrodesmus spiralis Lemmermann	28736	1.58	35.00	2.00	55.00
MEL - 0101	7-Sep-24	4351	Small chrysophyceae	581904	3.72	2.30	2.30	6.40
MEL - 0101	7-Sep-24	4352	Large chrysophyceae	79024	14.19	7.00	7.00	179.60
MEL - 0101	7-Sep-24	4355	Chrysochromulina parva Lackey	71840	4.70	5.00	5.00	65.40
MEL - 0101	7-Sep-24	4357	Chrysococcus sp.	215520	14.10	5.00	5.00	65.40
MEL - 0101	7-Sep-24	4358	Chrysostephanosphaera globulifera Scherffel	21552	7.69	8.80	8.80	356.80
MEL - 0101	7-Sep-24	4362	Kephyrion sp.	35920	0.41	2.80	2.80	11.50
MEL - 0101	7-Sep-24	4364	Mallomonas caudata Ivanov	400	2.14	40.00	16.00	5361.70
MEL - 0101	7-Sep-24	4378	Dinobryon borgei Lemmermann	57472	2.33	8.60	3.00	40.50
MEL - 0101	7-Sep-24	4383	Dinobryon bavaricum Imhof	79024	17.88	12.00	6.00	226.20
MEL - 0101	7-Sep-24	4383	Dinobryon bavaricum Imhof	4200	3.99	0.00	0.00	950.00
MEL - 0101	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	129312	29.25	12.00	6.00	226.20
MEL - 0101	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	10600	13.25	0.00	0.00	1250.00
MEL - 0101	7-Sep-24	4390	Dinobryon sociale Ehrenberg	129312	29.25	12.00	6.00	226.20
MEL - 0101	7-Sep-24	4390	Dinobryon sociale Ehrenberg	1400	1.75	0.00	0.00	1250.00
MEL - 0101	7-Sep-24	4401	Uroglena volvox Ehrenberg	107760	12.19	6.00	6.00	113.10
MEL - 0101	7-Sep-24	4413	Chrysochromulina laurentiana Kling	86208	34.02	9.10	9.10	394.60
MEL - 0101	7-Sep-24	4415	Bicosoeca lacustris Clark	114944	5.86	4.60	4.60	51.00
MEL - 0101	7-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	395120	10.79	5.80	3.00	27.30
MEL - 0101	7-Sep-24	4444	Dinobryon pediforme (Lemmermann) Steineche	800	2.44	18.00	18.00	3053.60
MEL - 0101	7-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	2800	6.69	11.50	23.00	2389.00
MEL - 0101	7-Sep-24	5509	Cyclotella ocellata Pant.	21552	2.33	4.10	8.20	108.30
MEL - 0101	7-Sep-24	5511	Rhizosolenia eriense H.L. Smith	7184	0.61	12.00	3.00	84.80
MEL - 0101	7-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	4600	3.51	81.00	6.00	763.40
MEL - 0101	7-Sep-24	5514	Tabellaria flocculosa (Roth) Kutzing	1200	1.60	26.00	14.00	1334.10
MEL - 0101	7-Sep-24	5515	Fragilaria crotonensis Kitton	5200	1.55	71.00	4.00	297.40
MEL - 0101	7-Sep-24	5518	Synedra acus Kutzing	12000	1.26	100.00	2.00	104.70
MEL - 0101	7-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	2400	4.98	220.00	6.00	2073.50
MEL - 0101	7-Sep-24	5524	Asterionella formosa Hassall	59600	6.31	101.00	2.00	105.80
MEL - 0101	7-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	1400	12.83	18.00	36.00	9160.90
MEL - 0101	7-Sep-24	5551	Cyclotella michiganiana Skvortzow	7184	0.18	2.50	5.00	24.50
MEL - 0101	7-Sep-24	6554	Rhodomonas minuta Skuja	35920	4.52	10.00	6.00	125.70
MEL - 0101	7-Sep-24	6558	Cryptomonas erosa Ehrenberg	1600	2.91	26.60	14.00	1819.90
MEL - 0101	7-Sep-24	7632	Gymnodinium sp.	2000	12.74	23.00	23.00	6370.60
MEL - 0101	7-Sep-24	7632	Gymnodinium sp.	1200	26.94	35.00	35.00	22449.30
MEL - 0101	7-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	2400	9.03	19.30	19.30	3764.20
MEL - 0101	7-Sep-24	7641	Peridinium aciculiferum Lemmermann	1800	16.29	30.00	24.00	9047.80
MEL - 0106	7-Sep-24	1073	Snowella sp	1800	1.35	0.00	0.00	750.00
MEL - 0106	7-Sep-24	2112	Sphaerocystis schroeteri Chodat	107760	1.24	2.80	2.80	11.50
MEL - 0106	7-Sep-24	2121	Oocystis lacustris Chodat	143680	3.72	5.50	3.00	25.90
MEL - 0106	7-Sep-24	2137	Dictyosphaerium simplex Sukja	21552	0.09	2.00	2.00	4.20
MEL - 0106	7-Sep-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0106	7-Sep-24	2164	Quadrigula closterioides (Bohl.) Printz	86208	1.90	14.00	2.00	22.00
MEL - 0106	7-Sep-24	2169	Planctonema lauterbornii Schmidle	28736	10.16	18.00	5.00	353.40
MEL - 0106	7-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	400	0.15	13.30	12.00	370.50
MEL - 0106	7-Sep-24	2193	Staurodesmus paradoxum Meyen	200	0.25	20.00	18.00	1256.60
MEL - 0106	7-Sep-24	2206	Botryococcus braunii Kutzing	600	0.86	14.00	14.00	1436.80
MEL - 0106	7-Sep-24	2215	Tetraedron caudatum (Corda) Hansgrig	14368	0.07	3.00	3.00	4.70
MEL - 0106	7-Sep-24	2235	Ankistrodesmus spiralis Lemmermann	7184	0.41	36.00	2.00	56.50
MEL - 0106	7-Sep-24	4351	Small chrysophyceae	581904	3.72	2.30	2.30	6.40
MEL - 0106	7-Sep-24	4352	Large chrysophyceae	86208	15.48	7.00	7.00	179.60
MEL - 0106	7-Sep-24	4355	Chrysochromulina parva Lackey	330464	21.61	5.00	5.00	65.40
MEL - 0106	7-Sep-24	4357	Chrysococcus sp.	244256	15.97	5.00	5.00	65.40
MEL - 0106	7-Sep-24	4362	Kephyrion sp.	50288	0.58	2.80	2.80	11.50
MEL - 0106	7-Sep-24	4363	Spiniferomonas serrata	7184	0.85	6.10	6.10	118.80
MEL - 0106	7-Sep-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - 0106	7-Sep-24	4368	Mallomonas crassisquama (Asmund) Fott	200	0.21	19.60	10.00	1026.30
MEL - 0106	7-Sep-24	4378	Dinobryon borgei Lemmermann	7184	0.29	8.60	3.00	40.50
MEL - 0106	7-Sep-24	4383	Dinobryon bavaricum Imhof	186784	42.25	12.00	6.00	226.20
MEL - 0106	7-Sep-24	4383	Dinobryon bavaricum Imhof	4800	4.56	0.00	0.00	950.00
MEL - 0106	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	114944	26.00	12.00	6.00	226.20
MEL - 0106	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	6400	8.00	0.00	0.00	1250.00

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0106	7-Sep-24	4390	Dinobryon sociale Ehrenberg	165232	37.38	12.00	6.00	226.20
MEL - 0106	7-Sep-24	4390	Dinobryon sociale Ehrenberg	1400	1.33	0.00	0.00	950.00
MEL - 0106	7-Sep-24	4401	Uroglena volvox Ehrenberg	35920	4.06	6.00	6.00	113.10
MEL - 0106	7-Sep-24	4413	Chrysochromulina laurentiana Kling	71840	28.35	9.10	9.10	394.60
MEL - 0106	7-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	79024	2.05	5.50	3.00	25.90
MEL - 0106	7-Sep-24	4444	Dinobryon pediforme (Lemmermann) Steineche	200	0.61	18.00	18.00	3053.60
MEL - 0106	7-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	2000	4.78	11.50	23.00	2389.00
MEL - 0106	7-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	9600	7.33	81.00	6.00	763.40
MEL - 0106	7-Sep-24	5515	Fragilaria crotonensis Kitton	8800	2.62	71.00	4.00	297.40
MEL - 0106	7-Sep-24	5518	Synedra acus Kutzing	8200	0.86	100.00	2.00	104.70
MEL - 0106	7-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	3200	6.64	220.00	6.00	2073.50
MEL - 0106	7-Sep-24	5524	Asterionella formosa Hassall	29200	3.09	101.00	2.00	105.80
MEL - 0106	7-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	800	7.33	18.00	36.00	9160.90
MEL - 0106	7-Sep-24	5551	Cyclotella michiganiana Skvortzow	57472	1.41	2.50	5.00	24.50
MEL - 0106	7-Sep-24	6554	Rhodomonas minuta Skuja	71840	9.03	10.00	6.00	125.70
MEL - 0106	7-Sep-24	6558	Cryptomonas erosa Ehrenberg	600	1.09	26.60	14.00	1819.90
MEL - 0106	7-Sep-24	7632	Gymnodinium sp.	400	2.55	23.00	23.00	6370.60
MEL - 0106	7-Sep-24	7632	Gymnodinium sp.	1000	9.20	26.00	26.00	9202.80
MEL - 0106	7-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	600	2.26	19.30	19.30	3764.20
MEL - 0106	7-Sep-24	7641	Peridinium aciculiferum Lemmermann	1000	9.05	30.00	24.00	9047.80
MEL - 0107	7-Sep-24	1014	Chroococcus limneticus Lemmermann	28736	0.26	2.60	2.60	9.20
MEL - 0107	7-Sep-24	1073	Snowella sp	2000	1.50	0.00	0.00	750.00
MEL - 0107	7-Sep-24	2100	Pyramidomonas tetrarhynchus Schmarda	200	0.11	14.00	12.00	527.80
MEL - 0107	7-Sep-24	2112	Sphaerocystis schroeteri Chodat	43104	0.50	2.80	2.80	11.50
MEL - 0107	7-Sep-24	2115	Pediastrum tetras (Ehrenberg) Ralfs	57472	0.48	4.00	3.00	8.40
MEL - 0107	7-Sep-24	2121	Oocystis lacustris Chodat	50288	1.30	5.50	3.00	25.90
MEL - 0107	7-Sep-24	2137	Dictyosphaerium simplex Sukja	7184	0.03	2.00	2.00	4.20
MEL - 0107	7-Sep-24	2145	Crucigenia quadrata Morr.	57472	0.27	3.00	3.00	4.70
MEL - 0107	7-Sep-24	2169	Planctonema lauterbornii Schmidle	86208	30.47	18.00	5.00	353.40
MEL - 0107	7-Sep-24	2178	Cosmarium sp.	200	0.28	20.00	20.00	1396.30
MEL - 0107	7-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	200	0.07	13.30	12.00	370.50
MEL - 0107	7-Sep-24	2195	Staurodesmus bullardii G.M. Smith	200	1.37	35.00	32.00	6841.70
MEL - 0107	7-Sep-24	2235	Ankistrodesmus spiralis Lemmermann	21552	1.19	35.00	2.00	55.00
MEL - 0107	7-Sep-24	4351	Small chrysophyceae	488512	3.13	2.30	2.30	6.40
MEL - 0107	7-Sep-24	4352	Large chrysophyceae	64656	11.61	7.00	7.00	179.60
MEL - 0107	7-Sep-24	4355	Chrysochromulina parva Lackey	215520	14.10	5.00	5.00	65.40
MEL - 0107	7-Sep-24	4357	Chrysococcus sp.	287360	18.79	5.00	5.00	65.40
MEL - 0107	7-Sep-24	4361	Kephyrion boreale Skuja	7184	0.85	6.10	6.10	118.80
MEL - 0107	7-Sep-24	4362	Kephyrion sp.	93392	1.07	2.80	2.80	11.50
MEL - 0107	7-Sep-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - 0107	7-Sep-24	4368	Mallomonas crassisquama (Asmund) Fott	200	0.21	19.60	10.00	1026.30
MEL - 0107	7-Sep-24	4378	Dinobryon borgei Lemmermann	43104	1.75	8.60	3.00	40.50
MEL - 0107	7-Sep-24	4383	Dinobryon bavaricum Imhof	143680	32.50	12.00	6.00	226.20
MEL - 0107	7-Sep-24	4383	Dinobryon bavaricum Imhof	3800	3.61	0.00	0.00	950.00
MEL - 0107	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	172416	39.00	12.00	6.00	226.20
MEL - 0107	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	12200	15.25	0.00	0.00	1250.00
MEL - 0107	7-Sep-24	4390	Dinobryon sociale Ehrenberg	107760	24.38	12.00	6.00	226.20
MEL - 0107	7-Sep-24	4390	Dinobryon sociale Ehrenberg	3800	3.61	0.00	0.00	950.00
MEL - 0107	7-Sep-24	4394	Epiphyxis sp.	14368	1.09	9.10	4.00	76.20
MEL - 0107	7-Sep-24	4401	Uroglena volvox Ehrenberg	114944	13.00	6.00	6.00	113.10
MEL - 0107	7-Sep-24	4413	Chrysochromulina laurentiana Kling	14368	5.67	9.10	9.10	394.60
MEL - 0107	7-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	21552	0.56	5.50	3.00	25.90
MEL - 0107	7-Sep-24	4444	Dinobryon pediforme (Lemmermann) Steineche	1000	3.05	18.00	18.00	3053.60
MEL - 0107	7-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	2600	6.21	11.50	23.00	2389.00
MEL - 0107	7-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	6200	4.73	81.00	6.00	763.40
MEL - 0107	7-Sep-24	5514	Tabellaria flocculosa (Roth) Kutzing	200	0.27	26.00	14.00	1334.10
MEL - 0107	7-Sep-24	5515	Fragilaria crotonensis Kitton	6000	1.78	71.00	4.00	297.40
MEL - 0107	7-Sep-24	5518	Synedra acus Kutzing	7200	0.75	100.00	2.00	104.70
MEL - 0107	7-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	1800	3.73	220.00	6.00	2073.50
MEL - 0107	7-Sep-24	5524	Asterionella formosa Hassall	54400	5.76	101.00	2.00	105.80
MEL - 0107	7-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	2200	20.15	18.00	36.00	9160.90
MEL - 0107	7-Sep-24	5551	Cyclotella michiganiana Skvortzow	21552	0.53	2.50	5.00	24.50
MEL - 0107	7-Sep-24	6554	Rhodomonas minuta Skuja	64656	8.13	10.00	6.00	125.70
MEL - 0107	7-Sep-24	6558	Cryptomonas erosa Ehrenberg	2600	4.73	26.60	14.00	1819.90
MEL - 0107	7-Sep-24	7631	Gymnodinium helveticum Penard	600	14.14	50.00	30.00	23561.90
MEL - 0107	7-Sep-24	7632	Gymnodinium sp.	1600	10.19	23.00	23.00	6370.60
MEL - 0107	7-Sep-24	7632	Gymnodinium sp.	1000	22.45	35.00	35.00	22449.30
MEL - 0107	7-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	1600	6.02	19.30	19.30	3764.20
MEL - 0107	7-Sep-24	7641	Peridinium aciculiferum Lemmermann	1000	9.05	30.00	24.00	9047.80
MEL - 0107R	7-Sep-24	1073	Snowella sp	1000	0.75	0.00	0.00	750.00
MEL - 0107R	7-Sep-24	2100	Pyramidomonas tetrarhynchus Schmarda	400	0.21	14.00	12.00	527.80
MEL - 0107R	7-Sep-24	2112	Sphaerocystis schroeteri Chodat	28736	0.33	2.80	2.80	11.50
MEL - 0107R	7-Sep-24	2121	Oocystis lacustris Chodat	114944	2.98	5.50	3.00	25.90
MEL - 0107R	7-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	21552	1.30	9.60	4.00	60.30
MEL - 0107R	7-Sep-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0107R	7-Sep-24	2169	Planctonema lauterbornii Schmidle	86208	30.47	18.00	5.00	353.40
MEL - 0107R	7-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	600	0.22	13.30	12.00	370.50
MEL - 0107R	7-Sep-24	2195	Staurodesmus bullardii G.M. Smith	400	2.58	34.00	32.00	6456.30
MEL - 0107R	7-Sep-24	2235	Ankistrodesmus spiralis Lemmermann	7184	0.40	35.00	2.00	55.00
MEL - 0107R	7-Sep-24	4351	Small chrysophyceae	366384	2.34	2.30	2.30	6.40
MEL - 0107R	7-Sep-24	4352	Large chrysophyceae	71840	12.90	7.00	7.00	179.60
MEL - 0107R	7-Sep-24	4355	Chrysochromulina parva Lackey	294544	19.26	5.00	5.00	65.40
MEL - 0107R	7-Sep-24	4357	Chrysococcus sp.	337648	22.08	5.00	5.00	65.40
MEL - 0107R	7-Sep-24	4361	Kephyrion boreale Skuja	7184	0.85	6.10	6.10	118.80
MEL - 0107R	7-Sep-24	4362	Kephyrion sp.	64656	0.74	2.80	2.80	11.50
MEL - 0107R	7-Sep-24	4368	Mallomonas crassisquama (Asmund) Fott	600	0.62	19.60	10.00	1026.30
MEL - 0107R	7-Sep-24	4378	Dinobryon borgei Lemmermann	35920	1.45	8.60	3.00	40.50
MEL - 0107R	7-Sep-24	4383	Dinobryon bavaricum Imhof	186784	42.25	12.00	6.00	226.20
MEL - 0107R	7-Sep-24	4383	Dinobryon bavaricum Imhof	5200	4.94	0.00	0.00	950.00
MEL - 0107R	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	186784	42.25	12.00	6.00	226.20
MEL - 0107R	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	10800	13.50	0.00	0.00	1250.00
MEL - 0107R	7-Sep-24	4390	Dinobryon sociale Ehrenberg	143680	32.50	12.00	6.00	226.20
MEL - 0107R	7-Sep-24	4390	Dinobryon sociale Ehrenberg	1200	1.14	0.00	0.00	950.00
MEL - 0107R	7-Sep-24	4394	Epiphyxis sp.	50288	3.83	9.10	4.00	76.20
MEL - 0107R	7-Sep-24	4401	Uroglena volvox Ehrenberg	57472	6.50	6.00	6.00	113.10
MEL - 0107R	7-Sep-24	4413	Chrysochromulina laurentiana Kling	28736	11.34	9.10	9.10	394.60
MEL - 0107R	7-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	64656	1.67	5.50	3.00	25.90

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0107R	7-Sep-24	4444	Dinobryon pediforme (Lemmermann) Steineche	800	2.44	18.00	18.00	3053.60
MEL - 0107R	7-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	3800	9.08	11.50	23.00	2389.00
MEL - 0107R	7-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	8000	6.11	81.00	6.00	763.40
MEL - 0107R	7-Sep-24	5514	Tabellaria flocculosa (Roth) Kutzing	2000	2.67	26.00	14.00	1334.10
MEL - 0107R	7-Sep-24	5515	Fragilaria crotonensis Kitton	9200	2.74	71.00	4.00	297.40
MEL - 0107R	7-Sep-24	5518	Synedra acus Kutzing	6000	0.63	100.00	2.00	104.70
MEL - 0107R	7-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	2400	4.98	220.00	6.00	2073.50
MEL - 0107R	7-Sep-24	5524	Asterionella formosa Hassall	51400	5.44	101.00	2.00	105.80
MEL - 0107R	7-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	3200	29.31	18.00	36.00	9160.90
MEL - 0107R	7-Sep-24	5551	Cyclotella michiganiana Skvortzow	50288	1.23	2.50	5.00	24.50
MEL - 0107R	7-Sep-24	6554	Rhodomonas minuta Skuja	86208	10.84	10.00	6.00	125.70
MEL - 0107R	7-Sep-24	6558	Cryptomonas erosa Ehrenberg	1800	3.28	26.60	14.00	1819.90
MEL - 0107R	7-Sep-24	6559	Cryptomonas ovata Ehrenberg	600	3.35	40.00	20.00	5585.10
MEL - 0107R	7-Sep-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0107R	7-Sep-24	7632	Gymnodinium sp.	1800	11.47	23.00	23.00	6370.60
MEL - 0107R	7-Sep-24	7632	Gymnodinium sp.	600	13.47	35.00	35.00	22449.30
MEL - 0107R	7-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	1200	4.52	19.30	19.30	3764.20
MEL - 0107R	7-Sep-24	7641	Peridinium aciculiferum Lemmermann	1800	16.29	30.00	24.00	9047.80
MEL - 0108	7-Sep-24	1014	Chroococcus limneticus Lemmermann	57472	2.89	6.00	4.00	50.30
MEL - 0108	7-Sep-24	1073	Snowella sp	2000	1.50	0.00	0.00	750.00
MEL - 0108	7-Sep-24	1133	Anabaena flos-aquae (Lyngb.) Breb. & Bornet	200	0.98	235.00	6.30	4883.70
MEL - 0108	7-Sep-24	2112	Sphaerocystis schroeteri Chodat	64656	0.74	2.80	2.80	11.50
MEL - 0108	7-Sep-24	2121	Oocystis lacustris Chodat	28736	0.74	5.50	3.00	25.90
MEL - 0108	7-Sep-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0108	7-Sep-24	2164	Quadrigula closterioides (Bohl.) Printz	7184	0.16	14.00	2.00	22.00
MEL - 0108	7-Sep-24	2169	Planctonema lauterbornii Schmidle	28736	10.16	18.00	5.00	353.40
MEL - 0108	7-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	200	0.07	13.30	12.00	370.50
MEL - 0108	7-Sep-24	2195	Staurodesmus bullardii G.M. Smith	200	1.29	34.00	32.00	6456.30
MEL - 0108	7-Sep-24	2199	Spondylosium planum (Wolle) W. and G.S. West	14368	0.54	6.00	6.00	37.70
MEL - 0108	7-Sep-24	4351	Small chrysophyceae	330464	2.11	2.30	2.30	6.40
MEL - 0108	7-Sep-24	4352	Large chrysophyceae	64656	11.61	7.00	7.00	179.60
MEL - 0108	7-Sep-24	4355	Chrysochromulina parva Lackey	251440	16.44	5.00	5.00	65.40
MEL - 0108	7-Sep-24	4357	Chrysococcus sp.	438224	28.66	5.00	5.00	65.40
MEL - 0108	7-Sep-24	4361	Kephyrion boreale Skuja	14368	1.71	6.10	6.10	118.80
MEL - 0108	7-Sep-24	4362	Kephyrion sp.	43104	0.50	2.80	2.80	11.50
MEL - 0108	7-Sep-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - 0108	7-Sep-24	4378	Dinobryon borgei Lemmermann	28736	1.16	8.60	3.00	40.50
MEL - 0108	7-Sep-24	4383	Dinobryon bavaricum Imhof	86208	19.50	12.00	6.00	226.20
MEL - 0108	7-Sep-24	4383	Dinobryon bavaricum Imhof	3000	2.85	0.00	0.00	950.00
MEL - 0108	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	158048	35.75	12.00	6.00	226.20
MEL - 0108	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	13200	16.50	0.00	0.00	1250.00
MEL - 0108	7-Sep-24	4390	Dinobryon sociale Ehrenberg	165232	37.38	12.00	6.00	226.20
MEL - 0108	7-Sep-24	4390	Dinobryon sociale Ehrenberg	2000	1.90	0.00	0.00	950.00
MEL - 0108	7-Sep-24	4394	Epiphyxis sp.	71840	5.47	9.10	4.00	76.20
MEL - 0108	7-Sep-24	4396	Chrysolykos skuja (Nauwerck) Willen	21552	0.57	5.60	3.00	26.40
MEL - 0108	7-Sep-24	4401	Uroglena volvox Ehrenberg	352016	39.81	6.00	6.00	113.10
MEL - 0108	7-Sep-24	4413	Chrysochromulina laurentiana Kling	71840	29.29	9.20	9.20	407.70
MEL - 0108	7-Sep-24	4414	Stichogloea spp.	28736	1.45	6.00	4.00	50.30
MEL - 0108	7-Sep-24	4415	Bicosoeca lacustris Clark	107760	4.18	4.20	4.20	38.80
MEL - 0108	7-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	28736	0.74	5.50	3.00	25.90
MEL - 0108	7-Sep-24	4444	Dinobryon pediforme (Lemmermann) Steineche	1400	4.28	18.00	18.00	3053.60
MEL - 0108	7-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	4800	11.47	11.50	23.00	2389.00
MEL - 0108	7-Sep-24	5511	Rhizosolenia eriense H.L. Smith	7184	0.61	12.00	3.00	84.80
MEL - 0108	7-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	4000	3.05	81.00	6.00	763.40
MEL - 0108	7-Sep-24	5515	Fragilaria crotonensis Kitton	9800	2.91	71.00	4.00	297.40
MEL - 0108	7-Sep-24	5518	Synedra acus Kutzing	8600	0.90	100.00	2.00	104.70
MEL - 0108	7-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	200	0.41	220.00	6.00	2073.50
MEL - 0108	7-Sep-24	5524	Asterionella formosa Hassall	45400	4.80	101.00	2.00	105.80
MEL - 0108	7-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	1800	16.49	18.00	36.00	9160.90
MEL - 0108	7-Sep-24	5551	Cyclotella michiganiana Skvortzow	43104	1.06	2.50	5.00	24.50
MEL - 0108	7-Sep-24	6554	Rhodomonas minuta Skuja	28736	3.61	10.00	6.00	125.70
MEL - 0108	7-Sep-24	6558	Cryptomonas erosa Ehrenberg	3400	6.19	26.60	14.00	1819.90
MEL - 0108	7-Sep-24	7631	Gymnodinium helveticum Penard	400	9.42	50.00	30.00	23561.90
MEL - 0108	7-Sep-24	7632	Gymnodinium sp.	2800	17.84	23.00	23.00	6370.60
MEL - 0108	7-Sep-24	7632	Gymnodinium sp.	1200	26.94	35.00	35.00	22449.30
MEL - 0108	7-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	1800	6.78	19.30	19.30	3764.20
MEL - 0108	7-Sep-24	7641	Peridinium aciculiferum Lemmermann	400	3.62	30.00	24.00	9047.80
MEL - 0109	7-Sep-24	1073	Snowella sp	1800	1.35	0.00	0.00	750.00
MEL - 0109	7-Sep-24	2100	Pyramidomonas tetrarhynchus Schmarda	1000	0.53	14.00	12.00	527.80
MEL - 0109	7-Sep-24	2112	Sphaerocystis schroeteri Chodat	150864	1.73	2.80	2.80	11.50
MEL - 0109	7-Sep-24	2121	Oocystis lacustris Chodat	129312	3.35	5.50	3.00	25.90
MEL - 0109	7-Sep-24	2169	Planctonema lauterbornii Schmidle	43104	15.23	18.00	5.00	353.40
MEL - 0109	7-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	800	0.30	13.30	12.00	370.50
MEL - 0109	7-Sep-24	2199	Spondylosium planum (Wolle) W. and G.S. West	35920	1.35	6.00	6.00	37.70
MEL - 0109	7-Sep-24	2206	Botryococcus braunii Kutzing	400	0.57	14.00	14.00	1436.80
MEL - 0109	7-Sep-24	4351	Small chrysophyceae	617824	3.95	2.30	2.30	6.40
MEL - 0109	7-Sep-24	4352	Large chrysophyceae	50288	9.03	7.00	7.00	179.60
MEL - 0109	7-Sep-24	4355	Chrysochromulina parva Lackey	287360	18.79	5.00	5.00	65.40
MEL - 0109	7-Sep-24	4357	Chrysococcus sp.	459776	30.07	5.00	5.00	65.40
MEL - 0109	7-Sep-24	4358	Chrysostephanosphaera globulifera Scherffel	7184	2.00	8.10	8.10	278.30
MEL - 0109	7-Sep-24	4362	Kephyrion sp.	143680	1.65	2.80	2.80	11.50
MEL - 0109	7-Sep-24	4363	Spiniferomonas serrata	7184	0.73	5.80	5.80	102.20
MEL - 0109	7-Sep-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - 0109	7-Sep-24	4368	Mallomonas crassisquama (Asmund) Fott	200	0.20	19.50	10.00	1021.00
MEL - 0109	7-Sep-24	4378	Dinobryon borgei Lemmermann	57472	2.33	8.60	3.00	40.50
MEL - 0109	7-Sep-24	4383	Dinobryon bavaricum Imhof	158048	35.75	12.00	6.00	226.20
MEL - 0109	7-Sep-24	4383	Dinobryon bavaricum Imhof	4800	4.56	0.00	0.00	950.00
MEL - 0109	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	114944	26.00	12.00	6.00	226.20
MEL - 0109	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	8000	10.00	0.00	0.00	1250.00
MEL - 0109	7-Sep-24	4390	Dinobryon sociale Ehrenberg	79024	17.88	12.00	6.00	226.20
MEL - 0109	7-Sep-24	4390	Dinobryon sociale Ehrenberg	2400	2.28	0.00	0.00	950.00
MEL - 0109	7-Sep-24	4394	Epiphyxis sp.	7184	0.56	9.30	4.00	77.90
MEL - 0109	7-Sep-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.20	5.80	3.00	27.30
MEL - 0109	7-Sep-24	4401	Uroglena volvox Ehrenberg	35920	4.06	6.00	6.00	113.10
MEL - 0109	7-Sep-24	4413	Chrysochromulina laurentiana Kling	64656	25.51	9.10	9.10	394.60
MEL - 0109	7-Sep-24	4415	Bicosoeca lacustris Clark	7184	0.37	4.60	4.60	51.00
MEL - 0109	7-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	352016	9.12	5.50	3.00	25.90

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0109	7-Sep-24	4444	Dinobryon pediforme (Lemmermann) Steineche	1400	4.28	18.00	18.00	3053.60
MEL - 0109	7-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	5400	12.90	11.50	23.00	2389.00
MEL - 0109	7-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	9000	6.87	81.00	6.00	763.40
MEL - 0109	7-Sep-24	5515	Fragilaria crotonensis Kitton	3400	1.01	71.00	4.00	297.40
MEL - 0109	7-Sep-24	5518	Synedra acus Kutzing	4000	0.42	100.00	2.00	104.70
MEL - 0109	7-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	2600	5.39	220.00	6.00	2073.50
MEL - 0109	7-Sep-24	5524	Asterionella formosa Hassall	27800	2.94	101.00	2.00	105.80
MEL - 0109	7-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	3000	27.48	18.00	36.00	9160.90
MEL - 0109	7-Sep-24	6554	Rhodomonas minuta Skuja	50288	6.32	10.00	6.00	125.70
MEL - 0109	7-Sep-24	6558	Cryptomonas erosa Ehrenberg	400	0.72	26.30	14.00	1799.40
MEL - 0109	7-Sep-24	7631	Gymnodinium helveticum Penard	400	9.42	50.00	30.00	23561.90
MEL - 0109	7-Sep-24	7632	Gymnodinium sp.	4000	25.48	23.00	23.00	6370.60
MEL - 0109	7-Sep-24	7632	Gymnodinium sp.	2200	49.39	35.00	35.00	22449.30
MEL - 0109	7-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	3600	13.55	19.30	19.30	3764.20
MEL - 0109	7-Sep-24	7641	Peridinium aciculiferum Lemmermann	800	7.24	30.00	24.00	9047.80
MEL - 0110	7-Sep-24	1014	Chroococcus limneticus Lemmermann	57472	1.93	4.00	4.00	33.50
MEL - 0110	7-Sep-24	1073	Snowella sp	1400	1.05	0.00	0.00	750.00
MEL - 0110	7-Sep-24	1077	Pseudanabaena sp.	35920	2.93	26.00	2.00	81.70
MEL - 0110	7-Sep-24	1133	Anabaena flos-aquae (Lyngb.) Breb. & Bornet	200	0.81	195.00	6.30	4052.40
MEL - 0110	7-Sep-24	2105	Chlamydomonas spp.	7184	0.28	6.00	3.50	38.50
MEL - 0110	7-Sep-24	2112	Sphaerocystis schroeteri Chodat	64656	0.74	2.80	2.80	11.50
MEL - 0110	7-Sep-24	2121	Oocystis lacustris Chodat	100576	2.60	5.50	3.00	25.90
MEL - 0110	7-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	57472	3.47	9.60	4.00	60.30
MEL - 0110	7-Sep-24	2169	Planctonema lauterbornii Schmidle	64656	22.85	18.00	5.00	353.40
MEL - 0110	7-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	800	0.30	13.30	12.00	370.50
MEL - 0110	7-Sep-24	2195	Staurodesmus bullardii G.M. Smith	200	1.29	34.00	32.00	6456.30
MEL - 0110	7-Sep-24	2199	Spondylosium planum (Wolle) W. and G.S. West	21552	0.81	6.00	6.00	37.70
MEL - 0110	7-Sep-24	2206	Botryococcus braunii Kutzing	200	0.29	14.00	14.00	1436.80
MEL - 0110	7-Sep-24	2235	Ankistrodesmus spiralis Lemmermann	7184	0.43	38.00	2.00	59.70
MEL - 0110	7-Sep-24	4351	Small chrysophyceae	617824	3.95	2.30	2.30	6.40
MEL - 0110	7-Sep-24	4352	Large chrysophyceae	50288	9.03	7.00	7.00	179.60
MEL - 0110	7-Sep-24	4355	Chrysochromulina parva Lackey	172416	11.28	5.00	5.00	65.40
MEL - 0110	7-Sep-24	4357	Chrysococcus sp.	215520	14.10	5.00	5.00	65.40
MEL - 0110	7-Sep-24	4358	Chrysostephanosphaera globulifera Scherffel	7184	2.56	8.80	8.80	356.80
MEL - 0110	7-Sep-24	4362	Kephyrion sp.	122128	1.40	2.80	2.80	11.50
MEL - 0110	7-Sep-24	4378	Dinobryon borgei Lemmermann	107760	4.36	8.60	3.00	40.50
MEL - 0110	7-Sep-24	4383	Dinobryon bavaricum Imhof	114944	26.00	12.00	6.00	226.20
MEL - 0110	7-Sep-24	4383	Dinobryon bavaricum Imhof	5600	5.32	0.00	0.00	950.00
MEL - 0110	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	193968	43.88	12.00	6.00	226.20
MEL - 0110	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	9400	11.75	0.00	0.00	1250.00
MEL - 0110	7-Sep-24	4390	Dinobryon sociale Ehrenberg	150864	34.13	12.00	6.00	226.20
MEL - 0110	7-Sep-24	4390	Dinobryon sociale Ehrenberg	2200	2.09	0.00	0.00	950.00
MEL - 0110	7-Sep-24	4394	Epiphyxis sp.	7184	0.57	9.40	4.00	78.70
MEL - 0110	7-Sep-24	4401	Uroglena volvox Ehrenberg	35920	4.06	6.00	6.00	113.10
MEL - 0110	7-Sep-24	4411	Bitrichia chodatii (Reverdin) Chodat	21552	1.08	6.00	4.00	50.30
MEL - 0110	7-Sep-24	4413	Chrysochromulina laurentiana Kling	21552	8.50	9.10	9.10	394.60
MEL - 0110	7-Sep-24	4414	Stichogloea spp.	28736	1.45	6.00	4.00	50.30
MEL - 0110	7-Sep-24	4415	Bicosoeca lacustris Clark	7184	0.37	4.60	4.60	51.00
MEL - 0110	7-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	567536	14.70	5.50	3.00	25.90
MEL - 0110	7-Sep-24	4444	Dinobryon pediforme (Lemmermann) Steineche	1800	5.50	18.00	18.00	3053.60
MEL - 0110	7-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	4600	10.99	11.50	23.00	2389.00
MEL - 0110	7-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	10800	8.24	81.00	6.00	763.40
MEL - 0110	7-Sep-24	5515	Fragilaria crotonensis Kitton	2800	0.83	71.00	4.00	297.40
MEL - 0110	7-Sep-24	5518	Synedra acus Kutzing	8600	0.90	100.00	2.00	104.70
MEL - 0110	7-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	3000	6.22	220.00	6.00	2073.50
MEL - 0110	7-Sep-24	5524	Asterionella formosa Hassall	48800	5.16	101.00	2.00	105.80
MEL - 0110	7-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	1600	13.47	17.50	35.00	8418.50
MEL - 0110	7-Sep-24	6554	Rhodomonas minuta Skuja	186784	23.48	10.00	6.00	125.70
MEL - 0110	7-Sep-24	6558	Cryptomonas erosa Ehrenberg	600	1.08	26.30	14.00	1799.40
MEL - 0110	7-Sep-24	7631	Gymnodinium helveticum Penard	400	9.42	50.00	30.00	23561.90
MEL - 0110	7-Sep-24	7632	Gymnodinium sp.	1200	7.64	23.00	23.00	6370.60
MEL - 0110	7-Sep-24	7632	Gymnodinium sp.	2800	62.86	35.00	35.00	22449.30
MEL - 0110	7-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	2200	8.28	19.30	19.30	3764.20
MEL - 0110	7-Sep-24	7641	Peridinium aciculiferum Lemmermann	800	7.24	30.00	24.00	9047.80
MEL - 0202	8-Sep-24	1019	Radiocystis geminata Skuja	21552	3.77	0.00	0.00	175.00
MEL - 0202	8-Sep-24	1073	Snowella sp	400	0.30	0.00	0.00	750.00
MEL - 0202	8-Sep-24	2112	Sphaerocystis schroeteri Chodat	93392	1.07	2.80	2.80	11.50
MEL - 0202	8-Sep-24	2113	Pediastrum duplex Meyen	200	0.42	0.00	0.00	2100.00
MEL - 0202	8-Sep-24	2121	Oocystis lacustris Chodat	93392	2.42	5.50	3.00	25.90
MEL - 0202	8-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	50288	3.03	9.60	4.00	60.30
MEL - 0202	8-Sep-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0202	8-Sep-24	2167	Elakatothrix gelatinosa Willen	100576	2.21	14.00	2.00	22.00
MEL - 0202	8-Sep-24	2169	Planctonema lauterbornii Schmidle	57472	20.31	18.00	5.00	353.40
MEL - 0202	8-Sep-24	2182	Euastrum spp.	200	0.37	22.00	22.00	1858.40
MEL - 0202	8-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	1400	0.52	13.30	12.00	370.50
MEL - 0202	8-Sep-24	2195	Staurodesmus bullardii G.M. Smith	400	2.58	34.00	32.00	6456.30
MEL - 0202	8-Sep-24	2199	Spondylosium planum (Wolle) W. and G.S. West	57472	2.17	6.00	6.00	37.70
MEL - 0202	8-Sep-24	2206	Botryococcus braunii Kutzing	200	0.29	14.00	14.00	1436.80
MEL - 0202	8-Sep-24	4351	Small chrysophyceae	258624	1.66	2.30	2.30	6.40
MEL - 0202	8-Sep-24	4352	Large chrysophyceae	21552	3.87	7.00	7.00	179.60
MEL - 0202	8-Sep-24	4355	Chrysochromulina parva Lackey	158048	10.34	5.00	5.00	65.40
MEL - 0202	8-Sep-24	4357	Chrysococcus sp.	316096	20.67	5.00	5.00	65.40
MEL - 0202	8-Sep-24	4358	Chrysostephanosphaera globulifera Scherffel	7184	2.56	8.80	8.80	356.80
MEL - 0202	8-Sep-24	4362	Kephyrion sp.	50288	0.58	2.80	2.80	11.50
MEL - 0202	8-Sep-24	4363	Spiniferomonas serrata	7184	0.77	5.90	5.90	107.50
MEL - 0202	8-Sep-24	4368	Mallomonas crassisquama (Asmund) Fott	200	0.21	20.00	10.00	1047.20
MEL - 0202	8-Sep-24	4378	Dinobryon borgei Lemmermann	7184	0.29	8.60	3.00	40.50
MEL - 0202	8-Sep-24	4383	Dinobryon bavaricum Imhof	28736	6.50	12.00	6.00	226.20
MEL - 0202	8-Sep-24	4383	Dinobryon bavaricum Imhof	1000	0.95	0.00	0.00	950.00
MEL - 0202	8-Sep-24	4388	Dinobryon sertularia Ehrenberg	43104	9.75	12.00	6.00	226.20
MEL - 0202	8-Sep-24	4388	Dinobryon sertularia Ehrenberg	2200	2.09	0.00	0.00	950.00
MEL - 0202	8-Sep-24	4390	Dinobryon sociale Ehrenberg	129312	29.25	12.00	6.00	226.20
MEL - 0202	8-Sep-24	4390	Dinobryon sociale Ehrenberg	2400	2.28	0.00	0.00	950.00
MEL - 0202	8-Sep-24	4394	Epiphyxis sp.	7184	0.55	9.10	4.00	76.20
MEL - 0202	8-Sep-24	4401	Uroglena volvox Ehrenberg	35920	4.06	6.00	6.00	113.10
MEL - 0202	8-Sep-24	4413	Chrysochromulina laurentiana Kling	165232	65.20	9.10	9.10	394.60
MEL - 0202	8-Sep-24	4414	Stichogloea spp.	14368	0.72	6.00	4.00	50.30

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0202	8-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	50288	1.30	5.50	3.00	25.90
MEL - 0202	8-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	4200	10.03	11.50	23.00	2389.00
MEL - 0202	8-Sep-24	5509	Cyclotella ocellata Pant.	71840	7.49	4.05	8.10	104.30
MEL - 0202	8-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	4200	3.21	81.00	6.00	763.40
MEL - 0202	8-Sep-24	5515	Fragilaria crotonensis Kitton	2400	0.71	71.00	4.00	297.40
MEL - 0202	8-Sep-24	5518	Synedra acus Kutzing	7600	0.80	100.00	2.00	104.70
MEL - 0202	8-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	3200	6.64	220.00	6.00	2073.50
MEL - 0202	8-Sep-24	5524	Asterionella formosa Hassall	24600	2.58	100.00	2.00	104.70
MEL - 0202	8-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	600	5.50	18.00	36.00	9160.90
MEL - 0202	8-Sep-24	5551	Cyclotella michiganiana Skvortzow	43104	1.06	2.50	5.00	24.50
MEL - 0202	8-Sep-24	6554	Rhodomonas minuta Skuja	50288	6.32	10.00	6.00	125.70
MEL - 0202	8-Sep-24	6558	Cryptomonas erosa Ehrenberg	2200	3.96	26.30	14.00	1799.40
MEL - 0202	8-Sep-24	7632	Gymnodinium sp.	800	5.10	23.00	23.00	6370.60
MEL - 0202	8-Sep-24	7632	Gymnodinium sp.	800	17.96	35.00	35.00	22449.30
MEL - 0202	8-Sep-24	7637	Peridinium limbatum (Stokes) Lemmermann	200	28.76	65.00	65.00	143793.30
MEL - 0202	8-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	3400	12.80	19.30	19.30	3764.20
MEL - 0202	8-Sep-24	7641	Peridinium aciculiferum Lemmermann	1000	9.05	30.00	24.00	9047.80
MEL - 0203	12-Sep-24	1073	Snowella sp	200	0.10	0.00	0.00	500.00
MEL - 0203	12-Sep-24	1133	Anabaena flos-aquae (Lyngb.) Breb. & Bornet	200	0.81	200.00	6.20	4025.40
MEL - 0203	12-Sep-24	2100	Pyramidomonas tetrarhynchus Schmarda	200	0.14	14.00	14.00	718.40
MEL - 0203	12-Sep-24	2112	Sphaerocystis schroeteri Chodat	7184	0.08	2.80	2.80	11.50
MEL - 0203	12-Sep-24	2121	Oocystis lacustris Chodat	258624	6.70	5.50	3.00	25.90
MEL - 0203	12-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	64656	3.90	9.60	4.00	60.30
MEL - 0203	12-Sep-24	2145	Crucigenia quadrata Morr.	86208	0.12	2.00	2.00	1.40
MEL - 0203	12-Sep-24	2167	Elakatothrix gelatinosa Willen	7184	0.16	14.00	2.00	22.00
MEL - 0203	12-Sep-24	2169	Planctonema lauterbornii Schmidle	79024	27.93	18.00	5.00	353.40
MEL - 0203	12-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	1000	0.37	13.30	12.00	370.50
MEL - 0203	12-Sep-24	2195	Staurodesmus bullardii G.M. Smith	200	1.29	34.00	32.00	6456.30
MEL - 0203	12-Sep-24	2206	Botryococcus braunii Kutzing	400	0.57	14.00	14.00	1436.80
MEL - 0203	12-Sep-24	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.03	3.00	3.00	4.70
MEL - 0203	12-Sep-24	4351	Small chrysophyceae	502880	3.22	2.30	2.30	6.40
MEL - 0203	12-Sep-24	4352	Large chrysophyceae	21552	3.87	7.00	7.00	179.60
MEL - 0203	12-Sep-24	4355	Chrysochromulina parva Lackey	229888	15.03	5.00	5.00	65.40
MEL - 0203	12-Sep-24	4357	Chrysococcus sp.	308912	20.20	5.00	5.00	65.40
MEL - 0203	12-Sep-24	4362	Kephyrion sp.	71840	0.83	2.80	2.80	11.50
MEL - 0203	12-Sep-24	4363	Spiniferomonas serrata	7184	0.85	6.10	6.10	118.80
MEL - 0203	12-Sep-24	4378	Dinobryon borgei Lemmermann	7184	0.29	8.60	3.00	40.50
MEL - 0203	12-Sep-24	4383	Dinobryon bavaricum Imhof	172416	39.00	12.00	6.00	226.20
MEL - 0203	12-Sep-24	4383	Dinobryon bavaricum Imhof	21552	4.88	12.00	6.00	226.20
MEL - 0203	12-Sep-24	4383	Dinobryon bavaricum Imhof	1200	1.14	0.00	0.00	950.00
MEL - 0203	12-Sep-24	4388	Dinobryon sertularia Ehrenberg	114944	26.00	12.00	6.00	226.20
MEL - 0203	12-Sep-24	4388	Dinobryon sertularia Ehrenberg	4400	4.18	0.00	0.00	950.00
MEL - 0203	12-Sep-24	4390	Dinobryon sociale Ehrenberg	2400	2.28	0.00	0.00	950.00
MEL - 0203	12-Sep-24	4401	Uroglena volvox Ehrenberg	43104	4.88	6.00	6.00	113.10
MEL - 0203	12-Sep-24	4411	Bitrichia chodatii (Reverdin) Chodat	21552	1.08	6.00	4.00	50.30
MEL - 0203	12-Sep-24	4413	Chrysochromulina laurentiana Kling	129312	51.03	9.10	9.10	394.60
MEL - 0203	12-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	237072	6.14	5.50	3.00	25.90
MEL - 0203	12-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	2400	5.73	11.50	23.00	2389.00
MEL - 0203	12-Sep-24	5509	Cyclotella ocellata Pant.	7184	0.81	4.15	8.30	112.30
MEL - 0203	12-Sep-24	5514	Tabellaria flocculosa (Roth) Kutzing	1600	2.13	26.00	14.00	1334.10
MEL - 0203	12-Sep-24	5515	Fragilaria crotonensis Kitton	200	0.06	71.00	4.00	297.40
MEL - 0203	12-Sep-24	5518	Synedra acus Kutzing	8400	0.88	100.00	2.00	104.70
MEL - 0203	12-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	1400	2.90	220.00	6.00	2073.50
MEL - 0203	12-Sep-24	5524	Asterionella formosa Hassall	12200	1.28	100.00	2.00	104.70
MEL - 0203	12-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	3400	31.15	18.00	36.00	9160.90
MEL - 0203	12-Sep-24	5551	Cyclotella michiganiana Skvortzow	71840	1.76	2.50	5.00	24.50
MEL - 0203	12-Sep-24	6554	Rhodomonas minuta Skuja	79024	11.92	12.00	6.00	150.80
MEL - 0203	12-Sep-24	6558	Cryptomonas erosa Ehrenberg	2000	3.60	26.30	14.00	1799.40
MEL - 0203	12-Sep-24	6568	Katablepharis ovalis Skuja	7184	0.29	7.60	4.00	40.30
MEL - 0203	12-Sep-24	7632	Gymnodinium sp.	1600	10.19	23.00	23.00	6370.60
MEL - 0203	12-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	1000	3.76	19.30	19.30	3764.20
MEL - 0203	12-Sep-24	7641	Peridinium aciculiferum Lemmermann	1000	9.05	30.00	24.00	9047.80
MEL - 0205	8-Sep-24	1073	Snowella sp	400	0.20	0.00	0.00	500.00
MEL - 0205	8-Sep-24	2112	Sphaerocystis schroeteri Chodat	71840	0.83	2.80	2.80	11.50
MEL - 0205	8-Sep-24	2121	Oocystis lacustris Chodat	222704	5.77	5.50	3.00	25.90
MEL - 0205	8-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	21552	1.30	9.60	4.00	60.30
MEL - 0205	8-Sep-24	2169	Planctonema lauterbornii Schmidle	21552	7.62	18.00	5.00	353.40
MEL - 0205	8-Sep-24	2178	Cosmarium sp.	200	0.28	20.00	20.00	1396.30
MEL - 0205	8-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	2400	0.89	13.30	12.00	370.50
MEL - 0205	8-Sep-24	2193	Staurodesmus paradoxum Meyen	400	0.50	20.00	18.00	1256.60
MEL - 0205	8-Sep-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - 0205	8-Sep-24	2206	Botryococcus braunii Kutzing	200	0.29	14.00	14.00	1436.80
MEL - 0205	8-Sep-24	4351	Small chrysophyceae	330464	2.11	2.30	2.30	6.40
MEL - 0205	8-Sep-24	4352	Large chrysophyceae	7184	1.29	7.00	7.00	179.60
MEL - 0205	8-Sep-24	4355	Chrysochromulina parva Lackey	114944	7.52	5.00	5.00	65.40
MEL - 0205	8-Sep-24	4357	Chrysococcus sp.	215520	14.10	5.00	5.00	65.40
MEL - 0205	8-Sep-24	4358	Chrysostephanosphaera globulifera Scherffel	35920	12.82	8.80	8.80	356.80
MEL - 0205	8-Sep-24	4362	Kephyrion sp.	35920	0.41	2.80	2.80	11.50
MEL - 0205	8-Sep-24	4378	Dinobryon borgei Lemmermann	43104	1.75	8.60	3.00	40.50
MEL - 0205	8-Sep-24	4383	Dinobryon bavaricum Imhof	28736	6.50	12.00	6.00	226.20
MEL - 0205	8-Sep-24	4383	Dinobryon bavaricum Imhof	1600	1.52	0.00	0.00	950.00
MEL - 0205	8-Sep-24	4388	Dinobryon sertularia Ehrenberg	21552	4.88	12.00	6.00	226.20
MEL - 0205	8-Sep-24	4388	Dinobryon sertularia Ehrenberg	4600	5.75	0.00	0.00	1250.00
MEL - 0205	8-Sep-24	4390	Dinobryon sociale Ehrenberg	150864	34.13	12.00	6.00	226.20
MEL - 0205	8-Sep-24	4390	Dinobryon sociale Ehrenberg	3400	3.23	0.00	0.00	950.00
MEL - 0205	8-Sep-24	4394	Epiphyxis sp.	7184	0.55	9.10	4.00	76.20
MEL - 0205	8-Sep-24	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.20	5.80	3.00	27.30
MEL - 0205	8-Sep-24	4401	Uroglena volvox Ehrenberg	21552	2.44	6.00	6.00	113.10
MEL - 0205	8-Sep-24	4413	Chrysochromulina laurentiana Kling	79024	32.22	9.20	9.20	407.70
MEL - 0205	8-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	64656	1.67	5.50	3.00	25.90
MEL - 0205	8-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	5800	13.86	11.50	23.00	2389.00
MEL - 0205	8-Sep-24	5509	Cyclotella ocellata Pant.	43104	4.50	4.05	8.10	104.30
MEL - 0205	8-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	200	0.15	81.00	6.00	763.40
MEL - 0205	8-Sep-24	5514	Tabellaria flocculosa (Roth) Kutzing	800	1.07	26.00	14.00	1334.10
MEL - 0205	8-Sep-24	5515	Fragilaria crotonensis Kitton	2400	0.71	71.00	4.00	297.40
MEL - 0205	8-Sep-24	5518	Synedra acus Kutzing	8400	0.88	100.00	2.00	104.70
MEL - 0205	8-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	1600	3.32	220.00	6.00	2073.50

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0205	8-Sep-24	5524	Asterionella formosa Hassall	18000	1.88	100.00	2.00	104.70
MEL - 0205	8-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	2000	18.32	18.00	36.00	9160.90
MEL - 0205	8-Sep-24	5551	Cyclotella michiganiana Skvortzow	7184	0.18	2.50	5.00	24.50
MEL - 0205	8-Sep-24	6554	Rhodomonas minuta Skuja	71840	9.03	10.00	6.00	125.70
MEL - 0205	8-Sep-24	6558	Cryptomonas erosa Ehrenberg	800	1.44	26.30	14.00	1799.40
MEL - 0205	8-Sep-24	7632	Gymnodinium sp.	1000	6.37	23.00	23.00	6370.60
MEL - 0205	8-Sep-24	7632	Gymnodinium sp.	800	17.96	35.00	35.00	22449.30
MEL - 0205	8-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	1600	6.02	19.30	19.30	3764.20
MEL - 0205	8-Sep-24	7641	Peridinium aciculiferum Lemmermann	400	3.62	30.00	24.00	9047.80
MEL - 0206	8-Sep-24	1014	Chroococcus limneticus Lemmermann	114944	5.13	4.40	4.40	44.60
MEL - 0206	8-Sep-24	2100	Pyramidomonas tetrarhynchus Schmarda	200	0.11	14.00	12.00	527.80
MEL - 0206	8-Sep-24	2121	Oocystis lacustris Chodat	35920	0.93	5.50	3.00	25.90
MEL - 0206	8-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	21552	1.30	9.60	4.00	60.30
MEL - 0206	8-Sep-24	2145	Crucigenia quadrata Morr.	7184	0.01	2.00	2.00	1.40
MEL - 0206	8-Sep-24	2167	Elakatothrix gelatinosa Willen	43104	0.95	14.00	2.00	22.00
MEL - 0206	8-Sep-24	2169	Planctonema lauterbornii Schmidle	129312	45.70	18.00	5.00	353.40
MEL - 0206	8-Sep-24	2178	Cosmarium sp.	200	0.28	20.00	20.00	1396.30
MEL - 0206	8-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	800	0.30	13.30	12.00	370.50
MEL - 0206	8-Sep-24	2193	Staurodesmus paradoxum Meyen	200	0.25	20.00	18.00	1256.60
MEL - 0206	8-Sep-24	2195	Staurodesmus bullardii G.M. Smith	200	1.29	34.00	32.00	6456.30
MEL - 0206	8-Sep-24	4351	Small chrysophyceae	574720	3.68	2.30	2.30	6.40
MEL - 0206	8-Sep-24	4352	Large chrysophyceae	35920	6.45	7.00	7.00	179.60
MEL - 0206	8-Sep-24	4355	Chrysochromulina parva Lackey	244256	15.97	5.00	5.00	65.40
MEL - 0206	8-Sep-24	4357	Chrysococcus sp.	352016	23.02	5.00	5.00	65.40
MEL - 0206	8-Sep-24	4358	Chrysostephanosphaera globulifera Scherffel	35920	12.82	8.80	8.80	356.80
MEL - 0206	8-Sep-24	4361	Kephyrion boreale Skuja	7184	0.85	6.10	6.10	118.80
MEL - 0206	8-Sep-24	4362	Kephyrion sp.	64656	0.74	2.80	2.80	11.50
MEL - 0206	8-Sep-24	4378	Dinobryon borgei Lemmermann	7184	0.31	9.10	3.00	42.90
MEL - 0206	8-Sep-24	4383	Dinobryon bavaricum Imhof	2000	1.90	0.00	0.00	950.00
MEL - 0206	8-Sep-24	4388	Dinobryon sertularia Ehrenberg	1400	1.33	0.00	0.00	950.00
MEL - 0206	8-Sep-24	4390	Dinobryon sociale Ehrenberg	43104	9.75	12.00	6.00	226.20
MEL - 0206	8-Sep-24	4390	Dinobryon sociale Ehrenberg	800	0.76	0.00	0.00	950.00
MEL - 0206	8-Sep-24	4394	Epiphyxis sp.	107760	8.63	9.10	4.10	80.10
MEL - 0206	8-Sep-24	4400	Ochromonas sp.	7184	0.46	7.60	4.00	63.70
MEL - 0206	8-Sep-24	4401	Uroglena volvox Ehrenberg	21552	2.44	6.00	6.00	113.10
MEL - 0206	8-Sep-24	4413	Chrysochromulina laurentiana Kling	172416	68.04	9.10	9.10	394.60
MEL - 0206	8-Sep-24	4414	Stichogloea spp.	57472	2.89	6.00	4.00	50.30
MEL - 0206	8-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	43104	1.12	5.50	3.00	25.90
MEL - 0206	8-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	1400	3.34	11.50	23.00	2389.00
MEL - 0206	8-Sep-24	5509	Cyclotella ocellata Pant.	7184	0.78	4.10	8.20	108.30
MEL - 0206	8-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	600	0.46	81.00	6.00	763.40
MEL - 0206	8-Sep-24	5514	Tabellaria flocculosa (Roth) Kutzing	3200	4.27	26.00	14.00	1334.10
MEL - 0206	8-Sep-24	5515	Fragilaria crotonensis Kitton	800	0.24	71.00	4.00	297.40
MEL - 0206	8-Sep-24	5518	Synedra acus Kutzing	6200	0.65	100.00	2.00	104.70
MEL - 0206	8-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	1200	2.49	220.00	6.00	2073.50
MEL - 0206	8-Sep-24	5524	Asterionella formosa Hassall	7800	0.82	100.00	2.00	104.70
MEL - 0206	8-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	3200	29.31	18.00	36.00	9160.90
MEL - 0206	8-Sep-24	6554	Rhodomonas minuta Skuja	7184	0.90	10.00	6.00	125.70
MEL - 0206	8-Sep-24	6558	Cryptomonas erosa Ehrenberg	1400	2.52	26.30	14.00	1799.40
MEL - 0206	8-Sep-24	7632	Gymnodinium sp.	1000	6.37	23.00	23.00	6370.60
MEL - 0206	8-Sep-24	7632	Gymnodinium sp.	400	8.98	35.00	35.00	22449.30
MEL - 0206	8-Sep-24	7637	Peridinium limbatum (Stokes) Lemmermann	200	28.76	65.00	65.00	143793.30
MEL - 0206	8-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	3200	12.05	19.30	19.30	3764.20
MEL - 0206	8-Sep-24	7641	Peridinium aciculiferum Lemmermann	800	7.24	30.00	24.00	9047.80
MEL - 0206R	8-Sep-24	1014	Chroococcus limneticus Lemmermann	28736	1.28	4.40	4.40	44.60
MEL - 0206R	8-Sep-24	1073	Snowella sp	200	0.10	0.00	0.00	500.00
MEL - 0206R	8-Sep-24	2100	Pyramidomonas tetrarhynchus Schmarda	400	0.21	14.00	12.00	527.80
MEL - 0206R	8-Sep-24	2112	Sphaerocystis schroeteri Chodat	86208	0.99	2.80	2.80	11.50
MEL - 0206R	8-Sep-24	2121	Oocystis lacustris Chodat	71840	1.86	5.50	3.00	25.90
MEL - 0206R	8-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.43	9.60	4.00	60.30
MEL - 0206R	8-Sep-24	2145	Crucigenia quadrata Morr.	57472	0.08	2.00	2.00	1.40
MEL - 0206R	8-Sep-24	2167	Elakatothrix gelatinosa Willen	43104	0.95	14.00	2.00	22.00
MEL - 0206R	8-Sep-24	2169	Planctonema lauterbornii Schmidle	143680	50.78	18.00	5.00	353.40
MEL - 0206R	8-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	400	0.15	13.30	12.00	370.50
MEL - 0206R	8-Sep-24	2193	Staurodesmus paradoxum Meyen	200	0.25	20.00	18.00	1256.60
MEL - 0206R	8-Sep-24	2195	Staurodesmus bullardii G.M. Smith	600	3.87	34.00	32.00	6456.30
MEL - 0206R	8-Sep-24	4351	Small chrysophyceae	495696	3.17	2.30	2.30	6.40
MEL - 0206R	8-Sep-24	4352	Large chrysophyceae	43104	7.74	7.00	7.00	179.60
MEL - 0206R	8-Sep-24	4355	Chrysochromulina parva Lackey	294544	19.26	5.00	5.00	65.40
MEL - 0206R	8-Sep-24	4357	Chrysococcus sp.	380752	24.90	5.00	5.00	65.40
MEL - 0206R	8-Sep-24	4358	Chrysostephanosphaera globulifera Scherffel	21552	7.69	8.80	8.80	356.80
MEL - 0206R	8-Sep-24	4362	Kephyrion sp.	43104	0.50	2.80	2.80	11.50
MEL - 0206R	8-Sep-24	4378	Dinobryon borgei Lemmermann	21552	0.87	8.60	3.00	40.50
MEL - 0206R	8-Sep-24	4383	Dinobryon bavaricum Imhof	1200	1.14	0.00	0.00	950.00
MEL - 0206R	8-Sep-24	4388	Dinobryon sertularia Ehrenberg	14368	3.25	12.00	6.00	226.20
MEL - 0206R	8-Sep-24	4388	Dinobryon sertularia Ehrenberg	1200	1.14	0.00	0.00	950.00
MEL - 0206R	8-Sep-24	4390	Dinobryon sociale Ehrenberg	64656	14.63	12.00	6.00	226.20
MEL - 0206R	8-Sep-24	4390	Dinobryon sociale Ehrenberg	800	0.76	0.00	0.00	950.00
MEL - 0206R	8-Sep-24	4394	Epiphyxis sp.	64656	4.93	9.10	4.00	76.20
MEL - 0206R	8-Sep-24	4401	Uroglena volvox Ehrenberg	7184	0.81	6.00	6.00	113.10
MEL - 0206R	8-Sep-24	4413	Chrysochromulina laurentiana Kling	158048	62.37	9.10	9.10	394.60
MEL - 0206R	8-Sep-24	4414	Stichogloea spp.	107760	5.42	6.00	4.00	50.30
MEL - 0206R	8-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	43104	1.12	5.50	3.00	25.90
MEL - 0206R	8-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	800	1.91	11.50	23.00	2389.00
MEL - 0206R	8-Sep-24	5509	Cyclotella ocellata Pant.	7184	0.78	4.10	8.20	108.30
MEL - 0206R	8-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	1600	1.22	81.00	6.00	763.40
MEL - 0206R	8-Sep-24	5514	Tabellaria flocculosa (Roth) Kutzing	1400	1.87	26.00	14.00	1334.10
MEL - 0206R	8-Sep-24	5515	Fragilaria crotonensis Kitton	2400	0.71	71.00	4.00	297.40
MEL - 0206R	8-Sep-24	5518	Synedra acus Kutzing	9200	0.96	100.00	2.00	104.70
MEL - 0206R	8-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	800	1.66	220.00	6.00	2073.50
MEL - 0206R	8-Sep-24	5524	Asterionella formosa Hassall	10200	1.07	100.00	2.00	104.70
MEL - 0206R	8-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	3200	26.06	16.00	36.00	8143.00
MEL - 0206R	8-Sep-24	6554	Rhodomonas minuta Skuja	21552	2.71	10.00	6.00	125.70
MEL - 0206R	8-Sep-24	6558	Cryptomonas erosa Ehrenberg	600	1.08	26.30	14.00	1799.40
MEL - 0206R	8-Sep-24	7632	Gymnodinium sp.	1400	8.92	23.00	23.00	6370.60
MEL - 0206R	8-Sep-24	7632	Gymnodinium sp.	200	4.49	35.00	35.00	22449.30
MEL - 0206R	8-Sep-24	7637	Peridinium limbatum (Stokes) Lemmermann	400	57.52	65.00	65.00	143793.30

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0206R	8-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	2400	9.03	19.30	19.30	3764.20
MEL - 0206R	8-Sep-24	7641	Peridinium aciculiferum Lemmermann	400	3.62	30.00	24.00	9047.80
MEL - 0208	8-Sep-24	1014	Chroococcus limneticus Lemmermann	158048	7.05	4.40	4.40	44.60
MEL - 0208	8-Sep-24	1073	Snowella sp	200	0.10	0.00	0.00	500.00
MEL - 0208	8-Sep-24	2112	Sphaerocystis schroeteri Chodat	215520	2.48	2.80	2.80	11.50
MEL - 0208	8-Sep-24	2121	Oocystis lacustris Chodat	64656	1.67	5.50	3.00	25.90
MEL - 0208	8-Sep-24	2137	Dictyosphaerium simplex Sukja	50288	0.21	2.00	2.00	4.20
MEL - 0208	8-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	21552	1.30	9.60	4.00	60.30
MEL - 0208	8-Sep-24	2145	Crucigenia quadrata Morr.	172416	0.24	2.00	2.00	1.40
MEL - 0208	8-Sep-24	2169	Planctonema lauterbornii Schmidle	28736	10.16	18.00	5.00	353.40
MEL - 0208	8-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	600	0.22	13.30	12.00	370.50
MEL - 0208	8-Sep-24	2193	Staurodesmus paradoxum Meyen	200	0.25	20.00	18.00	1256.60
MEL - 0208	8-Sep-24	2199	Spondylosium planum (Wolle) W. and G.S. West	57472	2.17	6.00	6.00	37.70
MEL - 0208	8-Sep-24	2206	Botryococcus braunii Kutzing	1000	1.44	14.00	14.00	1436.80
MEL - 0208	8-Sep-24	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.01	2.00	2.00	1.40
MEL - 0208	8-Sep-24	4351	Small chrysophyceae	265808	1.70	2.30	2.30	6.40
MEL - 0208	8-Sep-24	4355	Chrysochromulina parva Lackey	100576	6.58	5.00	5.00	65.40
MEL - 0208	8-Sep-24	4357	Chrysococcus sp.	186784	12.22	5.00	5.00	65.40
MEL - 0208	8-Sep-24	4358	Chrysostephanosphaera globulifera Scherffel	14368	5.13	8.80	8.80	356.80
MEL - 0208	8-Sep-24	4362	Kephyrion sp.	100576	1.16	2.80	2.80	11.50
MEL - 0208	8-Sep-24	4363	Spiniferomonas serrata	21552	2.56	6.10	6.10	118.80
MEL - 0208	8-Sep-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - 0208	8-Sep-24	4368	Mallomonas crassisquama (Asmund) Fott	200	0.21	20.00	10.00	1047.20
MEL - 0208	8-Sep-24	4383	Dinobryon bavaricum Imhof	2000	1.90	0.00	0.00	950.00
MEL - 0208	8-Sep-24	4388	Dinobryon sertularia Ehrenberg	21552	4.88	12.00	6.00	226.20
MEL - 0208	8-Sep-24	4388	Dinobryon sertularia Ehrenberg	4200	3.99	0.00	0.00	950.00
MEL - 0208	8-Sep-24	4390	Dinobryon sociale Ehrenberg	172416	39.00	12.00	6.00	226.20
MEL - 0208	8-Sep-24	4390	Dinobryon sociale Ehrenberg	4000	3.80	0.00	0.00	950.00
MEL - 0208	8-Sep-24	4401	Uroglena volvox Ehrenberg	57472	6.50	6.00	6.00	113.10
MEL - 0208	8-Sep-24	4413	Chrysochromulina laurentiana Kling	172416	68.04	9.10	9.10	394.60
MEL - 0208	8-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	50288	1.30	5.50	3.00	25.90
MEL - 0208	8-Sep-24	4444	Dinobryon pediforme (Lemmermann) Steineche	200	0.61	18.00	18.00	3053.60
MEL - 0208	8-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	1200	2.87	11.50	23.00	2389.00
MEL - 0208	8-Sep-24	5509	Cyclotella ocellata Pant.	21552	2.88	4.40	8.80	133.80
MEL - 0208	8-Sep-24	5515	Fragilaria crotonensis Kitton	1200	0.36	71.00	4.00	297.40
MEL - 0208	8-Sep-24	5518	Synedra acus Kutzing	7200	0.75	100.00	2.00	104.70
MEL - 0208	8-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	1200	2.49	220.00	6.00	2073.50
MEL - 0208	8-Sep-24	5524	Asterionella formosa Hassall	22400	2.37	101.00	2.00	105.80
MEL - 0208	8-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	2600	23.82	18.00	36.00	9160.90
MEL - 0208	8-Sep-24	6554	Rhodomonas minuta Skuja	43104	5.42	10.00	6.00	125.70
MEL - 0208	8-Sep-24	6558	Cryptomonas erosa Ehrenberg	400	0.72	26.30	14.00	1799.40
MEL - 0208	8-Sep-24	7632	Gymnodinium sp.	1200	7.64	23.00	23.00	6370.60
MEL - 0208	8-Sep-24	7632	Gymnodinium sp.	800	17.96	35.00	35.00	22449.30
MEL - 0208	8-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	1400	5.27	19.30	19.30	3764.20
MEL - 0208	8-Sep-24	7641	Peridinium aciculiferum Lemmermann	600	5.43	30.00	24.00	9047.80
MEL - 0301	12-Sep-24	2112	Sphaerocystis schroeteri Chodat	129312	1.49	2.80	2.80	11.50
MEL - 0301	12-Sep-24	2113	Pediastrum duplex Meyen	200	0.62	0.00	0.00	3100.00
MEL - 0301	12-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	35920	2.17	9.60	4.00	60.30
MEL - 0301	12-Sep-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0301	12-Sep-24	2167	Elakatothrix gelatinosa Willen	7184	0.16	14.00	2.00	22.00
MEL - 0301	12-Sep-24	2169	Planctonema lauterbornii Schmidle	244256	86.32	18.00	5.00	353.40
MEL - 0301	12-Sep-24	2182	Euastrum spp.	200	0.37	22.00	22.00	1858.40
MEL - 0301	12-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	1800	0.67	13.30	12.00	370.50
MEL - 0301	12-Sep-24	2191	Staurodesmus cuspidatus (Brebisson and Ralfs) Teiling	200	0.31	21.00	20.00	1539.40
MEL - 0301	12-Sep-24	2193	Staurodesmus paradoxum Meyen	200	0.25	20.00	18.00	1256.60
MEL - 0301	12-Sep-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - 0301	12-Sep-24	4351	Small chrysophyceae	545984	3.49	2.30	2.30	6.40
MEL - 0301	12-Sep-24	4352	Large chrysophyceae	79024	14.19	7.00	7.00	179.60
MEL - 0301	12-Sep-24	4355	Chrysochromulina parva Lackey	57472	3.76	5.00	5.00	65.40
MEL - 0301	12-Sep-24	4357	Chrysococcus sp.	215520	14.10	5.00	5.00	65.40
MEL - 0301	12-Sep-24	4358	Chrysostephanosphaera globulifera Scherffel	14368	5.13	8.80	8.80	356.80
MEL - 0301	12-Sep-24	4361	Kephyrion boreale Skuja	14368	1.71	6.10	6.10	118.80
MEL - 0301	12-Sep-24	4362	Kephyrion sp.	50288	0.58	2.80	2.80	11.50
MEL - 0301	12-Sep-24	4363	Spiniferomonas serrata	14368	1.54	5.90	5.90	107.50
MEL - 0301	12-Sep-24	4378	Dinobryon borgei Lemmermann	28736	1.16	8.60	3.00	40.50
MEL - 0301	12-Sep-24	4378	Dinobryon borgei Lemmermann	7184	0.31	9.10	3.00	42.90
MEL - 0301	12-Sep-24	4383	Dinobryon bavaricum Imhof	1000	0.95	0.00	0.00	950.00
MEL - 0301	12-Sep-24	4388	Dinobryon sertularia Ehrenberg	7184	1.63	12.00	6.00	226.20
MEL - 0301	12-Sep-24	4388	Dinobryon sertularia Ehrenberg	2000	1.90	0.00	0.00	950.00
MEL - 0301	12-Sep-24	4390	Dinobryon sociale Ehrenberg	114944	26.00	12.00	6.00	226.20
MEL - 0301	12-Sep-24	4390	Dinobryon sociale Ehrenberg	1000	0.95	0.00	0.00	950.00
MEL - 0301	12-Sep-24	4413	Chrysochromulina laurentiana Kling	7184	2.93	9.20	9.20	407.70
MEL - 0301	12-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	35920	0.93	5.50	3.00	25.90
MEL - 0301	12-Sep-24	4444	Dinobryon pediforme (Lemmermann) Steineche	200	0.61	18.00	18.00	3053.60
MEL - 0301	12-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	2000	4.78	11.50	23.00	2389.00
MEL - 0301	12-Sep-24	5509	Cyclotella ocellata Pant.	35920	3.89	4.10	8.20	108.30
MEL - 0301	12-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	1400	1.06	80.00	6.00	754.00
MEL - 0301	12-Sep-24	5514	Tabellaria flocculosa (Roth) Kutzing	800	1.07	26.00	14.00	1334.10
MEL - 0301	12-Sep-24	5515	Fragilaria crotonensis Kitton	1600	0.48	71.00	4.00	297.40
MEL - 0301	12-Sep-24	5518	Synedra acus Kutzing	7400	0.77	100.00	2.00	104.70
MEL - 0301	12-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	400	0.83	220.00	6.00	2073.50
MEL - 0301	12-Sep-24	5524	Asterionella formosa Hassall	1400	0.15	100.00	2.00	104.70
MEL - 0301	12-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	3000	27.48	18.00	36.00	9160.90
MEL - 0301	12-Sep-24	6554	Rhodomonas minuta Skuja	57472	7.22	10.00	6.00	125.70
MEL - 0301	12-Sep-24	6558	Cryptomonas erosa Ehrenberg	600	1.08	26.30	14.00	1799.40
MEL - 0301	12-Sep-24	7631	Gymnodinium helveticum Penard	400	9.42	50.00	30.00	23561.90
MEL - 0301	12-Sep-24	7632	Gymnodinium sp.	800	5.10	23.00	23.00	6370.60
MEL - 0301	12-Sep-24	7632	Gymnodinium sp.	400	8.98	35.00	35.00	22449.30
MEL - 0301	12-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	1400	5.27	19.30	19.30	3764.20
MEL - 0301	12-Sep-24	7641	Peridinium aciculiferum Lemmermann	800	7.24	30.00	24.00	9047.80
MEL - 0302	12-Sep-24	1073	Snowella sp	200	0.10	0.00	0.00	500.00
MEL - 0302	12-Sep-24	2112	Sphaerocystis schroeteri Chodat	93392	1.07	2.80	2.80	11.50
MEL - 0302	12-Sep-24	2121	Oocystis lacustris Chodat	7184	0.19	5.50	3.00	25.90
MEL - 0302	12-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	114944	6.93	9.60	4.00	60.30
MEL - 0302	12-Sep-24	2145	Crucigenia quadrata Morr.	86208	0.12	2.00	2.00	1.40
MEL - 0302	12-Sep-24	2169	Planctonema lauterbornii Schmidle	7184	2.54	18.00	5.00	353.40
MEL - 0302	12-Sep-24	2178	Cosmarium sp.	200	0.28	20.00	20.00	1396.30

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0302	12-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	1800	0.67	13.30	12.00	370.50
MEL - 0302	12-Sep-24	2193	Staurodesmus paradoxum Meyen	400	0.50	20.00	18.00	1256.60
MEL - 0302	12-Sep-24	2206	Botryococcus braunii Kutzing	200	0.29	14.00	14.00	1436.80
MEL - 0302	12-Sep-24	2247	Oocystis gigas Archer	200	0.48	18.00	16.00	2412.70
MEL - 0302	12-Sep-24	2260	Monomastix minuta Skuja	14368	0.33	6.50	3.20	23.20
MEL - 0302	12-Sep-24	4351	Small chrysophyceae	431040	2.76	2.30	2.30	6.40
MEL - 0302	12-Sep-24	4352	Large chrysophyceae	7184	1.29	7.00	7.00	179.60
MEL - 0302	12-Sep-24	4355	Chrysochromulina parva Lackey	100576	6.58	5.00	5.00	65.40
MEL - 0302	12-Sep-24	4357	Chrysococcus sp.	215520	14.10	5.00	5.00	65.40
MEL - 0302	12-Sep-24	4362	Kephyrion sp.	71840	0.83	2.80	2.80	11.50
MEL - 0302	12-Sep-24	4363	Spiniferomonas serrata	7184	0.85	6.10	6.10	118.80
MEL - 0302	12-Sep-24	4383	Dinobryon bavaricum Imhof	35920	8.13	12.00	6.00	226.20
MEL - 0302	12-Sep-24	4383	Dinobryon bavaricum Imhof	200	0.19	0.00	0.00	950.00
MEL - 0302	12-Sep-24	4388	Dinobryon sertularia Ehrenberg	7184	1.63	12.00	6.00	226.20
MEL - 0302	12-Sep-24	4388	Dinobryon sertularia Ehrenberg	1200	1.14	0.00	0.00	950.00
MEL - 0302	12-Sep-24	4390	Dinobryon sociale Ehrenberg	1800	1.71	0.00	0.00	950.00
MEL - 0302	12-Sep-24	4401	Uroglena volvox Ehrenberg	7184	0.81	6.00	6.00	113.10
MEL - 0302	12-Sep-24	4413	Chrysochromulina laurentiana Kling	7184	2.83	9.10	9.10	394.60
MEL - 0302	12-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	150864	3.91	5.50	3.00	25.90
MEL - 0302	12-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	2400	5.73	11.50	23.00	2389.00
MEL - 0302	12-Sep-24	5509	Cyclotella ocellata Pant.	21552	2.25	4.05	8.10	104.30
MEL - 0302	12-Sep-24	5511	Rhizosolenia eriense H.L. Smith	7184	0.61	12.00	3.00	84.80
MEL - 0302	12-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	8400	6.41	81.00	6.00	763.40
MEL - 0302	12-Sep-24	5515	Fragilaria crotonensis Kitton	2600	0.77	71.00	4.00	297.40
MEL - 0302	12-Sep-24	5518	Synedra acus Kutzing	5400	0.57	100.00	2.00	104.70
MEL - 0302	12-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	600	1.24	220.00	6.00	2073.50
MEL - 0302	12-Sep-24	5524	Asterionella formosa Hassall	5000	0.52	100.00	2.00	104.70
MEL - 0302	12-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	3200	29.31	18.00	36.00	9160.90
MEL - 0302	12-Sep-24	5551	Cyclotella michiganiana Skvortzow	7184	0.18	2.50	5.00	24.50
MEL - 0302	12-Sep-24	6554	Rhodomonas minuta Skuja	143680	18.06	10.00	6.00	125.70
MEL - 0302	12-Sep-24	6558	Cryptomonas erosa Ehrenberg	2600	4.68	26.30	14.00	1799.40
MEL - 0302	12-Sep-24	7631	Gymnodinium helveticum Penard	600	14.14	50.00	30.00	23561.90
MEL - 0302	12-Sep-24	7632	Gymnodinium sp.	2400	15.29	23.00	23.00	6370.60
MEL - 0302	12-Sep-24	7632	Gymnodinium sp.	1400	31.43	35.00	35.00	22449.30
MEL - 0302	12-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	1200	4.52	19.30	19.30	3764.20
MEL - 0302	12-Sep-24	7641	Peridinium aciculiferum Lemmermann	1800	16.29	30.00	24.00	9047.80
MEL - 0303	12-Sep-24	1044	Anabaena planctonica Brunnthaler	200	1.19	220.00	7.20	5971.50
MEL - 0303	12-Sep-24	2112	Sphaerocystis schroeteri Chodat	114944	1.32	2.80	2.80	11.50
MEL - 0303	12-Sep-24	2121	Oocystis lacustris Chodat	79024	1.20	5.50	2.30	15.20
MEL - 0303	12-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	21552	1.30	9.60	4.00	60.30
MEL - 0303	12-Sep-24	2169	Planctonema lauterbornii Schmidle	79024	27.93	18.00	5.00	353.40
MEL - 0303	12-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	1200	0.44	13.30	12.00	370.50
MEL - 0303	12-Sep-24	2193	Staurodesmus paradoxum Meyen	200	0.25	20.00	18.00	1256.60
MEL - 0303	12-Sep-24	2195	Staurodesmus bullardii G.M. Smith	400	2.58	34.00	32.00	6456.30
MEL - 0303	12-Sep-24	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27	6.00	6.00	37.70
MEL - 0303	12-Sep-24	2206	Botryococcus braunii Kutzing	400	0.57	14.00	14.00	1436.80
MEL - 0303	12-Sep-24	4351	Small chrysophyceae	596272	3.82	2.30	2.30	6.40
MEL - 0303	12-Sep-24	4352	Large chrysophyceae	79024	14.19	7.00	7.00	179.60
MEL - 0303	12-Sep-24	4355	Chrysochromulina parva Lackey	100576	6.58	5.00	5.00	65.40
MEL - 0303	12-Sep-24	4357	Chrysococcus sp.	603456	39.47	5.00	5.00	65.40
MEL - 0303	12-Sep-24	4362	Kephyrion sp.	114944	1.32	2.80	2.80	11.50
MEL - 0303	12-Sep-24	4383	Dinobryon bavaricum Imhof	1400	1.33	0.00	0.00	950.00
MEL - 0303	12-Sep-24	4388	Dinobryon sertularia Ehrenberg	7184	1.63	12.00	6.00	226.20
MEL - 0303	12-Sep-24	4390	Dinobryon sociale Ehrenberg	107760	42.65	21.00	6.00	395.80
MEL - 0303	12-Sep-24	4401	Uroglena volvox Ehrenberg	71840	8.13	6.00	6.00	113.10
MEL - 0303	12-Sep-24	4413	Chrysochromulina laurentiana Kling	43104	17.01	9.10	9.10	394.60
MEL - 0303	12-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	86208	2.23	5.50	3.00	25.90
MEL - 0303	12-Sep-24	4437	Pteridomonas sp.	7184	1.71	8.80	8.80	237.90
MEL - 0303	12-Sep-24	4444	Dinobryon pediforme (Lemmermann) Steineche	400	1.22	18.00	18.00	3053.60
MEL - 0303	12-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	2200	5.26	11.50	23.00	2389.00
MEL - 0303	12-Sep-24	5509	Cyclotella ocellata Pant.	21552	2.33	4.10	8.20	108.30
MEL - 0303	12-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	2800	2.14	81.00	6.00	763.40
MEL - 0303	12-Sep-24	5515	Fragilaria crotonensis Kitton	400	0.12	71.00	4.00	297.40
MEL - 0303	12-Sep-24	5518	Synedra acus Kutzing	8800	0.92	100.00	2.00	104.70
MEL - 0303	12-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	200	0.41	220.00	6.00	2073.50
MEL - 0303	12-Sep-24	5524	Asterionella formosa Hassall	8400	0.88	100.00	2.00	104.70
MEL - 0303	12-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	4000	36.64	18.00	36.00	9160.90
MEL - 0303	12-Sep-24	5551	Cyclotella michiganiana Skvortzow	7184	0.18	2.50	5.00	24.50
MEL - 0303	12-Sep-24	5860	Diatoma vulgare Bory	800	0.19	25.00	6.00	235.60
MEL - 0303	12-Sep-24	6554	Rhodomonas minuta Skuja	14368	1.81	10.00	6.00	125.70
MEL - 0303	12-Sep-24	6558	Cryptomonas erosa Ehrenberg	600	1.08	26.30	14.00	1799.40
MEL - 0303	12-Sep-24	7631	Gymnodinium helveticum Penard	200	4.71	50.00	30.00	23561.90
MEL - 0303	12-Sep-24	7632	Gymnodinium sp.	1000	6.37	23.00	23.00	6370.60
MEL - 0303	12-Sep-24	7632	Gymnodinium sp.	200	4.49	35.00	35.00	22449.30
MEL - 0303	12-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	800	3.01	19.30	19.30	3764.20
MEL - 0303	12-Sep-24	7641	Peridinium aciculiferum Lemmermann	400	3.62	30.00	24.00	9047.80
MEL - 0304	12-Sep-24	1014	Chroococcus limneticus Lemmermann	57472	1.93	4.00	4.00	33.50
MEL - 0304	12-Sep-24	1073	Snowella sp	200	0.10	0.00	0.00	500.00
MEL - 0304	12-Sep-24	2100	Pyramidomonas tetrarhynchus Schmarda	200	0.11	14.00	12.00	527.80
MEL - 0304	12-Sep-24	2121	Oocystis lacustris Chodat	50288	1.30	5.50	3.00	25.90
MEL - 0304	12-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	57472	3.47	9.60	4.00	60.30
MEL - 0304	12-Sep-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - 0304	12-Sep-24	2157	Kichneriella lunaris (Kirchn.) Moeb.	43104	0.56	8.30	2.00	13.00
MEL - 0304	12-Sep-24	2169	Planctonema lauterbornii Schmidle	7184	2.54	18.00	5.00	353.40
MEL - 0304	12-Sep-24	2182	Euastrum spp.	200	0.37	22.00	22.00	1858.40
MEL - 0304	12-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	600	0.22	13.30	12.00	370.50
MEL - 0304	12-Sep-24	2195	Staurodesmus bullardii G.M. Smith	200	1.29	34.00	32.00	6456.30
MEL - 0304	12-Sep-24	2199	Spondylosium planum (Wolle) W. and G.S. West	21552	0.81	6.00	6.00	37.70
MEL - 0304	12-Sep-24	2206	Botryococcus braunii Kutzing	200	0.29	14.00	14.00	1436.80
MEL - 0304	12-Sep-24	4351	Small chrysophyceae	488512	3.13	2.30	2.30	6.40
MEL - 0304	12-Sep-24	4352	Large chrysophyceae	35920	6.45	7.00	7.00	179.60
MEL - 0304	12-Sep-24	4355	Chrysochromulina parva Lackey	86208	5.64	5.00	5.00	65.40
MEL - 0304	12-Sep-24	4357	Chrysococcus sp.	208336	13.63	5.00	5.00	65.40
MEL - 0304	12-Sep-24	4358	Chrysostephanosphaera globulifera Scherffel	7184	2.56	8.80	8.80	356.80
MEL - 0304	12-Sep-24	4362	Kephyrion sp.	7184	0.08	2.80	2.80	11.50
MEL - 0304	12-Sep-24	4363	Spiniferomonas serrata	7184	0.73	5.80	5.80	102.20
MEL - 0304	12-Sep-24	4369	Mallomonas pseudocoronata Prescott	200	0.35	23.50	12.00	1771.90

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - 0304	12-Sep-24	4383	Dinobryon bavaricum Imhof	7184	1.63	12.00	6.00	226.20
MEL - 0304	12-Sep-24	4383	Dinobryon bavaricum Imhof	1600	1.52	0.00	0.00	950.00
MEL - 0304	12-Sep-24	4388	Dinobryon sertularia Ehrenberg	1200	1.14	0.00	0.00	950.00
MEL - 0304	12-Sep-24	4390	Dinobryon sociale Ehrenberg	43104	9.75	12.00	6.00	226.20
MEL - 0304	12-Sep-24	4390	Dinobryon sociale Ehrenberg	200	0.19	0.00	0.00	950.00
MEL - 0304	12-Sep-24	4401	Uroglena volvox Ehrenberg	93392	10.56	6.00	6.00	113.10
MEL - 0304	12-Sep-24	4411	Bitrichia chodatii (Reverdin) Chodat	7184	0.36	6.00	4.00	50.30
MEL - 0304	12-Sep-24	4413	Chrysochromulina laurentiana Kling	86208	34.02	9.10	9.10	394.60
MEL - 0304	12-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	21552	0.56	5.50	3.00	25.90
MEL - 0304	12-Sep-24	4444	Dinobryon pediforme (Lemmermann) Steineche	400	1.22	18.00	18.00	3053.60
MEL - 0304	12-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	2400	5.73	11.50	23.00	2389.00
MEL - 0304	12-Sep-24	5509	Cyclotella ocellata Pant.	35920	3.75	4.05	8.10	104.30
MEL - 0304	12-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	1000	0.75	80.00	6.00	754.00
MEL - 0304	12-Sep-24	5515	Fragilaria crotonensis Kitton	1600	0.48	71.00	4.00	297.40
MEL - 0304	12-Sep-24	5518	Synedra acus Kutzing	9000	0.94	100.00	2.00	104.70
MEL - 0304	12-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	1000	2.07	220.00	6.00	2073.50
MEL - 0304	12-Sep-24	5524	Asterionella formosa Hassall	2600	0.27	100.00	2.00	104.70
MEL - 0304	12-Sep-24	5529	Eunotia zazumenensis **********	600	0.02	49.00	1.80	41.60
MEL - 0304	12-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	2600	23.82	18.00	36.00	9160.90
MEL - 0304	12-Sep-24	5551	Cyclotella michiganiana Skvortzow	7184	0.14	2.30	4.60	19.10
MEL - 0304	12-Sep-24	6554	Rhodomonas minuta Skuja	57472	7.22	10.00	6.00	125.70
MEL - 0304	12-Sep-24	6558	Cryptomonas erosa Ehrenberg	1800	3.24	26.30	14.00	1799.40
MEL - 0304	12-Sep-24	7632	Gymnodinium sp.	2000	12.74	23.00	23.00	6370.60
MEL - 0304	12-Sep-24	7632	Gymnodinium sp.	200	4.49	35.00	35.00	22449.30
MEL - 0304	12-Sep-24	7637	Peridinium limbatum (Stokes) Lemmermann	200	28.76	65.00	65.00	143793.30
MEL - 0304	12-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	3800	14.30	19.30	19.30	3764.20
MEL - 0304	12-Sep-24	7641	Peridinium aciculiferum Lemmermann	1800	16.29	30.00	24.00	9047.80
MEL - 0305	12-Sep-24	1044	Anabaena planctonica Brunnthaler	200	1.66	305.00	7.20	8278.70
MEL - 0305	12-Sep-24	1073	Snowella sp	200	0.10	0.00	0.00	500.00
MEL - 0305	12-Sep-24	2112	Sphaerocystis schroeteri Chodat	21552	0.25	2.80	2.80	11.50
MEL - 0305	12-Sep-24	2121	Oocystis lacustris Chodat	43104	1.12	5.50	3.00	25.90
MEL - 0305	12-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	71840	4.33	9.60	4.00	60.30
MEL - 0305	12-Sep-24	2169	Planctonema lauterbornii Schmidle	7184	2.54	18.00	5.00	353.40
MEL - 0305	12-Sep-24	2178	Cosmarium sp.	200	0.28	20.00	20.00	1396.30
MEL - 0305	12-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	1200	0.44	13.30	12.00	370.50
MEL - 0305	12-Sep-24	2206	Botryococcus braunii Kutzing	200	0.29	14.00	14.00	1436.80
MEL - 0305	12-Sep-24	4351	Small chrysophyceae	431040	2.76	2.30	2.30	6.40
MEL - 0305	12-Sep-24	4352	Large chrysophyceae	64656	11.61	7.00	7.00	179.60
MEL - 0305	12-Sep-24	4355	Chrysochromulina parva Lackey	57472	3.76	5.00	5.00	65.40
MEL - 0305	12-Sep-24	4357	Chrysococcus sp.	323280	21.14	5.00	5.00	65.40
MEL - 0305	12-Sep-24	4361	Kephyrion boreale Skuja	7184	0.85	6.10	6.10	118.80
MEL - 0305	12-Sep-24	4362	Kephyrion sp.	129312	1.49	2.80	2.80	11.50
MEL - 0305	12-Sep-24	4383	Dinobryon bavaricum Imhof	28736	6.50	12.00	6.00	226.20
MEL - 0305	12-Sep-24	4383	Dinobryon bavaricum Imhof	800	0.76	0.00	0.00	950.00
MEL - 0305	12-Sep-24	4388	Dinobryon sertularia Ehrenberg	71840	16.25	12.00	6.00	226.20
MEL - 0305	12-Sep-24	4388	Dinobryon sertularia Ehrenberg	1000	0.95	0.00	0.00	950.00
MEL - 0305	12-Sep-24	4390	Dinobryon sociale Ehrenberg	21552	4.88	12.00	6.00	226.20
MEL - 0305	12-Sep-24	4390	Dinobryon sociale Ehrenberg	1000	0.95	0.00	0.00	950.00
MEL - 0305	12-Sep-24	4401	Uroglena volvox Ehrenberg	21552	2.44	6.00	6.00	113.10
MEL - 0305	12-Sep-24	4413	Chrysochromulina laurentiana Kling	7184	2.83	9.10	9.10	394.60
MEL - 0305	12-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	50288	1.30	5.50	3.00	25.90
MEL - 0305	12-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	2000	4.78	11.50	23.00	2389.00
MEL - 0305	12-Sep-24	5515	Fragilaria crotonensis Kitton	1600	0.48	71.00	4.00	297.40
MEL - 0305	12-Sep-24	5518	Synedra acus Kutzing	7000	0.73	100.00	2.00	104.70
MEL - 0305	12-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	1200	2.49	220.00	6.00	2073.50
MEL - 0305	12-Sep-24	5524	Asterionella formosa Hassall	3200	0.34	100.00	2.00	104.70
MEL - 0305	12-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	2000	18.32	18.00	36.00	9160.90
MEL - 0305	12-Sep-24	5551	Cyclotella michiganiana Skvortzow	21552	0.53	2.50	5.00	24.50
MEL - 0305	12-Sep-24	6554	Rhodomonas minuta Skuja	1300304	163.45	10.00	6.00	125.70
MEL - 0305	12-Sep-24	6558	Cryptomonas erosa Ehrenberg	2400	4.32	26.30	14.00	1799.40
MEL - 0305	12-Sep-24	6565	Cryptomonas rostratiformis Skuja	600	1.44	35.00	14.00	2394.60
MEL - 0305	12-Sep-24	7631	Gymnodinium helveticum Penard	600	14.14	50.00	30.00	23561.90
MEL - 0305	12-Sep-24	7632	Gymnodinium sp.	2600	16.56	23.00	23.00	6370.60
MEL - 0305	12-Sep-24	7632	Gymnodinium sp.	400	8.98	35.00	35.00	22449.30
MEL - 0305	12-Sep-24	7637	Peridinium limbatum (Stokes) Lemmermann	200	28.76	65.00	65.00	143793.30
MEL - 0305	12-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	1600	6.02	19.30	19.30	3764.20
MEL - 0305	12-Sep-24	7641	Peridinium aciculiferum Lemmermann	1000	9.05	30.00	24.00	9047.80
MEL - DUP1	7-Sep-24	1073	Snowella sp	1200	0.90	0.00	0.00	750.00
MEL - DUP1	7-Sep-24	2100	Pyramidomonas tetrarhynchus Schmarda	400	0.21	14.00	12.00	527.80
MEL - DUP1	7-Sep-24	2112	Sphaerocystis schroeteri Chodat	100576	1.16	2.80	2.80	11.50
MEL - DUP1	7-Sep-24	2121	Oocystis lacustris Chodat	21552	0.56	5.50	3.00	25.90
MEL - DUP1	7-Sep-24	2137	Dictyosphaerium simplex Sukja	57472	0.24	2.00	2.00	4.20
MEL - DUP1	7-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.43	9.60	4.00	60.30
MEL - DUP1	7-Sep-24	2169	Planctonema lauterbornii Schmidle	93392	33.00	18.00	5.00	353.40
MEL - DUP1	7-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	400	0.15	13.30	12.00	370.50
MEL - DUP1	7-Sep-24	2206	Botryococcus braunii Kutzing	1600	2.30	14.00	14.00	1436.80
MEL - DUP1	7-Sep-24	2235	Ankistrodesmus spiralis Lemmermann	7184	0.40	35.00	2.00	55.00
MEL - DUP1	7-Sep-24	4351	Small chrysophyceae	431040	2.76	2.30	2.30	6.40
MEL - DUP1	7-Sep-24	4352	Large chrysophyceae	79024	14.19	7.00	7.00	179.60
MEL - DUP1	7-Sep-24	4355	Chrysochromulina parva Lackey	287360	18.79	5.00	5.00	65.40
MEL - DUP1	7-Sep-24	4357	Chrysococcus sp.	445408	29.13	5.00	5.00	65.40
MEL - DUP1	7-Sep-24	4362	Kephyrion sp.	35920	0.41	2.80	2.80	11.50
MEL - DUP1	7-Sep-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - DUP1	7-Sep-24	4368	Mallomonas crassisquama (Asmund) Fott	200	0.21	19.60	10.00	1026.30
MEL - DUP1	7-Sep-24	4378	Dinobryon borgei Lemmermann	57472	2.33	8.60	3.00	40.50
MEL - DUP1	7-Sep-24	4383	Dinobryon bavaricum Imhof	86208	19.50	12.00	6.00	226.20
MEL - DUP1	7-Sep-24	4383	Dinobryon bavaricum Imhof	5400	5.13	0.00	0.00	950.00
MEL - DUP1	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	43104	9.75	12.00	6.00	226.20
MEL - DUP1	7-Sep-24	4388	Dinobryon sertularia Ehrenberg	10400	13.00	0.00	0.00	1250.00
MEL - DUP1	7-Sep-24	4390	Dinobryon sociale Ehrenberg	57472	13.00	12.00	6.00	226.20
MEL - DUP1	7-Sep-24	4390	Dinobryon sociale Ehrenberg	6200	7.75	0.00	0.00	1250.00
MEL - DUP1	7-Sep-24	4394	Epiphyxis sp.	7184	0.54	9.00	4.00	75.40
MEL - DUP1	7-Sep-24	4401	Uroglena volvox Ehrenberg	136496	15.44	6.00	6.00	113.10
MEL - DUP1	7-Sep-24	4413	Chrysochromulina laurentiana Kling	208336	84.94	9.20	9.20	407.70
MEL - DUP1	7-Sep-24	4415	Bicosoeca lacustris Clark	21552	1.10	4.60	4.60	51.00
MEL - DUP1	7-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	35920	0.93	5.50	3.00	25.90
MEL - DUP1	7-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	4200	10.03	11.50	23.00	2389.00

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL - DUP1	7-Sep-24	5509	Cyclotella ocellata Pant.	21552	2.69	4.30	8.60	124.90
MEL - DUP1	7-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	3600	2.44	72.00	6.00	678.60
MEL - DUP1	7-Sep-24	5515	Fragilaria crotonensis Kitton	6200	1.84	71.00	4.00	297.40
MEL - DUP1	7-Sep-24	5518	Synedra acus Kutzing	7400	0.77	100.00	2.00	104.70
MEL - DUP1	7-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	2200	4.56	220.00	6.00	2073.50
MEL - DUP1	7-Sep-24	5524	Asterionella formosa Hassall	39000	4.13	101.00	2.00	105.80
MEL - DUP1	7-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	400	3.66	18.00	36.00	9160.90
MEL - DUP1	7-Sep-24	5551	Cyclotella michiganiana Skvortzow	28736	0.70	2.50	5.00	24.50
MEL - DUP1	7-Sep-24	6554	Rhodomonas minuta Skuja	165232	20.77	10.00	6.00	125.70
MEL - DUP1	7-Sep-24	6558	Cryptomonas erosa Ehrenberg	1400	2.55	26.60	14.00	1819.90
MEL - DUP1	7-Sep-24	7631	Gymnodinium helveticum Penard	600	14.14	50.00	30.00	23561.90
MEL - DUP1	7-Sep-24	7632	Gymnodinium sp.	2600	16.56	23.00	23.00	6370.60
MEL - DUP1	7-Sep-24	7632	Gymnodinium sp.	3000	67.35	35.00	35.00	22449.30
MEL - DUP1	7-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	5200	19.57	19.30	19.30	3764.20
MEL - DUP2	8-Sep-24	1044	Anabaena planctonica Brunnthaler	200	1.12	196.00	7.40	5619.80
MEL - DUP2	8-Sep-24	1073	Snowella sp	1200	0.60	0.00	0.00	500.00
MEL - DUP2	8-Sep-24	2100	Pyramidomonas tetrarhynchus Schmarda	400	0.21	14.00	12.00	527.80
MEL - DUP2	8-Sep-24	2101	Carteria spp.	7184	3.76	10.00	10.00	523.60
MEL - DUP2	8-Sep-24	2105	Chlamydomonas spp.	7184	0.18	5.20	3.00	24.50
MEL - DUP2	8-Sep-24	2112	Sphaerocystis schroeteri Chodat	143680	1.65	2.80	2.80	11.50
MEL - DUP2	8-Sep-24	2121	Oocystis lacustris Chodat	50288	1.30	5.50	3.00	25.90
MEL - DUP2	8-Sep-24	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	57472	3.47	9.60	4.00	60.30
MEL - DUP2	8-Sep-24	2145	Crucigenia quadrata Morr.	28736	0.04	2.00	2.00	1.40
MEL - DUP2	8-Sep-24	2167	Elakatothrix gelatinosa Willen	7184	0.16	14.00	2.00	22.00
MEL - DUP2	8-Sep-24	2169	Planctonema lauterbornii Schmidle	79024	27.93	18.00	5.00	353.40
MEL - DUP2	8-Sep-24	2187	Staurodesmus extensus (Andersson) Teiling	1000	0.37	13.30	12.00	370.50
MEL - DUP2	8-Sep-24	2199	Spondylosium planum (Wolle) W. and G.S. West	21552	0.81	6.00	6.00	37.70
MEL - DUP2	8-Sep-24	2206	Botryococcus braunii Kutzing	800	1.15	14.00	14.00	1436.80
MEL - DUP2	8-Sep-24	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.01	2.00	2.00	1.40
MEL - DUP2	8-Sep-24	2247	Oocystis gigas Archer	400	0.97	18.00	16.00	2412.70
MEL - DUP2	8-Sep-24	4351	Small chrysophyceae	431040	2.76	2.30	2.30	6.40
MEL - DUP2	8-Sep-24	4355	Chrysochromulina parva Lackey	280176	18.32	5.00	5.00	65.40
MEL - DUP2	8-Sep-24	4357	Chrysococcus sp.	316096	20.67	5.00	5.00	65.40
MEL - DUP2	8-Sep-24	4358	Chrysostephanosphaera globulifera Scherffel	7184	2.56	8.80	8.80	356.80
MEL - DUP2	8-Sep-24	4362	Kephyrion sp.	93392	1.07	2.80	2.80	11.50
MEL - DUP2	8-Sep-24	4364	Mallomonas caudata Ivanov	200	1.07	40.00	16.00	5361.70
MEL - DUP2	8-Sep-24	4378	Dinobryon borgei Lemmermann	7184	0.29	8.60	3.00	40.50
MEL - DUP2	8-Sep-24	4383	Dinobryon bavaricum Imhof	7184	1.63	12.00	6.00	226.20
MEL - DUP2	8-Sep-24	4383	Dinobryon bavaricum Imhof	200	0.19	0.00	0.00	950.00
MEL - DUP2	8-Sep-24	4388	Dinobryon sertularia Ehrenberg	79024	17.88	12.00	6.00	226.20
MEL - DUP2	8-Sep-24	4388	Dinobryon sertularia Ehrenberg	2400	2.28	0.00	0.00	950.00
MEL - DUP2	8-Sep-24	4390	Dinobryon sociale Ehrenberg	186784	42.25	12.00	6.00	226.20
MEL - DUP2	8-Sep-24	4390	Dinobryon sociale Ehrenberg	1400	1.33	0.00	0.00	950.00
MEL - DUP2	8-Sep-24	4401	Uroglena volvox Ehrenberg	79024	8.94	6.00	6.00	113.10
MEL - DUP2	8-Sep-24	4413	Chrysochromulina laurentiana Kling	71840	28.35	9.10	9.10	394.60
MEL - DUP2	8-Sep-24	4418	Salpingoeca frequentissima (Zach.) Lemmermann	114944	2.98	5.50	3.00	25.90
MEL - DUP2	8-Sep-24	4437	Pteridomonas sp.	7184	1.33	8.10	8.10	185.50
MEL - DUP2	8-Sep-24	4444	Dinobryon pediforme (Lemmermann) Steineche	400	1.22	18.00	18.00	3053.60
MEL - DUP2	8-Sep-24	5507	Cyclotella stelligera Cleve and Grunow	2800	6.69	11.50	23.00	2389.00
MEL - DUP2	8-Sep-24	5509	Cyclotella ocellata Pant.	21552	2.88	4.40	8.80	133.80
MEL - DUP2	8-Sep-24	5511	Rhizosolenia eriense H.L. Smith	7184	0.61	12.00	3.00	84.80
MEL - DUP2	8-Sep-24	5513	Tabellaria fenestrata (Lyngbye) Kutzing	10000	7.54	80.00	6.00	754.00
MEL - DUP2	8-Sep-24	5515	Fragilaria crotonensis Kitton	1000	0.30	71.00	4.00	297.40
MEL - DUP2	8-Sep-24	5518	Synedra acus Kutzing	8800	0.92	100.00	2.00	104.70
MEL - DUP2	8-Sep-24	5523	Synedra ulna (Nitzsch) Ehrenberg	800	1.66	220.00	6.00	2073.50
MEL - DUP2	8-Sep-24	5524	Asterionella formosa Hassall	18200	1.91	100.00	2.00	104.70
MEL - DUP2	8-Sep-24	5529	Eunotia zazumenensis **********	2400	0.10	51.00	1.80	43.30
MEL - DUP2	8-Sep-24	5530	Stephanodiscus niagarae Ehrenberg	2600	23.82	18.00	36.00	9160.90
MEL - DUP2	8-Sep-24	6554	Rhodomonas minuta Skuja	28736	3.61	10.00	6.00	125.70
MEL - DUP2	8-Sep-24	6558	Cryptomonas erosa Ehrenberg	2200	3.96	26.30	14.00	1799.40
MEL - DUP2	8-Sep-24	7632	Gymnodinium sp.	1600	10.19	23.00	23.00	6370.60
MEL - DUP2	8-Sep-24	7632	Gymnodinium sp.	400	8.98	35.00	35.00	22449.30
MEL - DUP2	8-Sep-24	7639	Peridinium pusillum (Penard) Lemmermann	2400	9.03	19.30	19.30	3764.20
MEL - DUP2	8-Sep-24	7641	Peridinium aciculiferum Lemmermann	400	3.62	30.00	24.00	9047.80

APPENDIX F
SEDIMENT CHEMISTRY – SUPPORTING INFORMATION

Appendix F1
Meliadine Lake Sediment Chemistry – 2024 Data and Summary Statistics

APPENDIX F1 – TABLES

Table F1-1. Coordinates (Zone 15N; NAD83) and depths (m) at the sediment and benthic invertebrate stations in August 1
Table F1-2. Sediment chemistry results from the 2024 AEMP in Meliadine Lake 2
Table F1-3. MEL-01 sediment chemistry summary statistics in 2024 6
Table F1-4. MEL-02 sediment chemistry summary statistics in 2024 7
Table F1-5. MEL-03 sediment chemistry summary statistics in 2024 8
Table F1-6. MEL-05 sediment chemistry summary statistics in 2024 9

Table F1-1. Coordinates (Zone 15N; NAD83) and depths (m) at the sediment and benthic invertebrate stations in August

Area	Date	Depth (m)	Easting	Northing
MEL-01 (Near-field Exposure Area)				
MEL-01-01	09-Aug-24	9.0	542666	6989125
MEL-01-06	09-Aug-24	8.9	542738	6989051
MEL-01-07	16-Aug-24	8.4	542867	6989210
MEL-01-08	16-Aug-24	8.4	543065	6989071
MEL-01-09	16-Aug-24	7.7	542552	6989179
MEL-03 (Reference Area 1)				
MEL-03-01	15-Aug-24	9.3	533484	6998632
MEL-03-02	15-Aug-24	10.0	533311	6998665
MEL-03-03	15-Aug-24	9.9	532983	6998854
MEL-03-04	15-Aug-24	8.1	533598	6998645
MEL-03-05	15-Aug-24	8.4	534009	6998256

Area	Date	Depth (m)	Easting	Northing
MEL-02 (Mid-field Exposure Area)				
MEL-02-02	20-Aug-24	10.6	537085	6992618
MEL-02-03	20-Aug-24	10.1	537497	6992325
MLE-02-05	20-Aug-24	10.0	537778	6992498
MEL-02-06	20-Aug-24	11.1	536934	6992933
MEL-02-08	20-Aug-24	9.5	538300	6992000
MEL-05 (Reference Area 3)				
MEL-05-01	14-Aug-24	9.4	530683	6990915
MEL-05-02	14-Aug-24	8.9	530705	6991073
MEL-05-03	14-Aug-24	8.5	530735	6991395
MEL-05-04	14-Aug-24	10.0	530661	6991199
MEL-05-05	14-Aug-24	9.9	530277	6991177

Table F1-2. Sediment chemistry results from the 2024 AEMP in Meliadine Lake

Area	DL	MEL-01					MEL-02				
Station		MEL-01-01	MEL-01-06	MEL-01-07	MEL-01-08	MEL-01-09	MEL-02-02	MEL-02-03	MEL-02-05	MEL-02-06	MEL-02-08
Date (2024)		09-Aug		16-Aug			20-Aug				
WP2421139 ALS Sample ID		001	002	003	004	005	006	007	008	009	010
Particle Size (%)											
Clay < 2 µm	1	3.3	2.6	3.8	4.3	5.3	3	4.6	1.6	5.2	4.7
Silt 2 - 50 µm	1	77.5	74.8	86.4	88.8	80.9	65.5	60.3	41.8	70.4	61.5
Sand 50 µm - 2 mm	1	19.2	22.6	9.8	6.9	13.8	31.5	35.1	56.6	24.4	33.8
Fines (clay and silt; < 50 µm)	1	80.8	77.4	90.2	93.1	86.2	68.5	64.9	43.4	75.6	66.2
Percent Passing (%)											
0.002 mm	1	3.3	2.6	3.8	4.3	5.3	3	4.6	1.6	5.2	4.7
0.004 mm	1	5.6	4.9	6.5	7.5	8.1	4.2	6.3	2.2	7.1	6.7
0.005 mm	1	6.6	6.1	7.9	9.1	9.6	4.8	7.2	2.6	8	7.7
0.02 mm	1	27.8	27.3	32.2	35.4	33.4	21	23.9	12.4	26.9	25.3
0.0312 mm	1	47.6	46	53.9	56.9	53.1	38.7	39.2	24	45.1	40.6
0.05 mm	1	80.8	77.4	90.2	93.1	86.2	68.5	64.9	43.4	75.6	66.2
0.063 mm	1	83.5	80.4	91.5	94	87.8	70.3	67.3	46.3	78.6	68.3
0.075 mm	1	86	83.1	92.7	94.9	89.3	72	69.5	49	81.4	70.2
0.125 mm	1	96.2	94.4	97.5	98.3	95.6	78.9	78.7	60.1	93	78.1
0.149 mm	1	96.9	95.3	97.8	98.6	96.2	81.3	81.5	64.5	94.1	81.2
0.25 mm	1	99.6	99	99	99.6	98.5	91.3	93.5	83.2	99	94.3
0.42 mm	1	99.7	99.3	99.2	99.7	99.1	94.8	97.1	90.9	99.4	97.5
0.5 mm	1	99.8	99.4	99.2	99.8	99.4	96.4	98.8	94.5	99.6	99
0.841 mm	1	99.9	99.5	99.4	99.9	99.6	97.3	99.5	97.3	99.8	99.6
1 mm	1	100	99.6	99.5	100	99.7	97.8	99.8	98.7	99.8	99.9
2 mm	1	100	99.7	99.8	100	99.9	99.9	100	99.9	100	100
4.75 mm	1	100	99.7	100	100	100	100	100	100	100	100
9.5 mm	1	100	100	100	100	100	100	100	100	100	100
19 mm	1	100	100	100	100	100	100	100	100	100	100
25.4 mm	1	100	100	100	100	100	100	100	100	100	100
38.1 mm	1	100	100	100	100	100	100	100	100	100	100
50.8 mm	1	100	100	100	100	100	100	100	100	100	100
76.2 mm	1	100	100	100	100	100	100	100	100	100	100
Organic / Inorganic Carbon (%)											
Inorganic Carbon	0.05	0.108	0.076	0.097	0.11	0.09	0.082	0.094	0.052	0.109	0.102
Total Carbon	0.05	5.36	3.65	5.5	6	6.44	7.66	6.89	3.87	8.82	8.41
Total Organic Carbon	0.05	5.25	3.57	5.4	5.89	6.35	7.58	6.8	3.82	8.71	8.31
Inorganic Carbon (as $CaCO_3$)	0.4	0.9	0.63	0.81	0.91	0.75	0.68	0.79	0.43	0.91	0.85
Organic matter	0.1	9.05	6.15	9.31	10.2	10.9	13.1	11.7	6.58	15	14.3
Available Phosphorus (mg/kg)											
Method E384 (mod Kelowna)	2	*<2.0*	14.5	*<2.0*	*<2.0*	*<2.0*	*<2.0*	4.2	3.6	*<2.0*	2.3
Method E385 (Olsen)	1	14.1	15.0	11.1	17.4	6.0	3.6	8.3	1.8	5.7	8.8
Metals (mg/kg)											
Aluminum	50	11900	12400	13900	14000	11700	11200	11600	8100	12200	9300
Antimony	0.1	0.16	0.13	0.17	0.19	0.2	0.1	0.13	0.11	0.13	0.15
Arsenic	0.1	75	17	73.1	108	51.5	15.3	17.3	8.34	18.9	32.5
Barium	0.5	129	109	156	167	98.7	110	119	83.5	129	113
Beryllium	0.1	0.27	0.27	0.28	0.31	0.25	0.23	0.24	0.18	0.25	0.21
Bismuth	0.2	0.31	0.27	0.34	0.37	0.29	0.22	0.24	*<0.20*	0.23	0.22
Boron	5	6.5	*<5.0*	6.8	7.1	7.1	6.5	6.7	*<5.0*	7.6	8.4
Cadmium	0.02	0.436	0.592	0.493	0.548	0.377	0.317	0.368	0.244	0.395	0.364
Calcium	50	4380	4240	4860	5000	5280	4790	5020	3790	5320	5180
Chromium	0.5	45.4	47.7	51.8	55.2	46.9	43.5	44.2	30.6	47	37
Cobalt	0.1	15.7	10.3	16.4	22	17.3	10.7	10.7	7.13	12.8	9.5
Copper	0.5	63.6	71.2	79	93.2	68.9	81.3	74.4	51.8	89.3	79.5

Table F1-2. Sediment chemistry results from the 2024 AEMP in Meliadine Lake

Area	DL	MEL-01					MEL-02				
Station		MEL-01-01	MEL-01-06	MEL-01-07	MEL-01-08	MEL-01-09	MEL-02-02	MEL-02-03	MEL-02-05	MEL-02-06	MEL-02-08
Date (2024)		09-Aug		16-Aug			20-Aug				
WP2421139 ALS Sample ID		001	002	003	004	005	006	007	008	009	010
Iron	50	43400	23500	46000	61400	36800	21500	21800	14600	22900	19800
Lead	0.5	12.9	9.9	14	15.2	12.5	9.12	11.4	6.07	10.5	11.7
Lithium	2	12.5	13.1	13.7	14.3	12.7	11.6	12.6	8.4	11.4	9.8
Magnesium	20	7020	7180	7680	8000	6910	6710	7020	4920	7060	5490
Manganese	1	1050	382	1250	1270	388	346	390	227	473	407
Mercury	0.005	0.0551	0.0309	0.0618	0.0686	0.0594	0.0318	0.042	0.0132	0.043	0.0417
Molybdenum	0.1	4.5	3.19	5.11	6.77	6.02	3.58	2.9	2.57	3.94	3.4
Nickel	0.5	62.3	53.8	67.3	88	63.3	48.8	48.5	31.3	57.8	48.2
Phosphorus	50	1320	1070	1220	1620	943	808	876	677	919	834
Potassium	100	1990	2070	2320	2500	2090	1770	1830	1460	1930	1610
Selenium	0.2	0.98	0.81	1.04	1.41	0.95	0.93	0.84	0.53	0.9	0.8
Silver	0.1	0.13	0.15	0.17	0.21	0.16	1.33	0.13	*<0.10*	0.15	0.15
Sodium	50	326	334	367	369	345	298	289	201	346	307
Strontium	0.5	27.2	26.4	31.6	31.2	27.9	27	27.9	22.7	31.1	29.8
Sulfur	1000	1900	1100	1800	2000	3300	2100	1900	1300	2200	2400
Thallium	0.05	0.266	0.322	0.319	0.362	0.268	0.204	0.217	0.238	0.246	0.231
Tin	2	2	*<2.0*	*<2.0*	*<2.0*	*<2.0*	29.6	*<2.0*	*<2.0*	*<2.0*	*<2.0*
Titanium	1	676	752	749	738	659	602	653	545	673	482
Tungsten	0.5	*<0.50*	0.65	*<0.50*	*<0.50*	*<0.50*	*<0.50*	*<0.50*	*<0.50*	*<0.50*	*<0.50*
Uranium	0.05	3.22	3.58	3.78	4.21	3.28	2.93	2.79	2.42	3.18	2.67
Vanadium	0.2	50.9	52.6	58	61.8	50.4	44.1	44.2	37	48.5	38
Zinc	2	78.4	80.1	88.9	99.6	85.6	84	84.3	70.6	99.6	81
Zirconium	1	1.5	1.6	1.5	1.8	2.6	1.5	1.4	1	1.5	1

Notes
Italicized values were less than the detection limit (DL)

Table F1-2. Sediment chemistry results from the 2024 AEMP in Meliadine Lake

Area	DL	MEL-03					MEL-05				
Station		MEL-03-01	MEL-03-02	MEL-03-03	MEL-03-04	MEL-03-05	MEL-05-01	MEL-05-02	MEL-05-03	MEL-05-04	MEL-05-05
Date (2024)		15-Aug					14-Aug				
WP2421139 ALS Sample ID		011	012	013	014	015	016	017	018	019	020
Particle Size (%)											
Clay < 2 µm	1	4.2	1.9	2.9	2.6	2.4	1.1	2.4	3.0	4.3	3.1
Silt 2 - 50 µm	1	66.4	46.4	62.1	66.4	56.5	42.3	48.3	62.2	76.2	72.6
Sand 50 µm - 2 mm	1	29.4	51.7	35.0	31.0	41.1	56.6	49.3	34.8	19.5	24.3
Fines (clay and silt; < 50 µm)	1	70.6	48.3	65.0	69.0	58.9	43.4	50.7	65.2	80.5	75.7
Percent Passing (%)											
0.002 mm	1	4.2	1.9	2.9	2.6	2.4	1.1	2.4	3	4.3	3.1
0.004 mm	1	5.7	2.7	4.4	3.8	3.5	1.6	3.3	4.1	5.6	4.6
0.005 mm	1	6.4	3.1	5.2	4.4	4	1.8	3.8	4.7	6.2	5.3
0.02 mm	1	23.5	14.2	21.5	20.7	17.7	11.2	15.8	19.7	24.5	23.3
0.0312 mm	1	41.1	26.9	37.7	38.8	33.1	23.2	28.8	36.7	45.4	42.9
0.05 mm	1	70.6	48.3	65	69	58.9	43.4	50.7	65.2	80.5	75.7
0.063 mm	1	72.6	51.4	67.8	72	61.6	46.4	53.1	67.6	82	77.4
0.075 mm	1	74.5	54.2	70.5	74.8	64	49.2	55.3	69.8	83.4	78.9
0.125 mm	1	82.4	66	81.4	86.4	74.4	60.9	64.4	78.9	89.3	85.3
0.149 mm	1	84.8	70.7	84.4	88.5	78.1	66.2	68.9	82	90.9	87.1
0.25 mm	1	95.2	90.7	96.9	97.5	94	88.3	87.9	95	97.7	94.6
0.42 mm	1	97.6	96.1	98.6	99	97.3	95.1	94.9	97.8	98.7	97.5
0.5 mm	1	98.8	98.7	99.4	99.7	98.8	98.3	98.2	99	99.2	98.8
0.841 mm	1	99.5	99.4	99.8	99.9	99.5	99.3	99.1	99.5	99.4	99.4
1 mm	1	99.8	99.7	100	100	99.8	99.7	99.5	99.7	99.6	99.7
2 mm	1	100	100	100	100	100	99.9	100	99.9	100	100
4.75 mm	1	100	100	100	100	100	100	100	100	100	100
9.5 mm	1	100	100	100	100	100	100	100	100	100	100
19 mm	1	100	100	100	100	100	100	100	100	100	100
25.4 mm	1	100	100	100	100	100	100	100	100	100	100
38.1 mm	1	100	100	100	100	100	100	100	100	100	100
50.8 mm	1	100	100	100	100	100	100	100	100	100	100
76.2 mm	1	100	100	100	100	100	100	100	100	100	100
Organic / Inorganic Carbon (%)											
Inorganic Carbon	0.05	0.09	0.06	0.074	0.069	0.078	0.05	0.072	0.092	0.097	0.106
Total Carbon	0.05	9.41	4.68	6.71	6.76	5.33	4.41	6.58	7.58	9.42	9.5
Total Organic Carbon	0.05	9.32	4.62	6.64	6.69	5.25	4.36	6.51	7.49	9.32	9.39
Inorganic Carbon (as $CaCO_3$)	0.4	0.75	0.5	0.62	0.57	0.65	0.42	0.6	0.76	0.81	0.88
Organic matter	0.1	16.1	7.96	11.4	11.5	9.05	7.52	11.2	12.9	16.1	16.2
Available Phosphorus (mg/kg)											
Method E384 (mod Kelowna)	2	24.3	8.8	16.7	3.2	11.4	2.5	9.5	4.4	11.9	3.1
Method E385 (Olsen)	1	36.8	9.5	20.3	8.0	19.7	3.1	15.2	8.4	23.9	6.6
Metals (mg/kg)											
Aluminum	50	6910	5840	7660	8420	7520	8070	8540	8360	9290	10400
Antimony	0.1	*<0.10*	*<0.10*	0.11	0.12	0.13	*<0.10*	0.11	0.12	0.18	0.12
Arsenic	0.1	8.54	4.9	7.62	7.61	6.36	6.41	8.21	9.12	12.9	11.3
Barium	0.5	61	53.2	74.1	102	83.2	75.6	64.8	86.9	81.2	110
Beryllium	0.1	0.15	0.13	0.18	0.21	0.16	0.13	0.14	0.16	0.17	0.21
Bismuth	0.2	*<0.20*	*<0.20*	*<0.20*	*<0.20*	*<0.20*	*<0.20*	*<0.20*	*<0.20*	0.2	*<0.20*
Boron	5	7.5	*<5.0*	6.4	7.1	5.6	*<5.0*	5.8	7.5	8.5	7.9
Cadmium	0.02	0.217	0.145	0.219	0.197	0.212	0.149	0.184	0.21	0.309	0.235
Calcium	50	4650	3520	4920	5260	4920	3590	3840	4680	5080	5130
Chromium	0.5	25.4	20.6	27.5	31.1	26.2	32.2	34.5	33.2	36.4	42
Cobalt	0.1	5.9	4.29	5.93	7.09	6.73	6.33	7.16	7.12	8.36	9.23
Copper	0.5	45	32.7	47.1	55.7	45.4	42.8	50.6	67.8	73.4	84

Table F1-2. Sediment chemistry results from the 2024 AEMP in Meliadine Lake

Area	DL	MEL-03					MEL-05				
Station		MEL-03-01	MEL-03-02	MEL-03-03	MEL-03-04	MEL-03-05	MEL-05-01	MEL-05-02	MEL-05-03	MEL-05-04	MEL-05-05
Date (2024)		15-Aug					14-Aug				
WP2421139 ALS Sample ID		011	012	013	014	015	016	017	018	019	020
Iron	50	11600	9560	13100	14700	12000	13600	14600	14400	15800	18500
Lead	0.5	7.57	5.97	8.78	6.38	7.32	5.16	6.66	7.06	12.2	8
Lithium	2	8.9	7.8	10.1	11	9.7	7.8	7.9	7.8	8.8	9.9
Magnesium	20	4400	3440	4560	5040	4680	5240	5930	5250	6020	6530
Manganese	1	144	126	179	288	192	187	173	252	227	364
Mercury	0.005	0.0246	0.0184	0.0295	0.0219	0.031	0.0132	0.0222	0.0185	0.0429	0.0259
Molybdenum	0.1	2	1.14	1.94	1.86	1.46	1.35	1.42	2.13	2.42	2.8
Nickel	0.5	30	19.8	28.9	32.5	26.6	27	30.6	34.8	40.2	42.3
Phosphorus	50	802	586	763	717	689	536	591	671	713	669
Potassium	100	1450	1110	1510	1640	1410	1070	1100	1200	1420	1520
Selenium	0.2	0.58	0.39	0.62	0.56	0.56	0.43	0.52	0.63	0.81	0.82
Silver	0.1	*<0.10*	*<0.10*	*<0.10*	*<0.10*	*<0.10*	*<0.10*	*<0.10*	*<0.10*	0.13	0.12
Sodium	50	276	188	270	293	259	176	181	233	262	270
Strontium	0.5	25.9	17.7	25.9	27	23.7	19.4	20	25.2	25.6	27.3
Sulfur	1000	3300	1400	2800	1900	1900	1100	2000	2300	3600	2400
Thallium	0.05	0.115	0.091	0.124	0.155	0.128	0.111	0.108	0.132	0.128	0.15
Tin	2	*<2.0*	*<2.0*	*<2.0*	*<2.0*	*<2.0*	*<2.0*	*<2.0*	*<2.0*	*<2.0*	*<2.0*
Titanium	1	502	448	576	672	638	549	502	452	488	548
Tungsten	0.5	*<0.50*	*<0.50*	*<0.50*	*<0.50*	*<0.50*	*<0.50*	*<0.50*	*<0.50*	*<0.50*	0.53
Uranium	0.05	1.44	1.24	1.6	1.71	1.52	1.19	1.25	1.64	1.89	2.05
Vanadium	0.2	26.8	22.6	29.9	33.2	28.9	32.2	33.9	33.8	37.3	43.7
Zinc	2	43.5	32.1	43	51.8	43.1	41.6	43	49.3	52.4	60.6
Zirconium	1	1.3	*<1.0*	1.1	1.1	1	*<1.0*	*<1.0*	*<1.0*	1.2	1.3

Notes
Italicized values were less than the detection limit (DL)

Table F1-3. MEL-01 sediment chemistry summary statistics in 2024

Area	Parameter	ISQG[a]	PEL[a]	N	N<DL	Mean	Median	SD	SE	Min	Max	N>ISQG	N>PEL
MEL-01	**Grain Size and TOC (%)**												
	Fines (<0.05mm)	-	-	5	0	85.5	86.2	6.48	2.9	77.4	93.1		
	Clay (<2um)	-	-	5	0	3.86	3.8	1.02	0.457	2.6	5.3		
	Silt (2um-0.05mm)	-	-	5	0	81.7	80.9	5.88	2.63	74.8	88.8		
	Sand (0.05-2mm)	-	-	5	0	14.5	13.8	6.48	2.9	6.9	22.6		
	TOC	-	-	5	0	5.29	5.4	1.06	0.472	3.57	6.35		
	Available Phosphorus												
	Method E384 (mod Kelowna)	-	-	5	4	-	-	-	-	2	14.5		
	Method E385 (Olsen)	-	-	5	0	12.7	14.1	3.92	1.75	6	17.4		
	Metals (mg/kg)												
	Aluminum	-	-	5	0	12800	12400	1100	491	11700	14000		
	Antimony	-	-	5	0	0.17	0.17	0.0274	0.0122	0.13	0.2		
	Arsenic	5.9	17	5	0	64.9	73.1	33.5	15	17	108	5	4
	Barium	-	-	5	0	132	129	29.4	13.1	98.7	167		
	Beryllium	-	-	5	0	0.276	0.27	0.0219	0.0098	0.25	0.31		
	Bismuth	-	-	5	0	0.316	0.31	0.0397	0.0178	0.27	0.37		
	Boron	-	-	5	1	6.5	6.8	0.875	0.391	5	7.1		
	Cadmium	0.6	3.5	5	0	0.489	0.493	0.0858	0.0384	0.377	0.592	0	0
	Calcium	-	-	5	0	4750	4860	434	194	4240	5280		
	Chromium	37.3	90	5	0	49.4	47.7	4.02	1.8	45.4	55.2	5	0
	Cobalt	-	-	5	0	16.3	16.4	4.18	1.87	10.3	22		
	Copper	35.7	197	5	0	75.2	71.2	11.5	5.14	63.6	93.2	5	0
	Iron	-	-	5	0	42200	43400	13800	6180	23500	61400		
	Lead	35	91.3	5	0	12.9	12.9	1.98	0.885	9.9	15.2	0	0
	Lithium	-	-	5	0	13.3	13.1	0.74	0.331	12.5	14.3		
	Magnesium	-	-	5	0	7360	7180	464	208	6910	8000		
	Manganese	-	-	5	0	868	1050	449	201	382	1270		
	Mercury	0.17	0.488	5	0	0.0552	0.0594	0.0144	0.00645	0.0309	0.0686	0	0
	Molybdenum	-	-	5	0	5.12	5.11	1.38	0.618	3.19	6.77		
	Nickel	-	-	5	0	66.9	63.3	12.8	5.71	53.8	88		
	Phosphorus	-	-	5	0	1230	1220	259	116	943	1620		
	Potassium	-	-	5	0	2190	2090	211	94.2	1990	2500		
	Selenium	-	-	5	0	1.04	0.98	0.224	0.1	0.81	1.41		
	Silver	-	-	5	0	0.164	0.16	0.0297	0.0133	0.13	0.21		
	Sodium	-	-	5	0	348	345	19.3	8.63	326	369		
	Strontium	-	-	5	0	28.9	27.9	2.38	1.07	26.4	31.6		
	Sulfur	-	-	5	0	2020	1900	798	357	1100	3300		
	Thallium	-	-	5	0	0.307	0.319	0.0406	0.0182	0.266	0.362		
	Tin	-	-	5	4	2	2	-	-	-	2		
	Titanium	-	-	5	0	715	738	43.9	19.6	659	752		
	Tungsten	-	-	5	4	0.53	0.5	-	-	0.5	0.65		
	Uranium	-	-	5	0	3.61	3.58	0.403	0.18	3.22	4.21		
	Vanadium	-	-	5	0	54.7	52.6	4.97	2.22	50.4	61.8		
	Zinc	123	315	5	0	86.5	85.6	8.44	3.77	78.4	99.6	0	0
	Zirconium	-	-	5	0	1.8	1.6	0.464	0.207	1.5	2.6		

Notes

[a] ISQG (Interim Sediment Quality Guideline) and PEL (Probable Effects Level) thresholds as per CCME (2002).

Table F1-4. MEL-02 sediment chemistry summary statistics in 2024

Area	Parameter	ISQG[a]	PEL[a]	N	N<DL	Mean	Median	SD	SE	Min	Max	N>ISQG	N>PEL
MEL-02	**Grain Size and TOC (%)**												
	Fines (<0.05mm)	-	-	5	0	63.7	66.2	12.1	5.41	43.4	75.6		
	Clay (<2um)	-	-	5	0	3.82	4.6	1.49	0.667	1.6	5.2		
	Silt (2um-0.05mm)	-	-	5	0	59.9	61.5	10.9	4.86	41.8	70.4		
	Sand (0.05-2mm)	-	-	5	0	36.3	33.8	12.1	5.41	24.4	56.6		
	TOC	-	-	5	0	7.04	7.58	1.94	0.869	3.82	8.71		
	Available Phosphorus												
	Method E384 (mod Kelowna)	-	-	5	2	2.82	2.3	0.91	0.41	2	4.2		
	Method E385 (Olsen)	-	-	5	0	5.64	5.7	2.68	1.20	1.8	8.8		
	Metals (mg/kg)												
	Aluminum	-	-	5	0	10500	11200	1720	768	8100	12200		
	Antimony	-	-	5	0	0.124	0.13	0.0195	0.00872	0.1	0.15		
	Arsenic	5.9	17	5	0	18.5	17.3	8.82	3.94	8.34	32.5	5	3
	Barium	-	-	5	0	111	113	16.9	7.58	83.5	129		
	Beryllium	-	-	5	0	0.222	0.23	0.0277	0.0124	0.18	0.25		
	Bismuth	-	-	5	1	0.222	0.22	0.0148	0.00663	0.2	0.24		
	Boron	-	-	5	1	6.84	6.7	1.28	0.571	5	8.4		
	Cadmium	0.6	3.5	5	0	0.338	0.364	0.0594	0.0266	0.244	0.395	0	0
	Calcium	-	-	5	0	4820	5020	609	272	3790	5320		
	Chromium	37.3	90	5	0	40.5	43.5	6.62	2.96	30.6	47	3	0
	Cobalt	-	-	5	0	10.2	10.7	2.07	0.927	7.13	12.8		
	Copper	35.7	197	5	0	75.3	79.5	14.2	6.34	51.8	89.3	5	0
	Iron	-	-	5	0	20100	21500	3280	1470	14600	22900		
	Lead	35	91.3	5	0	9.76	10.5	2.29	1.03	6.07	11.7	0	0
	Lithium	-	-	5	0	10.8	11.4	1.66	0.741	8.4	12.6		
	Magnesium	-	-	5	0	6240	6710	976	436	4920	7060		
	Manganese	-	-	5	0	369	390	91.4	40.9	227	473		
	Mercury	0.17	0.488	5	0	0.0343	0.0417	0.0127	0.00566	0.0132	0.043	0	0
	Molybdenum	-	-	5	0	3.28	3.4	0.545	0.244	2.57	3.94		
	Nickel	-	-	5	0	46.9	48.5	9.62	4.3	31.3	57.8		
	Phosphorus	-	-	5	0	823	834	91.8	41	677	919		
	Potassium	-	-	5	0	1720	1770	186	83.2	1460	1930		
	Selenium	-	-	5	0	0.8	0.84	0.159	0.0712	0.53	0.93		
	Silver	-	-	5	1	0.372	0.15	0.536	0.24	0.1	1.33		
	Sodium	-	-	5	0	288	298	53.4	23.9	201	346		
	Strontium	-	-	5	0	27.7	27.9	3.22	1.44	22.7	31.1		
	Sulfur	-	-	5	0	1980	2100	421	188	1300	2400		
	Thallium	-	-	5	0	0.227	0.231	0.0168	0.00751	0.204	0.246		
	Tin	-	-	5	4	7.52	2	-	-	2	29.6		
	Titanium	-	-	5	0	591	602	78.6	35.1	482	673		
	Tungsten	-	-	5	5	0.5	0.5	-	-	-	0.5		
	Uranium	-	-	5	0	2.8	2.79	0.284	0.127	2.42	3.18		
	Vanadium	-	-	5	0	42.4	44.1	4.79	2.14	37	48.5		
	Zinc	123	315	5	0	83.9	84	10.4	4.65	70.6	99.6	0	0
	Zirconium	-	-	5	0	1.28	1.4	0.259	0.116	1	1.5		

Notes

[a] ISQG (Interim Sediment Quality Guideline) and PEL (Probable Effects Level) thresholds as per CCME (2002).

Table F1-5. MEL-03 sediment chemistry summary statistics in 2024

Area	Parameter	ISQG[a]	PEL[a]	N	N<DL	Mean	Median	SD	SE	Min	Max	N>ISQG	N>PEL
MEL-03	**Grain Size and TOC (%)**												
	Fines (<0.05mm)	-	-	5	0	62.4	65	9.06	4.05	48.3	70.6		
	Clay (<2um)	-	-	5	0	2.8	2.6	0.863	0.386	1.9	4.2		
	Silt (2um-0.05mm)	-	-	5	0	59.6	62.1	8.4	3.76	46.4	66.4		
	Sand (0.05-2mm)	-	-	5	0	37.6	35	9.06	4.05	29.4	51.7		
	TOC	-	-	5	0	6.5	6.64	1.81	0.809	4.62	9.32		
	Available Phosphorus												
	Method E384 (mod Kelowna)	-	-	5	0	12.9	11.4	7.18	3.21	3.2	24.3		
	Method E385 (Olsen)	-	-	5	0	18.9	19.7	10.3	4.61	8.0	36.8		
	Metals (mg/kg)												
	Aluminum	-	-	5	0	7270	7520	963	431	5840	8420		
	Antimony	-	-	5	2	0.112	0.11	0.013	0.00583	0.1	0.13		
	Arsenic	5.9	17	5	0	7.01	7.61	1.41	0.63	4.9	8.54	4	0
	Barium	-	-	5	0	74.7	74.1	19.2	8.57	53.2	102		
	Beryllium	-	-	5	0	0.166	0.16	0.0305	0.0136	0.13	0.21		
	Bismuth	-	-	5	5	0.2	0.2	-	-	-	0.2		
	Boron	-	-	5	1	6.32	6.4	1.03	0.462	5	7.5		
	Cadmium	0.6	3.5	5	0	0.198	0.212	0.0309	0.0138	0.145	0.219	0	0
	Calcium	-	-	5	0	4650	4920	670	300	3520	5260		
	Chromium	37.3	90	5	0	26.2	26.2	3.8	1.7	20.6	31.1	0	0
	Cobalt	-	-	5	0	5.99	5.93	1.08	0.483	4.29	7.09		
	Copper	35.7	197	5	0	45.2	45.4	8.22	3.68	32.7	55.7	4	0
	Iron	-	-	5	0	12200	12000	1900	849	9560	14700		
	Lead	35	91.3	5	0	7.2	7.32	1.1	0.492	5.97	8.78	0	0
	Lithium	-	-	5	0	9.5	9.7	1.21	0.543	7.8	11		
	Magnesium	-	-	5	0	4420	4560	598	268	3440	5040		
	Manganese	-	-	5	0	186	179	63	28.2	126	288		
	Mercury	0.17	0.488	5	0	0.0251	0.0246	0.00523	0.00234	0.0184	0.031	0	0
	Molybdenum	-	-	5	0	1.68	1.86	0.368	0.165	1.14	2		
	Nickel	-	-	5	0	27.6	28.9	4.83	2.16	19.8	32.5		
	Phosphorus	-	-	5	0	711	717	82.4	36.8	586	802		
	Potassium	-	-	5	0	1420	1450	196	87.6	1110	1640		
	Selenium	-	-	5	0	0.542	0.56	0.0884	0.0395	0.39	0.62		
	Silver	-	-	5	5	0.1	0.1	-	-	-	0.1		
	Sodium	-	-	5	0	257	270	40.6	18.2	188	293		
	Strontium	-	-	5	0	24	25.9	3.74	1.67	17.7	27		
	Sulfur	-	-	5	0	2260	1900	770	344	1400	3300		
	Thallium	-	-	5	0	0.123	0.124	0.0231	0.0103	0.091	0.155		
	Tin	-	-	5	5	2	2	-	-	-	2		
	Titanium	-	-	5	0	567	576	92.9	41.6	448	672		
	Tungsten	-	-	5	5	0.5	0.5	-	-	-	0.5		
	Uranium	-	-	5	0	1.5	1.52	0.177	0.0793	1.24	1.71		
	Vanadium	-	-	5	0	28.3	28.9	3.93	1.76	22.6	33.2		
	Zinc	123	315	5	0	42.7	43.1	7	3.13	32.1	51.8	0	0
	Zirconium	-	-	5	1	1.1	1.1	0.122	0.0548	1	1.3		

Notes

[a] ISQG (Interim Sediment Quality Guideline) and PEL (Probable Effects Level) thresholds as per CCME (2002).

Table F1-6. MEL-05 sediment chemistry summary statistics in 2024

Area	Parameter	ISQG[a]	PEL[a]	N	N<DL	Mean	Median	SD	SE	Min	Max	N>ISQG	N>PEL
MEL-05	**Grain Size and TOC (%)**												
	Fines (<0.05mm)	-	-	5	0	63.1	65.2	15.9	7.1	43.4	80.5		
	Clay (<2um)	-	-	5	0	2.78	3	1.16	0.521	1.1	4.3		
	Silt (2um-0.05mm)	-	-	5	0	60.3	62.2	14.8	6.62	42.3	76.2		
	Sand (0.05-2mm)	-	-	5	0	36.9	34.8	15.9	7.1	19.5	56.6		
	TOC	-	-	5	0	7.41	7.49	2.1	0.94	4.36	9.39		
	Available Phosphorus												
	Method E384 (mod Kelowna)	-	-	5	0	6.28	4.40	3.74	1.67	2.50	11.9		
	Method E385 (Olsen)	-	-	5	0	11.4	8.40	7.37	3.30	3.10	23.9		
	Metals (mg/kg)												
	Aluminum	-	-	5	0	8930	8540	936	419	8070	10400		
	Antimony	-	-	5	1	0.126	0.12	0.0313	0.014	0.1	0.18		
	Arsenic	5.9	17	5	0	9.59	9.12	2.56	1.14	6.41	12.9	5	0
	Barium	-	-	5	0	83.7	81.2	16.8	7.52	64.8	110		
	Beryllium	-	-	5	0	0.162	0.16	0.0311	0.0139	0.13	0.21		
	Bismuth	-	-	5	4	0.2	0.2	-	-	-	0.2		
	Boron	-	-	5	1	6.94	7.5	1.48	0.661	5	8.5		
	Cadmium	0.6	3.5	5	0	0.217	0.21	0.0603	0.027	0.149	0.309	0	0
	Calcium	-	-	5	0	4460	4680	711	318	3590	5130		
	Chromium	37.3	90	5	0	35.7	34.5	3.88	1.73	32.2	42	1	0
	Cobalt	-	-	5	0	7.64	7.16	1.15	0.513	6.33	9.23		
	Copper	35.7	197	5	0	63.7	67.8	16.8	7.52	42.8	84	5	0
	Iron	-	-	5	0	15400	14600	1910	856	13600	18500		
	Lead	35	91.3	5	0	7.82	7.06	2.66	1.19	5.16	12.2	0	0
	Lithium	-	-	5	0	8.44	7.9	0.918	0.411	7.8	9.9		
	Magnesium	-	-	5	0	5790	5930	551	246	5240	6530		
	Manganese	-	-	5	0	241	227	75.8	33.9	173	364		
	Mercury	0.17	0.488	5	0	0.0245	0.0222	0.0113	0.00505	0.0132	0.0429	0	0
	Molybdenum	-	-	5	0	2.02	2.13	0.63	0.282	1.35	2.8		
	Nickel	-	-	5	0	35	34.8	6.4	2.86	27	42.3		
	Phosphorus	-	-	5	0	636	669	71.2	31.8	536	713		
	Potassium	-	-	5	0	1260	1200	199	89	1070	1520		
	Selenium	-	-	5	0	0.642	0.63	0.173	0.0774	0.43	0.82		
	Silver	-	-	5	3	0.11	0.1	-	-	0.1	0.13		
	Sodium	-	-	5	0	224	233	44.1	19.7	176	270		
	Strontium	-	-	5	0	23.5	25.2	3.56	1.59	19.4	27.3		
	Sulfur	-	-	5	0	2280	2300	898	402	1100	3600		
	Thallium	-	-	5	0	0.126	0.128	0.0171	0.00763	0.108	0.15		
	Tin	-	-	5	5	2	2	-	-	-	2		
	Titanium	-	-	5	0	508	502	41.4	18.5	452	549		
	Tungsten	-	-	5	4	0.506	0.5	-	-	0.5	0.53		
	Uranium	-	-	5	0	1.6	1.64	0.38	0.17	1.19	2.05		
	Vanadium	-	-	5	0	36.2	33.9	4.6	2.06	32.2	43.7		
	Zinc	123	315	5	0	49.4	49.3	7.69	3.44	41.6	60.6	0	0
	Zirconium	-	-	5	3	1.1	1	-	-	1	1.3		

Notes

[a] ISQG (Interim Sediment Quality Guideline) and PEL (Probable Effects Level) thresholds as per CCME (2002).

Appendix F2
Meliadine Lake Sediment Chemistry – Supplemental Figures

APPENDIX F2 – FIGURES

Figure F2-1. Aluminum 1
Figure F2-2. Antimony 2
Figure F2-3. Arsenic 3
Figure F2-4. Barium 4
Figure F2-5. Beryllium 5
Figure F2-6. Bismuth 6
Figure F2-7. Boron 7
Figure F2-8. Cadmium 8
Figure F2-9. Calcium 9
Figure F2-10. Chromium 10
Figure F2-11. Cobalt 11
Figure F2-12. Copper 12
Figure F2-13. Iron 13
Figure F2-14. Lead 14
Figure F2-15. Lithium 15
Figure F2-16. Magnesium 16
Figure F2-17. Manganese 17
Figure F2-18. Mercury 18
Figure F2-19. Molybdenum 19
Figure F2-20. Nickel 20
Figure F2-21. Potassium 21
Figure F2-22. Selenium 22
Figure F2-23. Silver 23
Figure F2-24. Sodium 24
Figure F2-25. Strontium 25
Figure F2-26. Sulfur 26
Figure F2-27. Thallium 27
Figure F2-28. Tin 28
Figure F2-29. Titanium 29

Figure F2-30. Uranium 30
Figure F2-31. Vanadium 31
Figure F2-32. Zinc 32

Figure F2-1. Aluminum



Figure F2-2. Antimony

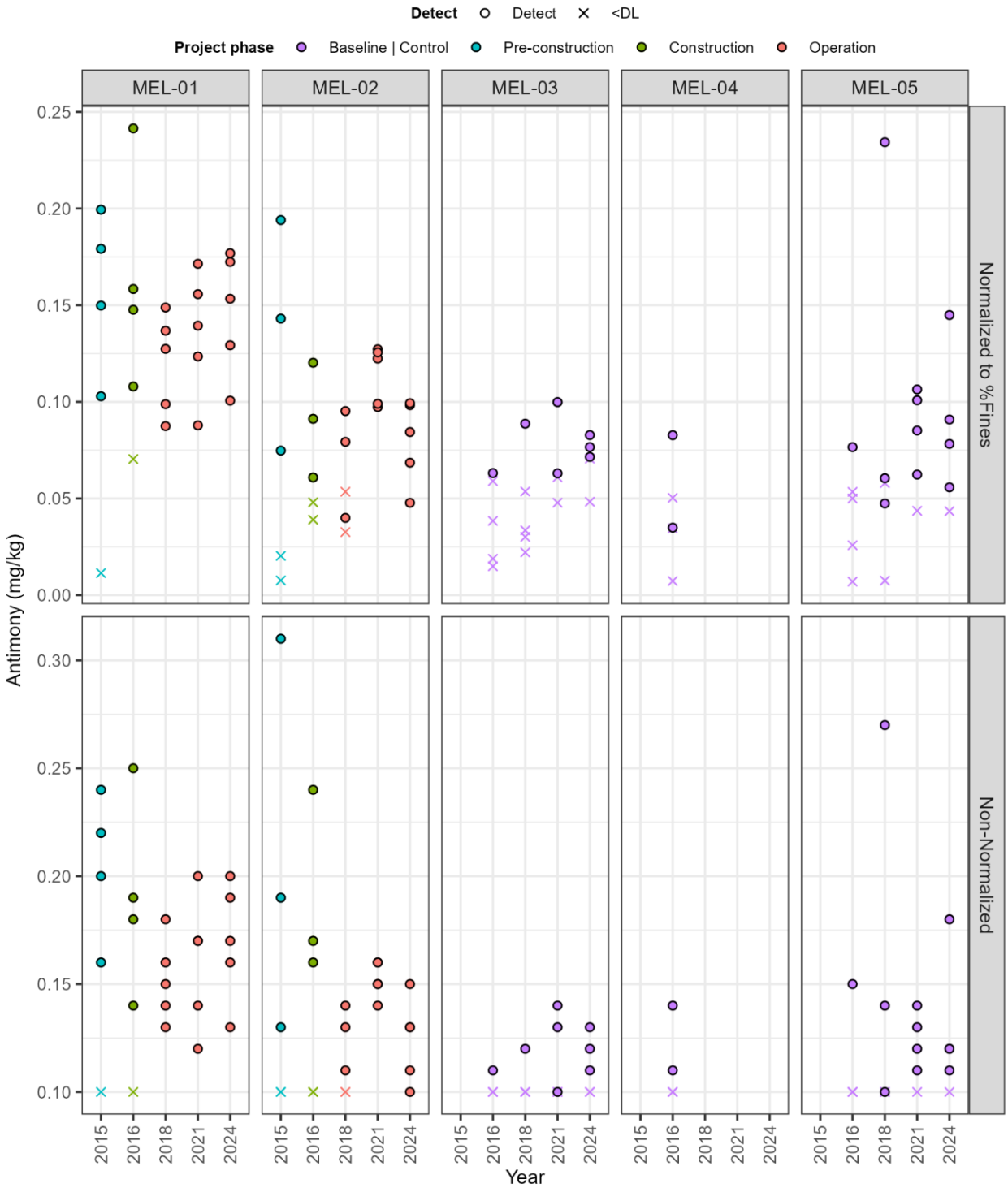


Figure F2-3. Arsenic

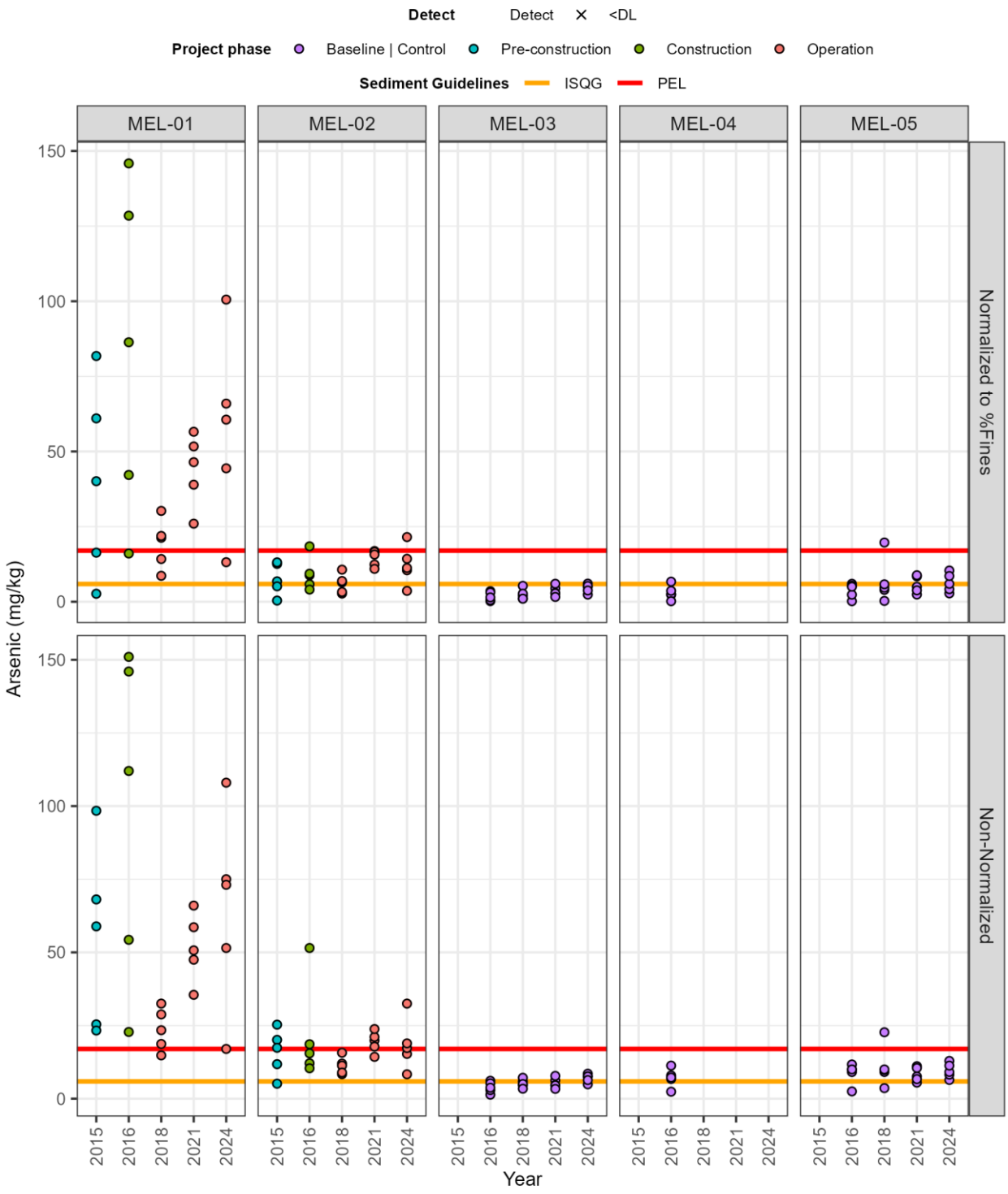


Figure F2-4. Barium

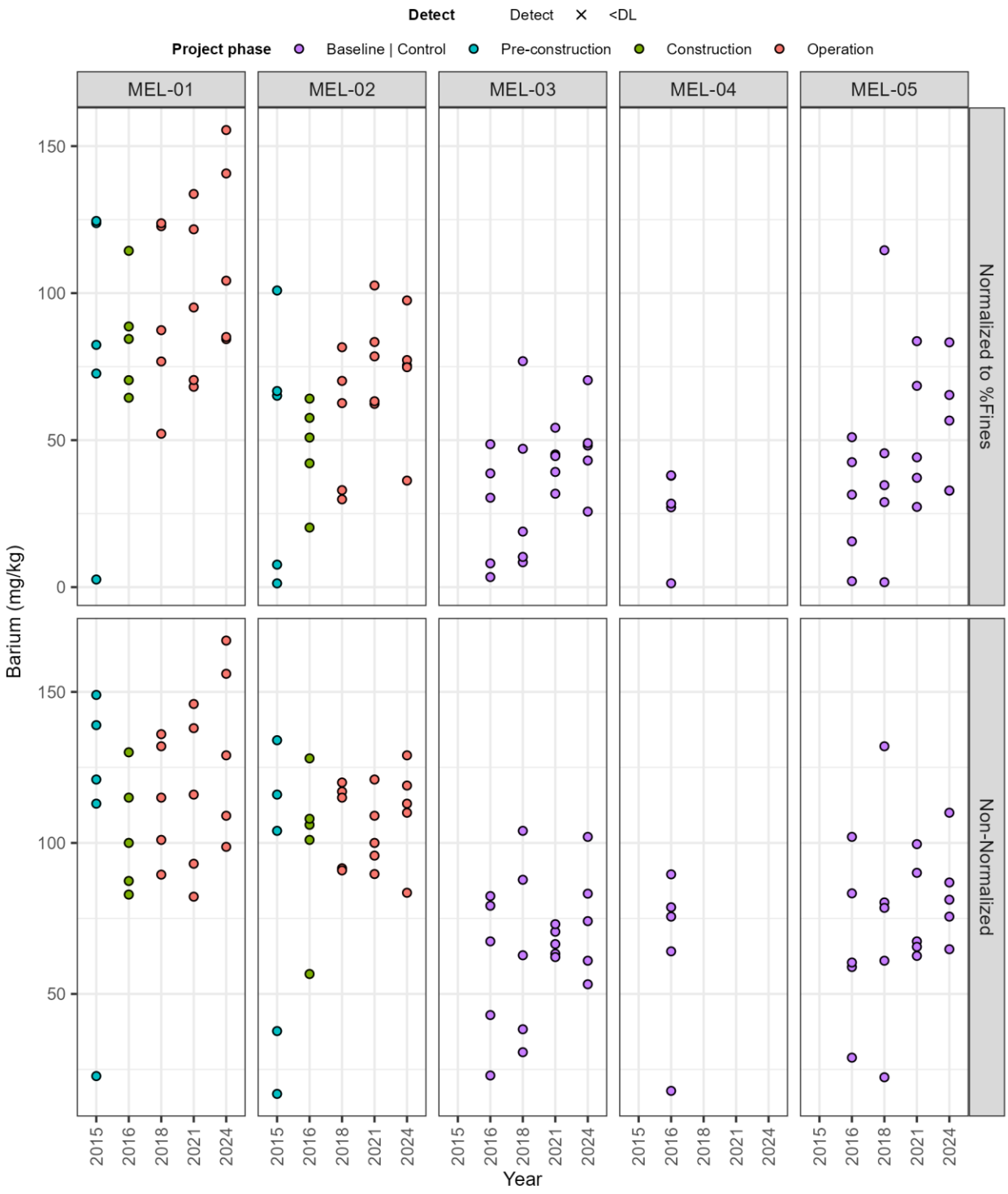


Figure F2-5. Beryllium

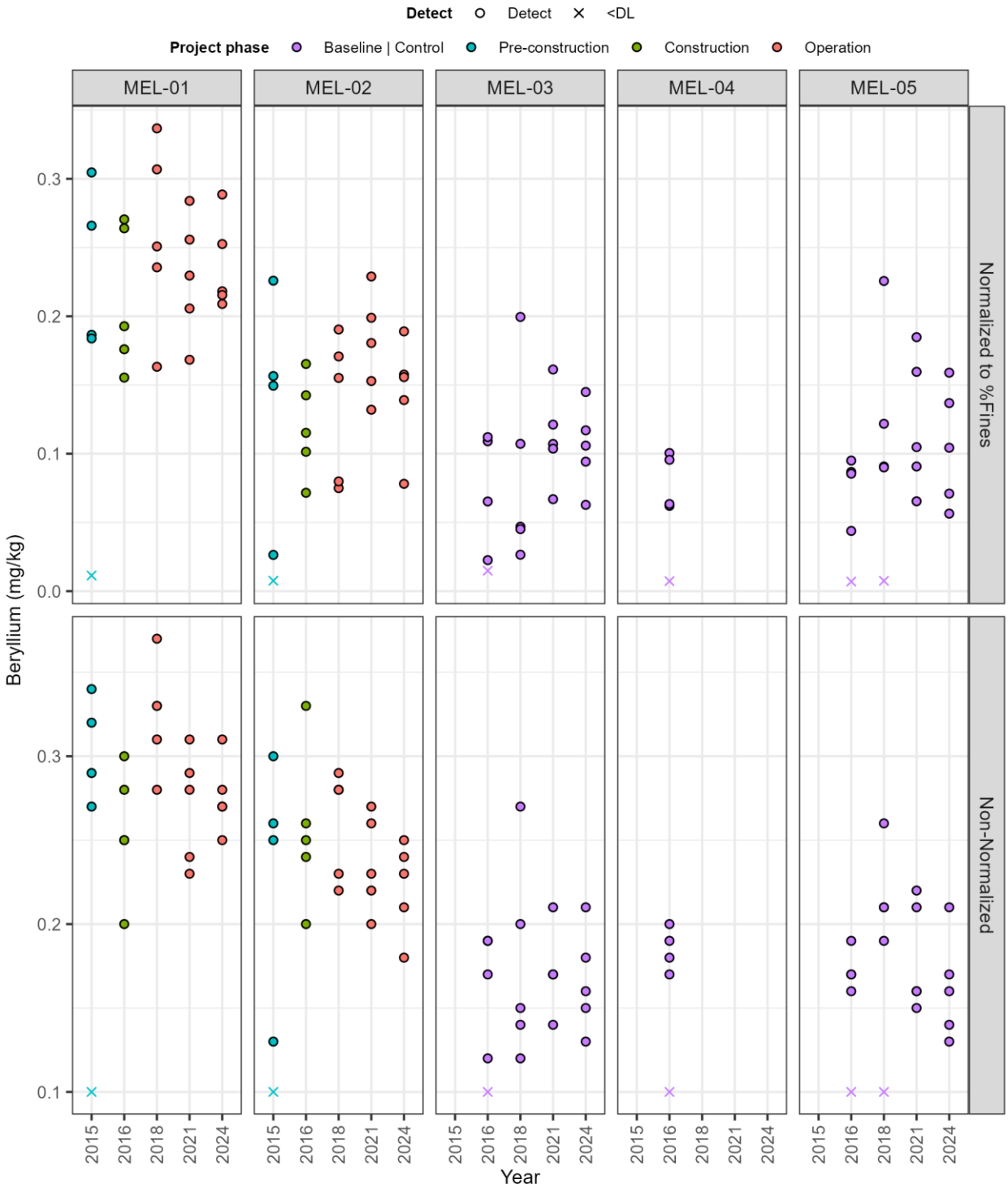


Figure F2-6. Bismuth

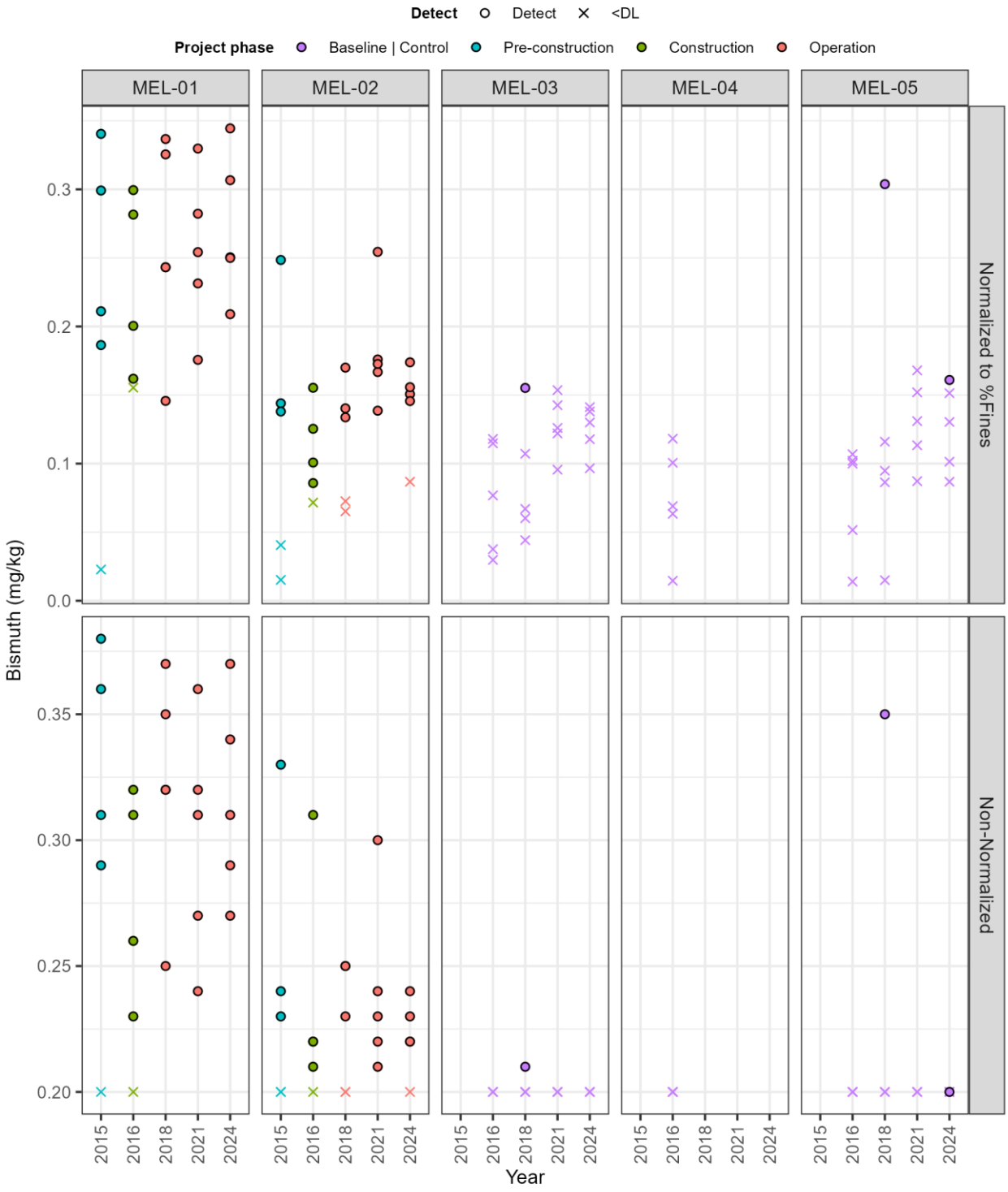


Figure F2-7. Boron



Figure F2-8. Cadmium

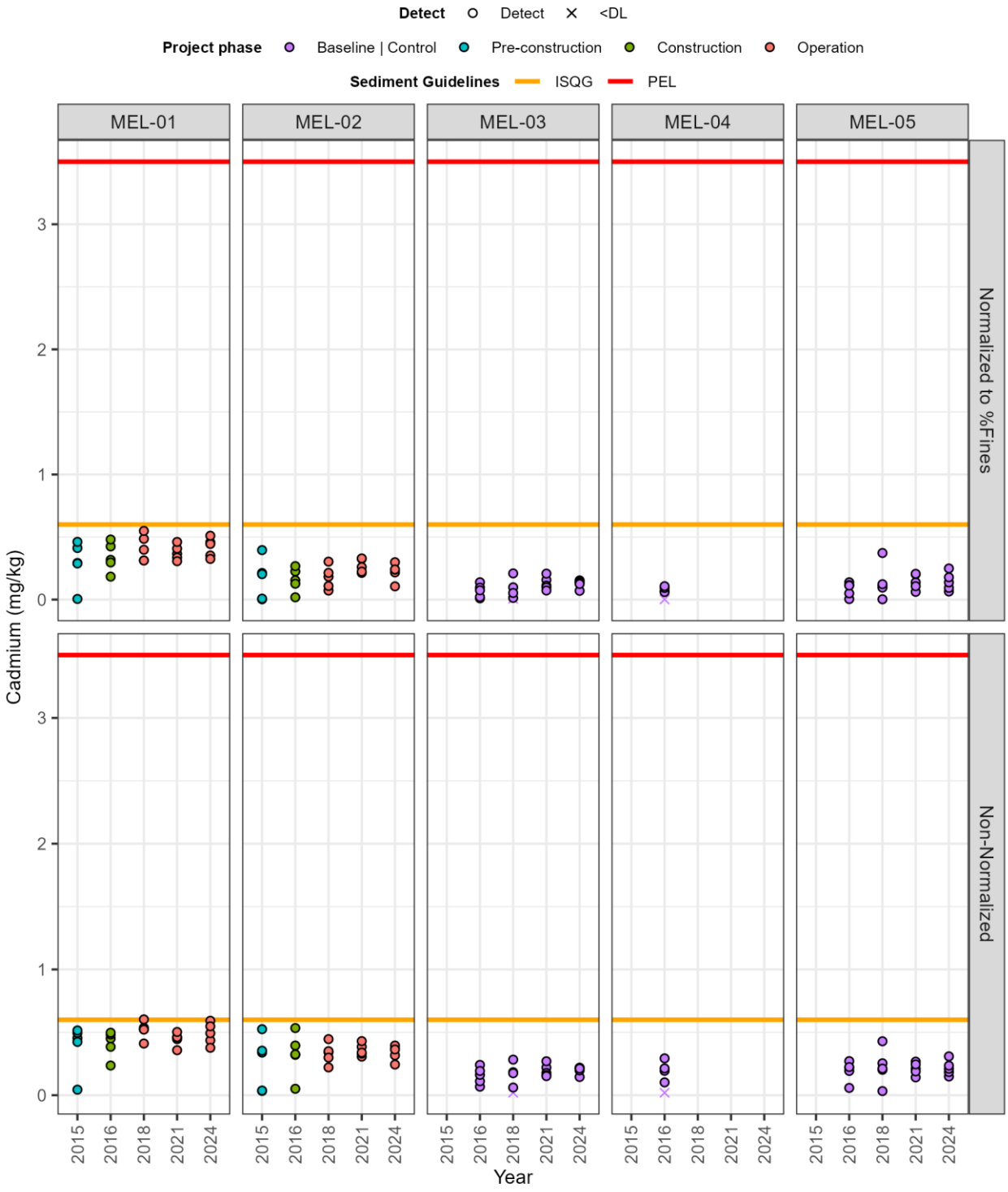


Figure F2-9. Calcium

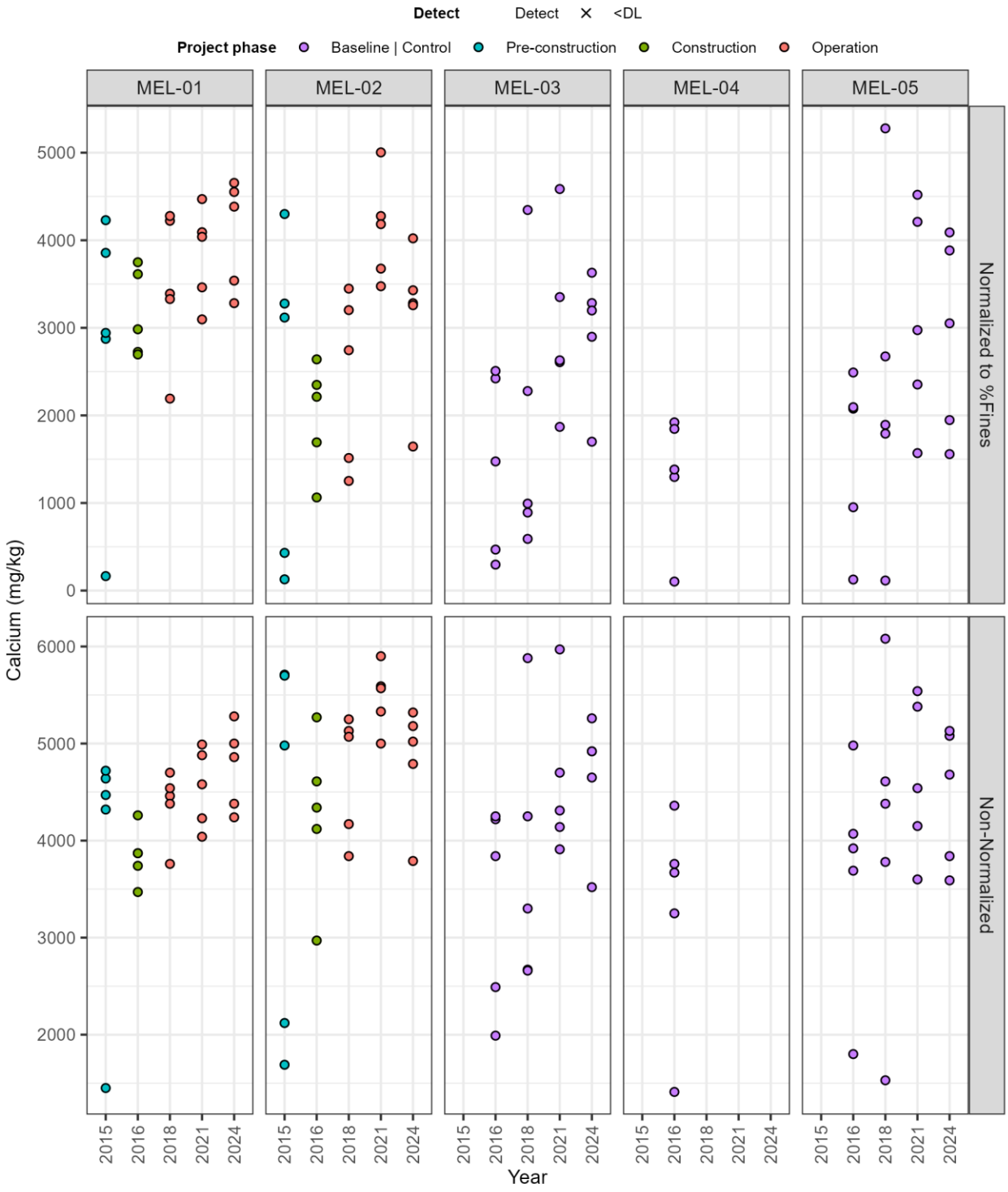


Figure F2-10. Chromium

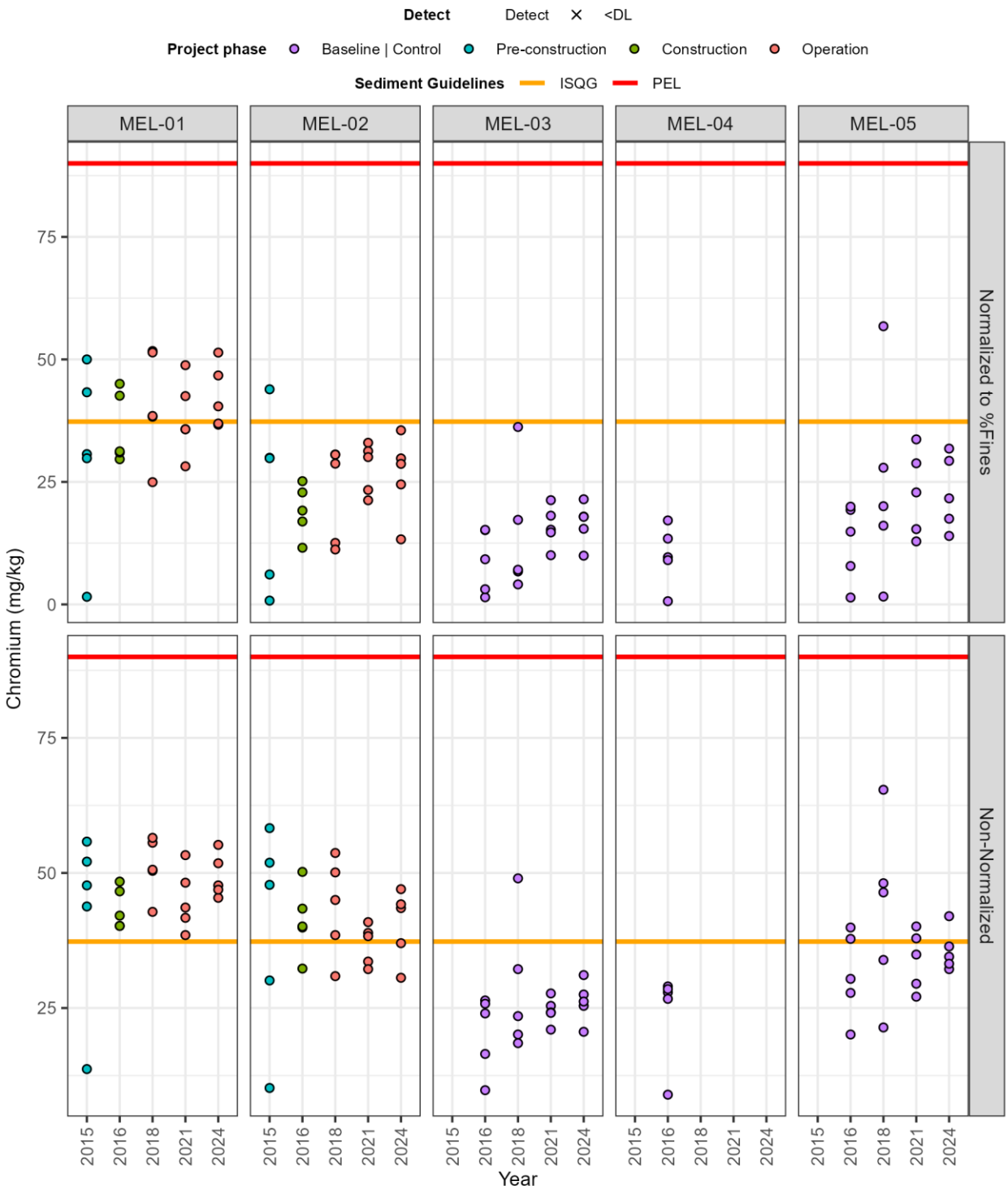


Figure F2-11. Cobalt



Figure F2-12. Copper

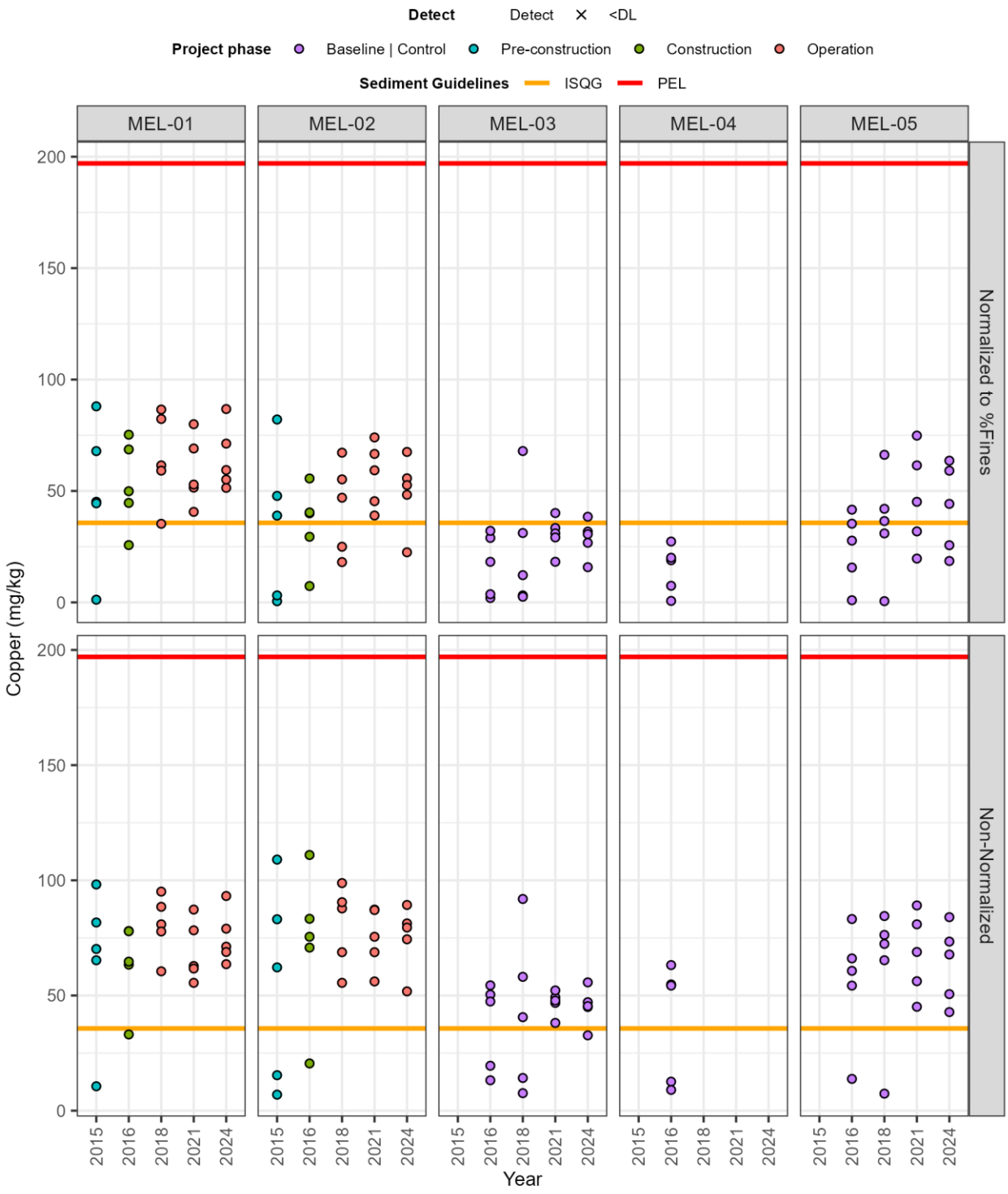


Figure F2-13. Iron

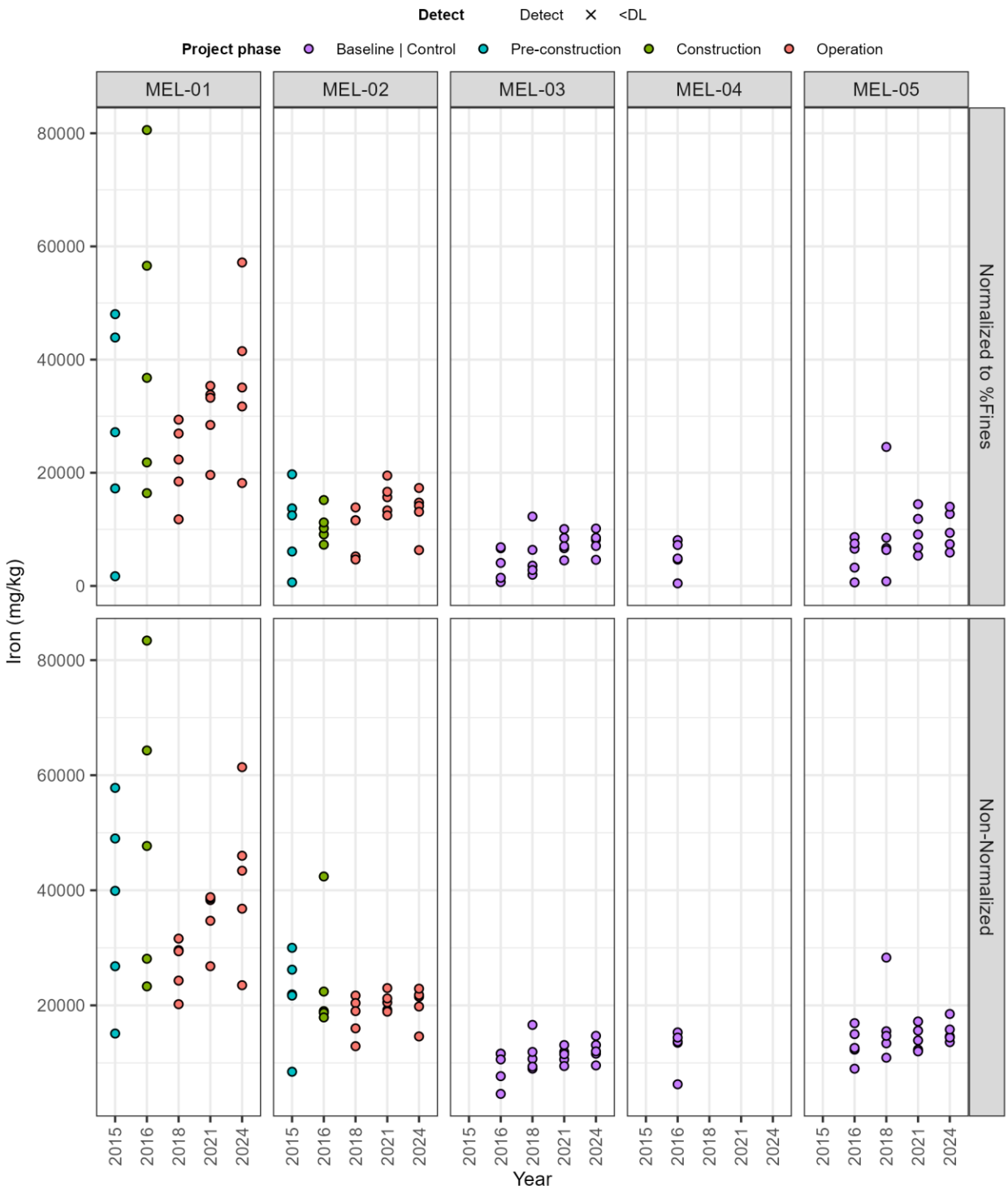


Figure F2-14. Lead

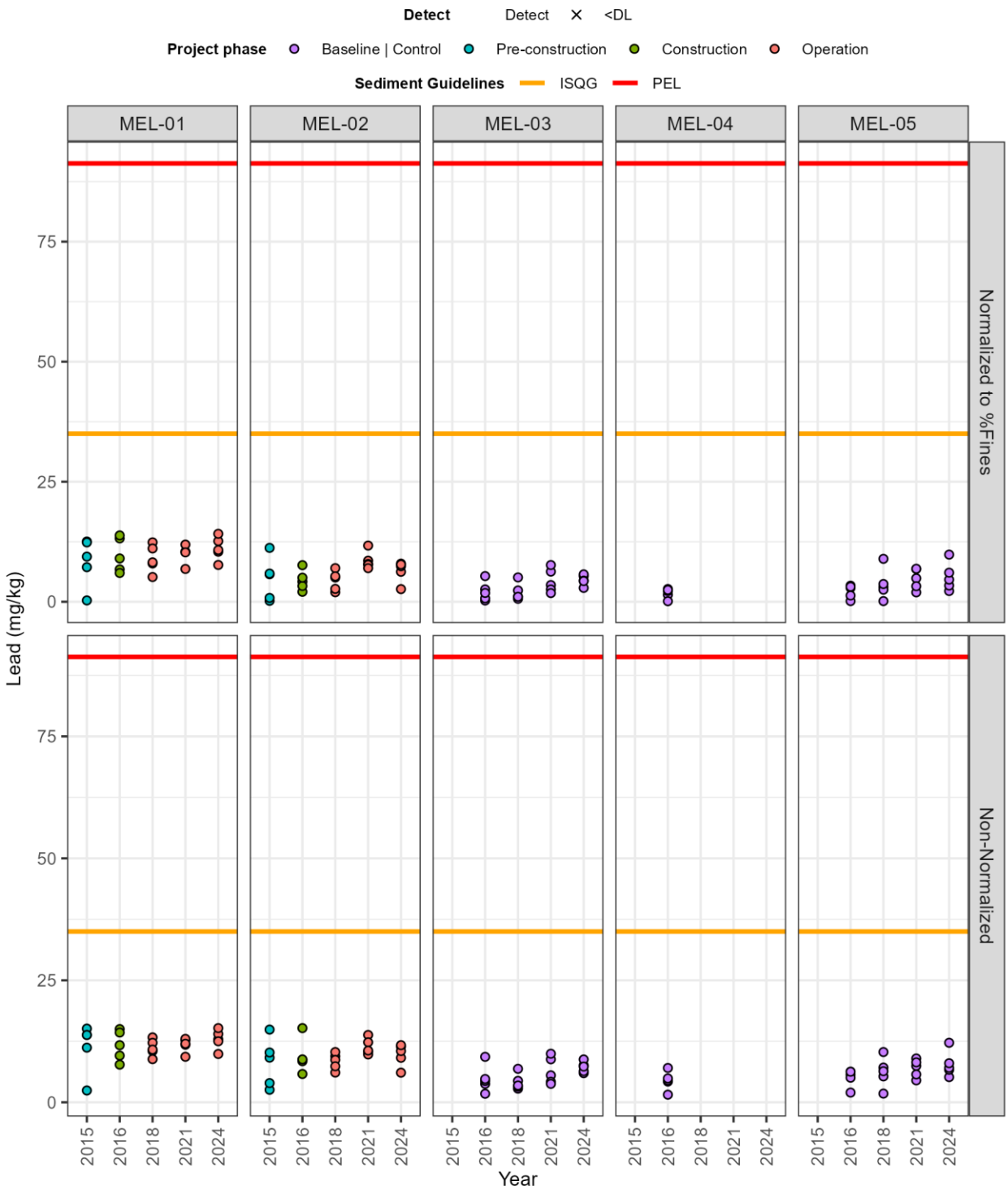


Figure F2-15. Lithium

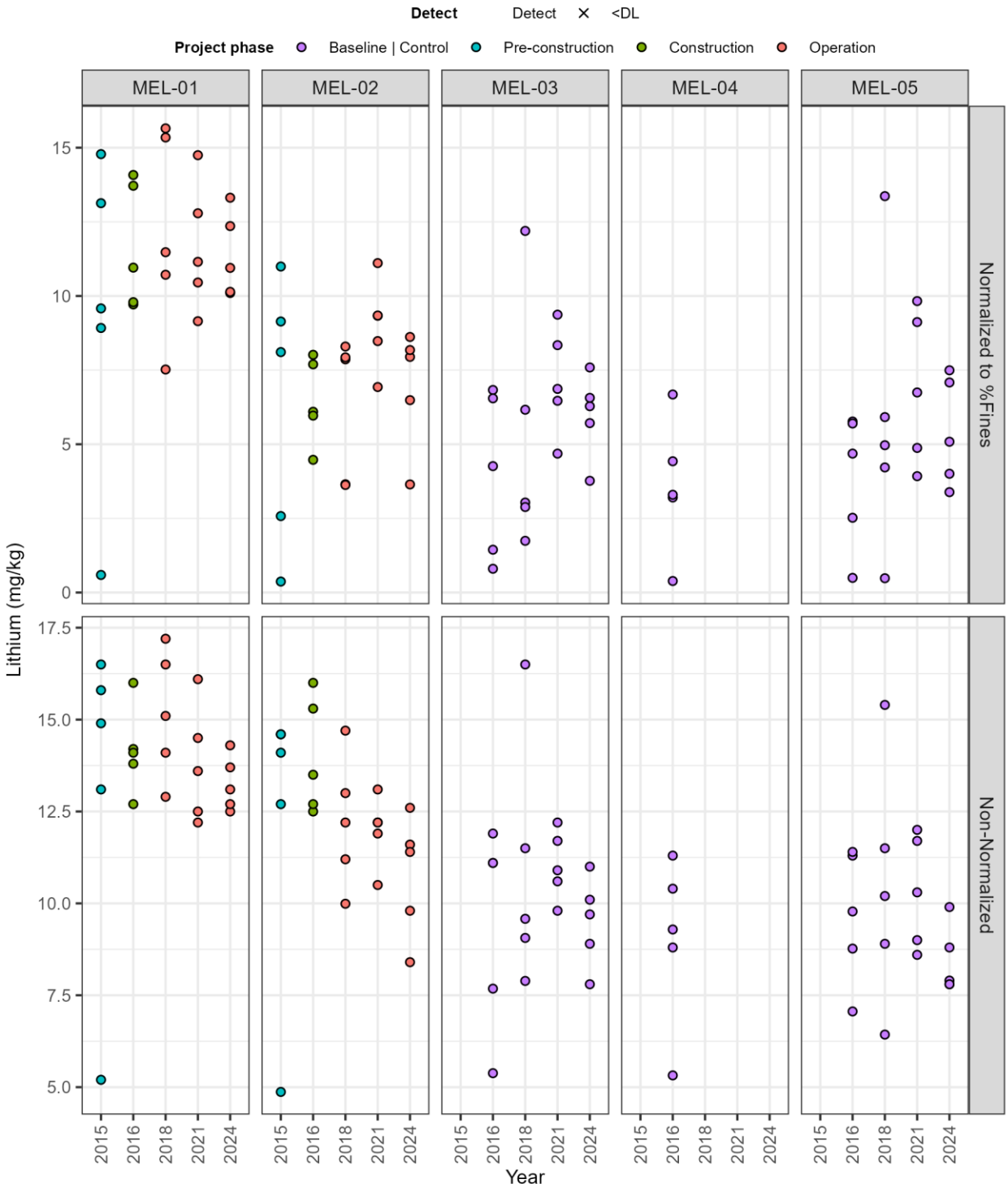


Figure F2-16. Magnesium



Figure F2-17. Manganese

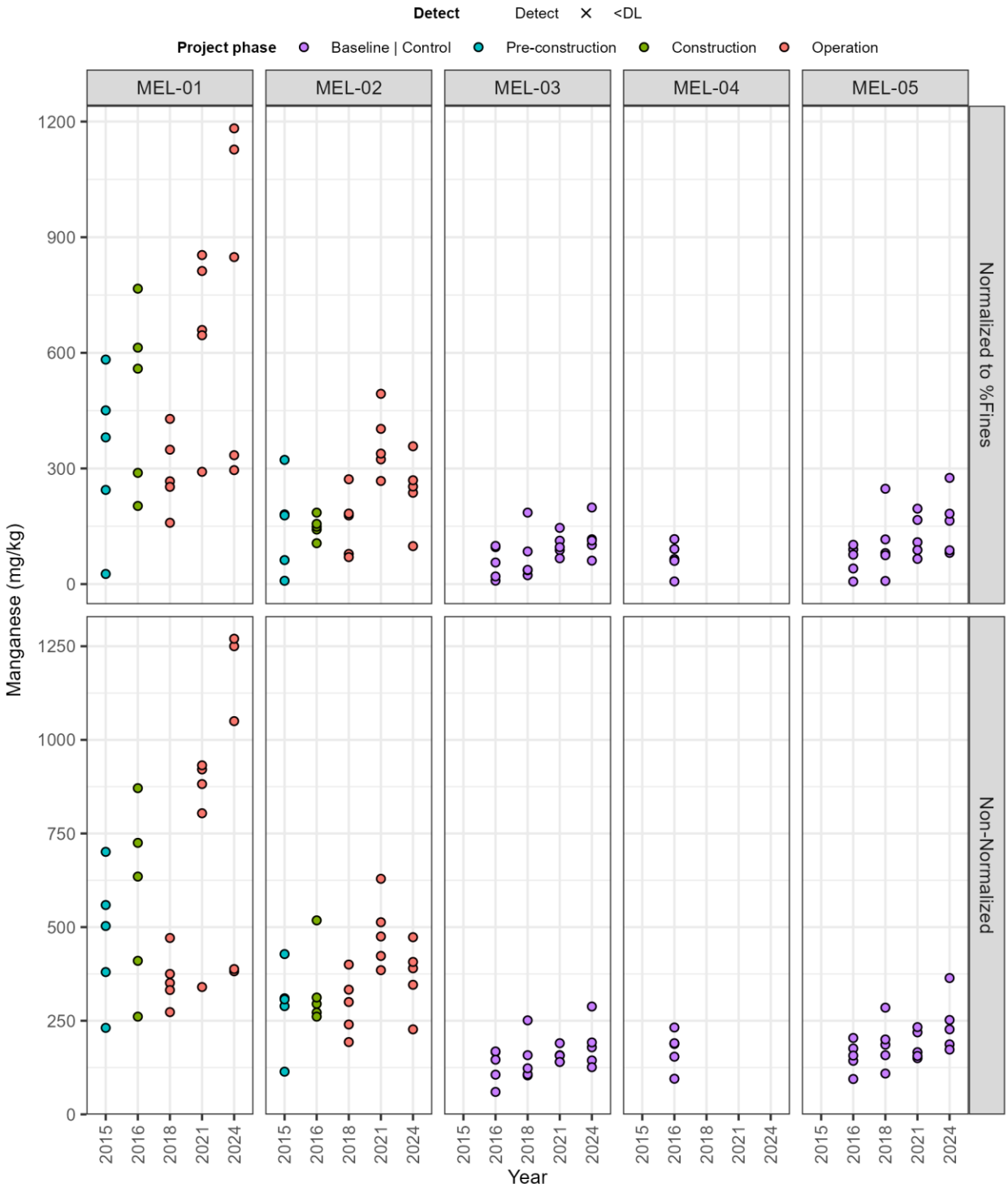


Figure F2-18. Mercury

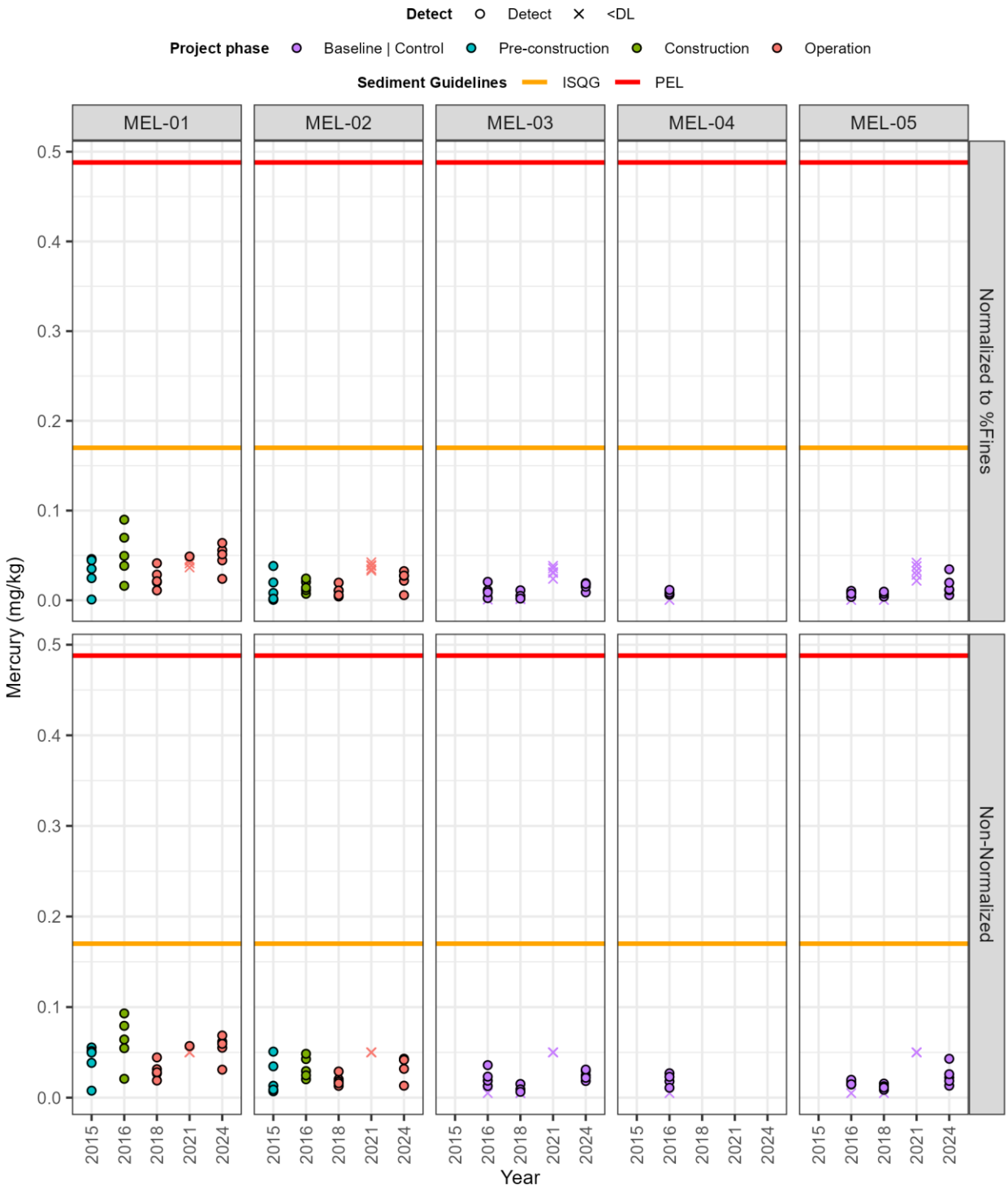


Figure F2-19. Molybdenum



Figure F2-20. Nickel

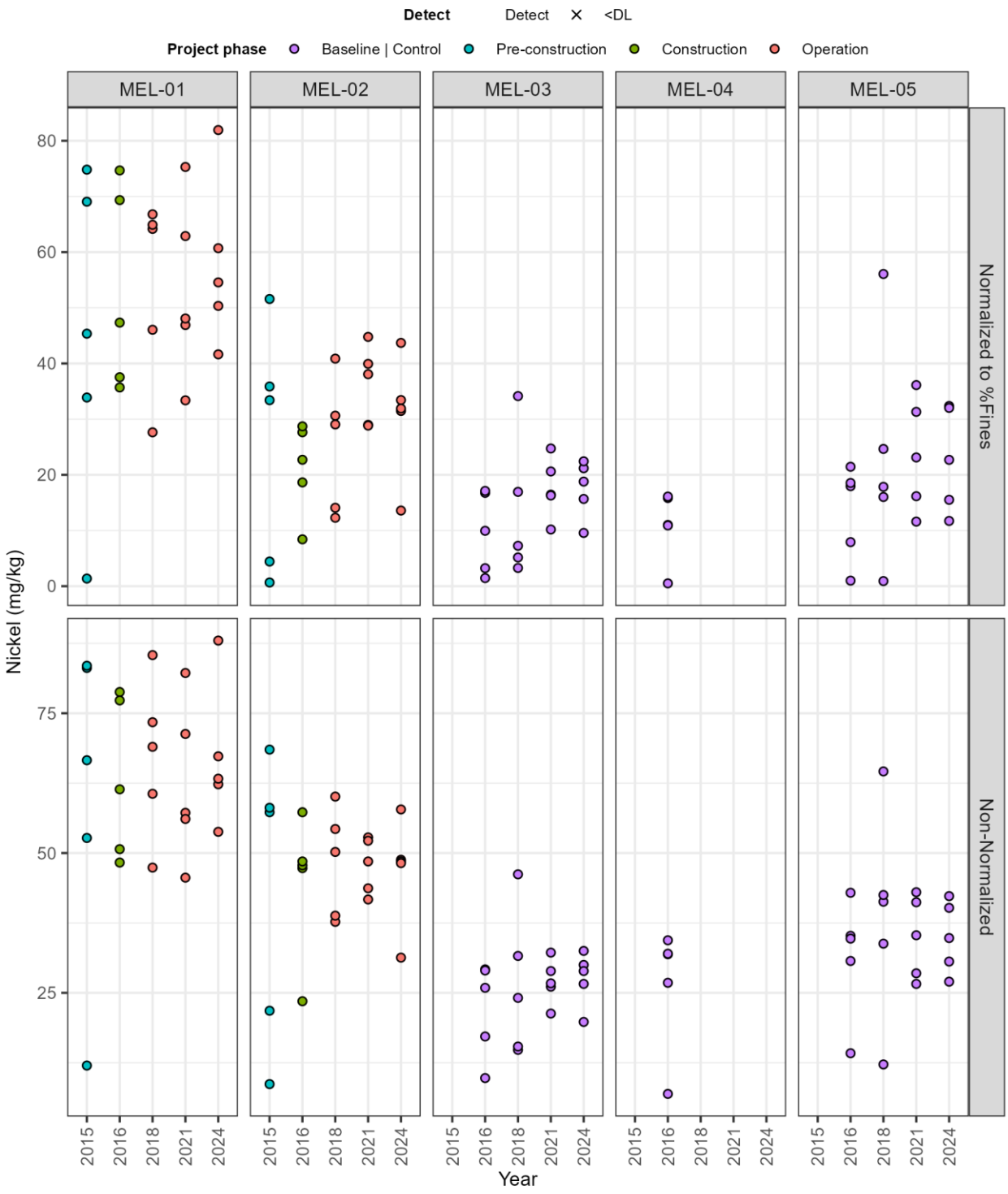


Figure F2-21. Potassium



Figure F2-22. Selenium



Figure F2-23. Silver

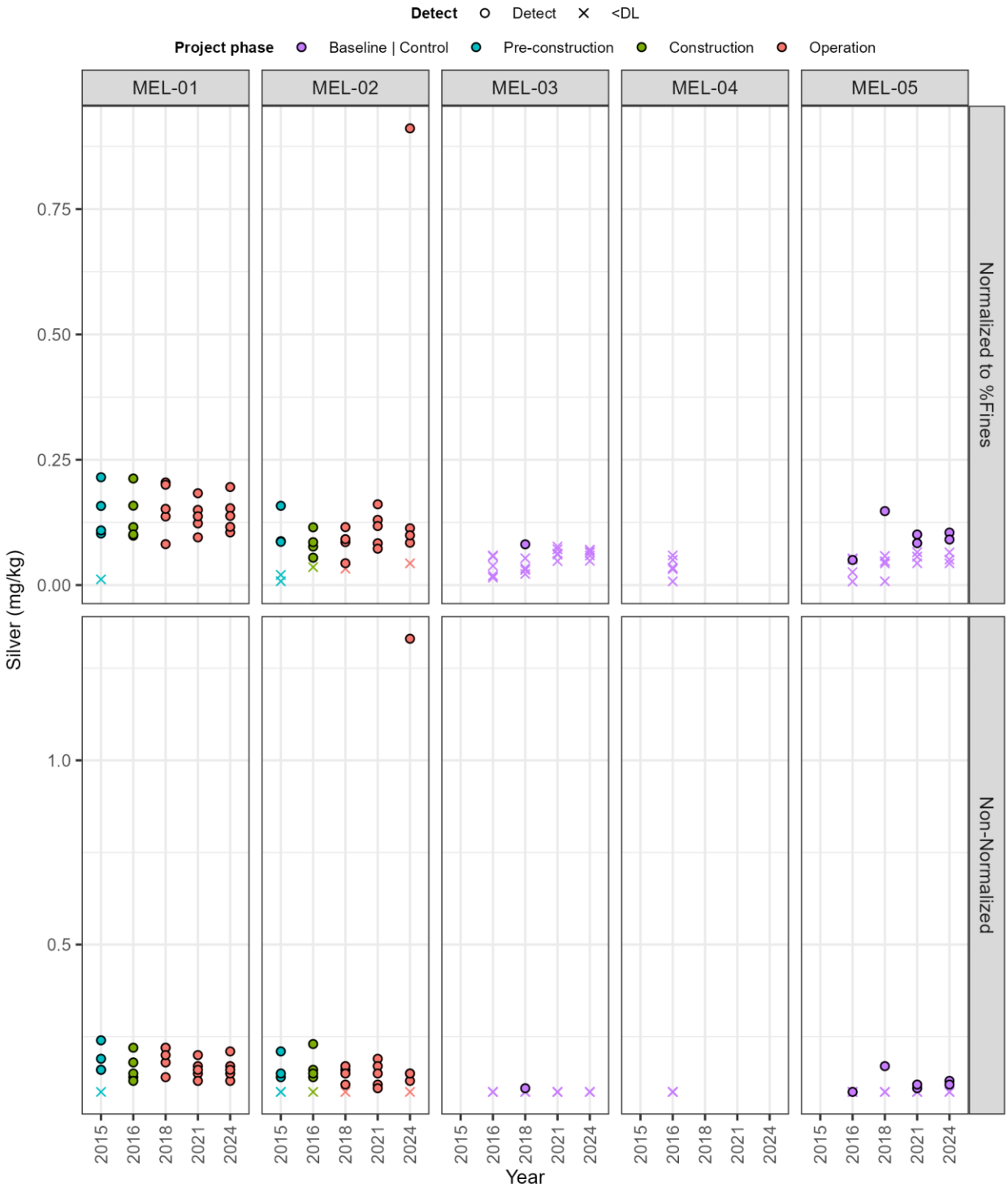


Figure F2-24. Sodium

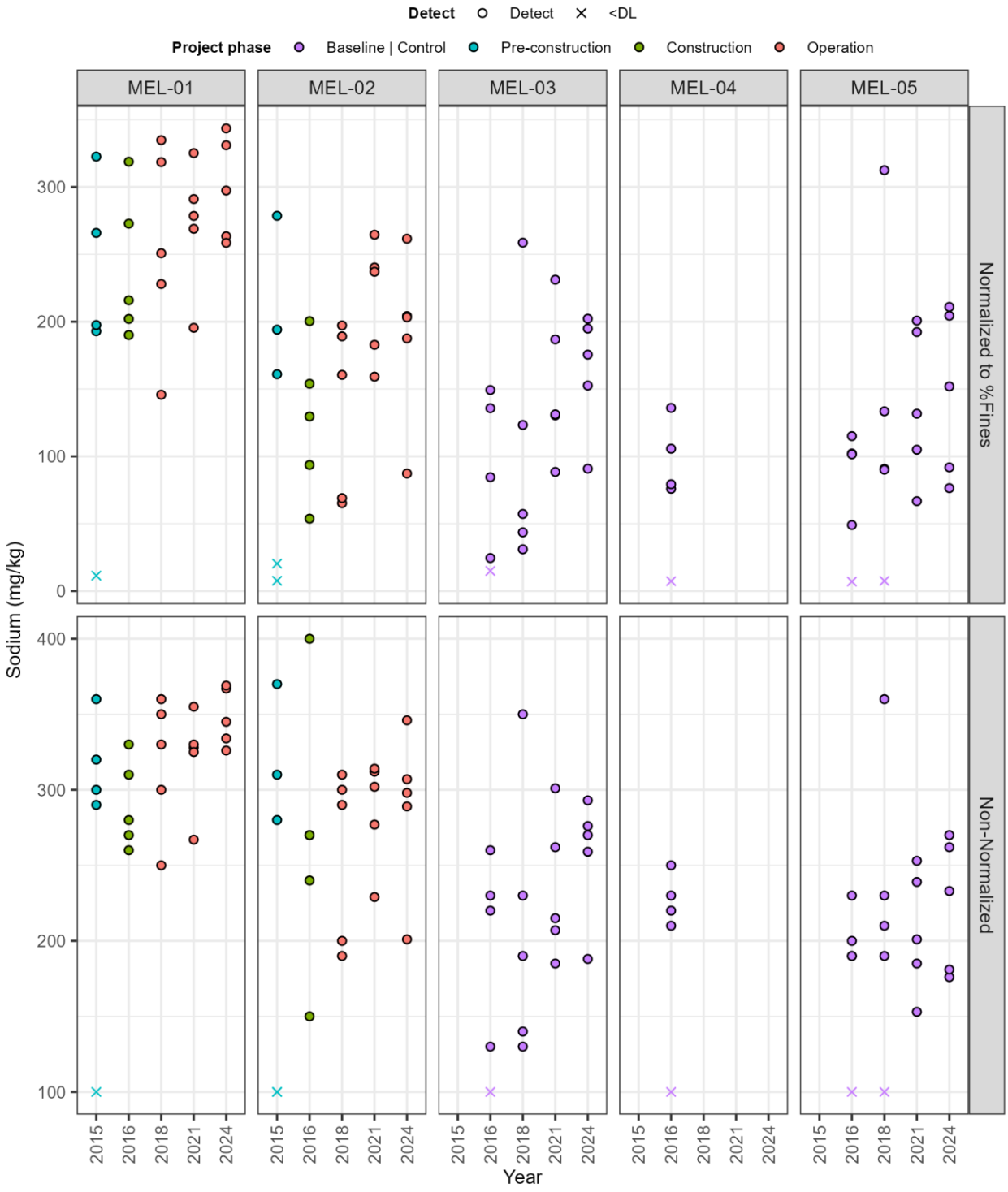


Figure F2-25. Strontium



Figure F2-26. Sulfur

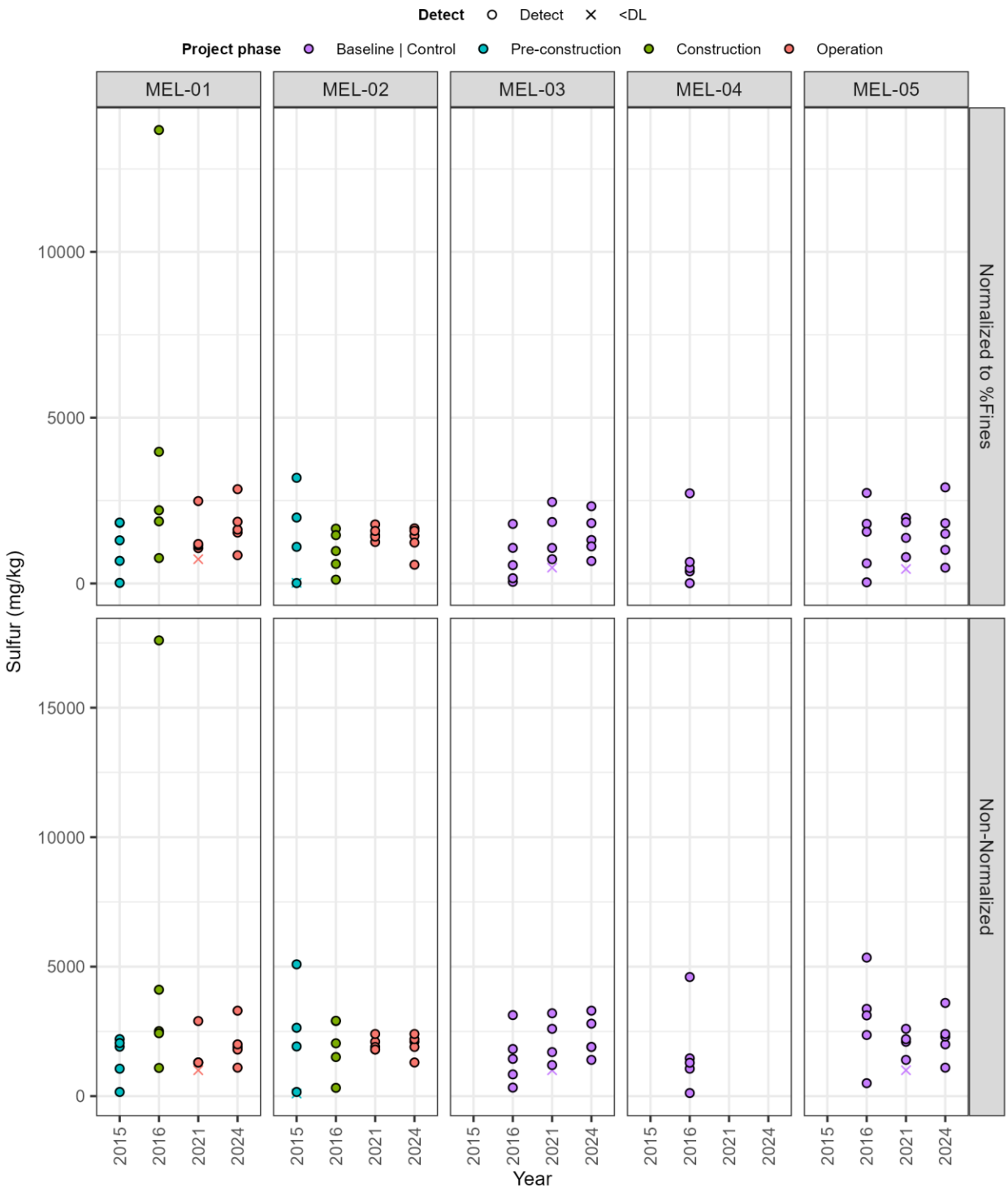


Figure F2-27. Thallium

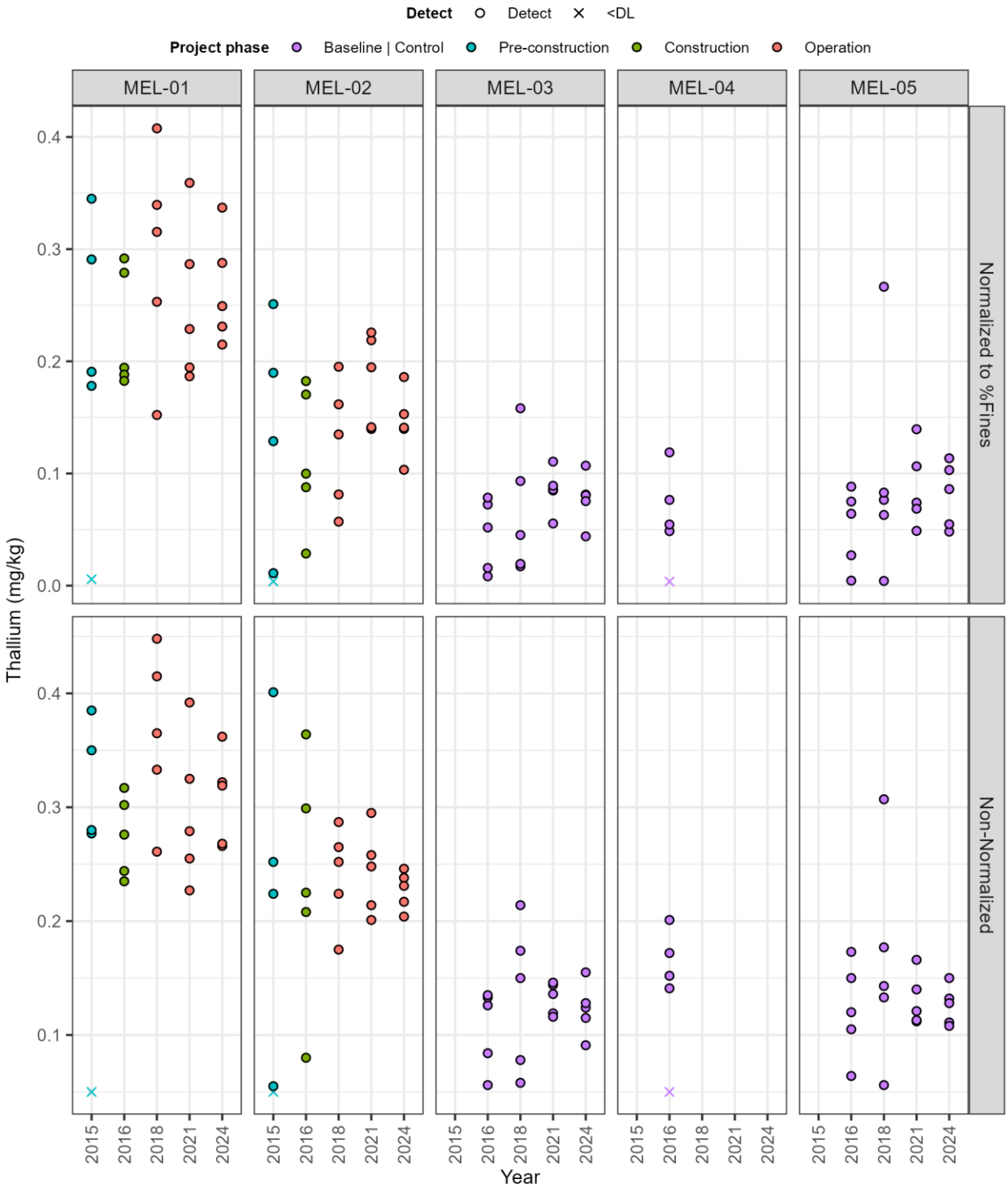


Figure F2-28. Tin

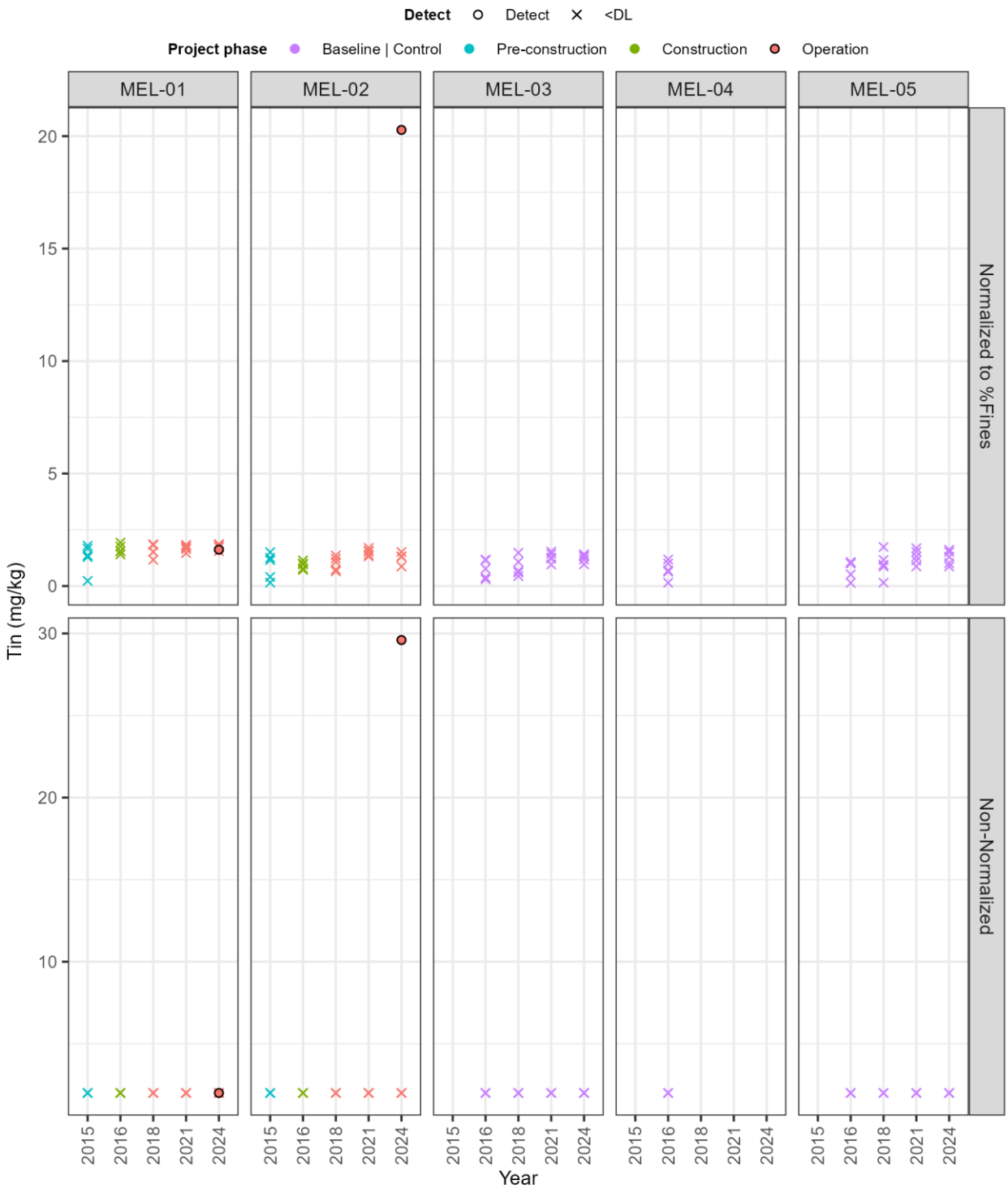


Figure F2-29. Titanium



Figure F2-30. Uranium



Figure F2-31. Vanadium

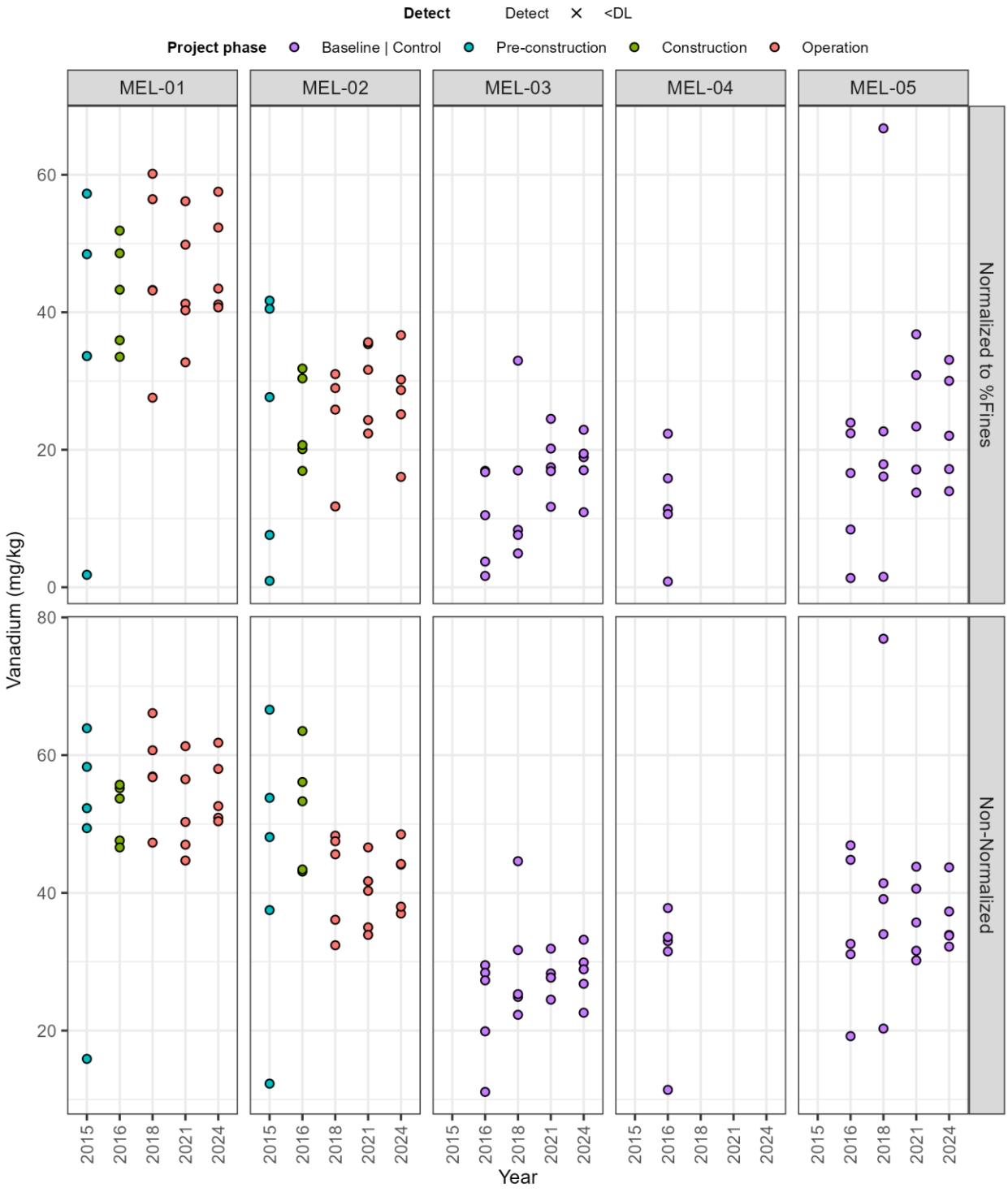
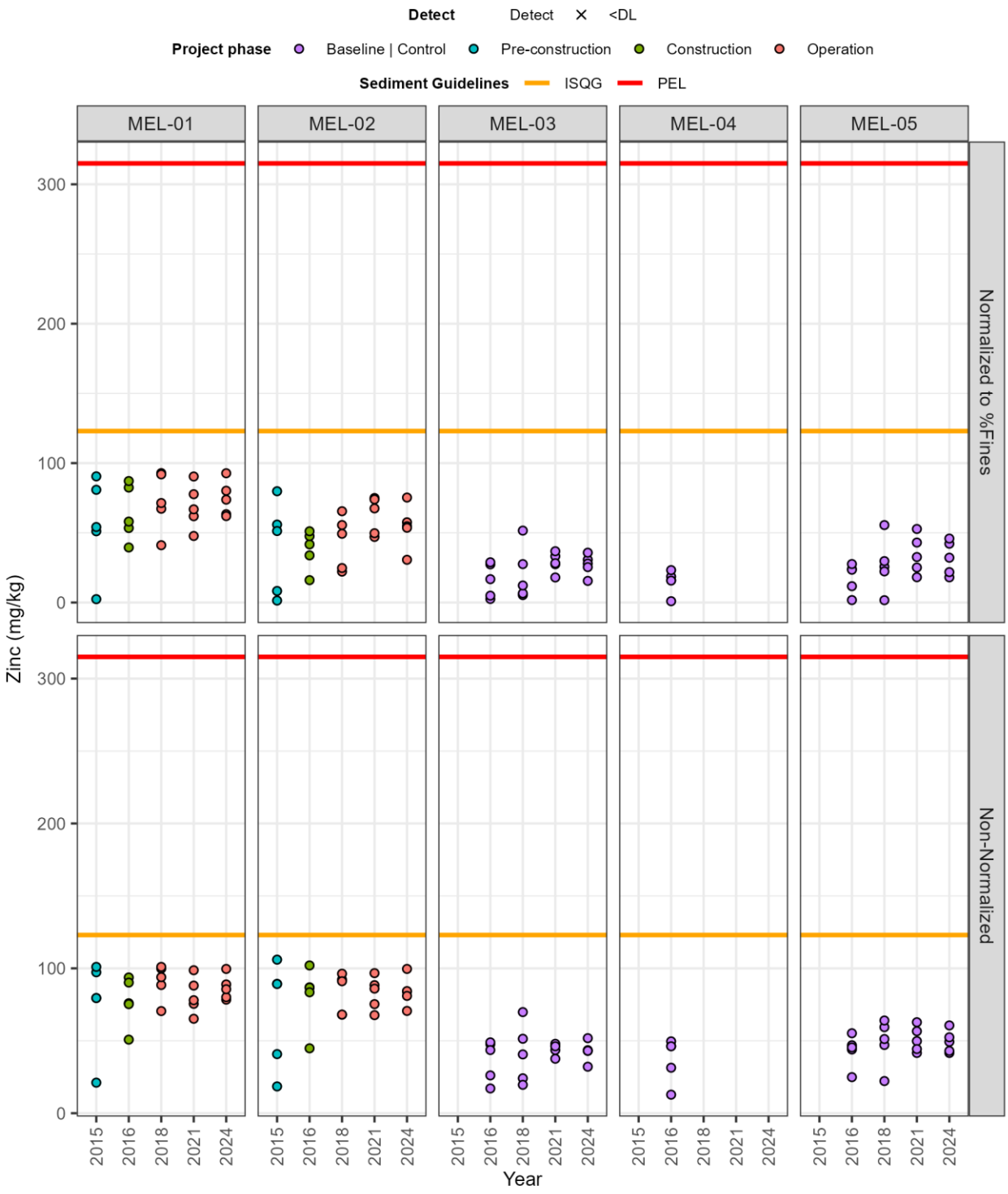


Figure F2-32. Zinc



APPENDIX G
BENTHIC INVERTEBRATES – SUPPORTING INFORMATION

Appendix G1
Benthic Invertebrate Community – Summary Statistics

APPENDIX G1 – FIGURES

Figure G1-1. Stress plot for the non-metric multidimensional scaling (nMDS) results from 2024 iv
Figure G1-2. Shepard plot for assessing goodness-of-fit for the 2024 nonmetric multidimensional scaling (nMDS) ordination..... v

APPENDIX G1 – TABLES

Table G1-1. Summary statistics for the 2024 benthic invertebrate community study. 1
Table G1-2. Top 5 dominant benthic invertebrate taxa by station in Meliadine Lake in 2024. 3
Table G1-3. Taxa presence / absence for the 2024 benthic invertebrate community survey. 4

BENTHIC INVERTEBRATE METRICS

Simpson's Diversity Index

Simpson's Diversity Index considers both the abundance and taxonomic richness of the community. There are typically two ways that Simpson's Diversity is presented, either by subtracting D from 1 (aka Simpson's Index of Diversity) or taking the reciprocal of D (aka, Simpson's Reciprocal Index [1/D]). D is calculated according to the formula in the TGD:

$$\mathrm{D} = \sum_{i-1}^{s} (p_i)^2$$

Where:

D = Simpson's Diversity,
pi = the proportion of the ith taxon at the station,
S = the total number of taxa at the station (i.e., taxa richness),
1 – D = Simpson's Index of Diversity: this index ranges from 0 to 1 with 0 representing no diversity and 1 representing infinite diversity, and
1/D = Simpson's Reciprocal Index: this way of presenting the diversity ranges from 1 as the lowest possible value (i.e., only one taxon in the sample) up to the number of taxa represented in the sample.

Simpson's Evenness Index

Simpson's Evenness is another way of measuring the diversity of the community that takes into consideration how the total abundance is distributed among the various taxa groups. Values range from 0 to 1, with 1 representing a community with completely equal distribution of the number of individuals among the taxa. Evenness was calculated using the density data set as follows:

$$\mathrm{E} = \frac{1}{D}\ x\ \frac{1}{S}$$

Where:

E = Simpson's Evenness,
D = Simpson's Diversity (see above), and
S = the total number of taxa at the station (i.e., taxa richness).

Bray Curtis Index

The Bray-Curtis index quantifies the difference between two ecological communities based on species composition and abundance. The Bray-Curtis Index reaches a maximum value of "1" for two samples that are entirely different and a minimum of "0" for two samples that possess identical descriptors (Bray and Curtis, 1957). Bray-Curtis was calculated according to methods prescribed in the EEM TGD (Environment Canada, 2012):

$$\mathrm{BCI} = \frac{\sum_{i=1}^{n} |y_{i1} - y_{i2}|}{\sum_{i=1}^{n} (y_{i1} + y_{i2})}$$

Where:

BCI = Bray-Curtis distance between sites 1 and 2,

Yi1 = count for taxon i at site 1,

Yi2 = count for taxon i at site 2, and

n = the total number of taxa at the two sites.

Note: The Bray-Curtis index is calculated relative to the reference mean on a year/program/habitat-specific basis.

Figure G1-1. Stress plot for the non-metric multidimensional scaling (nMDS) results from 2024

Notes: The stress value for 2-dimensional representation of the Bray-Curtis dissimilarity matrix was 0.239.

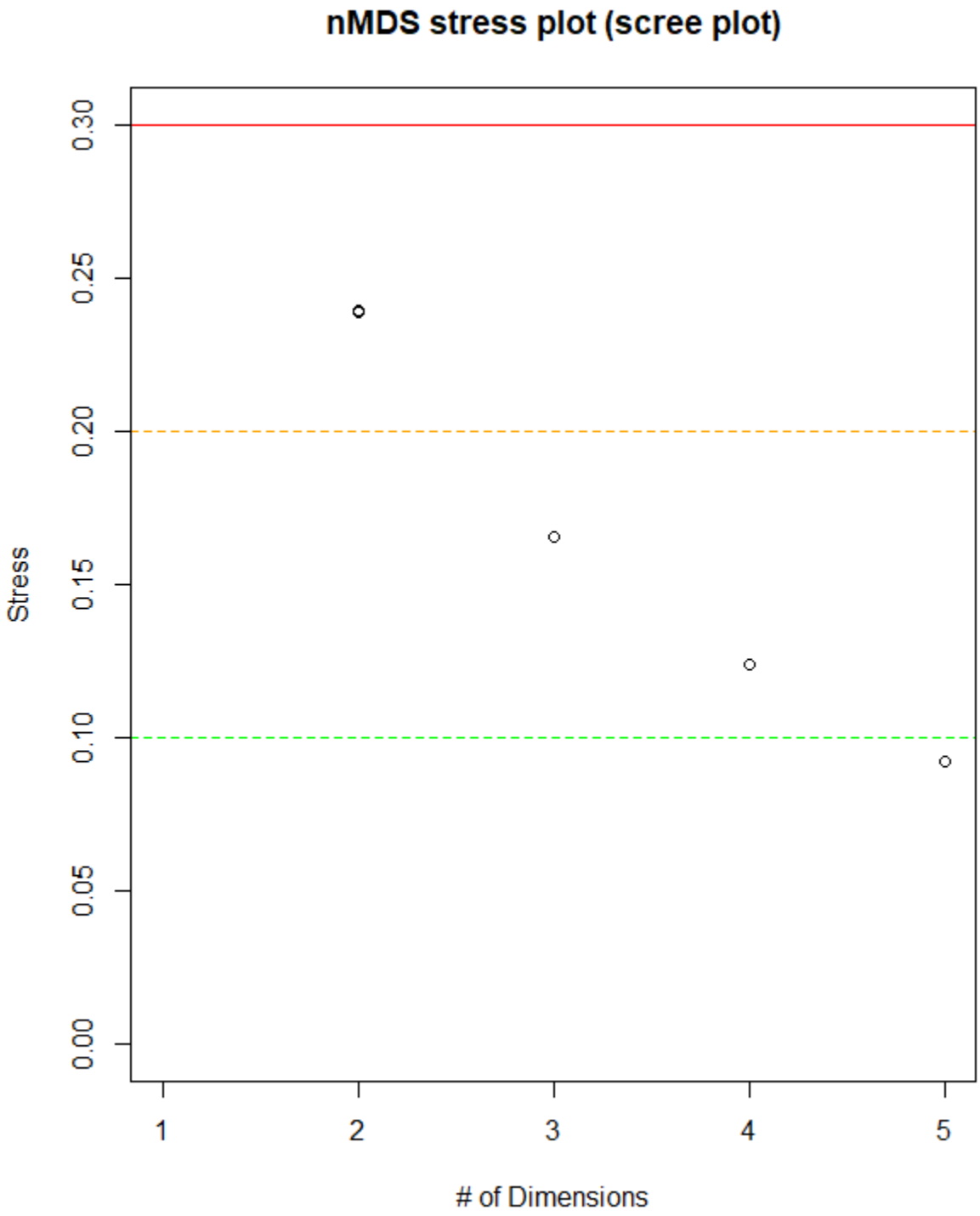


Figure G1-2. Shepard plot for assessing goodness-of-fit for the 2024 nonmetric multidimensional scaling (nMDS) ordination

Notes: The correlation statistics indicating the fit between ordination distances and observed dissimilarities.

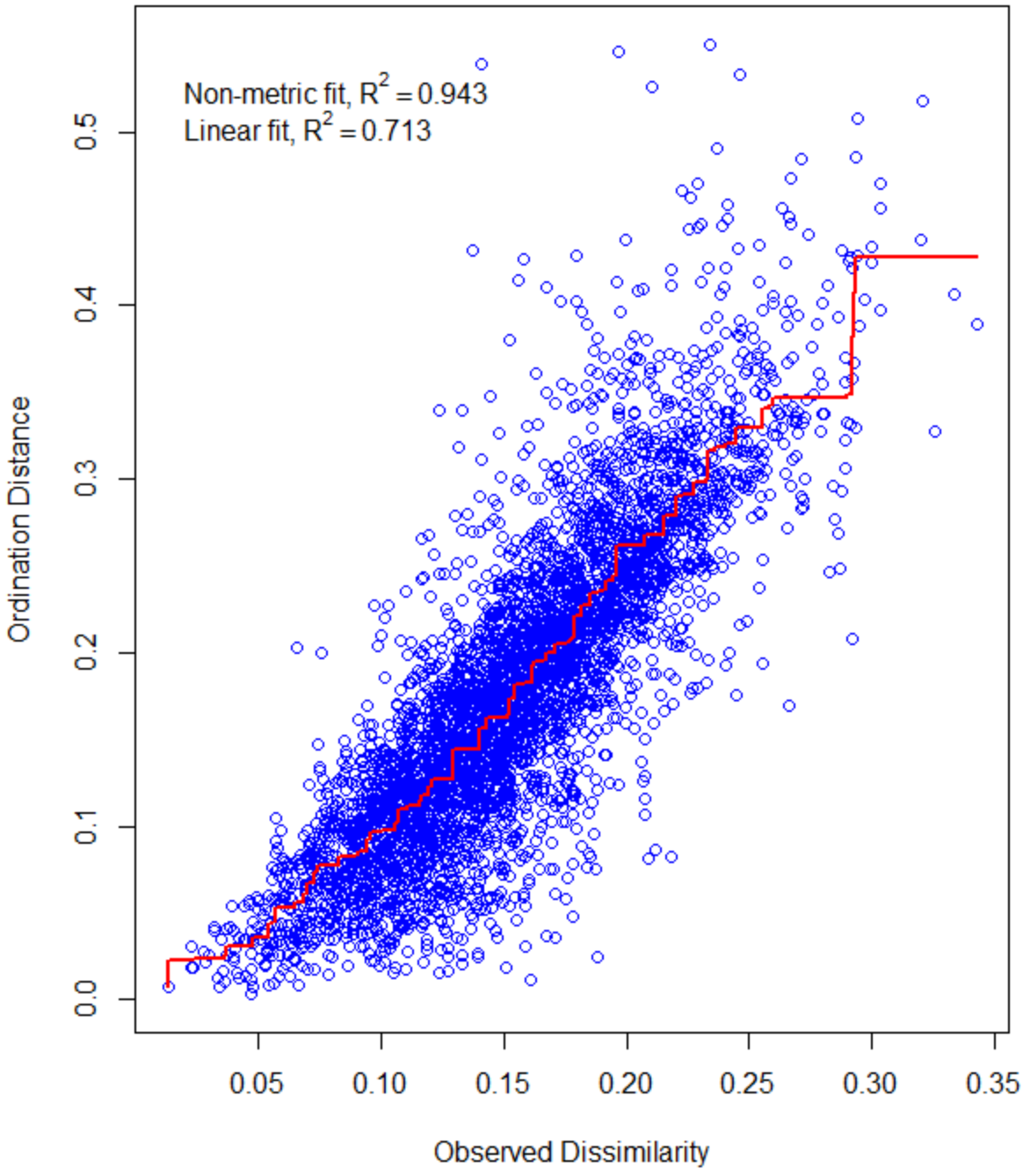


Table G1-1. Summary statistics for the 2024 benthic invertebrate community study.

Area	Endpoint	Taxa Group / Metric	Year	N	Mean	Median	SE	SD	Min	Max
MEL-01	Density (#/m2)	Total	2024	5	3523	3182	388	867	2836	4965
		Amphipods	2024	5	0	0	0	0	0	0
		Bivalves	2024	5	1308	1281	76.1	170	1149	1586
		Midges	2024	5	2044	1500	424	949	1414	3632
		Oligochaetes	2024	5	20.6	19.7	7.58	16.9	0	43.1
		Other	2024	5	27.6	29.5	7.58	16.9	0	43.1
		Snails	2024	5	122	118	10.4	23.2	98.4	153
	Taxa Richness	Total	2024	5	16.2	16	0.8	1.79	14	18
		Amphipods	2024	5	0	0	0	0	0	0
		Bivalves	2024	5	1.4	1	0.245	0.548	1	2
		Midges	2024	5	11.4	12	0.678	1.52	9	13
		Oligochaetes	2024	5	1	1	0.316	0.707	0	2
		Other	2024	5	1.2	1	0.374	0.837	0	2
		Snails	2024	5	1.2	1	0.2	0.447	1	2
	Indices	Bray-Curtis	2024	5	0.561	0.58	0.0633	0.142	0.323	0.683
		Simpson's (1/D)	2024	5	6.41	7.04	0.592	1.32	4.72	7.64
		Simpson's (1-D)	2024	5	0.838	0.858	0.0163	0.0365	0.788	0.869
		Simpson's (E)	2024	5	0.394	0.41	0.0267	0.0598	0.329	0.469
MEL-02	Density (#/m2)	Total	2024	5	4764	3750	880	1967	3339	7931
		Amphipods	2024	5	135	155	14	31.3	86.2	158
		Bivalves	2024	5	877	836	110	245	611	1276
		Midges	2024	5	3624	2776	738	1650	2319	6259
		Oligochaetes	2024	5	66	34.5	35.4	79.3	19.7	207
		Other	2024	5	58.9	69	21.9	49	8.62	121
		Snails	2024	5	3.45	0	3.45	7.71	0	17.2
	Taxa Richness	Total	2024	5	18.8	19	1.2	2.68	16	23
		Amphipods	2024	5	1	1	0	0	1	1
		Bivalves	2024	5	1.6	2	0.245	0.548	1	2
		Midges	2024	5	11.2	12	0.735	1.64	9	13
		Oligochaetes	2024	5	2	1	0.632	1.41	1	4
		Other	2024	5	2.8	3	0.8	1.79	1	5
		Snails	2024	5	0.2	0	0.2	0.447	0	1
	Indices	Bray-Curtis	2024	5	0.49	0.494	0.0157	0.035	0.439	0.524
		Simpson's (1/D)	2024	5	7.03	7.64	0.589	1.32	5.52	8.24
		Simpson's (1-D)	2024	5	0.853	0.869	0.0131	0.0292	0.819	0.879
		Simpson's (E)	2024	5	0.381	0.424	0.0417	0.0933	0.248	0.477

Table G1-1. Summary statistics for the 2024 benthic invertebrate community study.

Area	Endpoint	Taxa Group / Metric	Year	N	Mean	Median	SE	SD	Min	Max
MEL-03	Density (#/m2)	Total	2024	5	6159	5145	1115	2494	3888	9899
		Amphipods	2024	5	52.8	0	32.9	73.6	0	152
		Bivalves	2024	5	719	800	84.6	189	397	851
		Midges	2024	5	5209	4221	1030	2302	3345	8674
		Oligochaetes	2024	5	138	41.4	88.7	198	25.9	490
		Other	2024	5	24.7	27.6	8.96	20	0	45.9
		Snails	2024	5	15.3	0	9.67	21.6	0	45.9
	Taxa Richness	Total	2024	5	18.2	18	1.32	2.95	14	21
		Amphipods	2024	5	0.6	0	0.4	0.894	0	2
		Bivalves	2024	5	2	2	0	0	2	2
		Midges	2024	5	12	12	1	2.24	9	15
		Oligochaetes	2024	5	2.2	1	0.8	1.79	1	5
		Other	2024	5	1	1	0.316	0.707	0	2
		Snails	2024	5	0.4	0	0.245	0.548	0	1
	Indices	Bray-Curtis	2024	5	0.293	0.299	0.0305	0.0683	0.194	0.379
		Simpson's (1/D)	2024	5	6.11	5.81	0.565	1.26	4.71	8.16
		Simpson's (1-D)	2024	5	0.831	0.828	0.0143	0.032	0.788	0.877
		Simpson's (E)	2024	5	0.339	0.34	0.0287	0.0642	0.273	0.415
MEL-05	Density (#/m2)	Total	2024	5	5227	4841	534	1194	4080	6638
		Amphipods	2024	5	90.6	96.6	44.6	99.7	0	241
		Bivalves	2024	5	661	648	45.9	103	552	810
		Midges	2024	5	4261	4028	472	1055	3275	5638
		Oligochaetes	2024	5	57.4	69	19.9	44.5	0	103
		Other	2024	5	33.3	34.5	11.8	26.4	0	69
		Snails	2024	5	124	45.9	68.1	152	0	362
	Taxa Richness	Total	2024	5	16.8	17	1.07	2.39	14	20
		Amphipods	2024	5	0.6	1	0.245	0.548	0	1
		Bivalves	2024	5	1.8	2	0.2	0.447	1	2
		Midges	2024	5	10.8	11	0.583	1.3	9	12
		Oligochaetes	2024	5	1.2	1	0.374	0.837	0	2
		Other	2024	5	1.6	2	0.51	1.14	0	3
		Snails	2024	5	0.8	1	0.2	0.447	0	1
	Indices	Bray-Curtis	2024	5	0.245	0.25	0.0228	0.0511	0.185	0.314
		Simpson's (1/D)	2024	5	6.2	5.55	1.02	2.29	4.19	10.1
		Simpson's (1-D)	2024	5	0.824	0.82	0.0228	0.0509	0.761	0.901
		Simpson's (E)	2024	5	0.364	0.356	0.0416	0.0931	0.279	0.505

Table G1-2. Top 5 dominant benthic invertebrate taxa by station in Meliadine Lake in 2024.

Year	Area	Station	Status	Sum of Top 5 Taxa (%)	Dominant 1		Dominant 2		Dominant 3		Dominant 4		Dominant 5	
					Taxon	%	Taxon	%	Taxon	%	Taxon	%	Taxon	%
2024	MEL-01	MEL-01-01	Impact	85.9	Pisidiidae indet.	27.4	Stictochironomus sp.	26.5	Pisidium sp.	17.5	Procladius sp.	9.3	Chironomidae indet.	5.2
2024	MEL-01	MEL-01-06	Impact	80.8	Pisidiidae indet.	39.6	Stictochironomus sp.	16.7	Pisidium sp.	10.2	Phaenopsectra sp.	9.3	Procladius sp.	5
2024	MEL-01	MEL-01-07	Impact	73	Stictochironomus sp.	22.5	Pisidium sp.	18.8	Pisidiidae indet.	16.1	Tanytarsus sp.	7.8	Procladius sp.	7.8
2024	MEL-01	MEL-01-08	Impact	72.7	Pisidiidae indet.	21.3	Pisidium sp.	20.7	Stictochironomus sp.	13.7	Procladius sp.	10.6	Microtendipes sp.	6.4
2024	MEL-01	MEL-01-09	Impact	71.6	Corynocera sp.	27.8	Tanytarsus sp.	11.7	Stictochironomus sp.	10.8	Pisidiidae indet.	10.8	Procladius sp.	10.5
2024	MEL-02	MEL-02-02	Impact	71.1	Tanytarsus sp.	20.2	Pagastiella sp.	13.6	Pisidium sp.	13	Corynocera sp.	12.5	Pisidiidae indet.	11.8
2024	MEL-02	MEL-02-03	Impact	71.8	Tanytarsus sp.	21	Stictochironomus sp.	15.2	Pagastiella sp.	13.7	Procladius sp.	12.7	Pisidiidae indet.	9.2
2024	MEL-02	MEL-02-05	Impact	74.9	Pagastiella sp.	36.6	Tanytarsus sp.	12.7	Pisidiidae indet.	10	Stictochironomus sp.	9.4	Pisidium sp.	6.2
2024	MEL-02	MEL-02-06	Impact	69.4	Tanytarsus sp.	25.5	Pisidiidae indet.	13.1	Procladius sp.	11.7	Stictochironomus sp.	9.7	Pagastiella sp.	9.4
2024	MEL-02	MEL-02-08	Impact	76.4	Pagastiella sp.	34.8	Tanytarsus sp.	15.4	Corynocera sp.	10.4	Pisidiidae indet.	9.1	Pisidium sp.	6.7
2024	MEL-03	MEL-03-01	Control	75.3	Corynocera sp.	26.9	Tanytarsus sp.	25.9	Psectrocladius sp.	8.3	Chironomus sp.	8	Procladius sp.	6.2
2024	MEL-03	MEL-03-02	Control	75.8	Corynocera sp.	32.8	Stictochironomus sp.	17.8	Pisidiidae indet.	12.8	Procladius sp.	6.2	Pagastiella sp.	6.2
2024	MEL-03	MEL-03-03	Control	73.2	Corynocera sp.	41.8	Tanytarsus sp.	8.6	Pisidiidae indet.	7.8	Stictochironomus sp.	7.5	Pisidium sp.	7.5
2024	MEL-03	MEL-03-04	Control	65.6	Corynocera sp.	24.6	Tanytarsus sp.	16.6	Stictochironomus sp.	10.4	Pagastiella sp.	7.1	Microtendipes sp.	6.9
2024	MEL-03	MEL-03-05	Control	74.3	Tanytarsus sp.	30	Corynocera sp.	26	Psectrocladius sp.	6.8	Procladius sp.	5.9	Pagastiella sp.	5.6
2024	MEL-05	MEL-05-01	Control	59.5	Corynocera sp.	17.4	Pagastiella sp.	17.1	Paratanytarsus sp.	9.8	Stictochironomus sp.	7.6	Pisidiidae indet.	7.6
2024	MEL-05	MEL-05-02	Control	78.4	Corynocera sp.	37.1	Psectrocladius sp.	18.4	Pagastiella sp.	8.8	Paratanytarsus sp.	7.3	Procladius sp.	6.8
2024	MEL-05	MEL-05-03	Control	73.8	Corynocera sp.	35.2	Psectrocladius sp.	17.7	Pagastiella sp.	7.9	Paratanytarsus sp.	6.8	Pisidiidae indet.	6.2
2024	MEL-05	MEL-05-04	Control	74.1	Corynocera sp.	30.4	Pagastiella sp.	21.5	Psectrocladius sp.	10.3	Pisidiidae indet.	6.5	Pisidium sp.	5.4
2024	MEL-05	MEL-05-05	Control	87.2	Corynocera sp.	38.5	Microtendipes sp.	26.8	Pagastiella sp.	8.5	Pisidium sp.	7.7	Pisidiidae indet.	5.7

Notes:

"indet" = taxa were identified at the Family level (e.g., Pisidiidae and Chironomidae)

Table G1-3. Taxa presence / absence for the 2024 benthic invertebrate community survey.

Site:	MEL-01					MEL-02					MEL-03					MEL-05				
Sample:	MEL-01-01	MEL-01-06	MEL-01-07	MEL-01-08	MEL-01-09	MEL-02-02	MEL-02-03	MEL-02-05	MEL-02-06	MEL-02-08	MEL-03-01	MEL-03-02	MEL-03-03	MEL-03-04	MEL-03-05	MEL-05-01	MEL-05-02	MEL-05-03	MEL-05-04	MEL-05-05
Sample Collection Date:	9-Aug-24	9-Aug-24	16-Aug-24	16-Aug-24	16-Aug-24	20-Aug-24	20-Aug-24	20-Aug-24	20-Aug-24	20-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24
CC#:	CC250532	CC250533	CC250534	CC250535	CC250536	CC250537	CC250538	CC250539	CC250540	CC250541	CC250542	CC250543	CC250544	CC250545	CC250546	CC250547	CC250548	CC250549	CC250550	CC250551
Phylum: Arthropoda	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Subphylum: Hexapoda	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Class: Insecta	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Order: Trichoptera	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Family: Limnephilidae	No	No	No	No	No	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No
| Order: Diptera	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Family: Chironomidae	Yes	Yes	No	No	Yes	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
| Subfamily: Chironominae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Tribe: Chironomini	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Chironomus	No	No	No	No	No	No	No	No	No	No	Yes	No	Yes	No	Yes	No	No	No	Yes	No
Cladopelma	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No
Cryptochironomus	No	No	No	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	No	No	Yes
Cryptotendipes	No	No	Yes	No	Yes	No	No	No	No	Yes	No	No	No	Yes	Yes	No	Yes	No	No	No
Dicrotendipes	No	No	No	No	No	No	Yes	No	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	No
Microtendipes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Pagastiella	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Phaenopsectra	No	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Polypedilum	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Stictochironomus	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
| Tribe: Tanytarsini	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Cladotanytarsus	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Corynocera	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Paratanytarsus	Yes	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stempellinella	Yes	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Tanytarsus	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
| Subfamily: Diamesinae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Protanypus	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Subfamily: Orthocladiinae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Heterotrissocladius	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No
Limnophyes	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No
Psectrocladius	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rheocricotopus	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Subfamily: Prodiamesinae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Monodiamesa	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	No	No	No	Yes	No	No	No	No	No	No
| Subfamily: Tanypodinae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Table G1-3. Taxa presence / absence for the 2024 benthic invertebrate community survey.

Site:	MEL-01					MEL-02					MEL-03					MEL-05				
Sample:	MEL-01-01	MEL-01-06	MEL-01-07	MEL-01-08	MEL-01-09	MEL-02-02	MEL-02-03	MEL-02-05	MEL-02-06	MEL-02-08	MEL-03-01	MEL-03-02	MEL-03-03	MEL-03-04	MEL-03-05	MEL-05-01	MEL-05-02	MEL-05-03	MEL-05-04	MEL-05-05
Sample Collection Date:	9-Aug-24	9-Aug-24	16-Aug-24	16-Aug-24	16-Aug-24	20-Aug-24	20-Aug-24	20-Aug-24	20-Aug-24	20-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24
CC#:	CC250532	CC250533	CC250534	CC250535	CC250536	CC250537	CC250538	CC250539	CC250540	CC250541	CC250542	CC250543	CC250544	CC250545	CC250546	CC250547	CC250548	CC250549	CC250550	CC250551
Ablabesmyia	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
| Tribe: Pentaneurini	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Thienemannimyia group	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No
| Tribe: Procladiini	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Procladius	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Subphylum: Chelicerata	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Class: Arachnida	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Order: Trombidiformes	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	No
| Family: Arrenuridae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Arrenurus	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Family: Hygrobatidae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Hygrobates	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Family: Lebertiidae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Lebertia	No	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	No	No	Yes
| Family: Oxidae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Frontipoda	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes
Oxus	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	No	Yes	Yes	No	No	Yes	No	No	No	Yes
| Family: Pionidae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Piona	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	No	No	No	No
| Family: Unionicolidae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Unionicola	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No	No
Subphylum: Crustacea	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Class: Branchiopoda	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Order: Notostraca	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Family: Triopsidae	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Class: Malacostraca	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Order: Amphipoda	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
| Family: Gammaridae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Gammarus	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
| Family: Hyalellidae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Hyalella	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No
Phylum: Annelida	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Subphylum: Clitellata	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Class: Oligochaeta	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Order: Lumbriculida	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Table G1-3. Taxa presence / absence for the 2024 benthic invertebrate community survey.

Site:	MEL-01					MEL-02					MEL-03					MEL-05				
Sample:	MEL-01-01	MEL-01-06	MEL-01-07	MEL-01-08	MEL-01-09	MEL-02-02	MEL-02-03	MEL-02-05	MEL-02-06	MEL-02-08	MEL-03-01	MEL-03-02	MEL-03-03	MEL-03-04	MEL-03-05	MEL-05-01	MEL-05-02	MEL-05-03	MEL-05-04	MEL-05-05
Sample Collection Date:	9-Aug-24	9-Aug-24	16-Aug-24	16-Aug-24	16-Aug-24	20-Aug-24	20-Aug-24	20-Aug-24	20-Aug-24	20-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24
CC#:	CC250532	CC250533	CC250534	CC250535	CC250536	CC250537	CC250538	CC250539	CC250540	CC250541	CC250542	CC250543	CC250544	CC250545	CC250546	CC250547	CC250548	CC250549	CC250550	CC250551
| Family: Lumbriculidae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Lumbriculus	No	No	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
| Order: Tubificida	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Family: Naididae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Nais	No	No	No	No	No	No	Yes	No	No	Yes	Yes	No	No	No	Yes	Yes	No	No	No	No
Rhyacodrilus	No	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No
Slavina appendiculata	No	No	Yes	No	Yes	Yes	No	No	No	Yes	Yes	No	No	No	Yes	No	No	No	Yes	No
Uncinais uncinata	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Vejdovskyella	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	No
Phylum: Mollusca	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Class: Bivalvia	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Order: Veneroida	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Family: Pisidiidae	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pisidium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sphaerium	No	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
| Class: Gastropoda	Yes	Yes	Yes	Yes	No	No	Yes	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes	No
| Order: Basommatophora	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Family: Planorbidae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Gyraulus	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Order: Heterostropha	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Family: Valvatidae	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Valvata	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes	No	No	No	No	Yes	Yes	Yes	Yes	No

Taxa present but not included:

Phylum: Arthropoda	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Class: Copepoda	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes
Subphylum: Crustacea	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Class: Branchiopoda	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Order: Cladocera	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
| Class: Ostracoda	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Phylum: Nemata	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Phylum: Platyhelminthes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
| Class: Turbellaria	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Appendix G2
2024 Benthic Invertebrate Taxonomy Report

Methods and QC Report 2024

Project ID: Meliadine AEMP/EEM

Client: Azimuth Consulting Group

Prepared by:
Cordillera Consulting Inc.
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Table of Contents

Sample Reception **3**

Sample Sorting **4**

Sorting Quality Control - Sorting Efficiency **5**

Sorting Quality Control - Sub-Sampling QC **6**

Taxonomic Effort **8**

Taxonomists **8**

References **9**

Taxonomic Keys **9**

Sample Reception

On September 6, 2024, Cordillera Consulting received 20 benthic samples from Azimuth Consulting Group. When samples arrived to Cordillera Consulting, exterior packaging was initially inspected for damage or wet spots that would have indicated damage to the interior containers.

Samples were logged into a proprietary software database (INSTAR1) where the clients assigned sample name was recorded along with a Cordillera Consulting (CC) number for cross-reference. Each sample was checked to ensure that all sites and replicates recorded on field sheets or packing lists were delivered intact and with adequate preservative. Any missing, mislabelled or extra samples were reported to the client immediately to confirm the total numbers and correct names on the sample jars. The client representative was notified of the arrival of the shipment and provided a sample inventory once intake was completed.
See table below for sample inventory:

Table 1: Summary of sample information including Cordillera Consulting (CC) number

Sample	CC#	Date	Size	# of Jars
MEL-01-01	CC250532	08/09/2024	500 µM	1
MEL-01-06	CC250533	08/09/2024	500 µM	1
MEL-01-07	CC250534	08/16/2024	500 µM	1
MEL-01-08	CC250535	08/16/2024	500 µM	1
MEL-01-09	CC250536	08/16/2024	500 µM	1
MEL-02-02	CC250537	08/20/2024	500 µM	1
MEL-02-03	CC250538	08/20/2024	500 µM	1
MEL-02-05	CC250539	08/20/2024	500 µM	1
MEL-02-06	CC250540	08/20/2024	500 µM	1
MEL-02-08	CC250541	08/20/2024	500 µM	1
MEL-03-01	CC250542	08/15/2024	500 µM	1
MEL-03-02	CC250543	08/15/2024	500 µM	1
MEL-03-03	CC250544	08/15/2024	500 µM	1
MEL-03-04	CC250545	08/15/2024	500 µM	1
MEL-03-05	CC250546	08/15/2024	500 µM	1
MEL-05-01	CC250547	08/14/2024	500 µM	1

MEL-05-02	CC250548	08/14/2024	500 µM	1
MEL-05-03	CC250549	08/14/2024	500 µM	1
MEL-05-04	CC250550	08/14/2024	500 µM	1
MEL-05-05	CC250551	08/14/2024	500 µM	1

Sample Sorting

- Using a gridded Petri dish, fine forceps and a low power stereo-microscope (Olympus, Nikon, Leica) the sorting technicians removed the invertebrates and sorted them into family/orders.
- The sorting technician kept a running tally of total numbers excluding organisms from Porifera, Nemata, Platyhelminthes, Ostracoda, Copepoda, Cladocera and terrestrial drop-ins such as aphids. These organisms were marked for their presence (given a value of 1) only and left in the sample. They were not included towards the 300-organism subsample count.
- Where specimens are broken or damaged, only heads were counted.
- Subsampling was conducted with the use of a Marchant Box.
- When using the Marchant box, cells were extracted at the same time in the order indicated by a random number table. If the 300th organism was found part way into sorting a cell then the balance of that cell was sorted. If the organism count had not reached 300 by the 50th cell then the entire sample was sorted.
- The total number of cells sorted and the number of organisms removed were recorded manually on a bench sheet and then recorded into INSTAR1
- Organisms were stored in vials containing 80% ethanol and an interior label indicating the site names, date of sampling, site code numbers and portion subsampled. This information was also recorded on the laboratory bench sheet and on INSTAR1.
- The sorted portion of the debris was preserved and labeled separately from the unsorted portion and was tested for sorting efficiency (Sorting Quality Control – Sorting Efficiency). The unsorted portion was also labeled and preserved in separate jars.

Percent sub-sampled and total countable invertebrates pulled from the samples were summarized in the table below.

Table 2: Percent sub-sample and invertebrate count for each sample

Sample	Date	CC#	500 micron fraction	
			% Sampled	# Invertebrates
MEL-01-01	9-Aug-24	CC250532	100%	343

MEL-01-06	9-Aug-24	CC250533	87.5%	323
MEL-01-07	16-Aug-24	CC250534	87.5%	373
MEL-01-08	16-Aug-24	CC250535	100%	329
MEL-01-09	16-Aug-24	CC250536	56.25%	324
MEL-02-02	20-Aug-24	CC250537	100%	391
MEL-02-03	20-Aug-24	CC250538	50%	315
MEL-02-05	20-Aug-24	CC250539	87.5%	339
MEL-02-06	20-Aug-24	CC250540	100%	435
MEL-02-08	20-Aug-24	CC250541	50%	460
MEL-03-01	15-Aug-24	CC250542	37.5%	324
MEL-03-02	15-Aug-24	CC250543	62.5%	320
MEL-03-03	15-Aug-24	CC250544	62.5%	373
MEL-03-04	15-Aug-24	CC250545	100%	451
MEL-03-05	15-Aug-24	CC250546	28.125%	323
MEL-05-01	14-Aug-24	CC250547	75%	368
MEL-05-02	14-Aug-24	CC250548	50%	385
MEL-05-03	14-Aug-24	CC250549	75%	355
MEL-05-04	14-Aug-24	CC250550	50%	368
MEL-05-05	14-Aug-24	CC250551	62.5%	351

Sorting Quality Control - Sorting Efficiency

As a part of Cordillera's laboratory policy, all projects undergo sorting efficiency checks.

- As sorting progresses, 10% of samples were randomly chosen by senior members of the sorting team for resorting.
- All sorters working on a project had at least 1 sample resorted by another sorter.
- An efficiency of 90 % was expected (95% for CABIN samples).
- If 90/95% efficiency was not met, samples from that sorter were resorted.
- To calculated sorting efficiency the following formula was used:

$$\frac{\#OrganismsMissed}{TotalOrganismsFound} * 100 = \%OM$$

Table 3 Summary of sorting efficiency

	Total from Sample	Percent Efficiency

Site - QC, Sample - QC 1, CC# - CC250532, Percent sampled = 100%, Sieve size = 500			
Chironomidae	1		
Bivalvia	2		
Total:	**3**	343	99.13%

Site - QC, Sample - QC 2, CC# - CC250549, Percent sampled = 75%, Sieve size = 500		Total from Sample	Percent Efficiency
Chironomidae	3		
Total:	**3**	355	99.15%

Sorting Quality Control - Sub-Sampling QC

Certain Provincial and Mining projects require additional sorting checks in the form of sub-sampling QC, (Environmental Effects Monitoring (EEM) protocol). This ensured that any fraction of the total sample that was examined was actually an accurate representation of the number of total organisms. Organisms from the additional sub-samples were not identified; rather total organism count only was compared.

Sub-Sampling efficiency was measured on 10% of the number of sub-sampled samples in the project. Ex. In a project where 50 of 100 total samples were processed through subsampling using a Marchant box, then 10% of 50; or 5 samples were used for sub sampling efficiency.

Sub-Sampling efficiency was performed by fractioning the entire sample into sub-sample percentages. On each sub-sampled portion, a total organism count was recorded and compared to the rest of the sub-samples. In order to pass, all fractions were required to be within 20% of total organism count.

Example: If 300 organisms are found in 10% of the sample, the sorter will continue to sample in 10% fractions until the entire sample is separated. They will then count the total number of organisms in each of the 10 fractions of 10% and compare the organism count.

When divergence is >20% the sorting manager examines for the source of the problem and takes steps to correct it. With the Marchant box, the problem typically rested with how the box is flipped back to the upright position. For this reason, subsampling was performed by experienced employees only. Another common source of error would be the type of debris in the sample. Samples with algae or heavy with periphyton have a higher incident of failure due to clumping than clear samples.

Table 4 Summary of Sub Sample efficiency

Station ID		Organisms in Subsample																				Sorter		Actual Total	Precision		Accuracy	
CC#	Sample Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	By	Time		Percent Range		Min	Max
CC250538 (50%)	MEL-02-03	316	314																			HD	60	630	0.63	0.63	0.32	0.32
CC250548 (50%)	MEL-05-02	382	359																			HD	65	741	6.02	6.02	3.10	3.10

Taxonomic Effort

The next procedure was the identification to genus-species level where possible of all the organisms in the sample.

- Identifications were made at the genus/species level for all insect organisms found including Chironomidae (Based on CABIN protocol).
- Non-insect organisms (except those not included in CABIN count) were identified to genus/species where possible and to a minimum of family level with intact and mature specimens.
- The Standard Taxonomic Effort lists compiled by the CABIN manual[1], SAFIT[2] , and PNAMP[3] were used as a guide line for what level of identification to achieve where the condition and maturity of the organism enabled.
- Organisms from the same families/order were kept in separate vials with 80% ethanol and an interior label of printed laser paper.
- Chironomidae was identified to genus/species level where possible and was aided by slide mounts. CMC-10 was used to clear and mount the slide.
- Oligochaetes was identified to family/genus level with the aid of slide mounts. CMC-10 was used to clear and mount the slide.
- Other Annelida (leeches, polychaetes) were identified to the family/genus/species level with undamaged, mature specimens.
- Mollusca was identified to family and genus/species where possible
- Decapoda, Amphipoda and Isopoda were identified at family/genus/species level where possible.
- Bryozoans and Nemata remained at the phylum level
- Hydrachnidae and Cnidaria were identified at the family/genus level where possible.
- When requested, reference collections were made containing at least one individual from each taxa listed. Organisms represented will have been identified to the lowest practical level.
- Reference collection specimens were stored in 55 mm glass vials with screw-cap lids with polyseal inserts (museum quality). They were labeled with taxa name, site code, date identified and taxonomist name. The same information was applied to labels on the slide mounts.

Taxonomists

The taxonomists for this project were certified by the Society of Freshwater Science (SFS) Taxonomic Certification Program at level 2 which is the required certification for CABIN projects:

Scott Finlayson: Group 1 General Arthropods (East/West); Group 2 EPT (East/West); Group 3 Chironomidae (East/West); Group 4 Oligochaeta

Adam Bliss: Group 1 General Arthropods (East/West); Group 2 EPT (East/West); Group 3 Chironomidae
Rita Avery: Group 1 General Arthropods (East/West); Group 2 EPT (East/West)
Garret Naish: Group 2 EPT (East/West)

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[3] Pacific Northwest Aquatic Monitoring Partnership (Accessed 2015). www.pnamp.org

Taxonomic Keys

Below is a reference list of taxonomic keys utilized by taxonomists at Cordillera Consulting. Cordillera taxonomists routinely seek out new literature to ensure the most accurate identification keys are being utilized. This is not reflective of the exhaustive list of resources that we use for identification. A more complete list of taxonomic resources can be found at Southwest Association of Freshwater Invertebrate Taxonomists. (2015).
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CORDILLERA CONSULTING
FRESHWATER INVERTEBRATE TAXONOMY
Project: Meliadine AEMP/EEM
Azimuth Consulting Group
Taxonomist: Scott Finlayson
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250-494-7553

	Site:	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024
Sample:		MEL-01-01	MEL-01-06	MEL-01-07	MEL-01-08	MEL-01-09	MEL-02-02	MEL-02-03	MEL-02-05	MEL-02-06	MEL-02-08	MEL-03-01	MEL-03-02	MEL-03-03	MEL-03-04	MEL-03-05	MEL-05-01	MEL-05-02	MEL-05-03	MEL-05-04	MEL-05-05
Sample Collection Date:		9-Aug-24	9-Aug-24	16-Aug-24	16-Aug-24	16-Aug-24	20-Aug-24	20-Aug-24	20-Aug-24	20-Aug-24	20-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24
CC#:		CC250532	CC250533	CC250534	CC250535	CC250536	CC250537	CC250538	CC250539	CC250540	CC250541	CC250542	CC250543	CC250544	CC250545	CC250546	CC250547	CC250548	CC250549	CC250550	CC250551
Phylum: Arthropoda		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Insecta		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trichoptera		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Limnephilidae		0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0
| Order: Diptera		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Chironomidae		18	17	0	0	4	0	0	0	0	0	5	13	6	8	21	3	10	1	0	0
| Subfamily: Chironominae		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Chironomini		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chironomus		0	0	0	0	0	0	0	0	0	0	69	0	3	0	11	0	0	0	2	0
Cladopelma		0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Cryptochironomus		0	0	0	3	4	0	0	1	2	6	0	0	5	1	0	3	4	0	0	2
Cryptotendipes		0	0	1	0	2	0	0	0	0	4	0	0	0	1	4	0	2	0	0	0
Dicrotendipes		0	0	0	0	0	0	2	0	0	4	3	2	0	1	0	0	0	0	0	0
Microtendipes		3	2	24	21	27	9	10	22	36	52	8	3	43	31	18	23	4	0	38	150
Pagastiella		3	8	8	6	27	53	86	142	41	320	29	32	6	32	64	84	68	37	158	48
Phaenopsectra		0	34	26	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polypedilum		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stictochironomus		91	62	96	45	62	40	96	37	42	34	16	91	45	47	21	37	18	21	22	11
| Tribe: Tanytarsini		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cladotanytarsus		0	0	3	2	0	0	0	1	0	6	0	0	2	13	21	7	2	3	4	5
Corynocera		10	14	25	14	160	49	34	11	19	96	232	168	250	111	299	85	286	167	224	216
Paratanytarsus		1	0	0	0	2	0	14	2	2	12	19	18	3	4	36	48	56	32	8	5
Stempellinella		1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tanytarsus		5	2	33	9	68	79	132	49	111	142	224	29	51	75	345	9	6	5	18	6
| Subfamily: Diamesinae		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Protanypus		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Subfamily: Orthocladiinae		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heterotrissocladius		4	1	0	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0
Limnophyes		0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Psectrocladius		0	0	0	2	4	2	32	7	12	16	72	0	32	21	78	35	142	84	76	21
Rheocricotopus		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Subfamily: Prodiamesinae		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monodiamesa		3	9	6	7	0	3	0	5	0	2	0	0	0	2	0	0	0	0	0	0
| Subfamily: Tanypodinae		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ablabesmyia		0	0	1	0	4	2	4	2	4	0	13	6	6	9	18	8	4	7	4	3
| Tribe: Pentaneurini		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thienemannimyia group		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
| Tribe: Procladiini		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Procladius		32	18	33	35	60	32	80	16	51	32	53	32	37	31	68	36	52	27	32	0
Subphylum: Chelicerata		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes		0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0
| Family: Arrenuridae		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrenurus		0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hygrobatidae		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hygrobates		0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lebertiidae		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lebertia		0	0	1	0	0	4	4	1	1	4	5	0	2	0	0	3	2	0	0	3
| Family: Oxidae		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frontipoda		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Oxus		3	5	2	4	0	3	4	0	0	2	0	3	3	0	0	1	0	0	0	3
| Family: Pionidae		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Piona		0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0
| Family: Unionicolidae		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unionicola		0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0
Subphylum: Crustacea		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CORDILLERA CONSULTING
FRESHWATER INVERTEBRATE TAXONOMY
Project: Meliadine AEMP/EEM
Azimuth Consulting Group
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250-494-7553

Site:	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024
Sample:	MEL-01-01	MEL-01-06	MEL-01-07	MEL-01-08	MEL-01-09	MEL-02-02	MEL-02-03	MEL-02-05	MEL-02-06	MEL-02-08	MEL-03-01	MEL-03-02	MEL-03-03	MEL-03-04	MEL-03-05	MEL-05-01	MEL-05-02	MEL-05-03	MEL-05-04	MEL-05-05
Sample Collection Date:	9-Aug-24	9-Aug-24	16-Aug-24	16-Aug-24	16-Aug-24	20-Aug-24	20-Aug-24	20-Aug-24	20-Aug-24	20-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24
CC#:	CC250532	CC250533	CC250534	CC250535	CC250536	CC250537	CC250538	CC250539	CC250540	CC250541	CC250542	CC250543	CC250544	CC250545	CC250546	CC250547	CC250548	CC250549	CC250550	CC250551
| Class: Branchiopoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Notostraca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Triopsidae	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	2	6	2	9	0	0	10	0	4	0	3	0	5	0	2
| Family: Gammaridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gammarus	0	0	0	0	0	8	12	16	9	14	0	8	0	8	0	25	0	8	0	10
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hyalella	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lumbriculus	0	0	0	0	0	3	0	2	3	2	5	5	5	3	4	5	8	3	10	0
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nais	0	0	0	0	0	0	4	0	0	8	3	0	0	0	11	5	0	0	0	0
Rhyacodrilus	0	1	1	5	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0
Slavina appendiculata	0	0	1	0	4	1	0	0	0	10	3	0	0	0	36	0	0	0	2	0
Uncinais uncinata	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vejdovskyella	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	0	0	0	0	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	94	146	69	70	62	46	58	39	57	84	29	66	46	25	39	37	34	29	48	32
Pisidium	60	38	80	68	60	51	40	24	34	62	37	26	45	18	32	20	38	28	40	43
Sphaerium	0	0	0	1	11	0	4	8	0	2	32	2	6	3	11	7	10	11	6	0
| Class: Gastropoda	2	3	5	2	0	0	2	0	0	0	3	0	0	0	4	0	0	0	10	0
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Planorbidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gyraulus	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Heterostropha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Valvatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Valvata	10	7	9	14	18	0	0	0	0	0	3	0	0	0	0	3	22	5	32	0
Totals:	**343**	**368**	**425**	**329**	**579**	**391**	**630**	**387**	**435**	**920**	**863**	**514**	**596**	**451**	**1153**	**491**	**770**	**473**	**736**	**562**

Taxa present but not included:

Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Copepoda	1	1	1	1	2	1	2	1	1	2	3	2	2	1	0	1	0	1	2	2
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Branchiopoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Cladocera	1	1	1	1	2	1	0	1	1	2	3	0	2	1	4	1	0	1	2	2
| Class: Ostracoda	1	1	1	1	2	1	2	1	0	2	3	2	2	0	4	1	2	0	2	2
Phylum: Nemata	1	1	0	1	2	0	0	1	1	2	3	2	2	1	4	1	2	1	2	2
Phylum: Platyhelminthes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Turbellaria	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals:	**4**	**4**	**3**	**4**	**8**	**4**	**4**	**4**	**3**	**8**	**12**	**6**	**8**	**3**	**12**	**4**	**4**	**3**	**8**	**8**

APPENDIX H
THREESPINE STICKLEBACK– SUPPORTING INFORMATION

Appendix H-1
Threespine Stickleback Health Assessment

APPENDIX H1 - TABLES

Table H1-1. Minnow trap locations, set and lift times, and catch results for the 2024 Threespine Stickleback study. 1
Table H1-2. Descriptive statistics of fisheries data for Threespine Stickleback by Meliadine study area, sex, and parasitism in 2024. 3
Table H1-3. Threespine Stickleback age QA results in 2024 6
Table H1-4. Fisheries data for Threespine Stickleback collected from Meliadine Lake in 2024. 7

Table H1-1. Minnow trap locations, set and lift times, and catch results for the 2024 Threespine Stickleback study.

		Minnow Trap Coordinates UTM Zone 15N					Set (August '24)			Lift (August '24)			Catch Results				
		Start of Transect		End of Transect									THST				
Area	Transect	Easting	Northing	Easting	Northing	Trap #	Day	Hour	Min	Day	Hour	Min	Kept	Released	NNST	BURB	No Fish
MEL-01	MT-01	542750	6989394	542839	6989368	1	09	12	11	10	11	20	21				
						2	09	12	13	10	11	26	51				
						3	09	12	14	10	11	32	37				
						4	09	12	14	10	11	37	23				
						5	09	12	14	10	11	40	37	1	1		
						6	09	12	15	10	11	47	29				
						7	09	12	18	10	11	51	27				
						8	09	12	20	10	11	55	31	1			
						9	09	12	20	10	11	59	17				
						10	09	12	30	10	12	01	29				
						11	09	12	30	10	12	04	74				
						12	09	12	31	10	12	07	9				
MEL-03	MT-01	532965	6999542	532986	6999497	1	10	15	47	11	08	09	9				
						2	10	15	48	11	08	11	3				
						3	10	15	48	11	08	12	4				
						4	10	15	49	11	08	14	1				
						5	10	15	49	11	08	15	4				
						6	10	15	50	11	08	17	25	1			
						7	10	15	50	11	08	20					Empty
						8	10	15	51	11	08	21	38				
						9	10	15	56	11	08	24	28	1			
						10	10	15	57	11	08	29	7				
						11	10	15	58	11	08	31	6				
						12	10	15	58	11	08	33	15				
						13	10	15	59	11	08	35	3				
						14	10	15	59	11	08	36	6				
						15	10	16	00	11	08	37	26				
						16	10	16	01	11	08	46	2				
						17	10	16	01	11	08	47	8		1		
						18	10	16	03	11	08	49	16				
						19	10	16	03	11	08	51	19				
						20	10	16	03	11	08	54	35		2		
						21	10	16	03	11	08	58	28	3		1	
						22	10	16	05	11	09	06	1				
						23	10	16	05	11	09	06	7				
MEL-03	MT-02	532584	6998734	532593	6998696	24	10	16	38	11	15	49	39	27			
						25	10	16	39	11	15	54	2				
						26	10	16	40	11	15	55	29	21			
						27	10	16	40	11	15	59	42	30			
						28	10	16	40	11	16	04	63	49			
						29	10	16	41	11	16	10					Empty
						30	10	16	41	11	16	11	40	29			
						31	10	16	41	11	16	17	2	2			
						32	10	16	43	11	16	18	18	13	2		
						33	10	16	44	11	16	24					Empty
						34	10	16	45	11	16	24					Empty
						35	10	16	45	11	16	26	4	4			
						36	10	16	46	11	16	27	14	9			
						37	10	16	46	11	16	29	1	1			
						38	10	16	47	11	16	30	1	1			
						39	10	16	47	11	16	32	13	8			
						40	10	16	48	11	16	35	2	1			
						41	10	16	48	11	16	36					Empty
						42	10	16	48	11	16	37	11	7			
						43	10	16	48	11	16	40	3	2			
						44	10	16	49	11	16	42	4	3			
						45	10	16	49	11	16	44	11	9			
						46	10	16	49	11	16	45	27	21			

Table H1-1. Minnow trap locations, set and lift times, and catch results for the 2024 Threespine Stickleback study.

		Minnow Trap Coordinates UTM Zone 15N					Set (August '24)			Lift (August '24)			Catch Results				
		Start of Transect		End of Transect									THST				
Area	Transect	Easting	Northing	Easting	Northing	Trap #	Day	Hour	Min	Day	Hour	Min	Kept	Released	NNST	BURB	No Fish
MEL-04	MT-01	525830	7001831	525816	7001794	1	11	17	44	12	10	16	1				
						2	11	17	44	12	10	17	10				
						3	11	17	45	12	10	19	43	14		1	
						4	11	17	45	12	10	23					Empty
						5	11	17	50	12	10	25	3			1	
						6	11	17	51	12	10	26	2				
						7	11	17	52	12	10	27	20	1			
						8	11	17	52	12	10	30	6	3	3		
						9	11	17	53	12	10	34	7	6	2		
						10	11	17	54	12	10	38	40	12	2		
						11	11	17	55	12	10	45	29	10	1		
						12	11	17	56	12	10	49	39	20	4		
						13	11	18	01	12	10	55	27	9		1	
						14	11	18	02	12	10	59	22	11	1		
						15	11	18	02	12	11	2				1	
						16	11	18	02	12	11	3	1	1			
						17	11	18	02	12	11	4	7	3			
						18	11	18	03	12	11	9			1		
						19	11	18	03	12	11	10	29	7		1	
						20	11	18	04	12	11	16	5	1			
						21	11	18	04	12	11	16	18	10	1	1	
						22	11	18	05	12	11	17	2				
						23	11	18	05	12	11	18	78	52			

Notes:

THST = Threespine Stickleback; NNST = Ninespine Stickleback; BURB = Burbot

Table H1-2. Descriptive statistics of fisheries data for Threespine Stickleback by Meliadine study area, sex, and parasitism in 2024.

Area	Sex	Parasitism	Variable	N	Min	Max	Mean	Median	SD	SE
MEL-01	Male	Parasitized	Total Length (mm)	28	49	67	61.25	62	3.8933	0.7358
MEL-01	Male	Parasitized	Total Weight (g)	28	1.1185	3.5632	2.3859	2.491	0.4786	0.0905
MEL-01	Male	Parasitized	Age (yr)	28	3	5	3.9643	4	0.4288	0.081
MEL-01	Male	Parasitized	Carcass Weight (g)	28	0.7651	2.5309	1.7587	1.8083	0.3648	0.0689
MEL-01	Male	Parasitized	Liver Weight (g)	28	0.0215	0.1003	0.0615	0.0582	0.0234	0.0044
MEL-01	Male	Parasitized	Gonad Weight (g)	28	0.0013	0.0398	0.0154	0.0136	0.0091	0.0017
MEL-01	Male	Parasitized	Parasite Weight (g)	28	0.0132	0.4537	0.3103	0.3435	0.1139	0.0215
MEL-01	Male	Parasitized	Parasite Count	28	1	5	1.5	1	0.923	0.1744
MEL-01	Male	Parasitized	Condition Factor	28	0.8483	1.1847	1.0251	1.0207	0.0932	0.0176
MEL-01	Male	Parasitized	Hepatosomatic Index	28	0.8798	4.2244	2.5799	2.3852	0.8547	0.1615
MEL-01	Male	Parasitized	Gonadosomatic Index	28	0.1162	1.5483	0.6569	0.5642	0.3965	0.0749
MEL-01	Male	Parasitized	Adjusted Total Weight (g)	28	0.9359	3.1391	2.0756	2.1424	0.4554	0.0861
MEL-01	Male	Parasitized	Adjusted Condition Factor	28	0.7118	1.0843	0.8902	0.8773	0.1022	0.0193
MEL-01	Male	Parasitized	Adjusted Hepatosomatic Index	28	1.032	4.3694	2.9462	2.804	0.8643	0.1633
MEL-01	Male	Parasitized	Adjusted Gonadosomatic Index	28	0.1389	1.8149	0.7618	0.6062	0.469	0.0886
MEL-01	Male	Unparasitized	Total Length (mm)	17	53	71	61.412	61	4.1692	1.0112
MEL-01	Male	Unparasitized	Total Weight (g)	17	1.6125	3.6816	2.2508	2.1314	0.489	0.1186
MEL-01	Male	Unparasitized	Age (yr)	17	3	5	4.0588	4	0.4287	0.104
MEL-01	Male	Unparasitized	Carcass Weight (g)	17	1.3394	2.7844	1.8547	1.7351	0.3616	0.0877
MEL-01	Male	Unparasitized	Liver Weight (g)	17	0.0256	0.1816	0.0739	0.073	0.0368	0.0089
MEL-01	Male	Unparasitized	Gonad Weight (g)	17	0.0026	0.126	0.0323	0.0222	0.0331	0.008
MEL-01	Male	Unparasitized	Condition Factor	17	0.7399	1.121	0.965	0.9877	0.1063	0.0258
MEL-01	Male	Unparasitized	Hepatosomatic Index	17	1.5243	4.9326	3.1701	3.3426	1.0062	0.244
MEL-01	Male	Unparasitized	Gonadosomatic Index	17	0.1323	6.0589	1.3884	0.8582	1.3751	0.3335
MEL-01	Female	Parasitized	Total Length (mm)	47	47	72	64.064	65	5.443	0.7939
MEL-01	Female	Parasitized	Total Weight (g)	47	1.0016	3.8544	2.6051	2.6861	0.6326	0.0923
MEL-01	Female	Parasitized	Age (yr)	32	3	5	4	4	0.568	0.1004
MEL-01	Female	Parasitized	Carcass Weight (g)	32	0.6857	2.9224	1.9121	1.9518	0.4245	0.075
MEL-01	Female	Parasitized	Liver Weight (g)	32	0.0222	0.1492	0.0868	0.0856	0.0311	0.0055
MEL-01	Female	Parasitized	Gonad Weight (g)	32	0.0103	0.2373	0.0818	0.0677	0.0531	0.0094
MEL-01	Female	Parasitized	Parasite Weight (g)	32	0.0015	0.6445	0.3325	0.3532	0.1613	0.0285
MEL-01	Female	Parasitized	Parasite Count	32	1	4	1.4375	1	0.8007	0.1415
MEL-01	Female	Parasitized	Condition Factor	47	0.7756	1.3126	0.9739	0.9495	0.1122	0.0164
MEL-01	Female	Parasitized	Hepatosomatic Index	32	1.6091	4.7176	3.1673	3.1154	0.7518	0.1329
MEL-01	Female	Parasitized	Gonadosomatic Index	32	0.4245	7.8392	2.9473	2.4009	1.7875	0.316
MEL-01	Female	Parasitized	Adjusted Total Weight (g)	32	0.8153	3.5259	2.3513	2.378	0.5434	0.0961
MEL-01	Female	Parasitized	Adjusted Condition Factor	32	0.6747	1.2264	0.8407	0.8098	0.1124	0.0199
MEL-01	Female	Parasitized	Adjusted Hepatosomatic Index	32	1.9393	5.2469	3.6118	3.5862	0.7507	0.1327
MEL-01	Female	Parasitized	Adjusted Gonadosomatic Index	32	0.5679	9.9597	3.379	2.6063	2.1298	0.3765
MEL-01	Female	Unparasitized	Total Length (mm)	26	55	74	65.077	66	5.2377	1.0272
MEL-01	Female	Unparasitized	Total Weight (g)	26	1.4494	3.4493	2.5112	2.5745	0.5825	0.1142
MEL-01	Female	Unparasitized	Age (yr)	24	2	5	3.8333	4	0.637	0.13
MEL-01	Female	Unparasitized	Carcass Weight (g)	24	1.1445	2.7069	2.0436	2.1078	0.4586	0.0936
MEL-01	Female	Unparasitized	Liver Weight (g)	24	0.0492	0.2071	0.1077	0.1118	0.0418	0.0085
MEL-01	Female	Unparasitized	Gonad Weight (g)	24	0.0165	0.1223	0.066	0.0597	0.0287	0.0059
MEL-01	Female	Unparasitized	Condition Factor	26	0.7547	1.1158	0.8994	0.8862	0.0918	0.018
MEL-01	Female	Unparasitized	Hepatosomatic Index	24	2.448	6.0041	4.1356	4.1737	0.9775	0.1995
MEL-01	Female	Unparasitized	Gonadosomatic Index	24	1.1384	4.1406	2.5118	2.3721	0.8065	0.1646
MEL-01	Unknown	Parasitized	Total Length (mm)	3	45	53	48.333	47	4.1633	2.4037
MEL-01	Unknown	Parasitized	Total Weight (g)	3	0.8432	1.5139	1.1557	1.1101	0.3377	0.195
MEL-01	Unknown	Parasitized	Age (yr)	3	3	3	3	3	0	0
MEL-01	Unknown	Parasitized	Carcass Weight (g)	3	0.5844	0.9891	0.7682	0.7312	0.2049	0.1183
MEL-01	Unknown	Parasitized	Liver Weight (g)	3	0.0076	0.0463	0.0267	0.0262	0.0194	0.0112
MEL-01	Unknown	Parasitized	Parasite Weight (g)	3	0.1591	0.3233	0.2427	0.2456	0.0821	0.0474
MEL-01	Unknown	Parasitized	Parasite Count	3	1	3	2	2	1	0.5774
MEL-01	Unknown	Parasitized	Condition Factor	3	0.9253	1.0692	1.0038	1.0169	0.0728	0.0421
MEL-01	Unknown	Parasitized	Hepatosomatic Index	3	0.9013	3.0583	2.1066	2.3601	1.1006	0.6354
MEL-01	Unknown	Parasitized	Adjusted Total Weight (g)	3	0.6841	1.1906	0.9131	0.8645	0.2567	0.1482
MEL-01	Unknown	Parasitized	Adjusted Condition Factor	3	0.7507	0.8327	0.7944	0.7997	0.0412	0.0238
MEL-01	Unknown	Parasitized	Adjusted Hepatosomatic Index	3	1.1109	3.8888	2.6768	3.0307	1.4223	0.8212
MEL-01	Unknown	Unparasitized	Total Length (mm)	7	35	48	42.286	43	4.6085	1.7418
MEL-01	Unknown	Unparasitized	Total Weight (g)	7	0.4106	1.137	0.7125	0.6226	0.2442	0.0923
MEL-01	Unknown	Unparasitized	Age (yr)	2	2	3	2.5	2.5	0.7071	0.5
MEL-01	Unknown	Unparasitized	Carcass Weight (g)	2	0.4332	0.6944	0.5638	0.5638	0.1847	0.1306
MEL-01	Unknown	Unparasitized	Liver Weight (g)	2	0.0063	0.0287	0.0175	0.0175	0.0158	0.0112
MEL-01	Unknown	Unparasitized	Condition Factor	7	0.7831	1.0281	0.9154	0.9274	0.094	0.0355
MEL-01	Unknown	Unparasitized	Hepatosomatic Index	2	1.1452	3.3567	2.251	2.251	1.5638	1.1057

Table H1-2. Descriptive statistics of fisheries data for Threespine Stickleback by Meliadine study area, sex, and parasitism in 2024.

Area	Sex	Parasitism	Variable	N	Min	Max	Mean	Median	SD	SE
MEL-03	Male	Parasitized	Total Length (mm)	26	52	65	56.769	56	3.0765	0.6033
MEL-03	Male	Parasitized	Total Weight (g)	26	1.2313	2.5734	1.6618	1.5855	0.3562	0.0699
MEL-03	Male	Parasitized	Age (yr)	24	3	4	3.3333	3	0.4815	0.0983
MEL-03	Male	Parasitized	Carcass Weight (g)	26	0.8341	2.0936	1.243	1.1935	0.2851	0.0559
MEL-03	Male	Parasitized	Liver Weight (g)	26	0.0185	0.0704	0.0391	0.0376	0.014	0.0027
MEL-03	Male	Parasitized	Gonad Weight (g)	26	0.0077	0.033	0.0175	0.0159	0.0065	0.0013
MEL-03	Male	Parasitized	Parasite Weight (g)	26	0.0043	0.4567	0.2297	0.2575	0.1337	0.0262
MEL-03	Male	Parasitized	Parasite Count	26	1	3	1.4231	1	0.6433	0.1262
MEL-03	Male	Parasitized	Condition Factor	26	0.7575	1.1914	0.8976	0.884	0.0832	0.0163
MEL-03	Male	Parasitized	Hepatosomatic Index	26	1.2136	4.3355	2.3647	2.2329	0.7412	0.1454
MEL-03	Male	Parasitized	Gonadosomatic Index	26	0.4405	1.7108	1.069	1.0518	0.358	0.0702
MEL-03	Male	Parasitized	Adjusted Total Weight (g)	26	0.9562	2.3307	1.4322	1.3594	0.323	0.0633
MEL-03	Male	Parasitized	Adjusted Condition Factor	26	0.6101	0.98	0.7725	0.756	0.0822	0.0161
MEL-03	Male	Parasitized	Adjusted Hepatosomatic Index	26	1.4999	4.3478	2.7143	2.6359	0.6977	0.1368
MEL-03	Male	Parasitized	Adjusted Gonadosomatic Index	26	0.5459	1.9975	1.2419	1.2379	0.4155	0.0815
MEL-03	Male	Unparasitized	Total Length (mm)	20	45	64	54.2	55.5	5.1463	1.1507
MEL-03	Male	Unparasitized	Total Weight (g)	20	0.7952	2.0084	1.318	1.3129	0.3553	0.0794
MEL-03	Male	Unparasitized	Age (yr)	18	3	4	3.4444	3	0.5113	0.1205
MEL-03	Male	Unparasitized	Carcass Weight (g)	18	0.6828	1.7451	1.1767	1.1784	0.2961	0.0698
MEL-03	Male	Unparasitized	Liver Weight (g)	18	0.0172	0.0848	0.0448	0.0401	0.0197	0.0047
MEL-03	Male	Unparasitized	Gonad Weight (g)	18	0.0049	0.0359	0.0224	0.0238	0.0091	0.0021
MEL-03	Male	Unparasitized	Condition Factor	20	0.655	1.035	0.8137	0.802	0.0908	0.0203
MEL-03	Male	Unparasitized	Hepatosomatic Index	18	1.2005	5.1189	3.2407	3.251	0.9213	0.2172
MEL-03	Male	Unparasitized	Gonadosomatic Index	18	0.3761	3.0039	1.6552	1.6708	0.6443	0.1519
MEL-03	Female	Parasitized	Total Length (mm)	42	50	77	64.333	63	7.8575	1.2124
MEL-03	Female	Parasitized	Total Weight (g)	42	1.036	4.0659	2.4532	2.4255	0.882	0.1361
MEL-03	Female	Parasitized	Age (yr)	30	3	5	3.8333	4	0.5921	0.1081
MEL-03	Female	Parasitized	Carcass Weight (g)	30	0.9431	3.0246	1.886	2.0765	0.5319	0.0971
MEL-03	Female	Parasitized	Liver Weight (g)	30	0.0214	0.1072	0.0672	0.0712	0.0241	0.0044
MEL-03	Female	Parasitized	Gonad Weight (g)	30	0.0109	0.2964	0.0944	0.0925	0.0564	0.0103
MEL-03	Female	Parasitized	Parasite Weight (g)	30	0.1311	1.0291	0.4624	0.4216	0.2362	0.0431
MEL-03	Female	Parasitized	Parasite Count	30	1	5	2.1667	2	1.1769	0.2149
MEL-03	Female	Parasitized	Condition Factor	42	0.6957	1.0452	0.8837	0.8781	0.0834	0.0129
MEL-03	Female	Parasitized	Hepatosomatic Index	30	1.2368	3.8213	2.4549	2.5543	0.6207	0.1133
MEL-03	Female	Parasitized	Gonadosomatic Index	30	0.3568	7.3345	3.3514	3.1046	1.5303	0.2794
MEL-03	Female	Parasitized	Adjusted Total Weight (g)	30	1.067	3.5508	2.2593	2.429	0.6401	0.1169
MEL-03	Female	Parasitized	Adjusted Condition Factor	30	0.6024	0.8364	0.7336	0.7328	0.062	0.0113
MEL-03	Female	Parasitized	Adjusted Hepatosomatic Index	30	1.3222	4.2742	2.9451	3.0292	0.6944	0.1268
MEL-03	Female	Parasitized	Adjusted Gonadosomatic Index	30	0.4007	9.7099	4.08	3.6864	2.0309	0.3708
MEL-03	Female	Unparasitized	Total Length (mm)	33	42	69	53.182	52	5.2229	0.9092
MEL-03	Female	Unparasitized	Total Weight (g)	33	0.5093	2.3073	1.3332	1.2737	0.3263	0.0568
MEL-03	Female	Unparasitized	Age (yr)	4	3	5	3.5	3	1	0.5
MEL-03	Female	Unparasitized	Carcass Weight (g)	4	1.2754	1.9065	1.5974	1.6038	0.2578	0.1289
MEL-03	Female	Unparasitized	Liver Weight (g)	4	0.0422	0.08	0.0684	0.0756	0.0178	0.0089
MEL-03	Female	Unparasitized	Gonad Weight (g)	4	0.0372	0.0786	0.0668	0.0758	0.0198	0.0099
MEL-03	Female	Unparasitized	Condition Factor	33	0.6588	1.1517	0.8785	0.894	0.1112	0.0194
MEL-03	Female	Unparasitized	Hepatosomatic Index	4	2.8222	4.1066	3.5115	3.5586	0.5378	0.2689
MEL-03	Female	Unparasitized	Gonadosomatic Index	4	2.4878	4.0347	3.4178	3.5744	0.6848	0.3424
MEL-03	Unknown	Unparasitized	Total Length (mm)	26	33	52	43.154	43	4.9533	0.9714
MEL-03	Unknown	Unparasitized	Total Weight (g)	26	0.363	1.4318	0.7	0.5751	0.2993	0.0587
MEL-03	Unknown	Unparasitized	Condition Factor	26	0.4018	1.1461	0.8337	0.8372	0.1515	0.0297
MEL-04	Male	Parasitized	Total Length (mm)	29	48	63	56.103	56	3.4262	0.6362
MEL-04	Male	Parasitized	Total Weight (g)	29	0.9798	2.3531	1.5958	1.5673	0.3147	0.0584
MEL-04	Male	Parasitized	Age (yr)	28	3	4	3.5714	4	0.504	0.0952
MEL-04	Male	Parasitized	Carcass Weight (g)	29	0.7229	1.7684	1.158	1.1349	0.2647	0.0491
MEL-04	Male	Parasitized	Liver Weight (g)	29	0.0097	0.0574	0.0317	0.032	0.0124	0.0023
MEL-04	Male	Parasitized	Gonad Weight (g)	29	0.0028	0.0506	0.0196	0.0182	0.0108	0.002
MEL-04	Male	Parasitized	Parasite Weight (g)	29	0.0045	0.7881	0.2483	0.2365	0.174	0.0323
MEL-04	Male	Parasitized	Parasite Count	29	1	7	1.8276	1	1.3381	0.2485
MEL-04	Male	Parasitized	Condition Factor	29	0.7346	1.1657	0.8956	0.8939	0.0819	0.0152
MEL-04	Male	Parasitized	Hepatosomatic Index	29	0.7695	3.0541	1.9788	1.9461	0.6566	0.1219
MEL-04	Male	Parasitized	Gonadosomatic Index	29	0.1541	3.1995	1.2304	1.2168	0.6473	0.1202
MEL-04	Male	Parasitized	Adjusted Total Weight (g)	29	0.8284	2.0011	1.3475	1.304	0.3025	0.0562
MEL-04	Male	Parasitized	Adjusted Condition Factor	29	0.6176	0.8771	0.7509	0.7425	0.0611	0.0113
MEL-04	Male	Parasitized	Adjusted Hepatosomatic Index	29	0.9699	3.2867	2.3118	2.2638	0.6361	0.1181
MEL-04	Male	Parasitized	Adjusted Gonadosomatic Index	29	0.2237	3.2361	1.4351	1.5491	0.6599	0.1225
MEL-04	Male	Unparasitized	Total Length (mm)	8	55	60	57.625	58.5	1.9955	0.7055
MEL-04	Male	Unparasitized	Total Weight (g)	8	1.4211	1.9467	1.6909	1.7568	0.1827	0.0646

Table H1-2. Descriptive statistics of fisheries data for Threespine Stickleback by Meliadine study area, sex, and parasitism in 2024.

Area	Sex	Parasitism	Variable	N	Min	Max	Mean	Median	SD	SE
MEL-04	Male	Unparasitized	Age (yr)	8	3	4	3.75	4	0.4629	0.1637
MEL-04	Male	Unparasitized	Carcass Weight (g)	8	1.2275	1.6851	1.4252	1.4524	0.1712	0.0605
MEL-04	Male	Unparasitized	Liver Weight (g)	8	0.0394	0.0682	0.0541	0.0555	0.0086	0.0031
MEL-04	Male	Unparasitized	Gonad Weight (g)	8	0.0094	0.0442	0.024	0.0224	0.011	0.0039
MEL-04	Male	Unparasitized	Condition Factor	8	0.8242	0.9705	0.8819	0.8642	0.0555	0.0196
MEL-04	Male	Unparasitized	Hepatosomatic Index	8	2.2722	3.7982	3.2166	3.2284	0.5019	0.1774
MEL-04	Male	Unparasitized	Gonadosomatic Index	8	0.6615	2.4616	1.3945	1.2967	0.5645	0.1996
MEL-04	Female	Parasitized	Total Length (mm)	44	58	76	65.614	65	5.0173	0.7564
MEL-04	Female	Parasitized	Total Weight (g)	44	1.5951	4.6657	2.614	2.517	0.7852	0.1184
MEL-04	Female	Parasitized	Age (yr)	31	3	5	4.1935	4	0.5428	0.0975
MEL-04	Female	Parasitized	Carcass Weight (g)	30	1.1587	2.5568	1.7558	1.6868	0.434	0.0792
MEL-04	Female	Parasitized	Liver Weight (g)	31	0.0323	0.1653	0.0642	0.0605	0.0252	0.0045
MEL-04	Female	Parasitized	Gonad Weight (g)	31	0.0154	0.3657	0.1091	0.0827	0.0791	0.0142
MEL-04	Female	Parasitized	Parasite Weight (g)	31	0.0977	1.6056	0.4148	0.3367	0.2969	0.0533
MEL-04	Female	Parasitized	Parasite Count	31	1	12	2.3871	2	2.1241	0.3815
MEL-04	Female	Parasitized	Condition Factor	44	0.7362	1.2649	0.9008	0.8739	0.1127	0.017
MEL-04	Female	Parasitized	Hepatosomatic Index	31	1.4877	4.5639	2.5066	2.3384	0.689	0.1237
MEL-04	Female	Parasitized	Gonadosomatic Index	31	0.8199	14.233	4.1603	3.4425	2.7007	0.4851
MEL-04	Female	Parasitized	Adjusted Total Weight (g)	31	1.3416	3.6633	2.1858	2.0651	0.611	0.1097
MEL-04	Female	Parasitized	Adjusted Condition Factor	31	0.6336	1.068	0.7511	0.7384	0.0864	0.0155
MEL-04	Female	Parasitized	Adjusted Hepatosomatic Index	31	1.682	5.0355	2.9448	2.8328	0.7079	0.1272
MEL-04	Female	Parasitized	Adjusted Gonadosomatic Index	31	0.9658	15.954	4.903	3.8774	3.135	0.5631
MEL-04	Female	Unparasitized	Total Length (mm)	59	46	69	56.051	56	4.2888	0.5584
MEL-04	Female	Unparasitized	Total Weight (g)	59	0.8157	2.5297	1.5398	1.5085	0.3197	0.0416
MEL-04	Female	Unparasitized	Age (yr)	6	3	5	4	4	0.6325	0.2582
MEL-04	Female	Unparasitized	Carcass Weight (g)	6	1.2514	2.1142	1.6762	1.708	0.3254	0.1329
MEL-04	Female	Unparasitized	Liver Weight (g)	6	0.0257	0.1105	0.0777	0.0826	0.0315	0.0128
MEL-04	Female	Unparasitized	Gonad Weight (g)	6	0.0463	0.0943	0.0699	0.0693	0.0159	0.0065
MEL-04	Female	Unparasitized	Condition Factor	59	0.6701	1.0805	0.8674	0.8666	0.0827	0.0108
MEL-04	Female	Unparasitized	Hepatosomatic Index	6	1.724	5.1223	3.7563	3.9149	1.2472	0.5092
MEL-04	Female	Unparasitized	Gonadosomatic Index	6	2.7741	4.3939	3.4888	3.3033	0.6376	0.2603
MEL-04	Unknown	Unparasitized	Total Length (mm)	65	38	61	49.246	50	5.7745	0.7162
MEL-04	Unknown	Unparasitized	Total Weight (g)	65	0.4227	2.0127	1.0749	0.9477	0.4041	0.0501
MEL-04	Unknown	Unparasitized	Condition Factor	65	0.6549	1.2813	0.8642	0.8596	0.1203	0.0149

Table H1-3. Threespine Stickleback age QA results in 2024.

Area	Fish ID	Age (yr)		
		First Reading	Second Reading (QA)	Difference
MEL-01	1	5	5	0
	2	4	4	0
	3	3	3	0
	28	4	4	0
	29	4	4	0
	30	4	4	0
	61	3	3	0
	62	4	3	1
	63	4	3	1
	109	4	4	0
	111	4	4	0
	112	4	4	0
MEL-03	143	3	3	0
	144	4	3	1
	145	3	3	0
	194	4	4	0
	195	4	4	0
	196	5	5	0
MEL-04	278	3	3	0
	280	4	4	0
	282	3	3	0
	346	5	5	0
	351	4	4	0
	353	4	5	1
	428	4	4	0
	429	4	4	0
	431	4	4	0

Table H1-4. Fisheries data for Threespine Stickleback collected from Meliadine Lake in 2024.

Area	Fish ID	Total Length (mm)	Total Weight (g)	Carcass Weight (g)	Age (yr)	Liver Weight (g)	Gonad Weight (g)	Sex	Maturity	Gonad Status	Parasitism	Parasite Count	Parasite Weight (g)	Processing
MEL-01	1	70	2.9293	2.3768	5	0.1349	0.065	Female	Mature	Resting	Parasitized	1	0.0015	Full
MEL-01	2	62	2.3306	1.7991	4	0.07	0.0216	Male	Mature	Resting	Parasitized	1	0.2916	Full
MEL-01	3	65	2.4722	1.6669	3	0.0853	0.173	Female	Mature	Resting	Parasitized	2	0.36	Full
MEL-01	4	69	2.6949	2.2224	4	0.1375	0.0936	Female	Mature	Resting	Unparasitized			Full
MEL-01	5	61	1.6795	1.4966	5	0.0256	0.0104	Male	Mature	Resting	Unparasitized			Full
MEL-01	6	65	2.2119	1.6194	4	0.0523	0.0485	Female	Mature	Resting	Parasitized	1	0.3199	Full
MEL-01	7	65	2.6861	1.8226	5	0.0749	0.1804	Female	Mature	Resting	Parasitized	1	0.3152	Full
MEL-01	8	65	2.13	1.6764	4	0.0769	0.0591	Female	Mature	Resting	Parasitized	1	0.0648	Full
MEL-01	9	65	2.5251	2.1609	4	0.1052	0.028	Male	Mature	Resting	Unparasitized			Full
MEL-01	10	69	2.8015	2.2582	4	0.1464	0.116	Female	Mature	Resting	Unparasitized			Full
MEL-01	11	60	2.2885	1.4478	4	0.0781	0.0393	Female	Mature	Resting	Parasitized	3	0.4909	Full
MEL-01	12	62	2.2429	1.6118	4	0.0511	0.0136	Male	Mature	Resting	Parasitized	2	0.4026	Full
MEL-01	13	62	2.5205	1.6369	3	0.0554	0.0107	Female	Mature	Resting	Parasitized	4	0.6364	Full
MEL-01	14	68	2.9379	2.1332	4	0.093	0.1314	Female	Mature	Resting	Parasitized	1	0.3205	Full
MEL-01	15	68	2.6592	1.9028	4	0.0859	0.1375	Female	Mature	Resting	Parasitized	1	0.2858	Full
MEL-01	16	70	3.281	2.1344	4	0.0992	0.1229	Female	Mature	Resting	Parasitized	3	0.605	Full
MEL-01	17	67	2.5239	2.0508	4	0.1499	0.053	Female	Mature	Resting	Unparasitized			Full
MEL-01	18	72	3.3352	2.4858	4	0.1209	0.0552	Female	Mature	Resting	Parasitized	1	0.3526	Full
MEL-01	19	64	2.1316	1.5319	4	0.0343	0.0413	Female	Mature	Resting	Parasitized	1	0.3629	Full
MEL-01	20	65	2.9413	2.0818	4	0.122	0.1156	Female	Mature	Resting	Parasitized	1	0.3874	Full
MEL-01	21	66	2.6186	1.743	4	0.0815	0.0322	Female	Mature	Resting	Parasitized	1	0.5195	Full
MEL-01	22	72	3.5365	2.6243	4	0.1492	0.1301	Female	Mature	Resting	Parasitized	1	0.1894	Full
MEL-01	23	63	3.0271	1.8461	4	0.0567	0.2373	Female	Mature	Resting	Parasitized	2	0.6445	Full
MEL-01	24	62	2.1419	1.7801	4	0.0792	0.0454	Female	Mature	Resting	Unparasitized			Full
MEL-01	25	67	2.7875	2.1759	4	0.091	0.0446	Female	Mature	Resting	Parasitized	1	0.2257	Full
MEL-01	26	62	2.5823	1.8902	5	0.0921	0.0136	Male	Mature	Resting	Parasitized	1	0.3015	Full
MEL-01	27	70	2.8489	2.0314	5	0.1344	0.0455	Female	Mature	Resting	Parasitized	1	0.2874	Full
MEL-01	28	62	2.1944	1.7351	4	0.0587	0.0912	Female	Mature	Resting	Parasitized	1	0.0466	Full
MEL-01	29	66	2.7253	2.1964	4	0.1359	0.0986	Female	Mature	Resting	Unparasitized			Full
MEL-01	30	60	2.1698	1.7426	4	0.0868	0.029	Male	Mature	Resting	Unparasitized			Full
MEL-01	31	67	3.2788	2.1929	4	0.133	0.1429	Female	Mature	Resting	Parasitized	1	0.4485	Full
MEL-01	32	65	2.0725	1.7874	4	0.0627	0.0561	Female	Mature	Resting	Unparasitized			Full
MEL-01	33	66	2.9078	2.142	4	0.088	0.0156	Male	Mature	Resting	Parasitized	2	0.376	Full
MEL-01	34	74	3.2035	2.5255	5	0.1289	0.1223	Female	Mature	Resting	Unparasitized			Full
MEL-01	35	63	2.7142	1.987	4	0.1047	0.0701	Female	Mature	Resting	Parasitized	1	0.372	Full
MEL-01	36	63	2.3417	1.9029	5	0.1	0.0425	Male	Mature	Resting	Unparasitized			Full
MEL-01	37	73	2.9903	2.4532	4	0.1284	0.0632	Female	Mature	Resting	Unparasitized			Full
MEL-01	38	39	0.5501	0.4332	2	0.0063		Unknown	Immature	Undeveloped	Unparasitized			Full
MEL-01	39	72	3.4493	2.6901	4	0.2071	0.0818	Female	Mature	Resting	Unparasitized			Full
MEL-01	40	64	2.0349	1.8072	4	0.0352	0.0171	Male	Mature	Resting	Unparasitized			Full
MEL-01	41	55	1.4494	1.1445	3	0.0582	0.0165	Female	Mature	Resting	Unparasitized			Full
MEL-01	42	52	1.3197	0.9971	3	0.0511	0.0033	Male	Mature	Resting	Parasitized	1	0.1502	Full
MEL-01	43	64	2.5706	1.9402	4	0.0854	0.0398	Male	Mature	Resting	Parasitized	1	0.2876	Full
MEL-01	44	66	2.7232	1.9727	3	0.0684	0.0397	Female	Mature	Resting	Parasitized	3	0.3975	Full
MEL-01	45	68	2.9855	2.0298	5	0.0931	0.0878	Female	Mature	Resting	Parasitized	1	0.4542	Full
MEL-01	46	62	1.9652	1.5567	4	0.0529	0.0026	Male	Mature	Resting	Unparasitized			Full
MEL-01	47	69	3.0602	2.2574	4	0.0995	0.0653	Female	Mature	Resting	Parasitized	1	0.3538	Full
MEL-01	48	62	2.706	1.973	4	0.0656	0.0066	Male	Mature	Resting	Parasitized	1	0.4031	Full
MEL-01	49	68	2.9756	1.9622	5	0.0866	0.082	Female	Mature	Resting	Parasitized	2	0.433	Full
MEL-01	50	59	1.943	1.4892	3	0.0901	0.0345	Female	Immature	Undeveloped	Unparasitized			Full
MEL-01	51	69	2.9024	2.3119	4	0.1489	0.0834	Female	Mature	Resting	Unparasitized			Full
MEL-01	52	66	2.6753	2.2867	4	0.073	0.0222	Male	Mature	Resting	Unparasitized			Full
MEL-01	53	58	2.0531	1.6527	4	0.0394	0.014	Male	Mature	Resting	Unparasitized			Full
MEL-01	54	65	2.3297	1.7672	4	0.0487	0.01	Male	Mature	Resting	Parasitized	1	0.2941	Full
MEL-01	55	61	2.5037	1.8977	4	0.1003	0.0168	Male	Mature	Resting	Parasitized	1	0.0425	Full
MEL-01	56	60	1.8994	1.6751	4	0.0633	0.0197	Male	Mature	Resting	Parasitized	1	0.362	Full
MEL-01	57	65	2.7574	1.9415	4	0.0806	0.086	Female	Mature	Resting	Parasitized	1	0.3573	Full
MEL-01	58	72	3.079	2.5704	5	0.0884	0.0798	Female	Mature	Resting	Unparasitized			Full
MEL-01	59	65	2.8609	2.1649	4	0.1078	0.1069	Female	Mature	Resting	Unparasitized			Full
MEL-01	60	63	2.8293	2.1338	4	0.1166	0.0716	Female	Mature	Resting	Parasitized	1	0.0285	Full
MEL-01	61	55	1.5036	1.0802	3	0.0389	0.0118	Female	Immature	Undeveloped	Parasitized	2	0.2449	Full
MEL-01	62	64	2.5174	1.7462	4	0.0656	0.0563	Female	Mature	Resting	Parasitized	1	0.3922	Full
MEL-01	63	61	2.1972	1.5717	4	0.0591	0.0196	Male	Mature	Resting	Parasitized	3	0.3205	Full
MEL-01	64	62	2.223	1.6031	4	0.068	0.0458	Female	Mature	Resting	Parasitized	1	0.3072	Full

Table H1-4. Fisheries data for Threespine Stickleback collected from Meliadine Lake in 2024.

Area	Fish ID	Total Length (mm)	Total Weight (g)	Carcass Weight (g)	Age (yr)	Liver Weight (g)	Gonad Weight (g)	Sex	Maturity	Gonad Status	Parasitism	Parasite Count	Parasite Weight (g)	Processing
MEL-01	65	62	2.6169	1.9263	4	0.0574	0.0107	Male	Mature	Resting	Parasitized	1	0.358	Full
MEL-01	66	71	3.6816	2.7844	4	0.1816	0.1035	Male	Mature	Resting	Unparasitized			Full
MEL-01	67	70	3.6319					Female	Mature	Resting	Parasitized			Partial
MEL-01	68	68	2.6252	2.0398	4	0.1157	0.058	Female	Mature	Resting	Unparasitized			Full
MEL-01	69	65	2.546	1.8681	4	0.0224	0.0231	Male	Mature	Resting	Parasitized	3	0.3755	Full
MEL-01	70	65	2.6747					Female	Mature	Resting	Parasitized			Partial
MEL-01	71	61	2.1867	1.4611	3	0.0383	0.0147	Male	Mature	Resting	Parasitized	2	0.4375	Full
MEL-01	72	61	2.4784	1.782	5	0.0623	0.0095	Male	Mature	Resting	Parasitized	2	0.3641	Full
MEL-01	73	65	2.9431	2.3096	4	0.0758	0.0053	Male	Mature	Resting	Parasitized	1	0.2658	Full
MEL-01	74	53	1.6125	1.3394	3	0.0539	0.0273	Male	Mature	Resting	Unparasitized			Full
MEL-01	75	65	2.7992					Female	Mature	Resting	Parasitized			Partial
MEL-01	76	54	1.7065	1.1447	4	0.0274	0.0227	Male	Mature	Resting	Parasitized	2	0.3302	Full
MEL-01	77	47	1.0016	0.6857	3	0.0222	0.0103	Female	Immature	Undeveloped	Parasitized	2	0.1863	Full
MEL-01	78	67	2.7009					Female	Mature	Resting	Parasitized			Partial
MEL-01	79	55	1.5017					Female	Mature	Resting	Parasitized			Partial
MEL-01	80	60	2.533					Female	Mature	Resting	Parasitized			Partial
MEL-01	81	58	2.1873	1.6836	4	0.0885	0.0333	Male	Mature	Resting	Unparasitized			Full
MEL-01	82	61	2.5204	1.7181	4	0.0473	0.023	Male	Mature	Resting	Parasitized	1	0.4537	Full
MEL-01	83	65	2.3208					Female	Mature	Resting	Parasitized			Partial
MEL-01	84	60	2.195					Female	Mature	Resting	Parasitized			Partial
MEL-01	85	63	2.6742					Female	Mature	Resting	Parasitized			Partial
MEL-01	86	62	2.5831	1.9531	4	0.0969	0.0129	Male	Mature	Resting	Parasitized	1	0.2376	Full
MEL-01	87	60	1.7575	1.4511	4	0.0508	0.0534	Female	Mature	Resting	Unparasitized			Full
MEL-01	88	61	2.2299	1.8176	4	0.0942	0.0132	Male	Mature	Resting	Parasitized	1	0.0132	Full
MEL-01	89	45	0.8432	0.5844	3	0.0076		Unknown	Immature	Undeveloped	Parasitized	1	0.1591	Full
MEL-01	90	64	2.3052	1.6712	4	0.0488	0.0103	Male	Mature	Resting	Parasitized	1	0.3679	Full
MEL-01	91	65	2.7126	2.1969	4	0.0976	0.0148	Male	Mature	Resting	Unparasitized			Full
MEL-01	92	68	3.1071					Female	Mature	Resting	Parasitized			Partial
MEL-01	93	60	2.2476					Female	Mature	Resting	Parasitized			Partial
MEL-01	94	58	1.9755	1.657	4	0.0755	0.0099	Male	Mature	Resting	Unparasitized			Full
MEL-01	95	44	0.855	0.6944	3	0.0287		Unknown	Immature	Undeveloped	Unparasitized			Full
MEL-01	96	53	1.5139	0.9891	3	0.0463		Unknown	Immature	Undeveloped	Parasitized	2	0.3233	Full
MEL-01	97	47	1.1101	0.7312	3	0.0262		Unknown	Immature	Undeveloped	Parasitized	3	0.2456	Full
MEL-01	98	47	0.832					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-01	99	59	1.6846					Female	Mature	Resting	Parasitized			Partial
MEL-01	100	58	1.7862	1.4768	3	0.059	0.0237	Female	Mature	Resting	Unparasitized			Full
MEL-01	101	60	2.1442					Female	Mature	Resting	Unparasitized			Partial
MEL-01	102	57	1.6575	1.3065	2	0.0704	0.0216	Female	Mature	Resting	Unparasitized			Full
MEL-01	103	40	0.5802					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-01	104	53	1.3561					Female	Mature	Resting	Parasitized			Partial
MEL-01	105	43	0.6226					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-01	106	49	1.2751					Female	Mature	Resting	Parasitized			Partial
MEL-01	107	69	3.4097	2.7069	3	0.141	0.0809	Female	Mature	Resting	Unparasitized			Full
MEL-01	108	67	3.356	2.568	4	0.1536	0.0755	Female	Mature	Resting	Unparasitized			Full
MEL-01	109	60	2.0796	1.6909	4	0.0382	0.126	Male	Mature	Resting	Unparasitized			Full
MEL-01	110	70	3.8544					Female	Mature	Resting	Parasitized			Partial
MEL-01	111	62	2.7307	2.1312	4	0.0949	0.0294	Male	Mature	Resting	Parasitized	5	0.1577	Full
MEL-01	112	61	2.1908	1.5577	4	0.0501	0.0192	Male	Mature	Resting	Parasitized	1	0.2805	Full
MEL-01	113	61	2.0134					Female	Mature	Resting	Unparasitized			Partial
MEL-01	114	35	0.4106					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-01	115	57	1.8525	1.6249	4	0.0562	0.0088	Male	Mature	Resting	Unparasitized			Full
MEL-01	116	61	2.6566	1.9297	4	0.0487	0.0071	Male	Mature	Resting	Parasitized	2	0.428	Full
MEL-01	117	60	2.2247	1.5895	4	0.0375	0.0339	Male	Mature	Resting	Parasitized	1	0.3568	Full
MEL-01	118	49	1.1185	0.7651	3	0.0215	0.0013	Male	Mature	Resting	Parasitized	1	0.1826	Full
MEL-01	119	61	2.1314	1.7351	4	0.0737	0.0378	Male	Mature	Resting	Unparasitized			Full
MEL-01	120	67	3.5632	2.5309	4	0.0836	0.0068	Male	Mature	Resting	Parasitized	1	0.4241	Full
MEL-01	121	66	2.3653	2.026	4	0.0613	0.0602	Female	Mature	Resting	Unparasitized			Full
MEL-01	122	61	2.0098	1.6106	4	0.0492	0.0442	Female	Mature	Resting	Unparasitized			Full
MEL-01	123	61	2.2816	1.81	4	0.0849	0.0593	Female	Mature	Resting	Unparasitized			Full
MEL-01	124	62	2.5868	2.2113	4	0.0722	0.0222	Male	Mature	Resting	Unparasitized			Full
MEL-01	125	66	3.7736	2.9224	4	0.1148	0.0857	Female	Mature	Resting	Parasitized	1	0.2477	Full
MEL-01	126	67	3.0483	2.4048	4	0.1284	0.0568	Female	Mature	Resting	Unparasitized			Full
MEL-01	127	62	2.6144	1.8238	4	0.0415	0.0089	Male	Mature	Resting	Parasitized	1	0.4234	Full
MEL-01	128	48	1.137					Unknown	Immature	Undeveloped	Unparasitized			Partial

Table H1-4. Fisheries data for Threespine Stickleback collected from Meliadine Lake in 2024.

Area	Fish ID	Total Length (mm)	Total Weight (g)	Carcass Weight (g)	Age (yr)	Liver Weight (g)	Gonad Weight (g)	Sex	Maturity	Gonad Status	Parasitism	Parasite Count	Parasite Weight (g)	Processing
MEL-03	129	60	1.8325	1.4032	3	0.0421	0.0138	Male	Mature	Resting	Parasitized	1	0.2403	Full
MEL-03	130	73	3.8534	2.3489	4	0.0839	0.1104	Female	Mature	Resting	Parasitized	5	1.0291	Full
MEL-03	131	60	1.8827	1.2904	3	0.0613	0.041	Female	Mature	Resting	Parasitized	3	0.306	Full
MEL-03	132	59	1.8888	1.4095	3	0.057	0.0136	Male	Mature	Resting	Parasitized	2	0.2719	Full
MEL-03	133	74	3.3635	2.5098	4	0.0927	0.1259	Female	Mature	Resting	Parasitized	1	0.3826	Full
MEL-03	134	75	3.1591	2.3383	4	0.0723	0.0981	Female	Mature	Resting	Parasitized	1	0.3767	Full
MEL-03	135	72	2.9696	2.2616	4	0.0758	0.1046	Female	Mature	Resting	Parasitized	1	0.2507	Full
MEL-03	136	73	3.3406	2.2511	4	0.0984	0.1197	Female	Mature	Resting	Parasitized	3	0.5891	Full
MEL-03	137	71	3.1532	2.2798	4	0.083	0.083	Female	Mature	Resting	Parasitized	1	0.4902	Full
MEL-03	138	59	1.7625	1.5178	3	0.068	0.0285	Male	Mature	Resting	Unparasitized			Full
MEL-03	139	72	3.6558	2.3749	4	0.088	0.1327	Female	Mature	Resting	Parasitized	3	0.7605	Full
MEL-03	140	61	2.2633	1.4168	4	0.0603	0.1075	Female	Mature	Resting	Parasitized	2	0.472	Full
MEL-03	141	74	3.2803	2.3526	4	0.0947	0.1082	Female	Mature	Resting	Parasitized	1	0.4702	Full
MEL-03	142	73	3.0795	2.1567	4	0.07	0.0869	Female	Mature	Resting	Parasitized	2	0.4975	Full
MEL-03	143	64	1.9572	1.6103	3	0.0722	0.0746	Female	Mature	Resting	Unparasitized			Full
MEL-03	144	71	3.6355	2.2025	4	0.0699	0.1265	Female	Mature	Resting	Parasitized	5	1.0012	Full
MEL-03	145	63	2.6055	1.5317	3	0.0666	0.1911	Female	Mature	Resting	Parasitized	3	0.6374	Full
MEL-03	146	59	1.7978	1.3625	3	0.0687	0.0558	Female	Mature	Resting	Parasitized	1	0.1905	Full
MEL-03	147	60	1.6993	1.206	3	0.0355	0.0219	Female	Mature	Resting	Parasitized	1	0.2994	Full
MEL-03	148	69	3.0623	2.2056	4	0.0893	0.0813	Female	Mature	Resting	Parasitized	2	0.4623	Full
MEL-03	149	71	2.9498	1.9963	4	0.0446	0.0773	Female	Mature	Resting	Parasitized	4	0.6173	Full
MEL-03	150	46	0.3911					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	151	56	1.6776	1.4054	3	0.0492	0.0287	Male	Mature	Resting	Parasitized	1	0.0385	Full
MEL-03	152	54	1.3172	0.9585	3	0.0214	0.0178	Female	Mature	Resting	Parasitized	2	0.2502	Full
MEL-03	153	65	2.529	2.0936	4	0.045	0.022	Male	Mature	Resting	Parasitized	1	0.1983	Full
MEL-03	154	45	0.9431					Male	Immature	Undeveloped	Unparasitized			Partial
MEL-03	155	77	4.0114	3.0246	5	0.1072	0.1174	Female	Mature	Resting	Parasitized	2	0.4606	Full
MEL-03	156	68	2.889	1.9163	4	0.0578	0.1208	Female	Mature	Resting	Parasitized	3	0.6098	Full
MEL-03	157	55	1.4232	1.0073	3	0.0285	0.0147	Male	Mature	Resting	Parasitized	1	0.2632	Full
MEL-03	158	63	1.9481	1.5973	3	0.08	0.0786	Female	Mature	Resting	Unparasitized			Full
MEL-03	159	56	1.5222	1.0805	3	0.0382	0.0177	Male	Mature	Resting	Parasitized	1	0.2518	Full
MEL-03	160	53	1.3039	0.8341	3	0.0224	0.0191	Male	Mature	Resting	Parasitized	2	0.3477	Full
MEL-03	161	61	2.0295	1.5926	3	0.0251	0.0595	Female	Mature	Resting	Parasitized	2	0.1311	Full
MEL-03	162	59	1.7791	1.235	3	0.0368	0.0174	Male	Mature	Resting	Parasitized	3	0.3393	Full
MEL-03	163	62	2.3507	1.5845	3	0.079	0.1326	Female	Mature	Resting	Parasitized	2	0.3597	Full
MEL-03	164	53	1.507					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	165	52	1.4965					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	166	53	1.1318	0.9848	3	0.0317	0.0143	Male	Mature	Resting	Unparasitized			Full
MEL-03	167	54	1.4523					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	168	45	0.8803					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	169	55	1.3879					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	170	53	1.1941	1.0306	3	0.0395	0.0235	Male	Mature	Resting	Unparasitized			Full
MEL-03	171	39	0.4265					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	172	73	4.0659	2.3905	4	0.0783	0.2964	Female	Mature	Resting	Parasitized	4	1.0031	Full
MEL-03	173	56	1.68	1.1967	3	0.0397	0.0157	Male	Mature	Resting	Parasitized	1	0.3163	Full
MEL-03	174	61	2.266	1.6043	4	0.0275	0.011	Male	Mature	Resting	Parasitized	2	0.4325	Full
MEL-03	175	56	1.5223	1.297	3	0.066	0.0205	Male	Mature	Resting	Parasitized	1	0.0043	Full
MEL-03	176	57	1.7491	1.1782	3	0.0317	0.0092	Male	Mature	Resting	Parasitized	3	0.3941	Full
MEL-03	177	52	1.2313	0.9023	3	0.0267	0.0183	Male	Mature	Resting	Parasitized	1	0.1732	Full
MEL-03	178	61	1.8109	1.5126	3	0.0801	0.0321	Male	Mature	Resting	Unparasitized			Full
MEL-03	179	55	1.5131	1.2959	3	0.0404	0.0162	Male	Mature	Resting	Parasitized	1	0.0434	Full
MEL-03	180	51	1.2844					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	181	50	1.1803					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	182	69	3.0464	2.3204	4	0.0846	0.01087	Female	Mature	Resting	Parasitized	1	0.3336	Full
MEL-03	183	42	0.5093					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	184	61	1.7691	1.3326	5	0.0435	0.0412	Female	Mature	Resting	Parasitized	2	0.2525	Full
MEL-03	185	61	1.9561	1.3272	4	0.0544	0.0687	Female	Mature	Resting	Parasitized	1	0.3367	Full
MEL-03	186	46	0.7952	0.6828	4	0.0254	0.0142	Male	Mature	Resting	Unparasitized			Full
MEL-03	187	55	1.2016					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	188	41	0.4543					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	189	35	0.363					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	190	54	1.1705					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	191	42	0.526					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	192	38	0.4546					Unknown	Immature	Undeveloped	Unparasitized			Partial

Table H1-4. Fisheries data for Threespine Stickleback collected from Meliadine Lake in 2024.

Area	Fish ID	Total Length (mm)	Total Weight (g)	Carcass Weight (g)	Age (yr)	Liver Weight (g)	Gonad Weight (g)	Sex	Maturity	Gonad Status	Parasitism	Parasite Count	Parasite Weight (g)	Processing
MEL-03	193	40	0.4559					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	194	55	1.3686	1.1521	4	0.0392	0.0077	Male	Mature	Resting	Parasitized	2	0.0341	Full
MEL-03	195	63	2.5004	1.6368	4	0.073	0.1203	Female	Mature	Resting	Parasitized	2	0.4679	Full
MEL-03	196	70	2.8278	2.1767	5	0.0912	0.0821	Female	Mature	Resting	Parasitized	1	0.3024	Full
MEL-03	197	63	1.7395	1.2906	4	0.0238	0.0718	Female	Mature	Resting	Parasitized	2	0.2333	Full
MEL-03	198	52	1.2568	0.9213	3	0.0185	0.0157	Male	Mature	Resting	Parasitized	1	0.2176	Full
MEL-03	199	52	1.2543					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	200	53	1.4345					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	201	51	1.2					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	202	48	0.8042	0.6841	3	0.025	0.0064	Male	Mature	Resting	Unparasitized			Full
MEL-03	203	55	1.396	0.9431	3	0.0229	0.0219	Female	Mature	Resting	Parasitized	2	0.2989	Full
MEL-03	204	56	1.7136					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	205	55	1.397					Female	Mature	Resting	Unparasitized			Partial
MEL-03	206	57	1.7934	1.2733	4	0.0309	0.0079	Male	Mature	Resting	Parasitized	1	0.3463	Full
MEL-03	207	47	0.9626					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	208	47	0.7877					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	209	54	1.4047	0.9761	4	0.0299	0.0145	Male	Mature	Resting	Parasitized	2	0.2668	Full
MEL-03	210	52	1.2581					Female	Mature	Resting	Parasitized			Partial
MEL-03	211	61	1.4953	1.2754	3	0.0422	0.0372	Female	Mature	Resting	Unparasitized			Full
MEL-03	212	56	1.4706	1.1903		0.0382	0.0179	Male	Mature	Resting	Parasitized	1	0.1369	Full
MEL-03	213	51	1.1932					Female	Mature	Resting	Parasitized			Partial
MEL-03	214	46	0.837					Male	Immature	Undeveloped	Unparasitized			Partial
MEL-03	215	50	1.119					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	216	59	1.6					Female	Mature	Resting	Parasitized			Partial
MEL-03	217	47	1.0228					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	218	49	0.854					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	219	37	0.4285					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	220	39	0.5257					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	221	49	1.1511					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	222	39	0.4737					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	223	52	1.3302					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	224	39	0.5441					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	225	42	0.5288					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	226	44	0.6061					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	227	48	0.9504					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	228	41	0.6421					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	229	56	1.4313	1.2168	4	0.0496	0.0231	Male	Mature	Resting	Unparasitized			Full
MEL-03	230	48	0.8881					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	231	53	1.1288					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	232	33	0.3808					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	233	47	0.9703					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	234	49	1.0337					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	235	48	0.9357					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	236	60	2.5734	1.7852	3	0.0655	0.033	Male	Mature	Resting	Parasitized	2	0.4567	Full
MEL-03	237	49	1.3484					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	238	58	1.7641					Female	Mature	Resting	Parasitized			Partial
MEL-03	239	58	1.5645	1.3164	4	0.042	0.0343	Male	Mature	Resting	Unparasitized			Full
MEL-03	240	56	1.3028	1.1541	4	0.0455	0.0049	Male	Mature	Resting	Unparasitized			Full
MEL-03	241	61	1.8465					Female	Mature	Resting	Parasitized			Partial
MEL-03	242	56	1.6583	1.4543	4	0.0717	0.0286	Male	Mature	Resting	Unparasitized			Full
MEL-03	243	48	1.0377					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	244	71	3.141					Female	Mature	Resting	Parasitized			Partial
MEL-03	245	52	1.288					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	246	57	1.5403					Female	Mature	Resting	Parasitized			Partial
MEL-03	247	52	1.4318					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	248	58	1.278	1.1571	4	0.0259	0.0129	Male	Mature	Resting	Unparasitized			Full
MEL-03	249	53	1.3229	1.1299	3	0.0407	0.0211	Male	Mature	Resting	Unparasitized			Full
MEL-03	250	55	1.4084	1.1996	4	0.0319	0.0246	Male	Mature	Resting	Unparasitized			Full
MEL-03	251	54	1.3122	1.1141	4	0.037	0.0148	Male	Mature	Resting	Parasitized	1	0.0097	Full
MEL-03	252	47	0.8418					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-03	253	52	1.1512					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	254	50	1.1932					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	255	50	0.9654	0.8115	3	0.0344	0.029	Male	Mature	Resting	Unparasitized			Full
MEL-03	256	62	1.8053	1.4955	4	0.0704	0.0282	Male	Mature	Resting	Parasitized	1	0.0487	Full

Table H1-4. Fisheries data for Threespine Stickleback collected from Meliadine Lake in 2024.

Area	Fish ID	Total Length (mm)	Total Weight (g)	Carcass Weight (g)	Age (yr)	Liver Weight (g)	Gonad Weight (g)	Sex	Maturity	Gonad Status	Parasitism	Parasite Count	Parasite Weight (g)	Processing
MEL-03	257	56	1.6205	1.1534	3	0.054	0.0248	Male	Mature	Resting	Parasitized	1	0.3037	Full
MEL-03	258	64	2.0084	1.7451	4	0.0536	0.0241	Male	Mature	Resting	Unparasitized			Full
MEL-03	259	58	1.8365	1.2752		0.0304	0.0272	Male	Mature	Resting	Parasitized	1	0.3418	Full
MEL-03	260	54	1.4078					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	261	55	1.6363					Female	Mature	Resting	Parasitized			Partial
MEL-03	262	52	1.3711					Female	Mature	Resting	Parasitized			Partial
MEL-03	263	57	1.5505	1.1789	4	0.0298	0.0134	Male	Mature	Resting	Parasitized	1	0.2121	Full
MEL-03	264	73	3.4628					Female	Mature	Resting	Parasitized			Partial
MEL-03	265	69	2.3073	1.9065	5	0.0791	0.077	Female	Mature	Resting	Unparasitized			Full
MEL-03	266	55	1.297	0.8608	3	0.0212	0.0117	Male	Mature	Resting	Parasitized	2	0.2819	Full
MEL-03	267	53	1.0522	0.8755	3	0.0395	0.0289	Male	Mature	Resting	Unparasitized			Full
MEL-03	268	50	1.036					Female	Mature	Resting	Parasitized			Partial
MEL-03	269	55	1.5334					Female	Mature	Resting	Parasitized			Partial
MEL-03	270	48	1.2737					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	271	51	1.2315					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	272	58	1.4327	1.3027	3	0.0172	0.0174	Male	Mature	Resting	Unparasitized			Full
MEL-03	273	56	1.6566	1.4044	3	0.0848	0.0359	Male	Mature	Resting	Unparasitized			Full
MEL-03	274	52	1.2533					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-03	275	58	1.6247					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	276	55	1.2822					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	277	56	1.4715					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	278	48	0.9798	0.7374	3	0.0259	0.0118	Male	Mature	Resting	Parasitized	1	0.1514	Full
MEL-04	279	56	1.5849					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	280	60	2.1784	1.3757	4	0.055	0.0617	Female	Mature	Resting	Parasitized	2	0.4919	Full
MEL-04	281	51	1.2383					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	282	55	1.5398	1.0362	3	0.0236	0.0194	Male	Mature	Resting	Parasitized	3	0.344	Full
MEL-04	283	60	1.5868	1.3577	3	0.0432	0.0098	Male	Mature	Resting	Parasitized	1	0.0045	Full
MEL-04	284	56	1.6275					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	285	69	2.6159	1.877	5	0.0684	0.0715	Female	Mature	Resting	Parasitized	2	0.3275	Full
MEL-04	286	57	1.8174	1.082	4	0.0195	0.0028	Male	Mature	Resting	Parasitized	3	0.5657	Full
MEL-04	287	56	1.4707					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	288	58	1.6438	1.2181	4	0.0417	0.0566	Female	Mature	Resting	Parasitized	2	0.1889	Full
MEL-04	289	49	1.0152					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	290	54	1.6512					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	291	53	1.2827	0.9034	3	0.0328	0.0029	Male	Mature	Resting	Parasitized	1	0.1987	Full
MEL-04	292	54	1.5468					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	293	64	2.012	1.3935	4	0.0369	0.0366	Female	Mature	Resting	Parasitized	1	0.3367	Full
MEL-04	294	69	2.2271	1.8713	5	0.0672	0.0731	Female	Mature	Resting	Unparasitized			Full
MEL-04	295	52	1.2865	0.8576	4	0.0192	0.0066	Male	Mature	Resting	Parasitized	1	0.2932	Full
MEL-04	296	65	2.5694	1.7161	4	0.055	0.3657	Female	Mature	Resting	Parasitized	4	0.2772	Full
MEL-04	297	56	1.1768					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	298	49	1.2642					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	299	59	1.5846					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	300	51	1.1659					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	301	56	2.0472	1.0427	3	0.0323	0.0166	Male	Mature	Resting	Parasitized	7	0.7881	Full
MEL-04	302	57	1.5888					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	303	57	1.8753					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	304	53	1.2902					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	305	55	1.3953					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	306	56	1.6859					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	307	53	1.2982					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	308	44	0.9477					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	309	47	0.8339					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	310	55	1.4046					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	311	53	1.354	0.9486	4	0.0233	0.0124	Male	Mature	Resting	Parasitized	2	0.2725	Full
MEL-04	312	62	1.7545	1.226	4	0.056	0.0611	Female	Mature	Resting	Parasitized	1	0.2445	Full
MEL-04	313	61	1.669	1.4044	4	0.0649	0.0463	Female	Mature	Resting	Unparasitized			Full
MEL-04	314	54	1.4725					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	315	60	1.7638					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	316	46	0.8157					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	317	71	3.4236	2.278	4	0.0799	0.1962	Female	Mature	Resting	Parasitized	2	0.627	Full
MEL-04	318	52	1.3485					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	319	48	0.8078					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	320	57	1.5043					Female	Immature	Undeveloped	Unparasitized			Partial

Table H1-4. Fisheries data for Threespine Stickleback collected from Meliadine Lake in 2024.

Area	Fish ID	Total Length (mm)	Total Weight (g)	Carcass Weight (g)	Age (yr)	Liver Weight (g)	Gonad Weight (g)	Sex	Maturity	Gonad Status	Parasitism	Parasite Count	Parasite Weight (g)	Processing
MEL-04	321	52	1.1137					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	322	55	1.7977					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	323	56	1.4711	1.0358	4	0.0265	0.0179	Male	Mature	Resting	Parasitized	1	0.2365	Full
MEL-04	324	53	1.4488					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	325	63	2.4023	1.6612	4	0.0608	0.0827	Female	Mature	Resting	Parasitized	1	0.3818	Full
MEL-04	326	68	2.7213	1.7124	4	0.0585	0.1048	Female	Mature	Resting	Parasitized	3	0.6562	Full
MEL-04	327	57	1.7805					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	328	66	2.6178	1.8772	4	0.0965	0.0724	Female	Mature	Resting	Parasitized	3	0.4063	Full
MEL-04	329	71	2.8787	2.0735	5	0.0701	0.1216	Female	Mature	Resting	Parasitized	1	0.3918	Full
MEL-04	330	66	2.3953	1.5985	4	0.0429	0.0892	Female	Mature	Resting	Parasitized	3	0.4338	Full
MEL-04	331	61	1.8165					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	332	60	1.7944	1.2868	4	0.0528	0.0692	Female	Mature	Resting	Parasitized	1	0.2511	Full
MEL-04	333	55	1.4211	1.2362	3	0.0538	0.0094	Male	Mature	Resting	Unparasitized			Full
MEL-04	334	58	1.4907	1.2514	3	0.0257	0.0655	Female	Mature	Resting	Unparasitized			Full
MEL-04	335	72	3.3357	2.3242	5	0.0775	0.3115	Female	Mature	Resting	Parasitized	2	0.3989	Full
MEL-04	336	42	0.6978					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	337	60	1.6246	1.2403	4	0.0584	0.0548	Female	Mature	Resting	Parasitized	1	0.0977	Full
MEL-04	338	56	1.4628	1.1508	4	0.0363	0.0252	Male	Mature	Resting	Parasitized	1	0.1588	Full
MEL-04	339	61	1.8701					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	340	58	1.6587	1.1933	3	0.0393	0.0794	Female	Mature	Resting	Parasitized	3	0.1771	Full
MEL-04	341	55	1.4643					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	342	45	0.9697					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	343	61	1.776					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	344	50	0.903					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	345	55	1.3239					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	346	72	4.0021	2.3969	5	0.0825	0.0903	Female	Mature	Resting	Parasitized	6	1.1691	Full
MEL-04	347	55	1.4098					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	348	54	1.4417					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	349	49	1.0716					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	350	45	0.7086					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	351	55	1.3547	0.9616	4	0.0204	0.0195	Male	Mature	Resting	Parasitized	1	0.2145	Full
MEL-04	352	50	1.1674					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	353	63	2.4646	1.4646	4	0.0479	0.259	Female	Mature	Resting	Parasitized	3	0.5039	Full
MEL-04	354	45	0.8766					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	355	38	0.4227					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	356	42	0.677					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	357	42	0.6692					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	358	56	1.6334	1.1349	4	0.0161	0.0222	Male	Mature	Resting	Parasitized	3	0.2722	Full
MEL-04	359	55	1.5188					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	360	52	1.2728					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	361	51	1.1575					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	362	56	1.5487					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	363	70	3.072	1.9938	5	0.0605	0.19	Female	Mature	Resting	Parasitized	3	0.6142	Full
MEL-04	364	62	2.3531	1.6681	3	0.0574	0.0199	Male	Mature	Resting	Parasitized	3	0.4051	Full
MEL-04	365	59	1.6222					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	366	72	2.8924	2.2444	5	0.075	0.1004	Female	Mature	Resting	Parasitized	1	0.2946	Full
MEL-04	367	62	2.1504					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	368	62	1.9111	1.4761	4	0.0552	0.0185	Male	Mature	Resting	Parasitized	1	0.2316	Full
MEL-04	369	55	1.5085					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	370	51	0.8687					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	371	45	0.6422					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	372	46	0.7326					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	373	70	2.8634	2.1622	4	0.0426	0.0714	Female	Mature	Resting	Parasitized	2	0.3307	Full
MEL-04	374	46	1.2472					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	375	55	1.4132	1.0799	3	0.0387	0.0246	Male	Mature	Resting	Parasitized	1	0.1722	Full
MEL-04	376	56	1.6822					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	377	58	1.6249	1.1587	4	0.0323	0.0737	Female	Mature	Resting	Parasitized	2	0.2708	Full
MEL-04	378	56	1.5469					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	379	76	4.6657	2.5568	5	0.0824	0.0934	Female	Mature	Resting	Parasitized	12	1.6056	Full
MEL-04	380	48	0.8093					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	381	63	1.9132	1.561	4	0.098	0.0636	Female	Mature	Resting	Unparasitized			Full
MEL-04	382	49	1.0355					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	383	50	1.1925	0.7229	3	0.0148	0.0135	Male	Mature	Resting	Parasitized	2	0.3533	Full
MEL-04	384	50	0.9299					Unknown	Immature	Undeveloped	Unparasitized			Partial

Table H1-4. Fisheries data for Threespine Stickleback collected from Meliadine Lake in 2024.

Area	Fish ID	Total Length (mm)	Total Weight (g)	Carcass Weight (g)	Age (yr)	Liver Weight (g)	Gonad Weight (g)	Sex	Maturity	Gonad Status	Parasitism	Parasite Count	Parasite Weight (g)	Processing
MEL-04	385	51	0.9039					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	386	50	1.0163					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	387	42	0.5724					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	388	41	0.569					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	389	52	1.2389					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	390	55	1.6146	1.3812	3	0.0557	0.0275	Male	Mature	Resting	Unparasitized			Full
MEL-04	391	61	1.8658	1.57	4	0.038	0.0301	Male	Mature	Resting	Parasitized	1	0.0607	Full
MEL-04	392	52	1.2629					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	393	42	0.5829					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	394	55	1.4301					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	395	55	1.3532					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	396	52	1.2605	0.8606	3	0.0097	0.0161	Male	Mature	Resting	Parasitized	1	0.2604	Full
MEL-04	397	49	0.8319					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	398	56	1.5729					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	399	42	0.7526					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	400	40	0.468					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	401	42	0.7084					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	402	46	0.7432					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	403	58	1.7181					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	404	69	2.9536	2.217	4	0.076	0.1011	Female	Mature	Resting	Parasitized	1	0.3462	Full
MEL-04	405	59	1.5951	1.289	3	0.0373	0.048	Female	Mature	Resting	Parasitized	3	0.2535	Full
MEL-04	406	59	1.734	1.2678	4	0.0394	0.0258	Male	Mature	Resting	Unparasitized			Full
MEL-04	407	50	1.1157					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	408	66	2.2809	1.855	4	0.1105	0.0943	Female	Mature	Resting	Unparasitized			Full
MEL-04	409	72	3.6219		5	0.1653	0.1574	Female	Mature	Resting	Parasitized	1	0.3392	Full
MEL-04	410	63	2.3277	1.7684	3	0.0453	0.031	Male	Mature	Resting	Parasitized	1	0.3266	Full
MEL-04	411	69	3.0611	2.253	4	0.0715	0.0936	Female	Mature	Resting	Parasitized	1	0.4383	Full
MEL-04	412	67	2.5297	2.1142	4	0.0997	0.0765	Female	Mature	Resting	Unparasitized			Full
MEL-04	413	60	1.8783	1.4685	4	0.0423	0.0154	Female	Mature	Resting	Parasitized	1	0.2838	Full
MEL-04	414	57	1.7631					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	415	60	1.4514					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	416	57	1.902					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	417	61	2.1689	1.6107	4	0.0859	0.0712	Female	Mature	Resting	Parasitized	3	0.1777	Full
MEL-04	418	65	2.1287	1.5332	4	0.0628	0.0622	Female	Mature	Resting	Parasitized	1	0.208	Full
MEL-04	419	50	1.1326					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	420	55	1.4263	0.9839	3	0.0276	0.0182	Male	Mature	Resting	Parasitized	2	0.2689	Full
MEL-04	421	54	1.2405					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	422	50	0.9201					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	423	43	0.6913					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	424	38	0.4659					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	425	41	0.6566					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	426	45	0.833					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	427	51	1.1389					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	428	55	1.5673	0.8693	4	0.0135	0.0135	Male	Mature	Resting	Parasitized	4	0.5398	Full
MEL-04	429	70	3.9996	2.2722	4	0.0769	0.1208	Female	Mature	Resting	Parasitized	2	0.3363	Full
MEL-04	430	61	1.9483					Female	Mature	Resting	Parasitized			Partial
MEL-04	431	57	1.7975	1.3307	4	0.0295	0.0166	Male	Mature	Resting	Parasitized	1	0.2933	Full
MEL-04	432	60	1.8757					Female	Mature	Resting	Parasitized			Partial
MEL-04	433	72	3.28					Female	Mature	Resting	Parasitized			Partial
MEL-04	434	60	1.81					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	435	61	1.8457					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	436	51	1.3051					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	437	72	3.9676					Female	Mature	Resting	Parasitized			Partial
MEL-04	438	73	3.8324					Female	Mature	Resting	Parasitized			Partial
MEL-04	439	56	1.3991					Unknown	Immature	Resting	Unparasitized			Partial
MEL-04	440	57	1.6489	1.2751		0.0399	0.0329	Male	Mature	Resting	Parasitized	1	0.1453	Full
MEL-04	441	55	1.4162					Female	Immature	Undeveloped	Unparasitized			Partial
MEL-04	442	59	1.7956	1.5235	4	0.0682	0.0442	Male	Mature	Resting	Unparasitized			Full
MEL-04	443	60	1.897					Female	Mature	Resting	Parasitized			Partial
MEL-04	444	56	1.5698	1.251	3	0.0467	0.0335	Male	Mature	Resting	Parasitized	2	0.0944	Full
MEL-04	445	64	2.1985					Female	Mature	Resting	Parasitized			Partial
MEL-04	446	67	2.5902					Female	Mature	Resting	Parasitized			Partial
MEL-04	447	60	1.7887	1.5444	4	0.0587	0.0175	Male	Mature	Resting	Unparasitized			Full
MEL-04	448	57	1.4433					Unknown	Immature	Undeveloped	Unparasitized			Partial

Table H1-4. Fisheries data for Threespine Stickleback collected from Meliadine Lake in 2024.

Area	Fish ID	Total Length (mm)	Total Weight (g)	Carcass Weight (g)	Age (yr)	Liver Weight (g)	Gonad Weight (g)	Sex	Maturity	Gonad Status	Parasitism	Parasite Count	Parasite Weight (g)	Processing
MEL-04	449	55	1.4707					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	450	57	1.8068					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	451	62	2.1872					Female	Mature	Resting	Parasitized			Partial
MEL-04	452	58	1.5815	1.3026	4	0.0483	0.0506	Male	Mature	Resting	Parasitized	2	0.0179	Full
MEL-04	453	55	1.689					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	454	61	1.7303					Female	Mature	Resting	Parasitized			Partial
MEL-04	455	55	1.4152					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	456	65	2.337					Female	Mature	Resting	Parasitized			Partial
MEL-04	457	55	1.6245					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	458	59	1.9467	1.6851	4	0.0553	0.0329	Male	Mature	Resting	Unparasitized			Full
MEL-04	459	61	2.0127					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	460	58	1.7795	1.5359	4	0.0565	0.019	Male	Mature	Resting	Unparasitized			Full
MEL-04	461	55	1.5915					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	462	55	1.625					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	463	51	1.2492					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	464	56	1.4474	1.2275	4	0.0453	0.016	Male	Mature	Resting	Unparasitized			Full
MEL-04	465	66	3.6364					Female	Mature	Resting	Parasitized			Partial
MEL-04	466	55	1.7691					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	467	65	2.9167					Female	Mature	Resting	Parasitized			Partial
MEL-04	468	57	1.8087	1.3751	4	0.0287	0.035	Male	Mature	Resting	Parasitized	3	0.1844	Full
MEL-04	469	60	1.8705					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	470	56	1.547	1.2516	4	0.032	0.0291	Male	Mature	Resting	Parasitized	1	0.0478	Full
MEL-04	471	58	1.7963	1.2882	4	0.0417	0.0147	Male	Mature	Resting	Parasitized	1	0.2919	Full
MEL-04	472	57	1.7789					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	473	56	1.3936	1.2598	4	0.033	0.0043	Male	Mature	Resting	Parasitized	1	0.0069	Full
MEL-04	474	50	0.9224					Unknown	Immature	Resting	Unparasitized			Partial
MEL-04	475	48	0.9254					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	476	50	0.9747					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	477	50	0.9502					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	478	51	1.1691					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	479	49	0.9378					Unknown	Immature	Undeveloped	Unparasitized			Partial
MEL-04	480	46	0.7757					Unknown	Immature	Undeveloped	Unparasitized			Partial

Appendix H-2
Threespine Stickleback Tissue Chemistry

APPENDIX H2 - TABLES

Table H2-1. Descriptive statistics for metals concentrations (mg/kg ww) in Threespine Stickleback carcass samples collected in 2024 1

Table H2-2. Results of the ANOVA model (Type III) comparing metals concentrations in Threespine Stickleback carcass tissue among areas (MEL-01, MEL-03, and MEL-04) and years. 5

Table H2-3. Tukey post-hoc pairwise comparisons of Threespine Stickleback carcass tissue chemistry among areas and years ($p<0.05$). 7

Table H2-1. Descriptive statistics for metals concentrations (mg/kg ww) in Threespine Stickleback carcass samples collected in 2024

Area	Parameter	Summary Statistics (mg/kg ww; n = 20 fish per area)							
		DL	% > DL	Mean	Median	SD	SE	Min	Max
MEL-01	Aluminum	1	70	1.9	1.2	2	0.43711	1	9.5
	Antimony	0.002	60	0.00311	0.00215	0.00216	0.00048	0.002	0.0111
	Arsenic	0.006	100	0.3212	0.2855	0.10671	0.02386	0.176	0.558
	Barium	0.01	100	4.3	4.4	1.7	0.38614	1.29	7.52
	Beryllium	0.002	0	–	–	–	–	–	–
	Bismuth	0.002	5	–	–	–	–	0.002	0.003
	Boron	0.2	0	–	–	–	–	–	–
	Cadmium	0.002	100	0.00692	0.0067	0.00363	0.00081	0.0032	0.0206
	Calcium	4	100	27831	28500	10741.7	2401.9	9720	47900
	Cesium	0.001	100	0.01672	0.01635	0.00638	0.00143	0.0066	0.0391
	Chromium	0.04	35	–	–	–	–	0.04	0.111
	Cobalt	0.004	100	0.01172	0.01045	0.00308	0.00069	0.0081	0.0189
	Copper	0.04	100	0.7207	0.724	0.12353	0.02762	0.5	0.929
	Iron	1	100	25.2	18.4	20.8	4.7	10	104
	Lead	0.01	50	–	–	–	–	0.01	0.038
	Lithium	0.1	0	–	–	–	–	–	–
	Magnesium	0.4	100	563.7	566.5	149.3	33.4	289	876
	Manganese	0.01	100	37.4	37.1	13.8	3.1	11.4	62.8
	Mercury	0.001	100	0.09272	0.0816	0.03351	0.00749	0.0502	0.164
	Molybdenum	0.008	90	0.01344	0.01255	0.00629	0.00141	0.008	0.0368
	Nickel	0.04	45	–	–	–	–	0.04	0.287
	Phosphorus	2	100	16775.5	17150	5736.2	1282.6	6800	26800
	Potassium	4	100	2693	2810	409.8	91.6	1460	3240
	Rubidium	0.01	100	2.5	2.7	0.50634	0.11322	1.28	3.26
	Selenium	0.02	100	0.4938	0.5005	0.06864	0.01535	0.368	0.631
	Sodium	4	100	1142.7	1100	208.5	46.6	843	1570
	Strontium	0.02	100	24.5	25.4	9.2	2	8.42	41.4
	Tellurium	0.004	0	–	–	–	–	–	–
	Thallium	0.0004	100	0.00375	0.00354	0.00134	0.0003	0.0015	0.00698
	Tin	0.02	10	–	–	–	–	0.02	0.022

Table H2-1. Descriptive statistics for metals concentrations (mg/kg ww) in Threespine Stickleback carcass samples collected in 2024

Area	Parameter	Summary Statistics (mg/kg ww; n = 20 fish per area)							
		DL	% > DL	Mean	Median	SD	SE	Min	Max
MEL-01	Uranium	0.0004	100	0.00825	0.00762	0.00428	0.00096	0.00221	0.019
	Vanadium	0.02	40	–	–	–	–	0.02	0.037
	Zinc	0.2	100	80.3	73.2	21	4.7	43.2	125
	Zirconium	0.04–0.12	10	–	–	–	–	0.04	0.124
MEL-03	Aluminum	1	100	2.6	2.5	1	0.22947	1	5.3
	Antimony	0.002–0.0021	85	0.00319	0.00275	0.0015	0.00034	0.002	0.0083
	Arsenic	0.006–0.0063	100	0.14458	0.134	0.03734	0.00835	0.0877	0.232
	Barium	0.01	100	5.3	5.1	1.7	0.38527	2.45	9.8
	Beryllium	0.002–0.0021	0	–	–	–	–	–	–
	Bismuth	0.002–0.0021	5	–	–	–	–	0.002	0.0021
	Boron	0.2–0.21	0	–	–	–	–	–	–
	Cadmium	0.002–0.0021	100	0.0076	0.00645	0.00348	0.00078	0.0033	0.0172
	Calcium	4–4.2	100	29560	29900	7921.8	1771.4	14200	47100
	Cesium	0.001	100	0.0325	0.0292	0.01318	0.00295	0.0166	0.0701
	Chromium	0.04–0.042	60	0.1038	0.0475	0.13043	0.02917	0.04	0.551
	Cobalt	0.004–0.0042	100	0.01147	0.00995	0.00625	0.0014	0.005	0.0343
	Copper	0.04–0.042	100	0.71225	0.607	0.31503	0.07044	0.438	1.81
	Iron	1	100	89.5	36.2	222.5	49.8	12.4	1030
	Lead	0.01	90	0.0209	0.0165	0.01275	0.00285	0.01	0.064
	Lithium	0.1	0	–	–	–	–	–	–
	Magnesium	0.4–0.42	100	577.5	584.5	104.6	23.4	375	721
	Manganese	0.01	100	36.9	33.6	13.4	3	13.7	70.6
	Mercury	0.001–0.0012	100	0.10089	0.0981	0.03591	0.00803	0.0416	0.187
	Molybdenum	0.008–0.0084	100	0.02184	0.01385	0.02739	0.00613	0.0083	0.135
	Nickel	0.04–0.042	50	0.0619	0.041	0.03975	0.00889	0.04	0.188
	Phosphorus	2–2.1	100	18793.5	19350	4354.7	973.7	9360	26100
	Potassium	4–4.2	100	3041.5	3100	337.5	75.5	2260	3500
	Rubidium	0.01	100	2.7	2.7	0.65201	0.14579	1.51	4.08
	Selenium	0.02–0.021	100	0.59	0.581	0.10024	0.02241	0.411	0.778
	Sodium	4–4.2	100	1538	1515	216.6	48.4	1210	2020

Table H2-1. Descriptive statistics for metals concentrations (mg/kg ww) in Threespine Stickleback carcass samples collected in 2024

Area	Parameter	Summary Statistics (mg/kg ww; n = 20 fish per area)							
		DL	% > DL	Mean	Median	SD	SE	Min	Max
MEL-03	Strontium	0.02–0.021	100	27.4	28.1	7.8	1.7	12.5	43.4
	Tellurium	0.004–0.0042	0	–	–	–	–	–	–
	Thallium	0.0004–0.00042	100	0.00342	0.00287	0.0016	0.00036	0.0015	0.00724
	Tin	0.02–0.021	25	–	–	–	–	0.02	0.036
	Uranium	0.0004–0.00042	100	0.0051	0.00452	0.0026	0.00058	0.0025	0.0123
	Vanadium	0.02–0.021	25	–	–	–	–	0.02	0.059
	Zinc	0.2–0.21	100	65.4	65	12.3	2.8	43.9	92.5
	Zirconium	0.04–0.042	5	–	–	–	–	0.04	0.058
MEL-04	Aluminum	1	100	2.2	2	0.8089	0.18088	1.1	4.3
	Antimony	0.002	75	0.00264	0.00235	0.00078	0.00017	0.002	0.0044
	Arsenic	0.006	100	0.13177	0.128	0.0251	0.00561	0.0962	0.188
	Barium	0.01	100	5.9	5.5	1.6	0.34966	3.25	9.05
	Beryllium	0.002	0	–	–	–	–	–	–
	Bismuth	0.002	0	–	–	–	–	–	–
	Boron	0.2	0	–	–	–	–	–	–
	Cadmium	0.002	100	0.00756	0.00645	0.00343	0.00077	0.0032	0.0142
	Calcium	4	100	35210	33050	9948.8	2224.6	22000	58300
	Cesium	0.001	100	0.02558	0.0243	0.00835	0.00187	0.0136	0.0512
	Chromium	0.04	50	0.31115	0.0405	1	0.22794	0.04	4.62
	Cobalt	0.004	100	0.01229	0.01185	0.00372	0.00083	0.007	0.026
	Copper	0.04	100	0.7023	0.6465	0.17979	0.0402	0.513	1.28
	Iron	1	100	45.5	39.5	18.9	4.2	22	93.3
	Lead	0.01	100	0.0211	0.021	0.00855	0.00191	0.01	0.048
	Lithium	0.1	0	–	–	–	–	–	–
	Magnesium	0.4	100	604.9	573	139.4	31.2	370	928
	Manganese	0.01	100	47	50.4	12	2.7	26.6	64.7
	Mercury	0.001–0.0012	100	0.05806	0.05555	0.01268	0.00284	0.0398	0.088
	Molybdenum	0.008	100	0.01589	0.01545	0.00306	0.00068	0.0113	0.0222
	Nickel	0.04	95	0.0638	0.0485	0.03913	0.00875	0.04	0.211
	Phosphorus	2	100	21280	19800	5572.2	1246	13700	35400

Table H2-1. Descriptive statistics for metals concentrations (mg/kg ww) in Threespine Stickleback carcass samples collected in 2024

Area	Parameter	Summary Statistics (mg/kg ww; n = 20 fish per area)							
		DL	% > DL	Mean	Median	SD	SE	Min	Max
MEL-04	Potassium	4	100	3049	3030	299.6	67	2600	3630
	Rubidium	0.01	100	2.3	2.3	0.55135	0.12329	1.23	3.39
	Selenium	0.02	100	0.5978	0.5905	0.07463	0.01669	0.482	0.774
	Sodium	4	100	1540	1530	172.7	38.6	1300	1830
	Strontium	0.02	100	31	30.5	8	1.8	20.1	52.4
	Tellurium	0.004	0	–	–	–	–	–	–
	Thallium	0.0004	100	0.00437	0.00411	0.00128	0.00029	0.00198	0.00674
	Tin	0.02	5	–	–	–	–	0.02	0.027
	Uranium	0.0004	100	0.00639	0.00595	0.00293	0.00066	0.00243	0.0156
	Vanadium	0.02	35	–	–	–	–	0.02	0.042
	Zinc	0.2	100	75.2	76.3	15.2	3.4	52.6	96.4
	Zirconium	0.04	25	–	–	–	–	0.04	0.075

Notes

"-" = summary statistics were not calculated for parameters if fewer than 50% of the samples were measured above detection.

Table H2-2. Results of the ANOVA model (Type III) comparing metals concentrations in Threespine Stickleback carcass tissue among areas (MEL-01, MEL-03, and MEL-04) and years.

Parameter	N	Outlier ID	Model Parameter	Sum Square	DF	F Value	P Value
Aluminum	371	3192, 222, 473	Intercept	18.175	1	385.414	< 0.001
			Location × Year	4.399	8	11.661	< 0.001
			Residuals	17.071	362		
Antimony	370	329, 473, 494, 497	Intercept	1972.819	1	78386.73	< 0.001
			Location × Year	1.909	8	9.481	< 0.001
			Residuals	9.086	361		
Arsenic	374	–	Intercept	172.084	1	12214.05	< 0.001
			Location × Year	5.809	8	51.539	< 0.001
			Residuals	5.142	365		
Barium	373	20	Intercept	146.346	1	13974.96	< 0.001
			Location × Year	0.651	8	7.765	< 0.001
			Residuals	3.812	364		
Cadmium	373	120	Intercept	1431.177	1	42694.93	< 0.001
			Location × Year	1.654	8	6.167	< 0.001
			Residuals	12.202	364		
Calcium	373	20	Intercept	5834.68	1	587844.5	< 0.001
			Location × Year	0.854	8	10.756	< 0.001
			Residuals	3.613	364		
Cesium	374	–	Intercept	804.545	1	46287.05	< 0.001
			Location × Year	2.785	8	20.032	< 0.001
			Residuals	6.344	365		
Cobalt	374	–	Intercept	1138.227	1	56292.18	< 0.001
			Location × Year	3.213	8	19.865	< 0.001
			Residuals	7.38	365		
Copper	373	153	Intercept	7.627	1	1102.991	< 0.001
			Location × Year	0.833	8	15.054	< 0.001
			Residuals	2.517	364		
Iron	372	73, 179	Intercept	538.567	1	25400.27	< 0.001
			Location × Year	5.502	8	32.437	< 0.001
			Residuals	7.697	363		
Lead	370	2214, 3192, 329, 473	Intercept	965.866	1	29370.98	< 0.001
			Location × Year	1.464	8	5.566	< 0.001
			Residuals	11.871	361		
Magnesium	374	–	Intercept	2272.278	1	398589	< 0.001
			Location × Year	0.979	8	21.465	< 0.001
			Residuals	2.081	365		
Manganese	373	22	Intercept	677.538	1	53433.73	< 0.001
			Location × Year	1.845	8	18.188	< 0.001
			Residuals	4.616	364		
Mercury	374	–	Intercept	314.018	1	21722.32	< 0.001
			Location × Year	2.464	8	21.303	< 0.001
			Residuals	5.276	365		
Molybdenum	371	3344, 201, 179	Intercept	919.44	1	30717.01	< 0.001
			Location × Year	7.69	8	32.115	< 0.001
			Residuals	10.836	362		
Nickel	374	–	Intercept	281.173	1	2503.942	< 0.001
			Location × Year	88.82	8	98.872	< 0.001
			Residuals	40.987	365		
Phosphorus	373	20	Intercept	5297.824	1	701915.9	< 0.001
			Location × Year	1.456	8	24.108	< 0.001
			Residuals	2.747	364		
Potassium	372	2222, 118	Intercept	3526.71	1	1580418	< 0.001
			Location × Year	0.264	8	14.797	< 0.001
			Residuals	0.81	363		
Rubidium	374	–	Intercept	55.205	1	6382.332	< 0.001
			Location × Year	1.537	8	22.205	< 0.001
			Residuals	3.157	365		
Selenium	373	2222	Intercept	20.841	1	6912.69	< 0.001
			Location × Year	1.196	8	49.6	< 0.001
			Residuals	1.097	364		
Sodium	373	467	Intercept	2953.7	1	652670.1	< 0.001
			Location × Year	0.65	8	17.966	< 0.001
			Residuals	1.647	364		
Strontium	373	20	Intercept	559.973	1	58937.95	< 0.001
			Location × Year	2.783	8	36.611	< 0.001
			Residuals	3.458	364		
Thallium	374	–	Intercept	1611.449	1	82863.89	< 0.001
			Location × Year	2.051	8	13.183	< 0.001
			Residuals	7.098	365		

Table H2-2. Results of the ANOVA model (Type III) comparing metals concentrations in Threespine Stickleback carcass tissue among areas (MEL-01, MEL-03, and MEL-04) and years.

Parameter	N	Outlier ID	Model Parameter	Sum Square	DF	F Value	P Value
Uranium	374	–	Intercept	1511.371	1	44345.45	< 0.001
			Location × Year	3.662	8	13.431	< 0.001
			Residuals	12.44	365		
Zinc	374	–	Intercept	950.139	1	101774.9	< 0.001
			Location × Year	2.248	8	30.096	< 0.001
			Residuals	3.408	365		

Table H2-3. Tukey post-hoc pairwise comparisons of Threespine Stickleback carcass tissue chemistry among areas and years (p<0.05).

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Aluminum	MEL-01 2024 vs MEL-03 2024	0.074	-37.6	
	MEL-01 2024 vs MEL-04 2024	0.67	-25.0	
	MEL-01 2024 vs MEL-01 2021	0.998	-9.6	
	MEL-01 2024 vs MEL-03 2021	0.978	15.8	
	MEL-01 2024 vs MEL-04 2021	0.996	12.0	
	MEL-01 2024 vs MEL-01 2015	0.957	16.7	
	MEL-01 2024 vs MEL-03 2017	0.011	-36.7	decrease
	MEL-01 2024 vs MEL-04 2017	0.175	-28.6	
	MEL-03 2024 vs MEL-04 2024	0.964	20.1	
	MEL-03 2024 vs MEL-01 2021	0.154	44.8	
	MEL-03 2024 vs MEL-03 2021	< 0.001	85.5	increase
	MEL-03 2024 vs MEL-04 2021	< 0.001	79.4	increase
	MEL-03 2024 vs MEL-01 2015	< 0.001	86.9	increase
	MEL-03 2024 vs MEL-03 2017	1	1.5	
	MEL-03 2024 vs MEL-04 2017	0.98	14.4	
	MEL-04 2024 vs MEL-01 2021	0.912	20.5	
	MEL-04 2024 vs MEL-03 2021	0.044	54.4	increase
	MEL-04 2024 vs MEL-04 2021	0.085	49.4	
	MEL-04 2024 vs MEL-01 2015	0.02	55.5	increase
	MEL-04 2024 vs MEL-03 2017	0.923	-15.5	
	MEL-04 2024 vs MEL-04 2017	1	-4.8	
	MEL-01 2021 vs MEL-03 2021	0.415	28.1	
	MEL-01 2021 vs MEL-04 2021	0.61	23.9	
	MEL-01 2021 vs MEL-01 2015	0.246	29.0	
	MEL-01 2021 vs MEL-03 2017	0.014	-29.9	decrease
	MEL-01 2021 vs MEL-04 2017	0.324	-21.0	
	MEL-03 2021 vs MEL-04 2021	1	-3.3	
	MEL-03 2021 vs MEL-01 2015	1	0.7	
	MEL-03 2021 vs MEL-03 2017	< 0.001	-45.3	decrease
	MEL-03 2021 vs MEL-04 2017	< 0.001	-38.4	decrease
	MEL-04 2021 vs MEL-01 2015	1	4.1	
	MEL-04 2021 vs MEL-03 2017	< 0.001	-43.5	decrease
	MEL-04 2021 vs MEL-04 2017	< 0.001	-36.3	decrease
	MEL-01 2015 vs MEL-03 2017	< 0.001	-45.7	decrease
	MEL-01 2015 vs MEL-04 2017	< 0.001	-38.8	decrease
	MEL-03 2017 vs MEL-04 2017	0.904	12.7	
Antimony	MEL-01 2024 vs MEL-03 2024	0.999	-7.9	
	MEL-01 2024 vs MEL-04 2024	1	7.2	
	MEL-01 2024 vs MEL-01 2021	0.124	-24.5	
	MEL-01 2024 vs MEL-03 2021	0.482	23.5	
	MEL-01 2024 vs MEL-04 2021	0.902	14.9	
	MEL-01 2024 vs MEL-01 2015	0.059	33.5	
	MEL-01 2024 vs MEL-03 2017	0.939	12.5	
	MEL-01 2024 vs MEL-04 2017	1	-4.5	
	MEL-03 2024 vs MEL-04 2024	0.929	16.3	
	MEL-03 2024 vs MEL-01 2021	0.563	-18.1	
	MEL-03 2024 vs MEL-03 2021	0.092	34.0	
	MEL-03 2024 vs MEL-04 2021	0.405	24.7	
	MEL-03 2024 vs MEL-01 2015	0.003	44.9	increase
	MEL-03 2024 vs MEL-03 2017	0.442	22.1	
	MEL-03 2024 vs MEL-04 2017	1	3.6	
	MEL-04 2024 vs MEL-01 2021	0.017	-29.5	decrease
	MEL-04 2024 vs MEL-03 2021	0.896	15.2	
	MEL-04 2024 vs MEL-04 2021	0.999	7.2	
	MEL-04 2024 vs MEL-01 2015	0.326	24.6	
	MEL-04 2024 vs MEL-03 2017	1	5.0	
	MEL-04 2024 vs MEL-04 2017	0.947	-10.9	
	MEL-01 2021 vs MEL-03 2021	< 0.001	63.5	increase
	MEL-01 2021 vs MEL-04 2021	< 0.001	52.2	increase
	MEL-01 2021 vs MEL-01 2015	< 0.001	76.8	increase
	MEL-01 2021 vs MEL-03 2017	< 0.001	49.1	increase
	MEL-01 2021 vs MEL-04 2017	0.044	26.4	increase
	MEL-03 2021 vs MEL-04 2021	0.994	-7.0	
	MEL-03 2021 vs MEL-01 2015	0.983	8.1	
	MEL-03 2021 vs MEL-03 2017	0.945	-8.9	

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Mercury	MEL-01 2024 vs MEL-03 2024	0.993	-7.6	
	MEL-01 2024 vs MEL-04 2024	< 0.001	53.8	increase
	MEL-01 2024 vs MEL-01 2021	1	-2.7	
	MEL-01 2024 vs MEL-03 2021	< 0.001	-31.4	decrease
	MEL-01 2024 vs MEL-04 2021	0.595	-13.6	
	MEL-01 2024 vs MEL-01 2015	0.032	-20.8	decrease
	MEL-01 2024 vs MEL-03 2017	0.006	-23.4	decrease
	MEL-01 2024 vs MEL-04 2017	1	2.8	
	MEL-03 2024 vs MEL-04 2024	< 0.001	66.5	increase
	MEL-03 2024 vs MEL-01 2021	0.999	5.3	
	MEL-03 2024 vs MEL-03 2021	0.003	-25.7	decrease
	MEL-03 2024 vs MEL-04 2021	0.994	-6.5	
	MEL-03 2024 vs MEL-01 2015	0.434	-14.3	
	MEL-03 2024 vs MEL-03 2017	0.17	-17.0	
	MEL-03 2024 vs MEL-04 2017	0.846	11.3	
	MEL-04 2024 vs MEL-01 2021	< 0.001	-36.7	decrease
	MEL-04 2024 vs MEL-03 2021	< 0.001	-55.4	decrease
	MEL-04 2024 vs MEL-04 2021	< 0.001	-43.8	decrease
	MEL-04 2024 vs MEL-01 2015	< 0.001	-48.5	decrease
	MEL-04 2024 vs MEL-03 2017	< 0.001	-50.2	decrease
	MEL-04 2024 vs MEL-04 2017	< 0.001	-33.1	decrease
	MEL-01 2021 vs MEL-03 2021	< 0.001	-29.5	decrease
	MEL-01 2021 vs MEL-04 2021	0.603	-11.2	
	MEL-01 2021 vs MEL-01 2015	0.009	-18.6	decrease
	MEL-01 2021 vs MEL-03 2017	< 0.001	-21.2	decrease
	MEL-01 2021 vs MEL-04 2017	0.985	5.7	
	MEL-03 2021 vs MEL-04 2021	0.007	25.9	increase
	MEL-03 2021 vs MEL-01 2015	0.219	15.4	
	MEL-03 2021 vs MEL-03 2017	0.543	11.7	
	MEL-03 2021 vs MEL-04 2017	< 0.001	49.9	increase
	MEL-04 2021 vs MEL-01 2015	0.833	-8.4	
	MEL-04 2021 vs MEL-03 2017	0.429	-11.3	
	MEL-04 2021 vs MEL-04 2017	0.046	19.0	increase
	MEL-01 2015 vs MEL-03 2017	0.999	-3.2	
	MEL-01 2015 vs MEL-04 2017	< 0.001	29.9	increase
	MEL-03 2017 vs MEL-04 2017	< 0.001	34.2	increase
Molybdenum	MEL-01 2024 vs MEL-03 2024	0.93	-15.3	
	MEL-01 2024 vs MEL-04 2024	0.724	-19.6	
	MEL-01 2024 vs MEL-01 2021	0.017	-31.4	decrease
	MEL-01 2024 vs MEL-03 2021	0.986	-10.4	
	MEL-01 2024 vs MEL-04 2021	1	-3.0	
	MEL-01 2024 vs MEL-01 2015	0.254	-22.4	
	MEL-01 2024 vs MEL-03 2017	< 0.001	-61.6	decrease
	MEL-01 2024 vs MEL-04 2017	< 0.001	-49.1	decrease
	MEL-03 2024 vs MEL-04 2024	1	-5.1	
	MEL-03 2024 vs MEL-01 2021	0.612	-19.0	
	MEL-03 2024 vs MEL-03 2021	1	5.8	
	MEL-03 2024 vs MEL-04 2021	0.952	14.5	
	MEL-03 2024 vs MEL-01 2015	0.996	-8.3	
	MEL-03 2024 vs MEL-03 2017	< 0.001	-54.7	decrease
	MEL-03 2024 vs MEL-04 2017	< 0.001	-39.9	decrease
	MEL-04 2024 vs MEL-01 2021	0.875	-14.7	
	MEL-04 2024 vs MEL-03 2021	0.986	11.5	
	MEL-04 2024 vs MEL-04 2021	0.733	20.7	
	MEL-04 2024 vs MEL-01 2015	1	-3.4	
	MEL-04 2024 vs MEL-03 2017	< 0.001	-52.3	decrease
	MEL-04 2024 vs MEL-04 2017	< 0.001	-36.6	decrease
	MEL-01 2021 vs MEL-03 2021	0.073	30.7	
	MEL-01 2021 vs MEL-04 2021	0.004	41.4	increase
	MEL-01 2021 vs MEL-01 2015	0.843	13.2	
	MEL-01 2021 vs MEL-03 2017	< 0.001	-44.1	decrease
	MEL-01 2021 vs MEL-04 2017	0.007	-25.7	decrease
	MEL-03 2021 vs MEL-04 2021	0.994	8.2	
	MEL-03 2021 vs MEL-01 2015	0.714	-13.4	
	MEL-03 2021 vs MEL-03 2017	< 0.001	-57.2	decrease

Table H2-3. Tukey post-hoc pairwise comparisons of Threespine Stickleback carcass tissue chemistry among areas and years (p<0.05).

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Antimony	MEL-03 2021 vs MEL-04 2017	0.017	-22.7	decrease
	MEL-04 2021 vs MEL-01 2015	0.534	16.2	
	MEL-04 2021 vs MEL-03 2017	1	-2.0	
	MEL-04 2021 vs MEL-04 2017	0.218	-16.9	
	MEL-01 2015 vs MEL-03 2017	0.177	-15.7	
	MEL-01 2015 vs MEL-04 2017	< 0.001	-28.5	decrease
	MEL-03 2017 vs MEL-04 2017	0.187	-15.2	
Arsenic	MEL-01 2024 vs MEL-03 2024	< 0.001	117.4	increase
	MEL-01 2024 vs MEL-04 2024	< 0.001	135.3	increase
	MEL-01 2024 vs MEL-01 2021	0.659	14.7	
	MEL-01 2024 vs MEL-03 2021	< 0.001	62.8	increase
	MEL-01 2024 vs MEL-04 2021	< 0.001	73.9	increase
	MEL-01 2024 vs MEL-01 2015	< 0.001	69.3	increase
	MEL-01 2024 vs MEL-03 2017	< 0.001	175.9	increase
	MEL-01 2024 vs MEL-04 2017	< 0.001	101.1	increase
	MEL-03 2024 vs MEL-04 2024	0.992	8.3	
	MEL-03 2024 vs MEL-01 2021	< 0.001	-47.2	decrease
	MEL-03 2024 vs MEL-03 2021	0.004	-25.1	decrease
	MEL-03 2024 vs MEL-04 2021	0.074	-20.0	
	MEL-03 2024 vs MEL-01 2015	0.013	-22.1	decrease
	MEL-03 2024 vs MEL-03 2017	0.02	26.9	increase
	MEL-03 2024 vs MEL-04 2017	0.972	-7.5	
	MEL-04 2024 vs MEL-01 2021	< 0.001	-51.3	decrease
	MEL-04 2024 vs MEL-03 2021	< 0.001	-30.8	decrease
	MEL-04 2024 vs MEL-04 2021	0.002	-26.1	decrease
	MEL-04 2024 vs MEL-01 2015	< 0.001	-28.1	decrease
	MEL-04 2024 vs MEL-03 2017	0.354	17.2	
	MEL-04 2024 vs MEL-04 2017	0.372	-14.5	
	MEL-01 2021 vs MEL-03 2021	< 0.001	41.9	increase
	MEL-01 2021 vs MEL-04 2021	< 0.001	51.6	increase
	MEL-01 2021 vs MEL-01 2015	< 0.001	47.6	increase
	MEL-01 2021 vs MEL-03 2017	< 0.001	140.5	increase
	MEL-01 2021 vs MEL-04 2017	< 0.001	75.3	increase
	MEL-03 2021 vs MEL-04 2021	0.977	6.8	
	MEL-03 2021 vs MEL-01 2015	0.999	4.0	
	MEL-03 2021 vs MEL-03 2017	< 0.001	69.5	increase
	MEL-03 2021 vs MEL-04 2017	0.004	23.5	increase
	MEL-04 2021 vs MEL-01 2015	1	-2.6	
	MEL-04 2021 vs MEL-03 2017	< 0.001	58.7	increase
	MEL-04 2021 vs MEL-04 2017	0.164	15.7	
	MEL-01 2015 vs MEL-03 2017	< 0.001	63.0	increase
	MEL-01 2015 vs MEL-04 2017	0.013	18.8	increase
	MEL-03 2017 vs MEL-04 2017	< 0.001	-27.1	decrease
Barium	MEL-01 2024 vs MEL-03 2024	0.11	-19.2	
	MEL-01 2024 vs MEL-04 2024	< 0.001	-28.3	decrease
	MEL-01 2024 vs MEL-01 2021	0.038	-19.0	decrease
	MEL-01 2024 vs MEL-03 2021	< 0.001	-24.9	decrease
	MEL-01 2024 vs MEL-04 2021	0.036	-19.1	decrease
	MEL-01 2024 vs MEL-01 2015	0.97	-6.7	
	MEL-01 2024 vs MEL-03 2017	< 0.001	-24.7	decrease
	MEL-01 2024 vs MEL-04 2017	< 0.001	-26.2	decrease
	MEL-03 2024 vs MEL-04 2024	0.808	-11.2	
	MEL-03 2024 vs MEL-01 2021	1	0.3	
	MEL-03 2024 vs MEL-03 2021	0.968	-7.1	
	MEL-03 2024 vs MEL-04 2021	1	0.1	
	MEL-03 2024 vs MEL-01 2015	0.307	15.5	
	MEL-03 2024 vs MEL-03 2017	0.962	-6.8	
	MEL-03 2024 vs MEL-04 2017	0.858	-8.6	
	MEL-04 2024 vs MEL-01 2021	0.626	12.9	
	MEL-04 2024 vs MEL-03 2021	0.999	4.6	
	MEL-04 2024 vs MEL-04 2021	0.641	12.8	
	MEL-04 2024 vs MEL-01 2015	< 0.001	30.0	increase
	MEL-04 2024 vs MEL-03 2017	0.997	5.0	
	MEL-04 2024 vs MEL-04 2017	1	2.9	
	MEL-01 2021 vs MEL-03 2021	0.88	-7.3	

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Molybdenum	MEL-03 2021 vs MEL-04 2017	< 0.001	-43.2	decrease
	MEL-04 2021 vs MEL-01 2015	0.139	-20.0	
	MEL-04 2021 vs MEL-03 2017	< 0.001	-60.4	decrease
	MEL-04 2021 vs MEL-04 2017	< 0.001	-47.5	decrease
	MEL-01 2015 vs MEL-03 2017	< 0.001	-50.6	decrease
	MEL-01 2015 vs MEL-04 2017	< 0.001	-34.4	decrease
	MEL-03 2017 vs MEL-04 2017	0.002	32.8	increase
Nickel	MEL-01 2024 vs MEL-03 2024	1	6.6	
	MEL-01 2024 vs MEL-04 2024	1	0.8	
	MEL-01 2024 vs MEL-01 2021	0.855	-27.2	
	MEL-01 2024 vs MEL-03 2021	0.999	15.2	
	MEL-01 2024 vs MEL-04 2021	1	-1.4	
	MEL-01 2024 vs MEL-01 2015	0.218	-39.7	
	MEL-01 2024 vs MEL-03 2017	< 0.001	-93.0	decrease
	MEL-01 2024 vs MEL-04 2017	< 0.001	-89.2	decrease
	MEL-03 2024 vs MEL-04 2024	1	-5.4	
	MEL-03 2024 vs MEL-01 2021	0.681	-31.7	
	MEL-03 2024 vs MEL-03 2021	1	8.1	
	MEL-03 2024 vs MEL-04 2021	1	-7.5	
	MEL-03 2024 vs MEL-01 2015	0.103	-43.4	
	MEL-03 2024 vs MEL-03 2017	< 0.001	-93.4	decrease
	MEL-03 2024 vs MEL-04 2017	< 0.001	-89.8	decrease
	MEL-04 2024 vs MEL-01 2021	0.837	-27.7	
	MEL-04 2024 vs MEL-03 2021	0.999	14.3	
	MEL-04 2024 vs MEL-04 2021	1	-2.2	
	MEL-04 2024 vs MEL-01 2015	0.201	-40.1	
	MEL-04 2024 vs MEL-03 2017	< 0.001	-93.0	decrease
	MEL-04 2024 vs MEL-04 2017	< 0.001	-89.3	decrease
	MEL-01 2021 vs MEL-03 2021	0.166	58.2	
	MEL-01 2021 vs MEL-04 2021	0.713	35.3	
	MEL-01 2021 vs MEL-01 2015	0.957	-17.2	
	MEL-01 2021 vs MEL-03 2017	< 0.001	-90.4	decrease
	MEL-01 2021 vs MEL-04 2017	< 0.001	-85.1	decrease
	MEL-03 2021 vs MEL-04 2021	0.993	-14.5	
	MEL-03 2021 vs MEL-01 2015	0.002	-47.6	decrease
	MEL-03 2021 vs MEL-03 2017	< 0.001	-93.9	decrease
	MEL-03 2021 vs MEL-04 2017	< 0.001	-90.6	decrease
	MEL-04 2021 vs MEL-01 2015	0.051	-38.8	
	MEL-04 2021 vs MEL-03 2017	< 0.001	-92.9	decrease
	MEL-04 2021 vs MEL-04 2017	< 0.001	-89.0	decrease
	MEL-01 2015 vs MEL-03 2017	< 0.001	-88.4	decrease
	MEL-01 2015 vs MEL-04 2017	< 0.001	-82.0	decrease
	MEL-03 2017 vs MEL-04 2017	0.034	54.2	increase
Phosphorus	MEL-01 2024 vs MEL-03 2024	0.748	-10.3	
	MEL-01 2024 vs MEL-04 2024	0.009	-20.9	decrease
	MEL-01 2024 vs MEL-01 2021	0.002	-20.1	decrease
	MEL-01 2024 vs MEL-03 2021	0.114	-14.5	
	MEL-01 2024 vs MEL-04 2021	0.901	-7.5	
	MEL-01 2024 vs MEL-01 2015	0.014	20.3	increase
	MEL-01 2024 vs MEL-03 2017	0.65	10.1	
	MEL-01 2024 vs MEL-04 2017	0.782	8.9	
	MEL-03 2024 vs MEL-04 2024	0.558	-11.8	
	MEL-03 2024 vs MEL-01 2021	0.475	-10.9	
	MEL-03 2024 vs MEL-03 2021	0.994	-4.7	
	MEL-03 2024 vs MEL-04 2021	1	3.2	
	MEL-03 2024 vs MEL-01 2015	< 0.001	34.2	increase
	MEL-03 2024 vs MEL-03 2017	0.002	22.7	increase
	MEL-03 2024 vs MEL-04 2017	0.005	21.4	increase
	MEL-04 2024 vs MEL-01 2021	1	1.0	
	MEL-04 2024 vs MEL-03 2021	0.895	8.0	
	MEL-04 2024 vs MEL-04 2021	0.102	17.0	
	MEL-04 2024 vs MEL-01 2015	< 0.001	52.1	increase
	MEL-04 2024 vs MEL-03 2017	< 0.001	39.1	increase
	MEL-04 2024 vs MEL-04 2017	< 0.001	37.6	increase
	MEL-01 2021 vs MEL-03 2021	0.858	6.9	

Table H2-3. Tukey post-hoc pairwise comparisons of Threespine Stickleback carcass tissue chemistry among areas and years (p<0.05).

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Barium	MEL-01 2021 vs MEL-04 2021	1	-0.1	
	MEL-01 2021 vs MEL-01 2015	0.084	15.2	
	MEL-01 2021 vs MEL-03 2017	0.829	-7.1	
	MEL-01 2021 vs MEL-04 2017	0.571	-8.8	
	MEL-03 2021 vs MEL-04 2021	0.891	7.8	
	MEL-03 2021 vs MEL-01 2015	< 0.001	24.3	increase
	MEL-03 2021 vs MEL-03 2017	1	0.3	
	MEL-03 2021 vs MEL-04 2017	1	-1.6	
	MEL-04 2021 vs MEL-01 2015	0.078	15.3	
	MEL-04 2021 vs MEL-03 2017	0.844	-6.9	
	MEL-04 2021 vs MEL-04 2017	0.591	-8.7	
	MEL-01 2015 vs MEL-03 2017	< 0.001	-19.3	decrease
	MEL-01 2015 vs MEL-04 2017	< 0.001	-20.8	decrease
	MEL-03 2017 vs MEL-04 2017	1	-1.9	
Cadmium	MEL-01 2024 vs MEL-03 2024	0.999	-8.9	
	MEL-01 2024 vs MEL-04 2024	1	-7.6	
	MEL-01 2024 vs MEL-01 2021	0.583	25.2	
	MEL-01 2024 vs MEL-03 2021	0.209	-25.6	
	MEL-01 2024 vs MEL-04 2021	0.874	-15.6	
	MEL-01 2024 vs MEL-01 2015	0.99	10.9	
	MEL-01 2024 vs MEL-03 2017	0.998	8.3	
	MEL-01 2024 vs MEL-04 2017	0.978	12.2	
	MEL-03 2024 vs MEL-04 2024	1	1.3	
	MEL-03 2024 vs MEL-01 2021	0.135	37.4	
	MEL-03 2024 vs MEL-03 2021	0.713	-18.3	
	MEL-03 2024 vs MEL-04 2021	0.999	-7.3	
	MEL-03 2024 vs MEL-01 2015	0.678	21.7	
	MEL-03 2024 vs MEL-03 2017	0.802	18.8	
	MEL-03 2024 vs MEL-04 2017	0.587	23.2	
	MEL-04 2024 vs MEL-01 2021	0.176	35.5	
	MEL-04 2024 vs MEL-03 2021	0.636	-19.4	
	MEL-04 2024 vs MEL-04 2021	0.998	-8.6	
	MEL-04 2024 vs MEL-01 2015	0.757	20.1	
	MEL-04 2024 vs MEL-03 2017	0.864	17.2	
	MEL-04 2024 vs MEL-04 2017	0.672	21.5	
	MEL-01 2021 vs MEL-03 2021	< 0.001	-40.5	decrease
	MEL-01 2021 vs MEL-04 2021	0.001	-32.5	decrease
	MEL-01 2021 vs MEL-01 2015	0.896	-11.4	
	MEL-01 2021 vs MEL-03 2017	0.733	-13.5	
	MEL-01 2021 vs MEL-04 2017	0.932	-10.3	
	MEL-03 2021 vs MEL-04 2021	0.922	13.4	
	MEL-03 2021 vs MEL-01 2015	< 0.001	49.0	increase
	MEL-03 2021 vs MEL-03 2017	< 0.001	45.5	increase
	MEL-03 2021 vs MEL-04 2017	< 0.001	50.8	increase
	MEL-04 2021 vs MEL-01 2015	0.046	31.4	increase
	MEL-04 2021 vs MEL-03 2017	0.086	28.2	
	MEL-04 2021 vs MEL-04 2017	0.025	32.9	increase
	MEL-01 2015 vs MEL-03 2017	1	-2.4	
	MEL-01 2015 vs MEL-04 2017	1	1.2	
	MEL-03 2017 vs MEL-04 2017	1	3.7	
Calcium	MEL-01 2024 vs MEL-03 2024	0.996	-5.9	
	MEL-01 2024 vs MEL-04 2024	0.032	-21.3	decrease
	MEL-01 2024 vs MEL-01 2021	0.048	-18.2	decrease
	MEL-01 2024 vs MEL-03 2021	0.961	-7.2	
	MEL-01 2024 vs MEL-04 2021	1	-1.3	
	MEL-01 2024 vs MEL-01 2015	0.467	13.6	
	MEL-01 2024 vs MEL-03 2017	0.986	6.1	
	MEL-01 2024 vs MEL-04 2017	0.981	6.4	
	MEL-03 2024 vs MEL-04 2024	0.252	-16.4	
	MEL-03 2024 vs MEL-01 2021	0.397	-13.0	
	MEL-03 2024 vs MEL-03 2021	1	-1.4	
	MEL-03 2024 vs MEL-04 2021	0.998	5.0	
	MEL-03 2024 vs MEL-01 2015	0.041	20.8	increase
	MEL-03 2024 vs MEL-03 2017	0.502	12.8	
	MEL-03 2024 vs MEL-04 2017	0.466	13.1	

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Phosphorus	MEL-01 2021 vs MEL-04 2021	0.032	15.8	increase
	MEL-01 2021 vs MEL-01 2015	< 0.001	50.5	increase
	MEL-01 2021 vs MEL-03 2017	< 0.001	37.7	increase
	MEL-01 2021 vs MEL-04 2017	< 0.001	36.2	increase
	MEL-03 2021 vs MEL-04 2021	0.696	8.3	
	MEL-03 2021 vs MEL-01 2015	< 0.001	40.8	increase
	MEL-03 2021 vs MEL-03 2017	< 0.001	28.8	increase
	MEL-03 2021 vs MEL-04 2017	< 0.001	27.4	increase
	MEL-04 2021 vs MEL-01 2015	< 0.001	30.0	increase
	MEL-04 2021 vs MEL-03 2017	< 0.001	18.9	increase
	MEL-04 2021 vs MEL-04 2017	0.002	17.7	increase
	MEL-01 2015 vs MEL-03 2017	0.232	-8.5	
	MEL-01 2015 vs MEL-04 2017	0.116	-9.5	
	MEL-03 2017 vs MEL-04 2017	1	-1.1	
Potassium	MEL-01 2024 vs MEL-03 2024	0.119	-9.3	
	MEL-01 2024 vs MEL-04 2024	0.087	-9.7	
	MEL-01 2024 vs MEL-01 2021	0.942	-3.8	
	MEL-01 2024 vs MEL-03 2021	0.005	-10.9	decrease
	MEL-01 2024 vs MEL-04 2021	0.24	-7.3	
	MEL-01 2024 vs MEL-01 2015	0.996	-2.4	
	MEL-01 2024 vs MEL-03 2017	1	-0.6	
	MEL-01 2024 vs MEL-04 2017	0.135	8.1	
	MEL-03 2024 vs MEL-04 2024	1	-0.4	
	MEL-03 2024 vs MEL-01 2021	0.55	6.1	
	MEL-03 2024 vs MEL-03 2021	1	-1.8	
	MEL-03 2024 vs MEL-04 2021	0.998	2.2	
	MEL-03 2024 vs MEL-01 2015	0.179	7.7	
	MEL-03 2024 vs MEL-03 2017	0.028	9.6	increase
	MEL-03 2024 vs MEL-04 2017	< 0.001	19.2	increase
	MEL-04 2024 vs MEL-01 2021	0.453	6.6	
	MEL-04 2024 vs MEL-03 2021	1	-1.3	
	MEL-04 2024 vs MEL-04 2021	0.994	2.7	
	MEL-04 2024 vs MEL-01 2015	0.126	8.1	
	MEL-04 2024 vs MEL-03 2017	0.017	10.1	increase
	MEL-04 2024 vs MEL-04 2017	< 0.001	19.7	increase
	MEL-01 2021 vs MEL-03 2021	0.044	-7.4	decrease
	MEL-01 2021 vs MEL-04 2021	0.84	-3.7	
	MEL-01 2021 vs MEL-01 2015	0.999	1.5	
	MEL-01 2021 vs MEL-03 2017	0.858	3.3	
	MEL-01 2021 vs MEL-04 2017	< 0.001	12.3	increase
	MEL-03 2021 vs MEL-04 2021	0.785	4.1	
	MEL-03 2021 vs MEL-01 2015	0.002	9.6	increase
	MEL-03 2021 vs MEL-03 2017	< 0.001	11.6	increase
	MEL-03 2021 vs MEL-04 2017	< 0.001	21.3	increase
	MEL-04 2021 vs MEL-01 2015	0.328	5.3	
	MEL-04 2021 vs MEL-03 2017	0.039	7.2	increase
	MEL-04 2021 vs MEL-04 2017	< 0.001	16.6	increase
	MEL-01 2015 vs MEL-03 2017	0.991	1.8	
	MEL-01 2015 vs MEL-04 2017	< 0.001	10.7	increase
	MEL-03 2017 vs MEL-04 2017	< 0.001	8.7	increase
Rubidium	MEL-01 2024 vs MEL-03 2024	0.999	-4.3	
	MEL-01 2024 vs MEL-04 2024	0.815	11.3	
	MEL-01 2024 vs MEL-01 2021	0.994	-5.0	
	MEL-01 2024 vs MEL-03 2021	< 0.001	-24.9	decrease
	MEL-01 2024 vs MEL-04 2021	0.002	-21.4	decrease
	MEL-01 2024 vs MEL-01 2015	0.207	15.2	
	MEL-01 2024 vs MEL-03 2017	0.43	-11.1	
	MEL-01 2024 vs MEL-04 2017	< 0.001	-21.0	decrease
	MEL-03 2024 vs MEL-04 2024	0.391	16.3	
	MEL-03 2024 vs MEL-01 2021	1	-0.8	
	MEL-03 2024 vs MEL-03 2021	0.001	-21.5	decrease
	MEL-03 2024 vs MEL-04 2021	0.024	-17.9	decrease
	MEL-03 2024 vs MEL-01 2015	0.025	20.3	increase
	MEL-03 2024 vs MEL-03 2017	0.91	-7.2	
	MEL-03 2024 vs MEL-04 2017	0.014	-17.5	decrease

Table H2-3. Tukey post-hoc pairwise comparisons of Threespine Stickleback carcass tissue chemistry among areas and years (p<0.05).

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Calcium	MEL-04 2024 vs MEL-01 2021	0.999	4.0	
	MEL-04 2024 vs MEL-03 2021	0.18	17.9	
	MEL-04 2024 vs MEL-04 2021	0.01	25.5	increase
	MEL-04 2024 vs MEL-01 2015	< 0.001	44.4	increase
	MEL-04 2024 vs MEL-03 2017	< 0.001	34.9	increase
	MEL-04 2024 vs MEL-04 2017	< 0.001	35.3	increase
	MEL-01 2021 vs MEL-03 2021	0.264	13.3	
	MEL-01 2021 vs MEL-04 2021	0.009	20.7	increase
	MEL-01 2021 vs MEL-01 2015	< 0.001	38.8	increase
	MEL-01 2021 vs MEL-03 2017	< 0.001	29.7	increase
	MEL-01 2021 vs MEL-04 2017	< 0.001	30.1	increase
	MEL-03 2021 vs MEL-04 2021	0.952	6.4	
	MEL-03 2021 vs MEL-01 2015	< 0.001	22.5	increase
	MEL-03 2021 vs MEL-03 2017	0.084	14.4	
	MEL-03 2021 vs MEL-04 2017	0.07	14.7	
	MEL-04 2021 vs MEL-01 2015	0.072	15.0	
	MEL-04 2021 vs MEL-03 2017	0.82	7.5	
	MEL-04 2021 vs MEL-04 2017	0.784	7.8	
	MEL-01 2015 vs MEL-03 2017	0.764	-6.6	
	MEL-01 2015 vs MEL-04 2017	0.807	-6.3	
	MEL-03 2017 vs MEL-04 2017	1	0.3	
Cesium	MEL-01 2024 vs MEL-03 2024	< 0.001	-48.0	decrease
	MEL-01 2024 vs MEL-04 2024	< 0.001	-35.5	decrease
	MEL-01 2024 vs MEL-01 2021	0.002	-28.4	decrease
	MEL-01 2024 vs MEL-03 2021	< 0.001	-42.0	decrease
	MEL-01 2024 vs MEL-04 2021	0.007	-26.6	decrease
	MEL-01 2024 vs MEL-01 2015	1	-4.7	
	MEL-01 2024 vs MEL-03 2017	< 0.001	-33.7	decrease
	MEL-01 2024 vs MEL-04 2017	< 0.001	-43.2	decrease
	MEL-03 2024 vs MEL-04 2024	0.381	24.0	
	MEL-03 2024 vs MEL-01 2021	0.004	37.7	increase
	MEL-03 2024 vs MEL-03 2021	0.929	11.5	
	MEL-03 2024 vs MEL-04 2021	0.001	41.2	increase
	MEL-03 2024 vs MEL-01 2015	< 0.001	83.3	increase
	MEL-03 2024 vs MEL-03 2017	0.047	27.5	increase
	MEL-03 2024 vs MEL-04 2017	0.966	9.3	
	MEL-04 2024 vs MEL-01 2021	0.943	11.0	
	MEL-04 2024 vs MEL-03 2021	0.936	-10.1	
	MEL-04 2024 vs MEL-04 2021	0.825	13.9	
	MEL-04 2024 vs MEL-01 2015	< 0.001	47.8	increase
	MEL-04 2024 vs MEL-03 2017	1	2.8	
	MEL-04 2024 vs MEL-04 2017	0.785	-11.9	
	MEL-01 2021 vs MEL-03 2021	0.052	-19.0	
	MEL-01 2021 vs MEL-04 2021	1	2.6	
	MEL-01 2021 vs MEL-01 2015	< 0.001	33.2	increase
	MEL-01 2021 vs MEL-03 2017	0.941	-7.4	
	MEL-01 2021 vs MEL-04 2017	0.005	-20.6	decrease
	MEL-03 2021 vs MEL-04 2021	0.016	26.7	increase
	MEL-03 2021 vs MEL-01 2015	< 0.001	64.4	increase
	MEL-03 2021 vs MEL-03 2017	0.399	14.4	
	MEL-03 2021 vs MEL-04 2017	1	-2.0	
	MEL-04 2021 vs MEL-01 2015	0.001	29.8	increase
	MEL-04 2021 vs MEL-03 2017	0.756	-9.7	
	MEL-04 2021 vs MEL-04 2017	< 0.001	-22.6	decrease
	MEL-01 2015 vs MEL-03 2017	< 0.001	-30.4	decrease
	MEL-01 2015 vs MEL-04 2017	< 0.001	-40.4	decrease
	MEL-03 2017 vs MEL-04 2017	0.083	-14.3	
Cobalt	MEL-01 2024 vs MEL-03 2024	0.995	9.1	
	MEL-01 2024 vs MEL-04 2024	1	-4.3	
	MEL-01 2024 vs MEL-01 2021	1	2.4	
	MEL-01 2024 vs MEL-03 2021	0.996	7.8	
	MEL-01 2024 vs MEL-04 2021	0.981	9.8	
	MEL-01 2024 vs MEL-01 2015	< 0.001	49.0	increase
	MEL-01 2024 vs MEL-03 2017	0.186	-19.6	
	MEL-01 2024 vs MEL-04 2017	0.132	-20.5	

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Rubidium	MEL-04 2024 vs MEL-01 2021	0.149	-14.7	
	MEL-04 2024 vs MEL-03 2021	< 0.001	-32.5	decrease
	MEL-04 2024 vs MEL-04 2021	< 0.001	-29.4	decrease
	MEL-04 2024 vs MEL-01 2015	0.999	3.5	
	MEL-04 2024 vs MEL-03 2017	0.001	-20.2	decrease
	MEL-04 2024 vs MEL-04 2017	< 0.001	-29.0	decrease
	MEL-01 2021 vs MEL-03 2021	< 0.001	-20.9	decrease
	MEL-01 2021 vs MEL-04 2021	0.003	-17.2	decrease
	MEL-01 2021 vs MEL-01 2015	< 0.001	21.3	increase
	MEL-01 2021 vs MEL-03 2017	0.828	-6.4	
	MEL-01 2021 vs MEL-04 2017	< 0.001	-16.8	decrease
	MEL-03 2021 vs MEL-04 2021	0.99	4.7	
	MEL-03 2021 vs MEL-01 2015	< 0.001	53.4	increase
	MEL-03 2021 vs MEL-03 2017	0.003	18.3	increase
	MEL-03 2021 vs MEL-04 2017	0.96	5.2	
	MEL-04 2021 vs MEL-01 2015	< 0.001	46.5	increase
	MEL-04 2021 vs MEL-03 2017	0.102	13.0	
	MEL-04 2021 vs MEL-04 2017	1	0.5	
	MEL-01 2015 vs MEL-03 2017	< 0.001	-22.9	decrease
	MEL-01 2015 vs MEL-04 2017	< 0.001	-31.4	decrease
	MEL-03 2017 vs MEL-04 2017	0.043	-11.1	decrease
Selenium	MEL-01 2024 vs MEL-03 2024	< 0.001	-16.0	decrease
	MEL-01 2024 vs MEL-04 2024	< 0.001	-17.6	decrease
	MEL-01 2024 vs MEL-01 2021	0.002	15.0	increase
	MEL-01 2024 vs MEL-03 2021	< 0.001	-20.6	decrease
	MEL-01 2024 vs MEL-04 2021	< 0.001	-14.8	decrease
	MEL-01 2024 vs MEL-01 2015	0.71	5.9	
	MEL-01 2024 vs MEL-03 2017	< 0.001	-18.8	decrease
	MEL-01 2024 vs MEL-04 2017	< 0.001	-17.0	decrease
	MEL-03 2024 vs MEL-04 2024	1	-1.9	
	MEL-03 2024 vs MEL-01 2021	< 0.001	36.8	increase
	MEL-03 2024 vs MEL-03 2021	0.785	-5.5	
	MEL-03 2024 vs MEL-04 2021	1	1.4	
	MEL-03 2024 vs MEL-01 2015	< 0.001	26.0	increase
	MEL-03 2024 vs MEL-03 2017	0.98	-3.4	
	MEL-03 2024 vs MEL-04 2017	1	-1.2	
	MEL-04 2024 vs MEL-01 2021	< 0.001	39.5	increase
	MEL-04 2024 vs MEL-03 2021	0.978	-3.6	
	MEL-04 2024 vs MEL-04 2021	0.988	3.4	
	MEL-04 2024 vs MEL-01 2015	< 0.001	28.5	increase
	MEL-04 2024 vs MEL-03 2017	1	-1.5	
	MEL-04 2024 vs MEL-04 2017	1	0.7	
	MEL-01 2021 vs MEL-03 2021	< 0.001	-30.9	decrease
	MEL-01 2021 vs MEL-04 2021	< 0.001	-25.9	decrease
	MEL-01 2021 vs MEL-01 2015	0.042	-7.9	decrease
	MEL-01 2021 vs MEL-03 2017	< 0.001	-29.4	decrease
	MEL-01 2021 vs MEL-04 2017	< 0.001	-27.8	decrease
	MEL-03 2021 vs MEL-04 2021	0.232	7.3	
	MEL-03 2021 vs MEL-01 2015	< 0.001	33.4	increase
	MEL-03 2021 vs MEL-03 2017	0.994	2.3	
	MEL-03 2021 vs MEL-04 2017	0.715	4.5	
	MEL-04 2021 vs MEL-01 2015	< 0.001	24.3	increase
	MEL-04 2021 vs MEL-03 2017	0.606	-4.7	
	MEL-04 2021 vs MEL-04 2017	0.98	-2.6	
	MEL-01 2015 vs MEL-03 2017	< 0.001	-23.3	decrease
	MEL-01 2015 vs MEL-04 2017	< 0.001	-21.6	decrease
	MEL-03 2017 vs MEL-04 2017	0.986	2.2	
Sodium	MEL-01 2024 vs MEL-03 2024	< 0.001	-26.1	decrease
	MEL-01 2024 vs MEL-04 2024	< 0.001	-26.5	decrease
	MEL-01 2024 vs MEL-01 2021	< 0.001	-27.6	decrease
	MEL-01 2024 vs MEL-03 2021	< 0.001	-32.0	decrease
	MEL-01 2024 vs MEL-04 2021	< 0.001	-19.3	decrease
	MEL-01 2024 vs MEL-01 2015	< 0.001	-18.9	decrease
	MEL-01 2024 vs MEL-03 2017	< 0.001	-16.0	decrease
	MEL-01 2024 vs MEL-04 2017	0.027	-12.3	decrease

Table H2-3. Tukey post-hoc pairwise comparisons of Threespine Stickleback carcass tissue chemistry among areas and years (p<0.05).

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Cobalt	MEL-03 2024 vs MEL-04 2024	0.939	-12.3	
	MEL-03 2024 vs MEL-01 2021	0.999	-6.2	
	MEL-03 2024 vs MEL-03 2021	1	-1.2	
	MEL-03 2024 vs MEL-04 2021	1	0.6	
	MEL-03 2024 vs MEL-01 2015	0.008	36.5	increase
	MEL-03 2024 vs MEL-03 2017	0.009	-26.3	decrease
	MEL-03 2024 vs MEL-04 2017	0.005	-27.2	decrease
	MEL-04 2024 vs MEL-01 2021	0.998	7.1	
	MEL-04 2024 vs MEL-03 2021	0.922	12.7	
	MEL-04 2024 vs MEL-04 2021	0.836	14.8	
	MEL-04 2024 vs MEL-01 2015	< 0.001	55.8	increase
	MEL-04 2024 vs MEL-03 2017	0.49	-15.9	
	MEL-04 2024 vs MEL-04 2017	0.391	-16.9	
	MEL-01 2021 vs MEL-03 2021	0.999	5.2	
	MEL-01 2021 vs MEL-04 2021	0.989	7.2	
	MEL-01 2021 vs MEL-01 2015	< 0.001	45.5	increase
	MEL-01 2021 vs MEL-03 2017	0.008	-21.5	decrease
	MEL-01 2021 vs MEL-04 2017	0.004	-22.4	decrease
	MEL-03 2021 vs MEL-04 2021	1	1.9	
	MEL-03 2021 vs MEL-01 2015	< 0.001	38.2	increase
	MEL-03 2021 vs MEL-03 2017	< 0.001	-25.4	decrease
	MEL-03 2021 vs MEL-04 2017	< 0.001	-26.3	decrease
	MEL-04 2021 vs MEL-01 2015	< 0.001	35.7	increase
	MEL-04 2021 vs MEL-03 2017	< 0.001	-26.8	decrease
	MEL-04 2021 vs MEL-04 2017	< 0.001	-27.7	decrease
	MEL-01 2015 vs MEL-03 2017	< 0.001	-46.0	decrease
	MEL-01 2015 vs MEL-04 2017	< 0.001	-46.7	decrease
	MEL-03 2017 vs MEL-04 2017	1	-1.2	
Copper	MEL-01 2024 vs MEL-03 2024	0.643	12.1	
	MEL-01 2024 vs MEL-04 2024	1	3.8	
	MEL-01 2024 vs MEL-01 2021	1	-0.3	
	MEL-01 2024 vs MEL-03 2021	0.363	-11.2	
	MEL-01 2024 vs MEL-04 2021	0.877	-7.3	
	MEL-01 2024 vs MEL-01 2015	< 0.001	28.3	increase
	MEL-01 2024 vs MEL-03 2017	1	2.8	
	MEL-01 2024 vs MEL-04 2017	1	1.9	
	MEL-03 2024 vs MEL-04 2024	0.944	-7.4	
	MEL-03 2024 vs MEL-01 2021	0.415	-11.0	
	MEL-03 2024 vs MEL-03 2021	< 0.001	-20.8	decrease
	MEL-03 2024 vs MEL-04 2021	0.012	-17.3	decrease
	MEL-03 2024 vs MEL-01 2015	0.159	14.5	
	MEL-03 2024 vs MEL-03 2017	0.725	-8.3	
	MEL-03 2024 vs MEL-04 2017	0.6	-9.1	
	MEL-04 2024 vs MEL-01 2021	0.998	-3.9	
	MEL-04 2024 vs MEL-03 2021	0.075	-14.5	
	MEL-04 2024 vs MEL-04 2021	0.435	-10.7	
	MEL-04 2024 vs MEL-01 2015	< 0.001	23.6	increase
	MEL-04 2024 vs MEL-03 2017	1	-0.9	
	MEL-04 2024 vs MEL-04 2017	1	-1.8	
	MEL-01 2021 vs MEL-03 2021	0.146	-11.0	
	MEL-01 2021 vs MEL-04 2021	0.739	-7.1	
	MEL-01 2021 vs MEL-01 2015	< 0.001	28.6	increase
	MEL-01 2021 vs MEL-03 2017	0.997	3.1	
	MEL-01 2021 vs MEL-04 2017	1	2.1	
	MEL-03 2021 vs MEL-04 2021	0.985	4.4	
	MEL-03 2021 vs MEL-01 2015	< 0.001	44.5	increase
	MEL-03 2021 vs MEL-03 2017	0.005	15.8	increase
	MEL-03 2021 vs MEL-04 2017	0.011	14.7	increase
	MEL-04 2021 vs MEL-01 2015	< 0.001	38.4	increase
	MEL-04 2021 vs MEL-03 2017	0.147	10.9	
	MEL-04 2021 vs MEL-04 2017	0.25	9.9	
	MEL-01 2015 vs MEL-03 2017	< 0.001	-19.9	decrease
	MEL-01 2015 vs MEL-04 2017	< 0.001	-20.6	decrease
	MEL-03 2017 vs MEL-04 2017	1	-0.9	

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Sodium	MEL-03 2024 vs MEL-04 2024	1	-0.4	
	MEL-03 2024 vs MEL-01 2021	1	-2.0	
	MEL-03 2024 vs MEL-03 2021	0.579	-7.9	
	MEL-03 2024 vs MEL-04 2021	0.495	9.2	
	MEL-03 2024 vs MEL-01 2015	0.318	9.8	
	MEL-03 2024 vs MEL-03 2017	0.033	13.7	increase
	MEL-03 2024 vs MEL-04 2017	< 0.001	18.7	increase
	MEL-04 2024 vs MEL-01 2021	1	-1.6	
	MEL-04 2024 vs MEL-03 2021	0.653	-7.5	
	MEL-04 2024 vs MEL-04 2021	0.423	9.7	
	MEL-04 2024 vs MEL-01 2015	0.257	10.3	
	MEL-04 2024 vs MEL-03 2017	0.023	14.3	increase
	MEL-04 2024 vs MEL-04 2017	< 0.001	19.3	increase
	MEL-01 2021 vs MEL-03 2021	0.687	-6.1	
	MEL-01 2021 vs MEL-04 2021	0.053	11.4	
	MEL-01 2021 vs MEL-01 2015	0.012	12.1	increase
	MEL-01 2021 vs MEL-03 2017	< 0.001	16.1	increase
	MEL-01 2021 vs MEL-04 2017	< 0.001	21.2	increase
	MEL-03 2021 vs MEL-04 2021	< 0.001	18.6	increase
	MEL-03 2021 vs MEL-01 2015	< 0.001	19.3	increase
	MEL-03 2021 vs MEL-03 2017	< 0.001	23.6	increase
	MEL-03 2021 vs MEL-04 2017	< 0.001	29.0	increase
	MEL-04 2021 vs MEL-01 2015	1	0.6	
	MEL-04 2021 vs MEL-03 2017	0.924	4.2	
	MEL-04 2021 vs MEL-04 2017	0.147	8.8	
	MEL-01 2015 vs MEL-03 2017	0.939	3.6	
	MEL-01 2015 vs MEL-04 2017	0.109	8.1	
	MEL-03 2017 vs MEL-04 2017	0.799	4.4	
Strontium	MEL-01 2024 vs MEL-03 2024	0.877	-9.9	
	MEL-01 2024 vs MEL-04 2024	0.028	-21.2	decrease
	MEL-01 2024 vs MEL-01 2021	< 0.001	-31.1	decrease
	MEL-01 2024 vs MEL-03 2021	1	-1.2	
	MEL-01 2024 vs MEL-04 2021	0.996	5.4	
	MEL-01 2024 vs MEL-01 2015	0.003	26.2	increase
	MEL-01 2024 vs MEL-03 2017	0.119	17.7	
	MEL-01 2024 vs MEL-04 2017	0.002	27.0	increase
	MEL-03 2024 vs MEL-04 2024	0.621	-12.6	
	MEL-03 2024 vs MEL-01 2021	< 0.001	-23.6	decrease
	MEL-03 2024 vs MEL-03 2021	0.856	9.7	
	MEL-03 2024 vs MEL-04 2021	0.214	16.9	
	MEL-03 2024 vs MEL-01 2015	< 0.001	40.1	increase
	MEL-03 2024 vs MEL-03 2017	< 0.001	30.7	increase
	MEL-03 2024 vs MEL-04 2017	< 0.001	41.0	increase
	MEL-04 2024 vs MEL-01 2021	0.413	-12.6	
	MEL-04 2024 vs MEL-03 2021	0.008	25.4	increase
	MEL-04 2024 vs MEL-04 2021	< 0.001	33.7	increase
	MEL-04 2024 vs MEL-01 2015	< 0.001	60.2	increase
	MEL-04 2024 vs MEL-03 2017	< 0.001	49.4	increase
	MEL-04 2024 vs MEL-04 2017	< 0.001	61.2	increase
	MEL-01 2021 vs MEL-03 2021	< 0.001	43.5	increase
	MEL-01 2021 vs MEL-04 2021	< 0.001	53.0	increase
	MEL-01 2021 vs MEL-01 2015	< 0.001	83.3	increase
	MEL-01 2021 vs MEL-03 2017	< 0.001	71.0	increase
	MEL-01 2021 vs MEL-04 2017	< 0.001	84.4	increase
	MEL-03 2021 vs MEL-04 2021	0.937	6.6	
	MEL-03 2021 vs MEL-01 2015	< 0.001	27.8	increase
	MEL-03 2021 vs MEL-03 2017	0.003	19.2	increase
	MEL-03 2021 vs MEL-04 2017	< 0.001	28.5	increase
	MEL-04 2021 vs MEL-01 2015	0.003	19.8	increase
	MEL-04 2021 vs MEL-03 2017	0.247	11.7	
	MEL-04 2021 vs MEL-04 2017	0.001	20.5	increase
	MEL-01 2015 vs MEL-03 2017	0.715	-6.7	
	MEL-01 2015 vs MEL-04 2017	1	0.6	
	MEL-03 2017 vs MEL-04 2017	0.577	7.9	

Table H2-3. Tukey post-hoc pairwise comparisons of Threespine Stickleback carcass tissue chemistry among areas and years (p<0.05).

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Iron	MEL-01 2024 vs MEL-03 2024	< 0.001	-44.7	decrease
	MEL-01 2024 vs MEL-04 2024	< 0.001	-54.0	decrease
	MEL-01 2024 vs MEL-01 2021	1	-4.2	
	MEL-01 2024 vs MEL-03 2021	1	-5.3	
	MEL-01 2024 vs MEL-04 2021	0.96	11.6	
	MEL-01 2024 vs MEL-01 2015	0.004	40.5	increase
	MEL-01 2024 vs MEL-03 2017	0.141	-21.2	
	MEL-01 2024 vs MEL-04 2017	0.536	-16.1	
	MEL-03 2024 vs MEL-04 2024	0.735	-16.9	
	MEL-03 2024 vs MEL-01 2021	< 0.001	73.2	increase
	MEL-03 2024 vs MEL-03 2021	< 0.001	71.3	increase
	MEL-03 2024 vs MEL-04 2021	< 0.001	101.9	increase
	MEL-03 2024 vs MEL-01 2015	< 0.001	154.0	increase
	MEL-03 2024 vs MEL-03 2017	0.002	42.5	increase
	MEL-03 2024 vs MEL-04 2017	< 0.001	51.7	increase
	MEL-04 2024 vs MEL-01 2021	< 0.001	108.2	increase
	MEL-04 2024 vs MEL-03 2021	< 0.001	106.0	increase
	MEL-04 2024 vs MEL-04 2021	< 0.001	142.8	increase
	MEL-04 2024 vs MEL-01 2015	< 0.001	205.5	increase
	MEL-04 2024 vs MEL-03 2017	< 0.001	71.4	increase
	MEL-04 2024 vs MEL-04 2017	< 0.001	82.5	increase
	MEL-01 2021 vs MEL-03 2021	1	-1.1	
	MEL-01 2021 vs MEL-04 2021	0.511	16.6	
	MEL-01 2021 vs MEL-01 2015	< 0.001	46.7	increase
	MEL-01 2021 vs MEL-03 2017	0.091	-17.7	
	MEL-01 2021 vs MEL-04 2017	0.565	-12.4	
	MEL-03 2021 vs MEL-04 2021	0.414	17.8	
	MEL-03 2021 vs MEL-01 2015	< 0.001	48.3	increase
	MEL-03 2021 vs MEL-03 2017	0.136	-16.8	
	MEL-03 2021 vs MEL-04 2017	0.675	-11.4	
	MEL-04 2021 vs MEL-01 2015	0.024	25.8	increase
	MEL-04 2021 vs MEL-03 2017	< 0.001	-29.4	decrease
	MEL-04 2021 vs MEL-04 2017	< 0.001	-24.8	decrease
	MEL-01 2015 vs MEL-03 2017	< 0.001	-43.9	decrease
	MEL-01 2015 vs MEL-04 2017	< 0.001	-40.3	decrease
	MEL-03 2017 vs MEL-04 2017	0.977	6.5	
Lead	MEL-01 2024 vs MEL-03 2024	0.089	-31.9	
	MEL-01 2024 vs MEL-04 2024	0.019	-36.5	decrease
	MEL-01 2024 vs MEL-01 2021	0.217	-25.4	
	MEL-01 2024 vs MEL-03 2021	0.968	-12.2	
	MEL-01 2024 vs MEL-04 2021	0.013	-33.3	decrease
	MEL-01 2024 vs MEL-01 2015	1	-0.3	
	MEL-01 2024 vs MEL-03 2017	0.974	-11.1	
	MEL-01 2024 vs MEL-04 2017	0.46	-20.2	
	MEL-03 2024 vs MEL-04 2024	1	-6.7	
	MEL-03 2024 vs MEL-01 2021	0.997	9.6	
	MEL-03 2024 vs MEL-03 2021	0.393	28.9	
	MEL-03 2024 vs MEL-04 2021	1	-2.0	
	MEL-03 2024 vs MEL-01 2015	0.013	46.4	increase
	MEL-03 2024 vs MEL-03 2017	0.234	30.6	
	MEL-03 2024 vs MEL-04 2017	0.862	17.2	
	MEL-04 2024 vs MEL-01 2021	0.9	17.4	
	MEL-04 2024 vs MEL-03 2021	0.111	38.1	
	MEL-04 2024 vs MEL-04 2021	1	5.0	
	MEL-04 2024 vs MEL-01 2015	0.001	56.9	increase
	MEL-04 2024 vs MEL-03 2017	0.046	39.9	increase
	MEL-04 2024 vs MEL-04 2017	0.452	25.5	
	MEL-01 2021 vs MEL-03 2021	0.735	17.6	
	MEL-01 2021 vs MEL-04 2021	0.96	-10.6	
	MEL-01 2021 vs MEL-01 2015	0.025	33.6	increase
	MEL-01 2021 vs MEL-03 2017	0.502	19.1	
	MEL-01 2021 vs MEL-04 2017	0.997	6.9	
	MEL-03 2021 vs MEL-04 2021	0.084	-24.0	
	MEL-03 2021 vs MEL-01 2015	0.86	13.5	
	MEL-03 2021 vs MEL-03 2017	1	1.3	

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Thallium	MEL-01 2024 vs MEL-03 2024	0.959	12.8	
	MEL-01 2024 vs MEL-04 2024	0.725	-16.1	
	MEL-01 2024 vs MEL-01 2021	< 0.001	-43.0	decrease
	MEL-01 2024 vs MEL-03 2021	0.002	-30.4	decrease
	MEL-01 2024 vs MEL-04 2021	< 0.001	-37.5	decrease
	MEL-01 2024 vs MEL-01 2015	< 0.001	-36.9	decrease
	MEL-01 2024 vs MEL-03 2017	< 0.001	-29.7	decrease
	MEL-01 2024 vs MEL-04 2017	< 0.001	-34.5	decrease
	MEL-03 2024 vs MEL-04 2024	0.087	-25.7	
	MEL-03 2024 vs MEL-01 2021	< 0.001	-49.5	decrease
	MEL-03 2024 vs MEL-03 2021	< 0.001	-38.3	decrease
	MEL-03 2024 vs MEL-04 2021	< 0.001	-44.6	decrease
	MEL-03 2024 vs MEL-01 2015	< 0.001	-44.1	decrease
	MEL-03 2024 vs MEL-03 2017	< 0.001	-37.7	decrease
	MEL-03 2024 vs MEL-04 2017	< 0.001	-41.9	decrease
	MEL-04 2024 vs MEL-01 2021	< 0.001	-32.0	decrease
	MEL-04 2024 vs MEL-03 2021	0.466	-17.0	
	MEL-04 2024 vs MEL-04 2021	0.025	-25.5	decrease
	MEL-04 2024 vs MEL-01 2015	0.019	-24.8	decrease
	MEL-04 2024 vs MEL-03 2017	0.443	-16.1	
	MEL-04 2024 vs MEL-04 2017	0.068	-21.8	
	MEL-01 2021 vs MEL-03 2021	0.122	22.2	
	MEL-01 2021 vs MEL-04 2021	0.936	9.6	
	MEL-01 2021 vs MEL-01 2015	0.833	10.7	
	MEL-01 2021 vs MEL-03 2017	0.031	23.4	increase
	MEL-01 2021 vs MEL-04 2017	0.425	15.0	
	MEL-03 2021 vs MEL-04 2021	0.852	-10.2	
	MEL-03 2021 vs MEL-01 2015	0.851	-9.4	
	MEL-03 2021 vs MEL-03 2017	1	1.0	
	MEL-03 2021 vs MEL-04 2017	0.99	-5.9	
	MEL-04 2021 vs MEL-01 2015	1	0.9	
	MEL-04 2021 vs MEL-03 2017	0.653	12.6	
	MEL-04 2021 vs MEL-04 2017	0.998	4.9	
	MEL-01 2015 vs MEL-03 2017	0.607	11.5	
	MEL-01 2015 vs MEL-04 2017	0.999	3.9	
	MEL-03 2017 vs MEL-04 2017	0.938	-6.8	
Uranium	MEL-01 2024 vs MEL-03 2024	0.031	55.5	increase
	MEL-01 2024 vs MEL-04 2024	0.82	23.5	
	MEL-01 2024 vs MEL-01 2021	0.963	-12.7	
	MEL-01 2024 vs MEL-03 2021	0.526	26.6	
	MEL-01 2024 vs MEL-04 2021	0.91	17.2	
	MEL-01 2024 vs MEL-01 2015	< 0.001	75.7	increase
	MEL-01 2024 vs MEL-03 2017	< 0.001	72.4	increase
	MEL-01 2024 vs MEL-04 2017	0.464	25.8	
	MEL-03 2024 vs MEL-04 2024	0.738	-20.6	
	MEL-03 2024 vs MEL-01 2021	< 0.001	-43.8	decrease
	MEL-03 2024 vs MEL-03 2021	0.705	-18.6	
	MEL-03 2024 vs MEL-04 2021	0.272	-24.6	
	MEL-03 2024 vs MEL-01 2015	0.972	13.0	
	MEL-03 2024 vs MEL-03 2017	0.989	10.9	
	MEL-03 2024 vs MEL-04 2017	0.573	-19.1	
	MEL-04 2024 vs MEL-01 2021	0.074	-29.3	
	MEL-04 2024 vs MEL-03 2021	1	2.5	
	MEL-04 2024 vs MEL-04 2021	1	-5.1	
	MEL-04 2024 vs MEL-01 2015	0.038	42.3	increase
	MEL-04 2024 vs MEL-03 2017	0.056	39.6	
	MEL-04 2024 vs MEL-04 2017	1	1.8	
	MEL-01 2021 vs MEL-03 2021	0.004	45.0	increase
	MEL-01 2021 vs MEL-04 2021	0.053	34.3	
	MEL-01 2021 vs MEL-01 2015	< 0.001	101.3	increase
	MEL-01 2021 vs MEL-03 2017	< 0.001	97.5	increase
	MEL-01 2021 vs MEL-04 2017	< 0.001	44.0	increase
	MEL-03 2021 vs MEL-04 2021	0.997	-7.4	
	MEL-03 2021 vs MEL-01 2015	0.006	38.8	increase
	MEL-03 2021 vs MEL-03 2017	0.009	36.2	increase

Table H2-3. Tukey post-hoc pairwise comparisons of Threespine Stickleback carcass tissue chemistry among areas and years (p<0.05).

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Lead	MEL-03 2021 vs MEL-04 2017	0.967	-9.1	
	MEL-04 2021 vs MEL-01 2015	< 0.001	49.4	increase
	MEL-04 2021 vs MEL-03 2017	0.019	33.2	increase
	MEL-04 2021 vs MEL-04 2017	0.454	19.5	
	MEL-01 2015 vs MEL-03 2017	0.838	-10.8	
	MEL-01 2015 vs MEL-04 2017	0.072	-20.0	
	MEL-03 2017 vs MEL-04 2017	0.859	-10.3	
Magnesium	MEL-01 2024 vs MEL-03 2024	0.997	-4.2	
	MEL-01 2024 vs MEL-04 2024	0.856	-7.9	
	MEL-01 2024 vs MEL-01 2021	< 0.001	-21.8	decrease
	MEL-01 2024 vs MEL-03 2021	0.002	-17.6	decrease
	MEL-01 2024 vs MEL-04 2021	0.127	-12.4	
	MEL-01 2024 vs MEL-01 2015	0.292	11.3	
	MEL-01 2024 vs MEL-03 2017	0.996	3.8	
	MEL-01 2024 vs MEL-04 2017	0.99	4.3	
	MEL-03 2024 vs MEL-04 2024	0.999	-3.9	
	MEL-03 2024 vs MEL-01 2021	< 0.001	-18.4	decrease
	MEL-03 2024 vs MEL-03 2021	0.044	-14.0	decrease
	MEL-03 2024 vs MEL-04 2021	0.634	-8.5	
	MEL-03 2024 vs MEL-01 2015	0.025	16.2	increase
	MEL-03 2024 vs MEL-03 2017	0.678	8.3	
	MEL-03 2024 vs MEL-04 2017	0.598	8.9	
	MEL-04 2024 vs MEL-01 2021	0.019	-15.1	decrease
	MEL-04 2024 vs MEL-03 2021	0.324	-10.5	
	MEL-04 2024 vs MEL-04 2021	0.981	-4.8	
	MEL-04 2024 vs MEL-01 2015	0.001	20.9	increase
	MEL-04 2024 vs MEL-03 2017	0.153	12.7	
	MEL-04 2024 vs MEL-04 2017	0.115	13.3	
	MEL-01 2021 vs MEL-03 2021	0.918	5.4	
	MEL-01 2021 vs MEL-04 2021	0.086	12.0	
	MEL-01 2021 vs MEL-01 2015	< 0.001	42.3	increase
	MEL-01 2021 vs MEL-03 2017	< 0.001	32.7	increase
	MEL-01 2021 vs MEL-04 2017	< 0.001	33.4	increase
	MEL-03 2021 vs MEL-04 2021	0.814	6.3	
	MEL-03 2021 vs MEL-01 2015	< 0.001	35.1	increase
	MEL-03 2021 vs MEL-03 2017	< 0.001	25.9	increase
	MEL-03 2021 vs MEL-04 2017	< 0.001	26.6	increase
	MEL-04 2021 vs MEL-01 2015	< 0.001	27.0	increase
	MEL-04 2021 vs MEL-03 2017	< 0.001	18.4	increase
	MEL-04 2021 vs MEL-04 2017	< 0.001	19.0	increase
	MEL-01 2015 vs MEL-03 2017	0.36	-6.8	
	MEL-01 2015 vs MEL-04 2017	0.47	-6.3	
	MEL-03 2017 vs MEL-04 2017	1	0.5	
Manganese	MEL-01 2024 vs MEL-03 2024	1	4.9	
	MEL-01 2024 vs MEL-04 2024	0.146	-20.2	
	MEL-01 2024 vs MEL-01 2021	0.722	-11.8	
	MEL-01 2024 vs MEL-03 2021	0.143	21.8	
	MEL-01 2024 vs MEL-04 2021	0.048	25.4	increase
	MEL-01 2024 vs MEL-01 2015	< 0.001	35.2	increase
	MEL-01 2024 vs MEL-03 2017	< 0.001	33.2	increase
	MEL-01 2024 vs MEL-04 2017	0.022	25.6	increase
	MEL-03 2024 vs MEL-04 2024	0.026	-23.9	decrease
	MEL-03 2024 vs MEL-01 2021	0.264	-15.9	
	MEL-03 2024 vs MEL-03 2021	0.477	16.1	
	MEL-03 2024 vs MEL-04 2021	0.23	19.5	
	MEL-03 2024 vs MEL-01 2015	0.005	28.9	increase
	MEL-03 2024 vs MEL-03 2017	0.01	26.9	increase
	MEL-03 2024 vs MEL-04 2017	0.141	19.8	
	MEL-04 2024 vs MEL-01 2021	0.894	10.5	
	MEL-04 2024 vs MEL-03 2021	< 0.001	52.6	increase
	MEL-04 2024 vs MEL-04 2021	< 0.001	57.1	increase
	MEL-04 2024 vs MEL-01 2015	< 0.001	69.4	increase
	MEL-04 2024 vs MEL-03 2017	< 0.001	66.8	increase
	MEL-04 2024 vs MEL-04 2017	< 0.001	57.4	increase
	MEL-01 2021 vs MEL-03 2021	< 0.001	38.0	increase
Uranium	MEL-03 2021 vs MEL-04 2017	1	-0.7	
	MEL-04 2021 vs MEL-01 2015	< 0.001	49.9	increase
	MEL-04 2021 vs MEL-03 2017	< 0.001	47.1	increase
	MEL-04 2021 vs MEL-04 2017	0.996	7.3	
	MEL-01 2015 vs MEL-03 2017	1	-1.9	
	MEL-01 2015 vs MEL-04 2017	< 0.001	-28.4	decrease
	MEL-03 2017 vs MEL-04 2017	< 0.001	-27.1	decrease
Zinc	MEL-01 2024 vs MEL-03 2024	0.152	20.9	
	MEL-01 2024 vs MEL-04 2024	0.998	5.6	
	MEL-01 2024 vs MEL-01 2021	0.107	18.9	
	MEL-01 2024 vs MEL-03 2021	0.574	12.7	
	MEL-01 2024 vs MEL-04 2021	0.002	27.9	increase
	MEL-01 2024 vs MEL-01 2015	< 0.001	77.3	increase
	MEL-01 2024 vs MEL-03 2017	< 0.001	57.5	increase
	MEL-01 2024 vs MEL-04 2017	< 0.001	48.9	increase
	MEL-03 2024 vs MEL-04 2024	0.595	-12.7	
	MEL-03 2024 vs MEL-01 2021	1	-1.7	
	MEL-03 2024 vs MEL-03 2021	0.964	-6.8	
	MEL-03 2024 vs MEL-04 2021	0.992	5.8	
	MEL-03 2024 vs MEL-01 2015	< 0.001	46.6	increase
	MEL-03 2024 vs MEL-03 2017	< 0.001	30.2	increase
	MEL-03 2024 vs MEL-04 2017	0.008	23.1	increase
	MEL-04 2024 vs MEL-01 2021	0.58	12.6	
	MEL-04 2024 vs MEL-03 2021	0.979	6.7	
	MEL-04 2024 vs MEL-04 2021	0.046	21.1	increase
	MEL-04 2024 vs MEL-01 2015	< 0.001	67.9	increase
	MEL-04 2024 vs MEL-03 2017	< 0.001	49.1	increase
	MEL-04 2024 vs MEL-04 2017	< 0.001	41.0	increase
	MEL-01 2021 vs MEL-03 2021	0.976	-5.2	
	MEL-01 2021 vs MEL-04 2021	0.869	7.6	
	MEL-01 2021 vs MEL-01 2015	< 0.001	49.1	increase
	MEL-01 2021 vs MEL-03 2017	< 0.001	32.4	increase
	MEL-01 2021 vs MEL-04 2017	< 0.001	25.2	increase
	MEL-03 2021 vs MEL-04 2021	0.211	13.5	
	MEL-03 2021 vs MEL-01 2015	< 0.001	57.3	increase
	MEL-03 2021 vs MEL-03 2017	< 0.001	39.8	increase
	MEL-03 2021 vs MEL-04 2017	< 0.001	32.1	increase
	MEL-04 2021 vs MEL-01 2015	< 0.001	38.6	increase
	MEL-04 2021 vs MEL-03 2017	< 0.001	23.1	increase
	MEL-04 2021 vs MEL-04 2017	0.02	16.4	increase
	MEL-01 2015 vs MEL-03 2017	0.071	-11.2	
	MEL-01 2015 vs MEL-04 2017	< 0.001	-16.0	decrease
	MEL-03 2017 vs MEL-04 2017	0.874	-5.4	

Table H2-3. Tukey post-hoc pairwise comparisons of Threespine Stickleback carcass tissue chemistry between areas and years (p<0.05).

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Manganese	MEL-01 2021 vs MEL-04 2021	< 0.001	42.2	increase
	MEL-01 2021 vs MEL-01 2015	< 0.001	53.3	increase
	MEL-01 2021 vs MEL-03 2017	< 0.001	51.0	increase
	MEL-01 2021 vs MEL-04 2017	< 0.001	42.5	increase
	MEL-03 2021 vs MEL-04 2021	1	3.0	
	MEL-03 2021 vs MEL-01 2015	0.559	11.0	
	MEL-03 2021 vs MEL-03 2017	0.729	9.4	
	MEL-03 2021 vs MEL-04 2017	1	3.2	
	MEL-04 2021 vs MEL-01 2015	0.888	7.8	
	MEL-04 2021 vs MEL-03 2017	0.964	6.2	
	MEL-04 2021 vs MEL-04 2017	1	0.2	
	MEL-01 2015 vs MEL-03 2017	1	-1.5	
	MEL-01 2015 vs MEL-04 2017	0.81	-7.1	
	MEL-03 2017 vs MEL-04 2017	0.932	-5.6	

APPENDIX I
LAKE TROUT – SUPPORTING INFORMATION

Appendix I-1
Lake Trout Health Assessment

APPENDIX I1 - TABLES

Table I1-1. Gill net locations, set and lift times, and catch results for the 2024 Lake Trout study. 1
Table I1-2. Descriptive statistics of fisheries data for Lake Trout by lake, sex, and maturity in 2024..... 2
Table I1-3. Lake Trout age QA results in 2024. 4
Table I1-4. Catch data for Lake Trout in Meliadine Lake, Atulik Lake and Peter Lake in 2024. 5

Table I1-1. Gill net locations, set and lift times, and catch results for the 2024 Lake Trout study.

Lake	Gill net ID	Position	Depth (m)	UTM Zone 15N		Gill net set		Gill net lift		Catch Results					
				Easting	Northing	mmm-dd	hh:mm	mmm-dd	hh:mm	LKTR	ARCH	RNWH	BURB	CISC	ARGR
Meliadine	GN-01	start	1.6	542923	6989299	Aug-12	20:32	Aug-13	9:52	17	0	8	0	20	4
		end	5.6	542953	6989219										
	GN-02	start	5.6	542685	6989358	Aug-13	12:03	Aug-13	20:41	5	0	0	0	0	0
		end	7.3	542734	6989312										
	GN-03	start	2.3	542676	6989368	Aug-16	8:42	Aug-16	17:59	6	0	3	0	0	0
		end	7.7	542733	6989298										
Atulik	GN-01	start	3.3	555748	6978758	Aug-18	17:30	Aug-19	7:45	20	0	0	0	20	1
		end	5.8	555787	6978682										
	GN-02	start	3.9	556680	6978362	Aug-18	17:55	Aug-19	8:25	21	0	0	0	21	2
		end	2.6	556750	6978326										
	GN-03	start	2	555206	6979066	Aug-18	18:05	Aug-19	9:15	13	0	0	0	10	2
		end	1	555284	6979077										
Peter	GN-01	start	1.5	511179	6991431	Aug-17	14:10	Aug-18	8:20	19	1	3	0	8	0
		end	6.1	511250	6991377										
	GN-02	start	1.6	511496	6990761	Aug-17	14:45	Aug-18	9:37	26	1	1	0	8	0
		end	4.9	511455	6990828										
	GN-03	start	1.6	510885	6991289	Aug-17	14:55	Aug-18	10:55	17	2	1	0	11	1
		end	4.8	510915	6991213										

Notes:

LKTR = Lake Trout; ARCH = Arctic Char; RNWH = Round Whitefish; BURB = Burbot; CISC = Cisco; ARGR = Arctic Grayling

Table I1-2. Descriptive statistics of fisheries data for Lake Trout by lake, sex, and maturity in 2024.

Lake	Sex	Maturity	Variable	N	Min	Max	Mean	Median	SD	SE
Meliadine	Male	Immature	Fork Length (mm)	3	399	658	507	464	134.7479	77.7967
Meliadine	Male	Immature	Total Weight (g)	3	675	2764	1537	1172	1091.283	630.0526
Meliadine	Male	Immature	Age (yr)	3	9	32	17	10	13	7.5056
Meliadine	Male	Immature	Liver Weight (g)	3	4.23	25.1	18.01	24.7	11.9355	6.891
Meliadine	Male	Immature	Gonad Weight (g)	3	0.45	7.38	2.86	0.75	3.9173	2.2617
Meliadine	Male	Immature	Condition Factor	3	0.9702	1.1732	1.0687	1.0626	0.1016	0.0587
Meliadine	Male	Immature	Hepatosomatic Index	3	0.6267	2.1416	1.2206	0.8936	0.8087	0.4669
Meliadine	Male	Immature	Gonadosomatic Index	3	0.064	0.267	0.1326	0.0667	0.1164	0.0672
Meliadine	Male	Mature	Fork Length (mm)	5	541	804	660.8	612	127.1877	56.88
Meliadine	Male	Mature	Total Weight (g)	5	1794	6110	3390.6	2591	1897.408	848.5466
Meliadine	Male	Mature	Age (yr)	5	19	37	29.6	31	7.9875	3.5721
Meliadine	Male	Mature	Liver Weight (g)	5	15.73	48.8	28.466	27.3	13.7979	6.1706
Meliadine	Male	Mature	Gonad Weight (g)	5	12.03	133.01	65.484	44.6	49.341	22.066
Meliadine	Male	Mature	Condition Factor	5	0.9332	1.1756	1.0894	1.1304	0.0944	0.0422
Meliadine	Male	Mature	Hepatosomatic Index	5	0.7455	1.0536	0.8694	0.8724	0.1166	0.0521
Meliadine	Male	Mature	Gonadosomatic Index	5	0.2615	3.8364	2.1632	2.1769	1.2722	0.5689
Meliadine	Female	Immature	Fork Length (mm)	14	270	594	468.6429	472.5	86.198	23.0374
Meliadine	Female	Immature	Total Weight (g)	14	178	2075	1198.143	1253	560.4153	149.7773
Meliadine	Female	Immature	Age (yr)	14	4	24	13	13	4.8198	1.2882
Meliadine	Female	Immature	Liver Weight (g)	14	1.75	46.5	17.455	15.2	11.8606	3.1699
Meliadine	Female	Immature	Gonad Weight (g)	14	0.2	20.38	4.7407	3.105	5.2508	1.4033
Meliadine	Female	Immature	Condition Factor	14	0.8111	1.2684	1.065	1.0546	0.143	0.0382
Meliadine	Female	Immature	Hepatosomatic Index	14	0.8102	2.241	1.3508	1.2643	0.3946	0.1054
Meliadine	Female	Immature	Gonadosomatic Index	14	0.0372	1.1354	0.3493	0.2744	0.2814	0.0752
Meliadine	Female	Mature	Fork Length (mm)	3	639	714	684.3333	700	39.879	23.0241
Meliadine	Female	Mature	Total Weight (g)	3	3272	4765	4188.667	4529	802.5786	463.3689
Meliadine	Female	Mature	Age (yr)	3	22	34	27.3333	26	6.1101	3.5277
Meliadine	Female	Mature	Liver Weight (g)	3	42.9	65.4	55.4333	58	11.4675	6.6208
Meliadine	Female	Mature	Gonad Weight (g)	3	32.49	345	145.9667	60.41	172.9323	99.8425
Meliadine	Female	Mature	Condition Factor	3	1.254	1.3204	1.2945	1.3091	0.0355	0.0205
Meliadine	Female	Mature	Hepatosomatic Index	3	1.2806	1.3725	1.3214	1.3111	0.0468	0.027
Meliadine	Female	Mature	Gonadosomatic Index	3	0.993	7.2403	3.189	1.3338	3.5126	2.028
Meliadine	Unknown	Immature	Fork Length (mm)	3	267	384	324.3333	322	58.5349	33.7951
Meliadine	Unknown	Immature	Total Weight (g)	3	196	621	395	368	213.7826	123.4274
Meliadine	Unknown	Immature	Age (yr)	3	6	10	7.6667	7	2.0817	1.2019
Meliadine	Unknown	Immature	Liver Weight (g)	3	2.21	5.49	4.2233	4.97	1.7629	1.0178
Meliadine	Unknown	Immature	Gonad Weight (g)	2	0.17	0.21	0.19	0.19	0.0283	0.02
Meliadine	Unknown	Immature	Condition Factor	3	1.0297	1.1023	1.0762	1.0967	0.0404	0.0233
Meliadine	Unknown	Immature	Hepatosomatic Index	3	0.8841	1.3505	1.1207	1.1276	0.2333	0.1347
Meliadine	Unknown	Immature	Gonadosomatic Index	2	0.0338	0.0462	0.04	0.04	0.0088	0.0062
Atulik	Male	Immature	Fork Length (mm)	15	267	633	434.2667	467	110.8309	28.6164
Atulik	Male	Immature	Total Weight (g)	15	136.9	2872	1043.86	1094	744.4819	192.2244
Atulik	Male	Immature	Age (yr)	15	7	24	13.4667	15	4.8678	1.2569
Atulik	Male	Immature	Liver Weight (g)	15	1.6	28.9	11.9747	13	8.7239	2.2525
Atulik	Male	Immature	Gonad Weight (g)	15	0.09	3.14	0.9353	0.82	0.8933	0.2306
Atulik	Male	Immature	Condition Factor	15	0.5121	1.178	1.0554	1.1089	0.1642	0.0424
Atulik	Male	Immature	Hepatosomatic Index	15	0.5351	1.8992	1.1525	1.1296	0.3627	0.0936
Atulik	Male	Immature	Gonadosomatic Index	15	0.0208	0.191	0.0792	0.0758	0.0374	0.0097
Atulik	Male	Mature	Fork Length (mm)	3	583	667	632.6667	648	44.0492	25.4318
Atulik	Male	Mature	Total Weight (g)	3	2181	3783	2992.333	3013	801.1999	462.573
Atulik	Male	Mature	Age (yr)	3	19	25	21.3333	20	3.2146	1.8559
Atulik	Male	Mature	Liver Weight (g)	3	24.8	38.1	30.1667	27.6	7.0117	4.0482
Atulik	Male	Mature	Gonad Weight (g)	3	6.46	69.19	47.5967	67.14	35.6401	20.5768
Atulik	Male	Mature	Condition Factor	3	1.1007	1.2748	1.1609	1.1073	0.0987	0.057
Atulik	Male	Mature	Hepatosomatic Index	3	0.916	1.1371	1.0201	1.0071	0.1111	0.0641
Atulik	Male	Mature	Gonadosomatic Index	3	0.1708	3.1724	1.8572	2.2283	1.5349	0.8861
Atulik	Female	Immature	Fork Length (mm)	17	265	557	375.6471	356	87.4678	21.2141
Atulik	Female	Immature	Total Weight (g)	17	181.4	2243	684.2059	499	532.7085	129.2008
Atulik	Female	Immature	Age (yr)	17	7	19	11	11	3.3354	0.809
Atulik	Female	Immature	Liver Weight (g)	17	1.11	22.6	6.7859	4.95	5.5405	1.3438
Atulik	Female	Immature	Gonad Weight (g)	17	0.13	13.66	2.8488	0.98	3.9307	0.9533
Atulik	Female	Immature	Condition Factor	17	0.8856	1.298	1.0935	1.0918	0.107	0.026
Atulik	Female	Immature	Hepatosomatic Index	17	0.6119	1.4966	0.9607	0.9478	0.2294	0.0556
Atulik	Female	Immature	Gonadosomatic Index	17	0.0372	0.7403	0.3017	0.2101	0.2163	0.0525
Atulik	Female	Mature	Fork Length (mm)	2	452	535	493.5	493.5	58.6899	41.5
Atulik	Female	Mature	Total Weight (g)	2	1049	1702	1375.5	1375.5	461.7407	326.5

Table I1-2. Descriptive statistics of fisheries data for Lake Trout by lake, sex, and maturity in 2024.

Lake	Sex	Maturity	Variable	N	Min	Max	Mean	Median	SD	SE
Atulik	Female	Mature	Age (yr)	2	15	23	19	19	5.6569	4
Atulik	Female	Mature	Liver Weight (g)	2	10.2	20.4	15.3	15.3	7.2125	5.1
Atulik	Female	Mature	Gonad Weight (g)	2	16.09	27.43	21.76	21.76	8.0186	5.67
Atulik	Female	Mature	Condition Factor	2	1.1115	1.136	1.1237	1.1237	0.0173	0.0122
Atulik	Female	Mature	Hepatosomatic Index	2	0.9724	1.1986	1.0855	1.0855	0.16	0.1131
Atulik	Female	Mature	Gonadosomatic Index	2	1.5338	1.6116	1.5727	1.5727	0.055	0.0389
Atulik	Unknown	Immature	Fork Length (mm)	8	182	308	254.375	257	42.895	15.1657
Atulik	Unknown	Immature	Total Weight (g)	8	65.8	297	177.25	160.5	82.1855	29.057
Atulik	Unknown	Immature	Age (yr)	8	4	8	6.5	6.5	1.5119	0.5345
Atulik	Unknown	Immature	Liver Weight (g)	8	0.51	3.02	1.5413	1.29	0.8866	0.3135
Atulik	Unknown	Immature	Gonad Weight (g)	7	0.05	0.12	0.0857	0.08	0.0237	0.009
Atulik	Unknown	Immature	Condition Factor	8	0.9081	1.1037	1.0143	1.0328	0.0772	0.0273
Atulik	Unknown	Immature	Hepatosomatic Index	8	0.637	1.1313	0.8518	0.8562	0.1831	0.0647
Atulik	Unknown	Immature	Gonadosomatic Index	7	0.0376	0.1216	0.0553	0.0413	0.031	0.0117
Peter	Male	Immature	Fork Length (mm)	5	467	580	514	510	45.9184	20.5353
Peter	Male	Immature	Total Weight (g)	5	1095	2009	1475.6	1376	411.5152	184.0352
Peter	Male	Immature	Age (yr)	5	12	32	19	18	7.6811	3.4351
Peter	Male	Immature	Liver Weight (g)	5	10.2	27.1	16.28	14.4	6.4185	2.8704
Peter	Male	Immature	Gonad Weight (g)	5	1.29	2.59	1.774	1.68	0.5243	0.2345
Peter	Male	Immature	Condition Factor	5	1.0089	1.1644	1.065	1.0373	0.0621	0.0278
Peter	Male	Immature	Hepatosomatic Index	5	0.8979	1.3489	1.094	0.9884	0.2149	0.0961
Peter	Male	Immature	Gonadosomatic Index	5	0.0938	0.152	0.1224	0.1251	0.0267	0.012
Peter	Male	Mature	Fork Length (mm)	12	528	725	618.6667	604	55.9421	16.1491
Peter	Male	Mature	Total Weight (g)	12	1474	3962	2784.25	2606	765.0332	220.8461
Peter	Male	Mature	Age (yr)	11	13	30	20.1818	19	4.6652	1.4066
Peter	Male	Mature	Liver Weight (g)	12	13.9	47.8	27.2333	25.55	8.7251	2.5187
Peter	Male	Mature	Gonad Weight (g)	12	5.91	97.85	56.7675	63.46	30.5661	8.8237
Peter	Male	Mature	Condition Factor	12	1.0014	1.3232	1.1529	1.2036	0.1206	0.0348
Peter	Male	Mature	Hepatosomatic Index	12	0.6234	1.238	0.9839	0.9406	0.1653	0.0477
Peter	Male	Mature	Gonadosomatic Index	12	0.1544	3.4007	2.1457	2.5224	1.1019	0.3181
Peter	Female	Immature	Fork Length (mm)	8	277	560	412.625	422	94.7839	33.5112
Peter	Female	Immature	Total Weight (g)	8	133.1	1794	790.4375	753.5	557.5781	197.1336
Peter	Female	Immature	Age (yr)	8	6	15	10.5	9.5	3.9641	1.4015
Peter	Female	Immature	Liver Weight (g)	8	2.25	18	8.2188	7.15	5.5527	1.9632
Peter	Female	Immature	Gonad Weight (g)	8	0.28	15.57	3.6538	1.285	5.4609	1.9307
Peter	Female	Immature	Condition Factor	8	0.6044	1.1474	0.908	0.9648	0.1938	0.0685
Peter	Female	Immature	Hepatosomatic Index	8	0.8194	1.8388	1.1935	1.0239	0.3951	0.1397
Peter	Female	Immature	Gonadosomatic Index	8	0.0595	1.1895	0.3555	0.2659	0.3597	0.1272
Peter	Female	Mature	Fork Length (mm)	14	524	775	651	657.5	75.6083	20.2072
Peter	Female	Mature	Total Weight (g)	14	1372	4470	3145.571	3292.5	1005.852	268.8252
Peter	Female	Mature	Age (yr)	14	15	35	23.7143	23	6.3176	1.6885
Peter	Female	Mature	Liver Weight (g)	14	13	67.7	42.3214	45.25	18.1416	4.8486
Peter	Female	Mature	Gonad Weight (g)	14	23.91	467.4	115.1107	45.03	147.28	39.3622
Peter	Female	Mature	Condition Factor	14	0.896	1.2942	1.101	1.1073	0.1237	0.0331
Peter	Female	Mature	Hepatosomatic Index	14	0.8045	2.0813	1.341	1.2672	0.4266	0.114
Peter	Female	Mature	Gonadosomatic Index	14	0.9822	12.3415	3.5985	1.5222	4.3001	1.1492
Peter	Unknown	Immature	Fork Length (mm)	2	175	296	235.5	235.5	85.5599	60.5
Peter	Unknown	Immature	Total Weight (g)	2	59.3	132.6	95.95	95.95	51.8309	36.65
Peter	Unknown	Immature	Age (yr)	2	2	9	5.5	5.5	4.9497	3.5
Peter	Unknown	Immature	Liver Weight (g)	2	0.42	2.6	1.51	1.51	1.5415	1.09
Peter	Unknown	Immature	Gonad Weight (g)	2	0.05	0.25	0.15	0.15	0.1414	0.1
Peter	Unknown	Immature	Condition Factor	2	0.5113	1.1065	0.8089	0.8089	0.4209	0.2976
Peter	Unknown	Immature	Hepatosomatic Index	2	0.7083	1.9608	1.3345	1.3345	0.8857	0.6263
Peter	Unknown	Immature	Gonadosomatic Index	2	0.0843	0.1885	0.1364	0.1364	0.0737	0.0521

Table I1-3. Lake Trout age QA results in 2024.

Fish ID	Age (yr)		
	First Reading (L. Stanley)	Second Reading (C. Portt)	Difference
6	22	22	0
13	10	10	0
18	13	12	1
21	13	13	0
37	19	19	0
47	9	9	0
49	9	9	0
77	19	18	1
78	7	7	0
95	17	17	0
106	19	20	1

Table I1-4. Catch data for Lake Trout in Meliadine Lake, Atulik Lake and Peter Lake in 2024.

Lake	Fish ID	Sex	Maturity	Total Length (mm)	Fork Length (mm)	Total Weight (g)	Age (yr)	Liver Weight (g)	Gonad Weight (g)	Gonad Status	Egg Sample Count	Egg Sample Weight (g)	DELTs and Internal Observations[a]	Stomach Content
Meliadine	1	Female	Immature	446	409	728	18	8.1	2.48	Undeveloped			EC	
Meliadine	2	Female	Immature	506	458	1074	10	14.1	2.35	Undeveloped				1 cisco
Meliadine	3	Unknown	Immature	290	267	196	7	2.21		Undeveloped			EC	
Meliadine	4	Female	Immature	606	552	2075	13	46.5	6.04	Undeveloped			EC	1 unidentified fish
Meliadine	5	Male	Mature	612	557	1857	19	16.2	44.6	Resting				1 snail
Meliadine	6	Female	Mature	691	639	3272	22	42.9	32.49	Resting				
Meliadine	7	Female	Immature	458	411	706	15	5.72	4.13	Undeveloped			EC	
Meliadine	8	Male	Mature	595	541	1794	31	15.73	38.38	Resting			EC	2 stones
Meliadine	9	Female	Mature	788	714	4765	34	65.4	345	Ripe	324	31.87		1 whitefish
Meliadine	10	Male	Mature	670	612	2591	24	27.3	99.4	Resting				1 unidentified fish
Meliadine	11	Male	Immature	719	658	2764	32	24.7	7.38	Undeveloped			EC	
Meliadine	12	Female	Immature	533	487	1465	15	16.3	1.04	Undeveloped				
Meliadine	13	Unknown	Immature	422	384	621	10	5.49	0.21	Undeveloped			EC	
Meliadine	14	Unknown	Immature	354	322	368	6	4.97	0.17	Undeveloped				
Meliadine	15	Female	Immature	298	270	178	4	1.75	0.24	Undeveloped			EC	
Meliadine	16	Male	Immature	446	399	675	10	4.23	0.45	Undeveloped			2 waxy deposits	
Meliadine	17	Male	Mature	861	790	4601	37	34.3	12.03	Resting			EC	
Meliadine	18	Female	Immature	572	561	1432	13	25.2	3.69	Undeveloped			EC	
Meliadine	19	Female	Immature	578	528	1710	15	24.8	8.89	Undeveloped			EC	2 unidentified fish
Meliadine	20	Female	Immature	503	456	973	12	12.3	4.1	Undeveloped				
Meliadine	21	Female	Immature	572	518	1724	13	21.8	8.5	Undeveloped				2 3-spines
Meliadine	22	Male	Mature	871	804	6110	37	48.8	133.01	Ripe				
Meliadine	23	Female	Immature	476	433	809	13	11.7	1.81	Undeveloped				4 3-spines
Meliadine	24	Female	Immature	409	372	538	6	6	0.2	Undeveloped				1 unidentified fish; cisco or round whitefish
Meliadine	25	Female	Immature	556	512	1567	11	30.6	2.52	Undeveloped				1 unidentified fish; cisco or round whitefish
Meliadine	26	Male	Immature	500	464	1172	9	25.1	0.75	Undeveloped				
Meliadine	27	Female	Immature	647	594	1795	24	19.5	20.38	Undeveloped			EC	Fishing lure
Meliadine	28	Female	Mature	773	700	4529	26	58	60.41	Resting			EC	7 3-spines
Peter	29	Female	Immature	618	560	1794	15	14.7	8.07	Undeveloped			EC	1 lake trout
Peter	30	Male	Mature	637	582	2468	13	29.5	51.1	Resting			EC	
Peter	31	Male	Immature	566	510	1376	32	13.6	1.29	Undeveloped			EC; 2-mm parasite on the liver	

Table I1-4. Catch data for Lake Trout in Meliadine Lake, Atulik Lake and Peter Lake in 2024.

Lake	Fish ID	Sex	Maturity	Total Length (mm)	Fork Length (mm)	Total Weight (g)	Age (yr)	Liver Weight (g)	Gonad Weight (g)	Gonad Status	Egg Sample Count	Egg Sample Weight (g)	DELTs and Internal Observations[a]	Stomach Content
Peter	32	Male	Immature	539	477	1095	12	10.2	1.37	Undeveloped				
Peter	33	Female	Immature	466	426	756	10	8.1	0.45	Undeveloped				1 unidentified fish
Peter	34	Female	Mature	837	775	4425	35	35.6	60.97	Resting				
Peter	35	Male	Mature	728	679	3861	22	47.8	31.62	Resting			EC	
Peter	36	Female	Mature	712	656	2799	25	57.8	285.3	Ripe	332	31.1	EC	1 stone
Peter	37	Male	Mature	653	603	2744	19	30.4	89.76	Ripe				
Peter	38	Unknown	Immature	194	175	59.3	2	0.42	0.05	Undeveloped			EC	
Peter	39	Male	Immature	632	580	2009	15	27.1	1.94	Undeveloped			EC	1 unidentified fish
Peter	40	Male	Mature	659	605	2396	19	22.3	81.48	Ripe			EC	
Peter	41	Male	Mature	732	669	3962	18	24.7	97.85	Ripe			EC	
Peter	42	Female	Mature	584	535	1372	16	15.7	23.91	Resting			EC	
Peter	43	Female	Mature	751	690	3935	22	67.7	467.4	Ripe	292	31.96		1 burbot
Peter	44	Female	Mature	715	659	3075	19	64	379.5	Ripe	350	30.39	EC	
Peter	45	Female	Mature	577	524	1824	17	23.8	26.32	Resting			EC	6 3-spines
Peter	46	Male	Mature	625	572	2279		21	56.75	Ripe			EC	
Peter	47	Female	Immature	495	447	850	9	8.3	0.7	Undeveloped				
Peter	48	Female	Immature	430	402	589	8	5.6	1.89	Undeveloped				
Peter	49	Unknown	Immature	322	296	132.6	9	2.6	0.25	Undeveloped			EC	
Peter	50	Female	Immature	312	286	141.4	6	2.6	0.4	Undeveloped			EC	Fish remains
Peter	51	Female	Immature	540	485	1309	15	18	15.57	Undeveloped			EC	
Peter	52	Male	Mature	671	620	2835	25	26.6	73.71	Ripe			EC	1 stone
Peter	53	Female	Mature	736	675	3481	24	55.6	51.11	Resting			EC	
Peter	54	Female	Immature	460	418	751	15	6.2	1.87	Undeveloped			EC	
Peter	55	Male	Immature	513	467	1105	18	14.4	1.68	Undeveloped			EC	
Peter	56	Female	Mature	793	728	4470	32	49.7	73.79	Resting			EC	
Peter	57	Male	Mature	628	575	2384	16	21.8	70.17	Ripe			EC	
Peter	58	Female	Mature	796	722	4075	27	59.2	64.23	Resting			EC	Fish remains
Peter	59	Female	Mature	712	651	3318	25	40.8	32.59	Resting			EC	
Peter	60	Male	Mature	574	528	1474	17	13.9	39	Ripe			EC	
Peter	61	Male	Mature	656	598	2178	30	24.5	7.17	Resting			EC	
Peter	62	Female	Mature	588	537	1461	15	13	32.13	Resting				

Table I1-4. Catch data for Lake Trout in Meliadine Lake, Atulik Lake and Peter Lake in 2024.

Lake	Fish ID	Sex	Maturity	Total Length (mm)	Fork Length (mm)	Total Weight (g)	Age (yr)	Liver Weight (g)	Gonad Weight (g)	Gonad Status	Egg Sample Count	Egg Sample Weight (g)	DELTs and Internal Observations[a]	Stomach Content
Peter	63	Male	Mature	786	725	3828	20	37.9	5.91	Resting				
Peter	64	Female	Mature	681	632	3267	33	51.8	36.97	Resting			EC	
Peter	65	Female	Mature	756	700	3609	20	29.2	38.38	Resting			EC	
Peter	66	Male	Mature	729	668	3002	23	26.4	76.69	Ripe				
Peter	67	Female	Mature	690	630	2927	22	28.6	38.95	Resting			EC	3 3-spines
Peter	68	Male	Immature	584	536	1793	18	16.1	2.59	Undeveloped			EC	1 cisco or round whitefish
Peter	69	Female	Immature	308	277	133.1	6	2.25	0.28	Undeveloped			EC	
Atulik	70	Female	Immature	509	463	1123	11	14.7	5.03	Undeveloped			EC	1 unidentified fish
Atulik	71	Male	Immature	622	563	1644	24	13	3.14	Undeveloped			EC	
Atulik	72	Female	Immature	452	411	758	10	8.2	1.57	Undeveloped			EC	Zooplankton
Atulik	73	Female	Immature	602	557	2243	15	22.6	13.66	Undeveloped			EC	
Atulik	74	Female	Mature	583	535	1702	15	20.4	27.43	Resting			EC	
Atulik	75	Female	Immature	567	516	1303	17	11.8	8.48	Undeveloped				
Atulik	76	Male	Immature	690	633	2872	19	26.2	2.44	Undeveloped				1 cisco or round whitefish
Atulik	77	Female	Immature	541	496	1232	19	8.9	9.12	Undeveloped			EC	
Atulik	78	Male	Immature	330	299	136.9	7	2.6	0.14	Undeveloped			EC	
Atulik	79	Female	Immature	397	356	513	11	3.6	0.98	Undeveloped			EC	
Atulik	80	Female	Immature	434	386	728	11	6.9	0.36	Undeveloped				1 cisco or round whitefish and 3 3-spines
Atulik	81	Male	Immature	403	364	552	10	5.5	0.34	Undeveloped			EC	1 unidentified fish
Atulik	82	Female	Immature	353	320	349	8	3.5	0.13	Undeveloped			EC	
Atulik	83	Female	Immature	354	321	382	11	3.7	0.72	Undeveloped			EC	
Atulik	84	Male	Immature	333	299	299	8	1.6	0.14	Undeveloped			EC	1 burbot and 1 slimy sculpin
Atulik	85	Female	Immature	314	285	205	8	1.5	0.34	Undeveloped				
Atulik	86	Unknown	Immature	304	273	186	5	1.2	0.07	Undeveloped			EC	
Atulik	87	Unknown	Immature	201	182	65.8	4	0.51	0.08	Undeveloped				
Atulik	88	Male	Immature	505	468	1185	12	19	0.84	Undeveloped			EC	
Atulik	89	Male	Immature	585	539	1818	15	28.9	1.38	Undeveloped			EC	1 burbot
Atulik	90	Male	Immature	555	506	1319	15	14.9	1	Undeveloped			EC	
Atulik	91	Male	Mature	641	583	2181	20	24.8	69.19	Ripe				
Atulik	92	Male	Immature	557	505	1451	15	15.7	1.49	Undeveloped			EC	
Atulik	93	Male	Immature	535	497	1296	17	17.5	1.04	Undeveloped			EC	1 burbot

Table I1-4. Catch data for Lake Trout in Meliadine Lake, Atulik Lake and Peter Lake in 2024.

Lake	Fish ID	Sex	Maturity	Total Length (mm)	Fork Length (mm)	Total Weight (g)	Age (yr)	Liver Weight (g)	Gonad Weight (g)	Gonad Status	Egg Sample Count	Egg Sample Weight (g)	DELTs and Internal Observations[a]	Stomach Content
Atulik	94	Female	Mature	498	452	1049	23	10.2	16.09	Resting			EC	
Atulik	95	Male	Immature	479	434	963	17	12.3	0.81	Undeveloped			EC	
Atulik	96	Female	Immature	433	391	695	11	8.66	2.18	Undeveloped				
Atulik	97	Female	Immature	376	334	441	8	6.6	0.84	Undeveloped			EC	1 unidentified fish
Atulik	98	Female	Immature	393	360	499	10	4.95	1.09	Undeveloped			EC	Fish remains
Atulik	99	Male	Immature	364	334	392	10	3.15	0.26	Undeveloped				Insects
Atulik	100	Unknown	Immature	340	308	297	8	3.02	0.12	Undeveloped			EC	Fish remains
Atulik	101	Unknown	Immature	335	301	291	7	2.77	0.11	Undeveloped			EC	
Atulik	102	Male	Immature	294	267	204	7	2.62	0.1	Undeveloped			EC	
Atulik	103	Unknown	Immature	306	277	193	8	1.39	0.08	Undeveloped			EC	
Atulik	104	Unknown	Immature	265	241	135	6	0.86	0.09	Undeveloped			EC	
Atulik	105	Male	Mature	706	648	3013	25	27.6	67.14	Ripe				1 cisco
Atulik	106	Male	Mature	719	667	3783	19	38.1	6.46	Resting				1 cisco
Atulik	107	Male	Immature	516	467	1094	16	13	0.82	Undeveloped			EC	1 lake trout
Atulik	108	Female	Immature	386	351	458	13	4.26	2.57	Undeveloped			EC	Fish remains
Atulik	109	Female	Immature	338	308	326	9	2.76	0.72	Undeveloped			EC	
Atulik	110	Male	Immature	372	339	432	10	3.65	0.09	Undeveloped				Insects
Atulik	111	Female	Immature	293	266	195.1	8	1.62	0.41	Undeveloped			EC	
Atulik	112	Unknown	Immature	250	226	121.1	8	1.37	0.05	Undeveloped			EC	
Atulik	113	Female	Immature	294	265	181.4	7	1.11	0.23	Undeveloped				
Atulik	114	Unknown	Immature	248	227	129.1	6	1.21		Undeveloped			EC	

Notes

[a] DELTs = external deformities, erosions, lesions, and tumors; EC = encysted cestodes (tapeworms).

Appendix I-2
Lake Trout Tissue Chemistry

APPENDIX I2 – TABLES

Table I2-1. Descriptive statistics for metals concentrations (mg/kg ww) in Lake Trout muscle samples from Meliadine Lake, Atulik Lake and Peter Lake in 2024. 1

Table I2-2. Results of the ANOVA model (Type III) comparing metals concentrations in Lake Trout muscle tissue among lakes (Meliadine, Atulik, Peter) and years. 5

Table I2-3. Results of the ANCOVA model (Type III) comparing mercury concentrations in Lake Trout muscle tissue among lakes (Meliadine, Atulik, Peter) and years. 6

Table I2-4. Tukey post-hoc pairwise comparisons of Lake Trout muscle tissue chemistry among lakes and years ($p<0.05$). 7

Table I2-5. Tukey post-hoc pairwise comparisons of mercury concentrations in 500 mm Lake Trout muscle tissue among lakes and years ($p < 0.05$). 10

Table I2-1. Descriptive statistics for metals concentrations (mg/kg ww) in Lake Trout muscle samples from Meliadine Lake, Atulik Lake and Peter Lake in 2024.

Lake	Parameter	N	Summary Statistics (mg/kg ww)								
			DL	% > DL	N > DL	Mean	Median	SD	SE	Min	Max
Meliadine	Aluminum	28	0.4	43	12	0.84	0.4	1.7	0.31356	0.4	9.17
	Antimony	28	0.002	0	0	–	–	–	–	–	–
	Arsenic	28	0.004	100	28	0.06898	0.0423	0.06667	0.0126	0.019	0.278
	Barium	28	0.01	14	4	0.01436	0.01	0.01963	0.00371	0.01	0.114
	Beryllium	28	0.002	0	0	–	–	–	–	–	–
	Bismuth	28	0.002	0	0	–	–	–	–	–	–
	Boron	28	0.2	0	0	–	–	–	–	–	–
	Cadmium	28	0.001	11	3	–	–	–	–	0.001	0.002
	Calcium	28	4	100	28	95.1	74.1	50.7	9.6	55.6	260
	Cesium	28	0.001	100	28	0.04222	0.0381	0.02223	0.0042	0.0204	0.141
	Chromium	28	0.01	71	20	0.02875	0.016	0.02815	0.00532	0.01	0.124
	Cobalt	28	0.004	21	6	–	–	–	–	0.004	0.0142
	Copper	28	0.02	100	28	0.22121	0.2195	0.05079	0.0096	0.139	0.348
	Iron	28	0.6	100	28	4.5	3.5	3.8	0.72426	2.09	22.7
	Lead	28	0.004	11	3	–	–	–	–	0.004	0.0084
	Lithium	28	0.1	0	0	–	–	–	–	–	–
	Magnesium	28	0.4	100	28	299.9	306.5	22.1	4.2	249	329
	Manganese	28	0.01	100	28	0.11386	0.106	0.04408	0.00833	0.064	0.282
	Mercury	28	0.0015–0.0122	100	28	0.48404	0.3955	0.32266	0.06098	0.152	1.5
	Molybdenum	28	0.004	0	0	–	–	–	–	–	–
	Nickel	28	0.04	0	0	–	–	–	–	–	–
	Phosphorus	28	2	100	28	2597.9	2635	216.6	40.9	2080	2930
	Potassium	28	4	100	28	4119.3	4095	285.9	54	3460	4590
	Rubidium	28	0.01	100	28	6.7	6.8	1.8	0.34595	3.72	9.93
	Selenium	28	0.01	100	28	0.42968	0.441	0.06664	0.01259	0.33	0.554
	Sodium	28	4	100	28	291.2	289.5	59.2	11.2	209	441
	Strontium	28	0.01	100	28	0.07464	0.05	0.06908	0.01305	0.029	0.308
	Tellurium	28	0.004	0	0	–	–	–	–	–	–
	Thallium	28	0.0004	100	28	0.007	0.006	0.00281	0.00053	0.00433	0.0154
	Tin	28	0.02	0	0	–	–	–	–	–	–

Table I2-1. Descriptive statistics for metals concentrations (mg/kg ww) in Lake Trout muscle samples from Meliadine Lake, Atulik Lake and Peter Lake in 2024.

Lake	Parameter	N	Summary Statistics (mg/kg ww)								
			DL	% > DL	N > DL	Mean	Median	SD	SE	Min	Max
Meliadine	Uranium	28	0.0004	4	1	–	–	–	–	0.0004	0.00046
	Vanadium	28	0.02	4	1	–	–	–	–	0.02	0.02
	Zinc	28	0.1	100	28	3.4	3.3	0.50262	0.09499	2.67	4.6
	Zirconium	28	0.04	0	0	–	–	–	–	–	–
Atulik	Aluminum	45	0.4	53	24	0.75333	0.51	0.81752	0.12187	0.4	5.46
	Antimony	45	0.002	0	0	–	–	–	–	–	–
	Arsenic	45	0.004	100	45	0.0562	0.0482	0.0316	0.00471	0.0177	0.151
	Barium	45	0.01	58	26	0.01813	0.01	0.01351	0.00201	0.01	0.066
	Beryllium	45	0.002	0	0	–	–	–	–	–	–
	Bismuth	45	0.002	2	1	–	–	–	–	0.002	0.0042
	Boron	45	0.2	0	0	–	–	–	–	–	–
	Cadmium	45	0.001	18	8	–	–	–	–	0.001	0.0019
	Calcium	45	4	100	45	114.5	92.2	55	8.2	60.6	319
	Cesium	45	0.001	100	45	0.02597	0.0249	0.00637	0.00095	0.0113	0.0407
	Chromium	45	0.01	47	21	–	–	–	–	0.01	0.79
	Cobalt	45	0.004	73	33	0.00628	0.005	0.00278	0.00041	0.004	0.0136
	Copper	45	0.02	100	45	0.19058	0.19	0.04258	0.00635	0.109	0.324
	Iron	45	0.6	100	45	4	3.3	2.6	0.38805	1.8	17.1
	Lead	45	0.004	9	4	–	–	–	–	0.004	0.0223
	Lithium	45	0.1	0	0	–	–	–	–	–	–
	Magnesium	45	0.4	100	45	296.2	294	26.6	4	187	368
	Manganese	45	0.01	100	45	0.1294	0.105	0.06438	0.0096	0.061	0.346
	Mercury	45	0.001–0.0023	100	45	0.12294	0.0895	0.09544	0.01423	0.0048	0.481
	Molybdenum	45	0.004	2	1	–	–	–	–	0.004	0.0076
	Nickel	45	0.04	2	1	–	–	–	–	0.04	0.049
	Phosphorus	45	2	100	45	2620.4	2620	253.8	37.8	1710	3420
	Potassium	45	4	100	45	4262.2	4270	358.8	53.5	2920	5330
	Rubidium	45	0.01	100	45	5.6	5.6	1.3	0.18995	3.03	7.9
	Selenium	45	0.01	100	45	0.52593	0.517	0.07656	0.01141	0.312	0.689
	Sodium	45	4	100	45	301.8	295	82.4	12.3	137	481

Table I2-1. Descriptive statistics for metals concentrations (mg/kg ww) in Lake Trout muscle samples from Meliadine Lake, Atulik Lake and Peter Lake in 2024.

Lake	Parameter	N	Summary Statistics (mg/kg ww)								
			DL	% > DL	N > DL	Mean	Median	SD	SE	Min	Max
Atulik	Strontium	45	0.01	100	45	0.12956	0.102	0.08415	0.01254	0.039	0.426
	Tellurium	45	0.004	0	0	–	–	–	–	–	–
	Thallium	45	0.0004	100	45	0.0073	0.00714	0.00199	0.0003	0.00449	0.013
	Tin	45	0.02	0	0	–	–	–	–	–	–
	Uranium	45	0.0004	0	0	–	–	–	–	–	–
	Vanadium	45	0.02	2	1	–	–	–	–	0.02	0.026
	Zinc	45	0.1	100	45	3.4	3.4	0.45804	0.06828	2.43	4.42
	Zirconium	45	0.04	0	0	–	–	–	–	–	–
Peter	Aluminum	41	0.4	32	13	0.89293	0.4	1.3	0.20956	0.4	6.49
	Antimony	41	0.002	2	1	–	–	–	–	0.002	0.0022
	Arsenic	41	0.004	100	41	0.03558	0.0238	0.02982	0.00466	0.0097	0.127
	Barium	41	0.01	22	9	–	–	–	–	0.01	0.072
	Beryllium	41	0.002	0	0	–	–	–	–	–	–
	Bismuth	41	0.002	0	0	–	–	–	–	–	–
	Boron	41	0.2	0	0	–	–	–	–	–	–
	Cadmium	41	0.001	0	0	–	–	–	–	–	–
	Calcium	41	4	100	41	81.6	79.2	20.5	3.2	53.2	139
	Cesium	41	0.001	100	41	0.08354	0.0726	0.03632	0.00567	0.0148	0.189
	Chromium	41	0.01	34	14	–	–	–	–	0.01	0.625
	Cobalt	41	0.004	29	12	–	–	–	–	0.004	0.0099
	Copper	41	0.02	100	41	0.20468	0.203	0.04945	0.00772	0.127	0.359
	Iron	41	0.6	100	41	4.4	2.6	4.8	0.74876	1.59	22.1
	Lead	41	0.004	20	8	–	–	–	–	0.004	0.0137
	Lithium	41	0.1	0	0	–	–	–	–	–	–
	Magnesium	41	0.4	100	41	292.3	292	19.5	3.1	262	354
	Manganese	41	0.01	100	41	0.08976	0.085	0.04103	0.00641	0.046	0.272
	Mercury	41	0.0012–0.019	100	41	0.76922	0.832	0.33453	0.05224	0.114	1.36
	Molybdenum	41	0.004	5	2	–	–	–	–	0.004	0.0054
	Nickel	41	0.04	2	1	–	–	–	–	0.04	0.059
	Phosphorus	41	2	100	41	2428.5	2440	206.9	32.3	1970	2830

Table I2-1. Descriptive statistics for metals concentrations (mg/kg ww) in Lake Trout muscle samples from Meliadine Lake, Atulik Lake and Peter Lake in 2024.

Lake	Parameter	N	Summary Statistics (mg/kg ww)								
			DL	% > DL	N > DL	Mean	Median	SD	SE	Min	Max
Peter	Potassium	41	4	100	41	4010	4020	330.9	51.7	3280	4930
	Rubidium	41	0.01	100	41	8.8	8.8	1.9	0.30061	3.17	12.6
	Selenium	41	0.01	100	41	0.52968	0.536	0.1022	0.01596	0.368	0.9
	Sodium	41	4	100	41	336.1	335	64.7	10.1	208	465
	Strontium	41	0.01	100	41	0.06661	0.052	0.03543	0.00553	0.028	0.174
	Tellurium	41	0.004	0	0	–	–	–	–	–	–
	Thallium	41	0.0004	100	41	0.0099	0.00974	0.00262	0.00041	0.00416	0.0173
	Tin	41	0.02	0	0	–	–	–	–	–	–
	Uranium	41	0.0004	7	3	–	–	–	–	0.0004	0.0011
	Vanadium	41	0.02	5	2	–	–	–	–	0.02	0.023
	Zinc	41	0.1	100	41	3.1	3	0.46066	0.07194	2.44	4.88
	Zirconium	41	0.04	0	0	–	–	–	–	–	–

Notes

"-" = summary statistics were not calculated for parameters if fewer than 50% of the samples were measured above detection.

Table I2-2. Results of the ANOVA model (Type III) comparing metals concentrations in Lake Trout muscle tissue among lakes (Meliadine, Atulik, Peter) and years.

Parameter	N	Outlier ID	Parameter	Sum Square	DF	F Value	P Value
Arsenic	298	–	Intercept	412.853	1	4759.595	< 0.001
			Location × Year	23.792	7	39.183	< 0.001
			Residuals	25.155	290		
Calcium	296	8, 18	Intercept	1175.516	1	40069.5	< 0.001
			Location × Year	31.369	7	152.754	< 0.001
			Residuals	8.449	288		
Cesium	263	38	Intercept	430.817	1	14922.62	< 0.001
			Location × Year	6.764	6	39.051	< 0.001
			Residuals	7.391	256		
Copper	298	–	Intercept	125.818	1	11750.7	< 0.001
			Location × Year	0.518	7	6.913	< 0.001
			Residuals	3.105	290		
Iron	297	53	Intercept	68.687	1	1828.481	< 0.001
			Location × Year	1.455	7	5.535	< 0.001
			Residuals	10.856	289		
Magnesium	297	105	Intercept	1623.501	1	1168022	< 0.001
			Location × Year	0.175	7	17.984	< 0.001
			Residuals	0.402	289		
Manganese	298	–	Intercept	265.312	1	13987.17	< 0.001
			Location × Year	1.365	7	10.278	< 0.001
			Residuals	5.501	290		
Phosphorus	296	339, 105	Intercept	3138.607	1	2163650	< 0.001
			Location × Year	0.048	7	4.702	< 0.001
			Residuals	0.418	288		
Potassium	296	339, 105	Intercept	3543.574	1	3239253	< 0.001
			Location × Year	0.062	7	8.05	< 0.001
			Residuals	0.315	288		
Rubidium	264	–	Intercept	160.18	1	11787.01	< 0.001
			Location × Year	1.672	6	20.502	< 0.001
			Residuals	3.493	257		
Selenium	264	–	Intercept	24.245	1	3994.037	< 0.001
			Location × Year	0.341	6	9.357	< 0.001
			Residuals	1.56	257		
Sodium	298	–	Intercept	1707.241	1	202462.1	< 0.001
			Location × Year	0.698	7	11.827	< 0.001
			Residuals	2.445	290		
Strontium	297	18	Intercept	366.49	1	4527.669	< 0.001
			Location × Year	2.957	7	5.219	< 0.001
			Residuals	23.393	289		

Table I2-2. Results of the ANOVA model (Type III) comparing metals concentrations in Lake Trout muscle tissue among lakes (Meliadine, Atulik, Peter) and years.

Parameter	N	Outlier ID	Parameter	Sum Square	DF	F Value	P Value
Thallium	264	–	Intercept	1050.358	1	71707.19	< 0.001
			Location × Year	0.978	6	11.127	< 0.001
			Residuals	3.765	257		
Zinc	297	342	Intercept	63.977	1	20723.31	< 0.001
			Location × Year	0.248	7	11.484	< 0.001
			Residuals	0.892	289		

Table I2-3. Results of the ANCOVA model (Type III) comparing mercury concentrations in Lake Trout muscle tissue among lakes (Meliadine, Atulik, Peter) and years.

Parameter	N	Outlier ID	Model	Parameter	Sum Squares	DF	F Value	P Value
Mercury	296	71, 104	Reduced	Intercept	10.748	1	343.691	< 0.001
				Fork Length	8.83	1	282.352	< 0.001
				Location × Year	10.003	7	45.694	< 0.001
				Residuals	8.976	287		

Table I2-4. Tukey post-hoc pairwise comparisons of Lake Trout muscle tissue chemistry among lakes and years (p<0.05).

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Arsenic	Meliadine 2024 vs Atulik 2024	1.000	4.9	
	Meliadine 2024 vs Peter 2024	0.005	86.6	increase
	Meliadine 2024 vs Meliadine 2021	0.002	-48.8	decrease
	Meliadine 2024 vs Atulik 2021	0.828	-24.1	
	Meliadine 2024 vs Peter 2021	< 0.001	150.2	increase
	Meliadine 2024 vs Meliadine 2015	0.373	-28.6	
	Meliadine 2024 vs Meliadine 97/98	< 0.001	-76.8	decrease
	Atulik 2024 vs Peter 2024	0.003	77.9	increase
	Atulik 2024 vs Meliadine 2021	< 0.001	-51.2	decrease
	Atulik 2024 vs Atulik 2021	0.563	-27.6	
	Atulik 2024 vs Peter 2021	< 0.001	138.6	increase
	Atulik 2024 vs Meliadine 2015	0.082	-31.9	
	Atulik 2024 vs Meliadine 97/98	< 0.001	-77.9	decrease
	Peter 2024 vs Meliadine 2021	< 0.001	-72.6	decrease
	Peter 2024 vs Atulik 2021	< 0.001	-59.3	decrease
	Peter 2024 vs Peter 2021	0.699	34.1	
	Peter 2024 vs Meliadine 2015	< 0.001	-61.7	decrease
	Peter 2024 vs Meliadine 97/98	< 0.001	-87.6	decrease
	Meliadine 2021 vs Atulik 2021	0.314	48.3	
	Meliadine 2021 vs Peter 2021	< 0.001	388.6	increase
	Meliadine 2021 vs Meliadine 2015	0.227	39.5	
	Meliadine 2021 vs Meliadine 97/98	< 0.001	-54.7	decrease
	Atulik 2021 vs Peter 2021	< 0.001	229.5	increase
	Atulik 2021 vs Meliadine 2015	1.000	-5.9	
	Atulik 2021 vs Meliadine 97/98	< 0.001	-69.4	decrease
	Peter 2021 vs Meliadine 2015	< 0.001	-71.5	decrease
	Peter 2021 vs Meliadine 97/98	< 0.001	-90.7	decrease
	Meliadine 2015 vs Meliadine 97/98	< 0.001	-67.5	decrease
Copper	Meliadine 2024 vs Atulik 2024	0.162	16.0	
	Meliadine 2024 vs Peter 2024	0.870	8.3	
	Meliadine 2024 vs Meliadine 2021	0.995	4.4	
	Meliadine 2024 vs Atulik 2021	0.196	18.1	
	Meliadine 2024 vs Peter 2021	1.000	3.0	
	Meliadine 2024 vs Meliadine 2015	0.993	-4.3	
	Meliadine 2024 vs Meliadine 97/98	0.161	-14.6	
	Atulik 2024 vs Peter 2024	0.885	-6.6	
	Atulik 2024 vs Meliadine 2021	0.441	-10.0	
	Atulik 2024 vs Atulik 2021	1.000	1.8	
	Atulik 2024 vs Peter 2021	0.497	-11.2	
	Atulik 2024 vs Meliadine 2015	0.001	-17.5	decrease
	Atulik 2024 vs Meliadine 97/98	< 0.001	-26.4	decrease
	Peter 2024 vs Meliadine 2021	0.997	-3.6	
	Peter 2024 vs Atulik 2021	0.853	9.0	
	Peter 2024 vs Peter 2021	0.992	-4.9	
	Peter 2024 vs Meliadine 2015	0.170	-11.7	
	Peter 2024 vs Meliadine 97/98	< 0.001	-21.2	decrease
	Meliadine 2021 vs Atulik 2021	0.472	13.1	
	Meliadine 2021 vs Peter 2021	1.000	-1.4	
	Meliadine 2021 vs Meliadine 2015	0.605	-8.4	
	Meliadine 2021 vs Meliadine 97/98	0.007	-18.2	decrease
	Atulik 2021 vs Peter 2021	0.491	-12.8	
	Atulik 2021 vs Meliadine 2015	0.007	-19.0	decrease
	Atulik 2021 vs Meliadine 97/98	< 0.001	-27.7	decrease
	Peter 2021 vs Meliadine 2015	0.906	-7.1	
	Peter 2021 vs Meliadine 97/98	0.066	-17.1	
	Meliadine 2015 vs Meliadine 97/98	0.338	-10.8	
Iron	Meliadine 2024 vs Atulik 2024	0.995	8.5	
	Meliadine 2024 vs Peter 2024	0.710	20.1	
	Meliadine 2024 vs Meliadine 2021	0.068	37.8	
	Meliadine 2024 vs Atulik 2021	0.022	51.1	increase
	Meliadine 2024 vs Peter 2021	0.940	15.6	
	Meliadine 2024 vs Meliadine 2015	0.007	45.7	increase
	Meliadine 2024 vs Meliadine 97/98	0.999	-6.0	
	Atulik 2024 vs Peter 2024	0.966	10.7	
	Atulik 2024 vs Meliadine 2021	0.200	27.0	
	Atulik 2024 vs Atulik 2021	0.069	39.3	
	Atulik 2024 vs Peter 2021	0.999	6.6	
	Atulik 2024 vs Meliadine 2015	0.020	34.3	increase
	Atulik 2024 vs Meliadine 97/98	0.854	-13.3	
	Peter 2024 vs Meliadine 2021	0.860	14.7	
	Peter 2024 vs Atulik 2021	0.490	25.8	
	Peter 2024 vs Peter 2021	1.000	-3.7	
	Peter 2024 vs Meliadine 2015	0.403	21.3	
	Peter 2024 vs Meliadine 97/98	0.272	-21.7	
	Meliadine 2021 vs Atulik 2021	0.993	9.6	
	Meliadine 2021 vs Peter 2021	0.788	-16.1	
	Meliadine 2021 vs Meliadine 2015	0.999	5.8	
	Meliadine 2021 vs Meliadine 97/98	0.006	-31.7	decrease
	Atulik 2021 vs Peter 2021	0.434	-23.4	
Calcium	Meliadine 2024 vs Atulik 2024	0.487	-17.3	
	Meliadine 2024 vs Peter 2024	0.979	9.7	
	Meliadine 2024 vs Meliadine 2021	1.000	-0.8	
	Meliadine 2024 vs Atulik 2021	0.925	-12.5	
	Meliadine 2024 vs Peter 2021	0.999	-6.1	
	Meliadine 2024 vs Meliadine 2015	1.000	3.4	
	Meliadine 2024 vs Meliadine 97/98	< 0.001	-90.6	decrease
	Atulik 2024 vs Peter 2024	0.023	32.6	increase
	Atulik 2024 vs Meliadine 2021	0.390	19.9	
	Atulik 2024 vs Atulik 2021	0.999	5.7	
	Atulik 2024 vs Peter 2021	0.909	13.5	
	Atulik 2024 vs Meliadine 2015	0.089	24.9	
	Atulik 2024 vs Meliadine 97/98	< 0.001	-88.6	decrease
	Peter 2024 vs Meliadine 2021	0.940	-9.6	
	Peter 2024 vs Atulik 2021	0.332	-20.3	
	Peter 2024 vs Peter 2021	0.786	-14.4	
	Peter 2024 vs Meliadine 2015	0.996	-5.8	
	Peter 2024 vs Meliadine 97/98	< 0.001	-91.4	decrease
	Meliadine 2021 vs Atulik 2021	0.917	-11.8	
	Meliadine 2021 vs Peter 2021	0.999	-5.3	
	Meliadine 2021 vs Meliadine 2015	1.000	4.2	
	Meliadine 2021 vs Meliadine 97/98	< 0.001	-90.5	decrease
	Atulik 2021 vs Peter 2021	0.999	7.4	
	Atulik 2021 vs Meliadine 2015	0.657	18.2	
	Atulik 2021 vs Meliadine 97/98	< 0.001	-89.3	decrease
	Peter 2021 vs Meliadine 2015	0.974	10.1	
	Peter 2021 vs Meliadine 97/98	< 0.001	-90.0	decrease
	Meliadine 2015 vs Meliadine 97/98	< 0.001	-90.9	decrease
Cesium	Meliadine 2024 vs Atulik 2024	< 0.001	54.4	increase
	Meliadine 2024 vs Peter 2024	< 0.001	-51.0	decrease
	Meliadine 2024 vs Meliadine 2021	0.049	-24.7	decrease
	Meliadine 2024 vs Atulik 2021	0.258	28.2	
	Meliadine 2024 vs Peter 2021	0.009	-31.8	decrease
	Meliadine 2024 vs Meliadine 2015	0.016	-26.0	decrease
	Atulik 2024 vs Peter 2024	< 0.001	-68.2	decrease
	Atulik 2024 vs Meliadine 2021	< 0.001	-51.3	decrease
	Atulik 2024 vs Atulik 2021	0.491	-17.0	
	Atulik 2024 vs Peter 2021	< 0.001	-55.8	decrease
	Atulik 2024 vs Meliadine 2015	< 0.001	-52.1	decrease
	Peter 2024 vs Meliadine 2021	< 0.001	53.5	increase
	Peter 2024 vs Atulik 2021	< 0.001	161.3	increase
	Peter 2024 vs Peter 2021	0.021	39.1	increase
	Peter 2024 vs Meliadine 2015	< 0.001	51.0	increase
	Meliadine 2021 vs Atulik 2021	< 0.001	70.3	increase
	Meliadine 2021 vs Peter 2021	0.958	-9.4	
	Meliadine 2021 vs Meliadine 2015	1.000	-1.6	
	Atulik 2021 vs Peter 2021	< 0.001	-46.8	decrease
	Atulik 2021 vs Meliadine 2015	< 0.001	-42.2	decrease
	Peter 2021 vs Meliadine 2015	0.977	8.5	
Magnesium	Meliadine 2024 vs Atulik 2024	1.000	0.4	
	Meliadine 2024 vs Peter 2024	0.935	2.5	
	Meliadine 2024 vs Meliadine 2021	< 0.001	12.7	increase
	Meliadine 2024 vs Atulik 2021	0.002	10.2	increase
	Meliadine 2024 vs Peter 2021	0.729	4.0	
	Meliadine 2024 vs Meliadine 2015	0.009	7.3	increase
	Meliadine 2024 vs Meliadine 97/98	< 0.001	19.1	increase
	Atulik 2024 vs Peter 2024	0.949	2.1	
	Atulik 2024 vs Meliadine 2021	< 0.001	12.3	increase
	Atulik 2024 vs Atulik 2021	< 0.001	9.8	increase
	Atulik 2024 vs Peter 2021	0.742	3.6	
	Atulik 2024 vs Meliadine 2015	0.003	6.9	increase
	Atulik 2024 vs Meliadine 97/98	< 0.001	18.7	increase
	Peter 2024 vs Meliadine 2021	< 0.001	9.9	increase
	Peter 2024 vs Atulik 2021	0.027	7.5	increase
	Peter 2024 vs Peter 2021	0.998	1.4	
	Peter 2024 vs Meliadine 2015	0.150	4.7	
	Peter 2024 vs Meliadine 97/98	< 0.001	16.2	increase
	Meliadine 2021 vs Atulik 2021	0.968	-2.3	
	Meliadine 2021 vs Peter 2021	0.007	-7.8	decrease
	Meliadine 2021 vs Meliadine 2015	0.090	-4.8	
	Meliadine 2021 vs Meliadine 97/98	0.102	5.7	
	Atulik 2021 vs Peter 2021	0.276	-5.6	
	Atulik 2021 vs Meliadine 2015	0.911	-2.6	
	Atulik 2021 vs Meliadine 97/98	0.017	8.1	increase
	Peter 2021 vs Meliadine 2015	0.790	3.2	
	Peter 2021 vs Meliadine 97/98	< 0.001	14.6	increase
	Meliadine 2015 vs Meliadine 97/98	< 0.001	11.0	increase
Phosphorus	Meliadine 2024 vs Atulik 2024	0.993	-1.7	
	Meliadine 2024 vs Peter 2024	0.039	7.0	increase

Table I2-4. Tukey post-hoc pairwise comparisons of Lake Trout muscle tissue chemistry among lakes and years (p<0.05).

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Iron	Atulik 2021 vs Meliadine 2015	1.000	-3.5	
	Atulik 2021 vs Meliadine 97/98	0.002	-37.7	decrease
	Peter 2021 vs Meliadine 2015	0.389	26.0	
	Peter 2021 vs Meliadine 97/98	0.663	-18.7	
	Meliadine 2015 vs Meliadine 97/98	< 0.001	-35.4	decrease
Manganese	Meliadine 2024 vs Atulik 2024	0.941	-8.5	
	Meliadine 2024 vs Peter 2024	0.032	28.3	increase
	Meliadine 2024 vs Meliadine 2021	0.995	6.1	
	Meliadine 2024 vs Atulik 2021	0.767	14.9	
	Meliadine 2024 vs Peter 2021	0.730	15.5	
	Meliadine 2024 vs Meliadine 2015	0.376	17.0	
	Meliadine 2024 vs Meliadine 97/98	0.018	-24.0	decrease
	Atulik 2024 vs Peter 2024	< 0.001	40.2	increase
	Atulik 2024 vs Meliadine 2021	0.366	16.0	
	Atulik 2024 vs Atulik 2021	0.090	25.5	
	Atulik 2024 vs Peter 2021	0.075	26.2	
	Atulik 2024 vs Meliadine 2015	0.003	27.9	increase
	Atulik 2024 vs Meliadine 97/98	0.168	-17.0	
	Peter 2024 vs Meliadine 2021	0.121	-17.3	
	Peter 2024 vs Atulik 2021	0.877	-10.4	
	Peter 2024 vs Peter 2021	0.903	-10.0	
	Peter 2024 vs Meliadine 2015	0.844	-8.8	
	Peter 2024 vs Meliadine 97/98	< 0.001	-40.8	decrease
	Meliadine 2021 vs Atulik 2021	0.978	8.2	
	Meliadine 2021 vs Peter 2021	0.968	8.8	
	Meliadine 2021 vs Meliadine 2015	0.791	10.3	
	Meliadine 2021 vs Meliadine 97/98	< 0.001	-28.4	decrease
	Atulik 2021 vs Peter 2021	1.000	0.5	
	Atulik 2021 vs Meliadine 2015	1.000	1.9	
	Atulik 2021 vs Meliadine 97/98	< 0.001	-33.8	decrease
	Peter 2021 vs Meliadine 2015	1.000	1.3	
	Peter 2021 vs Meliadine 97/98	< 0.001	-34.2	decrease
	Meliadine 2015 vs Meliadine 97/98	< 0.001	-35.1	decrease
Potassium	Meliadine 2024 vs Atulik 2024	0.328	-4.0	
	Meliadine 2024 vs Peter 2024	0.811	2.8	
	Meliadine 2024 vs Meliadine 2021	0.801	-2.8	
	Meliadine 2024 vs Atulik 2021	0.239	5.2	
	Meliadine 2024 vs Peter 2021	0.996	-1.5	
	Meliadine 2024 vs Meliadine 2015	0.033	-5.4	decrease
	Meliadine 2024 vs Meliadine 97/98	1.000	-0.4	
	Atulik 2024 vs Peter 2024	< 0.001	7.2	increase
	Atulik 2024 vs Meliadine 2021	0.993	1.3	
	Atulik 2024 vs Atulik 2021	< 0.001	9.7	increase
	Atulik 2024 vs Peter 2021	0.883	2.6	
	Atulik 2024 vs Meliadine 2015	0.979	-1.4	
	Atulik 2024 vs Meliadine 97/98	0.405	3.8	
	Peter 2024 vs Meliadine 2021	0.021	-5.4	decrease
	Peter 2024 vs Atulik 2021	0.935	2.4	
	Peter 2024 vs Peter 2021	0.348	-4.2	
	Peter 2024 vs Meliadine 2015	< 0.001	-8.0	decrease
	Peter 2024 vs Meliadine 97/98	0.600	-3.2	
	Meliadine 2021 vs Atulik 2021	0.002	8.2	increase
	Meliadine 2021 vs Peter 2021	0.998	1.3	
	Meliadine 2021 vs Meliadine 2015	0.614	-2.7	
	Meliadine 2021 vs Meliadine 97/98	0.881	2.4	
	Atulik 2021 vs Peter 2021	0.054	-6.4	
	Atulik 2021 vs Meliadine 2015	< 0.001	-10.2	decrease
	Atulik 2021 vs Meliadine 97/98	0.116	-5.4	
	Peter 2021 vs Meliadine 2015	0.358	-4.0	
	Peter 2021 vs Meliadine 97/98	0.999	1.1	
	Meliadine 2015 vs Meliadine 97/98	0.039	5.3	increase
Sodium	Meliadine 2024 vs Atulik 2024	1.000	-1.7	
	Meliadine 2024 vs Peter 2024	0.107	-13.4	
	Meliadine 2024 vs Meliadine 2021	0.002	-18.7	decrease
	Meliadine 2024 vs Atulik 2021	< 0.001	-22.1	decrease
	Meliadine 2024 vs Peter 2021	0.004	-20.1	decrease
	Meliadine 2024 vs Meliadine 2015	0.917	6.2	
	Meliadine 2024 vs Meliadine 97/98	0.083	-14.3	
	Atulik 2024 vs Peter 2024	0.108	-11.9	
	Atulik 2024 vs Meliadine 2021	< 0.001	-17.3	decrease
	Atulik 2024 vs Atulik 2021	< 0.001	-20.8	decrease
	Atulik 2024 vs Peter 2021	0.003	-18.7	decrease
	Atulik 2024 vs Meliadine 2015	0.577	8.1	
	Atulik 2024 vs Meliadine 97/98	0.084	-12.9	
	Peter 2024 vs Meliadine 2021	0.866	-6.2	
	Peter 2024 vs Atulik 2021	0.507	-10.1	
	Peter 2024 vs Peter 2021	0.817	-7.7	
	Peter 2024 vs Meliadine 2015	< 0.001	22.6	increase
	Peter 2024 vs Meliadine 97/98	1.000	-1.1	

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Phosphorus	Meliadine 2024 vs Meliadine 2021	0.879	2.9	
	Meliadine 2024 vs Atulik 2021	0.480	5.0	
	Meliadine 2024 vs Peter 2021	1.000	1.0	
	Meliadine 2024 vs Meliadine 2015	0.999	-1.2	
	Meliadine 2024 vs Meliadine 97/98	0.808	3.4	
	Atulik 2024 vs Peter 2024	< 0.001	8.8	increase
	Atulik 2024 vs Meliadine 2021	0.235	4.7	
	Atulik 2024 vs Atulik 2021	0.065	6.8	
	Atulik 2024 vs Peter 2021	0.935	2.7	
	Atulik 2024 vs Meliadine 2015	1.000	0.5	
	Atulik 2024 vs Meliadine 97/98	0.191	5.2	
	Peter 2024 vs Meliadine 2021	0.478	-3.8	
	Peter 2024 vs Atulik 2021	0.992	-1.8	
	Peter 2024 vs Peter 2021	0.169	-5.6	
	Peter 2024 vs Meliadine 2015	< 0.001	-7.6	decrease
	Peter 2024 vs Meliadine 97/98	0.706	-3.3	
	Meliadine 2021 vs Atulik 2021	0.986	2.0	
	Meliadine 2021 vs Peter 2021	0.989	-1.9	
	Meliadine 2021 vs Meliadine 2015	0.302	-4.0	
	Meliadine 2021 vs Meliadine 97/98	1.000	0.5	
	Atulik 2021 vs Peter 2021	0.774	-3.9	
	Atulik 2021 vs Meliadine 2015	0.086	-5.9	
	Atulik 2021 vs Meliadine 97/98	0.998	-1.5	
	Peter 2021 vs Meliadine 2015	0.974	-2.1	
	Peter 2021 vs Meliadine 97/98	0.970	2.4	
	Meliadine 2015 vs Meliadine 97/98	0.247	4.6	
Rubidium	Meliadine 2024 vs Atulik 2024	0.133	18.2	
	Meliadine 2024 vs Peter 2024	< 0.001	-24.3	decrease
	Meliadine 2024 vs Meliadine 2021	0.920	7.7	
	Meliadine 2024 vs Atulik 2021	0.006	31.2	increase
	Meliadine 2024 vs Peter 2021	0.019	-21.8	decrease
	Meliadine 2024 vs Meliadine 2015	0.222	-13.5	
	Atulik 2024 vs Peter 2024	< 0.001	-36.0	decrease
	Atulik 2024 vs Meliadine 2021	0.664	-9.0	
	Atulik 2024 vs Atulik 2021	0.722	11.0	
	Atulik 2024 vs Peter 2021	< 0.001	-33.9	decrease
	Atulik 2024 vs Meliadine 2015	< 0.001	-26.8	decrease
	Peter 2024 vs Meliadine 2021	< 0.001	42.2	increase
	Peter 2024 vs Atulik 2021	< 0.001	73.4	increase
	Peter 2024 vs Peter 2021	0.999	3.3	
	Peter 2024 vs Meliadine 2015	0.178	14.3	
	Meliadine 2021 vs Atulik 2021	0.064	21.9	
	Meliadine 2021 vs Peter 2021	< 0.001	-27.4	decrease
	Meliadine 2021 vs Meliadine 2015	0.001	-19.6	decrease
	Atulik 2021 vs Peter 2021	< 0.001	-40.4	decrease
	Atulik 2021 vs Meliadine 2015	< 0.001	-34.1	decrease
	Peter 2021 vs Meliadine 2015	0.703	10.7	
Selenium	Meliadine 2024 vs Atulik 2024	< 0.001	-18.4	decrease
	Meliadine 2024 vs Peter 2024	< 0.001	-18.4	decrease
	Meliadine 2024 vs Meliadine 2021	1.000	-0.9	
	Meliadine 2024 vs Atulik 2021	0.014	-15.5	decrease
	Meliadine 2024 vs Peter 2021	0.004	-17.1	decrease
	Meliadine 2024 vs Meliadine 2015	0.524	-7.3	
	Atulik 2024 vs Peter 2024	1.000	-0.1	
	Atulik 2024 vs Meliadine 2021	< 0.001	21.5	increase
	Atulik 2024 vs Atulik 2021	0.989	3.5	
	Atulik 2024 vs Peter 2021	1.000	1.6	
	Atulik 2024 vs Meliadine 2015	0.007	13.6	increase
	Peter 2024 vs Meliadine 2021	< 0.001	21.6	increase
	Peter 2024 vs Atulik 2021	0.989	3.6	
	Peter 2024 vs Peter 2021	1.000	1.7	
	Peter 2024 vs Meliadine 2015	0.009	13.7	increase
	Meliadine 2021 vs Atulik 2021	0.010	-14.8	decrease
	Meliadine 2021 vs Peter 2021	0.002	-16.4	decrease
	Meliadine 2021 vs Meliadine 2015	0.513	-6.5	
	Atulik 2021 vs Peter 2021	1.000	-1.8	
	Atulik 2021 vs Meliadine 2015	0.323	9.8	
	Peter 2021 vs Meliadine 2015	0.135	11.8	
Thallium	Meliadine 2024 vs Atulik 2024	0.948	-6.6	
	Meliadine 2024 vs Peter 2024	< 0.001	-31.0	decrease
	Meliadine 2024 vs Meliadine 2021	0.816	-8.9	
	Meliadine 2024 vs Atulik 2021	0.975	-6.6	
	Meliadine 2024 vs Peter 2021	< 0.001	-33.5	decrease
	Meliadine 2024 vs Meliadine 2015	0.001	-22.7	decrease
	Atulik 2024 vs Peter 2024	< 0.001	-26.1	decrease
	Atulik 2024 vs Meliadine 2021	1.000	-2.4	
	Atulik 2024 vs Atulik 2021	1.000	0.0	
	Atulik 2024 vs Peter 2021	< 0.001	-28.7	decrease
	Atulik 2024 vs Meliadine 2015	0.012	-17.3	decrease

Table I2-4. Tukey post-hoc pairwise comparisons of Lake Trout muscle tissue chemistry among lakes and years (p<0.05).

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Sodium	Meliadine 2021 vs Atulik 2021	0.993	-4.2	
	Meliadine 2021 vs Peter 2021	1.000	-1.6	
	Meliadine 2021 vs Meliadine 2015	< 0.001	30.7	increase
	Meliadine 2021 vs Meliadine 97/98	0.961	5.4	
	Atulik 2021 vs Peter 2021	1.000	2.7	
	Atulik 2021 vs Meliadine 2015	< 0.001	36.4	increase
	Atulik 2021 vs Meliadine 97/98	0.691	10.0	
	Peter 2021 vs Meliadine 2015	< 0.001	32.9	increase
	Peter 2021 vs Meliadine 97/98	0.924	7.2	
	Meliadine 2015 vs Meliadine 97/98	< 0.001	-19.4	decrease
Strontium	Meliadine 2024 vs Atulik 2024	0.002	-46.6	decrease
	Meliadine 2024 vs Peter 2024	1.000	0.1	
	Meliadine 2024 vs Meliadine 2021	1.000	7.0	
	Meliadine 2024 vs Atulik 2021	0.637	-27.6	
	Meliadine 2024 vs Peter 2021	0.944	-19.0	
	Meliadine 2024 vs Meliadine 2015	1.000	-1.9	
	Meliadine 2024 vs Meliadine 97/98	0.999	-9.7	
	Atulik 2024 vs Peter 2024	< 0.001	87.4	increase
	Atulik 2024 vs Meliadine 2021	< 0.001	100.4	increase
	Atulik 2024 vs Atulik 2021	0.598	35.5	
	Atulik 2024 vs Peter 2021	0.192	51.7	
	Atulik 2024 vs Meliadine 2015	< 0.001	83.6	increase
	Atulik 2024 vs Meliadine 97/98	0.012	68.9	increase
	Peter 2024 vs Meliadine 2021	1.000	7.0	
	Peter 2024 vs Atulik 2021	0.534	-27.7	
	Peter 2024 vs Peter 2021	0.915	-19.0	
	Peter 2024 vs Meliadine 2015	1.000	-2.0	
	Peter 2024 vs Meliadine 97/98	0.997	-9.8	
	Meliadine 2021 vs Atulik 2021	0.278	-32.4	
	Meliadine 2021 vs Peter 2021	0.713	-24.3	
	Meliadine 2021 vs Meliadine 2015	0.998	-8.4	
	Meliadine 2021 vs Meliadine 97/98	0.950	-15.7	
	Atulik 2021 vs Peter 2021	0.999	12.0	
	Atulik 2021 vs Meliadine 2015	0.540	35.5	
	Atulik 2021 vs Meliadine 97/98	0.911	24.7	
	Peter 2021 vs Meliadine 2015	0.931	21.0	
	Peter 2021 vs Meliadine 97/98	0.999	11.4	
	Meliadine 2015 vs Meliadine 97/98	0.999	-8.0	
Thallium	Peter 2024 vs Meliadine 2021	< 0.001	32.1	increase
	Peter 2024 vs Atulik 2021	< 0.001	35.4	increase
	Peter 2024 vs Peter 2021	0.999	-3.5	
	Peter 2024 vs Meliadine 2015	0.410	12.0	
	Meliadine 2021 vs Atulik 2021	1.000	2.5	
	Meliadine 2021 vs Peter 2021	< 0.001	-27.0	decrease
	Meliadine 2021 vs Meliadine 2015	0.055	-15.2	
	Atulik 2021 vs Peter 2021	< 0.001	-28.8	decrease
	Atulik 2021 vs Meliadine 2015	0.076	-17.3	
	Peter 2021 vs Meliadine 2015	0.287	16.1	
Zinc	Meliadine 2024 vs Atulik 2024	0.999	-1.9	
	Meliadine 2024 vs Peter 2024	0.178	8.3	
	Meliadine 2024 vs Meliadine 2021	< 0.001	15.2	increase
	Meliadine 2024 vs Atulik 2021	0.040	11.8	increase
	Meliadine 2024 vs Peter 2021	0.018	12.8	increase
	Meliadine 2024 vs Meliadine 2015	0.043	9.5	increase
	Meliadine 2024 vs Meliadine 97/98	< 0.001	22.1	increase
	Atulik 2024 vs Peter 2024	0.010	10.4	increase
	Atulik 2024 vs Meliadine 2021	< 0.001	17.4	increase
	Atulik 2024 vs Atulik 2021	0.002	13.9	increase
	Atulik 2024 vs Peter 2021	< 0.001	14.9	increase
	Atulik 2024 vs Meliadine 2015	< 0.001	11.6	increase
	Atulik 2024 vs Meliadine 97/98	< 0.001	24.4	increase
	Peter 2024 vs Meliadine 2021	0.366	6.3	
	Peter 2024 vs Atulik 2021	0.981	3.2	
	Peter 2024 vs Peter 2021	0.924	4.1	
	Peter 2024 vs Meliadine 2015	1.000	1.1	
	Peter 2024 vs Meliadine 97/98	0.002	12.7	increase
	Meliadine 2021 vs Atulik 2021	0.984	-3.0	
	Meliadine 2021 vs Peter 2021	0.998	-2.1	
	Meliadine 2021 vs Meliadine 2015	0.522	-4.9	
	Meliadine 2021 vs Meliadine 97/98	0.495	6.0	
	Atulik 2021 vs Peter 2021	1.000	0.9	
	Atulik 2021 vs Meliadine 2015	0.998	-2.0	
	Atulik 2021 vs Meliadine 97/98	0.162	9.3	
	Peter 2021 vs Meliadine 2015	0.982	-2.9	
	Peter 2021 vs Meliadine 97/98	0.279	8.3	
	Meliadine 2015 vs Meliadine 97/98	0.002	11.5	increase

Table I2-5. Tukey post-hoc pairwise comparisons of mercury concentrations in 500 mm Lake Trout muscle tissue among lakes and years (p < 0.05).

Parameter	Pairwise Comparison	Adj p value	Effect Size	Direction
Mercury	Meliadine 2024 vs Atulik 2024	< 0.001	160.6	increase
	Meliadine 2024 vs Peter 2024	0.007	-30.7	decrease
	Meliadine 2024 vs Meliadine 2021	0.999	6.7	
	Meliadine 2024 vs Atulik 2021	< 0.001	94.2	increase
	Meliadine 2024 vs Peter 2021	0.408	27.1	
	Meliadine 2024 vs Meliadine 2015	0.976	9.9	
	Meliadine 2024 vs Meliadine 97/98	< 0.001	135.3	increase
	Atulik 2024 vs Peter 2024	< 0.001	-73.4	decrease
	Atulik 2024 vs Meliadine 2021	< 0.001	-59.1	decrease
	Atulik 2024 vs Atulik 2021	0.124	-25.5	
	Atulik 2024 vs Peter 2021	< 0.001	-51.2	decrease
	Atulik 2024 vs Meliadine 2015	< 0.001	-57.8	decrease
	Atulik 2024 vs Meliadine 97/98	0.977	-9.7	
	Peter 2024 vs Meliadine 2021	< 0.001	53.8	increase
	Peter 2024 vs Atulik 2021	< 0.001	180.1	increase
	Peter 2024 vs Peter 2021	< 0.001	83.3	increase
	Peter 2024 vs Meliadine 2015	< 0.001	58.5	increase
	Peter 2024 vs Meliadine 97/98	< 0.001	239.4	increase
	Meliadine 2021 vs Atulik 2021	< 0.001	82.0	increase
	Meliadine 2021 vs Peter 2021	0.746	19.1	
	Meliadine 2021 vs Meliadine 2015	1.000	3.0	
	Meliadine 2021 vs Meliadine 97/98	< 0.001	120.6	increase
	Atulik 2021 vs Peter 2021	0.009	-34.6	decrease
	Atulik 2021 vs Meliadine 2015	< 0.001	-43.4	decrease
	Atulik 2021 vs Meliadine 97/98	0.650	21.2	
	Peter 2021 vs Meliadine 2015	0.838	-13.5	
	Peter 2021 vs Meliadine 97/98	< 0.001	85.2	increase
	Meliadine 2015 vs Meliadine 97/98	< 0.001	114.1	increase